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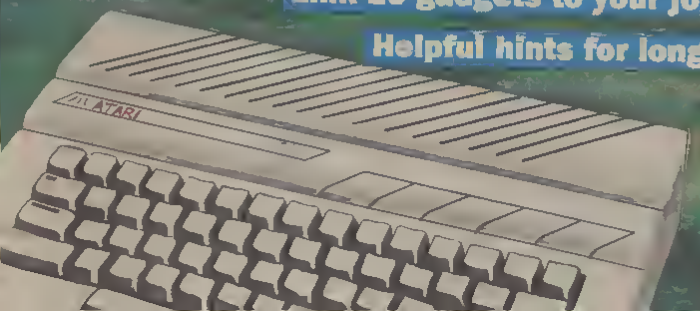
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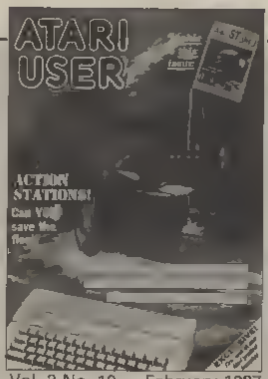
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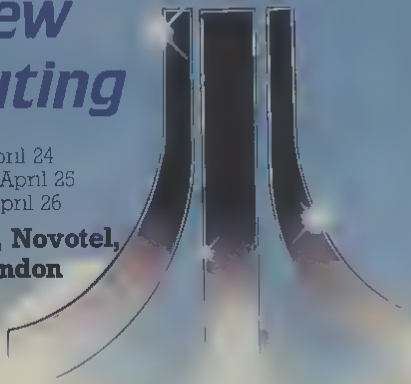
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Don't miss this launchpad for all that's new in Atari computing

ATARI COMPUTER SHOW

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

Champagne Suite, Novotel, Hammersmith, London



Experts are convinced 1987 will be the Year of Atari – thanks to exciting developments in the ST range coupled with a renewed commitment by Atari to support and encourage the ever-popular Atari 8-bit range

New hardware enhancements and hundreds of new software packages testify to how writers and developers throughout Britain and the USA are creating new ways of exploiting the power of Atari computers – and they'll all be on display at the April Atari Computer Show

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NEW ATARI MODELS ROCK MICRO WORLD

- IBM PC compatible
- Low cost laser printer
- Three new ST models

ATARI has shaken the computer industry to its foundations with the dramatic announcement of new products in three major areas of the micro marketplace.

They include an IBM PC compatible of radically new design, a revolutionary desktop publishing system with low cost laser printer, and three powerful additions to the ST series.

The Atari PC which will sell in the US for under $600 is a fully-loaded state of the art machine at a price low enough to send shudders through the ranks of competitors.

An observer at its unveiling in Las Vegas described it as "a compact and elegant system loaded with features not found on systems costing thousands of dollars more."

The unit includes a built in 5.25in disc drive, integral power supply, and detachable IBM XT-style keyboard.

A second 5.26in drive or ST-style 3.5in drive, capable of reading discs in either ST or IBM format, can be attached externally.

The machine comes with 512k of ram, expandable to 640k via sockets on the mother board. Standard serial, parallel and combination video ports – and an ST style disc port – are included.

A mouse port based on the Microsoft Import chip is built in and an ST type mouse included with the system, thereby enabling the Atari PC to run PC Gem, Microsoft Windows and mouse-based programs like Microsoft Word without adaptation.

On the graphics front Atari has somehow managed to squeeze IBM monochrome, CGA, EGA and Hercules graphics capabilities into the new PC.

It is the only PC compatible to include EGA graphics – completely downward compatible with CGA – as standard.

Atari is also bringing out a unique $200 monochrome green screen monitor for the PC that can display all its graphics modes – including the high resolution EGA colour mode – using grey scales to represent colours.

The monitor is intelligent and can recognise the frequency of signals coming from the combination video port, adjusting itself appropriately to display whatever kind of text or graphics the machine produces.

An Atari spokesman said the machine, a sleek and slimline 22 x 22 x 2in is "virtually 100 per cent compatible with existing software for the IBM PC and XT".

An observer who attended the Las Vegas launch told *Atari User*: "It's as if Atari, in one fell swoop has stepped into the leading edge in three markets – high performance workstations, desktop publishing systems and the lucrative PC compatible game.

"It's going to be the company to watch in 1987."

● For details of the Mega ST range and Atari desktop publishing system turn to Page 3 of *Atari ST User*.

TURNOVER HAS DOUBLED

ATARI has successfully silenced its critics in the USA by bouncing back into profit in a big way. In the two years since Jack Tramiel took over the helm, he has dragged the corporation back from the brink of disaster.

Now the first report to shareholders since going public last month reveals sales of $60 mill on worldwide in the last quarter. And this is more than double the turnover for the same period last year.

But more important for the American money men was the news that net income for the first nine months of 1986 was $21.5 million compared to a loss of $28.2 million to September 30, 1985.

Paul Freiberger of the influential San Francisco Examiner described the results as "the biggest surprise of the year in the personal computer industry". Nor was he stinting in his praise of chairman Jack Tramiel. "He has already accomplished more than the pundits expected", he wrote.

Now Atari is well and truly in the black. American analysts are predicted that the sky will be the limit for the company during 1987.

Latest products at Show

The next Atari Computer Show – to be held at the Novotel, Hammersmith, in April – promises to be the most exciting of them all.

As well as offering all the latest hardware and software products from UK suppliers it will provide a shop window for the stunning new machines just announced by Atari.

Last March saw the world's first ever Atari specific exhibition at the same venue. And the follow up Atari Christmas Show at the Royal Horticultural Hall, Westminster attracted close to 10,000 visitors in December.

Now the event that provides Atari's launch pad in the UK moves back to where it all started – the plush surroundings of the Novotel's Champagne Suite.

Exhibitors were queuing up after the Christmas Show to book space for April and in excess of 75 are expected to attend.

They will be bringing with them a host of new hardware and software, plus loads of bargains.

Again the show has the wholehearted support of Atari itself and the company will have a major presence.

And of course there will be every chance for visitors to talk to Atari's own experts about all the latest exciting developments – including the revolutionary Atari desktop publishing system currently being developed in the USA.

The Atari Computer Show takes place at the Novotel on Friday, Saturday and Sunday, 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 is on Page 6 of this issue of Atari User.



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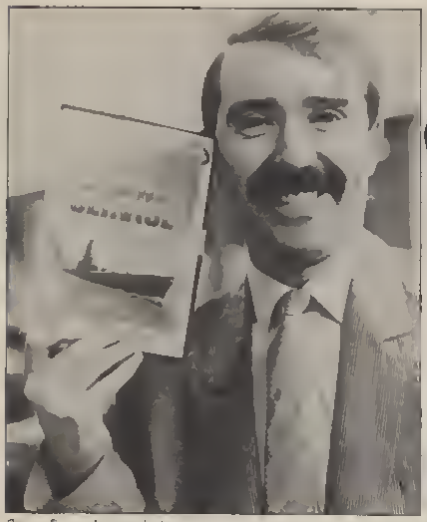
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Simon Barnard seeks top writers

Want to be a millionaire?

A SEARCH has been launched nationwide to find Atari soft ware writers with the ability to become 'millionaires almost overnight'

Men behind the hunt for ater programmers is Simon Barnard, the recently appointed development manager of MicroProse UK

He is able to offer the potential of far greater rewards than can be normally expected in the UK because ha is backed by the third largest entertainment software house in the US 'We believe that the UK hes the best software writers', he told *Atari User*

'And my job is to find them and offer them not only money but international rec ognition

Simon Barnard points to the fact that MicroProse in the States is known to spend in excess of $1 million devel oping each of its simulation blockbusters Each of these is eventually marketed not only in America but also Europe and Australasia

Royalties

Our titles literally remain at the top of the US charts for years, not just weeks like products over here , he says

And that can translate into rather a lot of royalties never mind substantial advances

'So I don't think it would be unfair to claim that if we can find someone who can write a simulation like our Silent Service for the Atari ST, they could become a millionaire almost overnight

Arcade

Although MicroProse is best known for its award-winning entertainment simu lation software Simon Barnard is not looking for writers exclusively in this area

'We would be just as happy to find writers of top quality arcade games for the Ateri , he said

MicroProse recently set up its British headquarters in the picturesque Cotswolds market town of Tetbury, Gloucestershire, the home of Prince Charles

Now it is hoping to more than emulate its success in the Atari 8 bit market in America where its titles account for more than 25 per cent of all sales

New 8 bit micro will boost market

ATARI has unveiled the prototype of a revolutionary 8 bit machine which will revitalise this sector of the UK market

With a built in cassette and priced at under £100, the micro is expected to go on sale in May

It will replace the previously announced car tridge based 7800 machine which was also scheduled for its British launch that month

The reason for this move is that Atari officials in the States have been convinced that the UK 8 bit market is still 'tape driven'

One of the arguments they accepted was that in Britain there are difficulties in producing cartridges in that they require high volume production and long lead times

So while the 7800 console may well be sold in the States, it will not now be shipped here

This is good news for the 350,000 Atari 8 bit users as it will precipitate a flood of new software titles This will prove a real injection for the 8 bit scene", says Bob Gleadow, Atari UK s general manager

It was he who brought the prototype of the new 8 bit machine from the States to show it to the British software houses

And according to early reports they have given it an enthusiastic welcome

Not that the Atari 8 bit user has in fact been ignored of late For new titles have been appearing for the machines at the rate of up to 10 a month

And the demand for devel opment kits from software houses wanting to supply the market has never diminished

'The fact of the matter is that the 8 bit scene had been ticking over quite nicely , says Bob Katz Atari UK s software development man ager ' But some users have felt a little ignored simply because most of the publicity has surrounded the ST range of late

'The point is with so many end users out there it almost becomes self perpetuating It would be very bad business for a company to ignore the Ateri 8 bit scene"

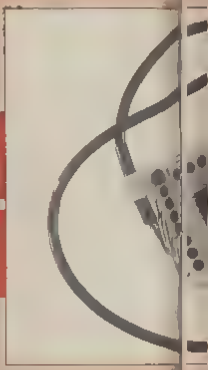
Nor is this just a company view

John Arundel, marketing manager of Silica Shop insists there has been no sign of support slipping for either the XL or XE

The 8 bit market is far from finished", he told *Aten User*, ' in fact it isn't even slowing down

And he points to his own company s current list of soft ware titles for the machines – covering 16 A4 pages of closely packed type – to demonstrate the extent of existing support

Interface to total control



Part 8 of LEN GOLDING'S series on using your Atari to control devices

HERE'S a simple interface which allows your computer to scan a large network of sensors, such as pressure mats, microswitches and thermostats. It can be used for intruder alarms, energy management systems or any other task which requires this kind of continuous monitoring.

It's based on the joystick port, which has nine pins – seven signal lines plus 5v and 0v. Five of the signal lines can detect only whether a device is on or off, but the other two can distinguish between 228 different states.

These two analog lines will accept inputs from a wide range of devices but you can't do anything very ambitious with only two lines per port. This simple interface uses a kind of electronic rotary switch to scan 16 separate devices and feed the results through a single analog line.

Figure 1 shows in simplified form how it works. Any one of 16 inputs can be connected to the common output line by setting up a binary number from 0000 to 1111 at the four control pins.

These codes represent decimal values 0 to 15 and we can send them from the joystick port by making pins 1 to 4 serve as outputs in the now familiar way.

The switch's common line is connected to the analog input at pin 9, though it could equally well go to the other one at pin 5, provided you modify the software.

The programs described use port number 2, leaving port 1 free for an output device such as the mains controller or four channel switch described in previous issues.

Information from the sensor network can therefore be used to trigger sirens, switch lights on or off, control central heating systems, water your plants, feed the goldfish or whatever.

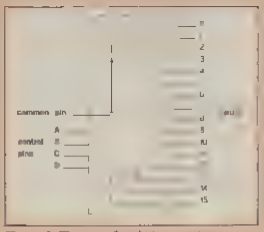


Figure 1 Theory of switch operation

Figures II and III show the printed circuit board foil pattern and component layout. It could hardly be simpler to put together. The terminal blocks account for about one quarter of the total cost and may be omitted if you don't mind soldering the various leads directly to the PCB tracks.

The 4067 chip is a CMOS device, so needs careful handling. Leave it in its packaging until you're ready to insert it and touch an earthed metal appliance before handling the chip to get rid of any static charge that may have built up on your hands.

Make sure you insert the chip the right way round and check that every one of its pins is correctly fitted into the socket. Remember the interface has to plug into joystick port 2 if you're using the software shown here.

Software is fairly straightforward and like Program I can be written in Basic. Line 10 initialises an array to hold the 16 sensor values, turns the cursor off and clears the screen.

Line 20 sets up both joystick ports for output – if you prefer to keep port 1 set for input, change the POKE 54016,255 to POKE 54016,240.

Line 30 starts a loop which steps through the numbers 0 to 15, multiplies them by 16 (because we're using port 2) and sends out the corresponding binary codes at each step.

The short delay at line 40 gives the analog reading time to settle down once a particular input has been selected.

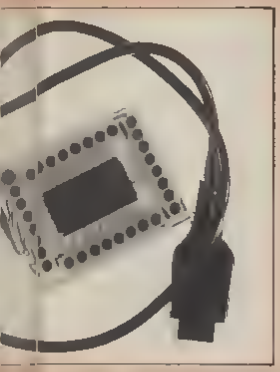
Line 50 stores the chosen sensor's value in the array, and line 60 completes the loop. Lines 70 to 90 print out all 16 values then start the process again.

Unfortunately this method is very slow. It can take a couple of seconds for a new reading to register and if you want to add any extra lines of code — to trigger a siren for example – you will have to fit them into the main loop.

This will slow things down even further and makes the program needlessly complex. It's much more elegant to use the machine code routine in Program II – which is also listed in source form as Program III.

This is inherently faster. And because it's executed during the vertical blanking interval it will run alongside your Basic program without interfering with it in any way.

The biggest advantage though, is that it synchronises precisely with the TV frame counter which also drives



the computer s analog to digital converter

With very little effort we can ensure that the chosen analog value is stable and valid by the time it is read so there's no need for any delay loop This routine updates each sensor's value about three times every second

Now let s look at a practical burglar alarm system Figure IV shows the simplest DIY layout using normally closed switches on windows and doors They are wired in series so if any is opened the circuit is broken and some kind of sensing device sounds an alarm

This approach has three drawbacks it cannot tell you which switch has been opened an enterprising burglar can easily bridge the switch terminals using a jump lead and if a fault occurs it can be very tedious to trace

Figure V shows how our gadget can overcome these problems When a switch is closed, it shorts out the resistor across its terminals leaving only 150k in circuit which returns a number around 75 at address 626

```
5 REM Len Golding  Gadgets VIII
6 REM Program I
10 DIM SENSOR(15),POKE 752,1 PRINT CHR
$(125)
20 POKE 54018,58 POKE 54016,255 POKE 5
4018,80 POKE 54016,0
30 FOR X=0 TO 15:POKE 53015,X+16 REM U
sing port 1
40 FOR N=1 TO 20 NEXT N
50 SENSOR(X)=PEEK(1026)
60 NEXT X
70 POSITION 2,2
80 FOR S=0 TO 15:PRINT #6;SENSOR(S)!"
" NEXT S
90 GOTO 30
```

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
5	7171	6	1197	10	7607
20	9297	30	9100	40	3639
50	3008	60	1175	70	2353
80	8858	90	1420		

Program I

```
5 REM Len Golding  Gadgets VIII
6 REM Program II
10 FOR K=0 TO 63:READ D:POKE 1718+K,D:
NEXT K:REM Store the machine code
20 DATA 104,169,56,141,2,211,169,245,1
41,0,211,169,64,141,2,211,169,0,141,0
30 DATA 211,141,255,6,162,6,104,269 10
9,6,32,92,228,96,174,255,6,173,2,210
40 DATA 157,210,6,232,224,10,144,7,169
,0,142 255,6 138,10,10,10,10,141,0,211
,76,95 228
50 X=USR(1718):REM New routine now exe
cuted during stage 1 vertical blank
60 POKE 752,1 PRINT CHR$(125) REM Clea
r screen
70 POSITION 2,2
80 FOR K=0 TO 15:PRINT K,PEEK(1776+K);
   " NEXT N GOTO 70 REM Print current
values for all sixteen sensors
```

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
5	7171	6	1562	10	14080
20	10178	30	10701	40	12500
50	10897	60	9375	70	2353
80	23935				

Program II

Opening the switch puts an extra 150k in series and the number goes to around 150 Cutting the wire will return 228 and bridging the switch with a jump lead will give 0

This ability to distinguish four separate states is a clear advantage and the system can easily be adapted to work with normally open switches, such as pressure mats

Figure VI shows how to wire four

```
10 COUNT =  $06FF
20 PACTL =  $D302
30 PORTB =  $D302
40 PORTA =  $D300
50 SETVBV =  $E45C
60 TABLE =  $06EE
70 SYSVBV =  $E45F
80       =  $06AE
90       PLA
0100     LDA #56      Set up joystick
0110     STA PACTL    ports for output
0120     LDA #255
0130     STA PORTA
0140     LDA #60
0150     STA PACTL
0160     LDA #0       Set all outputs
0170     STA PORTA    to zero
0180     STA COUNT
0190     LDX #VBCODE/256 Set new vector for
0200     LDY #VBCODE&255 immediate VBLANK
0210     LDA #6
0220     JSR SETVBV
0230     RTS
0240 VBCODE
0250     LDX COUNT    Get channel number
0260     LDA PORTB    Read pot value
0270     STA TABLE,X Store it in TABLE
0280     INX          Next channel?
0290     CPX #16
0300     BCC ON       Branch if (16
0310     LDX #0       Else reset to 0
0320 ON
0330     STX COUNT    Update counter
0340     TXA
0350     ASL A        Shift COUNT four
0360     ASL A        places left, to
0370     ASL A        get the binary
0380     ASL A        number 0 switch
0390     STA PORTA    to next channel
0400     JMP SYSVBV   Exit vertical blank
```

Program III Source listing for Program II

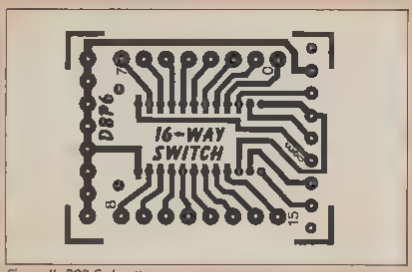


Figure II PCB Foil pattern

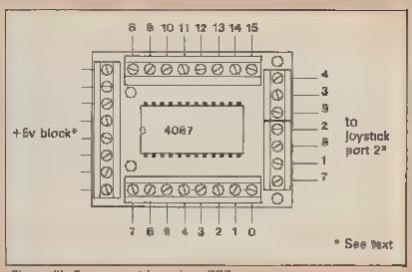


Figure III Component layout on PCB

switches within a single room – only one 5V line needs to go all the way back to the computer which saves cost and complexity

Since the switches are effectively in parallel rather than series it is easy to see which one has been activated. You can tell instantly where the intruder attempted to gain entry and trace faults very quickly

If you want to really impress the neighbours why not draw a house plan on screen with all sensors marked in colour to indicate whether they are open or closed?

The other main application for this gadget is energy management. You could use sensors to monitor individual room temperatures or keep track of lights that were (or needed to

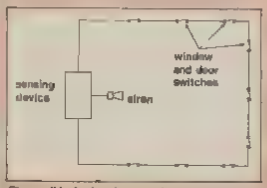


Figure IV A simple security system

be) switched on

To measure temperature, use a thermistor whose resistance at room temperature is between 100k and 400k – type VA1067 is suitable

Individual devices may vary by up to 20 per cent, so if you want accurate readings you will need to calibrate each one using a conventional room thermometer

Light levels can be measured using our friendly cadmium sulphide cell — type ORP12 works quite well. Figure VII shows how you can wire these sensors into the system, using terminal blocks

As for other uses, well, you could connect 16 keyboard switches to make

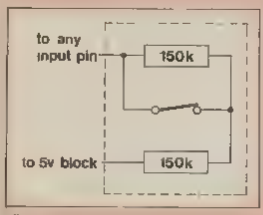


Figure V A tamper proof switch for use on doors and windows

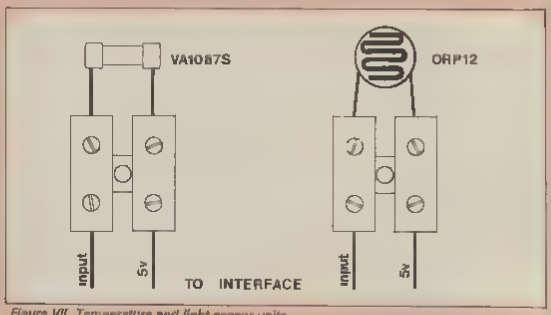


Figure VII Temperature and light sensor units

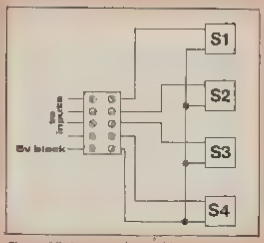


Figure VI Improved switching network

a complex signalling system (for a disabled person perhaps) and unlike the simple keypad described in part 5 this gadget will respond to more than one key at a time

How about fitting moisture sensors in the soil beside your favourite conservatory plants? A couple of stiff copper wires will do though they will tend to corrode before long. Carbon rods reclaimed from old dry batteries are better and you can solder leads directly to the brass caps

If you encase the rods in epoxy resin leaving just the ends showing, they will make a rain or flood detector which returns 228 when it's dry and between 0 and 100 when it gets wet

If you're content to use simple on/off devices you could connect the PCB common line to pin 6 at port 2 in which case the sensors status – 1' or 0' – will be returned at address 645

There's no need to allow settling down time in this case so a Basic program will work quite well

With suitable software and three interface boards you could use joystick pins 5, 6 and 9 simultaneously giving 48 inputs per port!

The gadget can even be used in reverse as an output device. Try connecting the common line through a 220 ohm resistor to 5V (joystick pin 7) and take each output through a light emitting diode to 0v (pin 8)

Numbers at the control pins will switch on one LED at a time, and there you have the basis for a wheel of fortune roulette game or bargraph display

● *That should keep you busy until next time, when we'll be looking at sound activated switches*

PARTS REQUIRED

		Maplin codes
1	4067BE analog switch IC	QW42V
1	24 pin IC socket	BL20W
3	8-way PC terminal blocks	RK38R
1	4 way PC terminal block	RK73Q
1	3 way PC terminal block	RK72P
1	Cable P clip 3/16"	LR44X

Approximate cost £5.86 with terminal blocks £3.18 without

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

All components, including the sensor devices mentioned in the text are available from

Maplin Electronic Supplies
P.O. Box 3
Rayleigh
Essex
SS6 8LR
Tel: 0702 552911

Printed circuit board (order code DBP6) available from

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The question of existence

By Brillig

HELP is at hand for David Purvis of Cardiff who has been ensnared by Infocom's Sorcerer. In fact, things are so bad that after diving down the coal chute to meet up face to face with his younger self, David soon ceases to exist!

The key to the problem is given below for David and for many others like him who are baffled by what is actually a beautifully logical puzzle. It concerns the interaction of the past, present and future, and the consequences of influencing history.

As the whole answer is impossible to give in coded form below, let me just say this:

When you (as the older self) meet your younger self, you've got to ensure that your younger self will grow up so that one day he will be the older self standing just where you are and similarly meeting his younger self!

If you don't assist the younger self he will not eventually become the older self. And that's why you, as the older self will suddenly cease to exist. Get it? You will if you go on to decode the clues below.

Can anyone help J C Bradbury of Sheffield (Glitch Master for the second month running) who wants to know how to find the correct combination to the jewel case chained to the cellar wall in Lapis Philosophorum? The number found under the desk appears to be a red herring.

He also wonders if it is possible to get past the boulder which blocks the passage near the Troll's cave.

Eric Nolan from Dublin has multiple troubles. He cannot find the grate from below ground in Zork I and although he has listened to the poem he is unable to get the plotter in Hitch Hiker's Guide to the Galaxy. Look below for a clue to Zork.

The problem in HHGG is probably one of finding the right syntax. You simply need to TYPE "BRILLIG" ON KEYBOARD (replacing Brillig by the discovered word which is random from game to game). Don't forget the quotation marks though.

Eric has contributed this month's 'For fun' tips below. Many thanks, Eric. I hope other readers will follow suit and send in their tips so that we can all get the most out of our adventures.

Scott Adam's Mystery Fun House has caused some head scratching. Ken White suggests that adventurers might welcome advice on how to get the coin from the grating since the solution is rather devious.

Mark Powell from Lewes would like to know how to ride the marry-go-round and reach the catwalk in the same adventure. Answers below. He would also like help with Morden's Quest. Has anyone got a complete solution to this one?

Both Ken and Mark have sent in some comprehensive tips for other games. Thanks to both of you.

Finally, a mention of an unusual service. Mrs Pat Winstanley of 13 Hollington Way, Wigan WN3 6LS publishes Adventure Contact, a magazine that is aimed not at adventure players but at adventure writers.

The service caters for all authors whether novice or experienced. If you're interested, why not write to Pat at the above address?

CLUES CORNER

SORCERER
Ceasing to exist in the coal bin room?
NOIT ANIBM OCEH TMIH EVIG
MOOR DETN ALSE HTOT TEGR EVEN LLIW EHES IWRE HTO
FLES REOL OEMO CEBD NACA MLOG TEGR O

ZORK I
Can't unlock the grate?
WOLE BMOR FTIK COLN U
EZAM EHTN IHTI WMOR FENS IETA RGEH T
For fun
TNES ERPT ONSI TINE HWEF INKE KATO TYRT
TNES ERPE RASE VINK HTOB NEHW EZAM EHTN IEFI
NKEK ATOT YRT
EFIN KYTS UREH TESU OTYR T

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For fun
PLEH SIHR OFMI HKNA HT
YAWR IATS GNID NIWE HTOT UOYW OLLO FRER UTNE
VDAE HTEK AM
LLEP SDAC LUKE HTTS ACNE HT

MYSTERY FUN HOUSE
Want the coin from the grating?
HCNA RBNO MUGK CITS NEHT MUGW EHC
HCNA RBHT IWNI OCTE G
Stumped by the merry go round?
PMUJ NEHT PUKO OLEL OPOG ESRO HOGY RREM OG

GLITCH OF THE MONTH

Sheffield man Jon Bradbury has found a beauty in Anolasoft's Lapis Philosophorum. The aim of this adventure is to cure the king with a potion made up of water and the philosopher's stone.

He says that if you go straight to the king with GO CASTLE and WEST, the game responds with "The King drinks the potion and is cured" and the game is over. The strange thing is that you can do this without ever having found the water or the stone!

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Simply fill in the general section and then the column which is based on the Ateri computer that you own If you own both 8 and 16 bit computers then fill in both sections

All the forms we receive will take part in e drew, end the first 25 names drawn out of the bag will each receive an *Atari User* T-shirt.

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Accessing CIO from machine code

André Willey continues his series on the Atari's input/output facilities

LAST month we took a general look at the way that the Atari operating system handles data transfer operations via the Central Input/Output system. This time we'll take a closer look at how CIO works, and see a simple example of its use from machine code

First though, how did you get on with the puzzle I left you with last time? If you remember, I gave you the following line to type in

```
OPEN #7,8,0,"P:" POKE 838,
PEEK(850) POKE 839,PEEK(851)
```

You probably noticed that everything the computer normally displays on the screen was sent to the printer instead — but why?

Well from last issue you know that IOCB zero — assigned to the screen editor — resides at location $340 (832 decimal), which means that the POKEs to 838 and 839 changed the values of IOCB0 plus 6 and IOCB0 plus 7.

If you look at Figure I you will see that these locations define the screen editor's Put Byte routine through which text is sent to the screen.

Since you also know that IOCB seven — which we OPENed to the printer — exists at $360 (944), the PEEKs to 850 and 851 return the equivalent two locations for the printer handler routines. Thus all we have done is to POKE the address of the printer's Put-Byte routine into the place where CIO expects to find the screen display Put Byte address.

We'll look in the future at how to use CIO from Basic, but let's start off by seeing how to access it from machine code. Don't be put off if you don't know anything about machine code — we'll keep it as simple as possible. All you will need to know are a couple of 6502 operations.

We will be using the three main 6502 registers, known as A, X and Y, which are really just the machine code equivalent of Basic variables.

These may be given values by using the commands LDA, LDX and LDY — short for Load A, Load X and Load Y — rather like the LET command in Basic. They may be POKEd back into memory with the store commands STA, STX and STY.

The other main command we shall use is the machine code version of GOSUB known as JSR — which simply means Jump to Subroutine.

In order to make use of CIO for yourself you must follow a set of simple steps.

First decide on the IOCB you wish to use. We'll use number one in these examples.

Then set up the various bytes within that IOCB, dependant on which function you wish to use.

Next store the IOCB number times 16 in the X register and jump to the subroutine called CIOV to execute.

Finally check the status of the operation before proceeding.

Program I is a pretty simple piece of machine code which opens channel one to the printer, sends a small message and then closes it again.

Lines 160 to 360 are used to tell the computer what names we are going to use for the various locations involved. This is known as an equates table because it equates the names we want to use with the real addresses in memory.

If you wanted to use a different channel number, simply change the address in line 160 according to Figure II. Don't forget to adjust line 500 accordingly also.

Lines 400 to 490 set up IOCB one ready to open the channel to the printer. This is the direct equivalent of the Basic command

```
OPEN #1,8,0,"P:"
```

In fact you can easily see the similarity between the two versions of the same command. The OPEN in Basic translates to the LDA #3 on line 400 since 3 is the CIO code for Open.

The #1 in Basic is the channel number which we have already defined in our equates table.

The second and third Basic parameters are always placed into ICAX1 and ICXA2, thus the values of 8 and 0 are stored there.

The final parameter in Basic is the filename — "P:" — which is actually on line 770 in the machine code program. Since a single byte can only store a number between 0 and 256, and the address of the "P:" filename is much greater than this, we have to use a special notation called low/high address storage.

This is actually very simple, and all it means is that we split the large number into two smaller byte size numbers, in much the same way as we use tens and units to represent larger numbers as two smaller digits when counting with ordinary numbers.

For example an address of $1234

Address	Label	Bytes	Description
IOCB + 0	ICHID	1	Index into HATABS
IOCB + 1	ICDNO	1	Device number (eg D1:, D2:)
IOCB + 2	ICCOM	1	Command type (eg OPEN, CLOSE)
IOCB + 3	ICSTA	1	Current Status of Device
IOCB + 4,5	ICBAL/H	2	Buffer or filespec address
IOCB + 6,7	ICPTL/H	2	Address of Put Byte routine (-1)
IOCB + 8,9	ICBLL/H	2	Buffer data length sent/returned
IOCB + 10	ICAX1	1	Auxiliary byte 1
IOCB + 11	ICAX2	1	Auxiliary byte 2
IOCB + 12	ICAX3	1	Auxiliary byte 3
IOCB + 13	ICAX4	1	Auxiliary byte 4
IOCB + 14	ICAX5	1	Auxiliary byte 5
IOCB + 15	ICAX6	1	Auxiliary byte 6

Figure I IOCB structure

IOCB Zero	$340	(832)
IOCB One	$350	(848)
IOCB Two	$360	(864)
IOCB Three	$370	(880)
IOCB Four	$3F0	(896)
IOCB Five	$390	(912)
IOCB Six	$3A0	(928)
IOCB Seven	$3B0	(944)

Figure II IOCB start addresses

would be stored as $12 in the high-byte address and $34 in the low byte address. These are often called the Most Significant Byte and the Least Significant Byte – MSB and LSB – but we'll stick to high and low for now.

All that needs to be done now is to load the X register with the channel number times 16, which is done on line 500. This may seem a little odd but if you think in hexadecimal for a moment all this means is that channel one would be $10, two would be $20 and so on up to $70 for channel seven. Sometimes looking at a problem in the computer's terms makes it very much clearer.

Once the IOCB is thus prepared, you may jump to CIOV with the JSR command. Before returning to your code, CIO will set a special switch inside the 6502 chip itself.

If the function was completed correctly this will be positive, but if there was any error it will be set to negative. Thus to test if there has been an error during the I/O operation all you need to do is perform a BMI instruction straight after your JSR. This means "Branch if Minus", and acts like an IF ... THEN GOTO command in Basic, jumping somewhere only if CIO has set up a minus code.

Should you be interested in the type of error, CIO also stores the error number in the Y register. In fact you could always check to see that the Y register contains a one – the code for no error – instead of testing for a minus.

Once the OPEN command has set up the system you may then send anything you like to it. We've chosen the simple HELLO THERE message on line 790. Note the carriage return at the end of the text because the output command we'll be using keeps sending characters until it comes to an end-of-line character, AtAscii code 155 – otherwise known as the carriage return.

As before, we use the low-high format to store the address of the message, and set the ICCOM command byte to tell CIO what we want it to do with that text.

This time we want to output a line, which is command number 9. As the X register will not have been altered since the last time we set it we can just call CIOV again, and follow it with the same error test we used earlier.

Finally store the Close command (12) in ICCOM and call CIOV again.

Now all this may seem to be an awful lot of work to go through to do what Basic does in the single command **LPRINT "HELLO THERE"**, but don't forget that there are many things that CIO is capable of that Basic does not fully support. Next time you type LPRINT just think of all the work Basic has to go through to perform that one simple task for you!

● *Next month we'll be providing a full list of these other commands and how each works. In the meantime, consider the results of the following*

OPEN #6,12+16,7,"S:"

(Hint: If ICAX1 is set to 4 for read data, and 8 for write data, what might 12 mean? And what do you think the +16 does? See what happens without it.)

```
0100 ;Example of the use of CIO to
0110 ;send "HELLO THERE" to the
printer.
0120 ;By Andrew Milley, Atari User Feb
 87
0130 ;
0140 ;Set equates for CIO addresses
0150 ;
0160 IOCB = $0350   ;Use IOCB one
0170 ;
0180 ICHID = IOCB+0
0190 ICDNO = IOCB+1
0200 ICCOM = IOCB+2
0210 ICSTA = IOCB+3
0220 ICBAL = IOCB+4
0230 ICBAH = IOCB+5
0240 ICPTL = IOCB+6
0250 ICPTH = IOCB+7
0260 ICBLL = IOCB+8
0270 ICBLH = IOCB+9
0280 ICAX1 = IOCB+10
0290 ICAX2 = IOCB+11
0300 ICAX3 = IOCB+12
0310 ICAX4 = IOCB+13
0320 ICAX5 = IOCB+14
0330 ICAX6 = IOCB+15
0340 ;
0350 CIOV = $E456   ;CIO Vector
address
0360 CR = 155       ;Carriage Return
character
0370 ;
0380 ;Open channel zero to printer
0390 ;
0400     LDA #3     ;OPEN command
0410     STA ICCOM
0420     LDA #FILE&255 ;Filespec
address low byte
0430     STA ICBAL
0440     LDA #FILE/256 ;Filespec
address high byte
0450     STA ICBAH
0460     LDA #8     ;Output mode
0470     STA ICAX1
0480     LDA #0     ;null value
0490     STA ICAX2
0500     LDX #$10   ;Set X for
channel one
0510     JSR CIOV   ;Jump to CIO
subroutine
0520     BMI ERROR  ;Test for an
error
0530     ;          If so, jump to
ERROR
0540 ;
0550 ;Tell CIO where in memory to
find message to print
0560 ;
0570     LDA #9     ;PRINT line
command
0580     STA ICCOM
0590     LDA #MESSAGE&255 ;Address of
message low byte
0600     STA ICBAL
0610     LDA #MESSAGE/256 ;Address of
message, high byte
0620     STA ICBAH
0630     JSR CIOV   ;Jump to CIO
subroutine
0640     BMI ERROR  ;Test for an
error
0650     ;          If so, jump to
ERROR
0660 ;
0670 ;Close channel one again
0680 ;
0690     LDA #12    ;CLOSE command
0700     STA ICCOM
0710     JSR CIOV   ;Jump to CIO
subroutine
0720     BMI ERROR  ;Test for an
error
0730     ;          If so, jump to
ERROR
0740 ;
0750 MORE ;         Continue your
program here...
0760 ;
0770 FILE .BYTE "P:",CR ;Filespec for
printer
0780 ;
0790 MESSAGE .BYTE "HELLO THERE",CR
;text to print
0800 ;
0810 ERROR ;        .... Comes here
if an I/O Error occurs
0820 ;
0830     .END
```

Program 1

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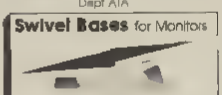
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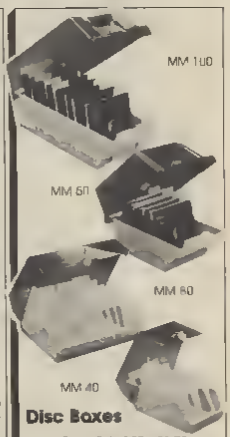
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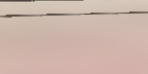
WORMY by M J TREBLE

In this small game you control a worm which works its way around the screen eating the white diamond shaped flowers. If you go back on yourself, you will die

Line breakdown

10 Draws the screen and initialises variables
20 Draws the flower and updates the score.
30 Draws the worm, reads the joystick and tests for death
40 Erases old flower
50 Prints the score at the end of the game and restarts

```
10 GRAPHICS 7 POKE 710,229:POKE 709,15
 POKE 755,0:COLOR 1:PLOT 0 0:DRAWTO 15
9,0:DRAWTO 159,75 DRAWTO 0,79 DRAWTO 0
,0 X=80 Y=40:S=0 Z=0 B=-8
20 O=0:C=INT(RND(1)*79+5):P=RND(1)*70+5 COLOR
2:PLOT O-2 P:DRAWTO O P-2 DRAWTO O+2,P
:DRAWTO O,P+2:DRAWTO O-2,P:S=S+200 ? "
Score=";S
30 COLOR 3:PLOT X,Y:T=STICK(0):E=T*(T<15)
*(T>6)*9:X=X+(E=6)-(E=10):Y=Y+(E=2)-
(E=14):D=0:LOCATE X,Y,L:IF L<>0 THEN 30
,80,40,50
40 COLOR 0:PLOT O-2 P:DRAWTO O,P-2 DRA
WTO O+2,P DRAWTO O P+2 DRAWTO O-2,P:GO
TO 20
50 GRAPHICS 17:POKE 752,1:? #6;"GAME
 OVER":POSITION 5,9:? #6;"score=";S:PU
T 2,0 TO 1000:REM I:END
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	32				

MACHINE CODE TO STRINGS from HORWARD MORGAN

THIS takes machine code routines from memory and turns them into those long strings without you having to press the control key once. The normal way for executing machine code is to use

X=USR(1536)

With machine code stored in a string such as P$, you use

X=USR(ADR(P$))

Using machine code strings means that you don't have to wait for the data to be poked in and the Atari will automatically store the machine code in free memory.
The machine code can be up to 113 bytes long. You can convert longer strings by breaking them up into sections and later recombining them using

P$(LEN(P$)+1)=Q$

where **Q$** is the second part of the routine.
Once the string is created the program will list it to disc under the chosen filename. To use cassette instead of disc you should change line 4 to

```
4 ?"POKE842,12 L ",CHR$(34) "C
 ",CHR$(34),",1,3 G 5" POS 0,0
 POKE 842,13 END
```

Line Breakdown

1 Inputs the routine's name, start address and length of the string
2 Inputs the file name and reads the machine code into the string
3 Creates a small program containing the string
4 Saves the string to disc or tape
5 Deletes the converter

```
1 CLR :DIM B$(48),P$(113),F$(12):? CHR
$(125);"String Purpose" ;:INPUT B$:? "S
tart address " ;:INPUT B ? "Bytes to re
ad "
2 INPUT #1;"D:sh fi:lename " ;:INPUT F$
:S = 1 FOR B=B TO B+B:X=PEEK(B) P$(I I)
=CHR$(X):I=I+1 NEXT B ? CHR$(125)
3 POKE 82,0 ? :? "1 REM " B$ ? "2 GOT
O 4" ? "3 POKE 842,12 L " CHR$(34),"D:" F$
4 ? "POKE 842,12 L " CHR$(34),"D " F$
CHR$(34)" 1,4";:IF S=1 THEN ? "POKE 842,
12" :POSITION 0,0:POKE 842,13 END
5 ? CHR$(125) POKE 82,0:POSITION 0 2:F
OR I=1 TO 5:? :NEXT I ? "POKE 842,12"
:POSITION 0,0:POKE 842,13 END
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	24238	2	28366	3	20791
4	10671	5	30759		

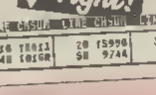
BIG TEXT from MARK GODFREY

DISPLAYING large characters on a graphics 8 screen is normally impossible, but this routine shows you how to do it. The program reads the character's definition from the character table and then POKEs this directly to the screen, blowing it up as necessary.

Line Breakdown

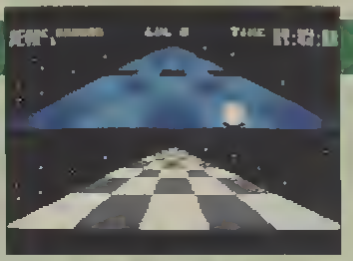
10 Gets the desired string from the user
20 Gets the desired size and begins to read the character from the table
30 Checks to see if the right hand side of the screen has been reached
40 Finds the location of the screen
50 Puts the characters on to the screen one line at a time

```
10 DIM B$(100):GRAPHICS 0:POSITION 15,
0:? "TYPE ITN!" POSITION 0 1:POKE 710,
0:INPUT B$:? "SIZE(1/16)"
20 INPUT SIZE:GRAPHICS 0:POKE 710,0:FO
R I=1 TO LEN(B$):CODE=ASC(B$(I,
I))-65:NB=112*8
30 IF I>19 THEN H=(8*40*SIZE)
40 SCRN=PEEK(88)+PEEK(89)*256+I*8*SIZE
J=0 TO 7 STEP (1/SIZE)
50 POKE SCRN+J*(40*SIZE),PEEK(NB+CODE+J)
:NEXT J:NEXT I
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	18011	20	15990	30	4707
40	10168	50	9744		

Trailing behind



Program Trailblazer
Price £8.95 (cassette)
£14.95 (disc)
Supplier Gremlin Graphics
10 Carver Street, Sheffield
S1 4SF
Tel 0742 753423

IF you want an action packed game which doesn't involve killing little green men or Russians this may be for you

The object is to keep a ball on a path of coloured squares There are holes in the path which you must steer clear of by using the ball's ability to jump and accelerate

Different coloured squares have a variety of effects Yellow squares, for instance, will cause you to bounce and purple squares reverse the left and right control

The squares are strategically placed to be a help in some places and a hindrance in others

There are 21 courses in all In the standard game you must complete each course in the fastest time possible Bonuses are awarded depending on the time remaining at the end of each round

There is a 'trail' option available in which you can select any three courses to race on with a 99 second time limit to complete each course

A two player option is also included Here the screen is split into two with player one taking the top half and player two or the computer taking the bottom

You can bump your opponent off the course as both balls are shown on each half if they are close enough

At the end of a game the bottom half of the screen is given over to a high score display

The game has been converted from the Commodore 64 and frankly it shows The Reset key isn't trapped and the Select Option and Start facilities are done with the joystick or keyboard

There is a keyboard option and you can have either two joysticks or one player on joystick and one player on keys There is no pause game facility

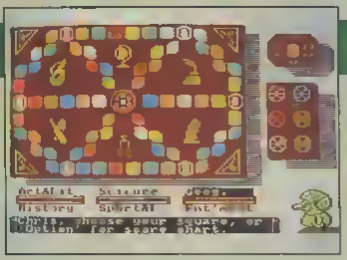
What music there is, is played only between games and is bland repetitive and tuneless

The price will prevent Trailblazer becoming a big hit If it were budget priced it would be worth it but at just under £10 it pales in comparison with Rescue on Fractalus or Star Raiders II

Rob Anthony

Sound	*5*
Graphics	*6*
Playability	*6*
Value for money	*5*
Overall	*6*

Hot pursuit



Program Trivial Pursuit
Price £14.95 (cassette)
£19.95 (disc)
Supplier Domark, 204
Worple Road, London
SW20 8FN
Tel 01 947 5624

QUIZ games come and go but Trivial Pursuit looks like being here for a long time Like Monopoly and Scrabble, it's going to be one of those games that is played time after time

This is not just a straight transposition While remaining faithful to the original Domark has used the computer to bring in new features such as sound, making Trivial Pursuit even more fun to play

The board resembles a spoked wheel around which are spread differently coloured squares, each representing a particular subject or a 'throw again' option The subjects are art & literature science geography history, entertainment and sport

Spread around the circumfarence are six wedges each of which represents one of the subjects

The aim is to move around the board in any direction gathering points by answering a question every time you land on a square

Your turn ends when you answer incorrectly But the main objective is to collect all of the six wedges first by landing on them and then correctly answering a question in that particular category

When all the wedges have been garnered, the player heads for the wheel's hub and once there must correctly answer a final question on a category chosen jointly by the other players to win the game

The screen displays the board player's tokens and status, list of categories and a masssage area plus a funny looking character called TP who will hurl a dart at the board to determine the number of squares the player may move

Selection of the square is by joystick When the square has been chosen the screen changes to show TP's living room and the question appears in a speech bubble

Some questions involve music or pictures in which case TP will switch on his radio or dim the lights and pull down a project on screen

A burning candle counts down the time allowed for your answer All you have to do is to speak it aloud – there's no typing or selection from multiple answers

More than 3,000 questions are supplied with the program

Bob Chappell

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

Moon eclipsed

Program Moonmist
Price £24.95 (Atari 8 bit or ST disc)
Supplier Infocom c/o Activision, 23 Pond Street Hampstead, London NW3 2PN
Tel 01-431 1101



WOE is me! Dress me in mourning! Something has happened that I would not have dreamed possible I have discovered an Infocom adventure that fails to satisfy

The cause of my despondency is the ease with which I completed Moonmist I started the adventure one afternoon and – shock horror – completed it by teatime

The plot is very English and concerns funny goings on at Tresylllian castle

Apparently a ghost, the White Lady has started some nightly perambulations and worse someone has attempted to kill one of the guests

You play a detective invited there by your female friend, Tamara Lynd The game commences as you pull up outside the castle gates in your sports car

Once inside and having met all the guests you can explore the castle or change for dinner

The program has a number of nice touches For example, it lets you choose your own name, including a title I couldn't resist a unique opportunity to solve the case as Lord Dimwit Flathead

If you try to arrest somebody too early in the game, you'll be told, 'Bad form Wait until after dinner"

Moonmist is quite enjoyable judged on its own merits, but suffers when compared to practically every other Infocom adventure

Because of their depth and originality these normally take most players weeks sometimes months, to unravel and complete Moonmist I'm sorry to say, is the glaring exception

To be scrupulously fair, Moonmist is specifically aimed at adult gamers new to adventures and has deliberately been made simpler than the usual run of Infocom products As an Infocom veteran it was only natural that I should find Moonmist easy meat

Then again, Wishbringer (an earlier release) was also a beginner's adventure but for my money offered yards more variety, entertainment, humour and challenge It also had very little padding symptoms of which are sadly evident in Moonmist

Having said that Moonmist is still a better adventure than many from other companies It is also as handsomely packaged playable and as bug-free as all Infocom adventures

If you're new to adventures then by all means give it a try If you're an old hand, then don't get your expectations too high Perhaps I did

Brillig

Presentation	*10*
Atmosphere	*8*
Frustration factor	*8*
Value for money	*7*
Overall	*7*

Worth an airing

Program Up Up & Away
Price £2.99
Supplier Bug Byte Victory House Leicester Place London WC2H 7NB
Tel 01-439 0666



THIS game first saw the light of day more than two years ago It was quite popular then, and although it looks dated compared with current products, it is still worth playing

If you don't recognise the title as being from an old Frank Ifield song you may not have realised that it's all about hot air ballooning

No this isn't a flight simulation but more of an arcade game

The idea is to pilot a pink balloon over and past a number of hazards You may have thought that ballooning was a safe and peaceful pastime – not so in this game

The wind is always westerly so you get blown from left to right across the screen the background scrolling smoothly away behind the balloon

As well as being able to move the balloon from left to right you can also go up by igniting the gas or hurling out sandbags or down (by releasing hot air)

There are refuelling points along the way where you can take on more gas and sand

The first hazard you'll encounter is a boy throwing stones If one hits the balloon it will pop and you'll plummet to earth

More perils lie ahead White clouds turn black and lightning fills the sky, tearing your balloon to ribbons if a flash strikes it

Kites need to be dodged and a passing seagull tries to drop something unpleasent on your balloon

A whirling windmill will suck your craft down if you're not careful and a lunatic aerobatic display flier may cause some discomfort

There are four skill levels and a practice mode The graphics are fairly simple by today's standards and although there's no music there are a few sound effects

Not bad at all but I would have thought that it could have been priced a fraction lower given its age

Bob Chappell

Sound	*6*
Graphics	*5*
Playability	*7*
Value for money	*7*
Overall	*7*

Mono moments



Program Molecule Man
Price £1.99
Supplier Mastertronic 8 Paul Street London EC2A 4JH
Tel 01 377 6880

HERE you, the Molecule Man, looking not unlike a Corona bubble having failed its fizzical are lost in the middle of a 3D maze

Your goal is to escape via the teleporter, which can be found somewhere within the 256 rooms However in order to use the teleporter you must collect 16 circuits from around the maze

At the off the clock ticks the seconds by and radiation starts gnawing away at you

Protective pills must be found quickly, or you'll be an ex bubble inside a minute They can be bought from dispensers found along the way, using money conveniently lying around on the floor though often hidden by the blocks of the maze

Taking the money you must then locate a dispenser and buy protection Your protective units increase by 20 for each coin used up to a maximum of 99

After you have attained 99 units the dispenser will still take your money but no further protection is bought

Bombs can also be bought from similar dispensers and used to blast through some parts of the maze that block your way but not all

If you are low on cash you will have to decide whether to spend on explosives or an extra lease of life Holdings of pills bombs, coins, circuits and time remaining are shown at the bottom of the screen

The graphics are nicely drawn but the game does lose out for not using colour, being drawn in white on a black background There is a large blank border, meaning that a considerable proportion of the screen remains unused which was again, a slight annoyance

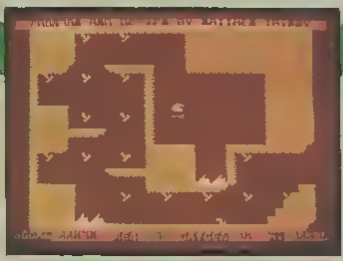
The numbers and positions of any or all of the graphic characters within the game are redefinable including your starting position Although editing the maze is easy enough if a little long winded it is a worthwhile extra

I do feel the game could be improved by the use of colour better use of sound and a more consistent pace to the play Even so Molecule Man is still very enjoyable and at under £2 better than many available at five times that price

Niels Reynolds

Sound	6
Graphics	7
Playability	8
Value for money	9
Overall	8

Logic unclear



Program Crystal Raider
Price £1.99
Supplier Mastertronic 8 Paul Street London EC2A 4JH
Tel 01 377 6880

THE card insert says this is not an arcade adventure, but a set of logic problems Well they could have fooled me

To my mind Crystal Raider is basically a platform game in which you need to collect crystals which give you extra lives

I think anyone who buys this expecting a set of logic problems may well feel disappointed although the six screen shots on the card do faithfully portray the game style

I really can't see why Mastertronic feels the need to imply Crystal Raider is something it isn't for the game is quite able to stand on its own merits

As platform games go this is a tricky one and you will have to plan your route through the screens carefully, and time your jumps well

Movements are left, right and jump the latter being maintained as long as the fire button is held down or until you hit a ceiling

Throughout the jump your Raider (who more closely resembles a portly navvy than the macho Indianna Jones character on the cassette cover) can be moved left or right whether moving upwards or downwards, and indeed this extra coordination is necessary to get through many of the screens

You can select day or night play and opt for solo or duo roles

The night game is very tricky as apart from the crystals and nasties only a small adjacent area is visible the rest of the screen being jet black

Selecting dual play, one player controls left and right movement the other times the jumps offering an opportunity for anding many a long standing friendship

The graphics are adequate though repetitive with little variation in the rooms apart from layout

Perhaps recognising this Mastertronic changes the rooms' background colour each time the Raider expires through lack of oxygen or contact with a nasty and for each new room

On the whole this is a fair variation on the platform theme If I had paid £10 for Crystal Raider I may have been disappointed, but at £1.99 this is good value for the platform fans

Niels Reynolds

Sound	7
Graphics	5
Playability	8
Value for money	8
Overall	7

Quality adventure

Program Rick Hanson
Price £14 95 (disc)
Supplier Robico Software 3 Fairland Close, Llantrisant Mid Glamorgan CF7 8HQ.
Tel 0443 227354



GENERAL Garentz is threatening to nuke the world if we don't give in to his demands And that's why I'm standing at this deserted railway station, awaiting further instructions

Rick Hanson's the name and I guess you could call me a special agent

I'm a tough no nonsense detective with a gritty determination and nerves of steel (but I just hate spiders!)

I've sniffed around a few text adventures in my time including the disc only type which is what this is, so you could say I know what I'm talking about

And what I'm talking about is quality with a capital Q which is what this one has in spades

Sure there's plenty of locations the parser's ace the response time is fast and the puzzles are neat – but that don't necessarily make it the bee's knees in my book

Where it brings home the bacon is in the quantity detail and atmosphere of the descriptions No threadbare one-liners from Robico – what they give is nothing less than fulsome and relevant prose coupled with a slick smatter of humour

So there I was at the station Being Rick Hanson, my first thought was to snoop around outside the entrance to see if I'd been followed I had

A suspicious character dodged behind a parked car, and then somewhere above, a window broke

In the time it took to look up there was the crack of gunfire and a bullet ripped through my chest, hurling me to the floor

Some you win some you lose I restarted and this time began exploring the station I found a tape recorder which told me to get my tail over to the inn in the next village where I would be contacted further about my mission which was to asssassinate Garantz

The recorder self destructed – the Chief thinks of everything Pity I was holding it at the time This was not turning out to be my lucky day

Once more into the breach, I just had to find some way out of this station A goods train passing under the bridge offered distinct possibilities and apart from a fracas with the guard, I had no more trouble until I reached the village outskirts

There was plenty to explore here and it seemed my task had barely begun

One final interesting point, I've never before been sent on an assignment where one of the ways you can get yourself killed is by sneezing yourself to death!

Robico promises two more Rick Hanson adventures in the future They'd better hurry up or I might just have to visit them with a small helping of knuckle pie

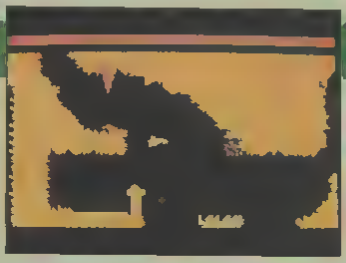
This is one wowser of an adventure so good that Level 9 had better hold tight to its laurels Here's looking at you kid

Bob Chappell

Presentation	*9*
Atmosphere	*9*
Playability	*9*
Value for money	*9*
Overall	*9*

Kamikaze caverns

Program Caverns of Eriban
Price £2 99
Publisher Firebird Wellington House Upper St Martin's Lane London WC2H 9DL
Tel 01-379 6755



THE object of this game is to refuel a whole series of underground mining installations using supplies obtained from surface supply stations

However this task is not as easy as it first appears, since each mine is protected by vicious defences which include falling water droplets kamikaze space ships and fireballs

Further difficulties are placed in your path in that your ship has limited fuel which must be replenished on the surface

Your manouevring has to be very precise since being a mere one pixel out can cause the destruction of your ship

You can carry up to five supply loads and each surface supply station holds only this number Each mine needs a load, indicating this by a flashing beacon To either leave or collect supplies, you must land on the yellow landing strip that forms part of every mine and supply station

A strange sort of pseudo gravity affects your steering, causing numerous crashes against the sides of the caverns On later levels reverse gravity appears, making manouevring even more difficult.

Fortunately you are given seven ships to play with as it is very easy to lose them

The graphics are well drawn but when moving at speed through the caverns the scrolling is slow and jerky

An interesting budget game let down by overly difficult play

Stephen Foster

Sound	*3*
Graphics	*7*
Playability	*5*
Value for money	*7*
Overall	*6*

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NEWSLETTER

For sale

PEOPLE at the Ford Motor Company have discovered a new "showroom" for selling their cars – MicroLink

Bob Hancox, a process engineer at Ford's Dagenham plant, used MicroLink to advertise his own Y registration Fiesta when he recently moved to a job which qualified him for a company car

He knows all about the system's speed and efficiency through his regular telex and telemessage contacts with other engineers in the US and Europe

And Bob is also familiar with MicroLink's ability to reach a wide audience, having previously used the bulletin board to successfully advertise a music centre and a camera

After swiftly disposing of the £3,700 diamond white Fiesta XR2, Bob said "MicroLink is the best system of its kind without a doubt'

Computers, comms and the clergy

CHURCH of Scotland minister Martin McKean's days are spent in the quiet old market town of Cumnock in the farming county of Ayrshire, an area which hasn't seen much excitement since the days of the Covenanters

But in the evenings the world is his playground thanks to MicroLink.

"Computing has been my hobby and relaxation since schooldays", he said ' MicroLink lets me see what's going on elsewhere in the field of computer communications"

Martin has already had a good browse around the giant American database Mnemonics which was coupled to the MicroLink system recently

"I was disappointed at not finding a section on religion – it seemed to cover just about everything else", he said

"I'd like to see a section on MicroLink for clergy man like myself to share news, views and ideas for sermons – and to discuss our shared interests in computers and communications

"I am already communicating regularly with a Roman Catholic priest in Manchester via MicroLink and I'd be delighted to hear from other clergy on MAG 30319"

TELEX FOR KIPPERS

FOR five years the Shetland Smokehouse on the island of Skeld has been supplying salmon, Shetland lamb silver eel – and of course kippers – to a mainly local market

But a recent major expansion has boosted production, which means there's quantity as well as quality now to meet demand from the mainland

Managing director David Hammond said "As an expanding business entering new markets we have to be competitive

' in business you have to get things down in black and white or risk making mistakes – the telephone just won't do

Letters take about five days and it's extremely difficult to get a dedicated telex line installed in an isolated place like Skeld

"But with MicroLink we have immediate access to telex links with our clients and, as a bonus an entry to all kinds of fascinating databases which could be useful for marketing purposes"

Shop electronic

MICROLINK has started yet another great consumer service for home computer owners

Shop Window is Britain's latest, and could become the biggest, computerised shopping service – a convenient 24 hours a day, seven days a week electronic emporium

It provides the opportunity to do your shopping without leaving the comfort of your fireside

And while other teleshopping services restrict themselves to a limited range of products like groceries or household goods, there are no such constraints on Shop Window

Although its initial catalogue of companies is mainly concerned with computer products it will grow to eventually include all manner of goods and services on a nationwide basis

There are even classified "exchange and mart" type sections for bargain hunters

And its motto from day one has been "Top brands at lowest-ever prices"

On the road

AS RAC services manager for Yorkshire, Danny Finney covers the organisation's biggest geographical area – North Humberside, South and West and North Yorks and Cleveland

His department is responsible for road patrols, directional and warning signs, motorway service centres, the RAC base garage and emergency control room

Naturally he can use all the help he can get, which is where MicroLink comes in Danny is using the system's electronic mail facility to tell Yorkshire folk all about the RAC's famous road sign service for special events

These are the familiar blue and-white pointers to the best routes for getting to and from everything, from the local church fete to the Lombard RAC Rally

Danny wants everyone to know that signposting an event only costs on average £72 – even though it involves expert input from the RAC professionals, police and relevant local authority

YOUR chance to join MicroLink – turn to Page 8

DESTROYER

By K.P. Middleton



DUST off your admiral's cap and uniform for a sea battle against your Atari. Destroyer puts you in command of a fleet of war ships which must be protected while you try to destroy the computer's craft.

The game starts by asking you how many ships should be in each fleet and then battle commences on two grids set side by side on the screen.

The squares where you have fired shots are clearly shown on the computer's grid while the positions of your ships are shown on your own.

You cannot see where the computer's ships are – and it cannot see yours. At least that's what it claims. You should check the listing carefully to make sure that your computer isn't cheating!

The Atari gives itself one more ship than you, but to make up for this you have a special salvo of missiles which destroys everything on the target square and the eight squares surrounding it.

The battle continues until one side has destroyed all the ships in the opposing fleet.

Each section of the program is well documented with REM statements so you can follow the flow with ease. See the accompanying chart for the program breakdown.

Once you have typed in the game, don't forget to save a copy on disc or tape before you run it.

And if you have any problems typing it in, don't forget to use our Get It Right! checksum program (which can be found in the August 1986 issue of *Atari User*).

Alternatively you can download Destroyers from MicroLink where all our monthly games and programs can be found.

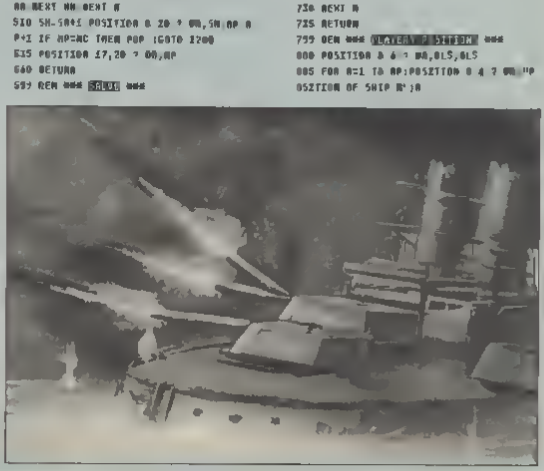
Line breakdown

1-30	Initialises the progam and sets up the variables
35-50	The main loop which calls the computer shots and player shots routines
99-265	The computer's shot routine
299-540	The player's shot routine
599-670	Fire the special salvo of missiles
699-735	Calculate random positions for the computer's ships
799-875	Get the player's ships' positions
899-950	Sets up the main screen
999-1050	Shows the computer's ships when it wins
1099-1130	Plays the computer's winning tune
1199-1225	Offers you another game when you win
1249-1310	Plays the player's winning tune
2000-2090	Displays the instructions
2100-2150	Redefines the character set

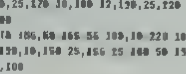
```
1 REM ********************
2 REM *   BESTBUYERS     *
3 REM *       by         *
4 REM * K R P M.Adlerton *
5 REM *       for        *
6 REM *   ATARI USER     *
7 REM *     (c) 1987     *
8 REM ********************
9 REM
10 GOSUB 2000:REM ** INITIALIZE **
15 GRAPHICS 17:SETCOLOR 0,7,10:SETCOLO
R 1,11,10 SETCOLOR 2,7,2 SETCOLOR 3,1,
4:SETCOLOR 4,7,2
20 MOVE 756,PEEK(106)-2:POKE 16,08 POKE
 53774,64
25 SV=1 SW=0 AP=0 AC=-8:BL=PEEK(560)+25
6*PEEK(561)
30 GOSUB 900 GOSUB 800 GOSUB 700
35 REM *** MAIN LOOP ***
40 GOSUB 100 REM ** COMPUTER'S SHOT **
45 GOSUB 300:REM ** PLOTTER'S SHOT **
50 GOTO 40
99 REM *** COMPUTER'S SHOT ***
100 X=INT(ABS(10*A)+65 Y INT(ABS(10*A)+
1
105 CSR A-56,CSY-Y+8 LOCATE CSR,CSY Z
110 IF Z-A5 OR Z-25 THEN GOTO 180
115 POSITION 0 6:? 00)"FIRING MISSILE
  "
120 FOR N=0 TO 165 SOUND 0 N,14,6:NEXT
 N SOUND 0,0 0 0
125 IF Z=(22 THEN GOSUB 250 REM MISS
130 POSITION 0 4 ? 00;"MY SHOT   " CHR
$(N) " " CHR$(Y+40),"        "
140 FOR N=1 TO 500:NEXT N.POSITION 0 4
 ? 00 015
145 RETURN
200 POSITION 0,4 ? 06;"HIT !!!
    "
205 POSITION CSR,CSY ? 00;CHR$(28)1
210 FOR N 6 TO 20:POKE DL+N,10:NEXT N
215 FOR N 15 TO 0 STEP -1 FOR NN=0 TO
16 SOUND 0 70,0 0 SOUND 1 150,1,8:POKE
 54277,NN NEXT NN
220 FOR NN=14 TO 0 STEP -1:POKE 54277
NN @EXT NN @EXT N
225 NC=NC+1 IF NC=AP THEN POP :POP :GO
TO 1000
230 RETURN
250 POSITION 0,4 ? 06  MISSED
    "
255 POSITION CSR,CSY ? 06 CHR$(00)
260 FOR N 6 TO 0 STEP -1 SOUND 0,1 0
,2*(N/10)+10 SOUND 1 5 0 INT(6/10) NEXT
 N
265 RETURN
293 REM *** PLAYER'S SHOT ***
300 POSITION 0 0 ? 06;"YOUR SHOT
    " POSITION 12,4
305 CLOSE #1 OPEN #1 4 0,"K:"
310 GET #1 X IF X(65 OR X)72 THEN 310
315 ? 00;CHR$(X);","
320 GET #1 Y IF Y-176 THEN GOTO 190
325 IF Y(49 OR Y)57 THEN 350
330 ? 00,CHR$(12),
335 GET #1,Z IF Z=100 THEN GOTO 350
340 IF Z=87 SOO SV=1 THEN GOTO 600
345 IF Z=176 THEN GOTO 380
350 POSITION 0,6 ? 00;"FIRING MISSILE
    "FOR N=0 TO 256*SOUND 0,N,14,01N
EXT N:SOUND 0 0,0,0
355 FOR N=1 TO NC:IF N-XC(N) 640 Y 46=
YC(N) THEN POP :GOTO 600:REM HIT
360 NEXT N
365 POSITION 0,6:? 00,"MISSED
    " AP=N-60 YP=Z-48
370 LOCATE AP YP,Z:IF Z()81 THEN SW=SW
+1 POSITION 0,20 ? 00 SW:FOR N 1 TO 10
0 NEXT N RETURN
375 POSITION AP YP ? 06,CHR$(80)
380 FOR N 100 TO 0 STEP -1 SOUND 0,1 0
,INT(N/10) SOUND 1,5,0 INT(N/10) NEXT
N
385 SW=SW+1 POSITION 0 20 ? 00,SW
390 RETURN
400 LOCATE XP-64,YP+8,Z IF Z()81 THEN
FOR L=1 TO 100 NEXT L RETURN
405 POSITION 0,4 ? 00,"HIT !!!
    ":POSITION XP-66,YP+8 ? 00,CHR$(Z
501
410 FOR N=6 TO 20 POKE 9L+N,10 NEXT N
415 FOR F=15 TO 0 STEP -1 FOR L=0 TO 1
4 SOUND 0,70,0 F SOUND 1 150,1,F POKE
54277 L NEXT L
420 FOR L 14 TO 0 STEP -1 POKE 54277,L
:NEXT L NEXT F
425 AP=AP+1:POSITION 17 20 ? 00 AP
430 IF AP AC THEN POP :POP  GOTO 1200
435 RETURN
500 LOCATE X-64,Y-60,Z IF Z()81 THEN P
00 N=1 TO 100 NEXT N RETURN
505 POSITION 0,4:? 00;"HIT !!!
    "
510 POSITION X-64 Y-48 ? 00 CHR$(250)
515 FOR N=6 TO 20 POKE DL+N 10 NEXT N
520 FOR N=15 TO 0 STEP -1 POKE 00 0 TO
16 SOUND 0 70,0 A SOUND 1 150 X N-POKE
 54277 AR NEXT AR
525 FOR 00 X4 TO 0 STEP -1 POKE 54277,
AR NEXT NN @ENT N
530 SW=SW+1 POSITION 0 20 ? 00,SW AP A
P+1 IF AP=AC THEN POP :GOTO 1200
535 POSITION 17,20 ? 00,AP
540 RETURN
599 REM *** SAVE ***
600 IF X(66 OR X)71 OR Y(50 OR Y)56 TH
EN GOTO 180
605 FOR N=0 TO 765 SOUND 0 N,14,6 NEXT
 N SOUND 0,0,0,0
610 FOR YP=Y-49 TO Y-47
615 FOR XP=X I TO X+1
620 FOR N=1 TO NC IF XP XC(N) AND YP=Y
C(N) THEN GOSUB 400:REM HIT
625 NEXT N
630 LOCATE XP-64,YP+8,Z IF Z()81 THEN
GOTO 650
635 POSITION 0 6:? 00,"MISSED
    "
640 POSITION AP-60 YP+8 ? 00,CHR$(80)
645 FOR A=100 TO 0 STEP -1 SOUND 0,1,0
,INT(A/10):SOUND 1,5,0,INT(A/10) NEXT
A:SOUND 0,0 0,0
650 SW SW+1 POSITION 0 20 ? 06;SW
655 NEXT XP
660 NEXT YP
665 SV=0 POSITION 11 21 ? 00 SV
```

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

```
670 RETURN
699 REM *** COMPUTER'S FOLLICONE ***
700 AC AP+1
705 FOR N=1 TO NC:AC(N)=INT(RND(0)*91+
65 YC(N)=INT(RND(0)*91+1:NEXT N
710 FOR N=1 TO NC
715 FOR L=N+1 TO NC:IF L)AC THEN L=AC:
GOTO 725
730 IF XC(N)=XC(L) AND YC(N)=YC(L) THE
N POP :POP :GOTO 705
725 NEXT L
730 NEXT N
735 RETURN
799 REM *** PLAYER'S POSITION ***
800 POSITION 0 6:? 00,BL$,BL$
805 FOR N=1 TO AP:POSITION 0 4 ? 00;"P
OSITION OF SHIP N";N
```



```
010 POSITION 0 5 CLOSE #1 OPEN #1 4 0,
"K "
015 GET #1,X IF X(85 OR X)73 THEN 010
020 ? #3;CHR$(X),",";
025 GET #1,Y IF Y=126 THEN POSITION 0,
5 ? #3;"   "GOTO 010
030 IF Y(42 OR Y)57 THEN 025
035 ? #6;CHR$(Y)
040 GET #1,Z:IF Z=125 THEN POSITION 0,
5:? #6;"   "GOTO 010
046 IF Z()155 THEN 040
050 LOCATE R-54,Y-40,Z IF Z()81 THEN 5
40
055 POSITION R-54,Y-40:? #6;CHR$(122)
060 POSITION 0,5 ? #6;"   "
065 NEXT R
070 POSITION 0,4 ? #6;BL$
075 RETURN
099 REM AND SET UP SCREEN ***
100 ? #6;CHR$(125)"POSITION 5,1 ? #6;"
destroyers" POSITION 1,8:? #6 "ABCDEFG
HI ANCDEFGHA"
105 CLOSE #1 OPEN #1,4,0,"K:"
110 FOR R=7 TO 17 POSITION 0,R:? #6,R-
8;"#####AHHH" R-8 "#####AHHG":NEXT R
115 POSITION 2,20 ? #6;"shots=";R  hits
=0" POSITION 2 22:? #6;"enter-1"
120 POSITION 0 4:? #6;"ENTER NO  OF SH
IPS  (1-8)   "
125 GET #1,NP:IF NP(49 OR NP)56 THEN 2
25
130 POSITION 9,5:? #6;CHR$(9)
135 SET #1,2:IF Z=125 THEN POSITION 8,
5:? #6;"  "GOTO 135
140 IF Z()155 THEN 335
145 OP NP-48
150 RETURN
199 REM *** COMPUTER MOVE ***
1000 POSITION 0 4:? #6,"I'VE HAD !!!
      GOSUB 1100
1005 POSITION 0,0:? #6  MORE ONE MY SH
IPS  "
1010 FOR N=1 TO NC
1015 LOCATE XC(N)-54,YC(N)+8,Z IF Z=25
0 THEN 1020
1020 POSITION AC(0) 84,YC(0)+61:? #6;CH
R$(122)
1025 NEXT N
1030 FOR Q=1 TO 1000 NEXT Q
1035 POSITION 0,5 ? #6 "ANOTHER SOMET
IME" ? GET #1,Z
1040 IF Z=89 THEN GOTO 15
1045 IF Z()78 THEN 1035
1050 END
1099 REM *** COMPUTER MOVE TIME ***
1100 RESTORE 1110
1105 READ A,B,C,D:SOUND 1 A,B,C,D
0:SOUND 1 0,0,0 RETURN
1110 SOUND 0,N,10,7 SOUND 1,N+4,10,7
1115 FOR F=1 TO 0 NEXT F
1120 SOUND 0,0,0 0:SOUND 1 0,0,0
1125 GOTO 1105
1130 DATA 100,75,100 25,170 25 170,25
0,25 100,25,170 30,100 12,130,25,120 2
5 212,100
1135 DATA 106,80 106 56 100,10 220 10
156 10 130,10,150 25,156 25 100 50 150
,50 121,100
1140 DATA 229,0
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	1114	2	1422	3	1809
4	1727	5	1105	6	1354
7	1127	8	1114	9	107
10	2039	15	6220	20	2501
26	2268	28	1342	35	1462
40	2104	46	2136	50	430
99	1534	100	2284	105	2408
110	1945	116	1469	120	1200
125	2468	130	1615	135	3594
140	2018	145	569	200	2137
205	3057	210	2117	215	5725
220	3425	225	1740	230	585
250	2270	256	2056	260	4644
265	585	299	2411	300	1364
305	1814	310	2003	315	592
320	1991	325	1540	330	4041
336	2002	340	1972	345	1436
350	5007	355	8761	360	479
365	1359	370	5977	376	1310
380	4044	385	1750	390	565
400	4258	405	4300	410	2199
415	5445	420	3167	425	1920
430	2330	435	565	500	4140
505	2401	510	2100	515	1425
520	5726	525	2425	530	4490
535	1450	540	565	595	1800
600	2096	605	2105	610	1296
615	1164	620	4495	625	479
630	2842	635	2270	640	2175
645	5492	650	1958	656	522
660	557	665	1924	670	666
675	5501	700	5011	705	4191
710	8966	715	2876	720	3549
725	827	730	472	735	565
772	4162	800	1629	805	3619
810	2414	815	2091	820	992
825	1401	830	1550	835	738
840	1401	845	1152	860	2215
865	1092	950	4410	865	473
870	1173	875	665	895	3261
900	5974	905	1511	910	4933
915	4713	920	3065	925	1721
930	1721	935	3305	940	1157
945	607	950	565	955	1544
1000	2357	1005	1627	1010	895
1015	2738	1020	2525	1025	872
1030	1456	1035	1158	1040	1346
1045	1151	1050	234	1055	4156
1100	845	1105	3620	1110	4546
1115	1109	1120	1670	1125	606
1130	4546	1199	2595	1200	4856
1205	2079	1210	1154	1215	1545
1220	1146	1225	294	1249	3685
1250	844	1255	1051	1260	2027
1265	11097	1270	1670	1275	612
1280	4260	1285	4157	1310	540
1900	1478	2005	4203	2010	4664
2015	1311	2020	7310	2025	7548
2030	7438	2035	8321	2040	8112
2045	7410	2042	1604	2047	4040
2045	7204	2050	6041	2055	7870
2060	7902	2065	91217	2070	9106
2075	7524	2080	7224	2085	7106
2090	754	2100	2654	2110	3360
2115	967	2120	4659	2125	5052
2130	4860	2135	4157	2140	9630
2145	1900	2150	1359		

```
1900 GOM XC(2) YC(2),BL$(20):BL$="
                                  "

2005 POKE 82 0 POKE 106,PEEK(106) 4 GR
APHICS 0 SETCOLOR 2 7 1 POKE 752 1
2010 ? "  "                    DESTROYERS
                                    by
2015 ?                    R P Middleton
2020 ?  ?  ?      the object of the ga
me is to sink  all the computers ship
s before all yours',
2025 ? 'have been sunk  This is not as
 easy as  it sounds because the comput
er always'
2030 ? "has one more ship than you hav
e and it  will never fire in the same
position"
2035 ? "twice "  1  ? "     To make up f
or this  you have a     salvo which we
ans you can fire a cluster"
2040 ? "of 9 shots at once  but you ca
n only use this once in any game " ?
2041 ?  ? "     PRESS ANY KEY FOR IN T
RUCTIONS" POKE 764 255
2042 IF PEEK(764)=255 THEN 2042
2043 ? CHR$(125) POSITION 1,0:? "  CON
TROLS  :?
2045 ? '     When the game starts, you
 will be   asked how many ships you wan
t in this'
2050 ? "game  You can choose from 1 to
 8, but   remember, whatever you choos
e the"
2055 ? "computer has one more "  ?  ? "
     Next you must position your ships
on the grid  To do this simply press a "
2059 ? "letter  then a number and pres
s RETURN  A ship will be placed in the
 chosen'
2065 ? "position and you are then aske
d to place your next ship  When you hav
e positioned"
2070 ? "all your ships the computer wi
ll start  the game " ?
2075 ?     To fire you use the same m
ethod as  positioning your ships  To u
se the salvo"
2080 ? "press  5' instead of RETURN  9
 shots are fired centred around your co
-ordinates ' ?
2085 ? "     PLEASE WAIT, REDEFINING CHA
RACTERS"
2089 POKE 764,255
2100 CSET=PEEK(755)*256 GOMSET 256*PEE
K(106)
2110 FOR A=0 TO 1023 POKE GAMSET+A PEE
K(CSET+A):NEXT A
2115 RESTORE 2115
2120 Z=GAMSET+8*(ASC("A")-7) READ D
 POKE Z+A D NEXT A:REM MAKES
2125 Z=GAMSET+8*(ASC("H")-7) READ D
 POKE Z+A D NEXT A:REM MAKES
2130 Z=GAMSET+8*(ASC("G")-7) READ D
:POKE Z+A,D NEXT A:REM MAKES
2135 DATA 48,72 132 1 48 72 132 1,48 1
 8 84 204 170 187 126 9,8 8 60 24 255 1
26 0 0
2140 ? CHR$(125);"     PRESS ANY K
EY TO START"      : POKE 764 255
2145 IF PEEK(764)=255 THEN 2145
2150 POKE 764,255:RETURN
```

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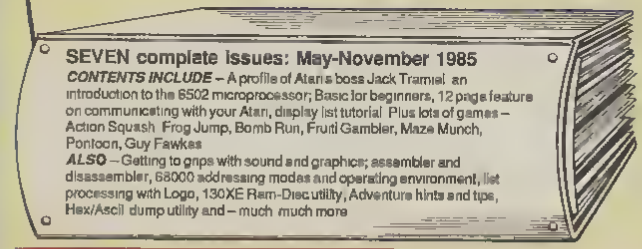
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TO ORDER TURN TO THE FORM ON PAGE 49

KNOW YOUR NYBBLES . . .

AS an aid to those of you who are new to computing or *Atari User*, we have collected together explanations of some of the terms which we often use in the magazine.

A

Ascii Stands for American Standard Code for Information Interchange It is a way of representing letters and digits inside the computer Atari s own brand of Ascii for the 8 bit range is called Atari Ascii or ATAscii

ANTIC The name of the 8 bit Atari graphics chip which generates display list interrupts.

Assembler A program which translates assembly language instructions into machine code

B

Bank switching This method used on the 800XL and 130XE to switch in and out various banks of memory so that the CPU can have access to more memory than it would normally be able to handle

Basic Beginners All Purpose Symbolic Instruction Code is the computer language which comes with your Atari It is one of the easiest to learn

Bit Another name for a binary digit One digit in binary can hold either a one or a zero

Bug A small error in a program which causes it to crash or work incorrectly

Byte Made up of eight bits

C

Cassette Stores programs and data from your Atari It is far slower than a disc

Chip An integrated circuit which can hold information or control some of the operation of your computer

Compiler Turns a program written in a language such as Basic into machine code

CPU The Central Processing Unit is the main chip inside of a computer which is responsible for its computing capabilities such as mathematics and decision making

Crash Your Atari may crash when it encounters a bug in a program A crash might fill the screen with gibberish or freeze the keyboard Crashes can always be cured by turning the computer off and then on again

Cursor The small square on the screen which you move using the arrow keys

D

Data Information that the computer operates on

Debug To remove the bugs from a program

DLI Display List Interrupts enable you to design the way that your Atari builds its display screen Using DLIs it is possible to have up to 256 colours on the screen at once and to mix screen resolutions

DOS The computer s Disc Operating System which allows the use of commands to manipulate data stored on the disc

Download When you download a program you receive that program via a cable or telephone line from another computer

E

Eight bit When we refer to the older Ataris , such as the 800XL, as 8 bit computers we mean that the largest amount of memory that they can move in one operation is eight bits or one byte

F

Floppy disc A flat piece of magnetic media on which programs and data can be stored using a disc drive Discs are far faster than cassettes and can hold more information

G

Get It Right! When you type in a listing from the pages of *Atari User*, you will find a strange looking table of numbers next to the listing This table is produced by our checksum program Get It Right! A checksum is the sum of all the characters in a line of program

When you have finished typing in a listing you pass it through Get It Right! and it produces a checksum table You then check each entry in the table against the one in the magazine, and if it matches you have typed that line in correctly

Any difference in the sums and the line is incorrect and must be retyped Get It Right! was last published in the August 1986 issue of *Atari User*

Graphics mode A method of describing how a screen is displayed A change in graphics mode might affect character size the resolution or the number of colours available

GTIA The Graphics Television Interface Adapter is a chip which controls graphic modes 9, 10 and 11 and Player Missile Graphics

H

Hard disc A sealed disc drive which is free from dust and is far faster and can hold much more information than a floppy disc

Hex Short for hexadecimal which refers to numbers in base 16

I

I/O An abbreviation for Input/Output which refers to the exchange of information between the computer and its peripherals

K

Kilobyte Often written as k a kilobyte is 1024 bytes of memory

L

Language Computers can be programmed in a variety of languages including Basic, Pascal Forth and machine code

M

Machine code The computer s natural language and the one that it runs fastest

Megebyte A megebyte is made up of 1024k or 1,048 576 bytes of memory

Modem Short for MODulate/DEModulate A modem is a small box which allows you to attach your Atari to the phone lines to communicate with distant information services such as MicroLink and bulletin boards

Monitor A monitor is a high quality display screen for your Atari

N

Nybble A nybble is made up of four bits or half a byte

P

Parallel A method of transferring

→

Glossary

data between a computer and a peripheral in which data is sent along several wires so that entire bytes can be transmitted together rather than one bit at a time

Peripheral An external device which plugs into the computer Peripherals include disc drives printers and modems

PIA The chip responsible for control of joysticks and bank switching on XLs and XEs

Pixel One dot on the screen

Pleyer/Missile Graphics Atari's own version of sprites — special graphics shapes which can be moved around the screen quickly and smoothly

POKEY This chip handles serial input and output and the sound channels

Port A name for the socket into which you plug peripherals

Printer A peripheral which prints out program listings and documents on to paper

Program A set of instructions for the Atari to perform

R

Return-Key mode Automates the Atari's program editor so that you don t have to press Return at the end of every line

Rom Read Only Memory is the type of memory which stores the programs which allow your Atari to function When you enter a Basic line or press a cursor key, programs interpret what you are doing and control the Atari

These are the programs which are stored in rom Although you can look at the contents of rom you cannot alter it — hence its name The information stored in rom is permanent and is not lost when the computer's power is turned off

Ram Random Access Memory is the part of your Atari's memory which stores your programs and their date You can not only look at the contents of this memory, but alter them as well

Ram is called random access because you can look anywhere in ram and don't have to start at the beginning The contents of ram are lost when you turn off your Atari

Resolution A method of describing the number of pixels on the screen A resolution of 320 by 200 means a screen made up of 320 pixels horizontally and 200 pixels vertically

68000 The 16 bit CPU inside the ST models

6502 The 8 bit CPU which controls the older Atari models such as the 800XL and 130XE

16 bit We often refer to the STs as being 16 bit computers This means that the largest amount of memory that they can move in one operation is 16 bits or two bytes

S

Serial A method of communication between the computer and a peripheral in which bits are sent one at a time down a wire

Statement A single computer instruction

T

Touch tablet Also called a graphics tablet this is a device which allows you to input information, such as sketches, into drawing programs

U

Upload When you upload text or a program, you send that text or program via a cable or telephone line to another computer ■

STORT SOFT

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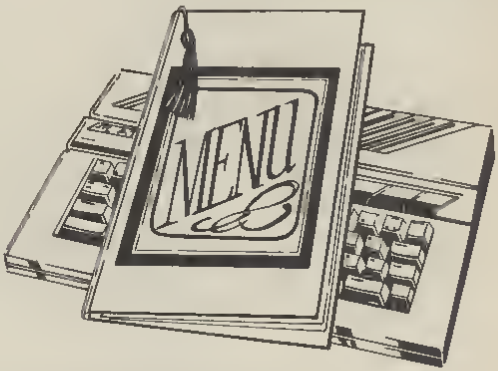
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MENU MAKER



MARK COCKER presents a versatile utility that will banish all those long loading commands

IF you're tired of typing in all those long commands to load and run your favourite Basic or machine code programs then this is the utility for you!

File Menu II is an autorun menu for your discs. A menu of the programs on the disc is shown and you make your choice with the joystick keyboard or by using the Option, Select and Start keys.

It can automatically load three different types of files – saved Basic, listed Basic and machine code – thus making it one of the most versatile menu programs available.

The program detects which type of file is being loaded by reading in the first two bytes of the file before loading it.

If these two numbers are both 255, then File Menu II opens the file and calls Dos vector 5576 using the USR function, and then disables Basic.

If the two numbers are anything but 255 or zero, then File Menu II assumes that the file has been stored in listed form. To get around problems this may cause, the program uses Return Key mode to erase itself before entering and running the file.

Type in Program I and save it. If you have any problems with the characters in lines 2220, 3010, 3020 and 3090, leave those lines out and save Program I to disc. Type NEW and type in Program II. Save and then RUN it. It will create a file called LINES.LST.

Type NEW and load Program I. Now type:

ENTER "D:LINES.LST"

and save the complete program to disc as MENU.BAS.

Now type in Program III which creates an AUTORUN.SYS file which will automatically run MENU.BAS when the disc is booted.

If you have any problems when typing in File Menu II, don't forget that all our listings can be checked using Get It Right!, or downloaded from MicroLink. ■

Program I

```
10 GOTO 870
20 INPUT #0,A$ A$(11,13):IF A$(0,10
1="E 5" THEN 100
30 IF A$="SYS" #0 #0="#0T" #0 A$="#I2"
 #0 A$(3,8) "MENU" THEN 2#
40 A$=A$(12):A$=A$(POSITION #2,A+5:? CH
R$(CH+#1," ");A$ Y2 Y2+1 RETURN
50 POKE 559,0:CLOSE #2 OPEN #0,6,0,"D
:*.*" PLA$=A
60 POKE 559 0 ? '4    ?;(e menu ::(((
```

```
    by MARK COCKER
```

```
 ' GOSUB 550
70 #2=2 Y2 2 CH=64:E#0 0=1 TO 15 GOSUB
 2# NEXT A
80 #2 21 Y2 2:CH=79 FOR 0=1 TO 12:GOSU
B 2# NEXT A CH=27 FOR A=32 TO 15 GOSUB
 2#:NEXT 0 Y2=Y2 1
90 POSITION 7,22:? "SPACE BAR to page
forward" PLA$=1 GOTO 110
100 POP :IF PLA$=1 THEN POSITION 6,22:
? "SPACE BAR for previous menu" PLA$=2
110 POSITION 11 21:? "PLEASE MAKE CHOI
CE"
120 X 0:Y=4:GOSUB 100 POKE 559,46 POKE
 54286,192 POKE 764,255
130 0=STICK(0) IF A=13 OR PEEK(532791=
5 THEN 5 1 GOSUB 100
140 IF 0 14 #0 PEEK(532791=1 THEN 5 2
GOSUB 100
150 IF STRIG(0)=0 #0 PEEK(53279)=6 #0
PEEK(764) 12 THEN 300
160 IF PEEK(7#4)<>255 THEN GOSUB 200
170 GOTO 130
180 TA=7 Y=Y+(5-13-(5-2) POKE 53279,0
190 IF Y<6 #00 K=0 10EN X=K2-2:Y=Y2+1
200 IF Y<4 #00 A=17 THEN X=0:Y=10
210 IF Y>10 #00 A 0 THEN A=K2-21Y=4
220 IF Y>Y2+1 #00 A K2-2 THEN K=0:Y=4
230 A=USR(M,0,PMH,PM0,69+76*(X-192,38+
(Y-4)*4,2) RETURN
240 GET #1 A:IF A=IF A=IZ AND PLA$=1 THEN G
0
250 IF A IZ #0 A=17 THEN 30
260 IF A>64 #00 A<#0 THEN K=0 Y=A-81:G
010 300
270 IF A>77 #00 A<91 (NEW X-17 Y=A-7#
GOTO 300
280 IF A>48 NOW A<#I THEN X 19 Y=A-14
GOTO 300
290 GOTO 130
300 #$="                "
310 FOR A=#+1 TO X+12:LOCATE A+1,Y,Z #
$(A-X #-1) CHR$(Z):NEXT A:IF #$(1 1)
 " THEN 130
320 POKE 559 0 #$="#1'!A$(4)=#$:#$=#$
(12 14) IF #$(12,12)=" " THEN 350
330 A$(12,12)=" ":FOR #-1 TO 12 IF #$(
#,#)=' ' THEN #$(#,#)=' ':A$(A+1)=#$ P
OP :GOTO 350
340 NEXT A
350 GOSUB#3C5 #.GOSUB 550 POKE 709,14:P
OKE 710,130 POKE 53248 0 POSITION 11,1
0:? #$:POSITION 13,0
360 ? "now loading   ", OPEN #1 4,0 #$
 GET #1 A:GET #1 B:IF B=0 AND #=0 THEN
 RUN #$
370 IF A<255 #00 A<255 THEN 410
380 IF A<47 OR A>58 THEN #00
```

```
170 ? "{CENTER}{5}";" POSATION 0,15 * "&C
#";" ;? "{ENTER}' CHR$(34),0$ ? " ;" *
 "&R_0 POKE 842,12 GUO
400 POSITION 0,11:POKE 842,13:STOP
410 ? "{BOTHOMS}";" *44+{TOUN OFF @ASIC
7 {NL/NES" GET #1,A CLOSE #2 CLOSE #1
 ? "{" POSITION 17,9
420 CLOSE #1 OPEN #1,4 0,A$ IF A<>78 T
HEN ? "{@ASIC OFF}" GOTO 460
430 IF A<>70 THEN ? "{@ASIC OFF}";:GOT
O 160
440 ? "{@ASIC ON}",
450 X=USR(55761 GUO
460 X=USR(ADR("
```

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

```
 *                    _")
490 X USR(ADR("
```



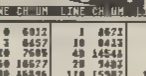
LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	1615	20	8232	30	10199
40	12532	50	7974	60	10105
70	8256	80	17017	90	12390
100	15440	110	7087	120	10002
130	9870	140	7316	150	9467
160	5626	170	1617	180	6021
190	6320	200	5547	210	5970
220	6811	230	9015	240	6312
250	6809	260	7130	270	7504
280	7475	290	1617	300	2126
310	14791	320	10121	330	11949
340	11279	350	14706	360	14021
370	6109	380	4702	390	16412
400	6763	410	18695	420	11051
430	6711	440	2479	450	1169
460	1772	470	15926	480	25710
490	18229	500	11416	510	10201
520	46346	530	13306	540	19284
960	7721				

Program II

```
0 DEM ### LINE 6560R FOR LIOE5    ###
1 DEM ### 405, 480, 456, 520      ###
2 DEM ### FOR FILE @C@U IT        ###
3 DEM @@U by Mark Cocker          ###
10 GRAPHICS 18 POKE 559,0 DIM B$(360),
B$(1) TOP= 60
20 FOR B=1 TO 40:B$=B$(B):TOTAL=TOTAL+C:N
EXT B
40 POP :IF C<>TOTAL THEN ? "{@ERROR IN
LINE"!LIST PEEK(C)+256*PEEK(106),END
65 TOTAL=0:FOR B=
66 IF C<>3327 AND PEEK(195) 6 THEN ? "
{ERROR #";PEEK(196);:END
70 ? "{ESC}{ SHIFT CLEAR} TO {ESC}{ SHIFT}
T";:INPUT B$
65 OPEN #5,8,0,"D LIOC5 .5T" # 65,B$(1
,360):CLOSE #5 ? "{COMPLETE" END
100 DATA 52,54,48 32 00 61,00,05,05,00
 56,58,92 40,34,104,169,205 101,1,211,
24,168,105 105 32,133 105 76,2642
110 DATA 200 25,24,41,41,68 92,05,70,3
2,155,52,56,40,32,63 61,56 60,62 40 34
,72,110,72,124,155,6 109 176,2413
120 DATA 6,101 10,212,141,24,200,105 2
00,6,141,23,200,210 156,6 104,170 104,
84,0,104,109,7 169 165 161,0,3133
130 DATA 32,92,228,96 169,1 101,&96,6
76 90,228,2,6 120,110,120,110,120,156,
120,110,120,156,120,110,120,120 2137
140 DATA 120,130,130,120 6,1,4,4,2,82 IX,1
2 12 12 12 12,12,IX,12,12,12,12,12
12,12 12,12,12,14,10 14 41 155 097
150 DATA 92,57 46 32 00 61 05 41 05,40
,65 60 00,40 14,104,104,133 104 104 13
```

Program III AUTORUN SYS File creator

```
0 DEM ### AUTOOUP SYS @&6ED       ###
1 DEM ### by @&00 COCKEN          ###
2 DEM ### (put 4my FILE@@@@ ENT   ###
3 REM @@U  in F05 - LI0C 101      ###
4 DEM
10 GRAPHICS 0:TRAP 00:OPEN #1,8,0,"D:1
@?@AUO SYS"
20 DIM E0$(155),0$(10)
30 F0$="6 @C@U @05":@0$="@U6
    " DEM IS SPACES
40 @$(4,4)=CHR$(141)+@$(5,LEN(F0$)+4)=E
N@
65 FOR B=1 TO 125 READ B PUT #1,B NEXT
 B
60 FOR A=10 TO 1 STEP -1:PUT #1,0:CLOS
E#1:NEXT B
70 CLOSE #1 ? "{COMPLETE" END
80 ? "{ERROR #" PEEK(195) END
165 DATA 255,255,166,6 167,6 76,175
419 DATA 6,175,6,251,6,160,11 165
120 DATA 0,220,151,163 6,136,16 247
130 DATA 169 222,141,167,6,169,6,141
140 DATA 165,6,172,170 6,170,167,6
150 DATA 231,208,1,200 142,248,6,140
165 DATA 247,6,169,165 141,17,3,169
170 DATA 6,141,34,1 96 172,0,0
185 DATA 206 10,165,0 141 33,3,169
150 DATA 170 141 34 3,165 1 6,206
195 DATA 0,6 72 32 251,6 104 160
210 DATA 1,96,253 6 250,6 185,250
220 DATA 151,00 2,06 1,0 5,0
230 DATA 9,0,1,220 2,222 2,165
240 DATA 6 224,2 225,2,253 6 0
250 DATA 6 15,5,10,155
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
0	6165	1	5845	2	6684
3	5178	4	871	10	8481
20	1721	30	9120	40	5920
50	6756	60	7918	70	5750
80	5710	100	4092	110	4710
120	4075	130	4596	140	4013
150	4916	160	4652	170	4093
180	4719	190	4653	200	4417
210	4746	220	3908	230	4061
240	4065	250	1880		

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VISA

PAGE 6 – *COMPLIMENTING AND EXPANDING THE WORLD OF ATARI*

Typing tutorial

ONE thing we get asked about time and time again is how to type in some of the special graphics characters in our listings. Here is a full list of ALL the special characters, along with their Ascii codes, and how to type them in.

Control and Shift, where indicated, should be held down as you press the key indicated. For example, Control-comma would be entered by holding down the Control button and pressing the comma key.

Where INV is indicated before a key sequence you should hit the inverse video key before pressing the keys. This is the Atari-logo key on older machines and the half-black/half-white key on the lower right of the XL or XE keyboard. Don't forget to press the inverse key again after you've typed your inverse characters in order to set it back to normal again.

Where we have indicated Esc — you should press the Escape (or Esc) key before pressing the key combination. For example, Esc Control-equals would mean press the Esc button, then hold down Control and press the equals key.

Don't forget that you will sometimes need to type in a line that is slightly longer than the normal three line maximum. To do this simply type POKE 82,0 before you start entering your program in order to reset the margin to the very edge of the screen.

You can also use abbreviations with many commands to save space, usually taking the form of a couple of letters followed by a fullstop. ■

A guide to correctly typing in the special graphics characters in *Atari User* listings

Ascii code		Description
0	♥	Control-comma
1	▗	Control-A
2	▌	Control-B
3	▖	Control-C
4	▝	Control-D
5	▘	Control-E
6	▞	Control-F
7	▚	Control-G
8	◢	Control-H
9	■	Control-I
10	◣	Control-J
11	▙	Control-K
12	▟	Control-L
13	▬	Control-M
14	▂	Control-N
15	▃	Control-O
16	✚	Control-P
17	▛	Control-Q
18	▔	Control-R
19	▜	Control-S
20	●	Control-T
21	▄	Control-U
22	▏	Control-V
23	▀	Control-W
24	▁	Control-X
25	▋	Control-Y
26	▙	Control-Z
27	ESC	Esc — Esc
28	↑	Esc — Control-minus (Up)
29	↓	Esc — Control-equals (Down)
30	←	Esc — Control-plus (Left)
31	→	Esc — Control-asterisk (Right)
96	♠	Control-fullstop
123	♠	Control-semicolon
124	|	Shift-equals
125	↖	Esc — Shift-< (Clear)
126	◀	Esc — Control-backspace
127	▶	Esc — Control-Tab
128	♥	INV Control-comma

Common Atari basic abbreviations

CL	CLOSE	NO	NOTE	ST	STATUS
C	COLOR	O	OPEN	T	TRAP
D	DATA	PL	PLOT	X	XIO
DR	DRAWTO	P	POINT		
GOS	GOSUB	POS	POSITION		
G	GOTO	?	PRINT	CS	CSAVE
GR	GRAPHICS		REM	E	ENTER
I	INPUT	RES	RESTORE	L	LIST
LOC	LOCATE	RET	RETURN	LO	LOAD
LP	LPRINT	SE	SETCOLOR	S	SAVE
N	NEXT	SO	SOUND		

129	INV Control-A	
130	INV Control-B	
131	INV Control-C	
132	INV Control-D	
133	INV Control-E	
134	INV Control-F	
135	INV Control-G	
136	INV Control-H	
137	INV Control-I	
138	INV Control-J	
139	INV Control-K	
140	INV Control-L	
141	INV Control-M	
142	INV Control-N	
143	INV Control-O	
144	INV Control-P	
145	INV Control-Q	
146	INV Control-R	
147	INV Control-S	
148	INV Control-T	
149	INV Control-U	
150	INV Control-V	
151	INV Control-W	
152	INV Control-X	
153	INV Control-Y	
154	INV Control-Z	
156	Esc Shift backspace	
157	Esc Shift > (Insert)	
158	Esc Control-Tab	
159	Esc Shift Tab	
224	INV Control-fullstop	
251	Control-semicolon	
252	INV Shift-equals	
253	Esc Control 2 (Bell)	
254	Esc Control-backspace	
255	Esc Control-> (Insert)	

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GETTING DLIs TO DISGORGE COLOURS

I AM writing in utter desperation. I bought a copy of Graphics Art Department about two months ago and I cannot get to grips with the DLI option for the extra 128 colours.

The problem is that I start by using one colour register and one DLI, but if I then use a second DLI from the same colour register and then overlap the colour of the first DLI, it changes to the colour of the second DLI.

This causes problems when you are trying to create a number of different shades around the same area of the screen using one colour register.

Am I doing something wrong or is it that you cannot use two or more DLIs from the same colour register on the same horizontal line? – **Philip Tackaberry, Clondalkin, Dublin.**

● The colour registers may only contain one value at a time and a DLI allows you to change that value on consecutive lines of the display.

This means that each time you use a DLI the contents of that colour register will be changed until either the bottom of the screen is reached or another DLI changes it to yet another value.

So you can have four new colours on each new line but you will lose the old ones.

If you write in machine code it is theoretically possible to 'count' along the line after a DLI has taken place and change colours part way along but the timing required is so critical that you would have to turn everything else (including the keyboard) off.

The more advanced assembler programmers might like to tackle this one.

Peculiar printing

I HAVE an Atari 800XL, Atariwriter a Brother M1009 printer and a Xetec Graphics interface. I cannot get the printer to print in the normal 10cpi mode irrespective of the G setting in the word processor.

The printer either prints in the expanded or emphasized mode, depending on the printer choice made at the printer option stage.

This strange behaviour is only experienced when the graphics mode setting on the Xetec interface is set off.

With the graphics mode set to on the printer works in the normal 10cpi mode, but prints all the control characters embedded in the text.

It is frustrating having dished out a lot of money for something which doesn't do the job for which it was bought. Can you help? – **J T Abebrese, London.**

● This is an odd one. We have heard a couple of cases of the Xetec interface giving slightly unusual results but we're not sure of the cure for this particular one. Perhaps a reader can help?

Commands on keypad

I RECENTLY bought a 130XE and was interested in Len Golding's article in your October issue about building a new keypad.

The article states that new keys can be programmed to duplicate any key combinations. So is it possible to program each key with a Basic command such as RUN, LIST and so on? – **Peter Amos, Orpington, Kent.**

● Not with the program as listed but by adding a few more bits of machine code there is no reason why it couldn't be done.

At present there is a vertical blank routine which simply dumps the single character you require into the keyboard character press register at location 764.

You could extend this routine to make the vertical blank dump a new character every 50th of a second until the text is complete.

This would give Basic time to detect and read each character as it is placed into the register, not knowing that your vertical blank routine was typing them in rather than the user.

Let us know how you get on.

String along with 800XL

I OWN an Atari 800XL and recently have been learning about string handling at school.

None of the small programs that we use at school work correctly on my Atari. It doesn't seem to like direct input into a string.

Could you tell me what I'm doing wrong and if there any books which will explain how to use strings properly? – **Daren Teather, Bradford, W Yorks.**

● Atari string handling is a little different to that on most machines.

The biggest difference is the lack of string arrays as A$(5) does not mean the fifth string called A$ but rather the portion of A$ from character five onwards.

Also DIM A$(100) means reserve 100 characters for A$ not 100 full strings called A$.

You can input directly to a string with INPUT A$ or INPUT #1,A$.

If you want to input to a portion of a string – a substring – then you must input to a temporary work string first. For example:

```
INPUT #1,TEMP$
A$(5,10)=TEMP$
```

Help for adventurers

I WOULD like to thank you for a really brilliant magazine which I have bought since October 1985.

The only criticism I have is the lack of an adventure help page where readers could help each other with adventuring problems. – **Christopher Walker, Oldham, Lancs.**

● Brilliig our adventure columnist has recently started his Lifeline which should meet your needs. We have passed your Zork II problem to him.

Looking into Logo

I OWN an Atari 800XL and have recently obtained an Atari Logo cartridge. With it came a booklet called Quick Reference Guide but unfortunately it wasn't much help for a beginner like myself.

Can you tell me if the Atari Logo package should have included another manual or if other books are sold

→

separately? – **Zaffer Aavon, Israel**

● Two fairly thick books that go with the Logo package used to be packed in a separate smaller box to the cartridge. They should have been included in the purchase price so contact your dealer and find out where the books vanished to.

1029 printer facts

DO any of your readers who own the Atari 1029 printer have any useful programs or information for this machine? – **R J Sandercock, Haverfordwest, Dyfed**

● Can anyone help Mr Sandercock?

Bug in the Data Editor

REGARDING your Data Editor in the October issue of Atari User I was very impressed by this useful program, but I have found a bug in the Load/Save routine which gives a memory full error when writing to disc.

The correct version of line 880 should be

```
880 IF X1=LN THEN 940
```

— **Andrew Yates, Oswestry, Shropshire**

● You are quite correct, but perhaps a better version still of line 880 would be

```
880 IF NOT (X1=LN AND
    IO=4) THEN 940
```

Playfields poser

I HAVE been following Stephen Williamson's articles on Player Missile Graphics and was impressed by Computer Canvas II in the November issue.

However although I have the listing working correctly, have created playfields and have saved them to cassette, when I try to load them to screen I just get Error 2.

The created playfields will successfully reload into Computer Canvas, but I need to know how I can use them in my own programs. Could you help? – **P Purchase, Truro, Cornwall**

● You can't just use CLOAD or LOAD "D:PLAYF" to load a data file into Basic – these commands are reserved for programs only, and would throw out any non-standard format.

To reload a saved playfield simply modify the routine on lines 1640 to 1820 of the Computer Canvas II program.

Don't forget to initialise the string IO$ before you access it – see lines 50 and 1960-1980.

Game maker required

I AM stationed in Germany and therefore don't hear much about new releases until I receive Atari User every month. I have designed what I think is an original platform arcade game. However I do not have much knowledge of programming.

I have looked around Germany for a game maker style of program which would enable me to write the game myself but to no avail. Is there such a program around? – **D Gratton, W Germany**

● There are some game makers around but they are not really suitable for the platform type variety.

Your best bet would be to contact one of the games companies and work with some of their programmers.

Do make sure that you first get a deal which gives you some form of multi-machine royalty agreement on your idea.

Purpose of the port

WHAT is the extension port at the rear of my Atari 130XE used for? If it is for plug in cartridges or peripherals could you tell me what is available and where they can be bought? – **Daniel Page, Enfield, Middlesex**

● There are two connectors on the back of a 130XE, the cartridge socket and the expansion port.

On the old XL range the expansion port was larger, but when designing the XE Atari decided that since most of the lines on the expansion port were duplicates of those on the cartridge socket (the address and data lines were present on both) they would make a dual socket instead.

So far there has been little around to use this new expansion port – which is really an extension of the machine's parallel data bus – but there must be some companies working on such products.

If anyone out there knows of any, why not write in and let us know?

Checksum revealed

AS a new reader of your magazine I am mystified by the checksum listing printed at the end of each program.

I should be most grateful if you could tell me where I can get the checksum program and its instructions – **John Gweeney, Kinross, Tayside**

★ ★ ★

I BROUGHT Atari User for the first time last November and I find it a very interesting magazine particularly the five liners, listings and the Mailbag.

I have seen your Get It Right! checksum program mentioned in various parts of the magazine. What is Get It Right! and how can I get a copy? – **Rghm Tombee, Lichtenvoode, Gelderland, Netherlands**

● The instructions and listing for our Get It Right! checksum program last appeared in the August 1986 *Atari User*.

You can order a copy using the form at the back of this issue. If you don't fancy typing in the listing, you can order a copy of the August monthly disc which carries a copy of Get It Right!

Special offer Ninja

IN your November 1986 issue you mentioned a special offer whereby I could order a game called Ninja for only 99p but when I looked at the order form I found that the price was £12.99.

Could you tell me how I

ATARI USER Mailbag

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

The address to write to is:

Mailbag Editor
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can buy Ninja for 99p? – **A J Quixley, Huyton, Merseyside**

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Using the XEP-80

I WOULD like to know more about the XEP-80 column chip mentioned in the November issue of Atari User

Can it be used with AtariWriter to get 80 columns in create and edit modes? – **Ian Goodwin Wrexham, Clwyd**

● The XEP-80 is not a chip but a separate module which plugs into your computer s second joystick port.

It can't be used with AtariWriter at present, but by the time the product is released there will also be an updated version of AtariWriter called AtariWriter 80 which will support full 80 column use See last month s issue for an in depth review

Downloading listings

I USE my Atari 800XL, MultiViewterm software and a Miracle Technology WS4000 modem to access MicroLink and Prestel

My problem is that I don't know how to download any of the listings mentioned in Atari User Can you help? – **Tony Parry**

● Well, there is a small problem with MultiViewterm which makes this job rather difficult

All decent terminal programs have what is known as a capture buffer, which allows you to store the text you receive from the host computer in memory

In many cases this text will be too long to keep intact in Ram so a download option is provided which allows the computer to spool it out to disc every time the buffer is almost full

Unfortunately MultiViewterm does not do this properly with text files, so what you must do is save the blocks manually

To do this, select the download option on MicroLink and turn your Viewterm buffer on just before you press the final Return key to tell MicroLink to send

When the buffer is almost full (the letters BUF disappear to show you the space left) you must press Control-S to stop the computer sending, then go back to the Viewterm menu and save the buffer contents to disc as FILE1

Then go back online and press Control Q which will start the computer sending again Keep on doing this until the download is finished saving each segment as FILE2, FILE3 and so on

Then you must boot up your DOS menu disc and append the files together Append is a special form of the copy function which adds the new file onto the end of an existing one So you would type

```
C <Return>
FILE2,FILE1/A <Return>
```

then

```
C <Return>
FILE3,FILE1/A <Return>
```

and so on until you have added all the files on to the end of FILE1 The /A tells DOS to use the append option FILE1 is then your downloaded program

If MultiViewterm had a text download option none of this would be necessary so a phone call or two to Miracle might help hurry them into producing a new version

Protection problem

I OWN an American 130XE and an Indus disc drive I have found your magazine extremely informative and have recently subscribed taking advantage of your Mercenary 2nd City offer

The package arrived promptly but to my dismay I am unable to load Mercenary

Upon booting I get four beeps from the Indus and the track counter stays at 00 The drive then spins until the computer is switched off I have numerous other games and have never had any other problems Can you give a solution? – **M Thompson, Overton, Hants**

● The problem almost certainly involves the NTSC computer which won t read the protection tracks on the disc correctly so the program reacts as it would to a pirated version

Try contacting Novagen, publishers of the product and see if they have any suggestions as to a way round your problems

Missing manuals

EXACTLY 12 months ago, while I was on leave from the forces in Germany I bought an Atari 800XL and disc drive from Dixons in Slough

On return to Germany I unpacked the various boxes to find that the disc drive users guide, Basic manual and DOS disc were all missing I wrote to Dixons and never received a reply to my letters

I tried contacting Atari UK and Dixons again but with absolutely no luck Could you help in this matter as my enthusiasm for ever receiving the missing vital items is diminishing fast

Also could you tell me whether Adventure International has gone into liquidation? – **S Day, Preston, Lancs**

● Try contacting Atari Germany Atari (Germany) Frankfurther Street 89 91 6096 Raunheim Germany Tel (010) 496 142 41081

Adventure International has indeed folded The firm was caught up in the shock end to the computer boom a couple of years ago and never really recovered

Rumour hes it that Scott Adams has formed another company so that he can continue to produce adventure games for Marvel comics in conjunction with the Questprobe series

Looking for Asteroids

COULD you please tell me where I might be able to buy Asteroids for my son s 800XL? My local shop has tried for a week and has not found it – **Mrs E Madelin, Bracknell, Berks**

* * *

DO you know of any Basic compilers which will enable me to write machine code speed programs without the brainache?

Also could you review some of the games which were available before Atari User started, so that new owners can find out which titles are worth buying? – **David Hicklin, Derby**

● To find out about the best of the old games look no further than our Games Old and New article in the December issue

You should be able to find an old copy of Asteroids if you try some of the larger

→

mail order companies but if they want more than £1 99 for it, forget it! It's not exactly the best game ever to be released

Books on machine code

I OWN an Atari 600XL and would very much like to learn how to program in machine code

Do you know of any good books which are for beginners and are tailored for the Atari? – **Nick Miller Rugby, Warwickshire**

● A number of good machine code books are available for the Atari the best of which is probably from Compute! – Machine Code for Beginners at £17 95

There is also a good book called the A B and C of Machine Code and numerous others

If you plan to start writing in machine code you will also need an assembler the best of which is Mac/65 from OSS but this is rather expensive

You may prefer to start out with the rather slower and less powerful Atari Assembler/Editor cartridge

Also try to get hold of a copy of an excellent book called Mapping the Atari (from Compute! again) which you'll quickly find will be worth its weight in gold

Brighter headlines

I RECENTLY bought an Atari 800XL 1050 disc drive and 1029 printer. I was wondering if there is a desktop publishing program along the lines of Newsdesk on the Commodore 64, which would allow the use of different fonts headlines and even illustrations on my 1029?

I am also a bit confused over the different versions of Dos available

The paint program which came with my computer will not save pictures on discs formatted with Dos 3, yet has no facility for formatting a disc itself

I did try formatting a disc with Home Filing Manager, but saving a picture on to this produced a 'No Room On Disc' error

I also tried converting it to Dos 3 with the utility on the master disc but this too was unsuccessful

I have seen advertisements for a Dos 4 but your reply to Mr R Powell recommends Dos 2 5!

All very confusing, you must agree. Which Dos should I use and where can I obtain it? A rough idea of price would also be appreciated

Ronald McAvoy Maryport, Cumbria

● Firstly Software Express should be able to help you out with some packages from XLent Software which might ease your typesetting problems

As far as Dos goes, Dos 2 5 is the current standard Dos 3 was brought out by Atari but proved rather inefficient and never took off

Dos 4 is not an official Atari system though it might have been commissioned for such use some time ago

Stick with Dos 2 5 and use Dos 3 only if you have to

You should be able to pick up a copy of Dos 2 5 for the price of a blank disc from most Atari dealers, and the manual comes as an AtariWriter text file on the disc

Using page zero

I AM becoming increasingly interested in machine code programming for my Atari 800XL and have bought two books on 6502 programming

My problem is that both

YOUR HINTS AND TIPS

KICKSTART

WHILE messing around on Kickstart by Mastertronic I found an amazing little trick

When you hear the starting tone, waggle the joystick (as in Decathlon) as fast as you can. Then you will start at the top speed and you will knock off at least two seconds from your time – **Owen Strride, Dereham, Norfolk**

BOUNTY BOB STRIKES BACK

Level 1 Take the flower pot and press 1 and Start
Level 2 Take the paint roller (after killing the aliens) and press 1 and Start.
Level 5 Take the coffee pot and press 8 and Start
Level 10 Take a pitch fork and press 5 and Start
Level 16 Set the suction tube number 1 to left, take pie and press 3 and Start
– **M Jones, Wirral, Merseyside**

STARQUAKE

THE names of the transporters are Traid, Kernx Whole, Minim, Saico Cosec, Artic, Quark Argon, Delta Crash ZAP Penta, Atari and Secon

To get 100 lives hold down the pause keys (Shift+P) after you have lost your last life. Keep them down and move the joystick down

You will be moving very slowly and the creatures will move fast. Get yourself killed, but still keep pressing the pause keys. The reading will say 00, but you will have 100 lives – **Mike Moulton, Castle Hedingham, Halstead, Essex**

AIRWOLF

FOR some extra points, when the game starts, keep firing – **Mr M Jones, Wirral, Merseyside**

ORIGINAL TIPS

MAY I congratulate you on a brilliant magazine. After the first few issues I thought it was just another 'five minute' magazine, but over the months you have got a lot better – Player missile graphics gadgets enhanced reviews, I love it!

I hate pirates, and I have a lot of software which cost me a lot of money and I am proud of it so the games tips I am going to give are from my originals not copies

Here are the first eight passwords for One Man and his Droid

Level	Password
1	Press START!
2	BUBBLE
3	ATARI
4	FINDERS
5	GENETIC
6	ZAPPED
7	MEGASONIC
8	TIME WARP

And here are the codes for Ollies Follies (American) To start at level 5, type FANDA while playing For level 10, type FRANK, for level 15, type NORBI and for level 20, type ZOOM (3 noughts)

Why don't you devote a page or so to hints and tips on games? I could send in tips, and how about a high score table? I have completed Mercenary in three months, and got 1,108,000 credits! – **Colin Raynor, Cadbury, Devon**

books state that page zero will always be available on any computer for zero page instructions and variable storage

However I also have a memory map of the Atari and it shows clearly that page zero is used by the operating system and Basic

Could you please tell me if it is possible to use page zero, and if so which locations are available

If not is there any other way around this problem? – **S Townend, Goole, North Humberside.**

● Page zero is indeed available on any computer assuming you have full control of the 6502

However the Operating System and Basic are both very complex machine code programs themselves and as such need their fair share of zero page locations

In the case of the Atari $00-$1F are used by the OS, $20-$3F by CIO but are otherwise free, $40-$7F by the display handler and should not be touched $80-$CA by Basic, but are free if you are not calling your machine code from Basic

$CB-$D1 are free for you to use $D2 and $D3 are reserved for cartridge use, $D4-$FF are used by the floating point routine and are completely free if you don't plan on calling the FP package from your machine code

On the whole unless you KNOW an area to be free don't use it the best idea being to stick to using $CB-$D1 which you should never have any trouble with

Elusive stripper

PLEASE can you tell me where I can get the following games for my computer (800XL) Ghosts 'n Goblins by Elite Cluedo and Sam Fox Strip Poker

I have been looking for ages I have seen the games but not for the Atari – **Jason Sweby Plymouth, Devon**

XIO commands

WOULD it be possible for you to do a series on the undocumented XIO commands? – **S K Stupple, Mansfield, Notts**

★ ★ ★

I WAS interested to read in the November issue of Atari User that it is possible to emulate certain DOS functions using the XIO command

I have several books on Atari Basic but they only deal with the XIO function to fill in blocks of colour Would it be possible to do an article on this subject? — **Peter Sendonaris, South Tottenham, London**

● In last month's issue we started a series on using the I/O facilities of the 8-bit Atari and XIO is one of the areas which will be fully covered over the next few months

The command is very powerful indeed but would take up too much space to describe it in full in the space we have here Stay tuned as they say

Phantom beeb blower

I OWN an Atari 800XL with dual operating system a 1050 disc drive with a Hyperdrive a 1010 tape recorder and a 1029 printer

This computer set is just perfect for me and I like it I'd like to explain a few things about this before going on about my problem

I got Mr G Paul's Dual Operating System in December 1985 and with a flick of a switch I have a built in translator I found this very useful as it saves a lot of loading time

My Hyperdrive also saves me a lot of time because it is twice as fast as normal 1050 disc drives

I had a problem in fitting these chips in, but my electronics teacher at school did it very well and everything works better then before – congratulations to Mr J L Birkett at Aldenham School Elstree

Anyway my problem I think, is something to do with my Dos system When I turn my computer on it beeps, although I'm not pressing start it only happens a few times but I want to know how I can get rid of it Have any readers with Mr G Paul's Dos got the same problem? If so then please contact me – **Tekeshi Ishikawa, Stanmore,Middlesex**

● The most likely reason that your computer beeps when you switch on is that the contacts on the Start button are sticking Drop it into your local dealer to have it checked

It's unlikely that the new chip has caused this to happen but taking the computer apart may have caused the contacts to move

HELP!

MORDEN'S QUEST

HOW do I get past the pigmy and the carnivorous plant? – **Daniel Nye, Bury St Edmunds, Suffolk**

HOW do I use the transporter? – **Owen Stride, Dereham Norfolk**

SPELLBOUND

HOW do I get past the gas room? How do I move the lift? How do I get over the wall? – **A Hughes, St Ives Cornwall**

Centronics interface

THERE is a gismo on the market which costs £24 95 and allows you to connect Centronics printers to your Atari 8 bit

How about doing a review of it so that we can see if it's as good as it sounds? – **D W May Chester**

● Look out for an upcoming part of our Gadget series which will show you how to build such an interface for yourself

Pen pals round the world

THESE foreign Atari User readers would like English pen pals

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The Atari Users Club 20—473 Lublin 49 PO Box 21 Poland

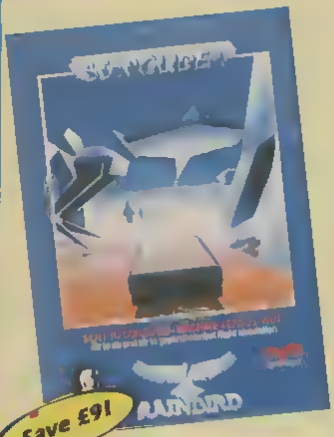
J F Gelswyck, Pemmel/ Royal Commison PO Box 30076 Jeubu Al Sinauyah Saudi Arabia

Max Terveen Textiel Boter markt 9 Leiden Magerhorst 8 Alphen A/D Ryn Gelden, Netherlands

(He can supply help to anyone having problems with a General Electric TXP 1000 printer and is especially interested in Forth and Pascal)

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Typewriter Use it to send codes and short messages to the printer while working on other programs
Printer Buffer Put aside any amount of the ST's ram as a buffer, allowing long documents to be printed while the computer is still in use
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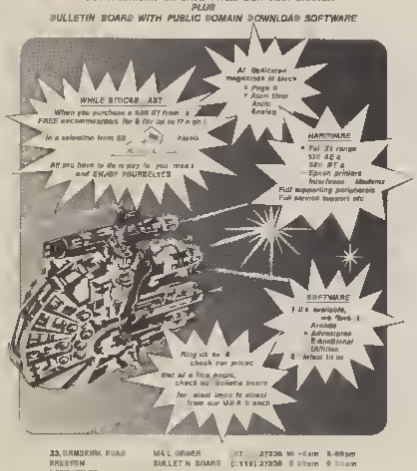
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Atari launches Mega-ST flagships



NEW flagships of the Atari line the Mega-ST workstations – just announced in Las Vegas – provide stunning power without the price in desktop publishing and professional applications The new machines incorporate one, two or four megabytes of ram respectively, and come with integral 800k floppy disc drive, graphics blitter chip and detachable ergonomic keyboard

Although they look completely different, all three micros are 100 per cent compatible with the existing Atari 520ST and 1040ST models

Enhancements incorporated in the Mega ST range include a battery backed real time clock internal mounting space for an additional circuit board and full external routing of the 68000 bus The architecture is left wide open for further enhancements which will include ram expansion capability up to 16Mb and networking

Each Mega ST is housed in a system unit 22 x 22 x 2 in containing the cpu, double sided floppy disc drive and internal power supply The normal complement of ST ports – DMA RS-232 serial parallel, disc video, cartridge, Midi, mouse and joystick – plus an additional port for the keyboard are included

The unit is reinforced to support a monitor and can be stacked with other components, notably the enhanced 20mb hard disc drive

The slimline Winchester drive, incorporating an extra port for daisy chaining with other DMA compatible peripherals like the new laser printer, was announced at the same time as the Mega-STs

A sleek new chassis contains a redesigned ST motherboard Standard equipment includes a battery backed clock calendar which runs off alkaline penlight batteries

Mega ST architecture is wide open permitting internal and external expansion with add on circuit cards

The new design provides full access to the 68000 bus and power supply and fixtures have been provided for installing a circuit board inside the case

Further expansion is possible by routeing the bus outside to an external card cage

The new keyboard can be lap-held, but has adjustable legs for desk use and can be adjusted to the user's preferred typing angle Internally the keyboard has been enhanced with high quality key switches for improved tactile and auditory feedback better feel and increased reliability

The Mega-ST range priced from $1 000 up was described at the launch by Atari Corp spokesman Neil Harris as 'our flagships'

He added 'They are also proof that Atari has been listening to its users and taking their advice seriously

The revolutionary Atari laser printer, shown in prototype at Las Vegas matches or exceeds the performance of other laser printer systems while costing only half as much at about $1,500

Coupled with the power of an ST the printer will form the output stage of a desktop publishing system costing less than $3,000

Designed to interface with the ST s high-speed DMA port and incorporating a standard laser engine the Atari laser printer will produce rapid throughput at 300 dots per inch resolution, and it can handle multiple and standard page description languages

Atari hardware engineering division head Shiras Shivji said 'We have designed an admirable flexible system that includes all the advantages and few of the disadvantages of present laser printer architecture

The printer will be able to handle multiple fonts and standard page description languages at the discretion of the software Moreover, adapting present software to take full advantage of the capabilities of the laser printer should be fairly simple providing it has been written in conformance with Gem standards'

ST SOFTWARE GALORE

A SURVEY has shown that more than 1 000 titles are now available for the ST range This compares with some 300 recorded in September last year and 650 in November Though these are global figures UK software houses have accounted for almost half of the packages

The British will also figure prominantly in the next wave, with more than 430 companies reported to be currently developing new products

This demonstration of support for the ST has been warmly welcomed by Roland Whitehouse, Atari UK s new marketing support manager software

We believe there is no reason why the current total should not have doubled by the end of the year , he told *Atari User*

However from now on Roland Whitehouse and his team will be placing the emphasis on quality rather than quantity In the light of this, Atari has been particularly pleased by the number of major software houses who have thrown their weight behind the ST

'When you get firms like Grafox with Logistics and MicroSoft with Write jumping on board then you know you are on target' , said the new software boss We are also aware of many other firms of that status who are developing products for the ST The big boys are on their way'

A breakdown of the 1,000 title bonanza for the

→

Mike Cowley reporting

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ST shows that entertainment software provides the largest category with 20 per cent But this is followed close behind by word processing utilities and languages – all with 10 per cent – then accounts comms, music education and graphics with around 5 per cent each

At the bottom of the percentage league table come spreadsheets and CAD But this situation is unlikely to remain this way for long for the second generation of ST software is likely to find vertical applications figuring prominently

"This year is going to be a very exciting time for the ST market here in the UK in particular", says Roland Whitehouse

SOFTWARE SNAG SOLVED

SINCE the recent launch of the 520STFM, a number of cases have been reported of people returning the machines to dealers claiming they were faulty Closer examination revealed that the problem lay not with the hardware but with some copy protected software, in particular with Arena Cards Deep Space O Ball and World Games

An investigation by Atari experts revealed that copy protection schemes which involve the use of disc drive tracks outside the normal operating specification may not run on all ST disc drives

Technical boss Les Player explained

"This is due to the fact that disc drive manufacturers – of which there are several for the ST – guarantee the performance of their drives up to certain track limits Access to tracks beyond this limit is not guaranteed

"For example, the 520ST currently uses a Chinnon 6ms drive which is guaranteed to access tracks between 1 and 81 Some software developers use track 82 – which can not normally be written on —from which to read a protection code This drive cannot access track 82 because it is beyond the specification of the hardware and therefore the software fails to load due to the protection code failing to load

Some software also uses protection based on timing techniques which may also cause load problems on certain manufacturers disc drives'

Atari has now informed all the developers of these facts and problems should not occur in the future



SHOT ACROSS PIRATES' BOWS

A LEADING duplicating house has come up with a revolutionary technique which it claims will put ST software pirates out of business

Top Copy has spent the last year designing a black box which connects to a normal disc drive The box destroys part of the magnetism on one of the tracks of the disc, making sectors on this track unstable Every time a checksum is taken a different number is returned

'To make the system secure the customer is asked to pick a number from one to 80 and the relevant track is then amended", said John Juleff managing director of Top Copy

Routines can be added to the original program to check the sector and verify that the disc is an original The disc cannot then be copied by normal software means

'There is no way to crack the system without the use of a black box and we re not selling these off because we want the duplicating business" said Juleff

Prices for the service range from £1 50 a copy for a minimum of 100 discs to £1 15 a copy for a maximum of 100,000 discs

MacEMULATOR ROMs ARRIVE

A SHIPMENT of roms needed to make the controversial MacEmulator work on the Atari ST has arrived in the UK

It has been brought in by Eagle Computers of Cardiff who are now marketing them for £29 95 a pair

This follows the importing of the boards from America by Middlesex based distributor Robtek last month

Now by combining the board – being sold for £169 95 – with two of the roms, it is claimed that an ST can be effectively turned into an Apple Macintosh As well as providing access to an entire new range of top flight business software the emulator also opens up the possibility of professional desktop publishing on the ST

It was first shown in America early last year but was hurriedly withdrawn when Apple threatened legal action

This was because the original design incorporated two Macintosh roms necessary for an effective interface between software and machine

It was subsequently re-released without the roms, leaving purchasers to persuade Apple dealers to sell them roms

Since then Apple has threatened to strike off any dealers who supply them for this purpose However Howard Kennedy a director of Eagle Computers, told *Atari User* that he thought his company was on safe ground selling the roms in the UK

'First of all, we are not an Apple dealer he said and we are supplying them completely independently of Robtek So we are very happy for people to know what we are doing'

Asked how successful he thought the emulator would be, Kennedy replied

' All I know is I ve sold an awful lot of these roms On the basis of this alone, I believe they must have sold 1,000 boards already But that s hardly surprising when you consider that for around £650 you can in effect have a Macintosh built around a 520STFM

Asked about the source of his roms, he replied That's one thing I m not going to tell you '

There has been little in the way of official comment from Atari itself about the emulator However one informed source who had seen one says he believes that it has at least one major drawback "You need a Macintosh alongside your ST with emulator in order to convert programs to ST format , he said

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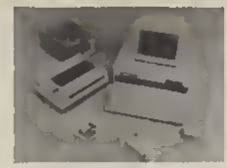
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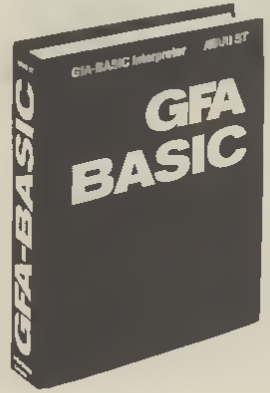
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TO put it simply QBall is something of a combination of Newton's Cradle and three-dimensional billiards The screen is divided vertically into two halves To the left is a large, transparent cube containing several billiard balls To the right is the game logo and input prompt

The aim of the game is to pot the six red and one yellow balls into any of the eight corner pockets of the table by cannoning a black cue ball into them

The table is really a large suspended cube with its front face open so that you can see what is going on inside By using the appropriate cursor keys the cube can be rotated horizontally and vertically

When horizontally shifted the cube rotates smoothly and swiftly before your eyes When rotated vertically the picture simply switches to show the new position

The game is played using the ST's numeric keypad The first step is to move the cue ball to any position you like within the cube Next a pulsating black ball will appear – this represents the spot at which you are aiming and can similarly be moved around

The amount of power friction and spin are then optionally set The more friction you use the faster and longer the balls will career around the cube

When all is ready pressing the asterisk key fires your cue ball If struck the balls will start bouncing about the cube like demented bubbles and with a bit of luck at least one may pop down a pocket The yellow ball must be the last one potted otherwise it just keeps reappearing

A countdown timer keeps the pressure on you to set up your next play When the timer reaches zero the cue ball will automatically fire ready or not

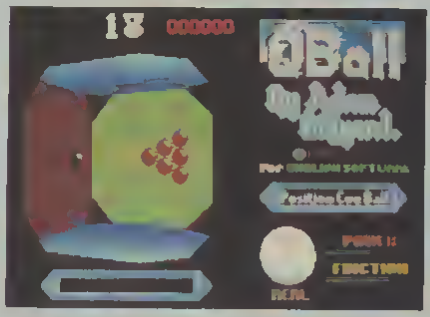
And that's about it really You just keep potting away until all the balls are safely tucked up in bed It may sound easy but because of the 3D element it's anything but

As a programming feat QBall is quite impressive As a sort of executive toy you could even say that it has a certain restful fascination about it But as a game I am afraid that QBall simply doesn't have enough going for it Despite the undoubted challenge it provides it lacks excitement and variety

I may be wrong but I would think that most games enthusiasts are unlikely to be kept interested beyond the first few plays And £20 is a lot of money to spend on an executive toy

Sound	4
Graphics	8
Playability	7
Value for money	6
Overall	6

Reviewed by Douglas Wooller





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Mercenary gets into top gear

HAVING seen just how impressive Paul Woakes Mercenary was on the 8 bit Atari it was I wondered if it could be bettered on the ST It has and how!

Apart from the much sharper graphics the game seems at first sight to be almost identical to the original

The neat opening sequence has you hurtling out of control in outer space and crash landing on the planet Targ Nearby is the ruined recently abandoned alien space craft which will be your initial means of transport around the planet

You step into the craft start her up and then you'll be struck dumb Ever gone from 0 to 1 000 mph in a second? You will in Mercenary

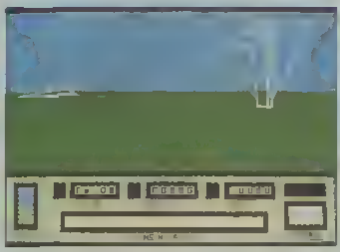
The game's speed is sensational and incredibly smooth too Switch to top speed and you can hurtle along the ground or through the air screaming past, through, around or over the many three dimensional wire frame structures that adorn this strange land It's totally exhilarating and all quite stunning

And there's more good news – Mercenary has been packaged as a compendium For your money you get two games – the original Escape from Targ and its sequel The Second City together with the Targ Survival Kit

The latter is a sumptuous Help package containing a comprehensive map of Targ charts and a 27 page novella which itself provides an insight into the game's many secrets The Kit comes in a sealed envelope bearing the legend Only to be opened in an emergency but can you resist the temptation?

Mercenary is a superb blend of arcade action adventure and flight simulation which uses astoundingly fast 3D vector graphics

In Escape From Targ you play the part of an intergalactic soldier of fortune You have crash landed among an alien civilisation of two mutually hostile races the Mechanoids and the Palyars Who will you choose to side with bearing in mind that your ultimate objective is to escape?



The plot of The Second City is similar but the craft landscape and locations have all changed Conspiracy is rife and escape will be much more difficult – and you'll get no help from the Survival Kit, either!

Mercenary is the most exciting and intriguing game so far released for the ST By itself, Escape From Targ would be worth every penny, but as a compendium Mercenary cannot be topped for value Three cheers for Paul Woakes and Novagen

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

No trivial challenge

Program Trivia challenge
Price £17.95
Supplier Microdeal PO Box 68 St Austell Cornwall PL25 4YB
Tel 0726 68020

WHO haunts Hastings Castle? Where are the live frog eating championships? Which member of the British Royal Family had 11 fingers? Why am I asking such oddball questions?

If you have the sort of rubbish up mind that is stuffed with more redundant knowledge than a treatise on the digestive tract of the Outer Mongolian liverwort let me tell you that your hour of glory has come

Equally, if you happen to be the type of wealthy egghead who can't walk past one of those Trivia arcade machines so beloved of pubs and hamburger joints without feeding umpteen 20 pence pieces into it then you're also going to save yourself a heap of silver

Trivia Challenge II is styled exactly like one of those aforesaid arcade machines The idea is to gain as high a score as you can by correctly answering questions from any of five categories – general knowledge pop music art, sport and science There are 4,000 teasers all told

You begin with a balance of $10 Each play will cost you either a $1 or 25 cents (like the machines, you get better value for money with the larger sum) Depending on the coin deposited you will be given a number of credits Once they have been exhausted you must feed in more money

You select your subject from a drop down menu Click on the Play icon and a question on

→

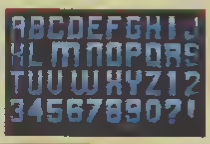
Reviews by Bob Chappell

MIRRORSOFT

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ON THE ATARI ST







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- Zoom edit at pixel level
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- Add captioning, music and sound effects
- Download the finished film on to a video cassette recorder for presentations

The picture elements can be constructed from Art Director, Neochrome, or Degas files; a conversion program is supplied. Each film sequence can be up to 2000 frames long, and can be projected at whatever speed you wish

Film Director is supplied complete with demo files and a comprehensive user manual

£59.95 inc VAT

FLEET STREET

CITY OF LONDON EC4

Publisher

Desktop publishing really comes into its own on the Atari ST, and the Fleet Street series uses the machine to its fullest capabilities

Giving the user total control over text, graphics, and the complete page, Fleet Street Editor enables novice and professional alike to produce finished pages that would have cost hundreds of pounds each using traditional methods.

Features include

- Direct text entry or import from other word processors
- Wordwrap, hyphenation and justification, kerning, and proportional spacing
- Widow and orphan control, tabulation and indentation
- Multiple fonts, point sizes and styles
- Graphics library supplied – you can also import your own graphics from other software or through a digitizer
- Full text editing and text and graphics manipulation facilities in page make-up
- Any page size from A5 to tabloid or user definable, with any number of columns and variable margins and automatically computed gutters

Fleet Street Publisher runs under GEM and will output as standard to a dot matrix printer. Laser printer drivers will be available in the New Year, together with additional fonts and graphics libraries.

Fleet Street Publisher is supplied complete with comprehensive manual

£115 inc VAT

More detailed brochures on each of these packages can be obtained from Mirrorsoft at the address at the foot of the page

For complete hardware and software packages contact

Andromeda Software, 200 Brent Street, London NW4. Tel: 01 203 6366

SDL, 1–4 The Mews, Hatherley Rd, Sidcup, Kent DA14 4DX. Tel: 01 309 1111

Haba Systems Ltd, Lonbridge Delta, Pier Road, North Feltham Trading Estate, Middlesex TW14 0TT. Tel: 01 751 6451

PS Don't forget Mirrorsoft publish games for the Atari ST too!

MIRRORSOFT

Maxwell House, 74 Worship Street, London EC2A 2EN
Tel: 01-377 4645 Telex: 886048 BPCC G
Fax: 01-377 0022



your chosen subject appears. After a pause long enough for you to read the question, three answers appear, only one of which is correct. A timer starts to count you down.

The faster you click on the correct answer, the more points you'll earn. Gain 1,000 points and you'll win $1, 1500 points $1.50, and so on. Slow but sure may be a better tactic though – answer two questions incorrectly and that play is over.

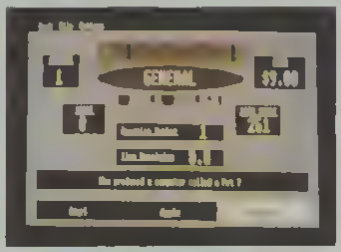
The game also includes a simple facility for designing your own question sets and storing them on the master disc. Your sets can have any title but only one can be called up and stored in memory at any time (it always occupies the General Knowledge slot).

However you could probably get round this single slot limitation by giving your sets the same names as the original categories, regardless of the contents, for example you could have a set about gardening but entitled science.

You would need to save the original question sets to another disc before deleting them from the master disc. Files can be copied, written and deleted to the master disc as long as you don't reformat it.

The game only runs in medium resolution so you might have difficulty in reading the questions and answers unless you have a monitor or a good TV. Judging by the number in the title, sequels seem a distinct prospect.

The same questions can appear in a single



then you should know the answer, at least that gives you an easy chance to rack up your score. Sound is minimal (a few beeps) and the graphics are rudimentary – but does that matter in a game of this nature?

Trivia Challenge II is good cheap trivial fun. Buy it, play it then bore everyone to death with your new found knowledge.

Sound	1
Graphics	4
Playability	8
Value for money	8
Overall	7

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Storage solution for ST programs

Q A

THE first question this month comes from Alan Thompson who is writing a Computer Aided Design (CAD) modelling program for the ST. He is having trouble developing techniques for hidden line removal, a method whereby lines which appear behind 3D objects aren't drawn.

A visit to your local university book shop will provide you with some useful if expensive books. Probably the best of these is Fundamentals Of Interactive Computer Graphics by Foley and Van Dam from Addison Wesley which costs around £25.

Mr M. Bann from Basildon asks why most ST programs insist on placing help files on disc rather than in memory. He argues that this means that you waste space on all your discs which could be used for data storage.

The main reason behind having help files on disc is that most software companies want to be able to sell their programs abroad. To translate a program into French or Spanish they only have to rewrite the text files on disc rather than having to rewrite and recompile the entire program.

One possible solution to your problem is to run your program from a double sided or hard disc drive. In this way you will have more room for your data files.

Mr Bann also asks why some ST programs display a message when you run them, asking you to set the correct resolution while others simply change the resolution themselves.

Although it is possible for a program to change from one resolution to another you will find that programs that use Gem rarely do because the Gem desktop cannot cope with having its resolution changed without rebooting.

If a Gem based program such as a word processor changed resolution from say low to medium and then returned to the desktop the ST would almost certainly crash. Programs which do change resolution such as Starglider, do not return the user to the desktop and therefore do not have to worry about Gem.

Gavin Johnson from Green Wotton wants to know if his copy of Starglider has a bug. In our review in the December issue of *Atari ST User* I stated that it takes more than one missile to destroy Starglider One. Gavin complains that on his copy it only requires one missile.

On the lower levels the game is much easier to play than when you have progressed. If you manage to reach the higher levels you will find that it takes much more than one missile to destroy Hermann's flagship.

Mr D. Leigh wants to know more about the internal workings of his ST and wants to know which books are best. I recommend the First Publishing range of ST books. They cover Gem, TOS, assembly language and C in depth but without leaving the beginner with a lost feeling.

Jeff Gardener from Hemel Hempstead writes to ask about blank 3.5in discs. We have all seen adverts from companies that sell discs at prices which seem almost free when compared to those of the high street stores and Jeff wants to know if discs without a big name label on them can safely be bought for the ST.

Like video tapes, blank discs of all sizes are made by a very small number of companies most of which are based in the Far East. All the discs are tested for reliability. Those that fail the double sided test are sold as single sided and those that fail the single sided test are thrown away.

A percentage of the good discs are labelled with big names while the remainder are left unlabelled. These latter are used by duplicating companies which produce discs for software companies and by some of the smaller disc companies.

Therefore if you own a brand name disc which cost £3.50 and an unlabelled disc which you bought for £1.50 there is a good chance that they both started life in the same factory.

HINTS AND TIPS

My thanks to Reg Williamson who has written to tell me how to stop Fast Basic from producing the same set of random numbers continuously. The solution is to place

dummy%=RND(-TIME)

at the start of your programs. This will produce a new seed for the random number generator and thereby produce different random numbers.

Matthew Westby has supplied me with three hints for using Atari's Neochrome more easily.

- Double clicking on the eraser will delete the area of the drawing which is showing.
- When in Pencil mode pressing the right mouse button will turn the pencil into an eraser.
- Pressing the right mouse button in Line Draw mode will draw a line made up of all of the colours in the current palette between the two markers.

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



Speaking Clock



IF you've just bought a copy of Computer Concepts' Fast Basic cartridge for the ST, you'll probably have been playing with its fascinating built in speech module. This Fast Basic program uses the module to turn your ST into a speaking clock – albeit a very expensive one.

Speaking clock works in any screen resolution. The current system time is displayed in the centre of the screen and every 10 seconds the program speaks the time adding 'o'clock'.

To use it, simply set the system clock with the control panel desk accessory and then run the program from Fast Basic. To stop the program press any key and the Fast Basic windows will be restored.

The program is split into several procedures:

Resolution finds out which screen mode is being used and sets clock position and colour accordingly.

Initialisation sets up the array which holds the numbers in text form ready to be spoken and loads the speech module from the disc.

Time extracts the hour, minutes and seconds from the system clock and converts them into words ready to be spoken by the speech module.

Close clears the screen and restores the windows and mouse pointer. ■

David Jones gets his ST to tell him the time

```
' ********************************
' *                              *
' *   ----- SPEAKING CLOCK -----  *
' *                              *
' *  Program ID: SAYTIME.MAC     *
' *  Programmer: David Jones     *
' *  Date:       23rd Nov 86     *
' *                              *
' ********************************
'
PROCresolution
PROCinit
PROCtime
stored_sec%=second%
REPEAT
  REPEAT
    PROCtime
    PRINT TAB(x%,y%) time$
    key$=INKEY$
  UNTIL second%<>stored_sec% AND (k%=0 AND key$<>"")
  IF second%<>stored_sec% THEN
    stored_sec%=second%
    || cont|=0
  ENDIF
UNTIL key$<>""
PROCclose
END
'
' PROCEDURE DEFINITIONS
' ********************
'
DEF PROCresolution
  res%=PEEK(&44C)
  SELECT res%
    CASE 0
      x%=8:y%=2:PAPER 12:INK 4
    CASE 1
      x%=13:y%=2:PAPER 3:INK 2
    CASE 2
      x%=18:y%=5
  ENDCASE
ENDPROC
'
DEF PROCinit
  HIDEMOUSE
  TXTSIZE 24
  wh%=OUTWINHDLE
  GETWINDCOORDS wh%,x%,y%,w%,h%
  SETWINDFULL wh%,x%,y%,w%,h%
  GETWINDCOORDS wh%,x%,y%,w%,h%
  TXTMOVE x%,y%,w%,h%
  TOP=1
  CLS
  stored_sec%=0
  DIM number$(23)
  FOR i%=1 TO 23
    READ number$(i%)
  NEXT i%
  DATA "ZERO","ONE","TWO","THREE","FOUR","FIVE","SIX","SEVEN","EIGHT","NINE"
  DATA "TEN","ELEVEN","TWELVE","THIRTEEN","FOURTEEN","FIFTEEN"
  DATA "SIXTEEN","SEVENTEEN","EIGHTEEN","NINETEEN"
  DATA "TWENTY","THIRTY","FORTY","FIFTY"
  LAUNCH "SPEAK ENG",0,0,0
ENDPROC
'
DEF PROCtime
  time$=TIME$:REM(time$)
  hour$=LEFT$(time$,2):hour%=VAL(hour$)
  minute$=MID$(time$,4,2):minute%=VAL(minute$)
  second$=RIGHT$(time$,2):second%=VAL(second$)
  IF hour%=0 THEN
    conhour$="ZERO"
  ELSE
    conhour$=FNconvert(hour%)
  ENDIF
  conhour$=conhour$+" "
  IF minute%=0 THEN
    conminute$="O CLOCK"
  ELSE
    conminute$=FNconvert(minute%)
    IF minute%<10 THEN conminute$="O "+conminute$
  ENDIF
  IF second%>0 THEN conminute$=conminute$+" and "
  IF second%=0 THEN
    consecond$=" EXACTLY"
  ELSE
    consecond$=FNconvert(second%)+" second"
  ENDIF
  IF second%>1 THEN consecond$=consecond$+"s"
  con|ine$=conhour$+conminute$+consecond$
ENDPROC
'
DEF PROCclose
  SETWINDCOORDS wh%,x%,y%,w%,h%
  TXTMOVE x%,y%,w%,h%
  CLS
  TOP=2
  SHOWMOUSE
ENDPROC
'
' FUNCTION DEFINITION
' *******************
'
DEF FNconvert(figure%)
  IF figure%<20 THEN
    fig$=number$(figure%)
  ELSE
    fig$=number$(18+figure%/10)+ "-"+number$(figure% MOD 10)
  ENDIF
=fig$
```



If you've written any useful or interesting five line programs in either Atari Basic, Fast Basic or Logo, why not send them in to our five-liners section for ST owners?

We pay £25 for each one published.

Simply send a copy on disc along with a clear listing and good explanatory notes to

ST Five-liners, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

MANDLEBROT SET

from P.S. HAND

THIS program generates a fractal-like Mandlebrot set on the ST's low resolution screen.

The program takes over two hours to complete the image and then saves it to disc under the name "PIC.BAS"

If you don't fancy waiting for 2 hours, you can speed up the program by changing lines 2 and 5 to

```
2 for p=0 to 300 step 0:for q=0 to 150
step 9 ... (rest of line)
5 color 1:gotoxy p/9,q/9:?"e";:next p,q
... (rest of line)
```

These changes will make the program plot the same picture using characters rather than individual points

Line Breakdown

1 Clears the screen and sets the horizontal and vertical magnification constants

2 Initialises the two loops and starts the calculation

3 Completes the calculation and performs a check to see if an acceptable value has been reached

4 Checks on the number of colours already used

5 Sets the colour, plots the point and goes to the next screen position. Saves the picture to disc when finished

```
1  defseg=0:defdbl a:a=peek(&h88)+256*peek(&h89):fullw 2:clearw 2:h=2.76214e-2:v=0.382
2  for p=1to 300:for q=1to 150:a=-2.25+int(p/2)*h:b=-1.4+int(q/2)*v:x=0:y=0:i=0
3  r=x^2+y^2:t=x^2-y^2+a:y=2*x*y+b:x=t:i=i+1:if r=100 then 5
4  if i=15 then 5 else if r<100 and i<15 then 3
5  color i,1,1:plot p,q,p,q:next p,q:preset:d=peek(a)+peek(a+1)*256+peek(a+2)*65536!
   bsave"pic",d,32767
```

POLYS

from DR.S.CHERIAN

THE POLY primitive in ST Logo is fiddly and difficult to use. POLYS is an alternative which will draw a polygon (including triangles and squares) at any chosen locus on the graphics screen.

The inputs are: Length of side, number of sides, line colour and X and Y coordinates of start position.

Line Breakdown

1 Defines the routine POLYS and takes the inputs

2 Places the pen at the start position and sets the colour

3 Draws the sides of the polygon

4 Moves the pen inside and fills the polygon

5 Ends the routine

```
TO POLYS :SIDE :NUM :COL :X :Y
PU SETX :X SETY :Y SETPC :COL PD
REPEAT :NUM [FD :SIDE RT 360 / :NUM]
PU RT 60 FD 10 PD FILL HT
END
```

FAST

FAST BASIC

Atari ST cartridge

A new and very fast BASIC interpreter ROM cartridge for the Atari ST computers. This 128K program has been written specifically for the Atari ST computers and so makes full use of (and gives the programmer full access to) all the special features of this machine.

Based around MBC BASIC, but considerably extended. FAST BASIC is a modern structured programming language. It is the ideal environment for those who want to experiment with the ST and to find out about GEM and 68000 assembly etc.

SPEED

With an average PCW benchmark speed of 1.8 seconds, this is the fastest BASIC available (faster than any other PCW have tested) and is faster than BASIC running on the new Compaq 80386 super micro See table for other comparisons

EDITOR

A full GEM based scrolling editor is included. Supports search and replace, cut, copy, paste and very fast scrolling speeds. Multiple programs may be held in memory at once, and each program can have its own editing window and associated icon. A special immediate window allows commands to be used immediately without forming part of the BASIC program

PROGRAM SIZE

There is no limit to program size, other than available memory and there is no speed degradation in running large programs as there is on many other interpreters. Strings may be up to 64K long, arrays may be over 64K

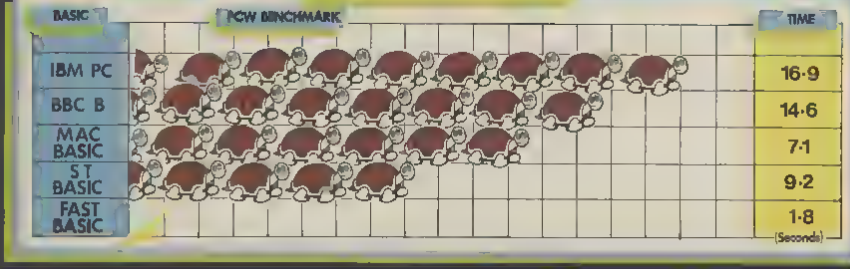


FAST BASIC INCLUDES:

- **ROM Cartridge** - it uses no RAM, leaving the maximum available for BASIC programs. It does not have to be loaded from disc and so offers instant start-up and can be permanently available
- **Example disc** containing a range of example programs from simple loops to complete GEM examples.
- **Manual.** Comprehensive 400 page spiral bound manual detailing all commands.
- **Quick reference card**



COMPARISONS



BASIC

ST CARTRIDGE.

FRACTAL.DSC

```
REM  Fractal graphics
REM  from Scientific American.
REM  Adapted by Phil Martin

REM  Runs in any mode

xa/=GRAFWIDTH/2:ya/=GRAFHEIGHT/
HIDEMOUSE
X=0
Y=0
REM  (Try 3,2,1 for starters)
INPUT"Type in any three numbers

REM  Plot dots, try with other
MARKTYPE 1

HOME CLG 0,PRINT"Press ESCAPE t
```

Output

Review

Review

EXAMPLE SCREEN

MONEY BACK GUARANTEE

Review

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▶ LATTICE C £99.95

The well known Lattice C compiler used by professionals and developers Many commercial ST packages have been written with this powerful and robust compiler, a full Kernighan and Ritchie implementation Comprehensive libraries of UNIX and utility functions Compatible with Lattice compilers on IBM-PC Commodore-Amiga OL etc Full IEEE format floating point arithmetic Powerful data types including pointers arrays structures, unions register variables etc, macros conditional compilation and other pre-processors Includes Menu + and screen editor

▶ MCC PASCAL £89.95

A powerful Pascal compiler that meets the exacting ISO 7185 standard (level 0) A fast, single pass compiler, generating native code Comprehensive error handling 32 bit IEEE format floating point arithmetic and full 32 bit integers Includes Menu + and screen editor

▶ METACOMCO MAKE £49.95

Metacomco MAKE is an intelligent batch file which is an invaluable tool for maintaining any computing project MAKE guarantees source and object code integrity by automating the process of compiling, assembling and linking programs Includes a screen editor Based on the UNIX MAKE utility

ALL METACOMCO PROGRAMMING LANGUAGES FOR THE ST HAVE THESE ADVANTAGES-

▶ **INTEGRATED RANGE OF LANGUAGES ON THE ST AND OTHER 68000s** Metacomco a range of languages for the ST provides an integrated and consistent programming environment for ST programmers Program modules written in different languages can be linked together Metacomco a ST languages are compatible with their languages for Amiga and QL Make it easy to port your programs by choosing Metacomco

▶ **GEMDOS LIBRARIES (Source code provided)** All Metacomco languages come with a set of GEMDOS libraries making it easy to program the graphics and the other features of the ST Full source code of Metacomco's libraries for GEMDOS is provided allowing programmers to modify them The source code is well documented

▶ **CHOICE OF LINKERS** All Metacomco languages include a linker where appropriate. Metacomco program modules can also be linked using the Digital Research Linker

▶ **FRIENDLY ENVIRONMENT** All Metacomco languages now include MENU + an easy-to-use programming environment using pull-down menus and the mouse

▶ **SCREEN EDITOR** A powerful screen editor for preparing programs is included with every language

▶ **DETAILED MANUAL** Every Metacomco language comes with its own detailed manual

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▶ MCC ASSEMBLER £49.95

A professional quality macro assembler with many useful features for the serious programmer Standard Motorola 68000 mnemonics Macro expansions Over 160 explicit error messages Fully formatted listings Large range of directives Includes the source of a simple debugger, Menu + and screen editor

▶ CAMBRIDGE LISP £149.95

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▶ BCPL £99.95

BCPL is a popular yet fast and powerful language suitable for applications including systems software, applications programs and games This BCPL compiler contains not only standard BCPL language functions but also many useful extensions Includes GEM libraries, Menu + and screen editor

▶ MENU+ £19.95

MENU + provides ST users with a friendly command shell to control their programs, using pull-down menus and the mouse Easy-to-use Runs single programs or batches, avoids repetitive command line entry The user can add his own tools, arguments and options Runs any program - not just Metacomco products

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Star just out of this world



Reviewed by André Willey

COMPUTERS and science fiction have always had more than a little in common, and as often as not you'll find that an interest in one of them will quickly breed an interest in the other. For this reason, if for no other, Beyond Software is certain to have a winner with its first offering for the ST – a fantastic computer simulation (game is too tame a word) of the classic TV space opera Star Trek.

Late last year I was lucky enough to be beamed aboard the USS Enterprise in the form of a pre-release version of the game, or to give it its full title, *Star Trek: The Rebel Universe*.

The theme could have come straight from an episode of the series itself, and we find the Enterprise battling against a combined force of the Federation's worst enemies. The Klingons and the Romulans have teamed up with a number of rebel Star Fleet captains to create a force powerful enough to overthrow the forces of good.

Fortunately for the United Federation of Planets, someone has had the good sense – not to mention considerable technical skill – to surround the enemy portion of the galaxy with a force field known as the Klein Sphere. As the Enterprise was the only starship in the vicinity at the time, Captain Kirk and his crew have been ordered into the zone to attempt to quell the rebellion.

Against this background is played a game which falls part way between adventure and arcade in style, with digitised sound and some amazing graphics adding to the atmosphere.

The game play centres around a display of the bridge of the Enterprise, around which are panels for each of the main crew members. In order to call on one of them for help – or to issue a command – you click on the relevent character and their full display fills the main working area of the screen. A nice little touch is the way the mouse pointer is represented as a small Star Fleet insignia.

All the regular favourites are there, drawn to perfection by artist Steve Cain. Each character has his or her own area of responsibility, often with more than one control panel at their disposal. Sulu is in charge of the ship's navigation, Checkov the weaponry systems, Mr Scott the state of the engines, and so on.

Mr Spock, Uhura and Dr McCoy are used mainly to provide information and assistance, and play a much lesser role than their TV counterparts. Captain Kirk, of course, oversees and coordinates the whole mission.

Each of the functions available to you have been modelled closely on the TV series, and the diehard fans will have little to complain about in terms of its faithfulness to the programme. The Enterprise has suddenly gained the power to speed off at warp 10 without blowing itself to pieces, and it seems to have grown a couple of extra phaser banks, but apart from these trivial points little would appear to have been altered.

You can navigate your way around the Klein Sphere by using the ship's main Astrogator – an amazing 3D display unit allowing you to view the galaxy and plot a route through it.

You have a time limit to complete your mission, so speed is of the essence – but don't forget that charging around at warp factor 10 the whole time will drain your dilithium crystals in no time flat. There are hundreds of solar systems to explore, some of which may contain life supporting planets, so plan your voyages carefully.

When you finally come across such a Class M planet you may use the transporter to beam down up to six of your crew, along with whatever equip







ment they currently have at their disposal. Once on the surface they will encounter a series of obstacles and problems and there are also various items to collect many of which will help you later in the mission.

No clues are given, but some intelligent guesses and good use of your crew's talents will go a long way to achieving your goal.

All of this would be tricky enough if it were not for the fact that the Enterprise is under constant attack from enemy ships. You may fight back with your phasers and photon torpedos aiming and firing via two 3D targeting and combat displays.

Digitised sound is used to excellent effect in this section of the game as you hear Checkov telling you that the phasers are locked on target and as you hear the forward phaser banks blast their deadly beams out into space you will less frequently hear his exuberant cry. Got 'im!

The final version of the game which will be available shortly after you read this will include a couple of extra finishing touches and must be a surefire candidate for game of the year for 1987.

It is a classy mixture of the old faithful elements from the TV series and the latest advances in computer graphics and sound technology. One gets the feeling it is the sort of game you would find Captain Kirk playing with in a spare off duty moment. A must for all ST owners – I know that I'll certainly be spending a good deal of time with my ST as soon as the final copy comes through.

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

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Resolving resolution problems



ONE of the few problems with the ST which confronts every user is its inability to display all three resolutions on one monitor or TV. This means that you cannot show a picture designed on a high resolution monochrome monitor on a colour monitor in low or medium resolution and vice versa.

The problem stems from two areas. Firstly, Atari designed the ST's high resolution 80 column mode to use a very high quality monitor running at 70MHz. This frequency is unusually high and would almost certainly burn out a normal monitor, making it nearly impossible to use a display other than Atari's for high resolution work.

Secondly, although each of the three resolutions is stored in 32,000 bytes of memory, it is stored very differently from the other two. To understand this we must look at each resolution in turn. The most straightforward of the three is high resolution which is made up of 640 by 400 pixels. There are only two colours in high resolution – black and white. These make it ideal to have a bit representation of a point – one is black and zero is white. This means that a single horizontal row of 640 pixels is represented by 640 bits or 80 bytes. Multipy this by 400 rows and we get 32,000 bytes or nearly 32k of memory.

The colour resolutions are slightly more complicated than this. Medium resolution is made up of 640 by 200 pixels, each of which can be any of 4 colours from the ST's 512 colour range. These colours are determined by the current values of the ST's palette, which can be altered by using the control panel or from within a program. A colour of any pixel on the screen is therefore defined by two bits, which when taken together give the possible 4 colour choice, as shown in Table I.

Unfortunately the ST uses a system of interweaving which means that the two bits which represent a pixel are not stored next to each other in memory, but at the same position in two adjoining words. Unlike the 8 bit Ataris a word on the ST is made up of 16 bits – hence its name as a 16 bit computer.

Colour	Bit Pattern
0	00
1	01
2	10
3	11

Table I

To find the colour of the first pixel on the screen we must therefore take the value of the first bit in screen memory and pair it with the first bit of the next 16 bit word, which is 16 bits further on in memory. We then use Table I to find out which colour the pixel is being displayed in. For a further explanation, look at Figure I.

Horizontally medium resolution is made up of 640 pixels, each of which requires 2 bits of storage. This makes a total of 1280 bits or 160 bytes of memory. Multiply this by 200 rows and we get 32,000 bytes.

The ST's low resolution is even more complicated but crafted along the same lines as medium resolution. It is made up of 320 by 200 pixels, each of which can be any of 16 colours. Instead of 2 bits to represent a pixel, low resolution needs 4 bits which taken together represent the possible range of 16 colours in a similar manner to Table I.

Four 16 bit words are taken together to represent each set of 16 pixels. Each digit of the binary number which represents the colour is taken from the next word along in the chain. Figure II explains this in more detail.

A low resolution pixel therefore takes 4 bits of screen memory and a complete horizontal row takes 1280 bits or 160 bytes which means that the complete screen of 200 rows once again takes 32,000 bytes of memory.

Since the colour of each of the pixels in low and medium modes is defined in terms of the value of

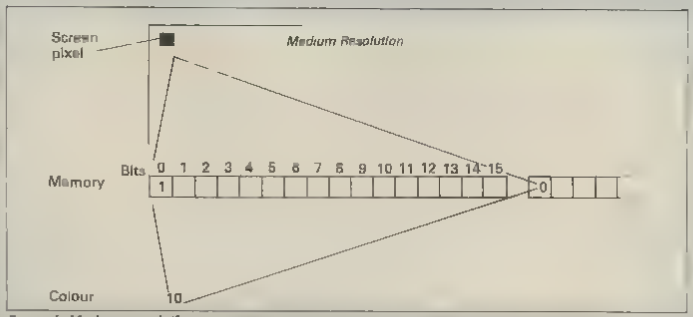


Figure I Medium resolution

By Andrew Bennett

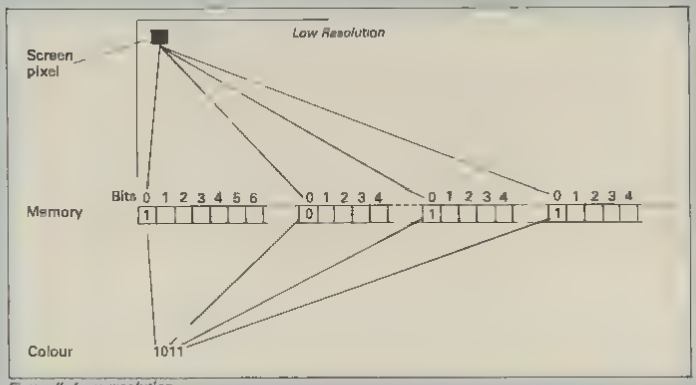


Figure II Low resolution



the ST's palette, it is possible simply to change the palette value – and all the corresponding pixels on the screen will also change automatically. This effect is called colour cycling and leads to such effects as the famous boink bouncing ball and the Neochrome waterfall demonstrations.

When the ST reserves memory for its screen it leaves aside 32k (32,768 bytes) of memory but as we have seen a screen of any mode only requires 32,000 bytes. The extra 768 bytes of memory are normally wasted or can be used by the clever programmer for a small machine code routine, such as the screen dump program which we published in the November 1986 issue of *Atari ST User*. ■

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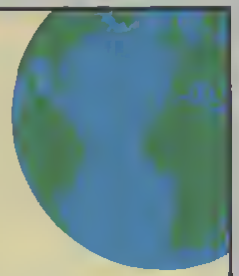
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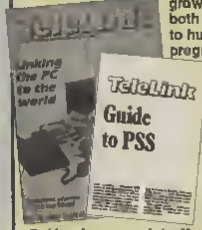
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EDWARD SHARK reports

Cutting cost of downloading ST programs

ON my trips down the phone lines to the various bulletin boards on this side of the Atlantic this month I have noticed a growing awareness of the problems of downloading ST programs

With connection charges ranging from a couple of dollars to more than $20 an hour it is annoying to find that the program that looked most interesting when it was described takes over 20 minutes to download via the modem to your ST

This problem doesn't affect 8 bit owners because programs for their computers tend to be smaller than 40k of Basic or machine code but programs for the ST have been known to be as long as 200k

Even at 1200 baud this represents a large cost in connection time while the program is downloading and you don't even know whether the program will be as good as it sounds until you go off line and run it

Another difficulty that ST owners face is that their programs are often made up of several files including the



program's data and resource file. This makes downloading difficult and it can be very annoying to go off line only to find that you haven't downloaded a crucial data file

There have been a number of attempts to overcome these difficulties and the most successful so far appears to be a program called ST Arc, a direct descendant of an IBM archiver program rewritten to use Gem. It not only compresses programs and their data but also joins them together into one file.

If you like the look of a particular program you simply download the singular file associated with it and then separate and decompress it using your copy of ST Arc.

ST Arc is available for downloading on most of the bulletin boards in the States and is a must if you intend to download ST software.

* * *

There has been a definite shortage of good word processors for the ST so far, which has allowed the public domain program STWriter to become popular. It doesn't use the mouse or windows but it is very fast and it supports dozens of printers.

Version 1.70 of STWriter has recently been rumoured and I'll be telling you about its features in a future *Atari User*.

* * *

A new extension to Gem has been released by Atari. Available only to software houses for insertion into their programs, Gdos allows programs to use many different fonts of the kind usually associated with Apple's Macintosh.

GDos was originally omitted from the ST version of Gem because the programmers at Atari and Digital Research were having trouble squeezing it into the ST's 192k of rom memory.

Atari charges a royalty to the company on each product using Gdos, which means that you should only expect to see it used in programs from the larger software houses.

* * *

ST Flight Simulator II from Subloglc is similar in operation to the older versions to be found on the Commodore 64, Apple II and Atari 8 bits, except for the ST's higher resolution display.

The option that sets it far apart from its younger cousins is the ability to play a two player game. This isn't achieved by using different parts of the keyboard so that each player can control his plane, but by attaching two STs either by normal cable or via the phone lines using modems.

Each player flies the plane of his choice and as well as the usual buildings, mountains and other scenery he can see the other player's craft in 3D as it flies over the same terrain.

However the American ST game playing community has been slightly disappointed because it isn't possible to collide with or shoot at the other



player's plane. Sublogic is working feverishly to include these capabilities and hopes to have another version out soon. A leisurely flight over New York will never be the same again!

* * *

If you're interested in 3D graphics and how you can include them in your programs look no further than a new book from Abacus. It teaches 3D computer aided design in C and discusses techniques such as rotation, shading and hidden line elimination.

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Degas takes big stride forward

Program Degas Elite
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IF you are interested in art and graphics on your ST the chances are that you will already have a copy of Tom Hudson's Degas graphic drawing package. This followed on from Atari's freebie NeoChrome and quickly established itself to such an extent that many other commercial packages offer the facility to load and save Degas picture files.

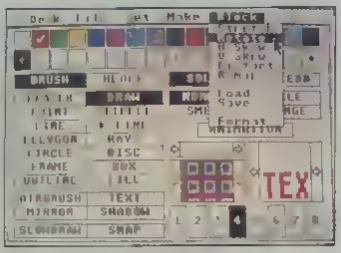
In the meantime Tom has not been sitting on his laurels. Since completing his excellent CAD 3D program he has been working on the long awaited update to Degas.

Anyone familiar with Degas will immediately feel at home with the controls of Degas Elite. There are still the two main screens – the work screen and the menu – selected between by using the right mouse button. The left button selects menu items and is also used to draw with.

The main menu is still in the same format as the original version, but a whole host of additions have been made. Many of the awkward selections of such things as palette, fill pattern, line pattern and so on have been made much simpler.

You may now click through the choices or double click to open up a full selection menu box. You may double click on many other function buttons to open control windows, making usage of some of the more complex functions a very straightforward matter.

All of these options are also available from a set of comprehensive pull down menus, and many may also be selected by using the keyboard while on the drawing screen – a great advantage over many of its competitors.



The main menu of Degas Elite



Degas Elite's block manipulation facilities can be used to create some amazing effects

All the normal drawing commands are here – point, line, kline, polygon, circle, box, fill and so on. New features include stipple and outline. Outline is a very useful tool which will create a single pixel wide border around any object in any colour. Fill has now been expanded to allow the use of some rather spectacular multi-coloured fill patterns.

Additionally, many functions may now be "smeared" which is a very easy way to blend two colours together. You simply select the smear option and then draw in the normal manner. Instead of a solid line, any colours under the brush will be mixed up and blended.

A new feature for Degas is the animation section which features four separate animation controls which will cycle through the colour values in various given registers. This is an enhancement of the Neo animate feature and can be very powerful indeed, especially when used with cycle drawing which will allow you to draw lines and patterns in the various colour cycle registers. This makes creating such pictures as the now famous waterfall a doddle.

The zoom facility of Degas has been expanded and you may now use any of the 10 function keys to give a magnification of between three and 12 times. This magnified view may be scrolled over the whole picture, modified and zoomed in and out at will.

Reviewed by André Willey



A complete new section of extremely powerful functions has been included which allows you to select a block of any size from your picture and store it in the block buffer. You may then paste it into another picture or use it as a brush and paint it back in again somewhere else on the same picture.

One of the most amazing things you can do with the block is to scale it up or down to any size, bend it, distort it, rotate it and generally do anything else you can think of to it. These options have to be seen to be believed, and I spent hours finding out what each one was capable of.

Loading and saving are now so versatile that you should never need to use another program again. You can load or save files from Neo, Degas, Amiga or 8 bit Atari Touch Tablet – in whatever resolution they happen to be – and Degas Elite will do its best to convert them into a suitable picture for the resolution you are currently working with.

It will even try to match up your palette values with the ones in the original file. This seems to work very well indeed, and I have converted a number of medium and high resolution pictures into low resolution with fantastic results.

The new load and save routines also allow you to work with saved blocks, brushes, lines, fill patterns, full Gem fonts and even load in new palettes without losing the current picture and vice versa.

If you are using a one megabyte machine you may have up to eight pictures in memory at once and flip between them with a click of the mouse button. Even the humble 520 will allow you to work with two pictures at once, which itself is an improvement over the old Degas.

Overall then, Degas Elite improves in almost every area on the original. Everything has been made easier to use, and hundreds of new facilities have been added. The package is now probably the most sophisticated of the drawing/art programs available today – but who knows what tomorrow will bring?

Its only serious drawback is its price. At £69.95 it is perhaps a touch more expensive than many people would like, but you certainly will get your money's worth.

Features	10
Ease of use	9
Manual	9
Value for money	9
Overall	10

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