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Vol. 1 No. 7 November 1985 £1



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One simple form on which you can order everything from a dust cover to a monthly cassette.

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Superb machine code pinball game is FREE with this month's disc and tape.

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No flood of cut-price STs, says Atari

ATARI UK has described reports of cut-price 520STs flooding into the country through the back door as "suspect to say the least".

The company has investigated several stories concerning possible black market machines and found them to be without foundation.

"All the leads we have followed up in this area have proved to be fruitless", says Max Barnbridge, Atari UK's general manager.

"Naturally because of the intense interest generated by the 520ST some people will have gone to considerable lengths to get their hands on them", he said.

"But if there is such a market it is much more likely to be grey rather than black".

However one major distributor still insists there is an

under-the-counter operation involving hundreds of machines. These are allegedly being offered for sale at discounts of more than £70.

These claims come from Terry Deane, a director of Slice Shop, the Atari distributor for Greater London south of the Thames, Sussex, Kent and Midlands.

"We believe that these machines are coming in via the back door from sources in the Far East and Holland", he told Atari UK.

"We know this to be true because dealers in our own area have bought them. This is all making a mockery of the Atari distribution plan for the ST which effectively carved the company up into regions".

Tony Deane added a warning for both dealers and customers that they may well

get their fingers burned if they do not buy from legitimate sources.

"If a machine has not been purchased through normal channels the guarantee is not valid", he said. "So if it goes wrong there is no comeback for the buyer."

"Then they will realise that, even if they have bought it cheaply it certainly won't be good value for money".

TOP **Atari** **programs**

Compiled every month for Atari UK by Terry Abbott Distribution Ltd

1	Spudlock
2	Space the Ball
3	Police Position
4	Atari's Tennis
5	Chop Chop
6	Summer Games 2
7	Red Moon
8	Search Word
9	Early Thompson's
10	Elite

Drive on schools

ATARI is poised to gain a foothold in the UK educational market with a discount scheme aimed at schools and colleges.

The company has announced that it is offering 10 per cent off all 8 bit

computer hardware, peripherals and software.

In addition it is aiming to win over the colleges with 15 per cent off the ST machines and their associated peripherals and software.

The Mac basher

A **BENCHMARK** test of computer speed has proved conclusively that the 520ST can show a clear pair of heels to the Apple Macintosh.

Set up by Amdc, an American computer magazine, it saw the Atari 860plus machine complete a program in 3.8 seconds which took the Mac from 7 to 13 seconds.

Using the most widely accepted standard in the computer industry, the procedure involved timing the index tests to find all prime numbers between 3 and 13,681.

By turning in a time of 2.8 seconds, the 520ST revealed itself to be as fast as microcomputers running on the Unix system.

Target is 20 million

ATARI has targeted a potential worldwide market of up to 20 million customers for the ST range.

This was revealed by the corporation's chairman Jack Tramiel during a recent visit to London.

Discussing the long term strategy behind the global marketing of the ST, he told Atari UK: "What we have out there are 20 million people who have already bought 8 bit machines."

"Now these people are looking to upgrade their. They want something that's faster and easier and at the right price. That that is just what Atari is offering them".

Jack Tramiel believes that his

team will set the pace because its members have a better understanding of what the end user really wants.

"The majority of manufacturers do not understand the customer", he insists. "All of them believe that with advertising they can reach the position that General Motors once held. That being they were able to persuade people that all they wanted out of life was a yellow car."

"Well that was okay until the Japanese arrived and offered blue cars of better quality at a lower price. Suddenly nobody wanted the yellow cars any more."

"That's what is now happening in the computer industry".

The outspoken entrepreneur is underlining in his belief that it will be the informed computer user who will make Atari number one.

"When I left Commodore I knew that the only way to bring the business back alive was to continue its philosophy of giving the end user - the most intelligent person in our society - the best technology available at the time", says Jack Tramiel.

"As far as I am concerned, I've had enough of 8 bit products, even with all the advertising that's been done."

"The launch of the ST was the best I have been involved in since the beginning. It proved to me once again that the end user knows best what he wants."

Atari 'seal of approval' for top software

The creme de la creme of Atari XL and XE software is now instantly recognisable, says Atari, having just initiated its own software "awards".

It is giving Atari Approved Software labels to what it believes are the best titles available in five categories - small businesses, education, recreation, utility and creativity. They are to be presented on a regular basis.

Software houses and distributors have already been invited to submit titles for evaluation by Atari and an outside examiner. Criteria for approval include quality, value for money and suitability to the machine. A licence fee is not being charged for the labels.

Atari has already decided on its first winners and one company which has fared extremely well in the listings is distributor Software Express.

The distributor's approved titles are *Earthworms*, *The Factory*, *Paperclip*, *Synaptic*, *B-Graph*, *Artistic Basic*, *RE Bank Street Music Writer*, *Print Shop*, *Hitch Hiker's Guide*, *Kennedy Approach* and *Space Base*, a number of which are American imports.

Artistic was next in line with *Seven Cities of Gold*, a 10000 version of *Paperclip* and *B-Graph*.

Also included were *Rescue from Francisco* and *Ballblazer* from Accision, *Doms* and *Kennedy Approach* from US Gold, *Minibase* from Silicon and *P-Funk* from Synapse Software.

Atari have been commended on the approval scheme by Mike Rowlands-Jones of Software Express. "It is not only a good incentive for the software houses, but a great help to customers", he said.

"Customers usually have several titles of a similar nature to choose from. If they see a label of approval from the machine's manufacturer they at

least know it must have something going for it".

"In the charts approval is given to a title because it is in the top ten that week. In three months it could be gone. I believe the titles which should be rewarded - and there are some out there - are the classics".

The approval scheme has already taken off in America and is working well, said Rowlands-Jones. "And it will work here as long as it is not a five minute publicity gimmick. It needs publicising and for all software houses to become involved".

Computer links for churches

THE recently-formed Christian Micro Users Association has begun its work of linking together computer users of various denominations and promoting the use of micro in church activities.

Association secretary Philip Clark told *Atari User*: "There is a great need to discover and make contact with the individuals and companies producing Christian software".

"We also need to share the expertise and ideas of the many who have sought to use micro in their church-related activities".

The aim of CMUA is to concentrate on the popular computers like the Atari and it has already presented a significant number of programs based on Bible studies.

The Association intends to produce a quarterly magazine called *Christian Micro* and, from next January, launch a series of tape magazines for specific micros.

Its other activities will include the formation of local groups.



Double challenge on the ST

TALENT Computer Systems is providing users of the 1000ST with a double challenge in its latest release.

The single 5.25-inch disc includes two fast paced adventures - *West and The Last Kingdom of Zed*.

West acts as an introduction to the more demanding challenges and dangers contained of *Zed*. The aim is to track down a notorious gang of bank robbers who have gone to ground in an abandoned mine in Indian territory.

There is gold to be collected, clues to be solved, and Indians, rattlesnakes, and robbers!

users to dodge in more than 120 locations.

Zed is a classic and complex adventure with in excess of 200 locations and a huge vocabulary.

Users must find the lost refuge of the dwarves, the Damed City, and the precious sword of the old civilization.

It is a real time adventure with tasks to complete, puzzles to solve and maps to negotiate. The two-in-one disc costs £24.95.

Video digitiser launch

A VIDEO digitiser for the Atari 800, 800XL and 1300E has been produced by Stern Computing.

Called *Computereyes*, it has been adapted for the British and European PAL video standard from the original NTSC model designed and manufactured by Digital Vision in the USA.

Computereyes will digitise from any standard video source including video recorder and video disc.

Images are placed in the hi-res graphics area and can be saved to disc if desired. Special high contrast and grey-scale capture routines are included. The system costs £109.

Pascal for ST

PORTMAN 77 and Pascal are to be developed for the Atari ST by Proprietor Software, which hopes to have the two language programs available at the end of this year.

PROTEUS ON ITS WAY

A **SECRET** software product with the code name Proteus is currently being developed at the London headquarters of Softak. It is an integrated suite of programs which has been designed, says the company, to sit on top of GEM.

"There has been nothing like it seen on the market before", says Tim Langford of Softak. "We are convinced it will rival both Jaz and Symphony in its impact."



Dutch schools go for the 800XL

Dutch children have begun to learn about computing, and the Atari 800XL is the machine chosen by the education authorities to do for Holland what the BBC Micro did for Britain.

A series of radio and television programs featuring the 800XL, is being broadcast to Dutch elementary schools.

The aim is to introduce youngsters to information technology and smooth the process of learning to use micros.

The project is being supervised by the Dutch school radio foundation SNS, a combination of the school radio services of



WRO and VARA, founded in 1951.

Other participants involved, apart from SNS and Atari, are the department of education at Amsterdam University and Walters Software.

Atari Benelux sales and marketing manager Wilfred de Graaf says the project could lead to sales of more than

100,000 800XLs in Holland.

Pupils will learn the history of communication, how to use the 800XL, solving problems by computer, programming and other skills.

The SNS is encouraging pupils and teachers to develop their own software to add to the library of programs broadcast on the school radio network for downloading on to cassette.

Two 15 minute television programs featuring the 800XL will be broadcast each week in the afternoon so that they can be watched during school lessons.

Mohawks take the Atari trail

ERG chief Jack Tzaniel has come to the aid of the Mohawk Indians in Canada, the country where he had some of his earliest business successes.

The Atari boss presented the first of 10 800STs to band councillor Maurice Masade at the 1986 Computer Fair in Toronto.

The machines will be used for training at the First Nations Technical Institute, but their donation is of much greater value than that to the Indians.

For Atari has commissioned the Mohawks' educational firm to develop a syllabic font for

use in developing software in the many North American Indian languages.

The syllabic font will be based on an alphabet of picture-like marks, or picture symbols, developed to represent words and phrases in the Indian tongues.

When the development work is done the Mohawks will become sales aided co-sellers for Atari, marketing the 800ST to native groups all over the

North American continent.

The idea of developing a syllabic font for use with the 800ST was discussed during meetings between the Mohawks and Atari Canada.

"Being good Canadians, and the Indians have been here long before us, we thought why don't we try to do something for them", says Atari Canada general manager Ian Kennedy.

"Then we spoke to Jack Tzaniel about it and he thought it was a great idea and sanctioned the donation of the 10 machines for training and software development".

Enhanced Gem is forecast

A MAJOR row between the Apple Corporation and Digital Research has been settled in such a way that Atari may emerge as the eventual winner.

Digital Research has agreed to pay Apple an undisclosed sum and amend its Gem programs to avoid any possible infringement of copyright.

It is these programs that are being offered with the new ST range of micros.

One result of the compromise settlement is that new versions of Gem are to be produced, "designed to be substantially different to Apple's Macintosh personal computer in both screen appearance and operation".

This is viewed by the industry as a move by Apple to counteract Gem providing the ST with a Macintosh type environment. For this had already earned the Atari machine - some half the price of the Mac - its nickname of the Jackintosh.

However Max Barnbridge, Atari UK's boss, seemed unperturbed by the news when it was broken to him by Atari UK.

"As this involves an agreement with which we are not directly involved, it is really nothing to do with us", he said.

"But it would seem safe to say that if the Gem packages available for the ST have to be changed they will naturally be improved."

"And this may well mean that the ST will be able to score even more heavily against the Macintosh".

Meanwhile Apple has disclosed that it has pressurized Digital Research to take immediate action in the modification of three specific programs - Gem Desktop, Gem Paint and Gem Draw.

However until the new versions of these become available, the current ones - available for the ST - will still be marketed.

Digital Research has given the assurance that all its current range of programs for the ST will operate in any future Gem environment.

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NEWSLETTER

MESSAGES THAT ARRIVE BEFORE THEY ARE SENT...

BELIEVE it or not - but MicroLink's subscribers in Australia can have a Telemessage delivered in England before they actually send it!

This feat of telecomputing wizardry is made possible by the speed of MicroLink's electronic mail service and the ten hour time difference between the UK and Australia's east coast.

So, for instance, MicroLink subscriber Ned Nife is writing for his morning holiday to hell in Sydney when he remembers with horror that it's the birthday of Lisa Doolittle, the child he met on holiday in South Coast, and he hasn't sent a card.

It's 5.30am Tuesday - which is 1.30 Monday evening at MicroLink's nerve centre, and half an hour before the deadline for guaranteed next day delivery of Telemessages.

Ned hastily scribbles out a few affectionate words and soon has the greeting safely transmitted to MicroLink, from where it is passed on to Lisa's local delivery office.

In contrast with her letter which takes three weeks, Lisa gets her mail very early... so Ned's birthday greeting arrives on a colourful Telemessage card at 5.15 Tuesday morning - half an hour before he transmitted it to MicroLink.

Even better news for Ned - because Australia is on the international PacketSwitch-Switch network he is able to send his message across 10,500 miles for the equivalent of about 15p. The MicroLink Telemessage itself costs him £1.80, plus 45p for the fancy greeting card.

So Ned's long distance romance with Lisa is saved for less than £2.

System speeds up

SENDING a telex message overseas via MicroLink is now easier and faster.

Previously when a system user was asked "Telex office or Code?" he had to access an alphabetical list of countries and read through it to get the appropriate code

number of the country he was sending to.

Now he can just type in the number and the nine-word code where appropriate, and press RETURN before typing in the text of the message he wants to send.

Church keeps in touch by telex

A MICROLINK member with a mission in Colonel K.A. Christian, who used to telegraph and data systems at British Telecom headquarters.

An secretary in the Diocese of Chert is the Diocese of Bury St. Edmunds and Ipswich by name his Emly Model 1 and Minich Modem as often as possible to communicate by electronic mail and telex with other church officials.

And he is also a member of the Church Computer User Group, whose parent is the Archbishop of York and whose aim is to spread the gospel of high tech among church administrators.

A prime target for a telecomputing baptism is his son of Dean, the Rev Andrew Higg, who has a Commodore 64 but hasn't yet got a modem.

"The feeling he'll obtain one very soon", says Col. Christian. "I can contact our Diocese Treasurer's Apple II via Frontal and I can use MicroLink's telex facility to communicate with the Diocesan Registrar."

"What would really please me is for them all to be linked by the electronic mail service so we could share how so we could share how telecomputing can help church administrators function more efficiently."



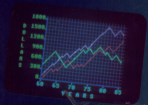
ST colour magic

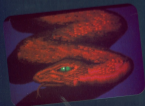
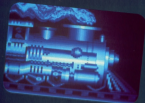
THE 920ST sitting in the *Star Line* office has obviously been the centre of attention recently. However, it was almost the scene of tears a few days ago when three demonstration discs for the 920ST arrived from America.

Tears of elation, then? Not so for the package had been damaged in the post. Fortunately, the story has a happy ending. Despite the ramblings of the Director of Mail Processing in San Francisco on how "insecurely enveloped" mail could cause their machinery to jam, the three discs had survived intact.

The collective editorial sigh of relief was heard several offices away.

The monochrome pictures in the "slide show" demos were pretty impressive, but when we hooked up a colour monitor – kindly rushed to us by *Silica Shop* – everybody gaped in amazement. The quality is so good that we've replicated them here. If you think they look good, you should see them in real life.





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All he's got is the spade he used to dig his way into the basement. He can use this to dig holes in the floors.

With a bit of luck the guards won't see these and will fall into them. But be careful though. If you fall down one of the holes yourself you've had it.

Guy Fawkes is a fast ladder and levels game with 15 screens. There's a catchy tune to accompany the title page and instructions.

The screen is stored as data statements starting at line 5183 and the layout can be changed by changing the data.

You could also add another set and randomly select one or the other for variety if you're feeling adventurous.

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VARIABLES

LIVES Lives left.
SCREEN Screen.
A100,201 A copy of the screen.
R100,11 The coordinates of the guards.
D100 Whether the guards are alive or dead.
X,Y Your coordinates.
S The start of screen RAM.
OK Whether you are dead or alive.
L Number of guards left.

```

00 000 000 0000
00 000 00 0,0,000000
00 000 000 0000 0000
00 000 00000 00 000 000 00
00 0000 000,0000000 0000000 0
00 0 0 0000000000000000
00 0000 000000 00000000000
00 0000 0000000 000000000000
00 0000 0000000 0000
00 00 00 000 0 0000 000
00 00 00 0000 000000000000
00 00 00 00 0000 0000 0000
00 00 00 0000 0000
00 0000 0000 0000 0000
00 0000 0000000 000000 0000
0000 0000 0000000 000000
0000 0000 ----- New Row -----
0000 000000000000 000,000 00 000000
0000 0000 000000000000
0000 00 000,00000 0000 000000000000
0000
0000 00 0000000 000 0 0000 0000,00
0000000 000000000000
0000 00000000000 0000 000000000000
0000 000000000000 000 0000 000
0000 00 000,000 00 0000 0000 0000
0000
0000 00000 0,000,000,0000000000 000
000000 0000 0000
0000 0000 0,000000,000000 0,0000
0000 000000000000 000,0,000000
0000 000 ----- New Screen -----
0000 00000 0,000,00,0000000 000000
0000 0000 000
0000 00000,000000,00 000 000 00
0000 00 000,000,000000,00 000 000 00
0000
0000 00 000,000,000 00000000000 000
0000,0000,0,00000
  
```


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T	Y	O	F	O	E	N	R	O	B	O	N	L	A	X	Z	N	Z	H	G
T	D	L	A	E	M	L	R	B	I	S	P	V	R	W	K	Z	S	Z	T
M	T	X	E	F	R	Z	A	R	M	X	R	O	K	A	V	A	J	N	O
D	Z	C	Z	B	N	N	R	B	W	A	M	N	F	E	R	N	I	O	I
R	N	P	G	U	E	C	E	U	E	M	L	S	T	A	V	I	T	I	S
G	R	P	R	R	B	C	D	Y	G	Y	I	A	H	C	I	H	A	Y	N
N	F	U	Y	M	B	T	T	N	M	E	K	O	Y	M	Z	C	P	Z	H
Z	G	G	A	E	F	Y	A	A	E	T	I	X	A	E	G	E	O	L	
M	C	V	N	A	P	A	J	N	D	L	A	F	Z	Q	H	O	S	O	R
S	L	U	M	Y	M	E	K	E	Z	I	A	B	A	S	H	M	O	O	
A	W	U	K	A	Y	W	H	V	T	L	W	A	I	X	X	I	R	B	F
T	I	A	R	T	A	M	U	S	H	M	A	Y	H	L	G	G	Y	Q	A
V	I	J	R	C	U	M	H	L	U	I	N	S	Q	T	O	O	E	D	I
A	K	E	C	G	P	Z	K	R	Q	Q	F	E	Q	K	B	G	H	A	D
E	G	S	M	G	Y	F	V	F	V	O	Q	X	C	G	Q	A	N	T	O
R	B	G	O	I	G	W	N	E	J	O	H	B	X	B	V	Y	I	O	B
O	F	X	M	A	Z	W	A	V	I	E	T	N	A	M	N	M	B	B	M
K	O	T	O	M	L	R	X	S	T	V	A	M	P	Z	V	T	F	Y	A
M	Y	D	G	I	W	I	I	P	H	D	U	N	A	F	Y	J	A	C	C

32) far in this series we've looked at Modes 0 to 8. If you have one of the older Atari 400s or 800s that's as far as you can go. This month's article assumes that your machine has a particular chip which some early models lacked.

The chip in question is referred to as GTIA, or Graphics Television Interface Adaptor, and its predecessor was referred to as CTIA. Unless you've had your machine since 1981, the chances are that it contains the GTIA.

If you have got an old machine and don't know which chip it contains, try entering Program 1, a simple routine which cycles through colours and luminosities.

If you do have the GTIA the whole of your television screen will cycle through the colours because the border and background are indistinguishable. However if your machine contains the earlier CTIA the border will be a different colour from the background and so will be visible. Press Break or Reset to stop the program.

Assuming that you're still with me then, I'll take a look at modes 9, 10 and 11. You can access these in the same way as the other modes we've considered, using the Graphics command.

Press Reset to get an empty Mode 9 screen with the Ready prompt at the top. Now type:

GRAPHICS 9

and press Return. The brief flash you'll see is Mode 9, but once the command has been executed the system reverts to Mode 0. If you want to see Mode 9 you've got to keep it there somehow.

In fact we saw the method used

```

10 GRAPHICS 9
20 FOR C=0 TO 255
30 FOR L=0 TO 255
40 SETCOLOR C,L,1
50 FOR DELAY TO 255:WAIT DELAY
60 NEXT L
70 NEXT C
80 GOTO 20
  
```

Program 1

YOU CAN GET STUNNING 3D GRAPHICS FROM ONLY ONE COLOUR

Part Seven of DAVE RUSSELL's series on Atari graphics modes

last month to keep a full-screen Mode 8. All that's involved is putting the system into a never-ending loop. With a program you can simply use a line which GOTOs to itself. For example:

```

10 GRAPHICS 9
20 GOTO 20
  
```

In immediate execution mode you can use the FOR . . . NEXT construction to create an endless loop. For example, type:

```

FOR A=1 TO 3 STEP 0:
GRAPHICS 9:NEXT A
  
```

and press Return. The fact that we've used a step size of 0 means that A never reaches its upper limit so the loop goes on forever.

The blank screen which confronts you is Mode 9. Unfortunately there's not much you can do with it in this state. The machine is locked in the loop and so most of the keys produce no response.

You can Break out of it, though, or Reset the machine.

Modes 9, 10 and 11 all have the same resolution of 192 rows x 80 columns with no possibility of a useful text window unless you're prepared

to use a display list interrupt and/or redefine the character set.

If you've been following Mike Rowe's series in Atari User you'll know what to do, but for now I'll assume that these modes don't have any text capabilities.

You can produce a Mode 9 screen with a separate window at the bottom very easily. Simply type GRAPHICS 9 and then POKE 623,64. However if you try this you'll soon see why I used the phrase "useful text window" earlier.

In Mode 9 you can only use one colour, but you can have up to 16 luminosities of that colour on the screen. Mode 11 is the opposite, with 16 available colours but only one luminance.

Mode 10 is a bit different in that it allows one background and eight foreground colours. However using these colours from Basic is not as simple as for the other two modes, so we'll leave Mode 10 until the end.

In Modes 9 and 11 we use a combination of SETCOLOR and COLOR commands. Only colour register 4 is used, so in Mode 9 the

colour is selected with:

```
SETCOLOR 4,colour,0
```

while in Mode 11 the luminance is selected with:

```
SETCOLOR 4,0,luminance
```

In Mode 9 the COLOR command is used to select one of the 16 levels of luminance, while in Mode 11 the same command is used to select one of the 16 colours.

To see the difference between the two modes type in Program 11 and run it. This produces a simple Mode 9 starburst pattern which cycles through the colours and luminances. When you've had enough of that Break out and list the program. To convert it to Mode 11 we need to change lines 10 and 30.

Alter line 10 to read:

```
10 GRAPHICS 11:0=0
```

and alter line 30 to read:

```
30 SETCOLOR 4,0,C
```

If you now run the program you

```
10 GRAPHICS 11:0=0
20 COLOR OF STAR BURST 0=0
30 SETCOLOR 4,0,C
40 FOR I=0 TO 15
50 SETCOLOR 0=0:FOR J=0 TO 15:SETCOLOR 0=0:FOR K=0 TO 15
60 COLOR 0
70 FOR L=0 TO 75
80 GRAPHICS 03:07
90 NEXT L
100 GOTO 40
```

Program 11

should see the same starburst pattern but in a multi-coloured simple-luminance form rather than the single-coloured multi-luminance Mode 9 version.

You might think that having only one colour available, as in Mode 9, is a severe limitation on what you can display. However the fact that you can have 16 luminances means that you can produce some stunning 3D graphics.

Rather than tax my brain to produce an example of such a display,

Program 11 does the job admirably. It was sent in to the Atari User office by Dean Kossiter, of Wellington.

If you fancy a different colour you'll need to alter line 10. As usual, a well-placed loop will cause the program to cycle through all the colours.

To see the sort of colourful effect that Mode 11 can give, enter and run Program 11. Its squashed appearance illustrates the pixel shape in these modes. With more rows than columns, pixels are long and thin.

Mode 10 allows nine independent colours, each with its own luminance, but there aren't nine colour registers, are there? Certainly the SETCOLOR command can only be used to access registers 0 to 4.

This is the problem with colour selection in Mode 10. Some of the registers can be accessed via SETCOLOR but the others must have the appropriate value POKED in.

Rather than try to mix the two

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methods, I recommend that when using Mode 10 you always **POKE** the colour registers. Of the two methods this is the only one which can be used on all the registers, and so is simpler.

To be accurate, we don't actually poke the registers themselves. Rather, we poke their "shadows" in RAM. However this is a detail which we need not take any further here.

The locations which contain the colour information are 704 to 712. These locations correspond to the commands **COLOR 0** to **COLOR 9** respectively.

The value which is poked into the register needs to contain not only the

```

POKE 704,0
POKE 705,0
POKE 706,0 TO 71
POKE 709,150
POKE 710,0
POKE 711,150
POKE 712,150
POKE 713,150
POKE 714,150
POKE 715,150
POKE 716,150
POKE 717,150
POKE 718,150

```

Program 17

colour information but also the luminance information. You arrive at the value by using the formula:

$$X = (\text{Colour} * 16) + \text{Luminance}$$

where X is the value which gets poked into the register.

For example, suppose you want to specify Colour 5 with Luminance 8, a sort of light purple colour. The value to be poked would be $5 * 16 + 8 = 88$.

Since **COLOR 0** controls the background colour, and this command corresponds to the register in location 704, we can change the background colour by poking location 704. Using the light purple colour that we've just calculated as 88, by entering the following:

```

FOR I=1 TO 2 STEP 0.5:GOTO
POKE 704,88:NEXT I

```

Once again we've used the **STEP 0** trick to set up a perpetual loop so that the Mode 10 screen is constantly displayed. If all has gone according to plan, your screen should be filled with colour/luminance combination 88, or light purple.

We can use the fact that the registers are all in adjacent locations

to produce some interesting effects. Suppose, for example, that we load the registers with particular values. We can then move the values "along" one register and move the last value back to the beginning.

This will have the effect of creating a "circle" of colour, and we can use this to produce an effect of movement. If your eyes aren't feeling too tired, try entering Program 17.

Lines 10 to 130 load the registers with random values and then draw bands of these colours across the screen. Each band is five rows deep. Lines 130 to 190 then shuffle the registers around constantly, producing the movement effect.

Since the colour values are selected constantly, the display will be different each time you run the program.

Use Break to give your eyes a rest every row and then.

If you want to choose a random background colour too, change line 30 to read:

```

30 FOR A = 0 TO 9

```

Because these modes require the GTIA chip, you'll sometimes see them referred to as the GTIA modes.

This chip's job is to interpret the data passed to it by the A6501 chip, and in fact Modes 9, 10 and 11 are three different interpretations of Mode 8. Consequently they require the same amount of memory - 8k.

Next month we'll finish off this article with a look at Modes 12 to 15 which are available to XL and XL owners from Basic.

```

0 FOR I=0 TO 15
POKE I,0
POKE I,0
POKE I,0
FOR I=0 TO 9
POKE 710,I
POKE 711,I
POKE 712,I
POKE 713,I
POKE 714,I
POKE 715,I
POKE 716,I
POKE 717,I
POKE 718,I
POKE 719,I
POKE 720,I
POKE 721,I
POKE 722,I
POKE 723,I
POKE 724,I
POKE 725,I
POKE 726,I
POKE 727,I
POKE 728,I
POKE 729,I
POKE 730,I
POKE 731,I
POKE 732,I
POKE 733,I
POKE 734,I
POKE 735,I
POKE 736,I
POKE 737,I
POKE 738,I
POKE 739,I
POKE 740,I
POKE 741,I
POKE 742,I
POKE 743,I
POKE 744,I
POKE 745,I
POKE 746,I
POKE 747,I
POKE 748,I
POKE 749,I
POKE 750,I
POKE 751,I
POKE 752,I
POKE 753,I
POKE 754,I
POKE 755,I
POKE 756,I
POKE 757,I
POKE 758,I
POKE 759,I
POKE 760,I
POKE 761,I
POKE 762,I
POKE 763,I
POKE 764,I
POKE 765,I
POKE 766,I
POKE 767,I
POKE 768,I
POKE 769,I
POKE 770,I
POKE 771,I
POKE 772,I
POKE 773,I
POKE 774,I
POKE 775,I
POKE 776,I
POKE 777,I
POKE 778,I
POKE 779,I
POKE 780,I
POKE 781,I
POKE 782,I
POKE 783,I
POKE 784,I
POKE 785,I
POKE 786,I
POKE 787,I
POKE 788,I
POKE 789,I
POKE 790,I
POKE 791,I
POKE 792,I
POKE 793,I
POKE 794,I
POKE 795,I
POKE 796,I
POKE 797,I
POKE 798,I
POKE 799,I

```

Program 18

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30 FOR A = 0 TO 9
POKE 704,0
FOR I=0 TO 9
POKE 705,I
POKE 706,I
POKE 707,I
POKE 708,I
POKE 709,I
POKE 710,I
POKE 711,I
POKE 712,I
POKE 713,I
POKE 714,I
POKE 715,I
POKE 716,I
POKE 717,I
POKE 718,I
POKE 719,I
POKE 720,I
POKE 721,I
POKE 722,I
POKE 723,I
POKE 724,I
POKE 725,I
POKE 726,I
POKE 727,I
POKE 728,I
POKE 729,I
POKE 730,I
POKE 731,I
POKE 732,I
POKE 733,I
POKE 734,I
POKE 735,I
POKE 736,I
POKE 737,I
POKE 738,I
POKE 739,I
POKE 740,I
POKE 741,I
POKE 742,I
POKE 743,I
POKE 744,I
POKE 745,I
POKE 746,I
POKE 747,I
POKE 748,I
POKE 749,I
POKE 750,I

```

Program 17

Get into top gear for a gruelling challenge

WITH the current trend toward athletics simulations, you might expect a game called **The Great American Cross-Country Road Race** to be all about marathon running — shades of Flanagan's Run, Loneliness of the Long Distance Runner, and all that. A gruelling race game this certainly is, but not on feet. A powerful racing car is your

mode of transport.

Road Race itself, I'm not typing that title out again in Acclaim's latest and follows in the best traditions of Pole Position and Pit Stop.

My thanks to Software Express of Birmingham for speedily arranging to let me have a review copy as soon as it became available here.

At bottom, the game is a



race against other drivers across America. But there's more to it than just twisting gear everything on four wheels.

To begin with, you can try to compete against any one of nine fields of already established times. Each field consists of the best results of 10 drivers.

Then there are four west to

east coast cross-country races to choose from (Los Angeles to New York, Seattle to Miami, San Francisco to Washington, and the US Tour). The latter is a tougher since it requires you to drive through every city on the map.

The map gives up once you've selected your race. And this is much, much more than a bit of glass — careful planning



IT WAS a wet night when I arrived at the mansion. As I entered, my reporter's instincts made me wonder whether I might be a little too conspicuous. I hadn't have worried.

Over by the fireplace Thania, queen of the mansion, was chatting up a shark. She was gazing at about one of her horses, name of Lurking Gnat.

A vampire seemed to be enjoying himself hugely. A

six-foot rabbit conversed with a man-sized peasant butter sandwich. Three mice in dark glasses leashed past Pacman. An astronaut strided up to the bar.

Near the entrance a gollin was doing a splendid job of looking after the guest's coats.

Other assorted weirdos were discussing everything from politics to local scandals while the more athletic took to the dance floor. By com-

GUILTY UNTIL

parison, the cowboy looked the very model of sobriety and good taste. The man in the outlandish cowboy outfit was me.

I wasn't being/being chosen — the nightmare would come later. No, I was attending one of Veronica Ashworth's famous fallows-in parties.

Actually I was mixing business with pleasure. Pleasure because I had been invited as a friend of the hostess. Business because my editor thought there might be a good story in it.

The fairy queen, none other than ming hostess Veronica, had clearly been snatching back the Buck's Flax from quite early on. Her words were slurred and she was none too steady on her fairy pins.

Emphasising a point to the steak, she waved her glass on high and succeeded in slop-

ping alcohol and ice cubes all down her timetied dress. Using a word that would make an elf's hair curl, she staggered off to clean up.

A little later, I saw Veronica again. She was stumped on the floor of her office somewhere in the mansion. She was less than dead drunk — she was dead, period.

And if that wasn't enough to dampen my party spirits, my secretary's fiancé, which I could have sworn I hung up in the closet with my damp coat, was wrapped tightly round her pretty little neck.

Just to put the cherry on the cake, a bullet lay by the body. Guess anyone goblin had one empty cartridge loop? I could almost hear the click of the jail cell door.

So there I was, plunged deep into **Suspect**, a superb new text adventure from

and selection at this stage should help you achieve good times. Equally, stop/go selection may well be regretted before you even reach your first checkpoint.

A flashing circle on the map denotes your point of departure, while a pointing arrow indicates a possible next stop on your route. By joystick movement, the arrow can be positioned to another destination city. Only those cities connected by a major road to your departure point are available for selection.

A scrolling bulletin across the top of the screen tells you the conditions on the road you have chosen. You have to be careful — things like lane closures, the dreaded roadworks or oil slicks could cause you to lose valuable time.

The weather conditions are no less critical in your route selection. Just like our good old Met Office maps, this one has plenty of those cute little symbols. Squiggles and rainclouds indicate just that while clouds without rain

indicate fog. It all seems nice like Britain — the UK of AI.

A clock indicates your time of departure. It can be set to any time you like. But watch it — you could end up driving at night or arriving at a city in the middle of the rain hour.

Now the race is on. The screen changes to reveal a Pole Position type scene: blue sky, green earth, a city skyline and your car sitting on a central road which tapers into the distance.

At the foot of the screen, reading from left to right, is a fuel gauge, a rev counter, timer, mile/minute, speedometer and radar trap warning.

The timer counts down, showing how much time remains for you to complete this leg of the journey. Failure to reach your destination before the timer reaches zero disqualifies you from the race, and that means you'll have to start all over again.

If you beat the clock the spare time is added to the time allowed for the next stage, so it

pays to learn earlier.

The millimeter also counts down, telling you how much further to your target city. The radar warning lights up when a police speed trap lies ahead — you'll know anyway because sirens start blaring.

You have two choices when hitting a trap — slow down or try to outrun the white police car. If you're caught, you stop dead, the police car pulls alongside, a warning message is displayed, like "Where's the fire?" and you're stuck there for several precious seconds. At least you don't get booked!

Left and right movement of the car is controlled by similar movements of the joystick. The fire button is used to accelerate, and pulling back on the joystick applies the brakes.

Gear changing is neatly handled. When the rev counter reaches the 5 or 6 o'clock position — and by then the engine is beginning to scream — the fire button is released and a quick forward tap of the joystick causes a change up. Similarly, a quick backward tap shifts the

gears down.

All very easy to get the hang of and, coupled with the appropriate engine noises, adds much to the motor racing atmosphere of the game.

There are four gears. Shift too soon and the car will respond sluggishly. Shift too late and you could blow your engine and have to push the car to the next service station. Pushing is accomplished by tapping doggedly away at the fire button.

You'll also have to push if you run out of petrol. Warning messages are given when you are approaching a service station.

The station is shown as a pink petrol pump and you must pull up beside it. Your car will be automatically refilled and/or repaired.

It's all too easy to overshoot, or stop by mistake at a cactus, when you've been having along at 150mph.

If you're not driving very fast, other drivers — and there are lots of them — go flashing past but never hit you from behind. The same cannot be said for you.

If you hit a car while overtaking your car instantly switches to bottom gear and slides over to the side of the track. Luckily, it hasn't stalled.

Arrive at the city within the time limit and you'll be greeted with a jolly tune and a welcome sign. Then it's back to the map to select the route for your next leg.

Run out of time and you'll be told "Sorry" and be out of the race.

The sound effects certainly add to the air of excitement and joystick response is perfect.

The graphics are first rate — especially liked the changes in skylines, the gradually darkening scene as night descends and the smooth high-speed scrolling.

Add these qualities to the planning elements, the combinations of possible routes and the variety of the challenge, and you have a very good race game indeed. This is one I would unhesitatingly recommend to any race game fan.

Bob Chappell

PROVEN INNOCENT

Infocom. Suspect is one of their best and follows in the footsteps of Deadline and Witness, their earlier detective adventures.

Deadline called you in to investigate — a suspicious suicide, while Witness placed you as an eye witness to a dastardly crime.

In Suspect you find yourself far more embroiled in murder than you have ever before — all the evidence points to you as the prime suspect. Unless you can find out who really did it and prove your reporting staff are over.

The case is stacked against you from the outset. There's the rope for starters. Then there's the bullet and gunbelt. You're also an outsider.

Yes, it's a set-up all right but since you know you're not a killer, it follows that the real murderer must be among the

menial collection of upper-crust characters present at the party.

The police are soon on the scene, among them Sgt. Duffy of Deadline fame. What you must do is build-up a case by exploring the mansion and grounds, watching and talking to the various characters, and analyzing and deducing.

Only by gathering enough irrefutable proof and presenting it to the police can you establish your innocence and another's guilt.

You can't make a citizen's arrest — you have to convince the detective to do that. You can accuse people though, but much good will it do you if you go around making wild allegations.

You have but a few hours (game time) to solve the mystery. Failure to do so will result in your being arrested

and found guilty of second degree murder.

Suspect is graded as an advanced adventure, so it's likely you'll be arrested and convicted many times over many weeks. Never mind, the preceding stimulation and excitement more than compensates for being falsely imprisoned.

All the Infocom hallmarks are here, massive vocabulary, sophisticated input parser, dazing and detailed prose, twists and turns, good humour, plenty of original puzzles and multiple solutions.

We should also tell, this is yet another excellent adventure from Infocom — how do they keep it up! It's across Infocom of being maddeningly brilliant. Prove their guilt beyond a shadow of a doubt yourself by buying Suspect. I rest my case.

Bob Chappell

Arcade action deep in the pond

Why not take a break from those shoot-'em-up arcade games and take a visit to a quiet country pond? *Savvy Frog* can take you there with **Savage Pond**, this interpretation of wild life under water.

Quiet it may be, peaceful it certainly isn't. In this fun arcade game you start by playing the role of a tadpole struggling to survive to adulthood.

Just like the inhabitants of any country pond, you have to avoid the perils of other insects and animals striving to live in there with you.

Survival of the fittest would appear to be an apt rule in this scenario.

Using the keyboard or joystick you must guide your tadpole through its stage of immaturity, fattening it as you guide it round the pond digesting amoeba.

Now and again a fat jelly worm falls into the water and eating this increases your worm count by one.

Every time your worm count reaches five a beetle larva appears and if you can catch this off you take another step along the long path of evolution.

In stage one a multi-colored dragonfly burps about above the pond dropping its eggs into the water. It is vital that you eat these as they sink, otherwise they settle into the cover of deadly plants and become inedible.

When they hatch at the bottom of the pond a larva dashes off the screen only to return as a deadly dragonfly except whose stage isn't 1... yes, tadpoles.

It relentlessly chases you until he either catches you or

you fire him out by outswimming him over the screen.

In stage two a bulldozer comes along adding another hazard as it dumps radioactive waste into the pond.

If you can survive all this and manage to become a frog, with a flick of your long sticky tongue you can catch that polluting dragonfly as it buzzes overhead. There's thanks for you.

If having got this far you have had all your eggs and tadpoles destroyed, the com-

puter dating agency comes into action and provides you with a lady frog.

After a loving embrace you provide a specimen of frog sperm and depart for pastures new.

The spawn comes to rest at the bottom of the pool before hatching to give you another chance to start all over again.

As it progresses the program introduces many new wonders of the deep, such as blood worms, jelly fish, spiders, water fleas and bumble bees.

They all have their role to play in this real life adventure.

Overall the game is fun to play and has very good graphics. The sound is effective and complements the game very well.

The instructions are clear and concise and give a good insight not only to the game, but to the species that you will meet and their descriptions.

The 184 cassette costs £7.95 - a bargain in my opinion.

David Andrews



A touch of the Bruce Lees

Bill down at your feet, hold your joystick at an aggressive angle, screw up your face, let rip a MouthBulldozing shout and go to it.

Well, even if you're not acting this strangely at the start of playing English Software's **Chop Suey**, I guarantee you will be after just a few minutes.

This martial arts simulation really gets to you. If you thought you were just a gentle pacifist at heart, better think again after you've tried this game. You might discover a latent Bruce Lee has been lurking undetected under your skin.

The action takes place, not in the fresh air or a gymnasium, but in what appears to be a theatre.

In fact it's very similar to the traditional setting used for the weightlifting events at the Olympic Games. In the lower

portion of the screen, looking up at an enclosed stage, are three rows of spectators who flit around from time to time to let you know they're wide awake.

On stage is where all the heaping, hitting and punching takes place.

The two deadliest Kung-Fu participants are dressed similarly - loose, white jujitsu-like costumes complete with black belts.

There are three options: player versus player, player versus computer and, if you want to select demo mode, computer versus computer. The demo mode will automatically begin if you just sit there and do nothing.

In addition you can choose between the laughingly named slow or fast modes. Slow mode is quite fast enough, thank you very much.

Fast mode has the two

players dashing around like characters from one of those old Koyakone Kap movies. Move up to this level only when you've become really adept at the art.

There are eight moves at your disposal - two shuffles, three kicks, one jab and two jumps. All are executed by moving the joystick to the appropriate compass position.

Pressing the fire button lets you make one further move - a smart about-turn from the direction you are currently facing.

The quick shuffles take you to the left or right. The one punch in your repertoire is a self-defence job. Used well it can have very gratifying results.

Kicks come in three sizes: the low sweep to the opponent's legs, the sheep kick

to the mid-air, and, my personal favourite, the high kick.

Executing the high kick when your opponent is some distance from you is most satisfying — you are smoothly through the air with your leading leg stretched as elegantly as a warrior's lance.

There are two legs. One is a simple vertical jump into the air, the other a full-blooded karatekick taking you right over the top of your opponent's head to the far side of the stage.

At the bottom of the screen, each player has a Power Gauge, pain-level indicator. It changes colour as punishment is soaked up. When it starts to flash the player is in a fragile state of health and one more thump will bring him to the floor.

The player recovers after a brief respite but always has a residual pain level which rises after each knockdown. When this reaches an intolerable level that player is retired and the opponent declared the winner.

It is comforting to note that nobody ever gets completely flattened — falling down on one knee and grimacing at the floor is the worst that can happen to you.

Again from your opponent's



face and feet, there is one other hazard. From time to time an air vent opens in the stage ceiling and a large scorpion drops down to scoldle across the stage.

You have to leap to avoid its poisonous bite. (David Attenborough would not be amused) — scorpions are supposed to have lethal stings, not bites!

The scorpion interludes detract somewhat from the main business hand and the game is exciting enough without them. Even so, they do present an added challenge.

Scorpions aside, the only minor criticism I have is that the contestants are identical

twins. If you've both just finished circling around the stage and have ended up close to each other, it is possible to get in a muddle as to which fighter is yours. Differently coloured belts or hair, for example, would have helped.

The two-player option is hugely entertaining but no doubt much of the time you'll play against the computer. And that option is just as much fun.

The computer opponent seems pretty easy meat to start with, a few well-placed usually sufficing to bring him quickly to his knees. However, you shouldn't let that mislead you into leaving your feet and

picking a fight with the local Third Dan.

For once duffed up, the first computer opponent is immediately replaced by another but considerably more skilled fighter. And there's six more whose faces have, each more experienced and laughter than the last. The challenge lies in seeing if you can out-Kung all eight contenders.

One item bugged me. The cassette intro hints that excellent play may be rewarded. Kung-fu has it that the famous Foo Yung (legend) and his son, Spring (all talent) are in the audience.

You'll just have to play well to see if that's of any significance — the play isn't even up to hearing opponent threat.

Colour is excellent while sound effects, introductory music, whooshes and beeps enhance the enjoyment.

But it is in the animation where the game excels. The players' movements are very realistic — the smoothness of the flying kick alone has to be seen to be believed.

Chop Suey is superb, and at only £19.95, this has got to be one of the best Atari buys of the year. Go get it, grasshopper. **Bob Chappell**

Saving a life requires dedication

BIO-DEFENCE, from Tames, appears to be an original idea in computer software. The object of the game is to keep a patient's temperature below the level at which he dies.

There are two separate parts to the game. In the first an outline of the human body is displayed horizontally across a grid of approximately 500 squares.

Using a joystick, you move a cursor from square to square within the body outline until you find an area of infection. There is no skill attached to finding this — it just suddenly appears, indicated by a orange dot.

From here you progress on to part two. This scenario is

acted out in the infected area, which is laid out like a maze.

You play the part of what appears to be a white cell, looking something like an amoeba, and your task is to soak up most of the bacteria around you. I say "appears" because there were no instructions with my advance review copy and surprisingly, none on the screen.

There are, in fact, several different sizes of bacteria and you should only be chasing the smaller ones. Any contact with the largest variety results in a darkening of your colour.

Should you contact these too often within a short space of time, you turn black and die and the patient's temperature rises by one degree.

You can eat the big blobs but you've got to time it right, hiding in your niche at the bottom of the screen. Of course, while you're hiding the bugs are multiplying.

Should you succeed in absorbing all the bugs, you automatically return to the first part of the game and start to search again for another infected area.

Once you find one it's back

to work as a bug gobble until such time as you get stepped on twice by the big boys, and the patient's temperature gets so high that he suffles in.

The more successful you are in your bacteria busting the more numerous and vicious are the enemy in subsequent locations.

The graphics are quite nice but don't really do the Atari justice, and the sound is nothing to write home about. An original has been made to synthesise speech, but the result is almost unrecognisable.

The game was fun the first few times I played it, but I didn't find enough variety to maintain interest.

David Andrews

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Account Number

B. Please debit my/our
Account No. / Bank/ Branch/ Agency

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* Cheques valid/valid only

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C. Please invoice the company/workshop.

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tent programmers do it sideways



```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

Demo 11

the rest of the screen will follow the first line.

Firstly the screen memory needs to be considered. In vertical scrolling the screen is the same width as a normal screen. However in horizontal scrolling the screen is going to be much wider. Therefore using operating system commands such as `GRAPH` or `PRINT` are really out of the question.

Secondly each line needs to have its own LMS instructions. Therefore the display list will consist of groups of three numbers.

The first will be a 64 (LMS) +

```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

Demo 12

mode number + 16 (for smooth scrolling). The LMS instruction means that the next two numbers will be the low and high bytes of the screen memory for that line.

Now we have a display list consisting of numerous individual lines each similar to the single line in Demos #1 to #4. To scroll these you need to move each of the memory location pointers along one byte at a

```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

Demo 13

```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

Demo 14

```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

Demo 15

```

10 REM *****
100 DIM M(1000) AS I, P(1000) AS I
101 M(0)=1000:FOR I=1 TO 1000
102 M(I)=M(I-1)*2
103 NEXT I
104 FOR I=0 TO 1000
105 PRINT M(I);
106 NEXT I
107 END

```

waves down the screen. Basic is just too slow.

Demo #6 is the same program with a machine code routine doing the job of increasing the 10 screen location pointers in the display list. Now the screen moves along in a single block.

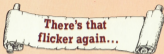
The next step is to add the smooth scroll. Demo #7 does this with an improved machine code routine for the coarse scroll. However it is less generalised, and will only work for a 10 line screen scrolling in one direction.

```

10 REM *****GRAPHICS C*****
20 REM *****GRAPHICS C*****
30 REM *****GRAPHICS C*****
40 REM *****GRAPHICS C*****
50 REM *****GRAPHICS C*****
60 REM *****GRAPHICS C*****
70 REM *****GRAPHICS C*****
80 REM *****GRAPHICS C*****
90 REM *****GRAPHICS C*****
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110 REM *****GRAPHICS C*****
120 REM *****GRAPHICS C*****
130 REM *****GRAPHICS C*****
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170 REM *****GRAPHICS C*****
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270 REM *****GRAPHICS C*****
280 REM *****GRAPHICS C*****
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980 REM *****GRAPHICS C*****
990 REM *****GRAPHICS C*****

```

Demo #6



You now have your smooth horizontal scrolling. Disappointed? I would be, because there's that flicker and flashing again.

The same problem arises as before, because the changes happen part way through drawing the screen, only now things are worse because so many alterations are being made to get smooth scrolling.

As in vertical scrolling, the only way around this is to use machine

```

40 REM *****GRAPHICS C*****
50 REM *****GRAPHICS C*****
60 REM *****GRAPHICS C*****
70 REM *****GRAPHICS C*****
80 REM *****GRAPHICS C*****
90 REM *****GRAPHICS C*****
100 REM *****GRAPHICS C*****
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690 REM *****GRAPHICS C*****
700 REM *****GRAPHICS C*****
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950 REM *****GRAPHICS C*****
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970 REM *****GRAPHICS C*****
980 REM *****GRAPHICS C*****
990 REM *****GRAPHICS C*****

```

Demo #7

code during the vertical blank interrupt (for new readers this is the small delay between the drawing of each screen).

Although VBI routines are too complicated to discuss at the end of this article, Demo #8 will give you some idea of how much improvement they can give in scrolling.

As a parting note, on the XL and XE models smooth, forward vertical scrolling is very easy in Graphics 0.

Try this. First load a relatively long Basic program. Secondly type POKE 622,285 then press Return. Thirdly type GRAPHICS 0 then Return. Now list the program.

```

40 REM *****GRAPHICS C*****
50 REM *****GRAPHICS C*****
60 REM *****GRAPHICS C*****
70 REM *****GRAPHICS C*****
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90 REM *****GRAPHICS C*****
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980 REM *****GRAPHICS C*****
990 REM *****GRAPHICS C*****

```

Demo #8

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DENIS KINANE
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to teach your computer
how to win an argument

Have a heart to heart chat with your Atari

CONVERSE is an Eliza type program which simulates a conversation between the user and the computer but differs from similar ones by allowing the Atari to learn new key words and replies.

It thus learns from conversations continuously and eventually will be able to converse without recourse to the learning procedure. It can also be altered easily to give the computer different "personalities".

Atari Basic has often been criticised for its lack of string handling functions and for not supporting string arrays. This program provides a fairly extensive demonstration and tutorial on both string handling and file handling with the Atari.

It includes informative REM statements and should be easy to follow.

The string handling routines include simulating a string array in Atari Basic, a string searching routine, routines for joining and patching up strings and exchanging words within a string.

The disc handling techniques used are standard files for printing and inputting, NOTE and POINT commands for random access of files and the PUT/GET files for holding numeric variables. All of these files can be updated during a program run, and are used in all subsequent program runs.

Finally the program can be easily used with the SAM and Replicator programs available from Don's Ask Software, thus allowing the computer to voice the replies rather than typing on the screen. To do this simply add the following lines:

```
### REM SAM-1.200  
### PS:=YOU ARE TALKING TO ME!  
###OUTS (0)050101010  
### SAM-PS:=PS010101010
```

In simulating a conversation between the computer and the user, Converse initiates the conversation and then accepts a sentence inputted by the user.

This sentence is then searched for specific key words which are contained in a file created on the first run of the program.

The file is then used to create a

simulated string array and the keywords taken from the array for the search procedure.

On subsequent runs the keyword file is simply read and the contents placed in the simulated string array. This simulated array is necessary as Atari Basic does not support string arrays.

Atari Basic does not have an INSTRING or specific string searching facility, so Converse uses an Instring routine to search the input string to find keywords.

On locating a keyword the program gets a reply, chosen at random from a variable number of suitable replies for the given keyword, in the reply file.

The reply is examined to see if it requires addition of a terminal phrase from the user input. If so the phrase is examined for words which will be required to be exchanged in order to preserve grammatical sense when the phrase is returned by the computer.

These words - called swap words - are personal pronouns and verb conjugations read from simple data statements within the program.

Once the word is swapped the phrase is reconstructed and tacked on to the reply and the complete reply is printed.

The program loop is then begun again as the user is prompted for the next input.

If during the conversation the program does not find a keyword in the input the user is prompted to teach the computer a new keyword and some suitable replies. These are saved to disc and used in all subsequent program runs.

If you choose the program to run in Learn mode any input that has no keyword will cause the program to ask for new keywords and replies. If the program is not in Learn mode and does not recognise keywords in the input it will give a "blat" type response.

Thus the conversation is continued without the computer actually knowing what it is talking about - a situation I find myself in all too often.

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LAST month we saw how the binary operators AND and OR can be used to combine pairs of binary numbers. The example we used was that of turning machines on and off under computer control.

Of course these operators have far more uses than this. To illustrate one, consider the Ascii character set. The codes for A to Z are in the range 65-90, while their lower case equivalents, a to z, are in the range 97-122.

Looked at in this decimal way, there seems little relation between the upper and lower case sets. If we look at them in hex, though, we can see that:

A...Z runs from &41 to &5A
a...z runs from &61 to &7A

I hope you can see the pattern.

In fact the numerical Ascii difference between a lower case character and its upper case equivalent is always &20. Looked at in binary, this difference is 1000100000. In other words, bit five is set for lower case, and is clear for upper case — remember, we start with the zero bit.

For example, the code for A is:

```
%01000001
```

whereas the code for a is:

```
%01100001
```

Similarly, the code for Z is:

```
%01011010
```

and the code for z is:

```
%01111010
```

In both cases the only difference is in bit five.

So if we have an Ascii code for a letter, we can force it to be upper case by clearing bit five to zero. We can do this by ANDing the code for the letter with the mask %11011111 (&DF).

Remember, the bits in the mask that contain 1 will leave the corresponding bits in the Ascii code for the letter unchanged in the resultant byte, whether they be 0 or 1. On the other hand, the bit in the mask with 0 in it will force the matching result bit to be zero.

So:

```
01100001 ( the code for a )
AND 11011111 ( the mask = &DF )
gives 01100001 ( the code for A )
```

It won't surprise you to learn that

we can reverse the procedure — forcing upper case into lower case — by using OR to set bit five. This time the mask will be 1000100000, the 0s leaving things unchanged in the resultant byte, the 1 forcing a corresponding 1 in bit five of the result bit.

So:

```
01100001 ( the code for A )
OR  10001000 ( the mask = &20 )
gives 01101001 ( the code for a )
```

One further use for AND is to test if a particular bit in a byte is set. We just AND that byte with a mask consisting of a 1 in the bit being tested, with 0s in all the rest. The bits with 0 in them, of course, set the corresponding bits in the resultant byte to zero.

Since the rest of the bits are already cleared to zero by the mask, the only thing that could stop the entire resultant byte being zero is the value derived from the bit under investigation:

- If that bit is set, the corresponding result bit will be set also (1 AND 1 = 1) so the resultant byte will be non-zero.
- If the bit being checked is clear,

the corresponding result bit will be clear (0 AND 1 = 0) so the resultant byte is zero.

In machine code we can differentiate between zero and non-zero bytes fairly easily.

Let's see how this works in practice. If we were testing for bit four being set, the mask would be 100010000.

Try ANDing this value with 1000110100, where bit four is set, and also with 1000101100, where bit four is clear, and you'll see that the resulting bytes are non-zero and zero respectively.

So what of XOR/XOR? Well, its function is to return a 1 if the pair of bits being compared differ, and 0 if they're identical. Given this, we can use XOR to test which bits in a byte differ. For example:

```
01001010
XOR 01000101
gives 01001111
```

where the set bits neatly mark out the differing pairs.

We can also use XOR/XOR to complement or NOT a byte, by XORing it with a mask of 1011111111. Since the mask is all 1s, the result depends entirely on what's in the byte under investigation. Bits that contain 1s will give 0

MIKE BIBBY
concludes his series
on binary numbers

(since $1 \oplus 0 = 1$), while bits that contain zero will give 1, since $0 \oplus 0 = 1$.

This is exactly what we want to happen with a NOT — change the 0s to 1s and vice versa. For example:

```

XXXXXXXXXX
XOR 01111111
-----
given 00000000  (the complement)
  
```

We can also use XOR/XOR to test if two bytes are identical. If the result after we XOR is zero, they must have been identical since every pair of bits must have given zero, which only happens when the bit values are the same.

If there's a non-zero result there must have been a pair of bits that differ, so the two bytes under consideration must differ. For example:

```

XXXXXXXXXX
XOR 01010101
-----
given 00000000
  
```

whereas:

```

XXXXXXXXXX
XOR 01010101
-----
given 00000000
  
```

which is, of course, non-zero, since the bytes differ.

We've probably already mentioned the use of XOR in graphics-application programs where it's widely used for its "key presto" effect. This is based on the fact that if you XOR a first byte with a second and then XOR the result of that once more with the second byte, the first byte reappears. Look at this, if you don't believe me:

```

XXXXXXXXXX  (first byte)
XOR 01010101  (second byte)
-----
XXXXXXXXXX  (result)
XOR 01010101  (second byte again)
-----
XXXXXXXXXX  (first byte back!)
  
```

We use this XORing technique to draw things on a background and

then move on, leaving the background unchanged. In this case the first byte is the background colour number, if we then XOR our second byte — corresponding to the colour number of whatever it is we're drawing — on to the background, it will be displayed in the resultant colour number. It's rather like mixing colours mathematically.

To get rid of what we've drawn, we draw it again with the same colour number, once more under the influence of XOR. Of course XORing twice with the same byte gives us the original byte back. This results in whatever it is being drawn appearing in the original, background colour. Hey presto — it's gone!

Well, that's the end of the series. Hopefully you'll have gained some idea of the power of binary numbers and the ways they can be combined. I've only touched on a fraction of the potential uses, but you'll be well equipped to work things out for yourself from now on.



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Going loopy over strings



I TOLD you aile last month when I said we'd be continuing with loops! Before that we're an interesting diversion into the world of strings.

Strings are simply groups of characters, letters, numbers or punctuation marks and so on, "strung" together. The micro remembers them as a group. More often than not, they're words or sentences, as in:

```
PRINT "This is a string"
```

Notice the quotes - they're the way we signal to the Atari that it's a string we're dealing with. Also, whatever's between the quotes is reproduced exactly as is:

```
PRINT "this is a string"
```

and

```
PRINT * "this is a string"
```

will give different outputs, since the second has two spaces between the quotes and the first word.

We saw that we can label strings with variables as in:

```
STRING = "this is a string"
```

The rule for string names are identical to those for numeric variables, except that string variable names must end with a \$.

Perhaps the most important thing about strings is that you have to tell the micro in advance the maximum

Part VII of MIKE BIBBY'S guide through the micro jungle

sized they're going to be. That is, you have to DIMENSION them as in:

```
10 DIM STRING(10)
```

In this case, STRING can only ever be six characters long. Of course, it can be under six long, it just can't be over six, as Program I illustrates.

If you run it, you'll see the following output:

```
12345
123456
1234567
123
```

I think you can guess what's

```
10 DIM PROGRAM 1
20 PRINT "00111000"
30 DIM STRING(10)
40 STRING="12345"
50 PRINT STRING
60 STRING="123456"
70 PRINT STRING
80 STRING="1234567"
90 PRINT STRING
100 STRING="123"
110 PRINT STRING
```

Program I

happened to the 1234567 you assigned to STRING in line 60 - it was one character too long, so the Atari simply ignored the last character.

However, the micro doesn't mind the string being shorter than maximum size, as shown by its accepting 12345 quite happily.

And just as you can lengthen strings, so you can shorten them, as shown by the assignment of 123 in line 100.

After running the program, enter:

```
PRINT STRING
```

and you'll find that it's 123, as the program left it. Now enter:

```
STRING=""
```

Notice that the two quotes go directly side by side, with no space between. Then enter:

```
PRINT STRING
```

This time instead of printing 123 as the value of the string, absolutely nothing appears on the screen save for the READY prompt. This is because the value of STRING is absolutely nothing since:

```
STRING=""
```

has absolutely nothing between the quotes, not even a space. This string

is called the null string and we use it when we wish to wipe out, or nullify, a string.

To see some more aspects of strings on the Atari, assign:

```
STRING="HELLO"
```

and then enter:

```
PRINT LEN(STRING)
```

You should receive the answer:

```
5
```

You see, `LEN()` is a function that tells you how long a particular string is. We've used it with a string variable, but you can, if you wish, use it with a string in quotes as in:

```
PRINT LEN("HELLO")
```

This might seem a bit cockeyed to you, though. Why do we need `LEN` since if the string's in quotes you can see how long it is, and if it's a variable you've already dimensioned it? Don't forget, though, that a string doesn't have to be the size you've dimensioned it, it can be less.

Often, when you're using `INPUT` with a string variable, you won't be too sure how long the string will be,

`LEN` lets you find out so you can, for instance, allow for different lengths in your screen layout.

Before we leave `LEN`, try to find the length of the null string with:

```
PRINT LEN("")
```

You'll receive the answer zero, proving that the null string consists of absolutely no characters whatsoever.

Incidentally, we've only been able to do all this assigning to `STRING` because we've dimensioned it when we ran Program 1. If we tried to assign to a new variable as in:

```
TEST="HELLO"
```

we get an error message, since `TEST` hasn't been dimensioned.

Anyway, at present `STRING` should hold the value `HELLO`. Try entering the following:

```
PRINT STRING(2)
```

and you'll see `HELLO` appear. Now try:

```
PRINT STRING(2)
```

and `ELLO` should arrive.

```
PRINT STRING(2)
```

will give you `ELLO`, while:

```
PRINT STRING(4)
```

will produce `LO`.

No prizes for guessing what:

```
PRINT STRING(1)
```

gives you `L`!

What's happening is that by following `STRING` with the brackets, only part of the string is printed. It's as if we're taking just a slice of the string.

The start of the slice will be the character whose position in the string is given by the number in brackets. It finishes at the end of the string.

So `STRING(2)` would give us from the third letter of `STRING` to the end, giving `ELLO`. With `STRING(1)` the whole string is printed out since the 1 means the slice starts at the first letter. On the other hand `STRING(5)` gives us a single character slice, since the fifth letter of the string is also the last.

See what happens when you try:

```
PRINT STRING(6)
```

Program 11 gives a graphic example of this slicing using a `FOR...NEXT` loop. Here the loop variable `START` decides the starting position of the slice. Each time through the loop the slice starts further up the string.

```
10 REM PROGRAM 11
20 PRINT CHR$(212)
30 DIM STRING$(100)
40 STRING$="ABCDEFGHIJ"
50 FOR START=1 TO 10
60 PRINT STRING$(START)
70 NEXT START
```

Program 11

Let's look at this in detail. The first part of our program clears the screen then sets `STRING$` equal to `ABCDEFGHIJ`. We then enter the loop.

The first time through `START` has the value 1 so line 60:

```
60 PRINT STRING$(START)
```

is in effect:

```
10 PRINT STRING(1)
```

If you've been following this you'll see it means we can print out from the first character of `STRING$` to the



last. That is it prints:

```
ABCDEFGHIJ
```

The next time through the loop though *START* is 2, so line 60 is in effect:

```
60 PRINT STRING(2)
```

so we can start at the second character of *STRING* and continue to the end to give:

```
BCDEFGHIJ
```

On the next cycle, *START* is 3, line 60 being:

```
60 PRINT STRING(3)
```

which gives you:

```
CDEFGHIJ
```

and so on.

Finally, *START* has the value 10, so line 60 prints out the slice from the 10th character to the end — the single letter J.

Actually we can slice off any part of a string we want by giving two numbers in brackets separated by a comma. The first number specifies the start of the slice and the second the finish.

Enter the following (assuming you've run Program 10):

```
PRINT STRING(2,5)
```

You'll get back:

```
BCDEF
```

Remember, *STRING* is ABCDEFGHIJ, so *STRING(2,5)* gives us the slice with its second letter, B, and finishing with its slash letter, F. Notice you get five letters, not the four that 6-2 might lead you to expect.

Program 11 allows you to experiment with slicing *STRING*. Initially *STRING* is printed out, then you'll be prompted for the number of the character you want to start from, and the number you want to finish with.

The slice you're requested will be printed out, and the process repeated. (You can escape from the loop by pressing the Break key.)

Play around with various slices until you're sure you understand how they operate, then have a look at how

```
10 REM PROGRAM 11
20 PRINT STRING(12)
30 REM STRING(2,5)
40 STRING="ABCDEFGHIJ"
50 PRINT STRING
60 PRINT "START":
70 INPUT START
80 PRINT "FINISH":
90 INPUT FINISH
100 PRINT STRING(START,FINISH)
110 PRINT
120 GOTO 50
```

Program 11

Program 11 actually works. Lines 60 and 90 prompt for an input value for the apply named numeric variables *START* and *FINISH*. Line 100:

```
100 PRINT STRING(START,FINISH)
```

then gives us exactly the slice we want.

For instance, if we wanted a slice from the second character to the sixth, we would input 2 for *START* and 6 for *FINISH*. Line 100 then becomes effectively:

```
100 PRINT STRING(2,6)
```

which gives us the slice we require, starting at the second character of *STRING* and finishing with the sixth.

Program 11 uses this slicing technique to give us the inverse of Program 11 by printing out the first character of the string, then the first two, followed by the first three and so on.

The loop formed by lines 50 to 70 does the actual printing out. The slice always starts at the first character of *STRING* so the first number inside the brackets in line 60 is fixed at 1.

```
60 PRINT STRING(1,FINISH)
```

FINISH varies from 1 to 10 throughout the loop, so the end of our slice gradually gets further and

```
10 REM PROGRAM 12
20 PRINT STRING(12)
30 REM STRING(1,1)
40 STRING="ABCDEFGHIJ"
50 FOR FINISH=1 TO 10
60 PRINT STRING(1,FINISH)
70 NEXT FINISH
```

Program 12

further along *STRING*, giving us our triangle of letters.

After you've run Program 12 enter:

```
PRINT STRING(J,LEN(STRING))
```

As you'll see, the whole of *STRING* is printed out. The reason is that *LEN(STRING)* gives us 10, the length of *STRING*. This means that what we've entered above boils down to:

```
PRINT STRING(1,10)
```

Since *STRING* starts at its first character and finishes with the tenth, the whole of the string is printed out. Finally, take a look at Program 13. We're using the fact that:

```
PRINT STRING(5,5)
```

prints out just the fifth character of *STRING*, since the slice starts and ends with the fifth character, instead of specifying a number, however.

```
10 REM PROGRAM 13
20 PRINT STRING(12)
30 REM STRING(5,5)
40 STRING="ABCDEFGHIJ"
50 FOR LETTER=1 TO 10
60 PRINT STRING(LETTER,LETTER)
70 NEXT LETTER
```

Program 13

we've made the loop variable, *LETTER*, which ranges from 1 to 10, so line 60 reads:

```
60 PRINT STRING(LETTER,LETTER)
```

This will pick out and print each letter of *STRING* in turn, as you'll see when you run it.

By the way, we could have written line 50 as:

```
50 FOR LETTER = 1 TO LEN(STRING)
```

Since *LEN(STRING)* is 10, this is equivalent to the original line 50. It has the advantage that, if you missed out one of the letters of *STRING* when you typed in line 40, the *LEN(STRING)* automatically compensates for the error, calculating the true length.

Well, perhaps I didn't mislead you too badly after all — we've used quite a few loops this month. And next month there'll be even more!

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Make yourself a...

BITWISE OPERATOR

with these routines by
KEVIN EDWARDS

The program listed here contains three useful subroutines to provide bit by bit (bitwise) operators for the logical functions AND, EOR and OR.

Atari Basic already recognises the two commands AND and OR, but these are treated as logical operators. In other words their result will be either true (1) or false (0).

To illustrate this we'll use a simple Basic program:

```
10 A=12: B=13
20 IF A<= B AND B<= A THEN PRINT "YES"
30 END
```

As you can see, it tests to see if A is 12 AND B is 13. Since this is true (1) the THEN statement is executed. But if B were changed to 100 the result would be false (0) and the THEN statement would be ignored.

However the operators can be used in bitwise fashion - not using Atari Basic commands, though.

With bitwise operations all corresponding bits of two numbers are compared to produce another bit - the result bit. Table 1 lists the result bits for AND, EOR and OR operations.

	1st bit	2nd bit	Result
AND	0	0	0
	0	1	0
	1	0	0
	1	1	1
EOR	0	0	0
	0	1	1
	1	0	1
	1	1	0
OR	0	0	0
	0	1	1
	1	0	1
	1	1	1

Table 1 - Result bits for AND, EOR and OR

You can find more information on this subject in the 88 Wise articles in Atari User for August and September 1985.

The machine code routines provided by Program 1 permit you to use all three of the bit by bit operators on two 16 bit numbers. Table 2 lists the start addresses for each machine code routine.

Start address	Operator	Subroutine line number
1952	EOR	7300
1972	OR	7300
1992	AND	7400

Table 2 - Start addresses for each routine

Each operator has been given its own Basic subroutine from which it should be called. This saves you repeating lines and lines of USR commands. Before the routines can be used the variables NUM1 and NUM2 must be set up with the two numbers which are to be compared.

The appropriate routine is then called and the result is returned in the variable RES. The end column in Table 2 shows the Basic line number for each operator.

You can, in fact, call the routines yourself, although it's a bit messy. First assign two variables with the numbers to be operated upon - VAR1 and VAR2 say. Next find the location of the required function - see Table 1.

Once this has been done the command USR is used to execute the routine and return the result:

```
A=BINVAR1,VAR1,VAR2
```

A will now contain the result.

The subroutine at line 7000 is responsible for putting the machine code data into memory.

This must be called at the start of any program which makes use of the bitwise routines. The example listed

below shows how the two numbers 256 and 83 are ANDed.

```
10 REM Set up machine code
20 GOSUB 7000
30 REM the two parameters
40 NUM1=255:NUM2=83
50 REM Call AND routine
60 GOSUB 7000
70 REM PRINT result
80 PRINT RES
90 END
```

If you change line 60 to GOSUB 7300 the two numbers will be ORed. See if you can work out the line number for EOR.

All line numbers below 7000 in Program 1 are there to test the three routines. When you require the bitwise operations in your own programs you only need lines 7000 onwards.

And that's it. There's plenty of things you can do with them. Why not have a go at printing hexadecimal and binary numbers?

```
10 REM BITWISE OPERATOR
20 REM by Kevin Edwards
300 GOSUB 7000:REM SET UP NUMS
400 NUM1=255:NUM2=83
500 PRINT NUM1:PRINT NUM2
600 REM EOR
700 GOSUB 7300:REM EOR
800 PRINT RES
900 REM OR
1000 GOSUB 7400:REM OR
1100 PRINT RES
1200 REM AND
1300 GOSUB 7000:REM AND
1400 PRINT RES
1500 REM NUMS
1600 REM NUM1:PRINT NUM1
1700 REM NUM2:PRINT NUM2
1800 REM END
1900 GOSUB 7000:REM SET UP NUMS
2000 NUM1=255:NUM2=83:RES=0
2100 GOSUB 7300:REM EOR
2200 PRINT RES:PRINT NUM1:PRINT NUM2
2300 GOSUB 7400:REM OR
2400 PRINT RES:PRINT NUM1:PRINT NUM2
2500 GOSUB 7000:REM AND
2600 PRINT RES:PRINT NUM1:PRINT NUM2
2700 REM END
2800 GOSUB 7000:REM SET UP NUMS
2900 NUM1=255:NUM2=83:RES=0
3000 GOSUB 7300:REM EOR
3100 PRINT RES:PRINT NUM1:PRINT NUM2
3200 GOSUB 7400:REM OR
3300 PRINT RES:PRINT NUM1:PRINT NUM2
3400 GOSUB 7000:REM AND
3500 PRINT RES:PRINT NUM1:PRINT NUM2
3600 REM END
```

Program 1

Micro Scope

CIRCLE computes a circle and draws it on a graphics screen chosen by the user.

It uses the **KXD** command to fill the circle as it's drawn.

If you remember your school maths you'll know that the general equation for a circle is $R^2 = X^2 + Y^2$.

**No. 5
Circle**

```
10 PRINT "Graphics Mode..."
20 INPUT 0
30 GRAPHICS SCREEN LINES 760,1
40 PRINT "Centre (X,Y)...?"
50 INPUT 00,70
60 PRINT "Radius...?"
70 INPUT R
80 GOTO 80
90 ALSO 00,7000
100 FOR X=0 TO -R STEP -1
110 G=SQRT(R^2-X^2)
120 DRAW0 G,70+Y
130 NEXT Y
140 FOR Y=0 TO R
150 G=SQRT(R^2-Y^2)
170 PLOT 00-G,70+Y
180 IF ABS(Y)=R THEN GOTO 190
190 G=0:G=0:G=0:G=0
200 NEXT Y
210 GOTO 10
```

10-20 Ask for and receive the desired graphics mode.

30 Set up the mode and colour. Location 760 tells the fill command which colour to use.

40-70 Ask for and receive the centre and radius of the circle to be drawn. Note that no error checking is done to prevent the cursor going out of range in the chosen mode.

80 Square R. Since the radius is a constant for any circle being drawn, it's more efficient to calculate it once outside the main drawing loops than repeatedly inside the loops.

90 Plot the first point on the circle.
100-140 Draw the right-hand half first. Compute the position to be drawn to using the circle equation.

150 Start of loop to draw left-hand half.
160-170 Compute each point and plot it.

180 Check for top and bottom points.

190 Fill the circle as it's drawn.

200 End of loop.

210 Go back and start again.

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Graphics exact too great a sacrifice

LEVEL 9's Red Moon is now in the shops and doing well by all accounts. It's the first Atari version with graphics, and part of Level 9's new strategy of releasing lower priced games between their normal priced "theme" games.

At £6.99, the same price as Emerald Isle, Red Moon is £3 cheaper than the Silicon Dreams Trilogy, the final part of which, The Worm in Paradise, will be launched soon.

In the meantime we adventurers are to get to grips with the first Majik adventure from Level 9. The story goes, as recounted on the inlay, that when Majik was at its most powerful so was the moon which glowed - scarlet surprise - deep red.

The moon and sun, however, didn't get on so well together, and whenever their paths crossed they tended to have a bit of a battle, and so the moon grew weaker and weaker. As a consequence so did Majik.

Obviously the Magicians' Union was none too pleased and so, in the moon tower of Baskalos, it placed a moon crystal powerful enough to cover the whole kingdom.

So what is the problem, you may ask? Well some little thing has nicked the crystal - and off you go to find it.

Two new elements appear in this game. First the use of spells, through a CAST command. Each spell requires a focus object - listed on the inlay. It might have been a bit more of a challenge if you had to discover which object was a spell focus.

Some of the connections are a bit remote. A pearl is the focus for the SNOOP spell and gloves for discovering whether or not TREASURE is visible.

Also SAVE and RESTORE are listed as spells. No focus object is required, but it means that, as with

the other spells, they will not work in the presence of iron, which can be a bit of a bind.

The other addition is of combat, as some of the treasures are guarded by the mythical beasts of the kingdom. This is the weakest of the new elements, since the combat routine is repetitive and is, in effect, a stand up battle between you and your opponent until one looks over.

The first screen sets you on a grassy plain and gives you the first taste of a slickly drawn colourful, yet somewhat two dimensional, graphics screen.

The plain is a sheet of green, with what appears to be six tufts of grass. The screen also refers to a yellow sun, but unless my Sony is playing up, or that is the RED moon up there, the sun is anything but yellow.

Just to help you at the start, you own nothing. By following the guide sent to reviewers you are able to quickly acquire several useful possessions. The ubiquitous axe and lamp, and by drawing the lake, a pearl, not from an oyster but oyster fungus - shades of Return to Eden.

In fact there is a great sense of déjà vu about the whole game. The graphics mean that the text is not as voluminous as usual and the whole game seems to consist of rooms, corridors and caves, with few interesting articles or problems other than a knock 'em down fight to the death.

The problems are not as involved as we have come to expect from Level 9, and some problems are recognizable from other adventures, such as getting past the watchdog.

Anyone who finishes The Pay-Off will have no problem here.

I reserve my final comment for Level 9's graphics. Let's face it, they add little or nothing to the game. They merely depict the fixtures of the

rooms in which you stand.

Even the more interesting characters, such as Bog the Howling and the Rat, are not drawn.

At \$8.95, Emerald Isle is a definite step forward by Level 3, a good cheap adventure with lots to do and lots of atmosphere. Red Moon loses much of the involvement through including graphics, and to my mind the sacrifice is too great.

On to a game which requires no introduction following the review in the August edition of *Attack Magazine*: **Inform's Hitch Hiker's Guide to the Galaxy.**

In that review the problem of how to get the Babel fish was touched upon, and it is an extremely entertaining puzzle which unfolds as one tries to prevent each successive Babel fish from disappearing in an ever more convoluted way.

It is not my policy to give away the answer to a problem. This particular problem, however, had me so enjoyably bamboozled that, step by step, I shall take you through how to solve it.

People wishing to extend themselves should read no further, but jump to Wizard of Aard later on.

Now then, as Arthur Dent, recently of no fixed planet, I have come to my senses in the hold of a Vagon space ship, and have a sleeping Ford Prefect and a Hitch Hiker's Guide for company.

Knowing from the books that I now need to insert a Babel fish in my ear in order to understand the wider universe and its various tongues, I press the button on the Babel fish dispenser, only for it to shoot across the room and vanish through a hole under a small hook!

No problem. Simply remove my dressing gown (I hope no one comes in), hang it on the hook, and try again. This time the Babel fish slides down the sleeve of the gown and slips through the previously unnoted gating on the floor and down the drain. *Cuecut!*

Eventually, as no hoopy frood should be without it, I place my towel on the gating. It fits, and lo and behold the next Babel fish alithers neatly onto the towel.

Behold also the zippy little cleaning robot which whizzes through at breakneck speed, picks up the Babel fish and disappears through a small panel a few inches high in the

wall. After several attempts at catching the robot I eventually hit on trying to block the panel.

Several bulky objects later, including myself, I place the wretched next to the panel.

Press the button and this time the robot plunges into the hatchel and the Babel fish also gracefully into the air, where a top half of the cleaning robot slips out and grabs the fish in mid-air and vanishes.

The next few hours are spent flinging a succession of objects into the air and watching a succession of extremely efficient cleaning robots gather them up, plus Babel fish.

Even summoning the Sirius Cybernetics Corporation engineer robot did

By Brillig

no good. You see, he only repairs the automatic Bumbis I tried throwing in the air.

Finally a brainwave.

Instead of throwing things into the air before getting the Babel fish try and get them there at the same time.

Carefully I piled the mail on the hatchel, and pop out comes the Babel fish, down the sleeve of my gown, onto the towel, scooped up by the robot which smashes into the hatchel, sending the whole lot and caboodle into the air.

So while the top half of the cleaning robot is frantically gathering up junk mail the Babel fish alithers neatly into my ear.

So now when the Vagon announcement that Ford and I are to be

Brown overboard is translated I can still smile.

The MMC is without doubt the finest, funniest adventure yet written, even if much of the action simply unfolds before you.

It's an absolute must for fans and non-fans alike.

This leaves me time to have a quick look at **Wizard of Aard** from Adventure International, where Simon Ashford keeps finding his spectacles falling off.

Early in the game, Simon, you should find a painting held on the wall by a fine chain. That should fit you up all right, but carry plenty of objects as mopping this Myzenous Adventure is as tedious as ever.

Finally Ginch of the Month this time goes to S.P. Basil of Davenport and concerns The Pay-Off from Atari.

Not the two responses that he got from the game, however.

They are both quite deliberate, and you should get a chastening response for one of the things you typed.

No, the glitch belongs to the Atari Helpline, which told Steve that by cutting a notch in his disc he would corrupt it.

In fact that is the only way to save the game position on the disc provided, which comes with the Atari disc promotion package.

Fearing that, any disc formatted to standard DOS 3.0 will enable you to save your position. But Tut Helpline. A medium T shirt is on its way to you Steve.

Also, move things around in the bank to find an exit you ought to realize is there, and you're almost home and dry at Luigi's.



Graphics galore on the 800XL

RECENTLY I purchased an Atari 800XL and after a few usability complaints with the 5010 cassette unit I settled down to the keyboard and taught myself the majority of Atari Basic.

However it does not support all the graphics modes of the GTIA chip, in particular the mode which allows 16 colours with a resolution of 80 x 182.

So I am left in a position where I know it's in there but I can't get to it.

Are there a few simple pages in just one of this mode? If not, can you suggest a book with a routine to do this.

At the moment all I have is a few American books and they seem to deny the existence of such a mode.

In reference to the new 50 range which I've told will have a new improved disc drive available, should I buy a 1050 or will the new disc drive be compatible with the 800XL and the available disc software? — M. Wilson, Yeovil.

■ You will be delighted to find that Atari Basic does support the extra graphics modes, even if the books you have been reading don't.

After Atari II there are another seven modes for three on the old Atari 800/800.

Basic's Mode 9 has one colour and 16 brightnesses 80 x 182.

Mode 10 has nine full

colour/brightness combinations 80 x 182.

Mode 11 has 16 colours and 1 brightnesses 80 x 182.

Mode 12 is multicoloured text 140 x 241.

Mode 13 is multicoloured text 120 x 241.

Mode 14 is 2 colour 1780 x 182.

Mode 15 is 4 colour 1780 x 182.

See Dave Russell's Graphics column for more details.

We couldn't bother waiting for the new drives — the quite a while yet software will be only available for the old drives, and a 1050 is quite cheap now anyway.

Banishing bugglers

HAVING been an avid Atari user for many years now, I recently bought your magazine which I found, to my delight, was that which I had been waiting for.

After years of Single/Commodore/MSX domination, good old Atari have finally

woken up their magazine/software makers which please me so.

I am writing in the hope that you can solve a few problems I and other Atari users I know of have had.

The first of these rather boggles is that I was wondering whether the video touch pad from the Console game (1200) Star Raiders is compatible with the joystick ports of my Atari 800.

If so, how is it possible to "read" the various buttons of the pad?

Secondly, I have discovered in the Atari manual "Your Atari Computer" the post/game location for allowing up to sixteen files open simultaneously.

A full paragraph carefully explained that I should poke (801, x) a being the amount of files I wanted to open at one time.

To my disgust this failed to work even after successful efforts to discover the problem and I have obviously savaged various pieces of my Atari equipment.

I am sure I have enough

memory and using DOS 2.057 should be allowed seven files open at once if only require four so what is the problem?

Finally, I was wondering whether you know of a program that could handle vertical and horizontal scrolling in various graphics modes. — R. Chapman, Southampton.

P.S. Here is a table of the post location to see if a console key has been pressed:

POKE (53270): You will get a value 0-7 and the following explains the meaning of each:

0	START	SELECT	OPTION
1	-	SELECT <td>OPTION</td>	OPTION
2	START	-	OPTION
3	-	-	OPTION
4	START	SELECT	-
5	-	SELECT	-
6	START	-	-
7	-	-	-

■ Firstly, assuming that the video pad from Star Raiders works in the same way as the ordinary key pad for the VIC, there is a little program to read the buttons in the Atari Basic Reference Manual — that's the original loose leaf manual released with the old 800/800 machines, which is still available from Atari.

The FORKs for DOS which create extra buffers DO work, but don't forget that they won't come into effect until you hit the System Reset button.

But for still, FORKs the numbers you require, then go to DOS and format a new disc. Once you've written the DOS files to that disc, the new configuration can be booted up every time.

For anyone who wants to try for themselves, location 1802 contains the number of drives active in bit-coded form.

Lighting up the micro scene

I HAVE a small emergency bulb which lights quite brightly on the power supply at the joystick port on my 800XL.

I wondered whether you could tell me how I could turn it off and then on again.

What software would have to be written to achieve this and which two pins would the temp have to be fitted to on the joystick port? — Dean Baxter, Wellington, Northants.

■ André Willey replies: The fact that the bulb may light

quite brightly does not necessarily mean that the computer is used to run it. The +5V DC output on Pin 7 of the joystick connector is only rated at 50mA maximum drain, which is not really enough to run even a small bulb.

The PIA output pins — the joystick connections — are rated for TTL levels, one load. This means that you can't directly run a bulb from the port.

However if you run a transistor from the TTL port

and switch a bulb/battery combination, then the 50V is your limit.

If you go one stage further and use an opto-isolator or relay, you can even switch mains — indeed, I've built a module to do that very thing.

The software would be very simple indeed, needing only a very few FORKs. If anyone would like to see an article on plugging Atari into the outside world, then let us know and we'll plan one for a future issue.

Thus 1 means you have Drive 1 only, 2 means Drives 1 and 2 are active, 3 means 1, 2 and 3, etc.

Each new drive requires more buffer space to work, so if you only have one drive, POKE with 1 to save memory. Location 1801 contains the number of active buffers. Each open file you wish to use simultaneously needs one buffer, plus each active drive will need two buffers.

Change this number 8, for instance, you want more than three files open at the same time.

Don't forget, though, to either hit Reset, or format a new DOS disc and re-load before you try to use the newly-set up configuration.

Bomb Run flashes

WHEN I received the July issue of the Atari User I typed in Bomb Run on my 780 Atari

800, but when I ran the game the screen was distorted by yellow and orange flashes.

Is there anything wrong with the program?

I also typed in Treasure Hunt. I had not finished the program but I had to go out, so I typed the program with my Atari 1050 monitor.

When I returned and tried to load the program, the computer loading sound was distorted and "Error 140" appeared on the screen.

So I reloaded the program. This time the message "Error 128" appeared.

The whole program had gone. Please can you explain why this happened? — **Kat-puh Tanna, Kanton, Mississippi.**

As far as we know there is no problem with Bomb Run.

Check all data statements and any pokes made from items read from data.

A faulty poker could easily crash the computer. Also, see the modifications offered by Peter Appleton in page 58 in last month's Atari User.

The problem with your crashing tape sounds like the age-old bug in the operating system of the 400/800 computers — it was corrected from the XL range onwards.

Basically, the tape recorder buffer area can be left full of random data and this is not cleared before writing to the tape.

To correct this, anyone using a 600 or 800 computer should always type (PRINT before saving anything to tape.

This will clear the buffer by sending the contents to a printer. If you don't have a printer, you will get an Error 138, but the buffer will still have been cleared, so you can ignore the message.

Pixelated pixels

I OWN an Atari 400 and both 410 and 1010 recorders. Looking at the programs in your magazine, I noticed that it

was a headache typing them in. You have a monitor, also with the programs on, but why not a monitor cassette?

This is quite inviting because I have no choice but to type them in. I explain the other Atari users about the same.

Also, when I type in graphics I don't see any colour, but when I start drawing them, they end up in lots of different colours. Why is this?

Finally, can you name anywhere where I could buy a 12-pin Atari high-density plug like the ones on the car decks? — **A. Graves, Bristol.**

The multicolour lines in Graphics II are not the fault of the computer, but of the TV you are using.

The British TV system is made up of grey patterns of red, green and blue dots. By turning these adjacent dots on "full", you get a white image on the screen.

The problem is that a Graphics II pixel is about the size of one of these small

LOOKING FOR A BETTER BASIC

I OWN a BBC Micro and am considering purchasing an Atari. One of its excellent graphics and colour, and also as it uses the same 6502 microprocessor, which assembly language I am accustomed with.

I know that the Basic provided with the machine is quite good, but is not structured. I should therefore like you to tell me what is the best Basic to buy for it, if necessary, which has advanced programming and is generally similar in concept to BBC Basic.

I have heard that Basic XL is excellent, and would be pleased if you could give me any details on this. I have also heard of a language known as Action, and would like to know the scope of this.

I would like to know the best assembler cartridge (also to buy). I already know the BBC2 assembler codes, but do not know the Atari computer's built-in machine code routines,

and the start of screen memory locations, and how they are structured.

I should therefore be grateful if you could tell me the names of any books giving the relevant information, that is, a book like the Advanced User Guide for the BBC, except obviously for the Atari.

I know printers are provided with the computer, and wonder how many there are, and whether they can be multi-coloured, as are the printers on the Commodore 64. Also can you give the name of a book which has this printer information in it?

It is possible to use one disc drive between two computers, without actually having to plug and unplug the drive between each computer?

Finally, do you know whether there is going to be a 4000 Atari ST, and if so, when is the ST range going to be on sale? — **N.C. Judge, Ashford.**

André Willey replies: Both

Basic-81, and its new, even more powerful, big brother Basic-8E and Action! are products of OSS in California, and can be obtained from many dealers or from the UK distributors, Software Express.

They each have their own advantages. Basic-8E, like normal Atari Basic, including structures, sprite handling, letter 3D, etc.

They are also about three times faster than Atari Basic.

Action! is a very high speed editor/compiler system which behaves like C and uses basic like anything else on the Atari except machine code.

It is also quite easy to write in, with a format nearer to structured Basic than C.

I use both extensively, and recommend them without reservation to any serious Atari programmer.

Your second question boils down to OSS again. Mac-85 cartridge or disc gives you speed, memory, etc. It also is an

editor/assembler, though it can do a complete disc-to-disc assembly if required.

For the technically minded, I recommend three main books:

De-De-Atari (Atari) is a tutorial/guide to many features of the hardware and OS.

Mapping the Atari (Computer Basics) is a superb memory map, and I find it quite invaluable. Once you know the system, this book would be referred to more than any other.

Technical User Notes (Atari) are the complete notes, including circuit diagrams, for the computer. You also get a full operating system listing and full OS documentation.

The above books cover sprites too, in great depth. There are eight, single colour, sprites (four large, four small), but these can be multiplexed and so forth "on-the-fly".

The original ST, the 286ST, will be around £500.

"colour gen" data, and so as the TV turns off all adjacent data - thus it can't properly balance out the first colour with two others - you get a colour bias.

If you use a high resolution monitor the effect becomes much less noticeable.

However, the effect can actually be quite pleasing if you utilize it well. See Dave Russell's Graphics column in the October issue for a good example program.

13-Pin I/O plugs are quite hard to get hold of, but you could try Silica Shop or Software Express.

As for monthly cassette editions of Atari-User programs, these are now available - see Page 61.

3D colour system

I AM looking for a three-dimensional colour drawing system for the Atari.

I have seen two advertised already, Atari Model and 3D Super-Graphics. Both were advertised by Maplin in 1983, but when I enquired they had never heard of them. They are made by United Software of America.

Do you know anyone who speaks them or is willing to order it?

I have tried Silica Shop, Maplin and Deaneart. Has anyone heard of it? - Nigel Miles, Rainham.

Both Maplin and the Atari Center in Broad Street, Birmingham, have had these titles in stock at one time or another, but if they have sold out, perhaps Software Express can get one for you, as they specialise in getting special order items from the States.

You may, of course, find that these items have been discontinued.

Books on machine code

WOULD you please be so kind as to tell me where I could obtain a machine code book for the Atari, or the name of a

ATARI USER Mailbag

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

The address to write to is:

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

book with this information in - Shane Bradford, Hartwell, Northants.

That's an easy one. The Complete's First Book of Machine Code in conjunction with their Mapping the Atari (Complete) Booklet, available from most good Atari specialists.

Also recommended, but on 8502 machine code generally, are Railway Jobs' Programming the 8502 and Lance & Lovemil's 8502 Assembly Language Programming.

Don't forget that with the last two a good look on the workings of the Atari is also essential, such as Mapping the Atari, or Atari's own De-Fe-Atari and the Technical User Notes.

Logging on to MicroLink

I HAVE an Atari 800 computer, an 850 interface and a WDC 2000 modem.

I have until recently used Hercules software by Data-Linx Incorporated to access bulletin boards.

Two weeks ago I paid a subscription to MicroLink but on trying to use this excellent program on MicroLink I was unable to log on to the system.

I am however able to log on with my SDDT with the default software, so there is no problem with the modem.

I have printed a complete description of Hercules but am unable to find where

the 8502 port is configured as I am only a beginner at machine code.

I would be grateful if you or anyone else could tell me how to correct this problem as I am reluctant to change this excellent program. - K.A. Horner, Sheffield.

We had exactly the same problem with HomePak as you seem to be experiencing.

After trying other programs - most less user friendly, but easier to re-configure - we found the problem was with the PSS system, not with HomePak.

What HomePak does in Atari mode is to send a line feed after every Return character. This causes Goto, and most other boards we have tried, no trouble at all.

However PSS needs two Returns with nothing between, so the line feeds throw it off completely.

The cure is to switch into Atari mode from menu, and whenever you should type Return hit ends of lines, not just type Control-M instead.

Once logged on, that is as soon as you have typed in your password, hit Control-Q to pause the system, return to Atari full-duplex mode, and use Control-Q to restart MicroLink.

We have configured a default file on HomePak to start up in Atari mode, and stored a macro to do all the work for us.

All we then need to do once the macro is complete is hit Select (or menu), & (or Atari), Return (or main screen again),

then Control-Q and we're on-line. Have fun!

Saving data files

I WOULD like to congratulate you on your superb new magazine, it's about time Atari users had their own publication.

I recently purchased a 1050 disc drive and at the same time Microsoft Basic II.

However I can't seem to save data files successfully, although I know you should use the OPEN, CLOSE and EOF commands.

Please help, as I need to be able to do this for my Q level project.

Might I suggest you start a page for classified advertisements, which should also include the names and address of our groups? - G. Manasse-Latin, Fulham, Beds.

As far as we know Microsoft Basic II works fine so far as I/O goes, although the commands are a little different to those in standard Atari Basic.

There may be some problems when trying to use it with some DOS variations, such as DOS 3, so perhaps your problems lie there?

Anyways, if after trying with another DOS you still have problems, contact the Atari Helpline on 01-308 7770.

Printer for labels

I NEED a roll feed printer with a nibbler for printing labels.

I have an Atari 800 computer with disc drive and tape recorder, so I would like any available information about the interface and software to go with the printer.

As it would be used to print address labels and product information, the software must be able to store the necessary addresses and information ready to print. - P.J.C. Gough, Brighton.

Atari's own 7020 printer is

probably the cheapest available with fiction and tractor feed, and it has the advantage of plugging straight into the machine.

It allows graphics printing, but is rather poorly supported by software. Print quality is only fair, but it results at about £300.

If you can afford that little bit extra, probably the best printers to look at for linking to an Atari are the Epson range, especially the established RX 80 R/T or the new LX 80 near-letter-quality model with optional tractor feed.

These are supported by a wide range of software which also allows you to print graphics. They use a Centronics connector, so will work with most commercial printer interfaces - Atari 850, Blackbox, PC Systems.

It is really a case of horses for courses though, and if you find a cheaper printer fits the bill exactly, then buy it.

The other thing to bear in mind is that if you may want to use a modem in the future try to get hold of an 850 module, because that has both serial and parallel ports.

On the software side, a good database to try is Synapse's Synfile +, which is not too expensive and is very versatile.

It will allow storage to any density of disc drive, plus full file/label options for your printouts.

It is also driven by co-co manual, which makes it very easy to use.

Connecting a printer

I AM interested in buying a printer for my Atari 800. I actually require a letter-quality printer, but the market for all types of printer seems rather limited.

There were virtually no adverts for printers in the first issue of Atari User. Please can you tell me what is available.

Does anybody besides Atari themselves manufacture printers directly compatible with the Atari 800?

What is the specification of

A case for keeping it clean

DO you know of anywhere I could get a case in which to keep my Atari 800XL and FDD recorder - I've seen them for a couple of other types of computer but not for the Atari.

A case cover isn't really protective enough, so at the moment I have to use the enormous cardboard box in which it came, or a case which is really very useful.

Also could you recommend a book for the 800XL which will actually get me doing things on it.

As the customer I seem to use it solely for games, so my very basic 12 level computer studies doesn't exactly provide

much inspiration.

Finally, a problem I have relating to the game Citadel Warrior from Atari Smart Art Vol 3.

There seems to be something in the program which stops it after seven minutes, so how is it possible to get beyond the first part of the second level? - Deborah Thompson, Nottingham.

■ We don't know of any cases for the 800XL, plus recorder, but someone out there probably makes them. If anyone knows of such an item, perhaps they could write to us.

As for books which get you doing something, the Com-

puter connector for the Atari bus, that is what signals are on what pins as well as the connector type?

Finally, what are the disadvantages of connecting a printer via a joystick port? - D.A. Wilson, Reading.

■ Atari makes a letter quality printer - the 1002, but it is very slow and noisy. It does, however, connect directly to the Atari without an interface, which saves you a bit of money.

It is the only letter quality we know of which can connect directly to the Atari bus.

Most types of printer will connect via a Centronics type connector, and any computer shop will be able to show you printers which can do this.

The bus is a special 19-pin based serial interface, and can't be linked to printers without a lot of extra circuitry to convert the serial signal to the parallel Centronics standard.

You can buy such interfaces, and there are about half-a-dozen currently available from various companies - see adverts in this issue.

You can connect a printer via the joystick port if you use a machine code handler routine, but it would only work with your own programs, say Basic listings. Any commercial software at all will expect the

printer to be attached via the bus, and it would be almost impossible to modify for joystick port use.

Drawing software

DOES anyone know of any technical/drawing/drafting software which is available for the Atari 800XL?

Numerous packages exist for the Apple and BBC computers which are the same processor, the 6800, as the Atari.

The Atari Peach Tablet should be an ideal input device for such a program.

The increasing use of CAD (Computer Aided Design) in engineering should generate a greater interest in this type of application on home computers, particularly those with the graphics capabilities of the Atari.

Schools and technical colleges would also appreciate such an application so do let anybody get any ideas? - A.O. Chamberlain, Tunbridge Wells.

■ We don't know of a specific CAD package for the Atari, but Datsoft produced something very similar called Graphic

craft! Series of Atari books are very extensive, and feature articles on many diverse aspects of Atari computers.

We wouldn't really recommend all of them for someone who is just starting with their machine, but you have absolute gain to grip with Basic already.

They contain programs and tips on all sorts of subjects, and would be a good starting point for developing your own ideas.

Contact any Atari dealer or read other specialist for details of the range, which is quite considerable.

Would anyone also want to comment on Citadel Warrior?

Monitor, which allowed designs to be created on a Graphics 8 screen, manipulated, rotated, flipped, etc.

Routines were included for lines, circles, polygons, overlays, moving blocks, changing the scale of portions of the design and these different text overlays.

You could also transfer portions between work screens, and use a system of icons, for example electronic component symbols.

Once drawn, the images created could be stored on disc or printed on an Epson or NEC type printer.

It's quite an old program, but well worth searching for if you can't find one but if someone like Software Express can import a copy for you.

Problem with Basic

I HAVE a problem with Atari Microsoft Basic V7.0.

I have just bought a 130XE to replace my old 800, at the same time I received my copy of DOS2.0 with the Ramsoft utility. When I would like to know it, can I use the Ramsoft with Microsoft's Basic 8.000.

and how can it be done? — **George Lushon, Beth.**

■ The old Microsoft Basic was recorded on a master disc which included DOS 2.0 and then protected. This means that apart of copying it to another disc and re-protecting it — a complex job — it can't be used with a different DOS.

However, Microsoft Basic 2 — the cartridge — can be used with DOS 2.0, as can Basic-81 from CGS.

If you decide to upgrade, we recommend Basic-81 over Microsoft, as it features almost all that the MSB-II does, plus better graphics routines and memory management.

More support needed

I'm selling my Commodore 64 to buy the Atari 1300C.

There are several shops out for their own name that sell Atari computers, and software for just about every game mine, other than the Atari.

I am thankful for your excellent magazine from which I will be able to send off for software.

Why is there so little support for Atari computers, that are in a class of their own? — **Andrew Sharp, Sale, Cheshire.**

■ Support for Atari machines seems to be increasing all the time. Keep asking for Atari software in the shops and maybe they'll get the message.

Shorter programs

CONGRATULATIONS on yet another excellent issue of Atari Age.

It is a pity, however, that you use AT to devote letter space to games scores. This sort of information is of interest only to AT readers, occupying space which could be put to better use.

Could you please at least reduce the coverage given to this tedious and gratuitous age



I WANT a 80081 and I am a great fan of adventures so I looked in Raider 1997 as well as I got my copy of the August edition.

Having only 10k I can't buy any adventures so you can imagine my annoyance when I got an error 5 at line 1020. Could you please tell me what might be wrong with it?

Also, I think you should

Trouble on line 1020

have more competitions and software reviews. — **Arady Latta, Fife.**

■ You've probably made a typing error somewhere. Check line 110 where 85 should be dimensioned 20.

typing?

I read with interest your guidelines for positive contributions. While it must be agreed that they are sensible and well thought out, they could also be a little restrictive.

Your insistence on disc or cassette support could result in a dearth of the very useful Atari program.

Surely only the most fanatical or squeaky among your readers would willingly shut out a line on the chance of their minor effort proving acceptable. Accordingly I have a suggestion.

Could you not designate a regular shorts feature? Submissions could be accepted in the form of floppy + documentation, under the understanding that any not used would be allowed.

I am sure that you would attract plenty of material, and so would be very happy.

The financial incentive need not be particularly high, and the extra word load an additional staff member could.

— **Bruce Woodard, Marlowden, London.**

■ Submitting anything should only cost you postage both ways. Any disc or tape will be returned. The "shorts" is a good idea, but even they need to be typed in so they can

be listed legibly and it all takes time — a rare commodity around here.

Pin outs, please

I WANT just purchased an Atari 80081 and am delighted with it. Can you print the pin outs in your magazine as I am interested in connecting a disc drive, modem and printer all at the same time.

I would like to run a lead to connect my 80081 to another 80081 in the next room. I know this is possible but I don't know how. I would like to be able to ask a question on an 80081 and answer it on the second one? I can't see any reason why I shouldn't be able to continue to add 80081s ad infinitum.

So how about an article for the technically-minded ones of us that have a soldering iron. — **John Hopkins, Wiltshire.**

■ Pin outs are given in the Technical User Notes, along with timing diagrams that you can purchase from Atari.

However you can simply plug a disc drive, printer, interface for RS232C, cassette and so forth into the machine at once. Each new unit plugs

into the extra socket at the back of the last one, like a daisy chain.

The best way to connect machines together is via the joystick ports.

We hope to have an article detailing this technique in a future issue.

Data on disc drives

CAN you send me some details on the 1050 and 810 disc drives.

The Atari game Tennis does not seem to work on my 80081. Why is this? Can I get a cartridge or cassette that will get this game to work? — **B.T. Brown, Waterlooville, Hants.**

■ The best thing to do if you want details on disc drives is to contact either your local dealer or Atari in Slough, both of whom can give you the information you require.

We would recommend the 1050, as it can store more data, is more compact and quieter.

Otherwise, there is no real difference between the drives except that a few — a very few, about five or six — old programs would not load correctly on the new drives. New versions of these titles have, of course, been brought out, but if a shop has stock over two years old it could be suspect.

The problem with Tennis is more fundamental — many old programs will not work with the AT computers at all.

This is due to the software houses not having followed Atari's guidelines correctly, so the program won't work on a new machine.

Theory[EM] Tennis is an old that we don't even remember it, but the best solution for a cassette-based system is either AT-File or Computer Support's 80 Columns Pack. Atari's own translator is good, but it's only available on disc.

The 80 Columns Pack has the very useful side-effect of converting the AT operating system into an enhanced version of the old Atari 800 one.

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The Atari 520ST comes with a variety of free software, including a word processor, a spreadsheet, and a graphics program. This makes it a great value for the money. Additionally, the Atari 520ST is designed to be expandable, with a variety of options available to enhance its performance and capabilities. This makes it a computer that can grow with your needs.

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ATARI 520ST SPECIFICATION

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The Atari 520ST is a powerful, user-friendly computer that offers the performance of a Macintosh at a fraction of the price. It features a built-in hard disk drive, a mouse, and a keyboard, making it a complete system ready to go.

OPERATING SYSTEM
The Atari 520ST features the Gem operating system, which is designed to be easy to use and understand. The interface is simple and intuitive, allowing you to navigate through the system with ease.

SOFTWARE
The Atari 520ST comes with a variety of free software, including a word processor, a spreadsheet, and a graphics program. This makes it a great value for the money.

EXPANSION
The Atari 520ST is designed to be expandable, with a variety of options available to enhance its performance and capabilities.

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PRICE	£2,099	£1,280
RAM	512K	512K
MONITOR	8" W	8" W
DISK DRIVE	500K 3.5"	500K 3.5"
KEYBOARD	85 KEYS	85 KEYS
MOUSE	YES	YES
SOFTWARE	WORD PROCESSOR, SPREADSHEET, GRAPHICS	WORD PROCESSOR, SPREADSHEET, GRAPHICS
EXPANSION	VARIABLE	VARIABLE

PRESS COMMENT
The Atari 520ST is a powerful, user-friendly computer that offers the performance of a Macintosh at a fraction of the price. It features a built-in hard disk drive, a mouse, and a keyboard, making it a complete system ready to go.

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