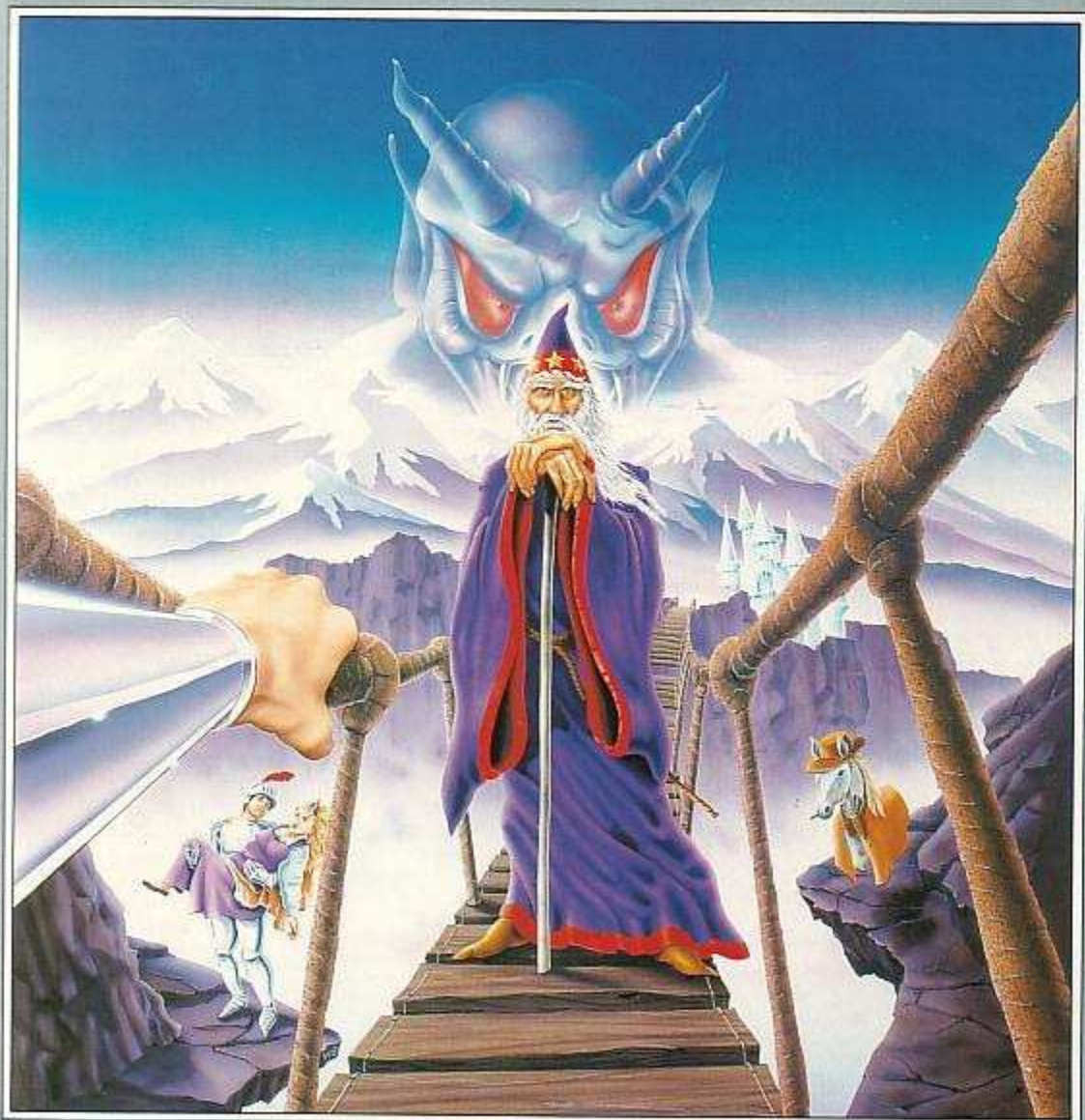


Atari ST User



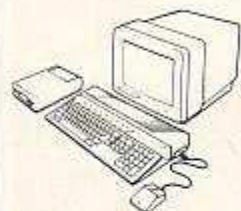
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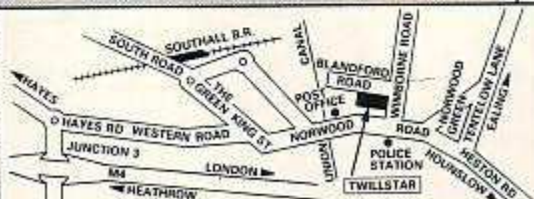
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1040 ST was top of the Show bill

MIKE COWLEY reporting

ATARI stepped into the limelight on centre stage at its own show with all the poise of a corporate Maurice Chevalier. It set out to woo its Novotel audience and this it achieved with style, thanks in no small part to the two new stars in its glittering ST range.

To the sound of synthesised space age music reverberating around the specially built theatre that set Atari back more than £40,000 the brash 520STM and the all-singing, all-dancing 1040ST were unveiled.

As the flashing light show ended and the simulated smoke effect which at one time threatened to engulf the invited guests dispersed, it was the 1040ST which was to emerge as top of the bill. Here we were told was the first personal computer on the market with one megabyte of memory at "a price below £800".

True enough if you don't include VAT in your costings or want the benefit of a colour monitor which brings the price of the machine up to £999, again not including VAT. And for my money at least to buy a 1040ST in monochrome would be akin to purchasing a Rolls Royce with plastic seat covers.

Nevertheless pound for pound, whichever the model you choose, the 1040ST is still the best value on the market today. You can stop twisting my arm now, Mr Tramie!

Strictly though, it was not the 1040ST that was wheeled out. In fact the machine that's arrived in the UK from the States is the 1040STF. And there's no prizes for what the F stands for - floppy.

Any way the 1040 STF is a system featuring professional integrated designs, with CPU, keyboard and disc drive all built in. It comes with Basic and Logo and Neochrome paint program as well as a VT52 terminal emulator for comms. Distinctive features include its double density 3 $\frac{1}{2}$ " disc drive and an operating system in ROM, leaving the full RAM available for user applications.

Hardly had the applause died down for the Big One when its upstart younger brother, the 520STM - M for modulator - was high kicking on stage. Now this machine had kept everyone guessing. Not about what it could do, but what it was going to cost.

In fact the decision about the price was not finally taken until late in the evening on the eve of the show. Problems over the strength of the dollar and the weakness of the pound - or vice versa - necessitated an eleventh hour decision.

And when it came it was something of an anti climax. Instead of the rumoured £300 price tag - some obviously slightly deranged pundit suggested less than £200 - it went on offer at £399.

Now this is really a cut price, unbundled version of the original 520ST package. The modulator means you don't have to buy an expensive monitor in that it can be connected to a standard television set. All you need for this one is a family who will forego the

pleasures of watching Coronation Street while you indulge yourself in one of the three software packages included in the price.

If that was not enough excitement for the assembled press corps and assorted distinguished hangers-on who made up the almost 300 strong launch audience, someone mentioned IBM compatibility.

Every time a jaded computer hack hears "IBM compatibility" he automatically begins to scribble on the back of a dog eared envelope saved from his gas bill. The effect is a bit like shouting "knickers" during a sermon.

What this turned out to be was a co-processing unit for the ST range, opening up the machines to a vast Aladdin's Cave of IBM or IBM compatible software. The unit, attached via the direct memory access input, contains an Intel 8088 processor with 512k of RAM and will accept a 5 $\frac{1}{4}$ " disc drive. In ST mode it acts as a second disc drive offering the user an additional 500k of memory.

However the Atari people are at great pains to point out that they are not into IBM clones, rather to making the ST even more attractive to all the unfortunate people stuck with IBM PCs and inordinately expensive libraries of software.

A price has yet to be fixed for the co-processing unit which will take its bow "at the end of the second quarter". Mind you, one informed source did provide me with an educated guess of £300.

THE IBM act was swiftly followed by CP/M. This time an emulation package for the ST which will enable the machines to run all software written under Digital Research's Z80 operating system. And this one will be given away free of charge through dealers as it is in Germany.

Meanwhile off stage Atari is currently negotiating with several of the major CP/M software development houses over the conversion of their programs to 3 $\frac{1}{2}$ " disc format.

THE finale of the launch presentation show saw a new ST integrated communications package take its bow. Again no price as yet and this time no guesses.

Known as Fastcom, it utilises the processing and graphics features of the ST and GEM with its multiple modes, multiple speeds, multi tasking and multiple modem support. It includes full implementation of VT100/VT52 for accessing ASCII/text systems or Viewdata databases such as Prestel, MicroLink and The Source.



The Pawn's main title screen with 500 colours, which uses up 80 per cent of the ST's processing power.

I HAVE a confession to make. I have never really liked adventures. I got bored watching matchstick men judder across the screen in Valhalla, and text-based games always left me frustrated.

It was necessary to learn a new language to communicate with the characters, who understood as much English as my cat. So it was with little enthusiasm that I set off for Telecom House, near Trafalgar Square, to see "the latest truly amazing state-of-the-art adventure game" for the ST from Rainbird.

In the back of my mind I'd always thought it should be possible to write a challenging game with graphics that do credit to the hardware and incorporating an intelligent human interface. However my own experience working with a professional programmer designing a couple of educational games for the BBC and Commodore 64 made me realise how difficult it is to produce something that is both bug-free and that doesn't insult the user's intelligence.

The frustration of trying to cram a 16th century trading game into the Commodore 64 made it clear that the ideal game would never appear on an 8 bit machine, whose owners are happy to spend hours learning the grammatical syntax and restricted vocabulary necessary to open the chest and take out the key.

At Rainbird I was introduced to Anita Straker, a programmer from Magnetic Scrolls, producers of *The Pawn*. I slumped into a chair and waited for the sales hype. Anita seemed genuinely excited. They really believed that they had developed a new generation of adventure games superior to anything currently on the market. They switched on the ST. The best picture I'd ever seen on a micro appeared. It contained 500 colours and used 80 per cent of the ST's processing power to keep it on the screen. I was about to get hooked on the *Pawn*.

Every adventure game has a set of rules for

The stuff from which cults are made...

communicating with the player. These are determined by the parser. The average parser reaches the limit of its ability with a syntax of verb noun preposition noun. If you're lucky it will understand Put knife in box.

Infocom, an American software house, developed a more sophisticated parser which can be seen in games like *Zork*, which allows more complex grammar like Do X with Y then do Z. Objects could also be described with adjectives - the gold dagger could be distinguished from the silver dagger, for example.

The parser in *The Pawn* is in another league. It is more akin to the artificial intelligence (AI) program Eliza than the *Go North* world of adventure games. Eliza is a conversational program written on a mainframe in the AI laboratory at the Massachusetts Institute of Technology. Professor Joseph Weizenbaum found his secretary talking to it. She quite



seriously asked him to leave the room as the conversation was private and intimate.

The Pawn's parser is context free. "You can talk to anybody about anything", Anita said. "Are you sure?" I asked. "Why don't you try".

I was standing on the plain, talking to Honest John the trader, trying to get him to give me a

**ANTHONY
GINN
discovers
the latest
line in
adventures**



These screen shots show the mouse pointer and the menu bar giving access to the four pull down menus

free bottle of malt whisky. He wasn't interested. The whisky was made by the dwarves, who were banished from Kerovnia by the king for alleged involvement in the assassination of Queen Jendah. The Farthington Real Ale Company and the Romni gnomes, producers of sparkling spring water, were putting commercial interest above all else and preventing the dwarves' return.

"So I can ask Honest John anything? It needn't be about the game?" Anita nodded. I thought I'd try a question that confuses politicians. I typed: "What is the meaning of life?" Honest John replied "I don't follow you".

"Well at least his answer makes sense even if he doesn't know", said Anita. "Why don't you ask the Guru?"

I typed: "Ask the Guru what is the meaning of life". The Guru replied: "Life can be strange, wonderful, frightening, exhilarating and completely inexplicable. Life is much more exciting if spent contemplating life itself, yet death brings an end to that contemplation. Perhaps it's better not to think about it and just live it, for it is a gift and should not be wasted".

I was hooked.

There are 35 pictures which do credit to the ST's capabilities and correspond closely to the text. They are not in as much detail as the title page, as there isn't so much memory available when the game is running. There are also 100 locations. A picture of the palace gardens revealed a shadowy brown building by the wall. I walked up to it. It was the potting shed. I entered. Inside was a plant and a pot. I typed: "Put the plant in the pot". The Pawn replied: "The plant is much happier now".

Back in the garden I typed: "Listen to the wall". Up came the message: "So you're a Pink Floyd fan". The sense of humour embedded in the game is the icing on the cake. It is also found in the book "A Tale of Kerovnia", which accompanies the game.

I quote: "Centuries of selected breeding, preserving the purest of bold lines by constant and meticulous inter-marriage have resulted in the impressive figure of our present monarch who, in poor light and with a following wind, could actually be mistaken for a human".

The parser also recognises possessions and understands complicated instructions like: "Take

the Guru's key from the hat and put in the bottle in the plant pot".

Someone who'd been playing the game for three weeks phoned Magnetic Scrolls. They were asked what score they'd got. "Oh, I'm not bothered about the score. I'm trying to crash the program".

"Have you had any luck?"

"Well I'm not really sure, but I think that if you're in the hall, take your jeans off and wrap



them round your neck, then walk out, the program thinks you've left them inside!"

There are four pull down menus - Files, Text, Graphics and Colour. Text has three options, borrowed from Infocom, Normal, Brief and Verbose. These enable you to move through the text at your own speed.

The Graphics menu has three options for black and white monitors - Stipple, Freehand and Dither. These offer a choice of graphic detail. The most complex plots the shades of individual colours in a detailed grey scale. There is also a simple editing facility to alter your text.

The plot was conceived by Robert Steggles, a philosophy student. It does not always develop in the obvious direction, and if plots had tongues The Pawn's would be in its cheek. If you rescue the princess, she will follow you around for the rest of the game, asking if her hair's all right and trying to stop you from going into dark places because she's scared of them.

The Pawn comes on disc with a story book, poster, game-playing guide and ST guide. At £24.95 you get good value for your money. The program took three man years of programming time to produce - and it shows. The Pawn is the stuff from which cults are made.



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Three approaches to disc doctoring

It may seem strange for a software company to release three disc utility programs at once, but Microdeal's Disk Help, Utilities and M-Copy are all significantly different from each other.

Disk Help is entirely menu-driven. After choosing the utility by pressing the indicated key the program gives a choice of several options to perform the relevant function. As such it is easy to use and suitable for the beginner. It is also less easy to ruin your disc.

There is an option to read the disc and show errors and bad sectors. This will show all the tracks with bad sectors on the disc or list all the individual sectors which are bad.

You can reformat old discs and rewrite the original data back to it. Like the normal format from the desktop this program can erase all data on the disc.

However it can also read the information from a disc first, reformat the disc, and write the data back out. This is supposed to refurbish old discs, but I doubt that it is of any real use.

The option to repair discs where the data is corrupted reads the disc one track at a time. If the data is intact it ignores the track. If it is unable to read a track it then tries each sector in turn and, if it is unable to read a byte, replaces it with the character X.

It then formats that track and writes the track back in its recovered form. If a file on the disc is not too badly damaged it may still be usable or be minimally corrupted.

Damage to a program file is more likely to be fatal, but damage to a picture or text file may be correctable after the file is made readable by repairing the disc.

Conversely, if your disc is physically damaged then the option to salvage data off corrupted or physically corrupted discs will recover as much data as possible from the disc and write it to a new, properly formatted disc. Again, unreadable bytes will be replaced by X.

The format option from the desktop does not like to find errors and if your disc is partly, physically damaged there is no way you can complete a format. However, the normal format

option in Disk Help tries to format the whole disc and tells you which tracks will not format. You can then use the tracks up to this point to store data, for example as a backup.

You can copy discs produced on machines other than the ST, or obtain data from them. The manual claims that the option to salvage data will also copy non-Atari 3 $\frac{1}{2}$ in discs or even salvage data from them but I was unable to test this.

The program will work with one or two drives, both single and double sided. It is aimed at the non-technically minded but as a result is not very versatile.

All options after loading are chosen from the keyboard and prompts are given to aid your choice. All the functions I was able to test worked well and I found no bugs.

It allows you to recover from some disc problems, especially corrupted data, but due to its simplicity its powers are limited. The manual is short, but the program is largely self-explanatory.

Disk Help is priced £29.95.

Harnessing the mouse

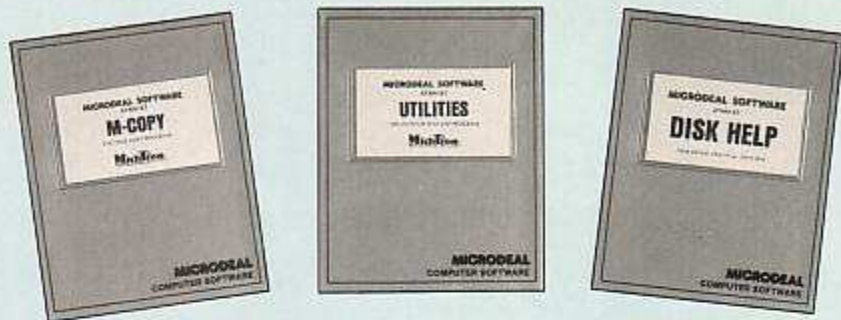
Utilities overlaps to some extent with Disk Help. However it is far more technical, requiring at least a working knowledge of disc architecture and layout.

The program uses the mouse to choose the options. These are simpler and allow direct manipulation of individual bytes on the disc. It is easy to ruin your entire disc in one fell swoop if you do the wrong thing.

The option to read and alter individual sectors reads in a specified sector and displays the data in Ascii form and in hex code. You can easily modify any of the bytes directly on the screen and then have the option of writing these changes back to the disc.

The sector to read is chosen by one or two

**Mike Rowe
reviews a
trio of
disc utility
programs**



sliders controlled by the mouse. I found this clumsy and due to errors on my part got some strange noises from my drive.

I would have preferred to just type the sector number in from the keyboard. Viewing a file is essentially the same.

When viewing a sector or a file you can search through from that point for a specified string or sequence of hex numbers. If the search is successful it will point to beginning of the string while displaying a view of the relevant sector. Again you can alter the data as above.

The volume name of a disc is chosen when it is first formatted. After choosing this, TOS gives no way of altering it. This can now be easily changed with a few commands. Similarly, the file name can be easily changed as can other file parameters in the disc directory such as the read/write status, whether the file is hidden or whether it is a system or a normal file. Utilities can format individual tracks and check for and display bad sectors.

It also allows you to copy a group of sectors into memory and rewrite it out to the same sectors or different sectors on the same or a different disc.

If you accidentally delete a file and then realise you wanted it there is an option to restore all or part of deleted files. If no further data has been written to the disc you should be able to recover the file intact. If data has been written to the disc you may still be able to recover some data from the file but it may be incomplete.

The options to recover data or repair damaged discs are similar to the options on Disc Help but less automatic, needing manual operation – as a result they are more versatile.

The program is mouse and keyboard operated and interfaces well with Gem except for my minor gripe above. A much more serious problem was my inability to get two of the options to work properly.

The option to format individual tracks refused to work at all and just folded back into the pull-down menu on execution.

Even worse was the copy sector's inconsistency – if lucky it worked, sometimes it just folded to the menu, often it would revert back to Gem desktop and several times it completely

crashed the computer with a bus error.

This happened with both the old operating system on disc and the later version in ROM. This was a shame because it spoils an otherwise nice and exceptionally useful program. Hopefully this has been corrected in the release version.

The manual is similar to Disk Help but larger. It explains the layout of an ST disc and tells you exactly how to use the options. The program becomes quite usable with only a limited knowledge, provided you take great care and stick to the manual.

Utilities costs £39.95.

Odd route to copying

M-Copy is a strange program, supposedly aimed at software companies to enable them to make multiple copies of a disc.

It operates by reading all the data off the disc into memory, ignoring unused sectors. It stops immediately on finding any bad sectors and so will not copy commercially protected discs.

It then gives you the option of formatting only the used parts or all of the destination disc and will then produce copy after copy of the original only swapping the destination disc each time.

Note that if your TOS is on disc you can only copy discs that are about half full. Only if you have all 512k available can you hold a full single sided disc in memory.

Any true software manufacturer would want a quicker way of duplicating discs than having someone tied up copying one at a time. It does not allow for creation of protection, so it is not much use to them.

Few individual users want to make more than one or two backups of a disc and, as it will only copy those that TOS will copy perfectly, well, the minimal time saved would certainly not be worth the cost of the program.

As I see it, only someone producing software on an amateur or semi-professional scale would find this program useful.

M-Copy costs £49.95.



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Planning leads to classy animation

SO you got your ST home, invited all your friends and neighbours round, showed off the bouncing ball and perhaps the flying bird and they were all suitably astounded, and rightly so.

So what do you do now? Chances are you want to try out the machine's graphics for yourself, I certainly did. At this point you have a choice. You could mess about with Basic or Logo or, quicker and easier, pick up a graphics program.

Basic and Logo each have strengths and weaknesses of their own which we won't go into here, so that leaves us with a graphics package. At the time of writing two such programs are available, Neo-Chrome, free from Atari, and Degas from Batteries Included via Ariolasoft.

Neo-Chrome is free for the asking from your Atari dealer and as such may be more common than Degas. It is a powerful program and, once the bugs in the latest revision have been ironed out, could well become the standard format.

The strongest feature of this package and the advantage it has over Degas is the animation facility. Two forms of animation are available from Neo, colour indirection and true frame-by-frame. The running waterfall demos are done purely with colour indirection; in other words, the picture remains constant at all times but the colours in the "paint pots" are cycled.

You can arrange for any number of consecutive colour registers to be cycled in either direction and you can choose the speed. If you save your masterpiece while the colours are cycling it will come to life when viewed with the slide show program that accompanies Neo.

Obviously, to make good use of this function you have to plan the picture in some detail right from the start. The true animation facility is incomplete in my copy, but it is with this system

that the flying bird was achieved. It looks as though it will be powerful and easy to use when finished.

Neo is still under development by an Atari employee, Dave Staugas, apparently in his spare time, and Atari is handing out the latest version to user groups and dealers as extra features are added. Obviously, as with any program which is still being developed, bugs are present, but at least the program does run and it can be used.

The notable bugs in the latest version (number 6) concern two of the new icons. The first is the movie camera. It seems that the code behind this button has not been written so that when it is chosen a sub-menu appears but it is totally unresponsive to any attempted choice. This does not affect your work, it only wastes your time.

The other bug is more serious, but can easily be avoided. Do not choose the icon which consists of a rectangle, a circle and a polygon. I suspect that when it is finished this will allow you to draw solid or outline shapes. If you select this feature at the moment an exact replica of the control panel is dumped on to your painting, obliterating about half of it. So avoid this by not selecting this icon.

All the Neo drawing functions are controlled from the left of the panel which sits on the lower half of the screen. These include free hand drawing, line drawing, spray painting, erasing, moving or duplicating blocks of the screen, adding text, filling, moving the whole image and also working with the disc.

Across the top of the control panel are the 16 paint pots. An arrow points to the colour currently in use. In the right of the panel is a window called the mixer which offers full control of the palette. There is a swatch of colour here with its RGB values to its right (000 for black, for example). By pointing to a number and pressing a

Kevin Bulmer begins a new series on ST graphics by looking at the two available packages, Neo-Chrome and Degas



mouse button you can increment or decrement the value and instantly see the colour change.

Pointing to the colour itself and double-clicking will transfer it to the paint pot you are using. Likewise pointing to a pot and double-clicking will bring the resident colour down into the window for you to examine. To the right of the number and to the left of the colour sample are two arrows. Clicking on these starts the colour movement, the more you click the faster the colours change.

Which colours are affected is controlled from the paint pots across the top of the panel. If you look closely at these you will see that two are shaped like arrowheads. Pointing at either and clicking the right hand mouse button allows you to drag the pointer to the pot of your choice. The colours in between the arrows will be the ones which cycle. Simple really!

Next to the colour window is a button labelled Undo. Clicking it undoes the last action. This is a lifesaver if a fill has spilt and obliterated your picture. If you have turned off the control panel, toggled with the escape key, turning it back on counts as the last action, so use the key marked undo on the keyboard itself.

Neo allows you the choice of several styles of text to print on the screen. If you look on page 68 of your Logo Sourcebook you will see them all printed out. The only drawback is limited flexibility when placing text on the screen. Once the cursor has been positioned that is where your text will appear. The Grabber allows you to scroll the picture behind the control panel so that you do not have to turn it off to see all of your screen.

The nicest feature about Neo-chrome, and I really can't praise it enough, is the window in the centre of the control panel. This area shows you all 512 colours on a grid. To choose a colour simply point to it and click, it will then appear in the mixer area ready to be moved to your palette.

The window is not large enough to allow you to see all of the colours at once but by pointing at it and holding down the right-hand mouse button you can scroll it left and right with a relative of the Grabber who moves the main screen.

This in itself is a nice feature, but as your pencil (yes I do mean pencil, the arrow icon changes to a pencil when you draw) moves out of

the control panel and over the picture, this window becomes a scrolling zoom window. This means that no matter where you are on screen or what drawing operation you are carrying out as long as the control panel is visible you can see an enlarged version of your picture.

I find when drawing that I tend to look at this window and only occasionally up at the main screen to check my position relative to the rest of my work.

Degas is beautifully presented and has, in my opinion, the edge over Neo-chrome. Also on the program disc are some sample pictures, a font editor, a slide show and a conversion program to make Neo-chrome pictures into Degas pictures.

One of Degas' strongest advantages is that it can be used to draw in all of the ST's three graphics modes. This will not be so important when Atari start selling STs with modulators, but for those of us who have already bought our ST and cannot afford a colour monitor, Degas is the only way to draw (let's forget about Doodle shall we?).

The first chapter in the book recommends that you make a back-up copy of the program disc and use that in future. This is excellent advice, especially if, like me, you soon start to customise your disc with new fill patterns, brushes and fonts.

The most immediate difference between Degas and Neo is that Degas uses a full screen menu and flips to your painting when you want to



paint. This is toggled by the right hand mouse button and is the only function this button is used for.

Several drawing modes are available, freehand, points, lines, K-lines and rays. The airbrush mode on Degas is worth a medal. Unlike the spray can in Neo, it acts like the real thing. The longer you hold the can in one position, the thicker the deposit of paint there, and on top of that you can set the nozzle size and the air flow.

There is a fill mode, of course, with 38 built-in fill patterns and the ability to design your own patterns and save them to disc - several are already on disc in fact.

Worth a mention while I am talking about the fill feature is that the undo key works in Degas too. A large selection of geometric shapes are available including circles, boxes and polygons and solid or outline.

The cursor can be slowed down for precise work, areas of the screen can be moved or copied to others, a mirror can be set up in any of several planes, the working drive is easily specified from a sub-menu which includes a ram disc if one is present and you have full control over the palette of colours.

Perhaps the best feature of this utility is its text handling. A small window on the right of the control screen shows a view of the type face currently in use. You can load another font, perhaps one you created with the editor supplied, into the window and write with that. Pointing at the text window and clicking the mouse button cycles through up to six permutations of the font.

Leave the style you want to use visible, point to text on the menu and go to your painting. You can now type away and see your text on screen and by moving the mouse, scroll the legend to exactly where you want it to be. Pressing the mouse button paints the letters on the image.

Another powerful and effective feature should be mentioned. The Degas menu has a box marked shadow which on hi-res systems is in grey and cannot be used. In colour this choice allows some simple but effective images to be created easily. As its name suggests you can set up a shadow in any of the available colours in any

of eight directions away from the original and at any distance from one to 16 pixels.

This looks nice when used on lettering and is used on a sample picture on the disc in this way. What is worth noticing, though, is that shadow works with almost all of the drawing functions not just text. A shadowed airbrush used with two shades of green and a displacement of two or three pixels allows for rapid spraying of foliage. Drawing a plan view with shadow set, if used carefully, can work out most of the light and shade in your picture.

There are two small bugs in Degas which, like those in Neo, are irritating but can be lived with. When saving a monochrome picture for the first time there is a tendency for the colours to be reversed. This does not happen every time and it is simple to correct.

The other flaw is with the Gem choice boxes. These appear when you have to choose a disc file to load or save to. The bug manifests itself as ghost choices. You may not have pressed your mouse button or even pointed at anything, but the computer chooses a file or blank file or cancels the menu all by itself. If this happens just try again.

It is quite easy to forgive the flaws in Neo since it is still being developed and after all, is free. Degas, however, is a commercially published program and should not contain two such obvious bugs.

The two packages offer pretty much the same features although with some important differences. Neo has its animation facility, its visible colour palette and its price in its favour whereas Degas has its stronger text handling, shadowing, mirroring, polygon routines, its flexibility and a couple of useful programs on the disc.

If not for their incompatible picture files I would use them both while working on a design to take advantage of the various good points. This is possible now that André Willey has written a Degas-to-Neo converter.

● *These are the tools available, and next month I shall describe the process of painting with them and discuss some of the techniques needed for successful computer graphics.*

Kev Bulmer



Let Neo animate your Degas drawings



MOST proud owners of Atari's new 16 bit ST computers will by now have received a copy of the free drawing package Neo-Chrome, which offers a wide range of facilities, including a couple of rather nice animation routines.

However as the final version is not yet ready there are no circles, boxes and so on, and the text features are rather limited. So when Tom Hudson's drawing package Degas, which had all of these extra options, was released many people rushed out and bought copies. The disc even included a program to convert your Neo pictures into a form Degas could use, so you could continue with your early masterpieces.

If you read Kev Bulmer's article you'll see that the advantages of Degas are many, but that it does not contain any colour rotation or other animation commands. This prompted me to think that many people would like to be able to use their Degas drawn pictures with Neo's animation.

There is, perhaps understandably, no routine provided to convert your Degas pictures back into Neo format, so I decided to write one.

The first question was simple – the manual keeps referring to 1, 2 or 4 plane graphics modes – Neo using the 4 plane variety – so what on earth does that mean? I started examining the files with a sector editor, and after much trial and error – rather more error than trial – I had it worked out.

Most of you will have already worked out that a 16 colour screen display will need a minimum of four binary bits to define each pixel or dot on the screen.

This is verified by the fact that the screen is 32k long – 320×200 pixels = $320 \times 200 \times 4$ bits, or 32000 bytes. The first colour would be coded as 0000, the next as 0001, then 0010, and so on. Just to make things easy for you though the data format bears no resemblance to this neat 4 bit pattern. The data is split up into "words" which are 16 bits wide – think of them as 2 bytes. The first four "words" must, therefore, contain the data for the first 16 pixels on screen.

In monochrome this is much easier. Each pixel is controlled by 1 bit only, so the first word covers the first 16 pixels, the second word the next 16, and so on. In order to make the computer's job easier Atari decided to follow a similar format for the other modes, and we find that the first word contains the first bit of data for the first 16 pixels.

The next three words contain, respectively,

the next three bits of the data for that same set of 16 pixels. The fifth word then starts again with the first bits of pixels 17 to 32, and so on. If this all sounds a bit complicated have a look at Diagram 1. To find the colour of the first pixel on the screen take the first bit of each of the first four words, and put them side by side. This is then the binary code for the pixel's colour.

The ST uses colour indirection, meaning that a screen pixel of colour 1 refers to the contents of the first colour register, not that the pixel should be displayed in the first colour out of 512. Thus if you change the contents of the register via the control panel, for example, everything drawn in colour 1 will take on the new value.

Each colour has three parts to it, the red, green, and blue levels, which make up the complete 512 colour range. Each of the three levels can be between 0 and 7, and these are stored within two bytes, each taking up four bits.

Each four bits could theoretically store any number from 0 up to 15, so perhaps a future



André Willey offers the best of both worlds with a package to convert Degas pictures to Neo format

"wonder graphics" chip may handle 16 x 16 x 16 colours, giving 4,096 possibilities in all - does that remind you of anything?

Now that we have discovered the screen format and the format of the colour registers, how does all of that fit into the file format of Degas and Nao?

Well Degas has a very simple format. The first word is a flag to indicate the resolution of the file, with 0 being low-res, 1 = medium res and 2 = high-res (monochrome). We are only interested in a value of 0 here, as Neo will only work in low-res. The next 16 words are the 16 colour register values, and the next 32000 bytes are a straight dump of the screen data. Neat, eh?

Neo, on the other hand, has many extra bytes of data to handle the colour animation and so on.

I haven't worked them all out as yet, but the ones in use so far are as follows:

- Words 0-1** Unknown (0,0).
- Words 2-17** Colour registers 0-15.
- Words 18-23** Unknown.
- Word 24** Low 8 bits = position of colour scroll markers.
- Words 25 & 26** Colour scroll settings, speed/time, and so on.
- Words 27-63** Unknown (empty at present).
- Words 64-16063** Screen data (32000 bytes).

If anyone has found out the purposes of any of the other data bytes, why not write in and let us all know.

Once the two formats are understood a

```

100 rem Simple ST BASIC program to convert DEGAS Pictures to NEO
110 rem By Andre Willey, 1986
120 clearw 2:fullw 2:gotoxy 0,1:color 2,1,1,1,1
130 ?"
140 ?:" CONVERT DEGAS (LOW RES) PICTURE TO NEO FORMAT"
150 ??:color 1,1,1,1,1 By Andre Willey, January 1986"
160 gotoxy 14,6:input "Enter Source (DEGAS) Filename >";in$
170 gotoxy 14,7:input "Enter Destination (NEO) Filename >";f$
180 open "R",#1,in$,2
190 field #1,2 as inwords
200 get #1,1
210 i%=cvl(inwords)
220 if i%<>0 then ?:"Can't convert ";in$;". Not Lo-Res":close:and
230 gotoxy 19,9: ?:"OK. Creating new file: ";f$
240 open "R",#2,f$,128
250 field #2,128 as outwords
260 lset outwords=string$(128,chr$(0))
270 for i%=1 to 251
280 put #2,i%
290 next i%
300 close #2
310 gotoxy 10,11:?"File set up: Converting formats ... PLEASE WAIT ...."
320 open "R",#2,f$,2
330 field #2,2 as outwords
340 for i%=2 to 17
350 get #1,i%
360 lset outwords%=inwords
370 put #2,i%+1
380 next i%
390 for i%=1 to 4
400 lset outwords=mkis$(h2020)
410 put #2
420 next i%
430 lset outwords=mkis$(h2E20)
440 put #2
450 lset outwords=mkis$(h20Z0)
460 put #2
470 lset outwords=mkis$(h001E)
480 put #2
490 for i%=10 to 16017
500 get #1,i%
510 lset outwords=inwords
520 put #2,i%+47
530 next i%
540 close
550 gotoxy 24,14:?"Conversion complete."
560 gotoxy 20,16:input "Another File? (Yes or No)";repl$
570 if left$(repl$,1)="Y" or left$(repl$,1)="y" then 120
580 if left$(repl$,1)<>"n" and left$(repl$,1)<>"N" then 560
590 clearw 2:and

```

- 100-150** Set up the screen.
- 160-180** Get the filenames and open the input file.
- 190** Tells Basic that each data item is two bytes in length.
- 200-230** Check if the Degas file is in low-res.
- 240-330** Set up the output file and write zeros to it.
- 340-380** Transfer the colour values.
- 390-480** Set up the Neo special data words.
- 490-530** Transfer the screen data itself.
- 540-590** Close file, check if more files to do.

conversion program is very easy. I have written it in ST Basic, which makes it rather slow, but at least everyone will have a chance to type it in and use it. I was using medium-res colour mode at the time, so you may need to change some of the print statements to fit it neatly on to your screen.

The program will ask for source and destination file names, for example A:FILE.P11, and B:NEWFILE.NEO if you have two drives. It

will then transfer the data from one file to the other, and ask if you have any more files to convert. Type Yes or No here. I have not used the INKEY\$ function as it has some bugs in it on most Basic discs, so you'll have to press Return afterwards. The resultant file will be ready to load into Neo. have fun...

André Willey



Pixels on the screen:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Word 1 (first bits):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Word 2 (second bits):	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Word 3 (third bits):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Word 4 (fourth bits):	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Thus, taking the first bit of each word, and adding them up as above, you will find the colour register for the first pixel, and so on across the full 16 bits.

Diagram I

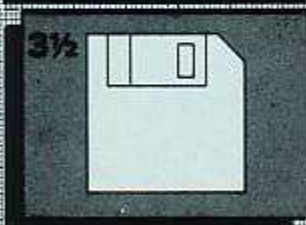
Each of the 16 colour registers is defined as follows:

Bit	First Byte								Second Byte							
	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Colour	x	x	x	x	x	R	R	R	x	G	G	G	x	B	B	B
	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1

EG: Would mean: red level 1, blue level 4, green level 7. (or \$0147)

Diagram II

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The ST's future on show... at the

THE first Atari User Show in March was a great success. Jeff Minter was there demonstrating his incredible Colourspace continually the entire weekend. At various stands it was possible to see all the ST software and have a little play with it.

The new 1040ST and 520STM made their first UK appearance. As I mentioned last month, the 520STM is simply a 520ST with a built-in modulator which allows you to use low-res on a TV. The 1040ST has a built in double sided disc drive, 1mbyte of RAM memory and ROMed operating system.

There was very little new software for the ST. However the software houses that first announced ST titles last September were showing completed versions of their games and business titles. Several houses are developing advanced word processors which will have built-in spell checkers and allow pasting of graphic pictures and diagrams.

Probably the most interesting place at the show, at least for 520 owners, was a small stand displaying various hardware products. AST, who have previously spent most of their time developing add-ons for the BBC computers, have now turned their guns on the 520ST. At the show they were selling a memory board to expand the 520 to 1mbyte for £100 and double sided 3.5 disc drives for about £100 less than Atari's own.

Near the entrance of the show was Megamax's stand. They are probably best known to you as authors of the excellent Megaroids game, which was written as a demonstration of Megamax's C compiler. If you can't afford Atari's own developer pack (£480) you should give this a serious look. Their own ST development pack contains all you need to start serious ST development and will soon be available in this country for about £150.

Overall the show was very exciting for ST owners. We saw the ST celebrate its first birthday - it was announced in Europe last March - with an ever growing base of good quality software. We also saw the future of the ST series.

On the Saturday afternoon of the show there was a private seminar for software developers. The main item of interest to come out of this was

that the spare sockets inside the 1040ST are to hold some new chips that will expand the ST's capabilities. The new chips will probably never be available for the 520 unless a third party manufacturer develops some method of giving the 520 the extra sockets.

The first of the new chips will be a hardware blitter - a blitter is designed to move large areas of memory around at great speeds without relying on the ST's 68000 processor for help.

Second will be a graphics chip which will expand the ST's resolution and give 4096 colours. Both chips will be available by the end of the year and shouldn't cost much more than £125 each. Their addition will mean that there will be five different versions of the ST - 520STM, 1040ST, 1040ST with blitter, 1040ST with new graphics chip and 1040ST with both new chips.

Atari sees the 520STM as the base machine which will soon be available from your favourite High Street retailers. For serious business uses there will be the 1040ST.

Atari feels that the new chips will be added if and when necessary. For example a user who wants to use his spreadsheet at the fastest possible speed will add the blitter and the 1040 owner who wants to do video design will add a blitter and the new graphics chip.

Atari is probably right in this approach - why pay for extra chips that you'll never use? I fear, however, that dealers will all too easily be able to sell the new chips to people who don't really need them. We'll just have to wait 10 months to find out.

Problems, problems

MR J. Partner and several others have written in to complain about STWriter's inability to display the vertical type of apostrophe that appears in the STWriter manual. This is a bug in the ST operating system which has been sorted out in the ROM versions. If you upgrade to ROM your problems should be solved.

Mr H. Symonds, from Harrogate, has written detailing a problem he has been having with his system discs. Sometimes when he attempts to boot up his ST it requests 'the system disc, even

Send your
Atari ST
queries to:
**ANDREW
BENNETT,**
Atari ST User,
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Stockport
SK7 5NY



though he has it in the drive. I have been having a similar problem with my own ST.

It is caused by a badly seated chip inside the ST. The chip in question is either U1 or U9. If you push these chips firmly into their sockets peace should be restored. If you don't feel confident enough to open up your ST your dealer should be able to help.

Paul Wooding has difficulty printing out Basic listings, his printer insisting on placing a blank line between every line of listing. This can usually be solved by changing the setting of one of the DIP switches inside the printer (see the printer manual for more details). The ST already sends a carriage return after each line and therefore you should turn off the carriage return inside the printer.

A few of you have had problems with the listings I've given over the last couple of months. You should take careful note of the spelling of the various variables. For example one variable is called CTRL rather than CONTROL. If you use CONTROL by mistake the ST will crash and display several small pictures across the middle of the screen. These will either be little atomic bombs (system on disc) or small spy bomb symbols (system in ROM).

Many of you may have watched Micro Live on March 14. At the beginning of the programme Fred Harris and Lesley Judd spent approximately four minutes discussing the Atari Show and the 1040 and 520STM. As far as I can remember this is the first time in its history that Micro Live has mentioned Atari or shown its products in any but a background role.

The report was full of snide comments. For example Atari were accused of doctoring their comparison between the Commodore Amiga

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and the ST. Hardly any software was shown and Atari's peripheral to give the ST IBM compatibility was reported as not being able to run well known IBM software. This despite the fact that I saw various IBM packages running quite happily on the ST.

Most of the four minutes was spent discussing Rainbird's Pawn adventure game and no other ST software was demonstrated. Micro Live didn't even feel that the show warranted a video camera.

Come on BBC! In Micro Live you have the opportunity to supply a magazine format programme showing new software for all machines, interviews, and hardware reviews. Micro Live has become little more than an advert for the BBC Micro and spends most of its time discussing computers in education.

As evidence, consider the period when Acorn was having financial problems. While the computer press were reporting Acorn's problems without bias, Micro Live spent several minutes defending Acorn and accusing the press for somehow bringing Acorn down. Write to me giving your feelings on this matter.



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