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Andrew Bennett takes a look at some of the queries from ST users.

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800XL support is guaranteed

A survey of leading suppliers has dispelled fears about future support for the 800XL now that it has ceased production.

It has conclusively revealed that ongoing back up is now guaranteed due to the machine's record sales over the Christmas period.

Almost all Atari's entire stock of 800XLs - some 100,000 machines - are reported to have been sold as a result of the cut-price offer through Dixon's High Street chain.

And this, in itself, is enough to ensure that both peripheral companies and software houses will carry on producing for the 800XL for the foreseeable future.

It seems that a lot of people were concerned that support for the XL would soon vanish once we had stopped making it", said an Atari spokesman.

"But this could not be further from the truth now. For the huge user base that's out there as a result of recent sales will make sure the machine is alive and well for a long time to come.

Viable

'The fact of the matter is that it remains a viable commercial proposition to service the 800XL market'.

According to Tony Deane of Silica Shop, the leading Atari distributor, there are currently 2,000 titles available for the 800XL and the figure is still growing.

'Not does he believe there is any cause for concern by anyone who has bought an Atari 8-bit machine - whether it is a 800XL or a 130XE.'

'The reason for this is that Atari has always had a policy of bringing out new machines totally compatible with its existing range', he told Atari User. 'This is a completely different approach than other manufacturers.

'The company historically has always proved willing to stand by the consumer by producing new machines that work with old software - and vice versa.

'Possibly the only way a problem could be created is if there was a lot of new software come out to fit the 130XE's higher memory capacity. Obviously this would not run on the 800XL.'

'But not much software makes use of this. After all, most software houses are clever and stick to 64k capacity so they can sell to users of both machines.'

'In fact of all the 8-bit software out at the moment there can't be more than six titles available for the 130XE exclusively'.

ST software growing

THE new year began with an amazing total of nearly 150 software items available from UK suppliers for the 520ST.

Rob Harding, Atari sales and marketing manager, says: 'The support from software developers is staggering.'

'We now have more than 200 ST development systems in use in the UK - along with a similar number in the USA.'

'As a result of all this effort new software titles are appearing on a daily basis'.

Atari seems to have succeeded in what Harding describes as 'our determination that the ST will have software covering all areas of the market from games and entertainment through to serious business and vertical applications'.

The latest list shows more than 140 titles of which only 51 are classified as 'entertainment'.

The others include 14 accounting packages, 10 word processors, three spreadsheets, nine databases, five communications packages, six graphics packages, 18 programming languages and 11 utilities.

Doncaster based software house CDS is right on cue with its introduction of Steve Davis Snooker for the XL range.

It offers a large variety of skills to suit all players with three table speeds, accurate control of the degree of spin and play options - all by either keyboard or joystick.

Edit mode displays a hand which can pick up, move or drop balls anywhere on the table. This enables the setting up of trick shots or problems for later solution.

If a shot is "fluffed", pressing the cheat key allows the move to be erased and the table to be reset to its previous position.

'Even Steve can't do that', says a CDS spokesman.

Steve Davis Snooker is £9.95 on cassette and £12.95 on disc.

Right on cue
Pirate threat rebounds

THE man who is offering a reward for tracking down Atari software pirates has himself been accused of selling equipment that can be used for illegal copying.

John Lawson, boss of utility specialist Computer Support, told Atari User last month that he will give £100 for information leading to the successful prosecution of those guilty of pirating his products.

This followed his discovery that his firm’s machine code monitor Ultimon and 80 column text mode 80 Column Peck had been copied and were available on the black market.

But Lawson’s stand has angered several Atari users who feel he wants to ‘have his cake and eat it too’.

One of them, Andrew Fisher, secretary of the Plymouth Atari User Group, said: “I personally find it very hypocritical of Mr Lawson to complain about the way in which his utilities are sold on the black market.

“Computer Support themselves sell items which, despite the disclaimer at the bottom of their adverts, enable people to pirate other companies’ software. The offending products are the disc, cassette and cartridge backup programs and most notably the disc drive modification Bad Sector which is exceedingly useful to anyone wishing to copy commercially available programs protected by – yes, you’ve guessed it – bad sectors.

“Even the ROM-based Ultimon could be used to pirate software if it is anything like its American lookalike Omnimon”.

Another reader, who asked Atari User to protect his identity, wrote: “This is a blatant case of the pot calling the kettle black.

“Mr Lawson’s range of utilities comprises mainly piracy aids such as Ultimon which allows users to break into programs and write to them or files which is easily copied.

“Also ROM Emulator which allows cartridge software to be copied, Bad Sector which enables copying of protected disc software, Super Disassembler to allow alteration of tapes to discs and vice versa, two disc copiers and various other ‘utilities’.

“I would say that at least 50 per cent of his products are aimed at the pirates market, which is strange coming from a man who is so much against piracy”.

The criticisms were described as absurd by John Lawson.

He told Atari User: “Any utility can be part of the toolkit of a pirate. It’s people who carry out illegal copying - not equipment.

“No supplier of utilities can control the uses they are put to after purchase. We can only put our trust in the honesty and goodwill of our customers.

“My programs are sold on the understanding they are used solely for personal backup and not for illegal purposes.

“Thankfully the vast majority of Atari users are not cheats and are 100 per cent behind me in the stand I am taking against the pirates.

“The people most likely to be upset about my actions are those engaged in copying themselves”.

Atari UK denies ST price – slashing report

A REPORT from America that Atari is about to dramatically slash the price of the 520ST has been officially dismissed as “speculative rubbish”.

The story which subsequently appeared on Micronet, the UK electronic mail service, claimed that the price of the machine was to be dropped to $399.

It alleged that this was to be timed to coincide with the launch of a 1 megabyte version of the ST – known as the 1040ST – to be marketed “with colour monitor for $999”.

When informed of this, Atari UK’s sales boss Rob Harding described the story of the proposed price cut as not only inaccurate but harmful.

“There are simply no plans to reduce the price of the 520ST package”, he told Atari User.

“What is actually happening in the States – and probably how the confusion started – is that for that market only there will be a special package made up of just the ST keyboard.

“It will be sold at a reduced price, but there will be no disc drive and no monitor, although it may come with a modulator. And it will not be sold in the UK.

“We remain convinced that the present 520ST bundle is the right configuration at the right price”.

As far as a possible launch of a 1 megabyte version of the ST was concerned, Rob Harding was less dogmatic.

“We have no immediate plans to sell any machines with 1 megabyte of memory, whether they be STs or not, he commented.

Meanwhile, despite yet a further report from the United States that the proposed 260ST was to be dropped, Rob Harding insists it is still on its way.

“We are still on target for spring”, he says.

Micro help for the handicapped

THREE special day courses dealing with the use of computer technology by disabled people have been arranged during March and April.

Dorset Spastics Society is sponsoring Technology and Young People with Special Needs in Poole on March 7. Enquiries to Mrs K. Vandelvelde, Langside School, Langside Avenue, Parkstone, Poole, Dorset BH12 5BN.

On March 21, New Developments in Technology and Disability will be the subject of a course in London. Enquiries to Miss Hilary Cane, Richard Clodjesley School, Golden Lane, London EC1Y OTJ.

Barrow and District Council for the Disabled is sponsoring New Developments in Disabled Living on April 2 at Barrow in Furness. Enquiries to Mrs B. Holgate, Health Education Department, The Rookery, Brogden Street, Ulverston, Cumbria.

Failure

ATARI has pulled out of a deal to bundle Digital Research’s GEMWrite and GEMPaint with the 520ST because the software giant failed to deliver on time.

The company has now come up with replacements in the form of 1st Word, a word processing package from Cambridge based GST, and DB Master One, a business database from USA’s Stonemaster.

“We made this decision based on Digital Research’s failure to supply us with a suitable product by the agreed date”, Rob Harding, Atari UK’s sales manager, told Atari User.

“So we had to make other arrangements”.

However Rob Harding insists that the new software will in no way detract from the ST bundle offer.

“1st Word is a superb GEM
Five get converted

BUDGET software house Blue Ribbon has converted five of its established range for the 48k Atari - Castle Assault, Diamond Mine 1, Nightmare Maze, Screwball and Darts. All cost £2.50 each on cassette or £9.95 for the five on disc.

The first two games have similar goals. In Castle Assault the task is to collect gold while avoiding a "menacing menagerie of meanies". In Diamond Mine it is to gather precious stones from tunnels and shafts while avoiding a hoard of obstructive bugs. Cups of coffee have to be found, escape keys collected and monsters avoided in Nightmare Maze, through which the player must guide Sleepy Joe.

In Screwball the player is given 60 seconds to change the colour of all the squares in the grid. This time the assailants are the Black Bugs. Last of the five games is Darts. This includes three programs - 501, Round the Board and Cricket.

ATARI'S 8 bit user base in the UK has now reached 400,000 thanks to High Street giant Dixons selling "almost all" the remaining stock of the now defunct 800XL.

In all, close to 100,000 of the machines are believed to have been sold during the run up to Christmas alone.

And Atari distributors and dealers couldn't be more pleased with the prospects for 1986.

"This will be the year of Atari", says Tony Deane of Silica Shop. "For the sale of all those XLs has helped create an enormous marketplace for software and peripherals. Competitive "And the 130XE is also going incredibly well, even to the extent where we actually ran out of stock at one time recently. So everyone is doing very nicely - including the customers. "After all, the larger the market out there, the more keen the companies are to get into it, so prices become even more competitive".

This will be the year of Atari

Software to fight heroin

A TRIO of software houses involved in the Atari market have joined forces in the fight against heroin addiction.

Grenlin Graphics, Activision and US Gold have all donated programs to "Off the Hook", a games compilation tape, the proceeds from which will be used in the war on drugs.

Launched by the home computer games industry at its annual dinner, it is hoped to raise more than £100,000 through the sale of the tapes campaign.

Artist David Rowe's picture (above) is being used to link up with the anti heroin campaign. This will involve the sale of a limited edition of some 70 colour prints.

Fleet Street gets bigger

MIRRORSOFT is working on an implementation of its Fleet Street Editor program which it claims will turn the 520ST into a fully operational photocomposition workstation.

Due for an early summer release, the ST version is still under development.

So far the company is keeping mum about the program's proposed features and price - except to say it is aimed at both professional and hobbyist markets.

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to deliver makes

Atari drop GEM

based word processor with full windowing and drop down menu facilities"; says the company sales boss.

"And we are including a database with the 520ST rather than GEMPaint because after consulting a number of people it is very clear that the ST is being sold in a professional and business environment where a database will be more useful".

Atari has also revealed that it is to include two further free pieces of software in the ST bundle - Megaroids, a version of the Asteroids arcade game, and Doodle, a graphic painting package.

"We believe that these will make the 520ST an even stronger overall total package" he said.

All current ST owners are now being requested to contact their dealers who will supply them with the new software free of charge.

Meanwhile just what happens to the Atari versions of GEMWrite and GEMPaint when they do become available is seems to be the centre of some controversy.

According to Digital Research's vice-president Paul Bailey, there is every likelihood they will subsequently be bundled with the 520ST.

"Now we appreciate the fact we were a month late in delivering for appraisal", he told Atari User. "But there is nothing that says they won't be eventually bundled with the ST".

However Atari doesn't seem to agree.

"As far as we are concerned, the deal is now dead", a spokesman said.

When informed of this, Paul Bailey commented: "if that is the case, we'll market it ourselves to Atari users".

Rob Harding: "Even stronger package now".

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A PRECURSOR of Logo was the language Lisp, which was used for LIST Processing and had a very unusual property—the statements that were used to run a program were themselves a list.

Thus Lisp could manipulate itself in ways that are only dreamed of in other languages. It is for this reason that Lisp is still around today, since it is an ideal language for use in artificial intelligence work. List processing is still part of Logo, and a very important part of it.

Let me digress and explain some of the Lisp-derived commands that are still found in Logo. First of all, variables are very difficult to handle in Logo. However lists are a necessary part of the language.

Commands like SET Position expect a list of two numbers so that the turtle will know where to move. There are strange commands like BUTLAST and BUTFIRST that will take a list and give back another list that is the same except that the first item in the list is gone (BUTFIRST).

Lists can be made up of other lists. Lists can be put together and taken apart. There is even a special command called NUMBER that tells how many members are in a list.

One further digression. I have been talking about lists and have not shown any examples of one. In Logo, lists are enclosed in brackets []. It could be a list of names, such as: [Rebecca Lauren Gabriel Daniel]. Or a list of numbers like {3 6 2 8}. Or a mixed list with the first element in the list itself, being a list, as in: [{1 3 7 2} Rebecca Gabriel Jason].

Let us call this list ABC. ABC has four members in it. If we asked LOGO to NUMBER ABC and PRINT the answer it would give us 4. If we asked LOGO to BUTFIRST ABC then LOGO would give us [Rebecca Gabriel Jason]. If we asked for FIRST ABC then it would give us [1 3 7 2]. Several other commands that can be used for manipulating lists include SE, WORD and CHAR.

You are probably asking yourself how does this relate to anything that is fun or useful. When a command is written in Logo it is written as a list. The command can be manipulated and changed and then run. Logo does not care if it is a list or a command.

What we are going to do is write a program to make the turtle draw what is known as a Dragon curve. This is a mathematical formula that is very recursive, and in effect bites its own tail. Every dragon curve will become more complicated until it will fill the screen, but every new dragon curve is related to the old one through a simple procedure.

The dragon curve is a method of making a line that fills up a space. The classical dragon curve will not touch itself at more than two points and will never cross itself. The program is made up so that the classical dragon curve is drawn or you can start the dragon curve with your own formula.

To make the turtle draw a dragon curve is very easy. The classical dragon curve, of order 1, is L. This means that the turtle walks forward so far and then makes a Left turn and walks the same distance again. Order 2 takes the Order 1 curve, adds an L to it, and then goes backwards through the old one, reversing every L to a R and every R to an L. Thus the Order 2 curve is L-R-L-R. This means that the turtle walks forward, makes a left turn, walks forward, makes a left turn, walks forward, makes a right turn and then walks forward again.

The Order 3 curve is made from the Order 2 curve. It is LLR-L-L-LRR, again reversing the Ls and Rs in a backward direction. Order 4 is LLRLLR-R-LLRLRLR, and so forth. It is very easy to teach the turtle to walk this path and as the paths become more complicated, the path begins to look like a Chinese dragon.

Back to list processing. Let us assume that there is a list with the instructions for a turtle on how to walk to make a dragon curve. If it is a list, then it can be manipulated and a new list made that is the next order of complexity. Then the next order of complexity can be made.

Let us see how this is done. There are procedures that are used to
...and the Dragon

manipulate this list of the directions.

First let me explain several of the
less common Logo commands — SE
(SEntence), RUN and COUNT. I will
also explain more about the recur-
siveness of Logo.

SE is an easy one. It takes the
elements in its inputs and makes a list
out of them. For example SE [1 2 3]
[REBECCA LAUREN GABRIEL]
would give an output of [1 2 3
REBECCA LAUREN GABRIEL]. This is
very useful for making lists up. It is
different than if we LIST them
together because then we would get
[[1 2 3][Rebecca Lauren Gabriel]].

The difference is more evident if
we use the NUMBER command to
determine the number of elements in
the list. If we NUMBER the first list
made by using SE the result would be
6. If we NUMBER the second list
made by using LIST the result is 2.

The next strange command is
RUN, which takes the next list and
tries to make it perform an action. If
all the commands in the list are
defined the proper action will be
done. This is the heart of any Lisp
program, the making of a proper list
and then RUNning it.

Another useful command is BUT-
FIRST and FIRST. Let us use the list
[1 2 3 4]. The FIRST member is [1],
and BUTFIRST is [2 3 4]. There is a

Finally there is the command
WORD which makes up a word out of
its inputs, and CHAR which puts out a
character from a number value.

Two other commands are used in
the program, RC (Receive Character)
outputs the next character read from
the keyboard, and RL (Receive Line)
gets a whole line that is typed and
ended with RETURN.

Let me go through the program.
The main command is DRAGON. It

The next statement is an IF test to
determine if the character typed is an
N. If it is, then DRAG is made equal to
[L] and a classical dragon is drawn. If
the character is not N then a line is
printed to tell you to type Rs and Ls to
make your own formula for a dragon.

DRAG is made equal to the value
from RL (Receive Line). Then there
are two checks to decrease the size of
STEP so that the dragon will fit on the screen. The program then returns back to DRAG 0N. Window is called to make the field larger, so that the turtle will go out of bounds rather than make a poor dragon curve. Then DRAW is repeated 10 times.

DRAW is the main procedure. It calls most of the other procedures and makes the turtles draw the Dragon curve correctly. The first thing that DRAW does is check to see if a key has been pressed (KEY P). If it has then the program stops.

The next thing it does is make a new variable equal to DRAG. If you remember the conventions of Logo a \"before a variable signifies the name and a \"\" before a variable signifies its value. So make \"\"WORK :DRAG means make the variable WORK equal to the value of DRAG.

The next step is to put an L on the end of WORK. This is done by making WORK equal to the Sentence of WORK and CHAR 76 (L). Next the recursive procedure REDO is called. This means that somewhere in REDO, REDO uses itself. The only way that this can work and not turn into an endless loop is if there is a check somewhere to stop the loop. The first statement does just this. IF 0 -- COUNT : DRAG then stop. If there are no more values in DRAG then stop.

The next statement makes the modifications for the next order of the dragon curve. IF R is the last member of DRAG then MAKE WORK the value of work and CHAR 76 (L) otherwise make WORK equal to WORK and CHAR 82 (R). The next line makes DRAG equal to BUTLAST DRAG and the REDO does it again. Each time DRAG goes through REDO it becomes shorter and finally it will fall out of REDO and return.

Back in DRAW, DRAG is made equal to WORK. The screen is cleared (CS), and TELL turtle 0 to go to work. The next statement is the heart of the program. It is RUN :WORK. It says to take the list found in WORK and RUN it.

As we have seen previously, WORK is make up of a series of Rs and Ls. And now we are telling the program to RUN this?

There are still some procedures that we have not gone through yet and two of these are R and L. There is a procedure called R that calls WALK and gives it two values 90 and STEP.

The procedure L calls WALK with the values --90 and STEP. WALK takes these two values and makes a RIGHT turn of the number of degrees and then walks FD STEP times.

What we have done is defined R and L so that it makes sense in this program. Then when we tell the program to RUN :WORK, what it will do is take the Rs and Ls and make a pattern on the screen.

The rest of the program is rather straightforward. Once the turtle 0 has made the pattern, SET UP tells all four turtles to simultaneously make the same pattern using another RUN :WORK command.

All the turtles are oriented at 90 degree angles so that there will be four dragons tail-to-tail on the screen. After this is done REDUCE makes STEP smaller if it is not less than 4. Then the program falls back to DRAG 0N.

One more set of routines is used in this program, and it was not added at any specific spot. One of the lacks of Logo is that there is not a screen dump routine written specifically for it that will work with any sort of printer. I have written a set of procedures that will put a screen dump on a printer, but it needs to be modified to run on each individual printer.

First let's see how the screen is set up in memory. The area called screen memory contains information on what will be put on the screen. Each byte of memory contains 8 bits, and the system uses these two at a time to make the dots on the screen.

The turtle draws in what is known as Graphics 7 mode, and each byte of memory corresponds to four dots, or pixels, on the screen. The bits taken two at a time say which colour is to be used for the dot, and since two bits can only have the values of 00 01 10 11 (0, 1, 2, 3), this corresponds to which pen is used to make the dot.

What the screen dump does is take the eight bits and divide them into two parts. It then looks at each four bit part which contains the information about two pixels and decides which pattern it is. Since most printers cannot make colours, all this routine does is determine if the pixel is lit or not. The four possibilities for two pixels are both dark, left dark—right lit, left lit—right dark, and both lit. Since there are 160 pixels across the screen, the two pixel pattern will correspond exactly to the 80 columns across the page, and a screen dump can now be done.

Since every printer is different, four procedures have to be modified to correspond to your printer. I have an NEC 8023 and the program was written for that model. However it is very easy to make the changes necessary for your printer.

The four procedures that need modification are BLANK, LEFTBLANK, RIGHTBLANK, and SQUARE. These procedures send certain characters to the printer. To send material to the printer the SETWRITE command SETWRITE P: must be done first. Then when BLANK is used it TYPEs the CHAR whose value is 32 into the printer. In most printers, this is the value that is the blank character.

LEFTBLANK uses the CHAR 139 to put a half column of darkness on the printer. On printers like the 825 the value 24 is used. The Epson uses a 234 for this. SQUARE uses the value 135 to put a black square on the printer. The 825 uses a 162 and the Epson a 239.

On the 825 a 150 value will give a RIGHTBLANK. The Epson uses a 233. However the RIGHTBLANK for the NEC uses a more complicated routine to put a blank right on the printer.

The NEC does not have a special character for a half column with the right part partially filled and I had to make up my own. The NEC has something called pin addressing which can make up for this. Every pin in my dot matrix printer can be told whether to be in or out.

What I want for RIGHTBLANK is a character made up of four vertical columns of nothing and then four columns of full blackness. To do this I need to send to the printer the coding that sets of the proper coding for pin addressing (27 83) and then tell it that there will be eight numbers coming to be used (48 48 48 56) and then finally the coding for the actual printing (0 0 0 255 255 255 255 255). I have thus generated my own character which has the printing that I want.

One other need is to have the lines closer together to make the picture appear more realistic. There is a procedure called SCW LATING that changes the spacing to 8/72 of an inch. This will have to be modified to your own printer also. The Epson uses
a [27 65] coding.

Thus PRINTER is called to do a screen dump. It determines the first spot in memory that is the screen memory by checking the pointer at 14273, and sets this value to SCREEN. It starts the printer and changes the SPACING. It then calls LINE 96 times to print out all 96 lines of the screen, and finally turns off the printer. LINE calls PIXEL 40 times and after each call, increments SCREEN.

PIXEL finds the value at the location SCREEN and separates it

into two parts which it sends to WRITE if it is not zero. If it is zero two BLANKS are sent and the procedure returns to LINE. WRITE determines if it is a BLANK, a RIGHTBLANK, a LEFTBLANK, or a SQUARE coding is to be sent to the printer. It then returns to PIXEL.

PRINTER is extremely slow. It will take almost five minutes to print out the full screen. I will control myself and make no bad puns about turtles.

There are facilities to make the screen dump in machine language, but that is not the purpose of this

program. If I were to add it, the step

would be in DRAW as follows: IF 1 STEP < 5 THEN PRINTER.

This program is an example of a program writing its own program – the major characteristic of Lisp. It does not care if the list contains names or numbers or instructions, it is treated just the same and stored just the same. Thus an instruction list can be modified when needed and when checked by external observations, which make this the language of choice for artificial intelligence work.
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6502 ASSEMBLY LANGUAGE

THE 6502 chip supports one accumulator, A, and two registers, X and Y. X, Y and A can be thought of as similar to variables in Basic, but with some important differences. They can hold any number between 0 and 255. Values can be added to or subtracted from the accumulator without any difficulty, though multiplication and division are more complex.

The X and Y registers can only be increased or decreased by one during any given operation. X and Y registers can be used as indexes. Where an address is followed by X or Y this indicates that this is an indexed operation.

For example, STA 37682,Y means store the contents of the accumulator in address 37682 plus whatever value is held in the Y register. Thus if Y holds a value of 10 and A a value of 100, then 100 is stored at address 37692 (37682+10).

Instructions followed by # mean that the operation is carried out in the immediate mode. Whatever is followed by the # sign is treated as a number and not an address. For example LDA #16 means load the accumulator with a value of 16 – this is similar to the Basic command A=16 – whereas LDA 1536 means load the accumulator with whatever value is stored at address 1536.

Instructions such as BNE or BEQ are branching instructions. If a branch instruction is followed by a number between 0 and 127 the program jumps forward. Followed by 128 to 256 the program jumps backwards. For example, the routine CMP 15, BEQ 13 means compare the accumulator with 15 and branch if equal 13 bytes forward. The routine CMP 15, BEQ 238 again compares the accumulator with 15, but branches if equal 256-238 or 18 steps backwards.

A number followed by .Z means that the number is an address in zero page (addresses 0 to 255). Thus STA 20.Z means store the contents of the accumulator at address 204.

NOW FOR ASSEMBLY LANGUAGE

NOW let's look at the assembly language version of Alien Attack, the game developed with the use of the RAW assembler from last August's issue of Atari User.

The assembler puts machine code into memory after analysing assembly language mnemonics contained within DATA statements. Program I is a list of the DATA statements used to compile the first part of the game.

The mnemonics used by RAW are fairly standard; so if you are used to using a different Atari assembler you should have no difficulty.

There may be some minor differences, for example, the RAW assembler recognises indexed instructions such as STA 37682,Y whereas most assemblers replace the full stop with a comma to give STA 37682.Y.

In case you are unfamiliar with assembly language, or only have a limited knowledge of the system, the adjacent panel gives a brief introduction to the subject and a list of the assembly language mnemonics used by Alien Attack are given elsewhere.

To keep things simple I have not used all the 6502 instruction set that is available to the programmer, nor have I used the hex number system.

Whereas Basic supports a large number of variables that can be used to store DATA, the 6502 chip can only handle two registers, X and Y, and one accumulator, A. It is therefore necessary at various points in a machine code program to store DATA in memory locations so that it can be retrieved later in the program.

Addresses in which Alien Attack DATA are stored in this way I refer to as stores. It is helpful to allocate areas of memory well away from the main program to act as stores.

In this way whenever you come across them in machine code programs you can recognise the addresses at once as being stores.

There are several locations in zero page, addresses 0 to 255, that are not used by the operating system, and I have used some of these as stores. For example, the current horizontal position of the ship is stored at address 204.

There is also a block of memory free at page 6, addresses 1536 to 1792, and I have also allocated some
of these as stores.

It would perhaps have been enough to just use page 6 addresses, but I have included zero page addresses for demonstration purposes. Where memory is at a premium zero page addresses have the advantage of being only 1 byte long.

Figure I is a list of the stores used by Alien Attack.

The game is built up from a series of 12 short subroutines, each handling a different aspect of the game.

The first is used only once for each game and initialises the game. The rest of the subroutines are labelled according to their function.

The RAW assembler, like most assemblers, can handle up to 255 labels and this facility makes it much easier to write and edit machine code.

Figure II provides a list of these mnemonics.

**Figure I**

<table>
<thead>
<tr>
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<th>Code</th>
</tr>
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<tbody>
<tr>
<td>150</td>
<td>790</td>
</tr>
<tr>
<td>180</td>
<td>3682</td>
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<tr>
<td>215</td>
<td>347</td>
</tr>
<tr>
<td>248</td>
<td>786</td>
</tr>
<tr>
<td>270</td>
<td>876</td>
</tr>
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</table>

**Figure II**

<table>
<thead>
<tr>
<th>Mnemonic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC</td>
<td>Add specified contents to accumulator.</td>
</tr>
<tr>
<td>ASL A</td>
<td>Shift left one-bit of accumulator.</td>
</tr>
<tr>
<td>BCC</td>
<td>Branch if carry clear.</td>
</tr>
<tr>
<td>BCS</td>
<td>Branch if carry set.</td>
</tr>
<tr>
<td>BEQ</td>
<td>Branch if equal.</td>
</tr>
<tr>
<td>BNE</td>
<td>Branch if not equal.</td>
</tr>
<tr>
<td>CMP</td>
<td>Compare accumulator with specified contents.</td>
</tr>
<tr>
<td>CPX</td>
<td>Compare X with specified contents.</td>
</tr>
<tr>
<td>CPY</td>
<td>Compare Y with specified contents.</td>
</tr>
<tr>
<td>DEX</td>
<td>Decrease X by one.</td>
</tr>
<tr>
<td>DEY</td>
<td>Decrease Y by one.</td>
</tr>
<tr>
<td>INX</td>
<td>Increase X by one.</td>
</tr>
<tr>
<td>INY</td>
<td>Increase Y by one.</td>
</tr>
<tr>
<td>JMP</td>
<td>Jump to specified address.</td>
</tr>
<tr>
<td>JSR</td>
<td>Jump to subroutine and save return address.</td>
</tr>
<tr>
<td>LDA</td>
<td>Load accumulator with specified contents.</td>
</tr>
<tr>
<td>LDX</td>
<td>Load X with specified contents.</td>
</tr>
<tr>
<td>LDY</td>
<td>Load Y with specified contents.</td>
</tr>
<tr>
<td>LSR A</td>
<td>Shift right one-bit of accumulator.</td>
</tr>
<tr>
<td>NOP</td>
<td>No operation.</td>
</tr>
<tr>
<td>PLA</td>
<td>Pull accumulator from stack.</td>
</tr>
<tr>
<td>RTS</td>
<td>Return from subroutine.</td>
</tr>
<tr>
<td>SBC</td>
<td>Subtract specified contents from accumulator.</td>
</tr>
<tr>
<td>STX</td>
<td>Store X in memory.</td>
</tr>
<tr>
<td>STY</td>
<td>Store Y in memory.</td>
</tr>
<tr>
<td>TAX</td>
<td>Transfer accumulator value to X.</td>
</tr>
<tr>
<td>TXA</td>
<td>Transfer value of X to accumulator.</td>
</tr>
</tbody>
</table>
labels and a brief description of what each subroutine does.

Figure III is a list of the relevant address of the Atari operating system that the program uses. Reference to this table will help in following the program.

Alien Attack makes extensive use of the player missile graphic system. In the following comments on the listing, Player 0 is referred to as the ship with players 1, 2 and 3 known as aliens 1, 2 and 3 respectively.

PM is used as an abbreviation for Player Missile.

**INITIALISATION**

Lines 180 and 190 initialise the game.

180

ORG 38916 tells the RAW assembler where to start storing machine code in memory. 85 is stored at address 53260. This sets the size of all missiles to double normal size. 144 is stored at address 54279 to tell the PM system that the PM base address is 36864.

All the data for the PM shapes are stored from 36864 upwards. 3 is stored in address 53277 to turn on the PM system. 62 is stored at address 559 to give single line resolution PMs on a normal size playfield.

190

16 is stored in the score stores 1547,

1548, 1549 to put the character zero in these stores. A value of 5 is stored in address 1546 which holds the number of lives left. To increase this number, a higher one can be stored at 1546. 118 is stored in address 204 and is the horizontal starting coordinate of the ship. Similarly 150 stored at 205 is the vertical starting coordinate of the ship.

**CLEAR**

Lines 200 to 250 perform further initialisation functions and clear many of the stores before the game starts and also after each wave of aliens has been hit.

210

The machine code routines are called up from Basic by the command A=USR (38916). When the USR command is executed, the number of parameters passed to the machine code routine is put onto the stack. In the case of Alien attack, no parameters are actually passed, but still a value of zero is put onto the stack.

The instruction PLA removes the 0 from the stack as this information is not needed by the program. This then leaves a two byte address at the top of the stack which is the return to Basic address. 0 is put into the Alien 1 and 2 stores to clear them off the screen.

The No Operation (NOP) Instructions are useful in the developmental stage of a machine code program.
Initially this section of memory held other instructions, but were later not needed as they performed no useful function.

Instead of re-writing the routine 8 NOP instructions are placed to erase the unwanted instructions. This wastes eight bytes of memory, but this is a negligible amount, and the time taken to cycle through theNOP instructions is infinitesimal.

220

A loop puts 0 in all the horizontal player and missile position registers and clears most of the stores.

230

Another loop clears all the PM data area of any garbage that may have accumulated there.

240

The colours of the players and missiles are set up in the colour registers according to the formula: colour x 16 brightness

250

A 1 is stored in address 53258 to set the size of Alien 2 to double size.

CONTROL

270

Address 53279 is looked at to see if a function key has been pressed. If START, SELECT or OPTION has been pressed then the Atari exits from machine code and control returns to Basic.

This routine is useful for de-bugging purposes during the developmental stage of machine code programs, for it means that you can exit from machine code without having to press the Reset key which can often result in the program being corrupted. O is stored at address 77. Without this routine the Atari would enter the attract mode after 10 minutes of playing Alien Attack.

280

This line calls up all the subroutines in the order that the game requires. Note that the fire routine is called twice. This means that the ship missile travels at approximately twice the speed of the alien missiles.

Next month we will work through the remainder of the assembly language program.

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FOR OTHER AMAZING ATARI DEALS
BOUNCE is an exciting, but frustrating game which is so simple that even the youngest Atari user will be able to play.

But be warned, you'll need plenty of practice and skill to reach the top level.

A ball rolls round the screen, bouncing off the walls. By pressing the fire button on your joystick, or any key, a block will be placed behind the ball.

What you have to do is trap the ball. It doesn't sound too difficult, but wait till you try it.

There's a very slight delay between pressing the button or key and the block being placed on the screen. This means you have to watch where the ball is going and press fire or a key just before the ball gets to the place you want the block.

There are 15 balls and the idea is to use as few blocks as possible to trap them. The smaller the number, the higher your rating at the end of the game.

Handy hint: Build traps for the ball, wait for it to bounce in, then place a block behind it so it can't get out.

By
ROLAND WADDILOVE

VARIABLES
SCR Start of screen memory.
P Position of ball.
D Direction it's travelling.
A(3) The four possible directions.
X Number of blocks used.
Tired of typing?
Take advantage of our finger-saving offer on Page 60.
Some computers have a Basic command allowing colours to be flashed, but despite the Atari's range of Basic graphics commands it lacks this facility.

The effect could be implemented in Basic by using the SETCOLOR command to change a colour register between two different hues and luminances, but this is often awkward.

It would be much easier just to tell the computer which colour register to flash, between which two colours, and at what speed - and this is what my program does.

The machine code routine uses a vertical blank interrupt (VBI) so once the flash for a particular colour register has been set there is no need to worry about it until the flash is to be turned off.

Listing I is the assembly listing of the routine, and for non-machine code programmers I've given a Basic demonstration program, Listing II.

The machine code data is POKE'd into page 6 in line 10, the data being read from lines 20 to 70. The USR call in line 10 sets up the VBI and the variables FLASHON and FLASHOFF are initialised to make calling routines easier. Their values should not be changed during the program.

To get the colour register to flash use:

A=USR(FLASHOFF, REG, COL1, COL2, SPEED)

where A can be any variable.

REG is the register number. A number 0 to 4 stands for the respective colour registers. A 5 will access location 755 - this can be changed to produce different effects in character graphics modes (a number greater than 5 will be ignored).

COL1 and COL2 are the two colours or values to flash between. The colour value is worked out as the hue*16+luminance, so varying from 0 to 63.

When register 5 is used the following effects in text modes can be produced using one of the parameters as shown (apply to Graphics 0 only, except where stated):

0 Inverse text to normal text.
1 Inverse text to blanks.
2 Normal setting.
3 Inverse text to inverse blanks.
4 Vertical reflect (all text modes) and inverse text to normal text.
5 Vertical reflect (all text modes).
6 Vertical reflect (all text modes) and inverse text to inverse blanks.

SPEED alters the frequency of the flash as follows:

0 and 1: Fast flicker effect.
2 and 3: Flashes of the same speed.
4 to 7: Flashes of the same speed, half the speed of 2 and 3.
8 to 15: Half the speed of 4 to 7.
16 to 31: Half the speed of 8 to 15.
32 to 63: Half the speed of 16 to 31.
64 to 127: Half the speed of 32 to 63.

Different values within the ranges are used so that the flashes can occur at the same rate but out of synchronisation from one another, as shown in the example program.

This USR call is used to stop a register from flashing:

A=USR(FLASHOFF, REG, COL)

where A is any variable.

REG is the register number (0 to 5 - a number greater than 5 will be ignored as before) and COL is the value that the register is to retain.

Note that using SETCOLOR or a GRAPHICS command to reset a colour register will not work while the register is being flashed as the flash routine will overwrite the command.
Listing II

1 REM ** MACRO FLASHER
2 REM ** by Richard Parkes
8 REM FLASH ROUTINE LINES 10 TO 70
10 FOR J=1 TO 160:POKE J,Z: NEXT J
20 A$ = "USR(FLLSH00,5,2,4,64)
30 D$ = "USR(FLLSH00,5,2,4,64)
40 GOSUB 2000
50 POKE J,Z
60 NEXT J
70 POKE J,Z
80 POKE J,Z
90 POKE J,Z
100 REM DEMONSTRATION FOR FLASH
110 REM
120 GRAPHICS 16
130 POSITION 7,7: 'Otul "Flash"
140 PRINT 7,7:"Flap"
150 PRINT 7,7:"Flash"
160 PRINT 7,7:"Flash"
170 POSITION 7,7: "Dun"
180 REM 7,7:"Dun"
190 PRINT 1222222222
200 PRINT 1222222222
210 PRINT 1222222222
220 PRINT 1222222222
230 PRINT 1222222222
240 PRINT 1222222222
250 PRINT 1222222222
260 PRINT 1222222222
270 PRINT 1222222222
280 PRINT 1222222222
290 PRINT 1222222222
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930 PRINT 1222222222
940 PRINT 1222222222
950 PRINT 1222222222
960 PRINT 1222222222
970 PRINT 1222222222
980 PRINT 1222222222
990 PRINT 1222222222
000 STOP

Get it right!
Tired of typing?
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GET IN THE PICTURE

MIKE ROWE shows how you can load and view pictures tucked away in commercial discs in non-DOS format.

THIS Micropainter transfer program enables you to manipulate Micropainter or other standard 62 sector graphics files.

Program I will allow you to transfer Micropainter files between DOS files, cassette files, and disc sectors.

Many commercial discs contain Micropainter-style files in non-DOS format, but saved as continuous sectors. This program will enable you to load and view these pictures.

When you first run Program I the screen will go blank for about 30 seconds. It will then display a blank screen with instruction lines below. You can now load a picture by pressing 1 or 3 and Return.

If you press 1 you will be asked for a filename. If you want to load a DOS file enter D:filename or enter C: for a cassette file.

If you press 3 you will be asked for the start sector. This will tell the program which disc sector to start loading from.

The last option is the one to use to load from a commercial disc. To do this when you are asked for the sector number initially enter 1.

If no recognisable part of a picture is seen next time enter 100, then 200 and so on up to 600.

If no portion of a picture is seen than there is no standard picture on the disc. If a picture is found you usually only have part of it, so keep changing the sector number until you find the correct sector to load the picture fully.

Many commercial discs contain
Graphics

Protection and part of the disc may be unreadable. If this is the case the program will restart and you can enter a different sector.

When you have a picture loaded you can press Return to toggle between a partial picture and the full one.

Saving a picture is just as easy. Pressing 2 will save the picture as a file. Again you will be asked for a filename.

To save to disc enter D:filename, to save to cassette enter C: If you want to save a picture directly to disc as a non-DOS file press 4 and enter the start sector as requested.

However beware, this option can write over any other information on a disc and erase it, so use it carefully.

There are two other disc commands. D which will produce a disc directory. To pause the rather rapid display of this press Ctrl-1 and press it again to resume printing.

The final command is F which after confirming the request will format the disc. Note that this will also erase the disc in your drive!

The program is not designed to handle the colours of the picture properly and will display only the default colours. This is because pictures saved as sectors or on tape have often lost their colour data and it is primarily these that the program is designed to deal with.

Also the program is only intended to work in single density format and may not work with double density.

Program II is a short Basic program to set up and load a micropainter file. The screen takes a while to set up as the 400/800 machines do not support the correct graphics mode from Basic.

Again, the program when run will ask for a filename. These can be D:filename or disc or C: for cassette. It will then load and display the picture.

---

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MAIN VARIABLES

A$ Used to get command input and also file names.
DL$ Used to hold second (full screen) display list.
D$ Start of full screen display list.
DLL Low byte of this.
DLH High byte of this.
DLIST Start of split screen display list.
DLU Low byte of this.
DUL High byte of this.
START Sector to start from.
BUF Address of screen memory.
NO Number of sectors to load.

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February 1986 ATARI USER 29
Graphics

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---

**Program I**

```plaintext
0 REN MICROPINTERFER TRANSFER PROGRAM
1 REN by Mike Rowe
5 POKE $87D,0
18 GOSUB 1000:GOSUB 3000
28 DIM A$(2)
38 POKE $59,34
180 REN MICROPINTERFER TRANSFER PROGRAM
110 IF A$="" THEN 500
120 IF A$="" THEN 600
130 IF A$="" THEN 700
140 IF A$="" THEN 800
150 GOTO 900
300 ? "MICROPINTERFER ARE YOU SURE?": INPUT A$: IF A$="Y" THEN 100
310 XI0 254,H,8,6,"B:" 320 GOTO 100
400 OPEN H,8,6,"D:" 410 TRAP 460
420 INPUT H,2,6:"":INPUT H,2,6:" 
760 AS GOSUB 420
460 CLOSE H:INPUT A$: 470 TRAP $800:GOTO 100
500 ? "?"$: "ENTER MICROPINTERFER FILENAME ME TO LOAD": INPUT A$: 510 CLOSE H:OPEN H,1,0,0,0
520 GOSUB 2300:CLOSE H
530 GOTO 100
600 ? "?"$: "ENTER MICROPINTERFER FILENAME ME TO SAVE": INPUT A$: 610 CLOSE H:OPEN H,1,0,0,0
620 GOSUB 2300:CLOSE H
630 GOTO 100
700 ? "?"$: "ENTER SECTOR B TO LOAD FROM DISK": INPUT A$:
710 GOSUB 2500:GOTO 100
800 ? "?"$: "ENTER SECTOR B TO SAVE TO DISK": INPUT A$:
720 GOSUB 2400:GOTO 100
900 POKE 560,DISK:POKE 561,DISK
910 POKE 764,255
920 IF PECK(74D)=93 THEN 720
930 POKE 764,256:POKE 560,DISK:POKE 561,DISK
940 GOTO 100
1000 POKE 3,0,SO TO 100
1010 READ Y:POKE X,VIEW X
1040 DATA 32,68,216,104,201,5,208,74
1050 DATA 104,104,141,1,3,104,104,141
1060 DATA 2,2,104,141,2,2,104,141
1070 DATA 16,1,141,2,104,141,203
1080 DATA 104,141,5,7,104,141,4,7
1090 DATA 32,68,216,48,35,172,4
1100 DATA 24,104,128,141,4,7,17,5
1110 DATA 3,104,141,5,7,220,10
1120 DATA 2,216,104,141,2,2,104,141
1130 DATA 204,119,204,16,210,160
1140 DATA 122,212,96,109,1,141,23,60
1200 FOR X=1526 TO 1689:READ Y:POKE X,VIEW X
1220 DATA 67,157,46,5,165,80,187,68,3,109,109,1
1230 DATA 57,93,157,1
1240 DATA 67,157,72,2,169,31,157,73,2,22,62,157,66,3,22,62,226,96,0,
1250 DATA 0,9,0,0,0,0,0
1260 RETURN
1270 ? "? mnemonic file": Print "= LOAD FILE E" FILE NAME:
1280 ? "= LOAD SECTORS B=SAVE SECTORS C=
1290 085:
```

---

**Program II**

```plaintext
0 REN GRAPHICS FILE LOADER
1 REN by Mike Rowe
10 GRAPHICS 0810:FIN$ (F28)
20 ? $ "Enter Picture File"? "0."
30 \D:\\PICTURE OR \C:\
40 \D:\\D:\\DISK
50 \D:\\E:\\HDD
60 \D:\\F:\\E:\\HDD
70 \D:\\D:\\DISK
80 ? "?": "Error": "PEEK (VIR) =KIP" A$ GOTO 100
```

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051-227 4800
THIS program allows you to bid and play contract-bridge against the computer. The standard of play is quite sophisticated so it uses storage-saving techniques to permit the program to run in 16k.

Select the card you wish to play with the joystick. Bidding is done by typing the particular bid you wish to make when it is your turn.

The game is in two parts – bidding and card-play. The computer randomly deals four hands. You play South and the computer bids and plays the other hands.

Bidding

The game follows the Nottingham club bidding convention which is described later. Bids are displayed at the top of the screen. Enter them by typing the bid, followed by Return. When it is your turn you are prompted with 'BID ?'. The bid format is a number, followed by the letter to indicate the suit.

For example, 1H for one heart, 3NT for three no-trumps, P for pass, and D for double. The computer will not accept bids in the wrong format and will prompt you again with 'BID ?'.

When bidding is finished, the computer asks you to type the identity of 'declarer', which is 1 for North, 2 for East, 3 for South or 4 for West.

You are then asked to type the contract say, 2NT or 3H and so on. This allows you to play a hand that would otherwise be played by the computer, or permits you to set a more challenging contract. You will find this useful.

Card-play

Plug the joystick into port 1. The contract is displayed at the top left of the screen.

The first card is played by the hand to the left of the declarer. "Dummy's" hand is then displayed. When you are required to play a card, you will be prompted with a '?' and the cursor will be displayed.

Using the joystick, place the cursor over the card you wish to play and press the Fire button. The card will be played, and deleted from your hand. At the end of the trick the screen displays the winner and the trick total for each hand. To begin the next trick, press the Fire button.

Pressing the Fire button after trick 13 instigates a resdeal and the bidding for the next game begins.

Pressing the Esc key at any point in the card play also instigates a resdeal as soon as the next card is played.

- The display follows the normal format to be found in books, except that 'T' represents Ten.
- Each hand is separate, and should be bid to the highest contract feasible for that hand.
- There is no 'vulnerability'.
- Each deal is random and yields interesting distributions.

Playing hints

The computer plays either to achieve the contract, if it is declarer, or to defeat the contract if it is defence. It is not concerned to get the maximum number of tricks.

It is capable of developing various long-term strategies – it can duck tricks, cross-trump, finesse, develop long suits and so on.

If you (South) are in defence, for example, the computer as your partner (North) will join with you in a sensible strategy, just as a human partner may do.

But the computer will not recognize the convention "lead the fourth highest of longest suit" in "no-trump" contracts. Also, if you hold KO or QJ etc and you are in defence, lead the higher of the pair, or the computer will...
assume that the opposition holds the higher card.

**Bidding convention**

Points are counted as ACE (4), KING (3), QUEEN (2) and JACK (1). This is a simple convention to use without many of the more complex -- and to my mind obtuse -- ingredients which impolorish the less than brilliant player's game. I have set limits for the computer which make it competitive and seemingly able to take risks.

**Opening bids.** The following are permissible:

<table>
<thead>
<tr>
<th>Bid</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1C</td>
<td>16-20 points. Partner is required to respond.</td>
</tr>
<tr>
<td>1D, 1H, 1S</td>
<td>12-15 points, with a five-card suit in the bid suit.</td>
</tr>
<tr>
<td>1NT</td>
<td>12-15 points, but with no five-card suit.</td>
</tr>
<tr>
<td>2C</td>
<td>12-15 points, with clubs as the five-card suit.</td>
</tr>
<tr>
<td>2D, 2H, 2S</td>
<td>20+ points, with a five-card suit in the bid suit.</td>
</tr>
<tr>
<td>2NT</td>
<td>20+ points without a five-card suit. Partner should respond.</td>
</tr>
<tr>
<td>3C, 3D, 3H, 3S</td>
<td>Pre-empt. Between 8-11 points, with at least seven cards in the bid suit.</td>
</tr>
</tbody>
</table>

Note that any other opening bid will not be understood by the computer. I would not like to predict its response.

**Responses.** The following describes the normal responding bids to the above.

**After 1C**

- Less than 7 points -- Respond 1D.
- Between 7-11 points -- 1NT, or 1 'something' in a good suit.
- Between 12-15 points -- Jump response to 2 'something'. If you have a five-card suit, the 'something' should be that suit, otherwise NT.
- More than 15 points -- Jump to 3 'something'.
- After 1D, 1H, 1S, 1NT, 2C

Responses are natural here, that is, more or less what you would expect. The responding bid lets partner know your points and distribution. So if you have a poor hand, but with some support for partner's suit, then rebid his suit at the next level, for example, 1D-2D.

If you have a good hand, perhaps an opening bid in your own right, then jump respond, showing your points as well as your strong suit. (For example 1D-2S, -- jumping past 1S). You have to use your sense here, because there are many variations.

Another example. Suppose the opening bid was 1NT. You have a poor hand but a five-card suit. So respond with 2 in that suit -- say, 1NT-2S.

Your partner will probably not bid further, because this is assumed to be a limiting-bid.

If you have a very strong hand, then jump to the level you think best describes that -- but if you bid too high you may not leave room for "slam" bidding.

After 2D, 2H, 2S, 2NT

If partner has bid this, he has a very strong hand. The chances are that you will have a weak hand, but of course you must respond.

If you have a poor hand, merely support your partner by bidding the next bid up, say, 2D-2H.

If you hold 6 points or more, bid your best suit at a higher level, such as 2D-3H. Other variations are possible.

**After 3C, 3D, 3H, 3S pre-empt**

The computer has quite a complex function to respond to your pre-empt, but how do you respond to it? In general, a pre-empt means "not many points, but one strong suit".

Therefore you are wise not to change suits unless your hand is exceptionally strong in another suit. Another consideration is that if you hold 11 points or less the opposition will probably hold the majority of the points.

You are probably best to bid "P" (pass) in that case. Otherwise, bid higher in your partner's suit, say, 3D-4D.

**Bidding to slam.** This can be tricky (pardon the pun). If you wish to bid to slam (6 or 6 'something'), signal this by bidding '4C'. The computer will probably assume you are asking for aces, and will respond:

- 4D-0 aces
- 4H-1 ace
- 4S-2 aces
- 4NT-3 aces
- 5C-4 aces

You should next ask for kings. Do this by bidding the next available bid. For example, if the computer has responded 4S, you return 4NT. The computer will tell you how many kings it has by bidding like this:

- Next available bid -- 0 kings
- Next available bid + 1 -- 1 king
- Next available bid + 2 -- 2 kings, and so on.

For example, if you had asked for kings by bidding 4NT (as above), the computer will bid 5H if it holds 2 kings.

Armed with knowledge of top cards, you can then make your final bid.

The problem comes when the computer bids 4C. Does this mean it is asking you for aces? You have to infer this from the pattern of the previous bidding.

**Bidding after opening-bid and response.** The object is to bid the best possible suit, or NT if a good fit cannot be found, at the highest level that you think the cards can be played.

Generally, after opening-bid and response, you should have a good idea of point counts and distribution, and you should bid naturally for best effect.

**Interference and competitive bidding.** The same rules apply as before, except that you may not be in a position to give a clear, unambiguous description of your hand.

**Doubling.** The computer thinks of 'double' as an indication of strength. It will not double for penalty points.
PROGRAM DESCRIPTION

6-17 Define variables, arrays.
20-500 Random deal into array C(4, 13), i.e. 4 hands with 13 cards.
900-1060 Subroutines for screen displays. Note the symbols for the suits. Also, on the first run through, CON=0, but only South's hand is displayed. After CON has been set to 1, other hands can be displayed.
2000-2310 Subroutine to evaluate hand strength. Each card is read in line 1910, and suit lengths (SU) and points (P) are calculated.
2500-2620 Subroutines for bidding display, plus analysis of South's bid BS. Each time a bid is made, a value is assigned to BD(n), and n is incremented. For example, if the opening bid is 'Pass', BD(1) is set to 50, and n increases to 2.
3000-4650 Main bidding control. Variable V is used to monitor the state of the bidding, so as to pass control to the rest of the program when bidding has finished. Z is either 1 or 2, with 1 being assigned to North and South, and 2 to East-West. This allows the total strength of either partnership to be estimated, and maximum values to be given to limit the bidding-MAX(2). This effectively determines the contract.
6000-7030 Responding bid control. The value previously given to BD(n) is now seen to be of use. BD(n-2) is the strength of your partner's last bid. BD(n-1) is the strength of the opponent's intervening bid.
5000-5130 Card-play control. This uses some of the variables used in the bidding to save storage. This section monitors the play, deciding whose turn it is, what cards are permissible, which suit is trumps, who has won the trick, and so on.
5900-5980 Crude subroutines to select either the highest or lowest card.
8000-8160 Joystick routine. S105 gets the card. The suit is given by the value of Q, which is dependent on the cursor row position.
8300-8590 Display routines for card-play.
7500-7880 and Play routines. These decide which card should be played, and which strategy should be adopted. At each trick, the program looks at how many tricks are needed to achieve or defeat the contract. If there is a simple strategy, it will use it. If not, the strategy will depend on whether or not the contract is in 'no-trumps', or how many trumps are outstanding, or how many tricks are left to play, and so on.
Of worms that turn not up, and a nasty line in operatic phantoms

By Brillig

is Opera House, from Bignose Software, a spooky tale of an aspiring Pavarotti who finds that the theatre of his dreams lies derelict under the curse of The Phantom.

In order to avoid the ignominious return to the chorus line the hero has to banish the Phantom from the theatre, a tough task as he turns out to be an elusive chap with a tendency towards clobbering you over the head if you let your guard drop for a moment.

The style of the game is verb/noun with a screen layout in the image of the early Scott Adams adventures. Progress around the locations at first is easy with plenty to explore and lots of objects to juggle with. Leaving the Opera House is problematic however, as you then have to locate the Phantom's lair, and there is only one way back in.

Humour abounds in the game, especially if you try to act out the role, and the usual Bignose play on obvious verb/noun commands is there.

I'm sure they only included a window for one purpose. It gives the impression that the game has been written by adventurers for adventurers rather than as an exercise in programming skill and technique, and is all the more playable for that.

At £9.95 for the cassette and £9.95 the disc the game is excellent value.

Scott Liddle, among others, has
been having a bit of trouble with the screening door in Hitch Hiker's Guide to the Galaxy from Infocom.

In view of last month's furor, I shall not reveal the full answer. Suffice it to say that when you have demonstrated enough grey matter then the door will allow you to progress. It knows what the score is.

If you are having trouble amazing points in HHHTG try being kind to animals, or being a bit of a bozo. Every little helps.

For those of you stuck in the vast expanses of Zork I, a little light-fingered assistance might help you to go to work on that egg. Also that black book may be a mass of help in ridding yourself of unwanted company.

If that rings any bells then it should also help you throw some light on the subject.

That's all for this month. Remember I need lots of glitches — especially an Infocom one — and next month is a sci-fi special with Level 9. Happy adventuring.

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ON to weightier matters. Where have all the glitches gone? Last month I used up the last of my current stock. Is not the thought of an Atari User T-shirt for free enough? Please send those glitches in, as apart from anything else, it keeps the adventure writers on their toes.

For instance, did anyone else notice the lengthy defence that Level 9 gave to their input analyser in the blur for Red Moon which could occasionally throw up the odd strange message? Other useful submissions are maps of completed games or hints on solutions.

Simon Ashford, of Birmingham, a previous glitch winner, has sent me a comprehensive map of Channel 8’s Golden Bat. So in case you are having problems with the Gorgon, try reflecting on your possessions in order to progress.

You may also find more than just a needle in a haystack when you visit the shed. Thanks for your tips, Simon. I’m sure you will have helped someone somewhere with those.
Fighter Pilot is right on target

IF you've ever fancied your chances as a jet pilot, then Digital Integration's Fighter Pilot should appeal to you.

This aircraft simulation puts you in the pilot's seat of an USAF F15 Eagle jet fighter, with options to allow straight-forward flying or air to air combat with enemy fighters.

From a menu of options you may choose to simulate your flight from take off position or landing approach. My disastrous attempts at landing soon convinced me that it was much easier to opt for take off.

Taking either of the combat options starts you off in mid-flight around 20,000 feet. You may select combat practice, where you are positioned two miles behind the enemy plane at approximately the same height.

If you can keep tail on the enemy it will appear in your gunsights at a distance of one mile, at which point with a little bit of luck you can blast it out of the sky.

In practice mode the enemy doesn't fight back, but with some experience you may like to attempt true air-to-air combat.

With this option you will track the enemy with the help of your on-board computers before shooting it down.

Be warned though, the enemy returns your fire, and it becomes a real dogfight.

If you really want to live dangerously you can lob in crosswinds and air turbulence, not to mention a blind landing in foggy conditions.

The screen display is excellent. The top section is the pilot's cockpit view, in which you see the horizon, the runways on approach to landing, and of course the enemy if you are in combat mode.

The lower half is taken up by the instrument panels.

There is quite a lot of detail to digest here and one soon learns the importance of keeping an eye on the most important instruments.

Quite often I found myself carefully holding a correct course while paying no attention to the fact that altitude was rapidly approaching zero.

The cockpit view can be changed to display a map of the area on which can be seen the four runways and various navigation beacons, and so on. Any enemy aircraft in the area are also identified if you are in combat mode.

I must confess to being a flight simulator addict, and I was particularly pleased with this program.

The instructions are adequate, all the available options are described together with the instruments and controls, and there's a little technical information to help you gain some flying experience.

The program also incorporates one of the latest innovations aimed at thwarting software pirates - Lenslok. For the uninitiated, this is a plastic lens that is folded and placed against the screen in order to read a security code.

It is quite easy to use and there's an optional tutorial mode to help you if you're at all uncertain. The protected program will only run if you enter the code correctly, and a different code is generated each time the program is loaded.

Hopefully developments like this will help to reduce software piracy. I certainly hope so because the program authors deserve their just rewards. It's a fine program and I enjoyed it immensely.

David Andrews

Mr Men do a good job

MR MEN books, ugh! Besides their obvious sexist bias, the story content never appealed to me. Why do young children love them?

I can appreciate that their simplicity is attractive, but how boring having to read them time and time again to

my three-year-old.

I was aware that certain lesser computers had versions of Mr Men programs but I always congratulated myself on my choice of Atari because such programs were not for it.

Well Mirrorsoft has produced an Atari version of the highly-successful set of programs "First Steps with the Mr Men".

With fear I loaded them, dreading the possibility that the magic moments I spend with my children learning Logo might be invaded by little fat men that had recently ruined the bedtime reading session.

There are four games in the set. They feature Mr Greedy, Mr Silly and Mr Forgetful.

The Great Ice Cream Hunt involves the child directing Mr Greedy around the screen to find a specially enormous ice cream.

It gets harder both for the child and Mr Greedy as he collects ice creams. Decisions have to be made about which way to send Mr Greedy.

This is similar to early Logo like activities and helps the child to grasp the concepts of direction while they control the computer.

The game is fun and much
Stand by with the insecticide

IN Axis Assassin from Ariolasoft your task is to fight off an army of insects which quickly multiply and attack you in droves. It's an interesting version of the well known arcade oldie Tempest.

Each screen holds a 3D grid and your object is to move your "man" around the parameter and in and out of the grid in order to fight off the approaching enemy.

Battle begins after the Master Arachnid sends out a Spinner to weave strands across the grid. With an unlimited amount of ammo you must try and see off the meanies sent after you by firing at them down the corridors.

They take the form of Hunters, Drones, Spores and Xterminators and each has an individual mode of attack and its own points system. You have to try to destroy enough of the enemy to make the Master Arachnid re-appear.

When he does you can zap him with a pulse bomb. Alternatively you can race on to a faster more ferocious screen.

If you choose to zap the Master and succeed you enter another mode which is rather like an Asteroid game.

This time you have to rescue a fellow Assassin who has been captured and lies imprisoned in a central box along with the Master.

Shoot away enough of the box to allow you to get in and you can attempt, within a set time limit, to rescue your mate without touching the walls of the box or the Master himself.

To add to your troubles the other insects float towards you like asteroids. Contact with anything means annihilation.

If you can rescue your colleague you are awarded an extra man. Fail and you lose one. Either way you move on to the next grid to start the battle over again.

There are three levels of play and 20 different grids, each increasing in difficulty.

Handily you can start at any level which removes the necessity of ploughing through earlier screens once you find them too easy.

However you would be well advised to start on the earlier screens on the higher levels.

The game kept me interested for a while but lacked the variety to make it really addictive. The graphics are acceptable but not up to the Atari's capabilities - all the characters and scenery are based on wire frame shapes.

It's one of Ariolasoft's Mid-Price series so the disc will only set you back £9.95, with the cassette costing £2 less.

David Andrews

The high price of war

IT seems that every second computer wargame that arrives from the States now is besotted with the German Wehrmacht, and this new release from Strategic Simulations is no exception. However this minor criticism should in no way deter any one from buying Panzer Grenadier.

The Panzer Grenadiers of the Second World War were an elite mobile infantry force, trained to move with and support the powerful armoured divisions of the German army.

In this program, Roger Damon sets out accurately to simulate the desperate actions of this crack German force as it attempts to stem the Russian advance on the Eastern front.

You are given the option to either enter a saved game or start a new one choosing from one of five scenarios.

Each is set on the Eastern front after the massive German offensive of 1941/42 has ground to a halt, and the Russian steamroller has begun to gain momentum. The first scenario, Bridges over the Luthe, is an ideal introduction for the novice player.

You can select a level of play from one to three which
caters adequately for beginners and experienced players alike.

SSI has moved away from the normal wargame screen format and given us a very good smooth scrolling terrain map with all features such as woods, ridges, roads and rivers very well depicted.

Troop types are represented by easily-recognisable icons and all orders and moves are given via the joystick, which helps playability.

Play is broken down into eight phases which cover movement and firing for both sides, with a victory phase at the end which gives an assessment of your overall play.

As is usual in SSI games, opportunity is given at the end of each turn to save the game.

I rate Panzer Grenadier quite highly. The game is well packaged, and has a well-written, easy to follow instruction manual.

The program is strong both in graphics and playability. However I find it hard to come to terms with a £35 price tag.

Also there is no provision for the creation of your own scenarios, a major drawback in a game of this type.

John Minchin

A colourful starter pack for ST adventurers

BEING the first Atari ST adventures I had encountered, I was full of glee when asked to review The Lost Kingdom of Zkul and West.

They are both text adventures and are produced by Talent Software, better known for their contributions to the Sinclair QL range.

The first thing that struck me was their size. Zkul weighs in at 73k but West is a smaller 49k. Talent tell me that West is purely an introduction to adventuring. Be that as it may, it is really very small compared to what it could have been on the ST.

Both games have loading screens. To say they are spectacular is an understatement. They have to be believed, leaving 8 bit screens way behind.

They are both colourful and detailed, staying on the screen until you press a key, at which point the main game loads.

Let’s look at West first. The vocabulary is reasonably large but mostly I found it limited to two word entries.

The plot involves tracking down bank robbers and duly killing them, before taking the money they stole back to the bank. During this time, you will find yourself being promoted to sheriff.

The game plays fairly well as far as it goes – it really is for beginners. The biggest problem is that it is in real time.

Nice idea, but if you cannot type quickly then you can find yourself dead as the robbers shoot quite fast and don’t wait for you.

Anyone who has played adventures before might get bored with West. The idea of a western adventure is quite a good one but the plot didn’t quite gel for me as there didn’t seem to be an objective.

However if you have never played a Talent adventure before then it’s a good idea to play West just to get used to their system.

Zkul, on the other hand is quite different. The idea is to find as much treasure as possible and return with it to a hut in the great forest where your friend Eldomir waits for you.

The scenario goes thus: Long ago there was a battle between humans and dwarves. The latter won but took heavy losses and so lately there have been very few of the little chaps around.

The battle has lapsed into legend but it is said that in the domed city there is lots of loot. So you have been sent by your friend to find both city and loot.

When you do see dwarves they don’t wait around long. They can be useful, but it’s up to you to find out how.

So far I have mapped about half of the game and believe me, it’s a very big adventure to play.

If you get stuck just wait a bit and sometimes the computer will offer you a clue. However it takes points off your score in payment.

There is the standard help and a health command which, when entered, tells you the condition of your character – very neat.

Zkul is quite complex but not so much that it is impossible to continue without solving a problem. Be wary of trap rooms, but quick thinking can usually produce a way out of them.

If you get stuck in a room with shrinking walls a bit of mathmatical progression on a certain word might help you out of it.

A strange man appears occasionally and takes all your treasure. To get it back you have to find his lair.

A strange thing about this adventure is that it does not give you directions in certain places, which makes for a real headache. This does add a touch of reality, for you lose your sense of direction in real mazes too.

There are plenty of locations to wander about and problems to be solved, which combine to make a pleasant adventure that takes a fair while to crack.

Zkul is not for the novice but West is. The combination makes a good starter pack for novice adventurers. It’s quite a fair package for the average ST owner and is worth buying just for Zkul. With West included, at £24.95 it makes an attractive buy to anyone.

Jed Glover
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LEN GOLDING shows how to keep your precious data safe from Basic's ruthless memory management.

THE Atari's most advanced features all involve storing lists of numbers in an area of memory which cannot be accidentally erased or over-written.

Player-missile graphics and re-defined character sets require data tables. Custom graphics modes, DLIs and scrolling techniques need special display lists. Page flipping needs space for the extra screens. Vertical blank interrupt and other machine code routines require a safe environment to work in.

Basic does its own memory management, which means that it will cheerfully wipe out anything beyond its ken. This article explains several techniques for making sure your safe areas stay that way.

First, a quick review of how memory is organised when you switch on. Figure 1 is a simplified memory map which shows how the address space of a 48k machine looks.

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65535</td>
<td>OS ROM, including that used by ANTIC POKEY, PIA and GTIA</td>
</tr>
<tr>
<td>49152</td>
<td>Basic ROM</td>
</tr>
<tr>
<td>40960</td>
<td>Addresses which do not have RAM chips installed (32k and 16k machines only)</td>
</tr>
<tr>
<td></td>
<td>RAM holding current screen data (varies in size according to graphics mode)</td>
</tr>
<tr>
<td></td>
<td>Display list</td>
</tr>
<tr>
<td></td>
<td>Unused RAM, if any</td>
</tr>
<tr>
<td></td>
<td>Runtime stack</td>
</tr>
<tr>
<td></td>
<td>String/array data</td>
</tr>
<tr>
<td></td>
<td>Statement table (Basic program typed in by the user)</td>
</tr>
<tr>
<td></td>
<td>Variable value table</td>
</tr>
<tr>
<td></td>
<td>Variable name table</td>
</tr>
<tr>
<td></td>
<td>General purpose buffer</td>
</tr>
<tr>
<td>1792</td>
<td>Page 6 RAM</td>
</tr>
<tr>
<td>1536</td>
<td>RAM used by the operating system</td>
</tr>
<tr>
<td>0000</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Simplified memory map.
at power-up with a Basic program in place and no peripherals attached.
The high end of memory from 40960 onwards is occupied by ROM, while the first five pages of low memory – 0 to 1535 – are reserved for use by the operating system.

A 256-byte data buffer starts at 1792, then Basic begins to build various tables which change size as programs are typed in.

Your program itself is contained in a block called the statement table. It starts immediately after the variable value table and grows upwards in a single continuous block, moving up or down in memory as the tables below it expand or contract.

Data for all the strings and arrays are placed at the end of the statement table, followed by a small buffer used as a stack to serve FOR . . . NEXT and GOSUB commands.

The high end of user RAM contains current screen data and the display list. This area grows downwards as graphics modes with higher RAM requirements are selected during program execution.

Needless to say, any foreign data in Basic’s path gets wiped out.

With everything moving around like this, it would be very risky to put your precious data just anywhere. Fortunately there’s plenty you can do to keep things secure.

A “page” of computer memory is 256 bytes long, so the sixth page of your computer’s memory stretches from 1536 to 1791. This is supposed to be an automatically safe area, since it is not used by the operating system and is below the address where Basic programs start.

Unfortunately the first 128 bytes are used to hold the data overflow whenever an INPUT statement collects more than 128 characters.

This does not happen very often, but you need to watch out for the possibility and, if necessary, provide software protection. The second half of page 6 is totally secure, but of course is only 128 bytes long.

Several regions are set aside automatically by the operating system for use when information is being transferred from one place to another.

If no such transfers can occur during program execution it is possible to use these buffers as safe storage areas. The two most valuable are the cassette buffer (1021-1151) and the printer buffer (960-999).

They are particularly useful for data or routines which are used only once at the very start of a program, then discarded. For example, machine code routines to initialise pointers or set up data tables, or custom display lists for title pages.

They can be used for longer-term storage so long as your software seals off all access to the relevant devices for as long as the data need to be remembered.

Basic keeps track of all its tables by using a system of pointers. These are fixed memory locations which do not themselves contain raw data, but instead hold an address where moveable data can currently be found.

There is one to show where screen data starts, another pointing to the display list, others to show where your Basic program and its various tables begin and end, and many more.

Most pointers consist of two consecutive bytes. The first contains the low byte of the address it points to, the second the high byte.

So to find the actual address you PEEK at both halves of the pointer, multiply the second half by 256 and add it to the first. For example, locations 88 and 89 point to the start of your screen display data:

\[ \text{SAVMSC} = \text{PEEK(88)} + 256 \times \text{PEEK(89)} \]

If you POKE any number from 0 to 255 into this address it will be printed as an Atascii character at top left of the screen. If you select a different graphics mode, the address contained in SAVMSC will change to point to the new start of screen data. All the pointers work in this same general way.

So although the various blocks of data set up by the OS must not be broken up in any way, it is possible to shunt them around in memory by altering their respective pointers.

The easiest pointer to change is RAMTOP (106) which tells the OS how many pages of memory are available. If you subtract 1 from the number stored in RAMTOP, then POKE it back in and execute a graphics command, the screen data and display list will move downwards by 256 bytes, leaving this amount of “spare” RAM above it which Basic cannot see.

You can save any multiple of 256 bytes in this way, so long as the display list is not forced to descend below the address pointed to by APPMHI (14,15).

This method is quick, simple and reliable, and is commonly used in magazine listings, but a quirk in the operating system reduces its appeal.

Whenever you execute a graphics or a clear screen command, the first 64 bytes above RAMTOP are wiped out. Even worse, scrolling a text window may erase up to 800 bytes in the supposedly safe area, so watch out.

Changing HIMEM (741,742) will let you reserve space just in front of the display list, and ensures that Basic will give an error message if your program grows long enough to interfere.

You must leave enough space to accommodate all the graphics modes your program uses, otherwise screen data will descend during program execution and overwrite your reserved area.

Simply enter the mode which will take up most RAM and find the address contained in HIMEM. This is the last safe address you can use. Then work out how much memory you want to reserve, calculate where you want the area to start and POKE this new address into HIMEM.

One point to remember when changing either RAMTOP or HIMEM is that not all computers are 48k machines. You cannot put a reserved area where no RAM is installed. For this reason, it’s usual to make your program PEEK the pointer’s initial value, then subtract a fixed amount and POKE the new value back.

This means, of course, that the reserved area will occupy different locations in different machines, so you can’t specify absolute addresses within the safe area for Basic to PEEK and POKE. Nor can you use this method to store non-relocatable machine code routines.

But it is the easiest way of
ensuring that your reserved area starts on a 1k or 2k boundary, so you can use it to protect PM data, display lists, character sets and the like.

The bottom end of memory looks the same whatever your computer's memory size, so if you reserve space by shunting MEMLO upwards you can predict precisely where the safe area will be.

This opens up possibilities for absolute addressing, and allows large amounts of non-relocatable machine code to be stored. Several peripheral devices which need special software to drive them, say disc drives, start off by booting a short machine code program to reset MEMLO, then load their driver software into the reserved space.

Unfortunately you can't simply write a Basic program to POKE a new address into MEMLO, since this would in effect tell the computer that your Basic program itself had suddenly disappeared.

If you want to alter MEMLO you really need to do it before your Basic program is loaded, and this means a machine code subroutine.

Another problem is that SYSTEM RESET will automatically set all pointers back to their default values. This isn’t a problem for those pointers which are reset within your Basic program, since they’ll change back to the values you want every time the program is RUN.

But for MEMLO the only solution is to trap the SYSTEM RESET routine, which again needs machine code. This is a bit beyond the scope of the present article, but a suitable program is given in De Re Atari.

The Atari can handle strings of any length up to its memory size. There is plenty of scope for storing data tables and machine code routines so long as they are the kind that can sit anywhere in memory.

Basic automatically ensures that strings do not overlap each other.

like character sets, display lists and player-missile data, which need to start on 1k or 2k boundaries, since strings move around in memory and you can never predict where they will finally settle.

There are two common ways of getting data into a string—entering it from the keyboard in literal form or building it from READ and DATA statements. The first is the easiest. Simply translate your numeric data into Atascii symbols, then type a program line with the symbols between double quotes:

```
10 DIM AS(5):AS="(2<Pd"
```

This will store the numbers 40, 50, 60, 80 and 100 in AS. There are two drawbacks to this technique.

Firstly the length of a literal string is limited to what you can get on a single program line—about 106 bytes.

Secondly some characters are hard to store in literal form: the numbers 34 (double quotes) and 155 (end-of-line) need special attention, along with all those numbers which translate into screen editing characters.

The length problem can be overcome by concatenating several literal strings in the usual way:

```
10 DIM AS(10),BS(5)
20 AS="ABCDCE":BS="FGHIJ"
30 AS(LEN(AS)+1)=BS
40 PRINT AS
```

By this method AS can be made as long as you like; it will still tuck itself safely away in memory with its first byte at ADR(AS).

Awkward characters are a bit more tedious to deal with. Number 34 can be forced into a literal string after it has been typed:

```
10 DIM AS(3):AS="XY":AS(2,2)=CHR$(34):PRINT AS
```

Control of actors such as 125 (clear screen), 28 (cursor up) and 253 (bell) can be forced into the string in the same way, but you won't be able to print them out unless you first disable the control functions by POKEing a non-zero number into address 786. CHR$(125) will then appear as the familiar bent arrow, for example, instead of clearing the screen. Use this to check that the string is correct, then POKE 766,0 or press Break to restore the control functions.

The only number that can never be printed as a screen character is 155 (end of line). If you must have this number in a string, the only way to check it is by retrieving the string data in numeric form:

```
10 FOR X=1 TO LEN(AS):PRINT ASC(AS(X,X)):NEXT X
```

The beauty of literal strings is that they put data straight into memory without wasting time and space on a loading routine. However typing long lines of apparently meaningless symbols is not a job well suited for human operators and if, as is very likely, you make an error, it can be very difficult to find.

You can get round this problem by using a loader routine to build the string from scratch every time the program is run:

```
10 DIM AS(6)
20 FOR X=1 TO 6
30 READ D:AS(X,X)=CHR$(D)
40 NEXT X
50 DATA 35,36,37,38,39,40
```

You can store any number without difficulty in this way, since you don't need to PRINT the characters on screen. The main drawback is the time it takes to build the string.

Long machine code routines, or large data tables can leave your user hanging around for half a minute or more every time the program is run. You can sometimes get the best of both worlds by using a short utility program to build a string from READ and DATA statements, then print it in literal form so that you can enter it as a program line. Try adding to the program above:

```
60 PRINT "100 AS=":CHR$(34):ASC(AS)
```

then RUN it. The new line 100 is all you need to insert permanently in your program.

You can put numbers directly into arrays and matrices without the
bother of converting to and from Atascii symbols, and the entries can be changed easily without restoring to string manipulation techniques, so it looks like an attractive option.

The snag is that every number will be stored as a floating point decimal, and use six bytes instead of the one required for an Atascii character. Try to avoid this method unless it has special advantages in your particular situation.

Basic ignores everything after a REM statement, but will not overwrite it. So if you store anything there it will normally be quite safe. Data can be inserted as Atascii symbols immediately after the REM statement. For example:

```
10 REM al @5%
```

will store the numbers 97, 33, 32, 64, 53 and 37. Note that any space other than the one immediately following REM is interpreted as the number value tables. But once settled into a finished program it will stay in the same place no matter what the host computer’s memory size, which could be an advantage sometimes.

Finally we ought to consider the easiest option of all — leaving data in the unprotected area marked “Free RAM” in Figure I. This puts the onus on you the programmer to ensure that things don’t overlap, rather than leaving it all to the operating system.

You have to work out the lowest address to which your screen data will descend during the program execution and the highest address of your finished Basic program. Anything in between should be relatively safe.

You can use this technique during program development, especially if your machine has lots of spare memory, but it’s better to choose one of the safer methods for the finished version.

---

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**FILM CITY VIDEO**

176 Chesterfield Road, Ashford, Middlesex.
ANDREW BENNETT begins a regular column especially for users of the Atari ST

fact it is – and therefore make it able to use both monitors.

The biggest problem with connecting two monitors, however, is far more difficult to overcome. Normally the first thing a program does is to look for which type of monitor is connected and then take the appropriate action, such as allowing more colours.

The software will only look for one kind of monitor and will stop looking when it finds one. Therefore it will ignore the other monitor even though it is connected. This problem will even occur with the desktop since it is just a very large example of a GEM program.

The overall problem therefore lies not with the hardware, which can handle two monitors, but with the software, which can’t. You could go halfway and connect both monitors by a special cable, then turn one off and the other on when you wished to change resolution, but the ST would almost certainly crash, or lock-up, when you did this and you would have to reboot the system.

Printer problems

One problem that will crop up again and again with the ST is that of printer compatibility with both the ST and its software.

A. Poole of Gwynedd and Reg Williamson of Kidsgrove have both written to say that they are having problems with the free word processor STWriter. This is a stopgap meant to provide users with something until Atari releases the full GEM word processor in the near future.

In the meantime, however, many of you have had problems using non-Epson or Atari printers with STWriter.

Two which seem to occur most often are printing certain characters – such as £ – and using the printer’s special capabilities such as condensed text.

Although I use an Epson printer with my ST, I believe the solution to the first of these problems is to include in your text a Control-O followed by the PRINTER code for the required character.

You may also need to send a Control-O sequence to change character sets beforehand.

The second problem can be solved by altering the file called "XYZZX.TXT" on your STWriter disc. Make a copy of the file on to another disc first and then load it into STWriter. The explanations following the *’s are simply comment lines and tell you what immediately follows.

The necessary codes that must be sent to the printer to turn on the required mode then follow – a code for each line followed by a Return.

If you change the required codes and then save the file as you would normally, you should be able to use all

Hint section

If you have been opening and closing directories to find a particular program, you may like to know that you don’t have to close the directory window every time you change discs.

First open a directory window as normal. Next change the disc in the drive and then press Esc once. The new directory will now be read in and will replace the old one on the screen.

End Bit

That’s it for this month. Don’t forget, if you’ve a question you’d like answered or you have a hint that you’ve discovered after many hours at the keyboard, then write to me at Atari User.

I also want to hear about the kind of ST articles you’d like to see in the future and what languages and other software and hardware you own.

Keep the questions rolling and I’ll see you next month.
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30 ATARI USER February 1986
Make time for a time check

By PAUL LAY

THIS program provides an interrupt driven 12 hour clock which will appear in graphics Mode 0 at the top right hand corner of the display.

In other modes it will be displayed at the top right hand corner of the text window if one is present.

The clock is constantly displayed but will be momentarily destroyed – for 1/50th of a second – by any screen scrolling. It is protected against the system reset key but pressing this key results in the loss of a second or so.

It is possible to turn the clock display off by POKEing a zero to location 1789 and it can be turned back on by POKEing any other value.

Once the clock has been set it can be reset by running this program again and the user may continue normally. The only point to watch is that page 6 is not used as the clock routine is stored here.

```
18 REM Atari 8 bit Driven Clock
20 REM for Atari User Magazine
30 GRAPHICS 0
40 DIM TEXTS(2)
50 ? 14 "Atari 8 bit Driven Clock"
60 ? "By Paul Lay"
70 IF PEEK(1530)=32 AND PEEK(1664)=281 THEN 270
80 REM "set up machine code"
90 CHECKSUM=0
100 FOR LOCATION=1536 TO 1789
110 READ CODE
120 POKE LOCATION, CODE
130 CHECKSUM=CHECKSUM+CODE
140 NEXT LOCATION
150 IF CHECKSUM=3686 THEN 190
160 ? 14 "Error in data statements!"
170 LIST 538, 859: STOP
180 REM "mask system Reset key"
190 IF PEEK(9)=1 THEN 240
200 POKE 2, 5
210 POKE 1, 7
220 POKE 7, 2
230 GOTO 270
240 POKE 1537, PEEK(12)
250 POKE 1538, PEEK(12)
260 POKE 12, 0
270 POKE 13, 6
280 REM "input the time"
290 ? 14 "Enter the time":?
300 ? "Hours (0-12)":?
310 ? "Minutes (0-59)":?
320 TRAP 339: INPUT HMS
330 IF HMS<0 OR HMS>59 THEN 310
340 ? "Seconds (0-59)":?
350 TRAP 339: INPUT SEC
360 IF SEC<0 OR SEC>59 THEN 350
370 ? "AM or PM":?
```

```
```
```
THERE IS MORE SUPPORT FOR ATARI THAN YOU MIGHT IMAGINE

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I NOTE that in Mike Rowe’s documentation for his Computer Countdown program in the December 1985 issue of Atari User, he reports that he found a bug while using his version A Basic cartridge which he attributes “to the VAL() function which apparently does not operate correctly after using it once.”

I would like to clarify the actual cause of this problem. The VAL function is not at fault.

The culprit is in fact the GET command. Bill Wilkinson, of Optimized Systems Software, identifies the problem in “The Atari Basic Source Book” from Compute! Publications.

The GET statement does not reinitialize its buffer pointer, resulting in corruption if used after a statement which has changed the system buffer pointer.

In Mike’s program the subroutine at line 300 contains a GET (at line 310) followed by a VAL (at line 340).

The first time through there’s no problem, the buffer pointer has not been changed prior to the GET, it changes when the VAL is first executed.

However on subsequent calls to the routine GET will not reinitialize the buffer pointer and the result is that VAL apparently corrupts the input.

Mr Willimon suggests a simple solution of using a statement such as DUM - MYS=STRS(0) or PRINTing any number before executing the GET.

Either of these statements correctly resets the buffer pointer. Another solution is to use the statement X=USR (ADR(“MLOZ”)) (where INVERSE) which effectively JSRs to the buffer initializing routine in the floating point ROM package which GET omits.

Incidentally, LOCATE has similar problems, as this statement calls GET.

The bug was present in Atari Basic Rev A (the original cartridge) but was corrected in the later B and C revisions.

The version of Basic can be determined by PEEKing location 43234. Rev A gives 162, Rev B gives 96 and Rev C gives 234.

One last comment on Atari Basic. I presume all these 800XLs which are currently being offered in bargain packages contain the Rev B Basic with its built-in bugs (the infamous 16 byte addition to each SAVE...).

I hope Atari or someone is notifying purchasers of these XLs that the bugs exist and ways around them.

It’s all well and good to grab a larger slice of the market, but not if you end up with a number of complaints about the product.

If the Rev B problem, and its solutions, is not clearly identified then the Hotline and shops are going to get plenty of questions.

I wonder how many people in Boots, Laskys and Dixons can explain the situation?

Finally congratulations on the continued publication of Atari User. I look forward to new series replacing the concluding graphics and display list articles.

Would it be possible to print a regular, comprehensive user group listing?

Mentions of one or two groups have been made in the Mailbag, but I’m sure it would be beneficial for all Atarians to see a detailed list.

I’m certain there are many who are looking for local groups and would welcome such a page. — Allan J. Palmer, Basingstoke.

Thanks for the information on the GET command.

We hope to publish a comprehensive list of user groups in the future.

Your fears about the Basic included in the “bargain” 800XLs may or may not be well founded, we can’t say at the moment.

Certainly some recently acquired 800XLs in our office all arrived with Rev C Basic, so let’s hope the bargain machines are similar.

The Bells

I GIVE up! I thought I knew my 800XL keyboard, but try as I may I can’t produce the special character on line 9702 of your Esmerelda game in the January issue.

Just what is that first item of data? It is certainly given me the hump! — Greg Barton, Crawley, Sussex.

- The offending character should be a 4, and once again we plead innocence. The original artwork was perfect (of course) and the glitch occurred in the printing process.

We’re mixing the sand and cement for the printer’s overcoat at this very minute, but apologies to all frustrated bell-ringers.

Limited on-screen editing

I WOULD like to see something more educational for my children in Atari User, also ideas on putting and getting characters on graphics screens.

In the December 1985 issue, you talked about the infamous math lock-up. Well being a sufferer of this problem for about 11 months I was concerned about the guarantee running out on my 800XL so I telephoned the Atari dealer in SE England who sold it to me.

I was told that this problem occurred if one did too much on-screen editing. I read the article from your magazine, but no offer was made to change anything.

I was told it was a design fault and that it was difficult to cure, I would have to live with it.

As I try to write a lot of programs and invariably get them wrong, I do a lot of on-screen editing. I therefore felt this was not a very satisfactory answer.

I decided to telephone the Atari Help line. They confirmed that there was a problem, but again no offer was made to change anything.

What they did offer was that if I sent a disc or cassette to them they would put on it for me Basic Revision C software, which would help solve the problem.

They did also mention an alternative answer — the purchase of Basic XL which would also solve the problem. — R.J. Hodgkins, Gillingham.
now have a new recorder and I don’t think my computer is at fault as I have carried out all the audio and visual tests and everything appears to be in perfect working order.

Every cassette I load gets as far as the “Ready” stage but as soon as I press play on my recorder and Return on my computer I get “BOOT ERROR” and “MEMORY TEST” on the screen.

This happens with every one of my numerous cassettes and I am just about ready to smash the lot against the wall. I hope you can help me. – Patrick McDonald, Lisburn, Co Antrim.

• It sounds as though you are trying to load commercial tapes, many of which require Basic to be “locked out”.

Although the loading instructions may tell you to hold down START when you switch on the machine, with an 800XL you often need to hold down START and OPTION. Try this with a few tapes—it may save you having to re-paper the wall!

Reason for the error

I TYPED in the program Canvas on my Atari 800XL from your October magazine.

When I tried to run the program it went to the graphic screen and printed “Error 8 at line 2070”.

Please can you tell me what is wrong with the program? – Robert Harvey, Cowplain, Hants.

• Guess what—you’ve made a typing error somewhere, probably between lines 2070 and 2120.

Books for beginners

I WOULD like to know if Ocean are thinking of bringing out Street Hawk and D.T. Supertest, also could you recommend a good book for the beginner?

Could you please tell me if my 800XL is OK? After I have saved a program a high pitched tone keeps going until I reset or press END. – M. Fryer, Wednesfield.

• • •

COULD give you the title of a book on how to use Atari Basic from the start, or where to get tuition on the subject.

I was not able to get to grips with the Atari manual and subsequently I have not been able to use my micro to best effect.

Could you tell me if Zoomsoft supply the software with Touch Tablet as it does not say anything about it in the advert in Atari User. – Alan McGill, Maidenstone.

• There is no problem if a machine carries on the high pitched tone after saving. Just hit Reset or type END—or use a SOUND statement—and it will go away.

The Touch Tablet comes as standard with the Atari-Artist cartridge, allowing you to use it to the full.

If you bought the package with the 1020 printer you also get a program which will allow you to get a paper print out of your masterpieces in four colours.

This package has only recently become available again, and is excellent value for money.

There have been a number of requests for good books for starting to program on Atari computers, possibly because of the poor manuals sent out with the XL range.

There are dozens of books available but you could do a lot worse than looking out the following titles.

The XL Handbook (Century Publications) £6.95. A good book to take you from first steps up to some quite advanced topics.

Easy Programming for the Atari Micros (Shiva) £6.95. A similar book to the above, but covering less ground when it comes to the more advanced sections.

Your Atari Computer (Osborne/McGraw Hill) £16.95. A superb book for someone who has perhaps mastered the very first steps, and wants an excellent tutorial/reference book with lots of information on all aspects of Atari programming. A must for the serious programmer.

Watsons Notes on the Atari (Glentop Publishers) £2.95 each: A series of six very reasonably priced books starting from first steps and moving eventually up to player/missile graphics, etc.

The full range consists of:
1) First steps in Basic
2) Exploring Basic
3) Making Basic work
4) Creative graphics
5) Advanced programming
6) Journey into memory

However if you have seen, or purchased, a book which you think other readers would find useful, why not write in and let everyone know about it.

The same applies, of course, if you found that a book didn’t help you with what you thought it would.

Hunting tigers

I WRITE in response to the letter published in the December issue from C.R.J. Summan regarding Tigers in the Snow.

My local Atari dealer Orem, has this title for £14.95, that’s the same price as the CBM64 and some £25 cheaper than Mr (or is it Ms) SunMan talked about.

I bought a copy myself and am very pleased with this excellent strategy game—Apple version one side of disc, Atari version the other. – Mrs L. Prestidge, Reading.

• The game also appears in the latest Silica Shop list as a US Gold release at £14.95 for cassette or disc.

Basic experience

I WAS sorry to hear that some of your more experienced readers object to space being used for beginners.

Well, I’d just like to say, we’re not all budding geniuses and being an ignorant housewife I find it very beneficial.

Also my children, who are four and five years old can learn to type in with these Basic small programs.

In fact they are very good now with all the keys of the keyboard and are enjoying doing these short lists.

So give a thought for the future generations of computer users. – Euphemia Hain, Livingston.

• Don’t worry, we intend to continue catering for as wide a range of users as possible.

Hard on gerbils

In the August 1985 issue of Atari User there was an article concerning the Ocean game Frankie Goes to Hollywood, which told us how great the game was going to be when it was released in “late summer”.

Well summer has come and gone—I think—and the game hasn’t made an appearance anywhere. Although it’s been out in other formats for ages.

Where is it? I want to buy it. I’ve played the Commodore
All in the same boat...

WE were interested to read G. Whittaker’s letter in the Sep-
tember issue of Atari User about the difficulties he is hav-
ing with his Atari.

We were unable to get our Atari to work correctly when
the memory module was attached, yet the computer
worked perfectly well on its
own.

As the memory was under
warranty we sent it to Slough
for attention and it was sent
back to us after checking.

Still the two would not
work correctly together, so we
sent it all to the recommended
Atari repairers, Mastercare
of Maidstone who returned it
saying all was in order. But on
trying it we not only found it
still had the original faults but
quite a few more as well.

We sent it back immedi-
ately but since then have been
told each time we enquire that
they have not been able to get
the parts. Surely if the
computers are still being made
somebody somewhere must
have parts.

Is it wrong to presume that
the recommended repairers
can mend a computer and not
make more faults – five
months seems to me an
exceptionally long time, and
then to tell the customer to be
patient or take it elsewhere for
repair after their mechanics
have fouled it up? – Mrs A.O.
Illes, Ashford.

ON reading G. Whittaker’s
letter, I feel I must agree with
him. I own a 800XL, 1020
printer, 1100 recorder and
touch tablet. Just recently I
bought a 1050 disc drive.

On getting my newly
acquired 1050 home imagine
my horror on opening it up to
find the 1050, leads and
transposer there, and that was
all.

I went back to Laskys, who
said that there should be
manuals and a DOS disc. I
asked if they could take them
from another box, but in each
one opened the instructions
were in German.

They suggested I write to
Atari at Slough which I have
now done three times, and
each time, as in Mr
Whittaker’s case, silence or
plain ignorance.

I think before Jack Tramiel
boasts about backing all
existing ranges and now labors
and the like, he should
put his UK house in order.

I have been so disappointed
over this that I have convinced
the 17 members of our local
user group that if things don’t
pick up with Atari we had
better consider going over to
Commodore, as a last resort.

Over the years I have grown
to love Atari but recent events
are making it hard for me to

Bridging
the gap

I KNOW not where or to whom
I should write to express my
disappointment.

Last April I purchased a
130XE with the assurance
that software for bridge was
available. This has never been
forthcoming.

Why do I see many games
which I am sure can not be big
sellers, whereas bridge is one
of the most popular games in
the country with far more
participants than chess.

Many hotels hold bridge
weekends throughout the
year. Evening classes certainly
in my area are over-sub-
scribed.

Even the BBC has produced
its own £200 computer de-
voted to the game.

I would be grateful if you
could help me with the right
contacts. – A.G. Formoy,
Ovington.

We don’t know of a
commercially produced pack-
age, but turn to Page 32 for
the Atari User Bridge program.

Canadian contact

BEING a native of England,
and an immigrant to Canada for
13 years, I was most pleased to
receive my first issue of

midwifery and nursing education.

Being an Atari owner and
battling with Basic at present
so that I can write my own
programs for my student
midwives, I read with interest
in your magazine that Atari are
offering a discount on their
hardware to educational
establishments.

I believe that Atari without
the discount offers good value
for money, therefore being a
good Samaritan I wrote to
Atari UK and informed them of
this very large virgin territory
in midwifery and nursing
schools.

Companies selling the BBC
B already know that they have
a large untapped pool of

get excited about Atari’s future
prospects. – J.B. Dray,
London W19.

***

YOU are right G. Whittaker of
Swinton, you are not the only
one with difficulties with Atari
UK.

Some time ago I sent a
letter about vertical lines
covering the screen display of
my 130XE asking whether it
was my machine at fault or
whether it isn’t compatible
with my Philips TV – and I’m
still waiting to see if it can be
fixed. – A. Bozward, Wor-
cester.

***

I WAS not surprised to read of
D. Whittaker’s account of his
dealings with Atari UK. There
must be dozens of people in
the same boat.

I am a midwifery tutor and
as yet in all but one or two
schools, computers do not
feature in our educational
techniques.

However tutors all over the
country are very keen to know
how and where computers
could be put to good use in

budget holders and I know of
at least two firms who are
trying to make inroads into this
market in my area alone.

We have regular regional
meetings where an Atari
representative could have
demonstrated the computer’s
uses to about a dozen budget
holders at once.

Did they acknowledge my
concern for them? No. I have
not as yet so much as
deceived a reply. In fact the
sheer rudeness caused me to
invite a firm selling the BBC B
to come to our school and
demonstrate that computer’s
potential.

When a few schools pur-
chase computers the others
will follow suit and probably
with the same make so that
there can be interchange of
software. So Atari beware,
there is a section of the market
that you are ignoring at your
cost. Computers are bound to
mushroom into offices and
ward areas in hospitals
throughout the country. The
hospital classroom is one foot
in the door. – Mrs Jackie
Paddison, Eggborough,
Goole.
Atari User, compliments of my English relatives.

I must say first and foremost well done on a fine magazine, I was most impressed with the layout. Your articles make excellent reading, also your type-in programs are unique, which brings me to the reason for writing this letter.

I am a member of MACE (Michigan Atari Computer Enthusiasts) group, I am also the disc librarian and program coordinator for my local Atari group ERACE (Essex Regional Atari Computer Enthusiasts). I would like to correspond with any Atari user group in the UK or individual who would like to exchange ideas and public domain programs with our group.

Our present membership is around 150 and growing, our library consists of approximately 50 discs all public domain and 100 MACE discs.

We would also like to trade new and interesting programs for the 520ST public domain.

Anyone or group can write to us care of myself at the address below. – Harold Warne, 2630 Reddock Avenue, Windsor, Ontario, Canada, N9E 4J4.

Taming the printer

My 1020 printer will print standard upper and lower case from a command from Atari Writer and Home Filing Manager.

But I cannot access the character widths, set, character, etc as described in the manual.

Please what am I doing wrong? My age is 65 (old codger) I do know a younger man (30th) who sells TVs and micros and he is having the same problem.

A second problem. We are encouraged to make a working disk of DOS, but when I tried to make a working copy of my Home Filing Manager I cannot.

I get “Format incompatible” using DOS 2 or 3. However using Atari Writer I have been able to list and print the files, but giving 000 sectors used and 000 unused.

EMI programs Billiards, Cribbage etc made for the 400 and 800 models, when loading into Xl models they stop after loading the first part.

What happens is the first part loads then the TV screen flashes and then crashes. To overcome this as soon as the TV flashes press Reset then the program continues to load normally. I discovered this by experimenting.

I am now converting my daughter to Atari and she is putting her Sinclair Spectrum (can't get on with it) up for sale. – E.C. Jones, Gilingham.

You might find that the problem is one of shifting between modes. If you check the 1020 manual, you will find the best way to access the extra modes is to go into Graphics Mode (ESC ESC Ctrl-G), then change the size, etc by following the manual, and try a sample by sending a line such as:

P (Text goes here . . .)

The P tells the Graphics Mode that some text to print follows, not more Graphic commands. Afterwards you can quit Graphics Mode by using command 'A', and send normal text again.

By the way, don't forget that your commands must be the first thing on a line, they cannot come after some text.

Most commercial discs are protected against home copying to avoid the potential problem of piracy.

However unless badly treated, a disc should last an awfully long time, so you shouldn't really need to copy it.

If your disc does go faulty your dealer should be able to replace it very quickly.

Good luck with converting the rest of your family to Atari! It’s nice to find we have such a wide age range in our readership.

**Mystery command**

I BOUGHT an Atari 800XL a year ago last December and am looking at some coloured pamphlets, pretending to be instructions, was disappointed at the feeble effort which Atari had put into explaining their machine.

I hoped that the computer would not be so useless, and luckily it was not.

I have now figured out how most of the main commands work, but there are still some lesser known ones which I have never seen before.

A fellow Atari user mentioned the XIO command.

He said it was used to fill shapes in, but neither he nor I know how it works, how to use it or even if there is such a command. I hope you can help. – C. Macdonald, Paisley.

Yes, there is an XIO command. It's a general input/output command which can be used to fill an area of the screen between plotted points and lines.

A typical example might be:

```
XIO 10,26,8,9,"5:1"
```

The 10 is the part which is needed for a fill operation – replace this with 12 and it performs a CLEAR operation instead.

For an example of its use, see the Microscope program on page 50 of our November issue.

**Directory reader**

**Auto-boot tapes**

I STARTED to load in Get
More on utilities

CONGRATULATIONS! For the first time that I can remember you have reviewed a utility, in Stephen Donoghue's excellent little article on Basic XL (December 1985).

Of course, as with other Atari software, the string comes in the tail with the usual exorbitant price, £7.50 or so, but that is Atari's fault, not the software house's, not Mr Donoghue's.

We normally get reviews of four games in Atari User, but in the 1985 December issue we had no less than 14 games reviewed, if you count Brigg's Adventuring Article.

Utilities, business and educational software gets scant attention by comparison. May I make a suggestion that you make a New Year resolution to put this imbalance right, and in future issues divide your software reviews equally between games and the non-games software?

Beginners like me haven't a clue which non-games software is worth looking at. Most of them are just names to us, and we would like a lot more information on what they do so that we can decide whether or not to buy.

Take a look through the lists of your advertisers to see just how little information is provided — and of course, they are biased. We do need impartial reviews on non-games software, please.

Perhaps Jack Tjampol & Co should be looking at getting software prices reduced, as well as the hardware? Even if you can afford it, Atari software is a real pain to find — unlike other popular makes of computer.

May I confirm what some of your other readers have said about the failure of Siltica Shop to provide an information mailing service, as advertised. I bought my 800XL and peripherals in March 1985, and I am still waiting for my first information sheet.

When you phone them they tell you that there have been delays, or words to that effect. This is simply not good enough — they should stop advertising this service if they cannot provide it.

With production of the 800XL now coming to an end, I hope that Atari User will still cater for the 800XL owner for some time to come, and not get carried away with enthusiasm for the new machines at least until owners of the older machines have up-dated their hardware.

Hopefully as the new machines become more plentiful, retailers will start to offer worthwhile trade-in deals to encourage owners of older machines to update.

Otherwise I can see the market becoming saturated, with no movement of the new machines. How about a discount for the 800XL like the one for the 130XE?

Best wishes — keep up the good work. Atari User is improving all the time. — C.H. Tedman, Westgate-on-Sea.

To a large extent we rely on software being sent by the manufacturers for review. Since most of the software released is games, the review pages reflect this.

We produce a dust cover for the 800XL — see Page 61.

York group

We are a group of Atari enthusiasts in and around York setting up a user group.

I would be grateful if all people interested in joining would, in the first instance contact me on York 708391 or at the address below.

— J.P. Nelson, 10 Dringfield Close, Dringhouses, York YO2 2TG.

Cheaper RAM pack?

I AM the unfortunate owner of an Atari 600XL. I say unfortunate because I only bought the damn thing just over two years ago, before the 800XL was released, so that the anticipated that the promised expansion RAM pack would be available early in 1984.

I have not only seen the price of Atari drop to £165 for Atari 800XL with disc drive I've seen the 800XL disappear without a trace.

So I am now fully resigned to leaving the Atari name and changing, dare I say it, to Commodore.

But before I take this painful step — one last, chance, can somebody tell me how I get my hands on an Atari 600XL expansion RAM pack?

Or better still, come on Jack, let's have a RAM pack offer with free software for £50 or less to show those who

Not so smashing hits

I HAVE a problem with Smash Hits volume 1. It has suddenly decided that it is not the original version and when it boots it cannot get past the stage where it searches for its bad sector.

I have a feeling that it is my disc drive's speed even though I can still access my old files from when I first bought my Atari about three years ago.

I am a Christian and have designed my alternate (very alternate) version of Pacman. It involves you running around the church collecting up the hymn books after the service.

The pews make up the maze and devil-shaped characters chase you around the screen. Of course there were Bibles scattered around the maze so you could chase the devil away with scripture.

The first time I typed my program into my Atari 800 it locked up just as I typed in the SAVE command — it locked mid sentence, not after I had pressed Return.

The second and third times I typed it in the same thing happened. The forth time however — 10 very sore fingers later — I saved the program every 10 minutes.

However when it came to save the final version the computer started its save and then stopped after about two seconds leaving me with all the pretty colours my computer usually saves for when I can't get a display list to work properly.

I came to the conclusion that someone didn't want me to finish this program. — Matthew Sims, Epsom.

You could have a drive speed problem in which case have the drive tested by an engineer. It should be 288.8 rpm, or thereabouts.

Also the disc could be faulty, which you can check by trying it out on a friend's machine or at a friendly local shop.
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June issue: Analysis of the 130XE, Submarine, Adventuring, Random numbers, Software reviews, Frog Jump, Microscope, Sounds, Atari Insights – Bit Wise, Beginners and Graphics, special 12 page feature on Communications.


September issue: 8 page special on the 520ST, Mode 8 screen dump routine, Maze Munch, Data Maker, Display List Tutorial, 68000 addressing modes, list processing with Logos, Software reviews, Atari Insights – Bit Wise, Beginners and Graphics.

October issue: Computer Canvas graphics program, Updates for RAW 6502 assembler, 130XE Ram-disc utility, Hex/Ascii memory dump utility, Pontoon, Software reviews, 68000 operating environment, Wrapstop, Atari Insights – Bit Wise, Beginners and Graphics.

November issue: Convex program, Bitwise operator utility, ST graphics examples, ST software list, Guy Fawkes game, Display List tutorial, Adventuring, Microscope, Software reviews, Atari Insights – Bit Wise, Beginners and Graphics.

December issue: Checksum program, Special keyboard characters, Basic XL review, GemWrite and GemDraw, Countdown game, Disco, Display List tutorial, Software reviews, Left-handed joystick, Adventuring, Beginners and Graphics.

January 1986 issue: Machine code games, Pt. 1, Atari in education, Sony ST monitor review, Hunchy game, Checksum update, Listing utility, Docoser game, 1020 screen dump routine, programming in C on the ST, Adventuring, Software reviews.

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