

ATARI ST USER

*The
top-selling
Atari ST
magazine*

Volume 2
Number 9
November 1987
£1.50

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Deathstrike, Sidewalk,
Tai-Pan, Space Quest
— and many more

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complete listing
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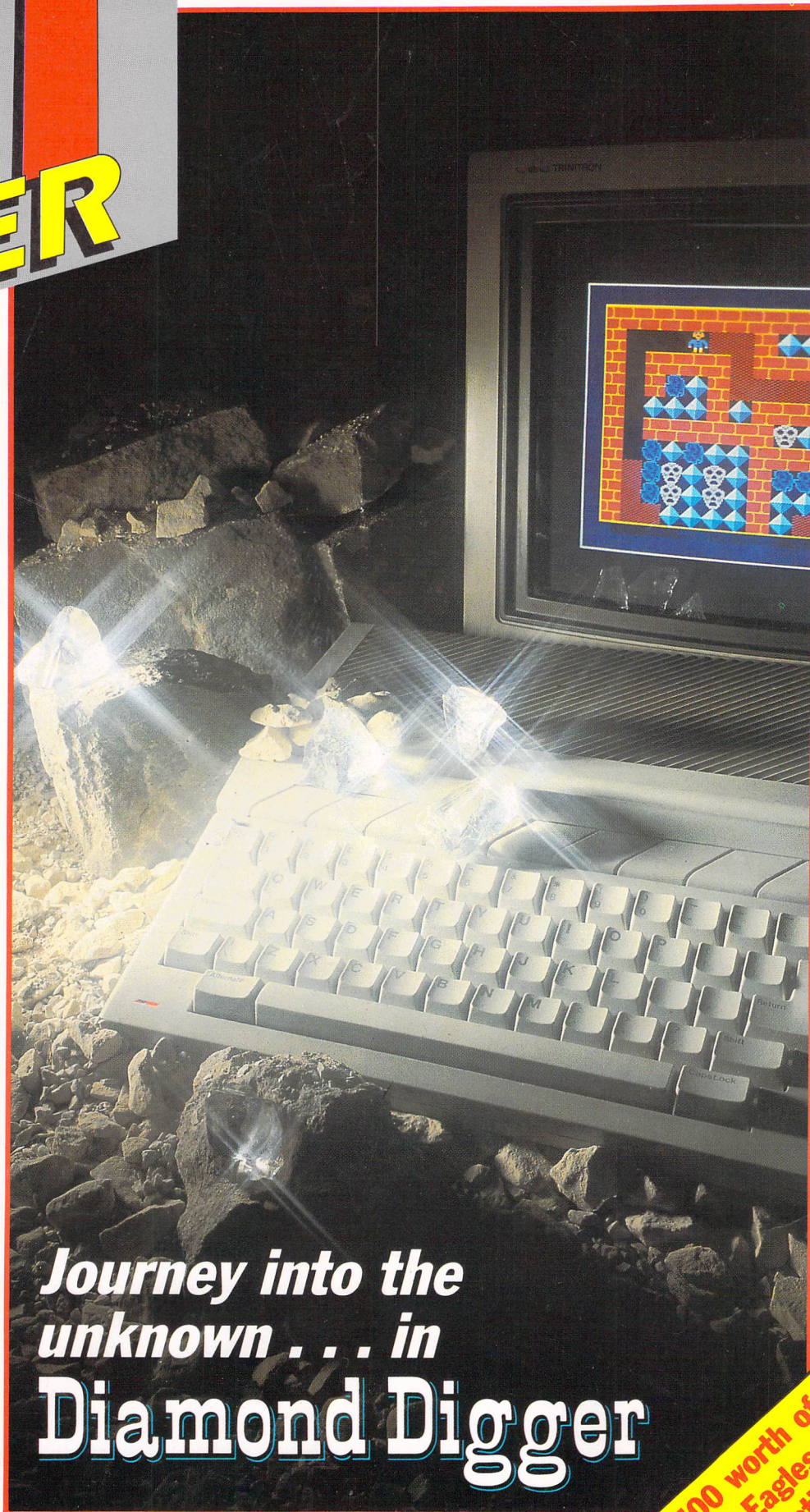
Payroll, Mirage, Raid,
Four colour Plotter,
Fast Asm, MicroStuffer
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GFA Basic tutorial
Machine code maths
Memory editor

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Guide to Knight Orc
Plus hints and tips



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Alas Biff & Bones

"Well the summers over Biff, might as well bin the old skateboard and get down to some serious telly."

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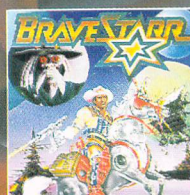
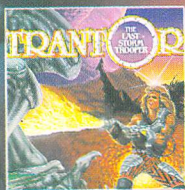
Aven't you seen all this exciting new software coming out from U.S. Gold and Go! Its in all the magazines, your ST should be red hot mate!"

"Yeh! Suppose I better get myself off to the shops Ere, is this U.S. Gold and Go! the number one in software then?"

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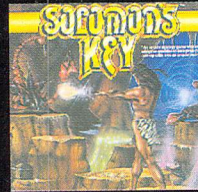


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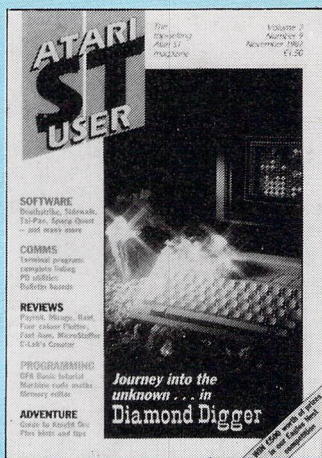


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The big event of 1987...

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Atari buys retail chain in big new sales push

ATARI Inc has made a dramatic move into retailing and looks set to go into component production as part of a major new page in the company's history.

The organisation's \$67 million takeover of American retail chain The Federated Group is the start of a new era, says chairman Jack Tramiel.

"Atari is going to be an international electronics company", he said. "We want to expand into basic production and distribution and the vertical market in computers".

As part of his expansion plans, Tramiel is currently negotiating with several electronics companies about moving into semiconductor manufacturing.

Atari says it has decided to buy into distribution in the US because it has been blocked in its attempts to persuade established retailers to carry its wares.

It is a very different situation in Europe, where Atari sells two-thirds of its computers, and where distributors are keen to take its products.

As one British industry pundit put it: "All this adds up to the fact that Atari is fast becoming a very big firm in the US, and it looks like the firm will go the same way in the UK as well".

Tramiel said: "In business, whatever we do, we go out there to win, not play the sport.

"We have the best product, the best personnel and the best store locations to make sure we win".

Tramiel took over the company in 1984 and quickly slashed costs, restored profitability and took Atari public last November. In the second quarter of 1987, Atari

earned \$13.4 million, an increase of 39 per cent on the same period last year, while sales grew 16 per cent to more than \$70 million.

The company raised a further \$75 million in a Eurobond financing deal this April.

All of which puts Atari in a position to move quickly should a semi-conductor firm become available.

Price cuts and free software for the ST

FOLLOWING the price cuts which brought the 520STFM down to less than £300, a new deal has just been announced by W.H. Smith which makes the computer even more of a bargain.

The High Street store has decided to put its weight behind the increasingly popular ST by bundling £200 worth of software free with each machine.

Among the list of high quality software in the package are The Hitchhiker's Guide to the Galaxy, Arkanoid and Lead-

erboard. Smiths says it has chosen the software "to show what the ST can do".

A spokesman said: "It isn't old stock left on our shelves - it includes key selling titles and premium products".

This additional support for the ST puts it even further ahead in the mid-range of the home computer market.

Together with other pre-Christmas promotions it looks set to boost the already extensive Atari ST user base still further.

ST links with RTL/2

THE Mega ST has penetrated the professional real time market with the availability of the RTL/2 programming language.

Originally designed and developed by ICI and used by blue chip companies and the military, RTL/2 is now available for the Mega ST from TJP Electronics (0723 378837).

For a little over £2000 the complete package contains the Mega ST, monitor, hard disc, mouse and the RTL/2 software.

The system may be used as a main-frame intelligent terminal/workstation or as a real time development host for TJP's M68000/68020 VMEbus or M6089 G64bus system control board range.

Transputer breakthrough

A NEW Transputer-based computer from Atari is now expected to be announced early next year.

As reported in the July issue of *Atari ST User* the company has put resources into the "delegating processor" as a major part of its product development. The hardware has been available for some time, but a suitable operating system has proved much harder to produce.

Dr Tim King, who produced AmigaDOS for Commodore, is reportedly at the forefront of transputer operating system development in a project which has brought together Atari and Perihelion, the Cambridge-based computer design company.

Reports from the US predict the

transputer will be produced as an add-on for the Mega ST.

The as-yet unnamed black box is expected to contain a 32-bit transputer with a high performance graphics subsystem capable of 1024 by 768 pixel resolution and the prospect of 4096 colours. Screen drawing will be done via a customised blitter.

The transputer add-on will be aimed at the workstation and education market.

In the meantime, Atari is expanding in another direction with another PC - this time 80386-based.

Expected out next year, the machine will shun PS/2 compatibility as the company is apparently not convinced that this will become the standard for some time.

CHAMPAGNE SHOWTIME

CHRISTMAS will come early again for Atari ST users.

Last year, the first ever Atari Christmas Show was a resounding success, with nearly 10,000 people packing the Royal Horticultural Hall in London.

This year's show will be held in the plush setting of the Champagne Suite at the Novotel, Hammersmith, scene of so many great computer events staged by Database Exhibitions.

From November 20 to 22, the Atari Christmas Show will mirror an eventful year which has seen the introduction of the Mega ST and laser printer, the Atari PC and a whole new approach to the games market.

Atari itself will again have a significant presence – bringing along all its latest machines and systems, as well as a team of experts to give helpful advice to visitors.

All the leading suppliers of Atari add-ons and software will be there, too, their stands piled high with new graphically-superior ST games and Christmas bargains.

"This is an event no ST user will want to miss", said head of Database Exhibitions Derek Meakin. "Our move to the stylish surroundings of the Novotel this year means they will be able to fill their Christmas stockings in a most comfortable and festive atmosphere".

A money-saving advance ticket order form is on page 4.

Staff's sponsored swim

MEMBERS of Atari UK's staff are all set for a marathon sponsored swim to try and help a toddler return to a more normal life style.

Yvonne Shaw, Philippa Kearney and Mary Barber who work at Atari's headquarters in Slough were so moved by the plight of two year old Adam Briner that they decided to raise as much money as possible to help pay for specialist medical treatment.

Adam suffered brain damage when he fell into a fish pond and almost drowned. Doctors managed to get his heart started again but told his parents that he would not be able to lead a normal life.

The girls are trying to raise up to £5,000 which will help Adam attend the St

Braviels Centre for Child Development in Monmouth, Gwent.

Doctors at the clinic are confident that with the right treatment Adam can regain his skills of speech and movement, but it is going to take at least four years.

Philippa Kearney told *Atari ST User*: "I have a young child myself and can fully understand what Adam's parents are going through. Everyone at Atari is trying their best to give Adam the opportunity that he deserves".

The three girls will be swimming a minimum of 30 lengths and are looking for as many sponsors as possible. *Atari ST User* readers who would like to offer help can do so by contacting Philippa on 0753 33344.

600 hours work – and Sentinel comes to life

TALENTED model maker Peter Clements has spent six months producing a unique chess set based on characters and objects from the ST's cult strategy game Sentinel.

"Having reached level 2974, I gave up my quest", he told *Atari ST User*. "Aching fingers and sore eyes got the better of me and I decided to spend my time in a more constructive way".

Impressed by the attractive characters Sentinel programmer Geoff Crammond had designed for the game, Peter set

about turning them into models for chess pieces.

He decided on Sentinel for the King, Robot for Queen, Sentry for Bishop, Meanie for Knight, Boulders for Rook and Tree for Pawn.

Using the game's pause facility, Peter took about six different tracings of each character. The Meanie was the hardest to visualise, but here he was helped by an original working drawing supplied by Geoff Crammond.

After scaling each individual design to an acceptable size for chess pieces, the models and their bases were carved in epoxy putty.

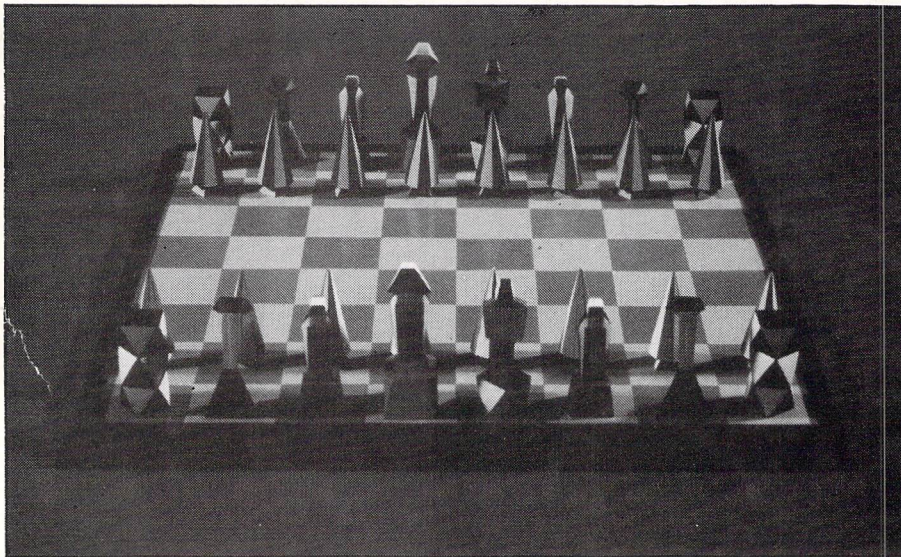
Said Peter: "This stage was the most time-consuming. For example, the Meanie took 16 hours to make in three sections".

The finished pieces are all made from polyester resin, as is the board which consists of moulded squares of yellow and blue tinted perspex – the same colours as the landscape squares on Sentinel's final level.

Finally, the chess pieces were hand-painted – red, yellow and black for one set and green, white and black for the other.

It took Peter 600 hours and £100 worth of materials to complete the project.

The unique chess set isn't for sale – "but if someone offered me the price of the new Mega ST I might just be tempted", he said.

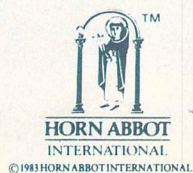


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Life in the fast lane

**Stephen Hill reviews
Fast Asm – a machine
code assembler**

FOR anyone wishing to utilise the many capabilities of the Atari ST to the full, a 68000 assembler is probably an essential buy. Unfortunately, the prices of such systems generally range from £40 to £50, which inevitably puts them beyond the reach of all but the most dedicated enthusiast.

However, help is now at hand with the release of Fast Asm – an assembler from Computer Concepts priced at just £19.95. Fast Asm comes on one single sided disk which contains the program itself and a small addendum to the manual.

The operating environment is practically identical to that of Fast Basic, upon which the program is largely based. The system makes maximum use of Gem, with most commands being available directly from on-screen menus.

In addition, many of these options can also be accessed straight from the keyboard. Like Fast Basic it's rather memory hungry, with only about 190k available for your own programs.

Among its many powerful features is a clever little evaluation function which you can call up from the Asm menu at any time. EVAL enables you to perform some quite complex arithmetic calculations in either hex or decimal notation.

These calculations can include any of the labels defined by your assembled program, and you can even use many standard Basic functions like SIN and COS.

Another thing I especially like about Fast Asm is that it works perfectly well in all three resolution modes. This makes it one of the few assemblers currently on the market which is readily usable by someone restricted to using a domestic television set.

One of the nicest features of Fast Basic is its superb editor, which incorporates every facility you could possibly need. This same editor has been built into Fast Asm and provides an excellent programming environment suitable for extensive use.

Just like its counterpart, it is capable of

*Product: Fast Asm
Price: £19.95
Supplier: Computer Concepts, Gaddesden
Place, Hemel Hempstead, Herts HP2
6EX
Tel: 0442 63937*

dealing with up to 10 separate programs simultaneously. Instead of storing your source programs in Ascii, Fast Asm uses a completely different format directly compatible with Fast Basic. This means any files generated by Fast Asm can be easily loaded into your own Fast Basic programs, though you can save in Ascii form too if you wish.

The assembler itself, like everything else in this package, is almost identical to the one in Fast Basic. It is a fairly unexciting system which provides none of the extras such as macros and conditional assembly found in the more expensive packages.

Oddly enough, it's slightly less powerful than the Fast Basic version, which cleverly utilises Basic procedures to provide an intelligent macro facility. In my opinion the lack of these macros is a serious omission as they simplify the process of calling the notoriously complex Gem and Tos routines considerably.

In practice, this assembler is extremely easy to use. It can be invoked either directly from the Asm menu, or by pressing Alternate+A from the keyboard. A



dialogue box is displayed which enables you to choose where the assembled object program is to be placed and which output device the assembly listing should be sent to.

The options available include the ability to assemble your program either into memory or to a disc file which can then be run from Gem Desktop. By default, no code at all is generated and this allows you to correct the syntax errors in your routines before assembling them to disc.

Although you can assemble the contents of any segment you like, only one object program can be stored in memory. In use, Fast Asm easily lived up to its name, with many programs assembling almost instantaneously.

As usual, an Include directive is supported, allowing you to incorporate whole files of assembly language instructions anywhere in your program. One slight snag with this command is that when Include is executed, the file it uses is immediately loaded into a spare memory segment.

This limits the size of the file to the amount of memory currently available, and therefore makes this function far less effective than the equivalent directive found in most other assemblers.

Dosegment is a powerful feature which enables you to include the contents of any other segment as part of your program during assembly.

You can use this facility to debug each individual subroutine of your program

separately and then merge them directly into your final program with a single instruction to the assembler. Because all the segments are already stored in memory, there is no loss of speed and the whole operation performs amazingly quickly.

After you've assembled your program, the next step in the debugging process is to test it. Some assemblers force you to return to Desktop to do this, which can be rather tedious.

Fortunately, Fast Asm provides you with the ability to execute any program currently in memory, using a special Run Code option from the menu. The dialog box first asks you to input the location of the program, which can be specified using either a label or an absolute address.

The current contents of all the 68000 processor registers are shown and most of these can be readily changed before your program is run. The program is executed and the dialogue box is then redisplayed showing you the final state of the registers.

If an error occurs in your program which causes a 68000 exception such as an address error, this is automatically trapped by the system. The dialogue box will then tell you precisely what has gone wrong. You can now exit to the editor and make any alterations required.

One problem found with this feature was any attempt to call the CONIN function from Gemdos locked up the ST completely.

This means it would be very hard to use this facility to debug programs which accessed the keyboard. I still contend that a machine code monitor of some sort is essential for the serious assembly language programmer, but this type of system is perfectly capable of detecting many of the more common mistakes, and in practice it proved very useful.

Considering Fast Asm's origins it's probably not surprising to find most of the 35 page manual has been copied word for word from the appropriate sections of the Fast Basic version.

Although there's nothing inherently wrong with this approach – and many of the details involving the actual operation of the package are fairly well explained – there's no information at all on how the system can be used in the development of real programs.

Only two example programs are included in the manual and since one of these uses a Gemdos CONIN call, it doesn't work when you try to execute it directly from the assembler.

The manual also offers no assistance to the many buyers wishing to incorporate their finished programs into a high level language such as Basic.

This would have taken less than a couple of hundred words to explain fully and is really a rather serious omission in a package destined to be used by many

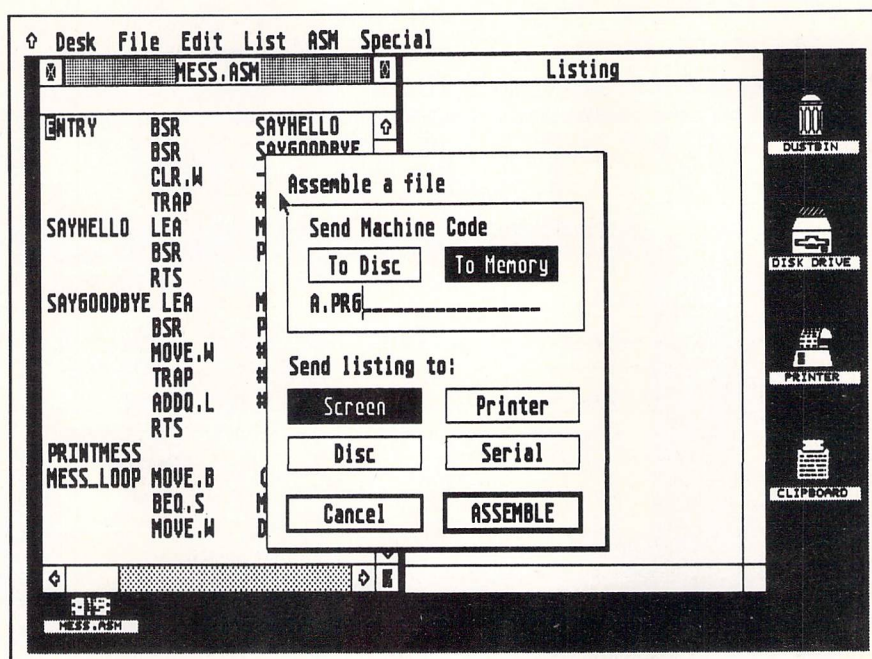


Figure I: Assembly options

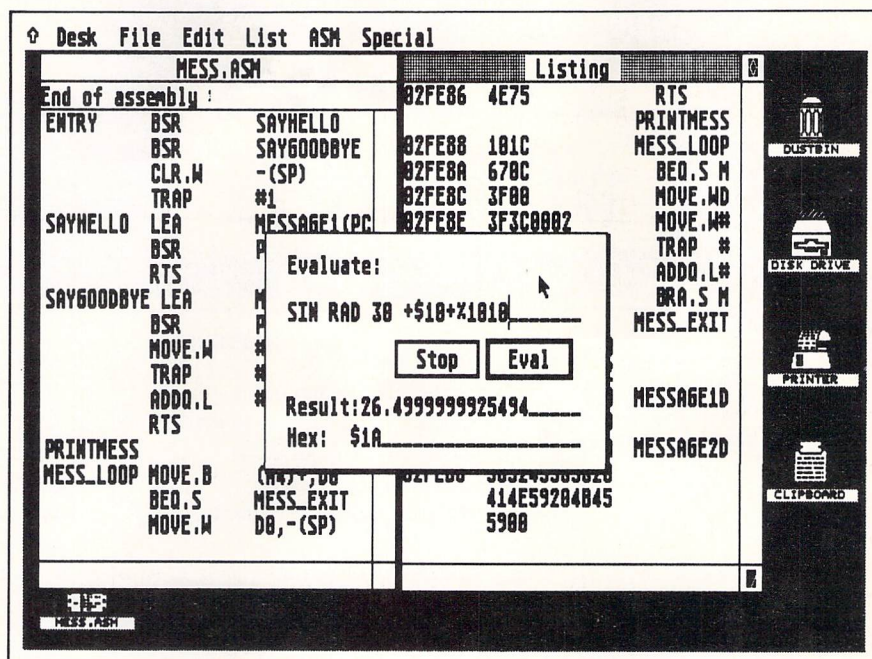


Figure II: Fast Asm's evaluation function

beginners to assembly language programming.

There's also a noticeable lack of any example programs on the disc. This irritating omission would cost Computer Concepts almost nothing to rectify and would make it much easier for inexperienced users to familiarise themselves with this package.

Fast Asm is less than half the price of any of its competitors, but it is also only about half as powerful. Having said that, the package still represents excellent value for money and for many people will provide a perfect introduction to assembly language programming.

The documentation is rather sparse and there are no example programs

included on the disk to get you started. I also encountered a couple of problems with the memory management system, which occasionally caused the whole package to crash.

Computer Concepts assures me these problems were due to my early copy of the program (version 0.91) and they have all been eliminated in the production version (1.00 upwards).

Now Fast Basic is available on disc for around £40, the difference between this and Fast Asm is barely £20, and any prospective buyers should carefully consider incurring the extra expense.

But the bottom line is, that at the current price, Fast Asm is quite simply in a class of its own. □

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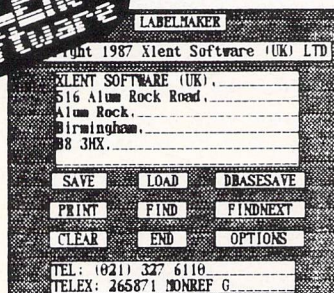
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Solution without a problem?

SITTING across the table in the Atari ST User office, systems programmer David Hogkinson delivered a demonstration of one of the most important software developments for the ST to date.

Mirage is an operating system offering true multi-tasking, multi-user facilities for the ST range of micros at an affordable price.

It was originally released in 1981 by British software house Swift Computer Systems and was one of the first operating systems available for the 68000 series of microprocessors.

Implementations followed for use on the HP 200 and 300, Stride 400 series, Gemini Challenger, Ferroglen Lucid and so on.

Since those early days, its designer Bill Dowling of Swift Computers has continued to update and improve the system, which has now reached release 2.0.

The conversion to the ST, by David Hogkinson of Sahara Software, took just six months work on his Stride 440. A remarkable feat considering the entire program is coded in assembly language. Other operating systems, Gem for example, have been written in high level languages like C.

Assembly language was used for compactness and speed – the complete Mirage system occupies less than 100k, the kernel taking only 37k of that. The practical advantage for the ST is that this, along with a comprehensive suite of utilities, fits very neatly into a 128k prom cartridge.

Getting the system up and running is simply a matter of plugging in the cartridge and booting the Mirage start of day disc.

When this is done Tos remains active to perform background tasks such as keyboard handling, disc I/O and Line-A graphics. Gem is switched off completely speeding disc access time considerably.

However, if you wish to return to Gem, it is simply a matter of warm booting the system with a Gem format disc. One practical upshot of this is it allows files to be imported from, and exported to Tos very easily – except Mirage can only read from the Tos root directory, that is, any file which is not in a folder.

My first impression of Mirage is that it is, at present, a solution without a problem. For a start, it has none of the user friendly features of Gem that make it so nice to use, like a Wimp environment. The whole system is driven by command lines.

Users of CP/M will no doubt feel at home here, but the ST owner, having

Mark Smiddy previews Mirage, a new operating system for the Atari ST

become used to Gem, may find this irksome. It has to be said though, Mirage is not aimed at the home user, but at those who find Gem a restriction.

That means almost anyone who has ever tried to develop serious software while under Gem control, for instance in a scientific or research environment or even in higher education.

As a command line driven operating system I found Mirage remarkably friendly. The command structure is well thought out and meaningful.

For many of us, the first time we meet a command driven operating system it's in the form of, say CP/M on the 8 bit, Z80-based micros, or even MSdos on a PC – and they can be a bit daunting.

In Mirage commands like COPY exist, which is rather more meaningful than CP/M's PIP, (peripheral interchange program), but does exactly the same thing.

Thankfully things have come a long way since those industry standard operating systems became popular and Mirage suffers from very few of the early hangups.

Filenames are still limited to eight letters in length with an optional four letter

extension, allowing names such as MYFILES.ASCI. This follows a historical precedent, for which I can find no reasonable excuse today, but it still clings on with limpet-like tenacity.

To be fair though, because you can have as many directories and filenames as available disc space will allow, this will rarely present a real problem.

Device naming conventions is another area where Mirage will present a headache for the confirmed Gem user. Physical disc drives are known as DSCn: where n is the drive number, rather than A, B and so on as you might expect.

In a multi drive or hard disc based system the system drive must always be specified after booting or Mirage will look on the default drive DSC0: normally drive A.

After the system boots up, the time and date are requested so various housekeeping functions can be carried out. It then looks for a file called autoboot.cmdf, a command file similar to CP/M's PROFILE.SUB or MSdos' AUTOEXEC.BAT.

This allows the system manager to define a sequence which will automatically configure the system to his precise needs at switch on. Unlike CP/M the command file has its own programming language, allowing day to day customisation if required.

An example of this can be found in the MULTI.CMDF file, which is used to set up multiple jobs automatically. The program is a text file containing a sequence of commands that are executed like a ▷

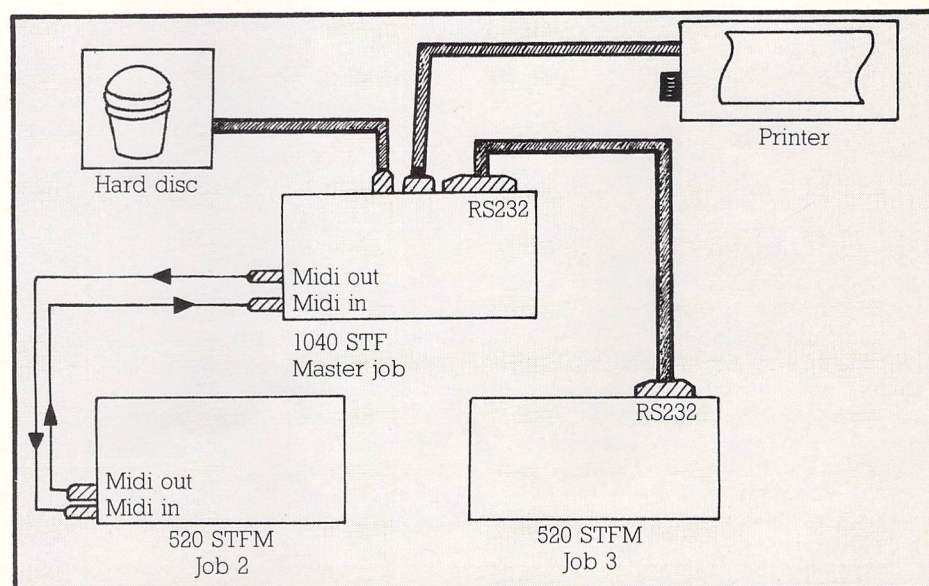


Figure 1: Simple three user multi-user system using Mirage

◁ program.

It first prompts for a number of jobs between one and seven, checks the input for range errors, then sets up each job in turn together with its memory allocation.

Other features of Mirage worth noting, merely because similar facilities do not exist under Tos, are the bolt-ons and the shared modules.

Basically a bolt-on is a utility program that can be added, or bolted on to the operating system at any time, usually at startup. Examples of bolt-ons are the IEEE 754 floating point package which supplies full floating point routines, and the disc cache which helps to speed up disc access by storing the most frequently used tracks in memory.

Another bolt-on, not supplied with the package, is Trap, an extended file handler. Using this it should be possible to implement bulletin boards and even complex multi-user dungeon games.

To all intents and purposes, the shared modules are the same as bolt-ons. Examples include the run time language packages for Pascal, Lisp and so on. The only difference is in the multi-user environment, where bolt-ons can only be used by the host machine.

The real power of Mirage becomes apparent when you start to use its extensive multi-tasking features. Given an ST with enough memory, the system gives access to up to 31 bit-mapped screens, each one belonging to a separate job with its own memory allocation. At any time you can flick between these with a simple keypress.

Because each screen takes a full 32k, on a half-megabyte ST seven concurrent jobs is about the useable maximum. This allocates half of the available memory for display, and 32k for the master's own display.

Jobs can be thought of as being terminals connected to a host processor: As such each job can run its own programs, set up its own tasks and so on.

Provided enough memory is available, it is quite possible to have a spreadsheet, word processor, database and even a bulletin board all running concurrently on the same machine.

It is vital to realise that each program is running individually. Each can be accessing the disc, performing calculations or talking to a modem while the user gets on with his current task, like using the word processor.

On a standard ST, applications like Kuma's excellent K-switch also allow two programs to reside in memory simultaneously, but not to run as such. This is a very important difference.

Taking the aspect of multi-tasking one stage further we step into the realms of multi-user. This sort of facility is superfluous to the average home user, but is a cost-effective solution for those in business or education.

For a relatively small outlay, a small business could buy three machines and use them in a simple multi-user setup as in Figure I. The host machine, equipped

with a hard disc and printer is used as a terminal and fileserver, with two parasitic intelligent terminals, one connected to the midi port and the other to the serial.

Each of the terminals can use the printer and hard disc as if it belonged to them, thus reducing the cost. A further advantage is that the system manager can effectively lock them out of certain areas of the hard disc, thus providing security for precious data.

As Figure II shows, by connecting the machines differently it becomes possible to network them in a ring of three via the midi ports.

The data in this case is passed to and from the system host machine in time sliced packets, each machine on the ring having its own unique identity and user priority.

In this format, users with heavy disc I/O can use their own floppy drive during the day, only accessing the hard disc on

RS232.NET software, the price of which is not yet fixed.

It is without doubt the most complex and powerful open ended operating system I have used on anything resembling a micro and for most users it's more than they'll ever need.

Overall support for Mirage is unique in the budget micro field. The designers will allow and even encourage those with know-how to extend the system. To this end they include the source listing of some of the software with the package.

For the home market, its uses are obviously limited, although it does open doors with programming languages such as Basic, Fortran, Lattice C and Pascal already available with more to follow.

Included with all of these is a comprehensive 68000 assembler package which costs over £50 if bought separately. For the business user there's always the Oxsys suite, a Lotus 1-2-3 feelalike.

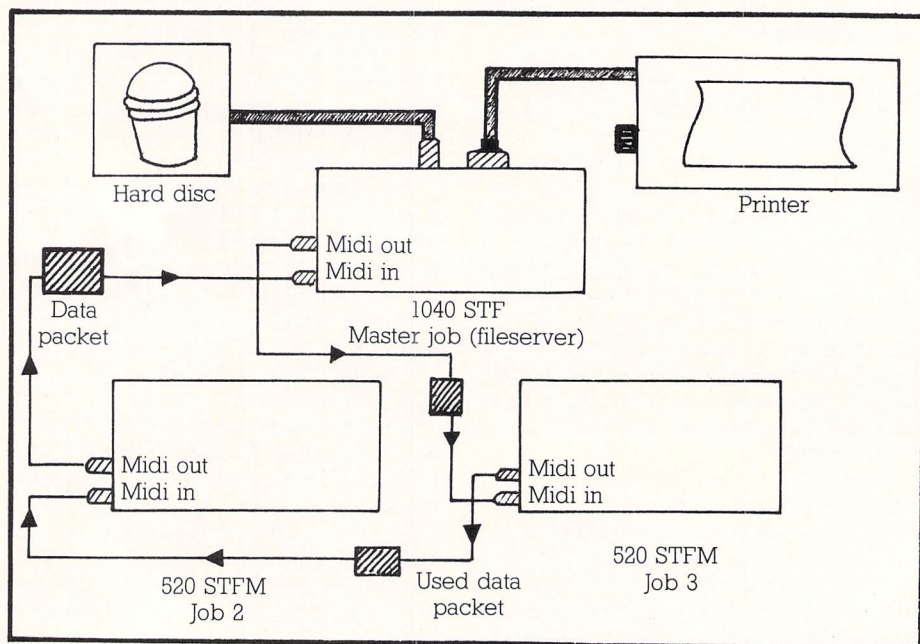


Figure II: A three machine packet switched network using Mirage

startup and updating it using the copy by date utility before switching off. In this way extensive time overheads are kept to a minimum.

Unfortunately, although Mirage can allocate literally hundreds of networked terminals, three is the practical maximum due to the speed of the midi port.

A further feature of the multi-user facility is system security. Normally, in a single user setup, security is kept to a minimum with the user gaining effective system manager status.

In the multi-user environment though, it is vital to ensure low grade operators are not given access to system files or confidential records.

To this end, Mirage provides a comprehensive, multi-level access permission coding. Four main levels are supported together with certain privileges allocated to individual users by the system manager.

The use of Mirage in multi-user mode requires the additional purchase of the

Because of its complexity, Sahara Software offer regular training courses for system managers and users. They will also act as consultants to customers running Mirage in the multi-user environment.

I found Mirage to be an excellent addition to my ST, but it's not for the beginner. What it does it does very well and could open the door to a whole new market for the ST worldwide.

The pricing structure of Mirage and associated software is lean to say the least, the cartridge itself weighing in at just under £100. For the current price and availability of Trap, RS232.NET and all languages, contact Sahara.

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Price: £122.89

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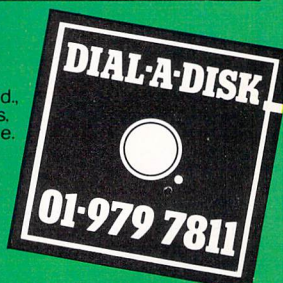
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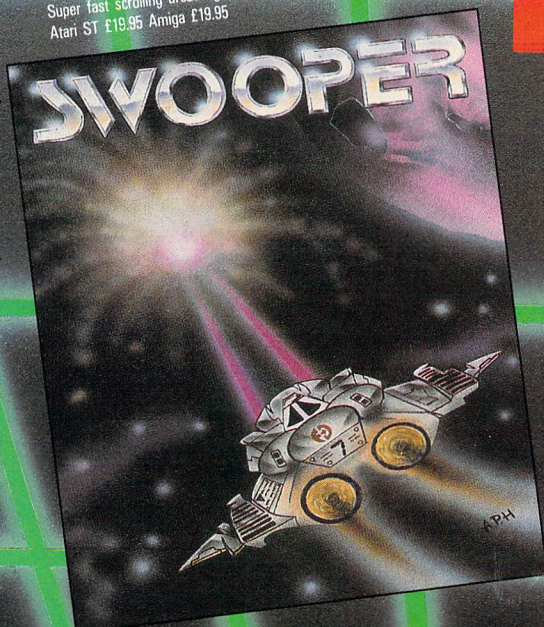
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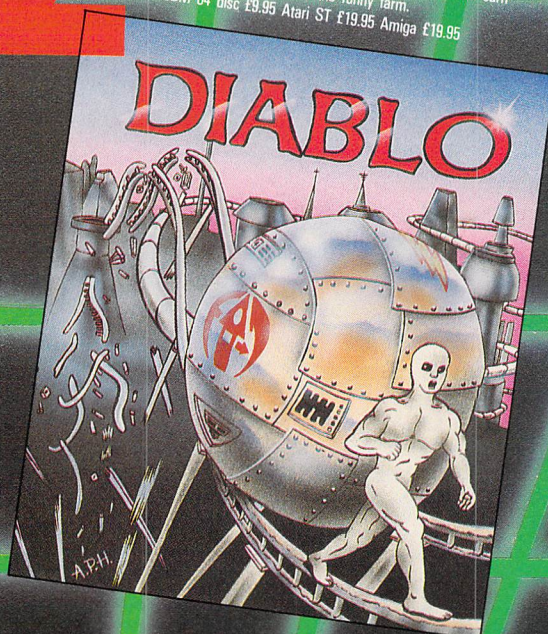
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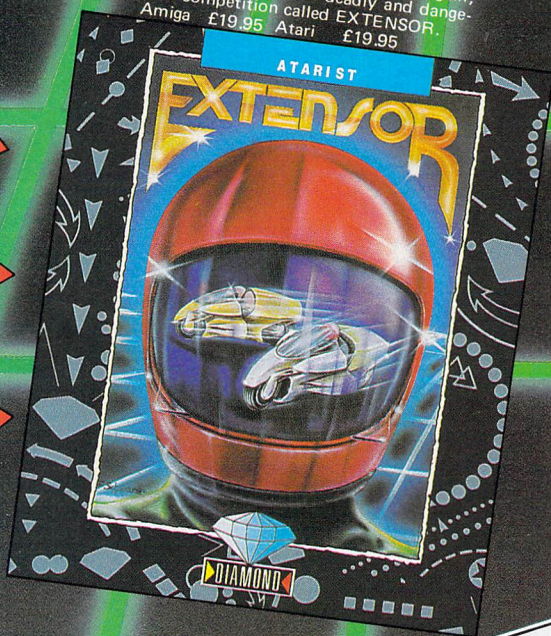
DIABLO

This game is very simple really. You slide pieces of track in front of a moving ball, and as it passes over a section of track, the track disappears. You just have to keep the ball rolling until all the track is gone. Graphics are simple but effective, sound is nice and the mouse interface easy to use. It's also so maddeningly addictive that it could earn you a one way ticket to the funny farm.
CBM 64 disc £9.95 Atari ST £19.95 Amiga £19.95



EXTENSOR

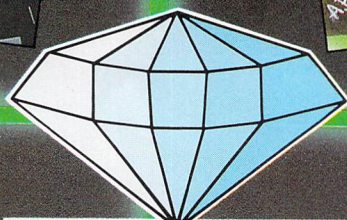
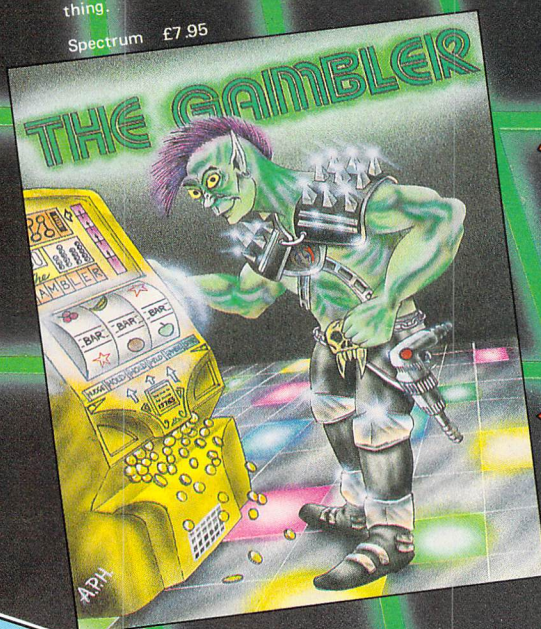
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DIAMOND

Diamond Games, Unit 4, Isleworth Business Complex,
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DIY Basic menus

THE Basic supplied with the ST is a little sluggish and limited in what it can do. There are also many undocumented features – bugs – which make its operation uncertain.

Software houses have been quick to capitalise on this and have launched their own versions which offer significant improvements over the standard one.

Upgrading to a more versatile Basic seems to be high on the priority list of many ST owners, so in this article I shall be providing some programming tips for GFA Basic owners.

The manual supplied with it is quite comprehensive in covering the syntax of all the commands. However, if you can read the black text on red paper without suffering permanent eye damage, you will no doubt have noticed there are very few program examples which demonstrate how to apply the commands. The aim of this article is to rectify that omission.

GFA Basic is very versatile and to my mind its most useful feature is the inclusion of the Menu and Alert commands.

You can give your homegrown software a professional look by incorporating a menu bar across the top of the screen from which various selections can be made. And when operator intervention is required, or an error has occurred, signify the fact with a dialog or alert box.

Implementing these features is not too difficult, as we shall see. The final listing gives you your own Desktop environment and although the actual applications of the menu items are all rather trivial, they do illustrate the principles involved. Using that program as a template you should be able to adapt it to meet your own needs and requirements.

The Alert box gives you the means to pass on a message to the user at some point in the execution of a program. For instance, it could be used to warn of impending disaster, or prior to quitting a program.

One, two or three click boxes can be activated and a user selection made to confirm a choice. In GFA Basic these are exceedingly easy to implement. Load GFA Basic and type in the following listing:

```
Rem Alert Demo
A$="Do you really want to quit"
B$=" No | Yes "
Repeat
Input "Press Return to Quit",Z$
Alert 3,A$,1,B$,var
Cls
Until var=2
```

Bruce Smith shows how to write custom menus in GFA Basic

It's very simple, but makes the point. Run the program and hit the Return key. An Alert Box appears and asks if you really want to quit.

Notice how the No box is highlighted and the Yes box isn't. Clicking the mouse on the No box (or pressing return) re-runs the program: Click on Yes and you quit the program.

The Alert command is doing all the donkey work and it has the following syntax:

Alert a,A\$,b,B\$,var

The items *a*, *b* and *var* can be replaced with numbers or can be variables set to a particular value. The strings *A\$* and *B\$* may be either pre-defined or you can use text encased in quotes. Let's examine each component.

The value *a* should be in the range zero to three and defines which character is displayed in the alert box. Zero displays no character and one, two and three display !, ? and STOP respectively.

There are no particular hard and fast rules here, so use which ever seems suitable.

The string *A\$* holds the message to be displayed in the Alert box. It is limited to four lines of 30 characters each. It is up to you to split each line by using a vertical bar character in the text. If you don't, then only the first 30 characters of the line will be displayed.

The value of *b* lets you define which button is to be highlighted – this determines what action will take place if the Return key is pressed. Up to three buttons may be present so this value must be in the range one to three.

The string *B\$* contains the text to be written inside the buttons. The text of each button should be separated by the vertical bar character, and each button

can display up to 8 characters.

The last variable, *var*, is used to hold the number of the button that was clicked on.

In our first example *A\$* holds the text to be displayed "Do you really want to quit", *B\$* the text for the buttons, "No" and "Yes". Option 3 is selected as the *a* parameter and so the STOP sign is displayed.

When the Yes button is clicked the variable *var* is loaded with the value 2, the loop condition is met and the program ends.

Displaying a menu bar across the top of the screen is just as simple, though considerably more programming is required. Figure 1 shows a simple menu bar so we'll now set about programming this.

The first thing to do is decide on the items you want in the menu bar and the options each will give you access to. Table 1 lists the example bar – there are four main headings.

It is conventional to place the Quit option in the first pull-down menu, (not counting the Desktop menu), and this is included below a series of dashes.

Each of the items (and a few more) must be read into a string array – this is simply a string variable that has a pre-defined number of elements, the position of each being defined by a number.

The first thing to do is dimension the array with the requisite number of items. The formula for this is easy: Add up the total number of menu items and options and double it. This will give you more ▶

Menu Desktop	Options in Menu About DIY Desktop <Other Desktop Accessories>
Circles	Circle Ellipse ----- Quit
Rectangle	Rectangle Square
Messages	Greetings Abuse

Table 1: The menu bar options

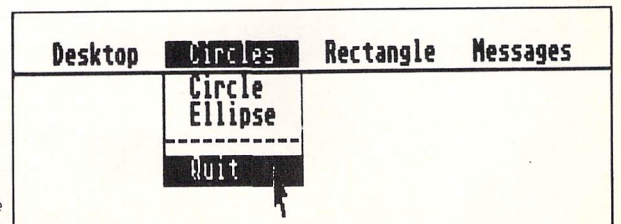


Figure 1: The menu bar

◁ elements than you need, but it's better to have too many than not enough.

Once we have worked out our total we can enter the first line of the program. The line numbers are not needed but are included here to help you follow the order of the program – don't enter them:

```
10 Rem DIY Desktop
20 Rem GFA Basic Only
30 Rem by Bruce Smith
40 Rem Atari ST User
50 Dim Z$(26)
```

The array variable is Z\$. The next step is to read each of the menu options into the array. The quickest way to do this is to put the information into DATA statements and use a loop structure to read each one in turn.

For descriptive purposes I have used the longwinded approach of defining each array element individually to make it easier to follow.

The first set of array entries must follow a particular format to allow any desk accessories you may have installed to work correctly. You call the first entry, Z\$(0), Desktop and follow this by a program information option in Z\$(1) followed by a row of dashes in Z\$(2).

In turn, this must be followed by six dummy elements in Z\$(3) to Z\$(8) in which desk accessory options will be written (lines 90 to 140). Finally all menus are terminated by a null string as shown in line 150:

```
60 Z$(0)=" Desktop "
70 Z$(1)=" About DIY Desktop "
80 Z$(2)="-----"
90 Z$(3)="1"
100 Z$(4)="2"
110 Z$(5)="3"
120 Z$(6)="4"
130 Z$(7)="5"
140 Z$(8)="6"
150 Z$(9)=""
```

Defining the main menu options is done in a similar manner. First define the title to be displayed on the menu bar, followed by the options to be displayed when the menu is pulled down. Again, the lists are terminated by null strings:

```
160 Z$(10)=" Circles "
170 Z$(11)=" Circle "
180 Z$(12)=" Ellipse "
190 Z$(13)="-----"
200 Z$(14)=" Quit "
210 Z$(15)=""
220 Z$(16)=" Rectangles "
230 Z$(17)=" Rectangle "
240 Z$(18)=" Square "
250 Z$(19)=""
260 Z$(20)=" Messages "
270 Z$(21)=" Greetings "
280 Z$(22)=" Abuse "
290 Z$(23)=""
```

When you have listed all your menu

items and the options they contain, an extra null string should be included at the end. This is because the GFA Basic interpreter recognises this sequence as the end of the menu definition:

```
300 Z$(24)=""
```

The next step is to display the menu on screen and this is done with two calls of the Menu command:

```
310 Menu Z$()
320 Menu Off
```

To deactivate the menu at any time the command is Menu Kill. All we need to do now is place the program in a continuous loop which sits there scanning the menu bar until a selection is made. Luckily most of this is handled by the On Menu command as follows:

```
330 On Menu Gosub Info
340 Do
350 On Menu
360 Loop
```

Line 330 points GFA's menu-handling routines to the main Procedure which in turn handles the menu selections. Procedure Info has to control a number of things. First when a selection is made it must turn the menu off and clear the screen.

From the assignments made to the various array strings earlier each item in the menu has a number related to it. For instance, the ellipse option in circles was assigned to Z\$(12) and so the number assigned to the ellipse option is 12.

When a menu item is selected by the mouse it is passed to the menu command which can then be read into a variable thus:

```
370 Procedure Info
380 Menu Off
390 Cls
400 Value=Menu(0)
```

The parameter to read the menu number selected is zero, but there are other actions Menu can perform by varying this number.

All we need to do now is test the value in the variable Value and take the appropriate action on each occasion. If the number matches, then call a procedure to carry out its wishes, else test for the next value. As an example, the About DIY Desktop selection is menu item one so if Value equals one we can throw up a small Alert box to print out the program information like:

```
410 If Value=1
420 NS="DIY Desktop | Bruce Smith | Atari ST User "
430 Alert 1,NS,1," OK ",B
440 Endif
```

The If/Endif structure is used here and works like this: If the expression being tested is correct (true) Then carry out the instructions until you reach an Endif command Else move directly to the Endif command ignoring all the commands in between.

In this case if Value equals one the Alert command is performed and then the ST will wait for the user to click on OK or press Return. The other menu options are treated in the same way.

```
450 If Value=11
460 Dia=100
470 Gosub Docircle
480 Endif
490 If Value=12
500 Dia=50
510 Gosub Docircle
520 Endif
530 If Value=14
540 End
550 Endif
560 If Value=17
570 A=300
580 B=500
590 C=100
600 Gosub Dosquare
610 Endif
620 If Value=18
630 A=100
640 B=200
650 C=200
660 Gosub Dosquare
670 Endif
680 If Value=21
690 GS="Hello there Matey"
700 Gosub Message
710 Endif
720 If Value=22
730 GS="Go back Home!"
740 Gosub Message
750 Endif
```

Once all the options have been defined all that remains to do is clear the screen and display the menu bar again (lines 760 and 770). At the end of the program we can place the procedural definitions as called by the Gosub commands:

```
760 Cls
770 Menu Z$()
780 Return
790 Procedure Docircle
800 Ellipse 320,200,100,Dia
810 Fill 0,0
820 Input "Press Return to continue",AS
830 Return
840 Procedure Dosquare
850 Box 100,A,B,C
860 Fill 0,0
870 Input "Press RETURN to continue",AS
880 Return
890 Procedure Message
900 Alert 1,GS,1," OK ",B
910 Return
```

If you are still a bit unsure then do play around with the program and try to adapt it. Try adding a new menu option to the bar – perhaps a More Messages option to begin with – but don't forget to change the Dim statement in line 50. □

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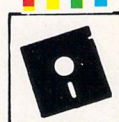
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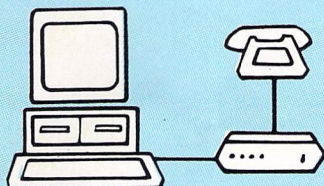


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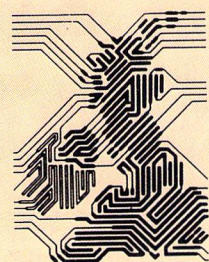
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D	<i>Silica Shop: Miracle WS4000 V21, V23 modem + PC Intercomm software (£332)</i>
E	<i>Aaronfay: Trinitas Phasor V21, V22 modem + ST Datacomm II software (£413)</i>

* Any of these modems can be used with the Terminal program on Page 31 of this month's Atari ST User, instead of the software listed here.



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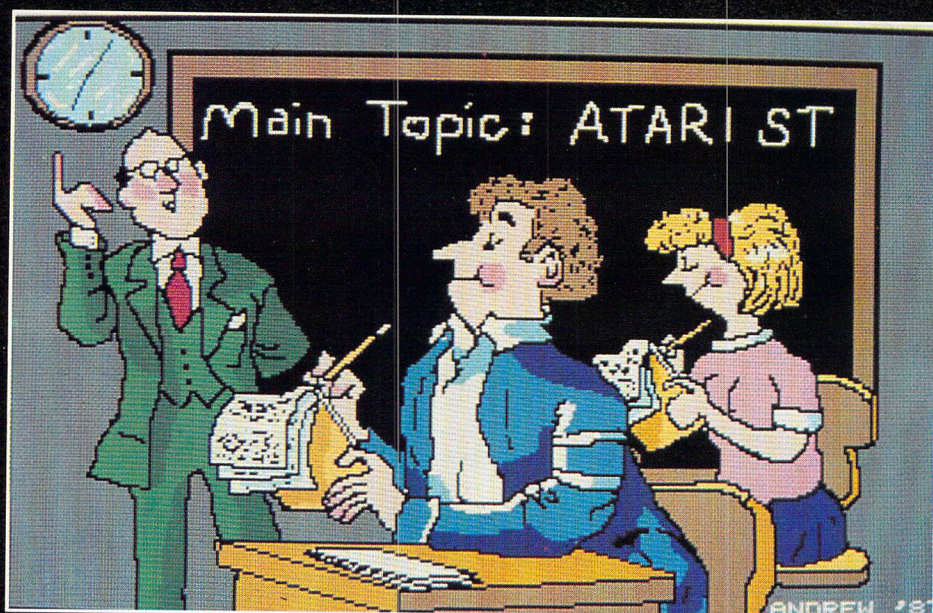
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GALLERY goes international once again: First class and Tanks for the memory come from Andrew Chiou in exotic West Malaysia.

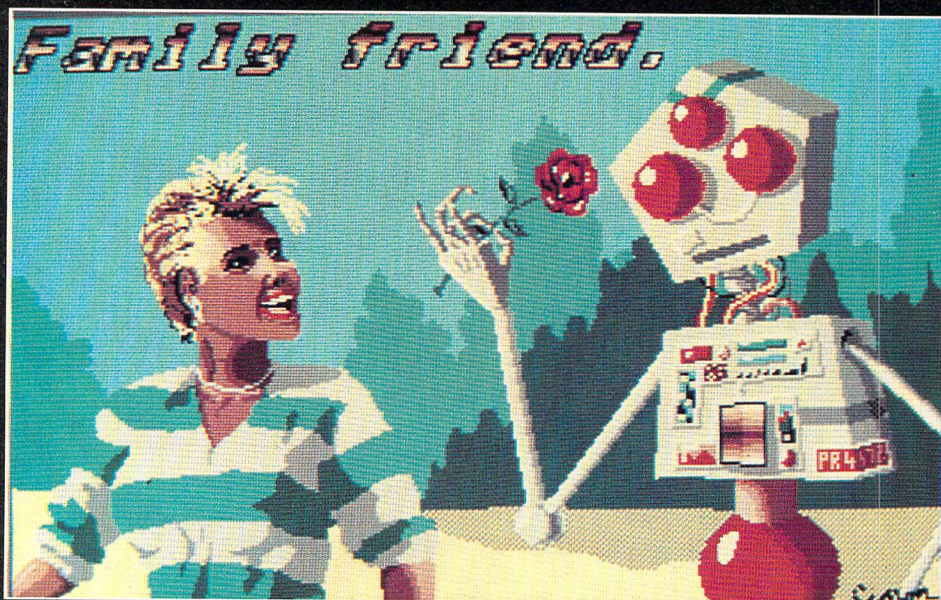
The Lakeland cottage was sent to us by Ian Elliott from slightly less exotic Hull on Humberside, and the other three graphical greats fought their way through the tropical rain forests which surround Accrington in Lancashire, and are by Simon Brewer.

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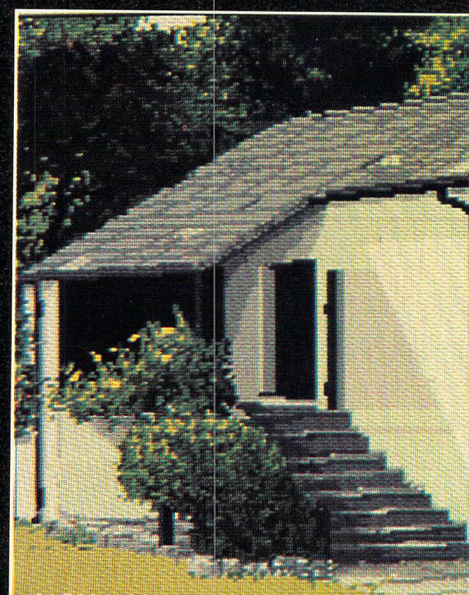


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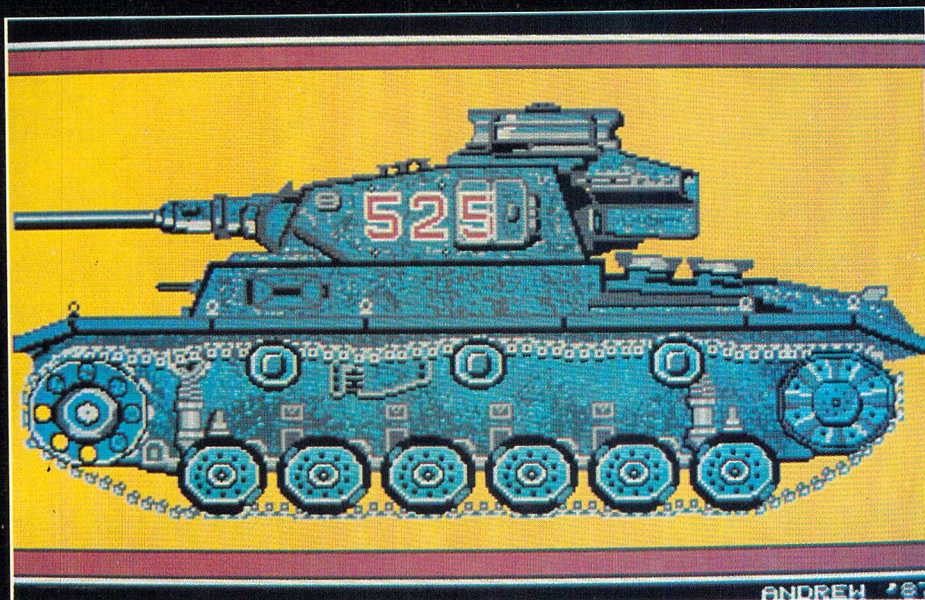
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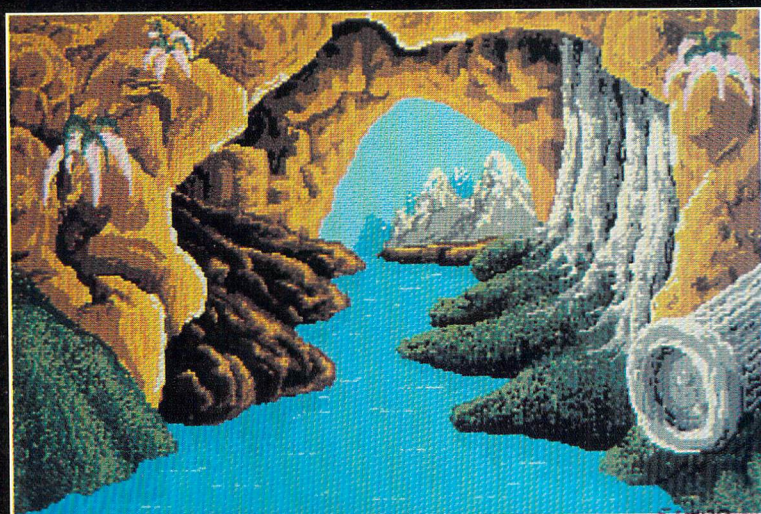
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Raiders of the lost spark

IF you ask a 68000 assembly language programmer what stage of development of a software package he dislikes the most, the probable answer will be debugging.

This involves a lot of time and effort as the programmer jumps between the monitor and assembler, correcting errors as they are found. However, Microdeal's latest release, Raid, aims to make this vital chore easier and much faster.

Raid is a fairly compact 50k program and so allows relatively large programs to be worked on. To its credit, it runs in all three screen resolutions, although with a television set, even when set to low resolution, the characters are rather small and quite hard to read.

The program will work in conjunction with Kuma's K-Switch (a utility I regularly use) and will load at bootup from an Auto folder. It is unprotected and so can easily be placed on a hard disc drive.

The program has three display screens. The first is shown in Figure I and is the main screen from which most work is done. The second is the Help screen which lists all the commands and their syntax. The third is for the application being debugged.

This means the effects of the program being debugged can be seen without having to leave Raid. Figure I was created by copying Raid's main screen to the application's screen, then dumping it to the printer using Alternate+Help.

Although the main screen does not use Gem at all, it is well designed with the 68000 system variables, any breakpoints set up, and memory variables always on hand.

The bottom left corner of the screen is

William Hern evaluates Raid, a machine code programmer's toolkit

the user area where the command cursor is placed and the results of those commands displayed. The screen is well planned with the most important information always on the screen.

The program has all the usual monitor commands you would expect and you can dump the contents of the memory to the screen or printer, set up to six breakpoints, manipulate memory by moving, copying, or filling blocks and you can trace the machine code by single stepping through it as it is being executed.

What really gives Raid the edge over others of its type, is the inclusion of a disassembler and mini assembler.

This means small alterations to the application being debugged can be made on the spot without the tedium of having to exit the debugger, load an assembler, alter the source code, save it, leave the assembler and finally reload the debugger.

This single feature could save many hours of programming time.

The assembler is certainly not up to entering complete programs, having none of the more sophisticated editing features of full assemblers, but it is unquestionably useful in altering the source code.

The manual assumes a fair level of technical knowledge and is simply an

index of the commands with a brief account of their operation plus a couple of example uses for each one. This is probably sufficient, as the package is aimed at the more advanced programmer.

I have only a couple of complaints. Once the command line has been read into the machine it is wiped, leaving no trace of it on the screen. I would have liked to have had it scroll up the screen with the rest of the text so I could see what I typed in last time.

My other complaint regards the ? command. According to the manual ? should convert a decimal number to hex among other things, but I couldn't get it to work. Perhaps this feature will be corrected in future versions.

In conclusion, I found this utility to be very useful indeed. I am an ardent mouseketeer, but not once with this program did I feel the need for the mouse or Gem windows.

I know of no product which can match it for debugging as it seems perfect for this most tedious stage of a program's development, with a well chosen set of commands and a very clear display.

This program is in no way aimed at the beginner, but then few beginners start off with 68000 assembler. If you find 68000 debugging a time-consuming business I recommend at least having a look at Raid. It could save you a lot of time and effort.

Product: Raid

Price: £24.95

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Tel: 0726 68020

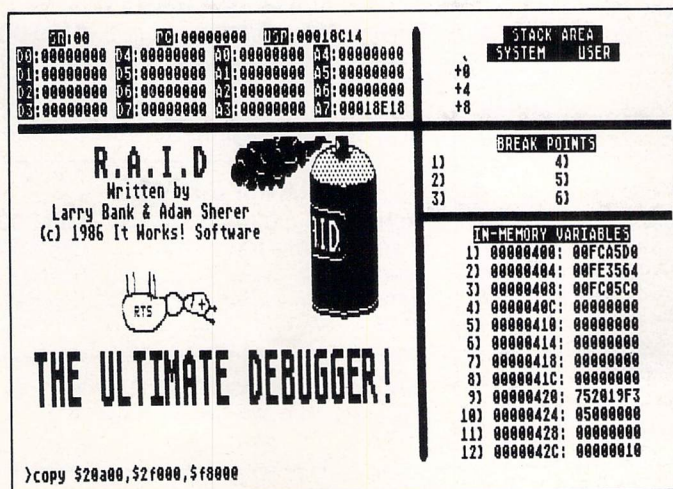


Figure I: The main opening screen

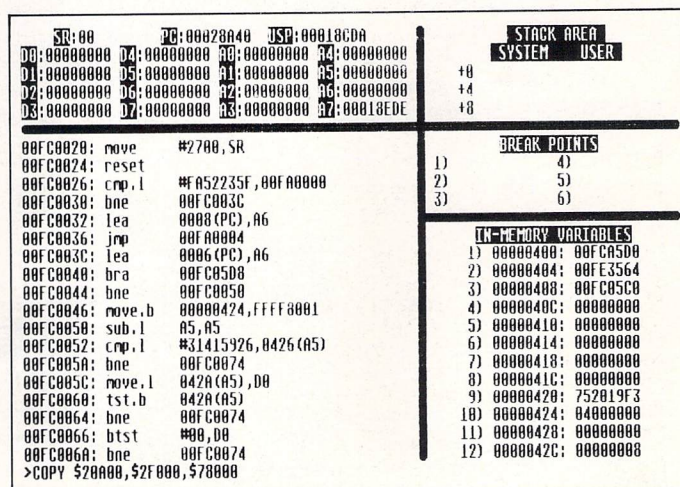


Figure II: Disassembling a machine code program



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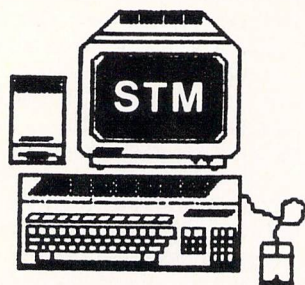
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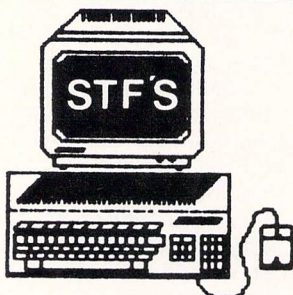


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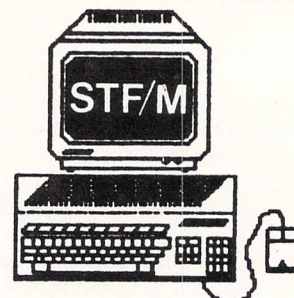
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Music composer

IN the June 1987 issue of *Atari ST User* I examined two relatively cheap Midi sequencing programs – Hybrid Art's EZ-Track and Super Conductor from Microdeal.

They both got the thumbs up and are very good value for money. So why, you may ask, would anyone want to spend more money on a bigger program?

To put the whole business of introductory and professional programs into perspective I thought it would be a good idea to let you see what you get with one of the biggies.

C-Lab's Creator is one of the biggest, capable of playing 64 tracks at once and with a list of features which will make any Midi buff drool and salivate all the way to the bank.

I'll have to assume you know just a teeny bit about Midi sequencing programs otherwise I'll never get through all this. Don't worry though, I'll make it as painless as possible.

Creator uses high resolution mode so the first thing you need is a monochrome monitor. A colour version would be nice, especially for those people who bought a 1040 (without TV modulator) and a colour monitor although the screen contains so much information it would probably have to be redesigned.

Most of the features can be accessed with the mouse directly from the main screen or from the pull down menus. Alternatively you can use the computer keyboard or a combination of both.

The program supports a high degree of multi-tasking and almost all functions can be used at all times, even when recording or playing back. This is incredibly useful as you can edit a piece "on the fly".

Let's get down to recording. A song (the culmination of all your musical effort) is constructed from a series of patterns. Creator can store 99 patterns each containing 16 tracks and they can be arranged so any four patterns can play together. This is where the massive 64 (16 x 4) tracks come from.

But that's not all. You won't need your computer to work out that 99 patterns holding 16 tracks means in theory you could record a total of 1584 separate music lines.

You'd never do this however, primarily because the maximum amount of music the system can store is around 1330 bars in 4/4 time at a tempo of 120 beats a minute – even one megabyte of ram has its limits.

That's very approximate, of course, but it would last – very approximately again – about 45 minutes. You could well use most of the patterns, however, in a complex arrangement.

Ian Waugh explores C-Lab's Creator, a professional Midi sequencing program

As well as music lines, you can store complete drum tracks and you should even be able to dump and load a bank of voices from a synth – providing it has that ability.

The recording procedure is similar to that of a tape recorder so the process is easy to follow. Select a pattern number and a track within that pattern, press Record and off you go. The screen inverts (black becomes white and vice versa) during recording.

Timing is broken down into bars, beats, quantise units and ticks. A tick is 1/768th of a note. Using these you can isolate a section of a track very precisely for looping or editing.

The Forward and Rewind keys move you around a track bar by bar and there are drop-in and punch-out recording functions, too. There is also an Autodrop function which restricts the drop-in to a preset area so protecting important sections outside that area.

The Track Window shows lots of information about each track and I'll just pick out a few of the more exciting options. You can add or subtract velocity information to make a piece louder or quieter and you can compress or expand it to smooth out a performance.

Lowest and Highest options let you limit the range of notes which will play and Loop will repeat the track after a specified number of beats.

Ghost Of lets a track play the data of any track in any pattern with its own parameters. This is similar to a copy function

except the track has no notes of its own and will use those of its allocated track even after editing. With this you can easily produce echo effects and add octaves or harmonies to a part.

The Quantise menu gives you two automatic and intelligent quantise systems and you can elect to quantise all events – pitch wheel and modulation controls included, note on events only or note on and off events.

You can also quantise note lengths (as opposed to the track quantise function just described which acts on the timing of the notes), give them maximum, minimum or fixed values.

Tracks and patterns can be copied freely and the speed can be halved and doubled almost without restriction to absurd limits – if you're that way inclined – but it's a very useful facility during recording.

Moving bar graphs show activity on the tracks and indicate if any are peaking at maximum volume.

You can merge tracks, mix all tracks in a pattern down to track one, de-mix them again (by channel) and you can extract a channel from a track which has been recorded with several Midi channels.

In addition you could play a piece continuously adding overdubs to it as you go. In fact, in Arrange mode as your final, or near-final, song is playing you can record a full-length overdub on top of it. A real-time stopwatch shows you the duration of the performance.

You can filter Midi information on the way in and on the way out including program changes, control data, pitch wheel, channel pressure, poly pressure, system exclusive events and even notes. Data filtered on the way out is not removed so you can change your mind.

To arrange a song, a list of patterns are put together on the left of the screen under one of the groups or levels A, B, C or D. In this way up to four patterns can

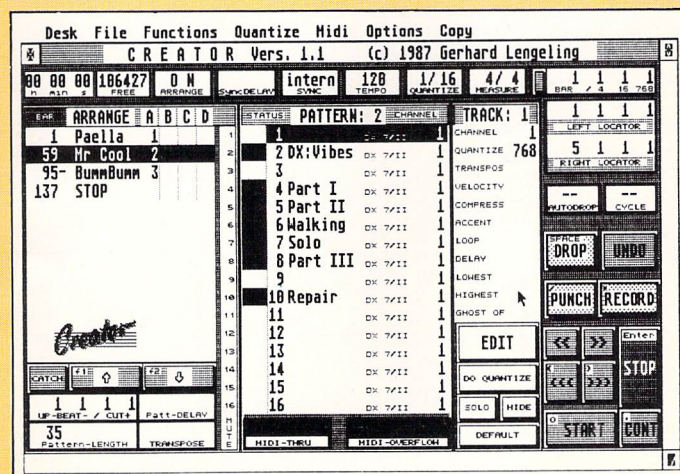


Figure 1: Creator main screen

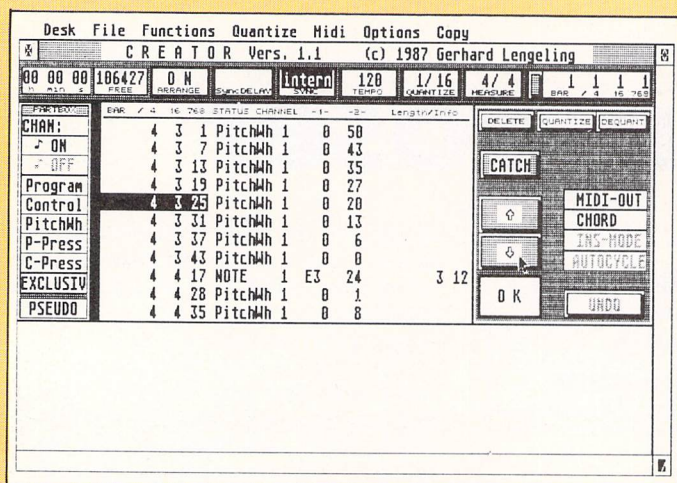


Figure II: Creator edit screen

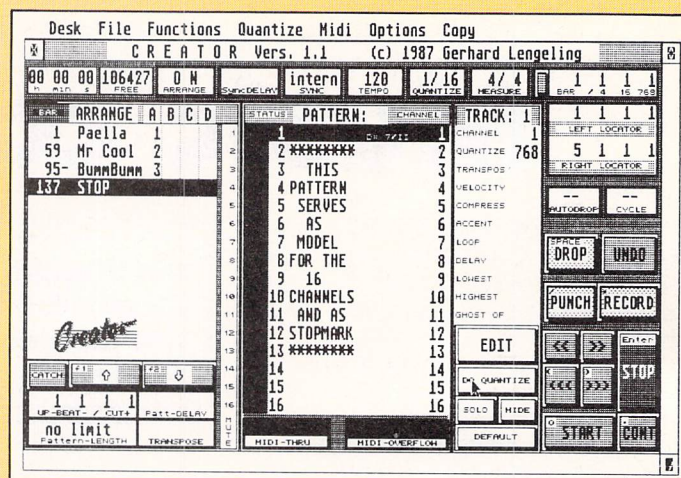


Figure III: The opening screen

◁ play at the same time.

This area also tells the pattern when to start playing (in terms of bars) so if a section has a pick up leading into a chorus, for example, you just bring it in a bar early and it will play along with, for example, the last bar of the verse.

For each entry you can enter pattern parameters such as Upbeat, Transpose, Delay and Mute. The Upbeat can be used to form a push.

The large number of tracks means you will probably never have to merge tracks so you always have access to every part of your music. Individual tracks in a pattern can be muted and you can mute the four levels individually.

Individual tracks can be named and you can also name the instrument which will be assigned to each Midi channel number. When patterns are used in an arrangement, you can name these, too. It all helps you keep track (if you'll pardon the expression) of your music.

The other screen in Creator is the Edit screen. Here, every Midi event in a track is listed along with its parameters.

You can scroll through the list or click the Catch icon which finds the event whose time position is nearest to the current bar. As you move through the list the events are transmitted so you can hear what is happening on your instrument.

Although notes require Note On and Note Off commands, note events are defined in the Editor by a start time followed by a length which is far more convenient than listing them as two separate events.

Events and parameters can be altered by clicking on them and you can use the mouse to drag events into (insert) and out of the Editor (delete). Insert mode will push all events forward whenever the time position of an event is altered. It can be used, for example, to create a gap in a track or to move a whole track forward by altering the first event.

The Partbox on the left of the screen holds a list of events and it can used to filter out any event information, too.

For instance, if you only want to edit the notes you can filter out all the other information. This only affects the screen dis-

play, not the actual data. You can set the track to play as you edit to hear a continuously updated version.

There is a Chord function which sends all events with the same time position through Midi simultaneously (they are normally sent one at a time as you scroll through the list).

You can quantise individual events so different sections within the same track can have different quantise settings. The Quantise function on the main screen affects all of a track.

Creator is well able to handle Systems Exclusive messages and the Pseudo command lets you add tempo changes to a track.

These can be absolute, that is set a completely new tempo, or relative in which case the current tempo is altered by a specific amount. This lets you alter the tempo of the whole piece while still maintaining variations within it.

There's also an Undo option here and you have access to all the Tempo, Bar, Arrange and Sync Delay features, too.

Creator can sync to an external Midi clock and although this only has a resolution of a 1/96 note, it measures the time between pulses and uses an interpolation routine to bring it back up to 1/768.

Of course it supports all the usual Midi song position pointers and the manual explains how it can be used with sync-to-tape and SMPTE units.

Other features of Creator include a Play Algorithm which constantly checks timing errors and attempts to foresee and prevent or minimise potential Midi data bottlenecks.

It also carries out data reduction according to certain musical criteria. You can switch off both these options if you wish.

File handling is comprehensive allowing you to load and save complete songs and sequences. You can delete a file or format a disc and a picture of a formatting disc appears on screen as it does so.

You can do all this while a piece is playing although the program does warn you it is safer to stop playing first.

Creator is a performance oriented

sequencer and doesn't have a step-time method of note entry. You can edit and add notes in the Event Editor, but it's far from ideal.

For most musicians however, real-time recording is the natural way to work – once upon a time all music was played live and Creator undoubtedly gives them an incredible amount of power and flexibility. In spite of the number of features, it is very easy to use.

The 61 page manual is quite explanatory once you realise takt is German for bar. A numbered contents page (or index) would be nice and if they really wanted to go to town they could render some of the phrases into clearer English.

Unless you've immersed yourself in the intricacies of Midi some of the facilities may appear a little daunting, even, I suspect to some professionals. Still, you don't have to use them and they're there if and when you need them.

Is there anything they haven't thought of, I wonder? You can't fail but be impressed with Creator. It's truly state-of-the-art with features undreamt of not so long ago – and even if such a blueprint had been lying dormant in some entrepreneurial mind it needed the computing power of the ST to make it happen.

Creator has already been snapped up by such musical visionaries as producer Tony Visconti, Go West's Alan Murphy, Pat Seymour, a Canadian group called Saga and Patrick Moraz of Moody Blues fame.

It is a professional package in every sense of the word and now you know what you get for your money – at least in part because there is just not enough room to cover everything it can do.

You will have a flavour – and a taste, I hope – of the system by now though. If you're still feeling hungry I can only suggest you get a demonstration. Be prepared to be amazed. □

Product: Creator

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Logical operator

THIS month we'll be examining the logical operations supported by the 68000. Before we can understand how they work, however, we'll first need to know a little about number bases.

These are really just another way of counting. When we normally deal with numbers, we count in units of 10. Let's look at the number 5432. This can be split up in the following manner:

1000s	100s	10s	1s
5	4	3	2

As you can see, we take each digit from right to left, to denote successive multiples of 10 – units, tens, hundreds, thousands and so on. Put another way:

$$432 = (4 \times 10 \times 10) + (3 \times 10) + (2 \times 1)$$

$$5555 = (5 \times 10 \times 10 \times 10) + (5 \times 10 \times 10) + (5 \times 10) + (5 \times 1)$$

When dealing with computers, it's often more convenient to base our numbers on units other than 10. The digits we use depend on the size of the unit involved, and range from 0 to *unit*-1.

So if we count in binary – bi meaning two – we will be restricted to using the numerals 0 and 1. Table I shows some typical examples of binary numbers.

This is an important number base because all computers store their data in this format. Inside the micro, electrical voltages are used to represent the two numbers. Typically, five volts represents the number 1 and zero volts shows as 0.

The problem with the binary system occurs when dealing with very large numbers. To represent 255 decimal we would have to use eight digits and for 65535 we need 16. Very cumbersome.

We can get around this by using base 16, or hexadecimal notation (hex for short). Since we only have digits to indicate from 0 to 9 and hex needs to represent numbers up to 15, we need some way of representing the extra six digits.

For these we use the letters A through F. Table II contains a list of the first 15 hexadecimal numbers, along with their equivalents in both binary and decimal.

Suppose, for instance, we wish to manipulate the eight digit binary number 10101011 (a byte). We must first split it up into two groups of four figures – 1010 and 1011 (two nybbles).

We now replace each nybble by one hexadecimal number so 1010 is A and 1011 is B. This produces the final hex number AB which we can either use directly or readily convert into the decimal number 171. This may all seem

Stephen Hill shows how to manipulate numbers in Part 4 of his guide to assembly language

rather complicated at first, but with a little practice it will quickly become second nature.

Binary has a number of special properties, including the ability to perform logical operations such as AND, OR, NOT and EOR. These involve the manipulation of the binary digits (bits) of a number by following a simple set of rules.

The AND instruction takes any two numbers and compares each binary bit in the first number with the bit at the same position in the second. If the first bit AND the second bit are both one the appropriate bit in the result is also set to one, otherwise it is set to zero.

For instance, we can AND two numbers like this:

0011	1010
0110 AND	1001 AND
0010	1000

Notice how we take each successive (vertical) pair of binary digits in the numbers and perform an AND operation on them to work out the value of the equivalent bit in the result. In practice, AND is used as a mask to set one or more bits in a number to zero.

The action of OR is roughly what you would expect from its usage in English. It returns a one if the first bit OR the second is a one, otherwise it returns a zero. OR is often used to set bits in a number to ones. For instance:

0011	1010
0110 OR	1001 OR
0111	1011

The Exclusive OR operation is really just a specialised version of OR. The difference is EOR returns a one if both binary digits are different, otherwise the result is zero. A common use of EOR is to invert a range of bits in a number. For instance:

0011	1010
0110 EOR	1001 EOR
0101	0011

The final logical operation is NOT. Unlike the last three operations this instruction only needs one number to calculate a result. Its effect is to invert each binary digit in the number. So zero is NOT one and one is NOT zero. Expanding this to larger numbers we get:

NOT 1000 = 0111

NOT 0101 = 1010

NOT 1010 = 0101

An important point to bear in mind when using these operators is the result produced will vary depending on the precision you are using, because any leading digits will be unaffected. So NOT 00000001 is 11111110 or 254 in decimal, but NOT 00000000000000001 is 1111111111111110 or 65534 in decimal.

Let's now write a small subroutine to output just one hex digit stored in data register D0. The full listing is in Figure I, here's the bare bones:

```
digit AND.L #15,D0
      CMP#9,D0
      BLE number
      ADD #7,D0
number ADD #48,D0
      MOVE.W D0,-(A7)
      MOVE.W #2,-(A7)
      TRAP #1
      ADD.L #4,A7
      RTS
```

This routine needs some explanation as

128	64	32	4	8	4	2	1	Value
7	6	5	16	3	2	1	0	Bit
0	0	0	0	0	0	1	1	= 3 (2+1)
0	0	0	0	1	1	1	1	= 15 (8+4+2+1)
0	0	1	0	1	0	1	1	= 43 (32+8+2+1)
1	0	1	0	1	0	0	1	= 169 (128+32+8+1)

Table I: Binary numbers

it introduces a couple of new 68000 instructions. The first AND instruction sets all the bits in D0 apart from the first four to zero isolating the lower nybble, thus forcing it to be between binary 0000 and 1111 or 0-15 in decimal.

This avoids the necessity of having to check if our number is in the correct range before we make our conversion. The action of the two ADD instructions is to convert the number into an Ascii code for the appropriate hexadecimal digit.

CMP compares two numbers by subtracting them and sets the flags in the condition code register according to the result. It's important to note the two numbers themselves aren't actually changed.

BLE, Branch if Less than or Equal, is an example of the Bcc instruction and acts on the result of the comparison. If the condition is true, then the program jumps to the instruction at the address denoted by the label, otherwise it carries on with the next instruction. It's a bit like ST Basic's:

```
IF a<=b THEN GOTO label
```

So CMP and Bcc are really just a low level version of the standard IF condition THEN GOTO statement in Basic. The difference is you are only allowed to test one condition at a time and you can't have something like:

```
IF a<b AND c>d THEN GOTO label
```

If you want to test more than one condition in your program, you will need to nest multiple sets of these instructions. So the Basic statement:

```
IF D0<2 AND D0>0 THEN GOTO label
```

translates to:

```
CMP #2,D0    Compare D0 to 2
BGE false    IF D0>=2 GOTO false
CMP #0,D0    Compare D0 to 0
BGT label    If D0>0 GOTO label
false
.            Execute this if
.            both comparisons
.            are false
label
.            Execute this if
.            both comparisons
.            are true
```

Here BGE means Branch if Greater than or Equal to and BGT means Branch if Greater Than.

● Next month we will develop routines for dealing with much larger hexadecimal numbers. □

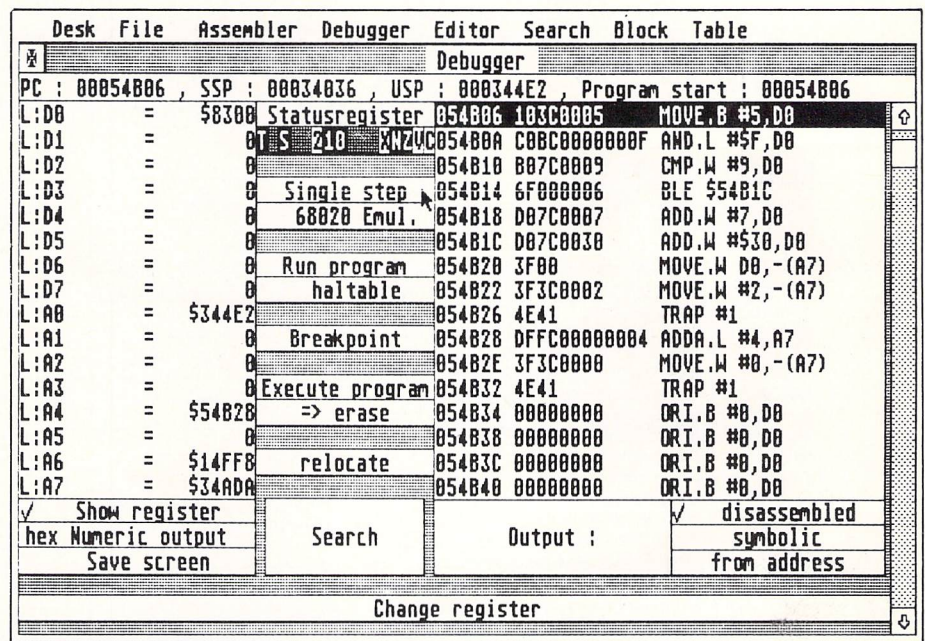


Figure I: Printing a single hexadecimal number

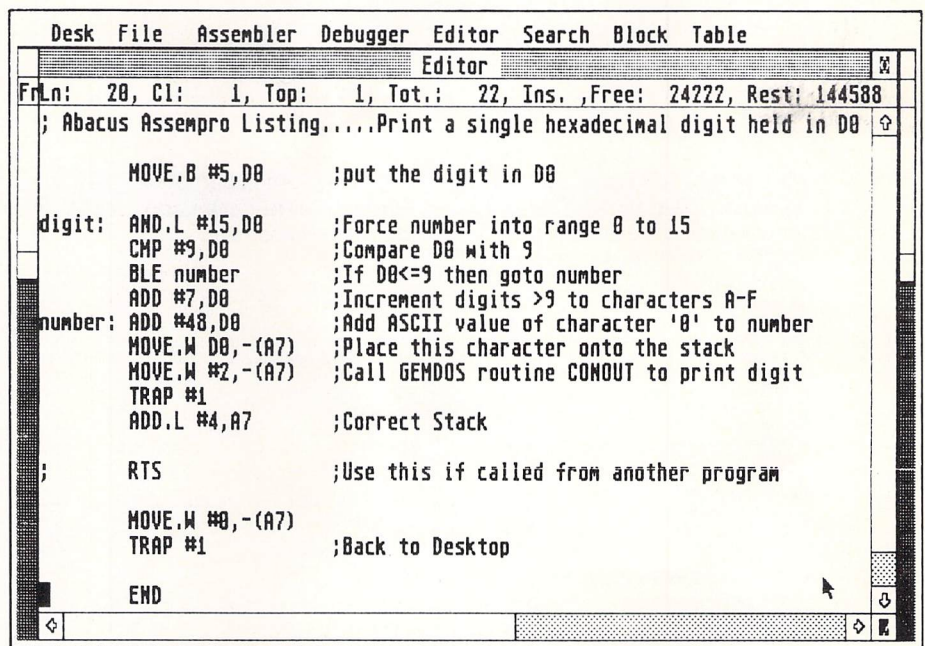
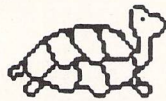


Figure II: Single stepping through the hex print routine using Abacus' Assempro

Decimal	Hexadecimal	Binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

Table II: Equivalent decimal, hex and binary numbers

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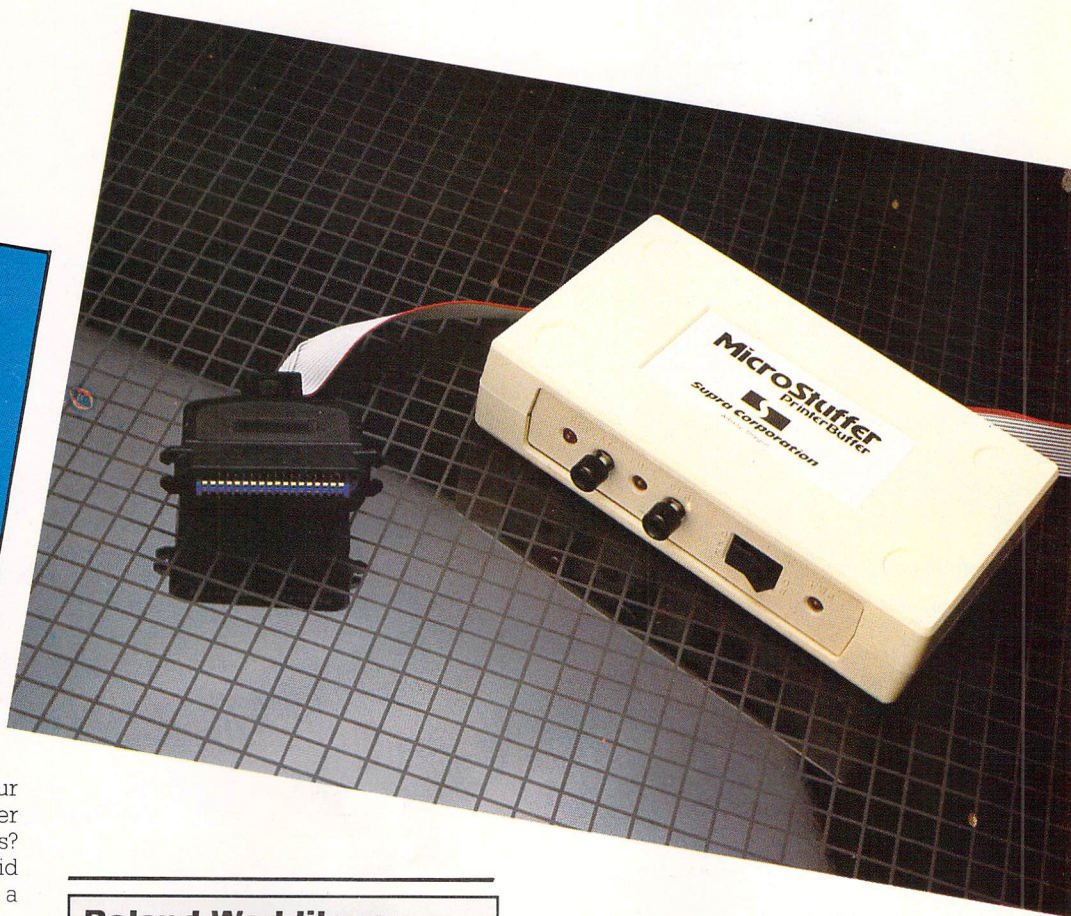
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All good stuff



HAVE you ever sat twiddling your thumbs while waiting for the printer to print a long document or listing? Yes? Well MicroStuffer is designed to avoid this holdup altogether by providing a massive 64k printer buffer.

One of the problems of using a computer with a printer is the fact that they both run at different speeds. Computers like the ST process information at quite a high speed, yet most printers can only print the data provided by the micro relatively slowly. This forces the micro to reduce its speed to match that of the printer.

The effect of this is apparent when printing long documents or screen dumps – the micro is tied up for several minutes while the printer clatters away, preventing you from getting on with your work.

To make matters worse, the better the quality of print, the slower the printer runs and the longer the micro is tied up. This is why many printers, and even some software packages, have a draft and final quality print mode.

If you want a rough idea of what the document looks like on paper you use draft mode for speed. When everything is to your liking you use final quality – which may take up to twice as long to print, but the finished article is much more presentable.

A printer normally has a very small amount of ram on board, typically 1k or so, which it uses as a buffer. When it is empty (strictly speaking, as soon as there is a free space) a signal is sent to the micro telling it to send some text. The micro sends characters until the printer signals the buffer is full and waits for it to print the text.

When the buffer has some free space

Roland Waddilove assesses a 64k printer buffer designed to increase your micro's speed and efficiency

or is empty again the printer requests more text from the micro. It sends this so quickly the buffer fills in no time at all and consequently spends most of its time waiting for the printer to empty it. This time is wasted as the micro can't be used for anything else.

The larger the printer's buffer the more text the micro can dump in it before it becomes full. If it is very large, say 64k as in the MicroStuffer, the whole of the text will easily fit in.

The micro dumps all the text in the buffer and you can start on your next task straight away. The printer will merrily chug away printing all the text in the buffer regardless of what the computer is doing (in fact you can even switch the micro off) so you can get on with the rest of your work.

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If you fill the buffer with text and suddenly discover an error you can hit the Clear button and flush it. You can't do this from the computer.

MicroStuffer isn't cheap, but if you find your time is being wasted waiting around for the printer it could improve your efficiency no end. If you rarely use your printer it isn't necessary, but if you regularly print large documents it could easily repay itself in time saved very quickly.

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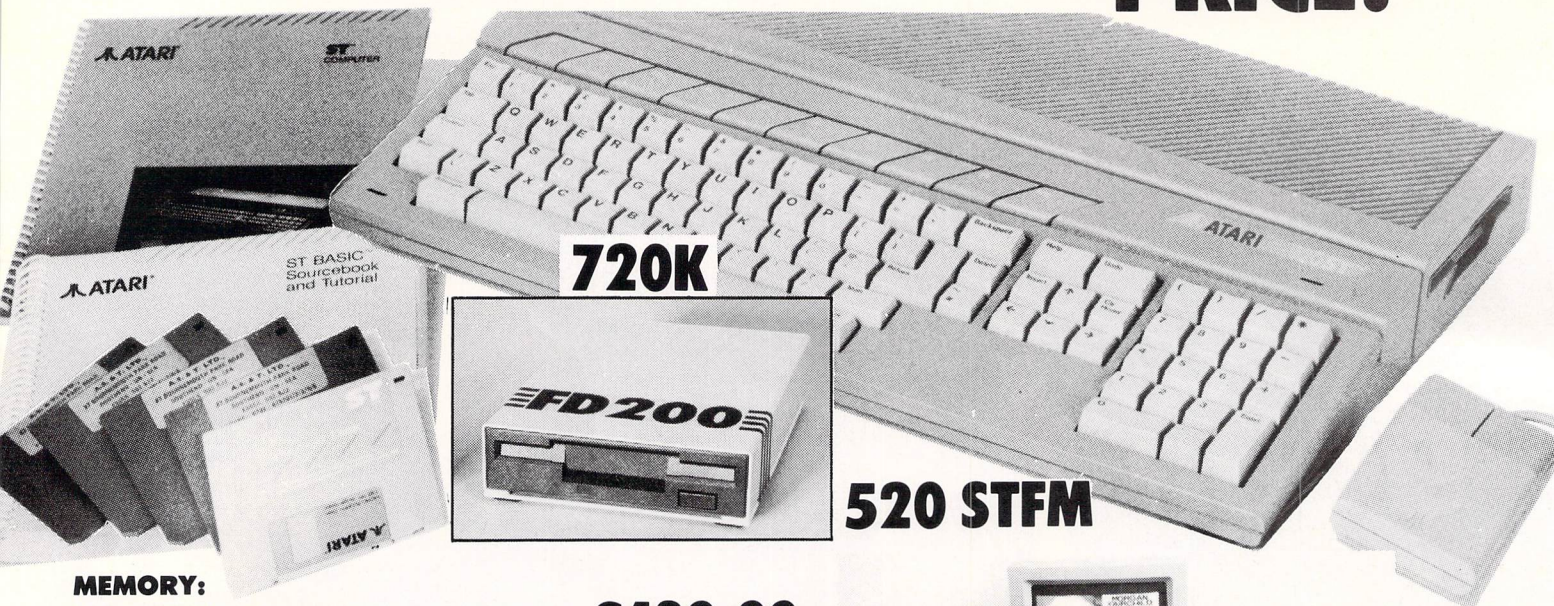
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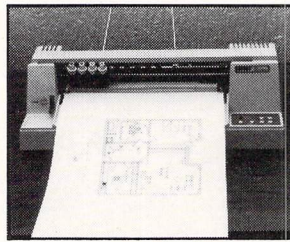
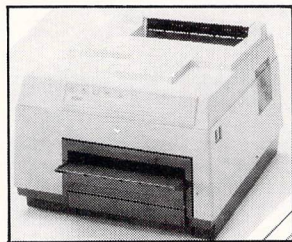
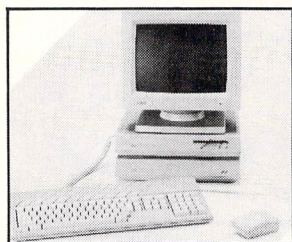


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the world**

IF all you want to do is talk to another computer, either directly or down a telephone line, it seems a little pointless to pay out sums in excess of £40 for specialised communications software.

True, there are public domain, programs around, but you then have the fuss of finding them. With this in mind, *Atari ST User* is pleased to present your very own ST Terminal program.

With this powerful utility you can logon to MicroLink and browse through the many thousands of pages of information and download ST software, including *Atari ST User* listings.

Unfortunately, you can't logon to Prestel, but you can link up to many of the private bulletin boards scattered around the country and download text files and software – provided they are in Ascii form.

Enter and save Program I, ignoring the line numbers as Fast Basic doesn't need them. This will create a telephone directory for use in the main terminal program.

Your own phone numbers can be added to the data statements without any alterations to the main code being necessary. Run this program before you run the comms program for the first time.

Program II, the terminal program, is written in Fast Basic and will run in any resolution, although medium or high gives the better display. Before saving it, set the workspace to 240k from the Show Info menu option.

The program should now be saved. When it is loaded in future, the required workspace will be preset. Because of this large download buffer, no accessories, ram discs or printer spoolers should be resident if you are using a 520ST.

When the terminal program starts up, you are presented with a list of options. You must set the RS232 parameters before going online

Press 1 to do this and a second list of options will be displayed on your screen – Baud rate, Local echo, cts/rts and xon/xoff. A question mark will be showing alongside Baud rate. You can now enter 1, 2 or 3 depending on whether you want 300, 1200 or 2400 baud.

Split baud working (1200/75) is not implemented in this program. If you need that mode, you could use a speed buffered modem or try some of the public domain software as described in Ken Hughes' article on Page 39 of this issue.

Once you have selected the baud rate, the question mark will move to the next option. The response required for this

Terminal bliss

and the next two queries is either Y or N, depending on whether you want clear to send (CTS), ready to send (RTS) or xon/off handshaking. The final prompt gives you the opportunity to re-enter your protocols or accept them.

To display the options menu at any time, press the Help key. When you select Ascii transfer you will first be asked for the length of file in bytes. The maximum is preset to 230k – about the maximum for a half Mbyte machine.

If you have more memory available, the RESERVE command on line 80 can be

changed and the program workspace altered to suit.

The next prompt is for the pathname of the directory which will hold the transferred file followed by the filename itself. All that's left to do now is enter a Y if you want a carriage return sending to tell the remote computer to start sending – as in the telesoftware section of MicroLink.

The next three options are simple to use: Screen allows you to save or load the screen window, Phone book loads the telephone directory and On line returns you to terminal mode. □

```
>BB

*****
      Bulletin Board System
*****

1 : Access Bulletin Board
2 : Check for new messages
3 : Manual
4 : Setup Terminal
5 : Useful external BB Commands
6 : Hints on using BB

1-6 R(edisplay Q(uit : 1

S)end      R)ead  SC)an  C)ategories  Q)uit  H)elp

BB> R

F)wd, B)ack, N)ew or H)elp:F

      Msgf:      1  *COMMUNICATIONS*      (Read 418 times, 3 replies)
      From:  MAG023      Posted:  Sat 15-Nov-86 12:33 GMT Sys 72
      Subject: MICROLINK FEATURES WANTED

--More--
      Actually MAG004 is just a figment of your imagination.

R)eply, N)ext, S)top, or Msg f:

      Message has replies, read now? Y

      Msgf:      13  *COMMUNICATIONS*      (Read 181 times, 0 replies)
      From:  MAG20272      Posted:  Sun 16-Nov-86 0:08 GMT Sys 72
      Subject: Reply to: Msgf 1: MICROLINK FEATURES WANTED

--More--
      ...OR EVEN A REGISTRATION NUMBER ON THE BACK OF AN XR3.
```

Figure 1: An on line session: exploring the telesoftware section of MicroLink

Program I: Phone list generator

```
10 REM Phone List
20 REM by M. D. R. Croning
30 REM (c) Atari ST User
40 REM Creates 'NUMBERS.ASC'
50 REM phone numbers file
60 REM
70 REM Do not exceed 50
80 REM directory entries
90 REM
100 REM Written in Fast Basic
110 REM Do not enter line numbers
120
130 PATH$="A:\\"
140 handle%=OPENOUT "NUMBERS.ASC"

150 REPEAT
160 READ number$:IF number$="QUIT" T
HEN CLOSE# handle%:END
170 PRINT# handle%,number$
180 UNTIL FALSE
190 DATA "Microdeal BBS 24hrs      0
726 65422 v21/v23"
200 DATA "London ST BBS 12am-5am  0
1 443 2432 v21/v23"
210 DATA "The sySTem      10pm-8am  0
206 304 804 v21/v23"
220 DATA "ATARI BBS      24hrs      0
753 823 925 v21/v23"
230 DATA "London Ugrd      24hrs      0
1 863 0198 v21/v23"
240 DATA "QUIT"
```


Program 17: ST Terminal

```

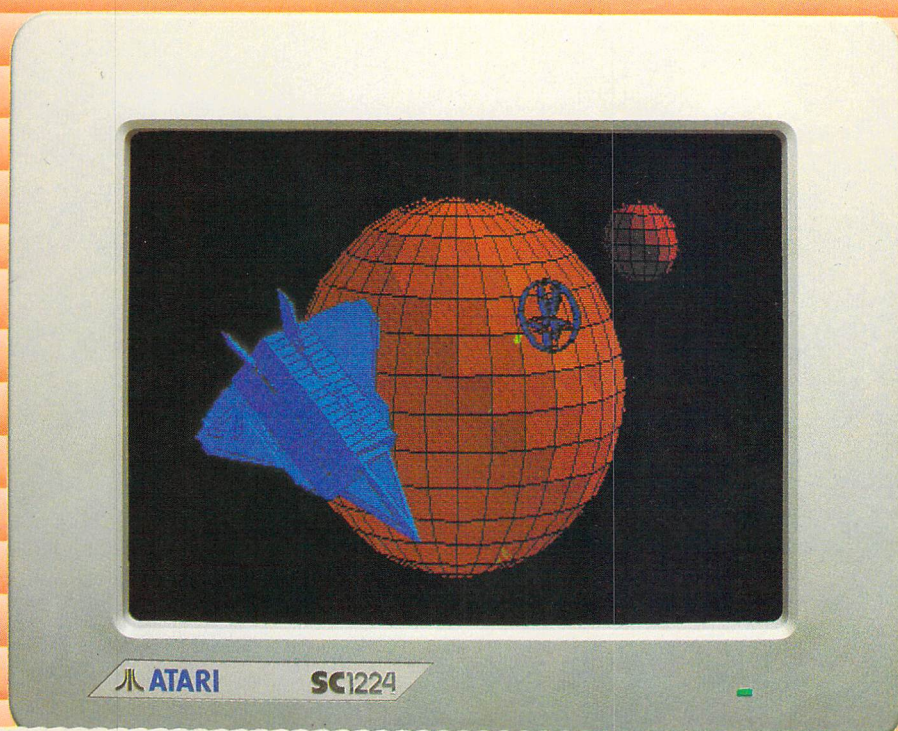
10 REM ST Terminal
20 REM by M. D. R. Croning
30 REM (c) Atari ST User
40 REM
50 REM Written in Fast Basic
60 REM Do not enter line numbers
70 REM
80 RESERVE BUFFER%,230*1024
90 PROCinitscreen
100 SHOWMOUSE
110 dummy%=ALERT("[3][ I COMMS
-ST I I written by MDR Croning.][
Begin]",0)
120 HIDE MOUSE
130 SETCOL 2,0,0,6
140 DIM numbers$(49)
150 bspc$=CHR$(8):send%=0
160 REM Default RS232 parameters fol
low on next line
170 le%=0:spd%=9::rts%=0:xon%=0:nle%
=0:hand%=2
180 newpath$="":transfile$="":prnumb
er%=0:resp%=0
190 phoneindex%=0
200 RS232 spd%,hand%
220 SHOWMOUSE
230 dummy%=ALERT("[1][ I Put a disk
containing the I phone numbers file in
I Drive A.][Ready]",0)
240 HIDE MOUSE:newpath$=PATH$:PATH$="
A:\":
250 phonehandle%=OPENIN "NUMBERS.ASC
"
260 IF SGN(phonehandle%)=-1 THEN VDU
7:newpath$="":GOTO begin
270 phoneindex%=0
280 REPEAT
290 INPUT# phonehandle%,number$(phon
eindex%)
300 phoneindex%=phoneindex%+1
310 UNTIL EOF# phonehandle%=TRUE
320 CLOSE# phonehandle%
330 phoneindex%=phoneindex%-1
340 PATH$=newpath$:newpath$="
360 begin:
370 HIDE MOUSE:PROCOptions
380 HELP ON:ON HELP PROCOptions
400 REM Next four lines hold RS232 r
ead/write
410 KREAD:k%=INKEY:IF k%=-1 THEN b%
=0:GOTO RSWRITE ELSE IF le%=1 THEN VDU k
%
420 RSWRITE:IF OUTSTAT(1) THEN OUT 1
,k%:b%=0 ELSE b%=-1
430 RSWRITE:IF INPSTAT(1) THEN VDU IN
P(1)
440 IF b%=-1 THEN GOTO RSWRITE ELSE
GOTO KREAD
460 DEF PROCcapture:
470 i%=0
480 IF send%=1 THEN OUT 1,13
490 REPEAT
500 SCAN:IF INPSTAT(1) THEN POKE buf
fer%+i%,INP(1) ELSE GOTO SCAN
510 i%=i%+1
520 UNTIL i%=by%
530 INK 2:PRINT TAB(8,3) "Captured d
ata ":INK 1

540 IF newpath$ <> "" THEN PATH$=new
path$
550 BSAVE transfile$,buffer%,by%
560 ENDPROC
580 DEF PROCquit
590 SETCOL 2,0,7,0
600 END
620 DEF PROCinitscreen
630 LOCAL seg%
640 HIDE MOUSE
650 CLOSEWIND OUTHANDLE
660 DELEWIND OUTHANDLE
670 CLOSEWIND IMMHANDLE
680 DELEWIND IMMHANDLE
690 FOR seg%=1 TO 10
700 CLOSEWIND SEGHANDLE(seg%)
710 DELEWIND SEGHANDLE(seg%)
720 NEXT
730 GRAFRECT 0,0,SCREENWIDTH,SCREENH
EIGHT
740 TXTRECT 0,0,SCREENWIDTH,SCREENHE
IGHT
750 CLG 0
760 ENDPROC
780 DEF PROCiorec
790 x1%=SCREENWIDTH/2-iorecx%:y1%=SC
REENHEIGHT/2-iorecy%
800 x2%=x1%+2*iorecx%:y2%=y1%+2*iore
cy%
810 FILLSTYLE 0,0:FILLPERIM 1:FILLCO
L 1
820 BAR x1%,y1%,x2%,y2%
830 LINECOL 1:LINE x2%+1,y1%+1 TO x2
%+1,y2%+1
840 LINE x1%+1,y2%+1 TO x2%+1,y2%+1:
LINE x2%+2,y1%+2 TO x2%+2,y2%+2
850 LINE x1%+1,y2%+2 TO x2%+2,y2%+2
860 TXTRECT x1%+1,y1%+1,iorecx%*2-2,
iorecy%*2-2
870 ENDPROC
890 DEF PROCOptions
900 cx%=TXTXPOS:cy%=TXTYPOS
910 GRAB 0,0,SCREENWIDTH,SCREENHEIGH
T
920 iorecx%=90:iorecy%=60:PROCIorec
930 INK3:PRINT:PRINTSPC(8)"OPTIONS":
PRINT
940 PRINT" 1 SET RS232"
950 PRINT" 2 ASCII TRANSFER"
960 PRINT" 3 SCREEN"
970 PRINT" 4 PHONE BOOK"
980 PRINT" 5 ONLINE"
990 PRINT" 6 QUIT"
1000 getoption:a$=GET$
1010 IF VAL(a$)<1 OR VAL(a$)>6 THEN
GOTO getoption
1020 PUT 0,0,3
1030 SWITCH VAL(a$)
1040 CASE 1:PROCsetrs232
1050 CASE 2:PROCtransfer
1060 CASE 3:PROCscreen
1070 CASE 4:PROCphonebook
1080 CASE 6:PROCquit
1090 END SWITCH
1100 INK 1:PUT 0,0,3:TXTRECT 0,0,SCRE
ENWIDTH,SCREENHEIGHT
1110 TXTXPOS=cx%:TXTYPOS=cy%:HELP ON:
BEEP
1120 IF prnumber%=1 THEN PRINT:PRINT
LEFT$(number$(n%),25):INK 2:PRINT MID$
(number$(n%),26,LEN(number$(n))-25):P
RINT:prnumber%=0:INK 1

1130 ENDPROC
1150 DEF PROCsetrs232
1160 setstart:INK 3:iorwidth%=100:ior
height%=80:PROCIorec
1170 PRINT:PRINT SPC(7)"SET RS232"
1180 PRINT:PRINT" Baud rate":PRINT:PR
INT" Local echo":PRINT
1190 PRINT" CTS/RTS":PRINT:PRINT" XON
/XOFF":INK 1
1200 PRINT TAB(11,3)"?"bspc$;
1210 getbaud:a$=GET$
1220 IF VAL(a$)<1 OR VAL(a$)>3 THEN G
OTO getbaud
1230 SWITCH VAL(a$)
1240 CASE 1:spd%=9:PRINT" 300 baud"
1250 CASE 2:spd%=7:PRINT"1200 baud"
1260 CASE 3:spd%=4:PRINT"2400 baud"
1270 END SWITCH
1280 PRINT TAB(12,5)"?"bspc$;
1290 PROCyesno
1300 SWITCH yes%
1310 CASE 0:nle%=0:PRINT"off"
1320 CASE 1:nle%=1:PRINT"on"
1330 END SWITCH
1340 PRINT TAB(9,7)"?"bspc$;
1350 PROCyesno
1360 SWITCH yes%
1370 CASE 0:rts%=0:PRINT"Off"
1380 CASE 1:rts%=1:PRINT"On"
1390 END SWITCH
1400 PRINT TAB(10,9)"?"bspc$;
1410 PROCyesno
1420 SWITCH yes%
1430 CASE 0:xon%=0:PRINT"Off"
1440 CASE 1:xon%=1:PRINT"On"
1450 END SWITCH
1460 PRINT TAB(6,12)"Correct ?"
1470 PROCyesno
1480 IF yes%=1 THEN GOTO calcvalues
1490 PRINT TAB(6,12)" ABORT ?"
1500 PROCyesno
1510 IF yes%=0 THEN GOTO setstart
1520 ENDPROC
1530 calcvalues:
1540 IF rts%=1 AND xon%=1 THEN hand%=
3:GOTO setport
1550 IF rts%=1 THEN hand%=2:GOTO setp
ort
1560 hand%=xon%
1570 setport:RS232 spd%,hand%:le%=nle
%
1580 ENDPROC
1600 DEF PROCtransfer
1610 settransfer:INK 3:iorecx%=120:io
recy%=75:PROCIorec
1620 PRINT:PRINTSPC(7)"ASCII TRANSFER
"
1630 PRINT:PRINT" Status ";INK 2:PRI
NT"Setup":INK 3:PRINT:PRINT
1640 PRINT" Length _____":PRINT
1650 PRINT" Path ";INK 1:PRINT PATH$
;:INK 3:IF LEN(PATH$)<22 THEN PRINT ST
RING$(22-LEN(PATH$),"_"):PRINT
1660 PRINT" Name ";STRING$(22,"_"):PR
INT
1670 PRINT" Send init char":INK 1
1680 getlength:PRINT TAB(8,6);:INPUT"
by%
1690 IF by%<1 THEN GOTO getlength
1700 INPUTTAB(6,8)"newpath$
1710 INPUT TAB(6,10)"transfile$
1720 PRINT TAB(16,12)"?"bspc$;

```


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1730 PROCyesno
1740 SWITCH yes%
1750 CASE 0:send%=0:PRINT"No"
1760 CASE 1:send%=1:PRINT"Yes"
1770 END SWITCH
1780 PRINT:PRINT:PRINT SPC(10)"Correc
t ? "
1790 PROCyesno
1800 IF yes%=1 THEN INK 2:PRINT TAB(8
,3)"Capturing data":INK 1:PROCcapture:
ENDPROC
1810 PRINT TAB(10,15)" Abort ? "
1820 PROCyesno
1830 IF yes%=0 THEN GOTO settransfer
1840 ENDPROC
1860 DEF PROCyesno
1870 fetch:a$=GET$
1880 IF a$="Y" OR a$="y" THEN yes%=1:
ENDPROC
1890 IF a$="N" OR a$="n" THEN yes%=0:
ENDPROC
1900 GOTO fetch
1910 ENDPROC
1930 DEF PROCscreen
1940 scrset:INK 3:iorecx%=120:iorecy%
=45:PROCiorec
1950 PRINT:PRINTSPC(7)"SCREEN LOAD/SA
VE":PRINT
1960 PRINT" PATH ";:INK 1:PRINT PATH$

```

```

;:INK 3:IF LEN(PATH$)<22 THEN PRINT ST
RINGS(22-LEN(PATH$),"_"):PRINT
1970 PRINT" NAME ";STRING$(22,"_"):IN
K 1
1980 INPUT TAB(6,3)"newpath$
1990 INPUT TAB(6,5)"scrfile$
2000 PRINT:PRINT:PRINTSPC(6)"(S)ave o
r (L)oad ?"
2010 getfunc:t:a$=GET$
2020 PRINT TAB(6,1)SPC(4);:INK 3:IF a
$="S" OR a$="s" THEN scrfunc:t:=1:PRINT
"SCREEN SAVE"SPC(6):GOTO checkcorrect
2030 IF a$="L" OR a$="l" THEN scrfunc
t%:=0:PRINT "SCREEN LOAD" SPC(6) ELSE G
OTO getfunc:t
2040 checkcorrect:
2050 INK 1:PRINT TAB(6,8) SPC(4) "COR
RECT ?" SPC(6)
2060 PROCyesno
2070 IF yes%=1 THEN GOTO diskaccess
2080 PRINT TAB(6,8) SPC(6) "ABORT ?"
SPC(6)
2090 PROCyesno
2100 IF yes%=1 THEN newpath$="":ENDPR
OC ELSE GOTO scrset
2110 diskaccess:
2120 IF newpath$<>" THEN PATH$=newpa
th$
2130 SWITCH scrfunc:t%

```

```

2140 CASE 1:PUT 0,0,3:BSAVE scrfile$,
PHYSBASE,$8000
2150 CASE 0:BLOAD scrfile$,PHYSBASE:G
RAB 0,0,SCREENWIDTH,SCREENHEIGHT
2160 END SWITCH:newpath$=""
2170 ENDPROC
2190 DEF PROCphonebook
2200 INK 3:iorecx%=150:iorecy%=70:PRO
Ciorec
2210 PRINT:PRINTSPC(10)"PHONE BOOK":I
NK 1:TXTYBASE=TTYBASE+20:TXTHEIGHT=TX
THEIGHT-20
2220 FOR n%=0 TO phoneindex%
2230 IF n%<10 THEN PRINT TAB(1)"0" n%
; ELSE PRINT TAB(1) n%;
2240 PRINT SPC(1)LEFT$(number$(n%),25
)
2250 FOR d%=1 TO 100
2260 IF INKEY <>-1 THEN n%=phoneinde
x%+1
2270 NEXT d%,n%
2280 getindex:INK3:PRINT:PRINT " Ente
r index number ";:CURSLEFT:CURSLEFT
:CURSLEFT:INK 1
2290 INPUT "" n%
2300 IF n%>phoneindex% THEN CURSUP:CU
RSUP:BEEP:GOTO getindex
2310 prnumber%=1
2320 ENDPROC

```



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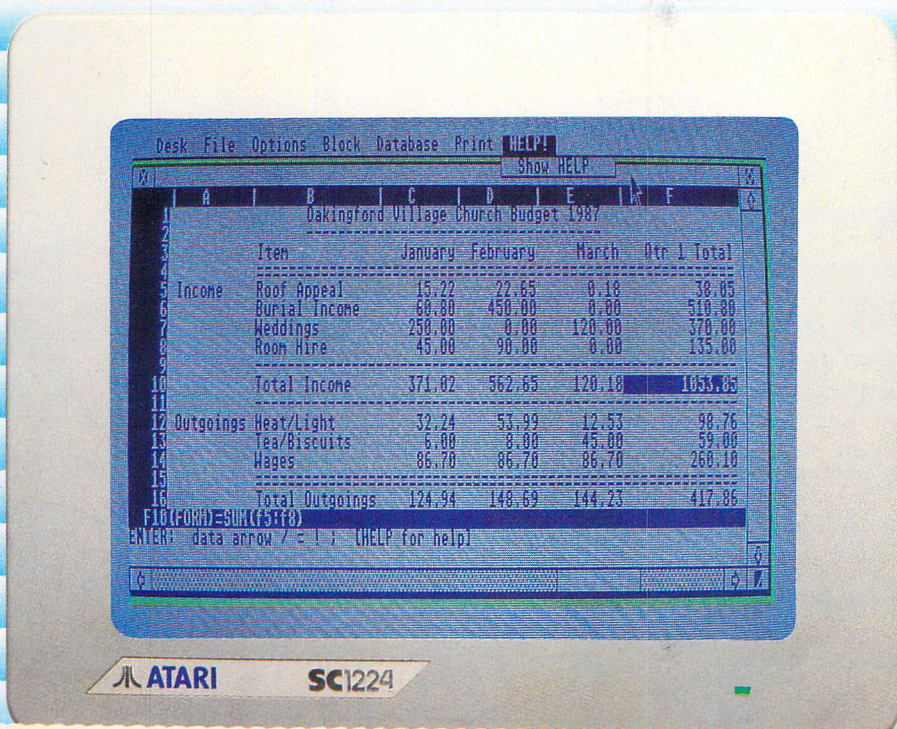
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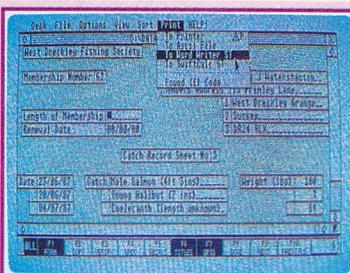


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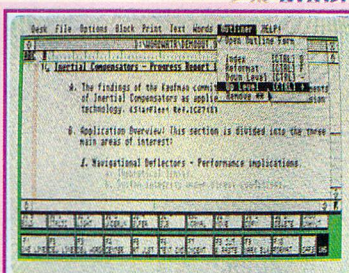
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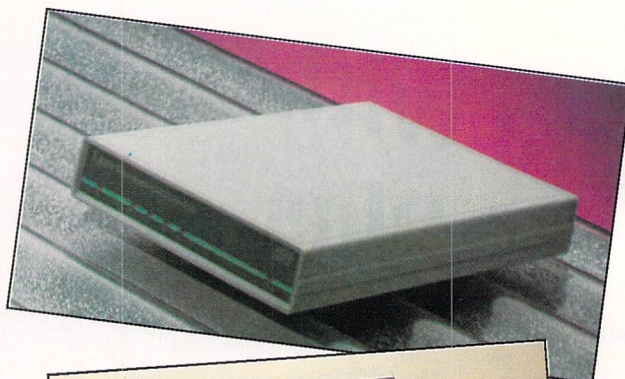
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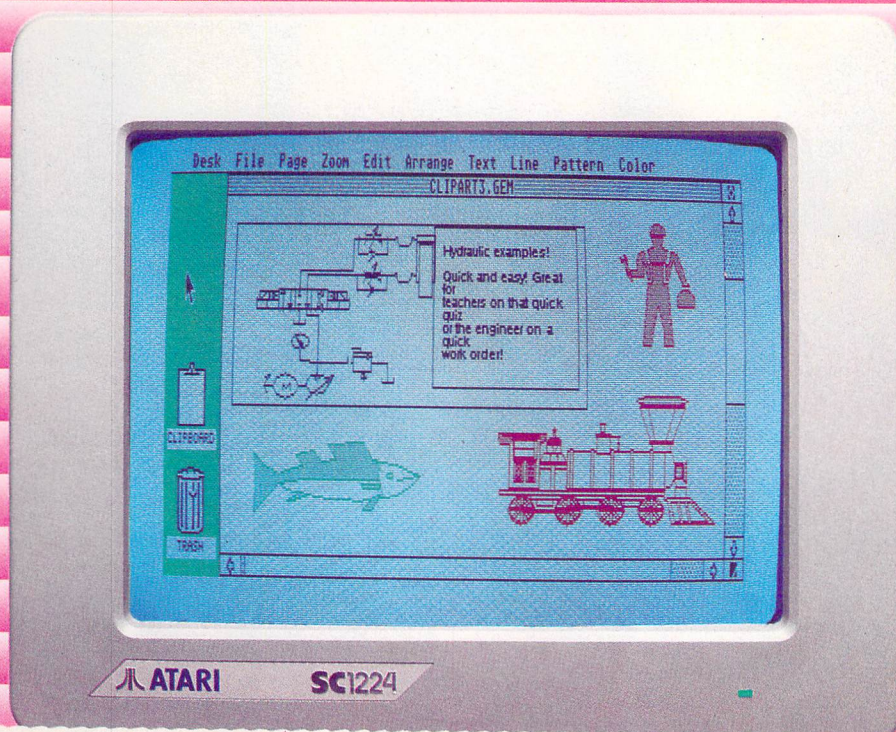
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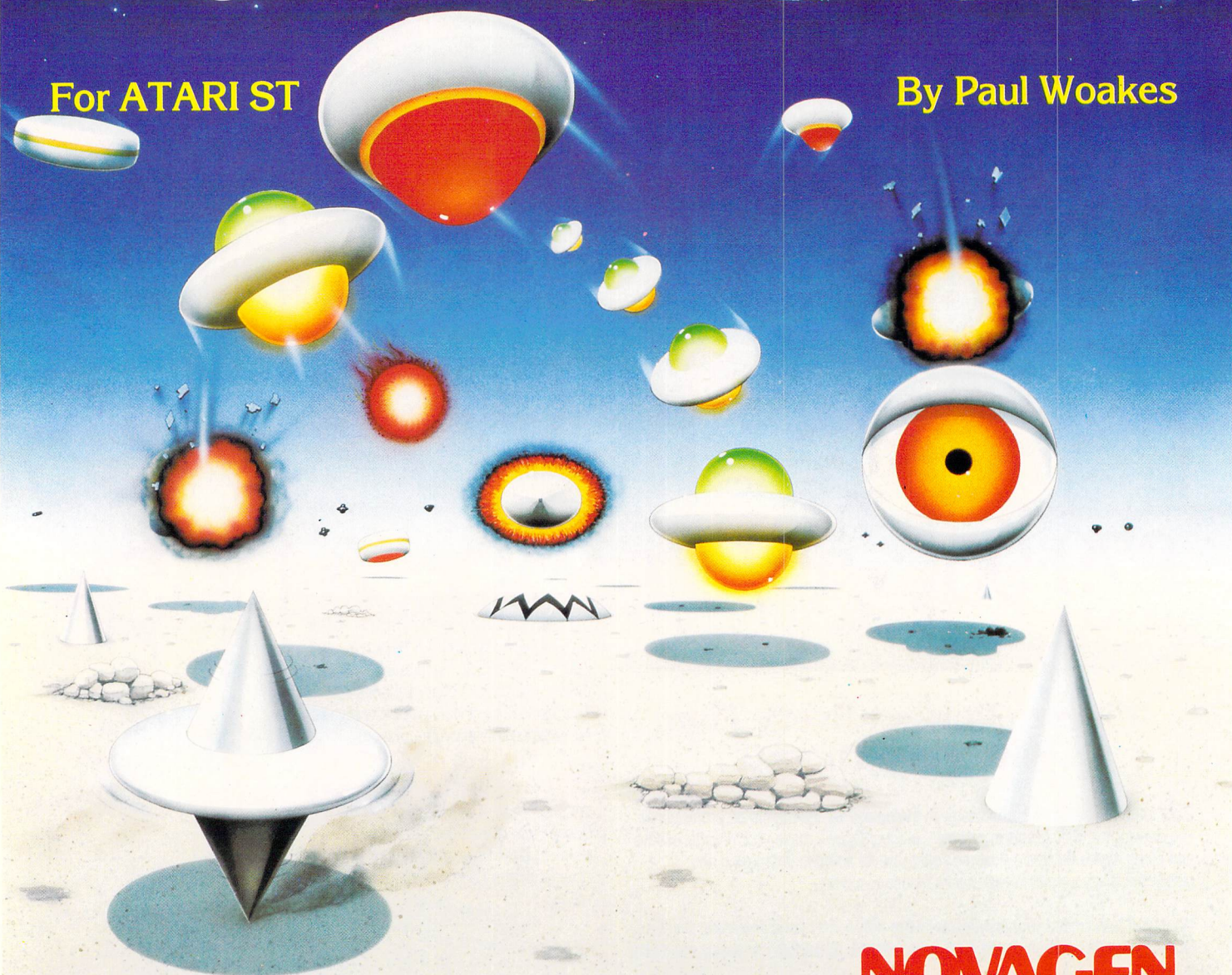
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Free software — is it good for nothing?

A GREAT deal of interest has been aroused by David Atherton's computer communications series which started in the August 1987 issue of *Atari ST User*.

The one item which causes most worry is the cost of initially getting online. Not only is a modem necessary, but also software. While the VT52 emulator, supplied free with the ST on the language disc, may allow you access to many bulletin boards and online databases, the facilities offered are very limited.

For instance, to be able to download software from a bulletin board you need an error checking protocol. The most common of these is called Xmodem. It enables files (text or program), to be transmitted in such a way as to give better than 90 per cent certainty of receiving the data in an uncorrupted form.

Most commercial software has this protocol, but it costs from £40 upwards. A more economical method of getting online for the first time is to try some of the public domain software that can be had for just a few pounds.

The concept behind this free (well, almost free) software is simple: I have a copy of a program which is public domain, my friend wants a copy of it so I, quite legally, give it to him. I can charge him for the cost of the disc if I've provided it and also for the cost of duplication – my time, electricity and so on.

I can't make a profit from the transaction, neither can I claim the copyright in the program – this is retained by the original author.

In many cases, the new user is expected to make a nominal contribution to the writer of the software but there is no enforceable charge, and it's left to the user's conscience.

So what's on offer, how good is it and where can it be obtained? The major sources of public domain software are bulletin boards, software libraries and user groups.

Ken Hughes takes a look at the goodies on offer in the public domain comms market

user groups.

Reading through the advertisers in current and back issues of *Atari ST User* produced the addresses of McSoft in Bath and The Southwest Software Library in Bristol, though there are many others.

Stamped, self-addressed envelopes brought lists of all their available discs and from these we selected the required communications software.

There is obviously some duplication in the programs offered, but both libraries offered, in my opinion, the best public domain comms program – Uniterm.

This is a Gem-based, mouse-driven program which offers a range of file trans-

fer protocols – Xmodem, Ymodem, Kermit as well as standard Ascii.

The one thing it lacks is split baud working so access to say, MicroLink at 1200/75 baud using a Pace Nightingale is out. An intelligent modem, which buffers the speed between your ST and the remote computer, will get round this problem.

Another useful program is STtalk. This has a facility to transfer Ascii files between the Atari XE with its non-standard character set and your ST. It also supports auto-dial for those whose modem will allow it.

If you already have a commercial program but need an extra facility such as Kermit, there is software available dedicated to your requirements. There is even a program which will give access to Prestel with full graphics.

Not all the authors are enthusiastic amateurs either. Stern is a nice program to use. It supports Xmodem, allows the capture and transmission of Ascii files and was written by Jez San – possibly ▷

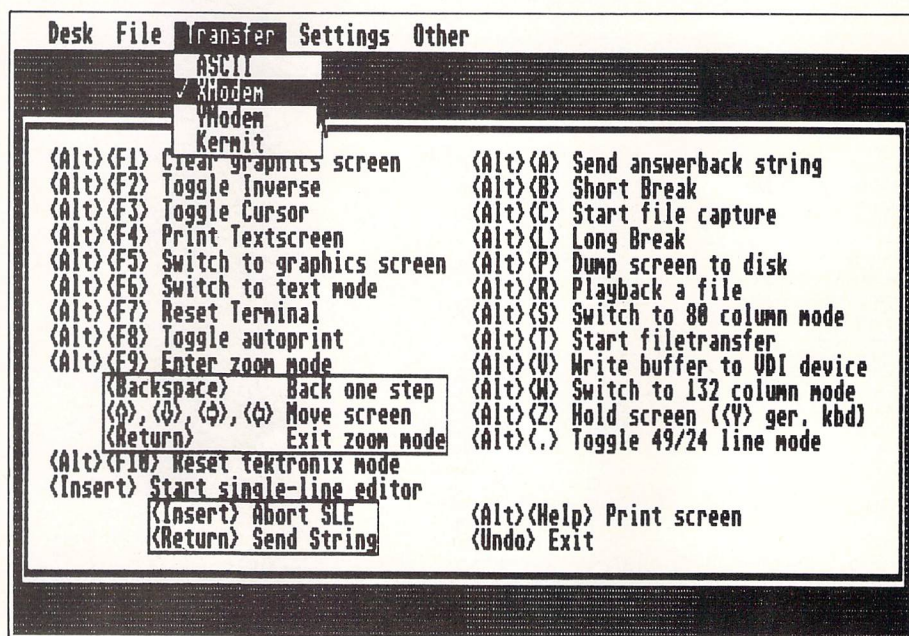


Figure 1: Uniterm's comprehensive Help screen

◁ slightly better known as the author of Star Glider.

With many of the discs you don't just get one program. There may be three or four comms programs plus a handful of utilities which enable you to compress and encode files. Plus of course, the ability to return them to their original condition.

The reason for file compression is to reduce the amount of time online, thus keeping your phone bills to a reasonable level. File encryption allows some degree of security. If the wrong person receives your file, it's unlikely they'll be able to read the data without the correct password.

Don't be worried about trying the public domain. If you don't like a program once you've got it you can always wipe the disc clean and use it for something else. As you will have paid less than £5, you won't have lost much financially and you will have had the fun of trying it out.

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Figure II: Setting Kermit's parameters



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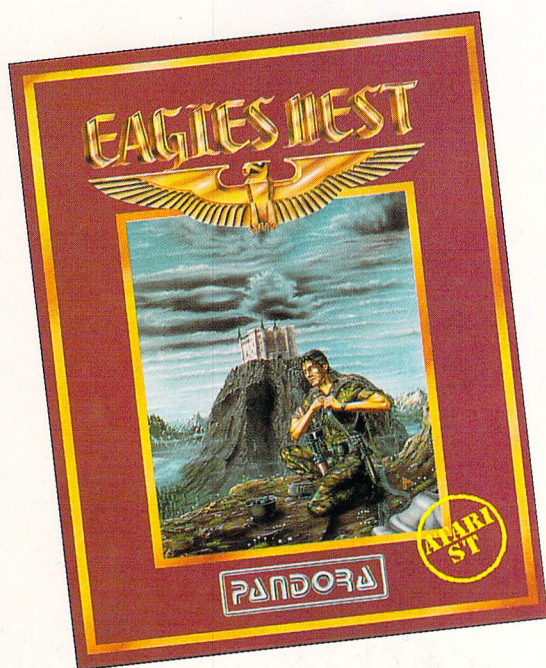
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All you have to do is answer the questions below — complete the entry form (or photocopy) and ensure that it arrives no later than November 30.

The first correct entry pulled from the sack will receive the WM60 Walkman plus Pandora's Eagle's Nest.

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1. Name the programmer responsible for the ST version of Eagle's Nest.
2. Give the name of two other computers for which Eagle's Nest is available.
3. Who wrote the music for Goldrunner?

ENTRY FORM

ANSWERS

1
2
3

Name

Address

.....

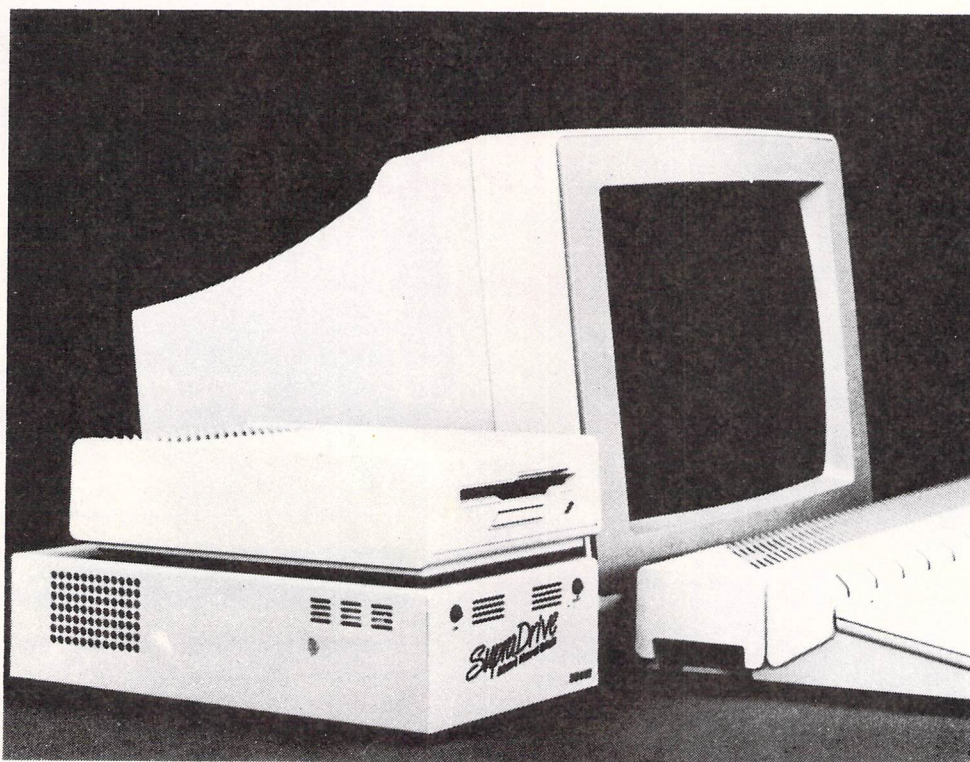
.....

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3D Adventure

Program: *King's Quest II*

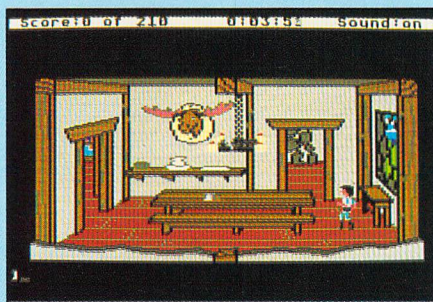
Price: £24.99

Supplier: Sierra On-Line c/o Activision, 23
Pond Street, Hampstead, London NW3
2PN.

Tel: 01-431 1101

ALTHOUGH I'm not a great admirer of the Sierra On-line 3D animated adventures, this latest one in the King's Quest series is certainly the best of the bunch.

The characters can move behind, in front, on top and under many of the objects on the screen, hence the 3D descriptor. When your character reaches one of the exit points of the scene, the new appropriate location is loaded in



from disc while the present one disappears using an impressive screen dissolve.

Text is input at the bottom of the screen by keyboard in the normal way, though several function and other keys can be used for system commands (save, restore and so on).

A window pops up in the centre of the screen in response to a typed input or any program generated event and contains the appropriate response in text. The window remains and no further commands can be given until Return or the right mouse button is pressed.

King's Quest III concerns your adventures as Gwydion; a young slave to a rather nasty wizard, Manannan. Said wizard simply doesn't like doing the dirty chores around the house and so every 17 years he kidnaps a baby boy, brings him up as his servant and then disposes of him when he reaches 18. Gwydion is the current slave.

Your task is to escape from the evil thrall of the wizard. To do this, you will need to learn the wizard's secret spells and use them to free yourself from bondage.

The documentation that comes with the package provides helpful instructions on ingredients and directions for such spells.

You will eventually find yourself embarking on a perilous journey to a dis-

tant land, there to free a kingdom from the ravages of a terrible monster.

You start inside the wizard's house, set high up on a rocky hill. Before you know where you are, the wizard appears in a puff of smoke and says "Gwydion, my chamber pot needs servicing. Go empty it immediately" and puffs off again. Charming man.

If you dawdle around for too long, the wizard reappears, shouts some more, ominously points his finger and you turn into a puffball. Fortunately you're only being beamed up to the bedroom – there to find you have been locked in.

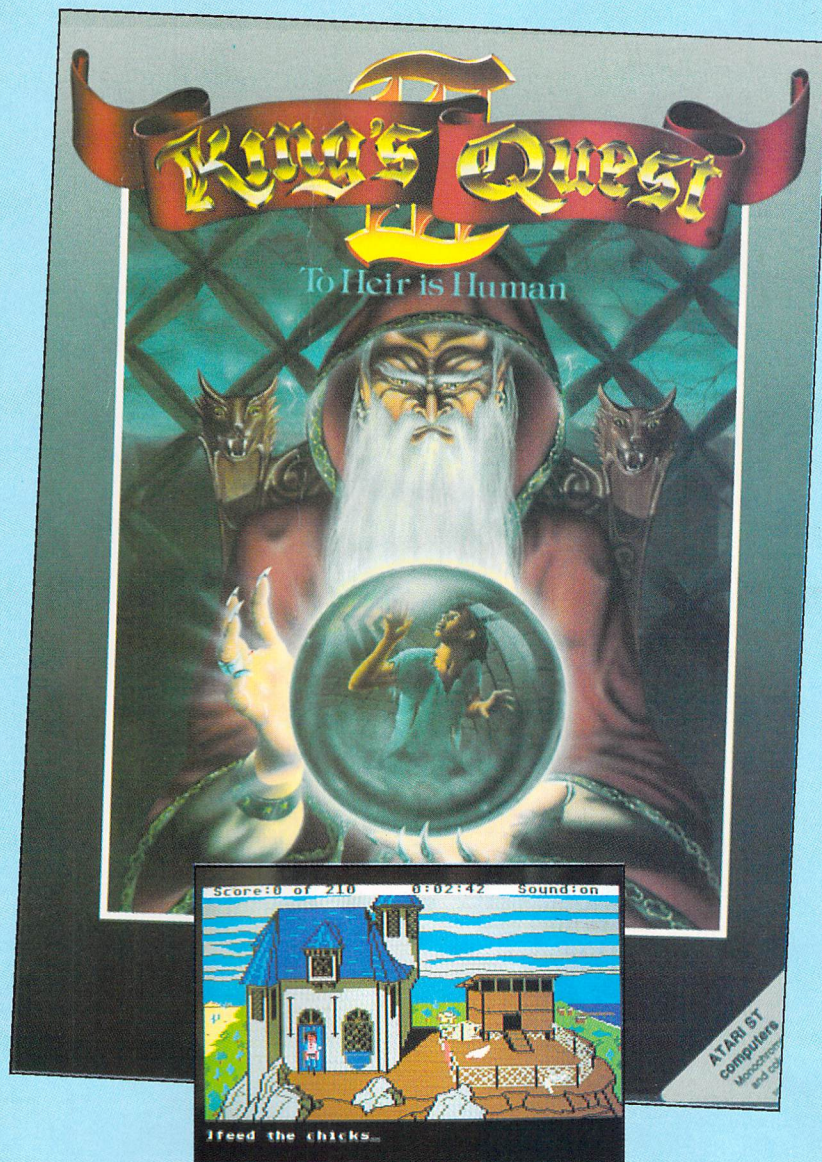
While the animation is somewhat basic, the graphics are extremely eye-catching. Each scene is colourful and imaginatively presented and there are some delightful little surprises in store.

The vocabulary, while sufficient for a game of this type, does show signs of

narrowness in some areas. When facing row upon row of books, I typed "Read a book" and received the reply "How can you do that?". I tried searching the books, but was told "Is it lost?". Sound effects are reasonably good, but the music is awful.

I was pleasantly surprised by King's Quest III. The success and popularity of the King's Quest programs is beyond doubt – this latest release is a clear advance on the earlier ones. And if you've never played an animated adventure, you could do no better than to try this.

Bob Chappell



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

Hot stuff

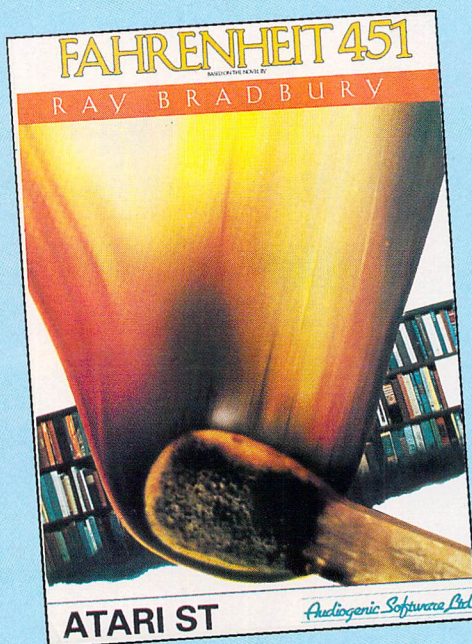
Program: *Fahrenheit 451*
 Price: £19.95
 Supplier: Audiogenic Software, 12 Chiltern
 Enterprise Centre, Station Road, Theale,
 Berkshire RG7 4AA.
 Tel: 0734 303663

WHAT sort of fireman wears a black shirt, sports a badge stitched with an image of an orange salamander and carries a platinum lighter? Which fireman's rules include the instructions, "Answer the alarm swiftly, start the fire swiftly and burn everything"?

These are the firemen of the 451 corps, and they are book burners – 451 Fahrenheit being the temperature at which book paper burns. In Ray Bradbury's famous futuristic novel, to own a book is not only illegal, but dangerous. They are regarded as fermenters of unrest and the fireman's job is to eradicate them from the face of the earth.

This two-disc text and graphic adventure has you playing the part of Guy Montag, one of the feared book-burning corps. Your conscience has, however, turned you into a rebel with a passion for literature, and as a result you are now the most wanted fugitive in the country.

An underground resistance organisation has dedicated itself to keeping



contents – which they do with one snap of their venomous jaws.

The distinctive aroma of gasoline you carry with you as a permanent talisman from your former duties doesn't help you to go unrecognised.

If you are to succeed in escaping the clutches of your enemies and bring the world of books back from the edge of extinction, you'll need the help and advice of the underground.

They will not only teach you how to dupe the metal mutts, but may also give

guidance on how to obtain a false identity and how to avoid military checkpoints.

The graphics appear in the top half of the screen with text in the lower half. The illustrations are quite good and often appear as two or three smaller panels. They can be switched off. Sound effects also play a small part in the game.

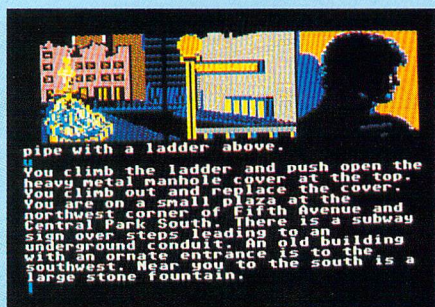
While the plot and puzzles are highly engrossing, it is in the text where this game excels. As becomes an adventure that features literature as its central theme, the descriptive prose is of a high standard. If you want an adventure whose text is vibrant and imaginative, poetic even, then this is the one for you.

The command parser is of a high standard and the comprehensive documentation includes a list of all the words understood and also contains a few coded hints to help you on your way.

Fahrenheit 451 is an excellent and literate adventure with an unusual theme and meaty content. As well as being a must for Bradbury fans and for those who thirst for imaginative prose with their adventures, Fahrenheit 451 deserves to be in the collection of all dedicated adventurers.

Bob Chappell

Presentation	8
Atmosphere	9
Puzzlement	8
Value for money	8
Overall	8



books alive by the unusual expedient of memorising entire works of literature – each member is a living, breathing, talking book. And it is to this movement you must turn for help.

The adventure begins in New York's Central Park where going one way results in death by drowning and another in being ripped to pieces by a tiger.

A frustrated kick at a pile of leaves reveals an alternative route out of the park and before long you resurface in a different part of the city and make your first contact with a member of the underground.

The streets are dangerous places, not least because they are patrolled by ferocious mechanical hounds, trained to detect, track down and destroy all mal-

Software piracy

Product: *Tai-Pan*
 Price: £19.95
 Supplier: Ocean, 6 Central Street, Manchester M2 5NS.
 Tel: 061-832 6633

TAI-PAN is based on the book by James Clavell. The object is to make money, legally or otherwise, by trading in goods, contraband or even by becoming a pirate.

The game starts with a rather bland title screen announcing that the graphics were designed by Pete Lyon of Karate Kid Part II fame and requests whether you wish to use the mouse or joystick for control.

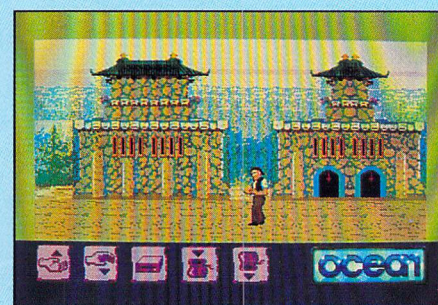
It's a pity the games designer insisted on using the port zero for the joystick, as this means anyone with a mouse (and that's just about everyone) will have to unplug it and change to a joystick.

After I'd got over the disappointment of the title screen I progressed, joystick in hand, to the game itself. The screen

appeared and announced I couldn't leave port without a ship. This message, one of many that crop up during the play, appeared in the form of a scroll, slowly unrolling across the screen.

The effect is quite nice for a while, but it soon becomes frustrating when you get the hang of the game. Likewise, the tune playing continuously in the background soon becomes very repetitive.

As the game gets underway, you wander around the town penniless, looking for someone to sponsor you to make



Bombs away!

Program: Deathstrike

Price: £14.95

Supplier: Talent Computer Systems,
Curran Building, 101 St James's Road,
Glasgow G4 0NS.

Tel: 041-552 2128

THIS new shoot-'em-up from Talent Computer Systems is based on Scramble and is just about as different from Trimbase – its major product – as you can get.

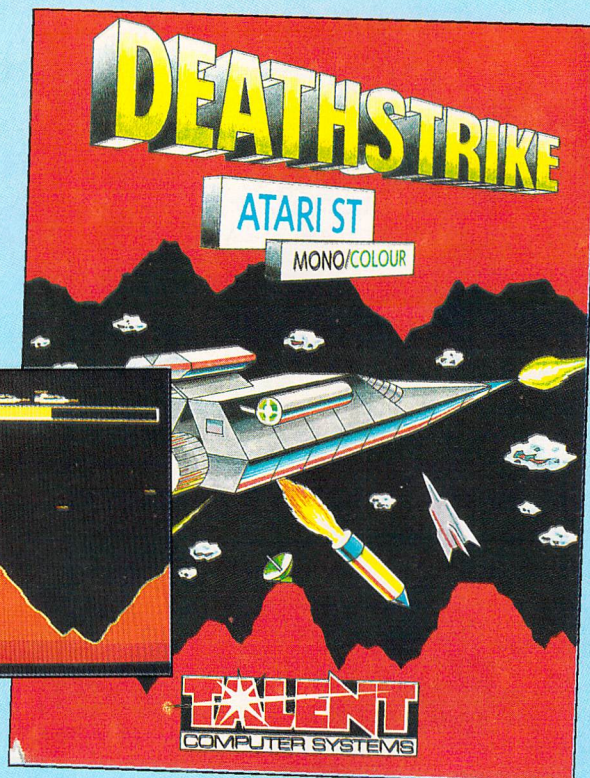
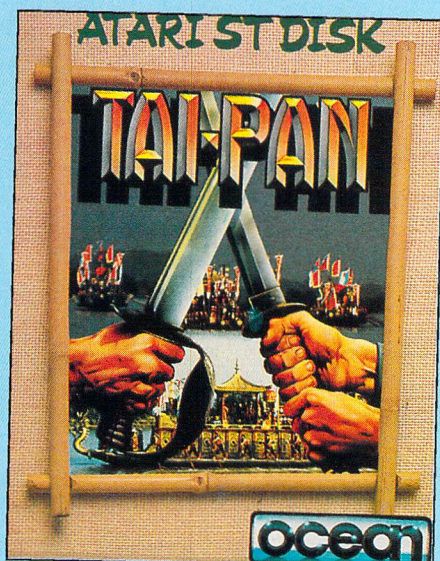
It was one of the first real zap-'em games to appear in the arcades after space invaders and is still the most addictive game I have played.

The packaging is rather dull and simple which made me wonder whether the game itself would be equally uninspiring. So I was pleasantly surprised to find such a well written and enjoyable game. The old adage – don't judge a game by its cover is certainly true here.

The aim is to fly your craft over a planet and through large caverns, showering enemy targets with your bombs and missiles before attacking and hopefully destroying the mothership. When you have completed this mammoth task the game is repeated – but next time it's much more difficult.

your fortune on the high seas. When you eventually find him, you must repay the money within six months or you will lose your head.

Movement around the town is hindered by poor control. The design centres around pretty pictures, rather than ease



During the mission you have to shoot or dodge rockets fired from the ground, UFOs bouncing up and down, and fast moving meteors which hurtle towards you.

If you run out of fuel, control of the ship is lost and the craft plummets earthwards. Fuel consumption increases when accelerating, so be frugal. Refuelling is accomplished by destroying fuel tanks dotted about the landscape along the way

– these aren't very frequent and are often hard to hit.

At the top of the screen is your score, remaining lives, fuel supply and the difficulty level you are on – there are seven in all. Underneath is the playing area. The graphics are of average detail and don't overcrowd the screen.

You control your space fighter with joystick, mouse or cursor keys. I found the joystick was the easiest method overall, although dropping bombs in this mode is quite difficult.

Points are awarded for each enemy target destroyed and once you have achieved a high score you may enter the Hall of Fame. Function key f10 saves your position and automatically starts from there next time you play.

The sound is reasonable, with different noises for missiles, bombs and exploding enemy ships. There is also a tune which plays throughout the game. Both the effects and tune can be switched off if required.

If the game is not played for more than 40 seconds the demonstration mode will start. This shows what kind of hazards you can expect to find at each level of the game.

Unlike other ST games you can play Deathstrike in either a high resolution monochrome or low resolution colour. It's a must for all shoot-'em-up games players and at only £14.95 you can't afford to miss it.

John Butters

of use and this is frustrating.

The only guide to the availability of exits from each location is by watching the other characters appearing and vanishing apparently into thin air. Once discovered, getting through can be hit or miss because there's no on-screen cursor.

Once you have enough money you can buy yourself a ship, fill its hold with goods and acquire a crew. Human nature makes it very tempting to press-gang a few drunks. But beware, as capture carries a heavy penalty.

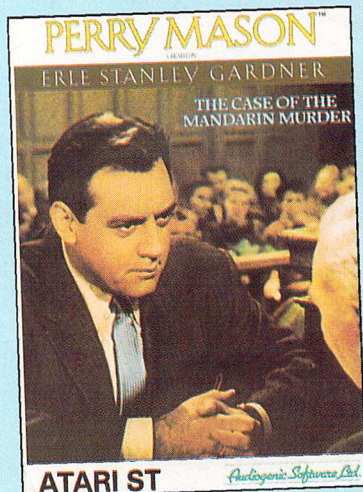
On the positive side the puzzles are elaborate and well thought out. Becoming a pirate can be profitable and great fun. The battle scenes are good for what must surely class as a graphic adventure. I was disappointed that the rest of the game was not so well constructed though, and I expected more from Tai-Pan.

Mark Smiddy

Sound	5
Graphics.....	7
Playability	4
Value for money.....	6
Overall	6

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

Gripping court drama



Program: *Perry Mason and the Case of the Mandarin Murder*

Price: £19.95

Supplier: Audiogenic Software, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 4AA.

Tel: 0734 303663

IN this two-disc text and graphics adventure, Perry Mason has to defend a woman charged with murdering her restaurateur husband.

Since she was found beside his dead body with the murder weapon in her hand, has a history of mental instability and possesses a clear motive for wanting him dead, her prospects look pretty bleak.

As the world famous criminal lawyer who always gets his man (or woman) you must prove your client innocent and if possible bring the real culprit to justice.

You can examine the scene of the murder for clues and possible evidence, visit the accused in prison and call upon your legal assistant, Della Street, and private eye, Paul Drake, for help with the investigation.

But what makes this adventure game so different and entertaining is that much of the action takes place in court.

This includes introducing and present-

ing evidence, listening to and carefully analysing the prosecution's case, interjecting with objections on a number of grounds where you think it appropriate and cross-examining the witnesses. You can even indulge in a private consultation with the judge.

Della Street is always on hand to assist in sticky personal matters and she is particularly good at persuading the less forthcoming characters to submit depositions on the defence's behalf.

She will also take notes for you at the trial, giving you on request a summary of a direct examination of a witness. If you're really stuck, you can ask her to assist you in formulating a cross-examination strategy for the current witness, including a list of possible questions to put to the witness.

Paul Drake is a willing workhorse, but each job you give him takes time so choose the what and when carefully – you don't want him reporting back after your client has just been sent down for the rest of her natural.

When listening to the prosecuting attorney's examination of witnesses, you may object at any time. The judge will either overrule you or ask for the grounds for your objection. Choose wisely or you will be overruled, not to mention being sternly rebuked by the judge if you overdo it.

Comic capers

Program: *Sidewalk*

Price: £19.95

Supplier: Infogrames, Mitre House, Abbey Road, Enfield, Middlesex EN1 2RQ.

Tel: 01-364 0123

SIDEWALK is an unusual game in two respects. Firstly, although it is basically an arcade-adventure revolving around large-scale graphics, there is no colour. Secondly, the game is styled like a comic strip and this lack of colour enhances it.

The starting point for Sidewalk is that your motorbike has been stolen and disassembled. Your task is to search the town, find all the bits and reassemble it in time to take your girlfriend to the concert that evening.

You must also buy the tickets and be ready by 7.30 pm, otherwise your girlfriend will ditch you for another bloke.

The upper half of the screen is split into three panels. To the left is a generously-sized profile of your less than handsome face.

The centre panel shows a picture of your current location in the town with a full frontal of your face in the foreground. When you walk away from the screen, your face is replaced by a small, but complete figure which can then walk left, right or fight.

The right panel normally displays a



beer mug, the level indicating the amount of energy you have left. Once the glass is empty, the game is over. If it gets low, you can refill it at the bar in the town.

During your travels, you will come across many different characters. When you meet one, the right panel changes to show you another comic-strip style picture of him or her. Overlaid across the left side is a brief description of the character – weight, height and other features.

At each encounter, three symbols appear representing the choices avail-

able to you: Ask a question, run for your life or fight. Usually there are a number of different questions you can put to the character and moving the joystick scrolls through the list while pressing the fire button selects one.

Electing to run away (many characters are pretty nasty and downright dangerous, the Flailer in particular) instantly moves you to the next location indicated by a corresponding joystick push.

Fighting can take the form of two-fisted thumping, swift kicking or head-butting,

The graphics are attractive and restrained, adding to, rather than detracting from the atmosphere and are often used in a split screen format (text to one side, picture to the other). The game can be played with them off if you prefer.

Unfinished games can be saved to and loaded from disc. The optional demo mode gives you a good feel for how the game plays.

Music includes the familiar Perry Mason theme tune playing here and there as well as some dramatic chords and snatches at appropriate moments. Other sound effects include a ringing telephone and music playing when you switch on a hi-fi in the game.

Perry Mason and the Mandarin Murder is a highly professional, literate product and a refreshing change from the normal run of adventures. After all, who could resist passing up the chance to be a famous criminal defence lawyer with the odds stacked against an acquittal? Perry Mason is a winner yet again.

Bob Chappell

Presentation	10
Atmosphere	10
Puzzlement	9
Value for money	9
Overall	9

depending on how you handle the joystick. Another beer mug will appear showing your opponent's energy level – both will diminish as the short and swift scrap takes place.

While the fight is going on, the left panel shows a close-up of the damage being inflicted to your face – not a pretty sight, but comically effective.

If you're successful in a scrap, you may well recover a piece of your bike. The lower half of the screen shows all the bits so far recovered together with a purse (indicating the amount of money you have) and a clock to let you know time is passing.

When it comes down to it, Sidewalk is another mixture of stroll, search and scrap and the marked limitations of the gameplay put a large question mark over its value for money.

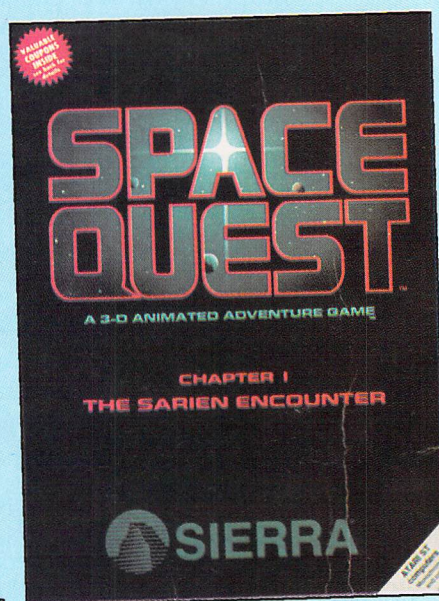
However, Sidewalk is lifted above the usual run-of-the-mill games of this nature by the comic illustrations and it's nice to see something a little out of the ordinary again from Infogrames. They certainly try hard to be original.

Doug Wooller

Sound	4
Graphics	7
Playability	5
Value for money	4
Overall	5

Graphics adventure

Program: Space Quest
Price: £24.99
Supplier: Sierra On-Line c/o Activision, 23
Pond Street, Hampstead, London NW3
2PN.
Tel: 01-431 1101



SPACE Quest is very much in the mould of previous Sierra On-Line text and graphic adventures. The plot of Space Quest, The Sarien Encounter, concerns a planetary system called Earnon whose sun is slowly dying.

Scientists on nearby planet Xenon have been working on a device called the Star Generator with which they hope to convert one of the system's lifeless planets into a new sun.

The development team for this project is housed on the space laboratory Arcadia aboard which you are cast in the role of Roger Wilco a janitor. Unfortunately, some Sarien space pirates have gotten wind of the device and have attacked and boarded.

The game commences as you creep out of a closet where you had been taking a crafty nap. Loud explosions, laser blasts and screams of dying crewmates having woken you from your janitorial dreams.

A graphic representation of the current location fills most of the screen. Across the scene and in and out of doors and lifts toddles Roger whose movement you control with joystick or mouse. When he reaches the edge of the screen, the disc drive whirrs for several seconds and a new scene appears.

This constant disc accessing tends to slow the game down and much of what atmosphere is generated is dissipated by

the delays when you are trudging from screen to screen.

Roger's movement can operate at three speeds: Slow, normal or fast. Fast is best for zipping through scenes, but positioning Roger precisely (before objects or doors, for example) becomes a headache. Switching to slow at such points is recommended. All other commands are input at the keyboard.

Positioning Roger can be difficult, but even more of a problem are the graphics. You must know what the object is called before you can check it out, so the gameplay can become a little frustrating if you cannot identify what is on the screen.

No rooms are described automatically – you have to type "Look at room" or "Look room" before you are told. It is in this description that the names of some of the objects in the present location can be found.

The secret of this type of game is to examine everything in sight. Some of this searching will be a complete waste of time and so frustrating, but it does prove profitable in the long run.

Gameplay apart, the actual adventure is quite enjoyable. There is plenty of variety in the puzzles and responses and the game has a robust sense of humour.

Having encountered about my sixth dead crewman, I was told "Here lies another heap of fried humanity. The attackers have proven to be very thorough thus far. There's something to be said for not being the hero type, you rationalise".

A lot of people like this type of adventure and if you are one of them then Space Quest is going to provide you with a good deal of fun.

Bob Chappell



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

USA link back in action

THE giant American database Mnemetics is once again available to MicroLink subscribers after a complete reorganisation.

Mnemetics' switch to a more efficient system carrier caused the temporary severance of UK links with the dynamic electronic information source.

But now MicroLink subscribers can again chat to enthusiasts in the USA

and tap the vast array of computer-related and special interest group sections.

All the old Mnemetics features are back – plus some new departments – and there are plans for even closer ties with MicroLink.

These include a reverse gateway to allow the Americans to make direct calls to MicroLink and see what's on offer over here.

A new line for the Church

COMPUTER communications systems like MicroLink have become a major focus of interest for Britain's churches.

A joint study of information technology is currently being undertaken by Church House, the Anglican Consultative Council and the British Council of Churches. It will eventually lead to more efficient electronic communication between churches all over the world.

Meanwhile similar assessments on a smaller scale are being conducted in just about every diocese in the UK. Typical of these is the one being done by the Rev Richard Thomas, communications officer for the Diocese of Winchester.

"I'm using MicroLink as part of my brief to explore the whole area of communications", he said.

"I believe electronic mail is going to become very important and I'm sure it has a lot to offer the Church – both nationally and internationally – as a communications medium".

Farming baronet on line

DOWN on the farm or in the factory, baronet and MicroLink subscriber Sir Charles Legard is equally at home thanks to computer communications.

Information technology makes sure he's always up to date with what's happening on his North Yorkshire estates in the Vale of Pickering as well as the family businesses in Leeds and Bradford.

Sir Charles farms 1,700 acres of arable land around Scampston Hall, Malton, in addition to running companies involved in engineering and wholesaling electrical components.

Legards have owned land in Yorkshire since the 12th Century, but the micro and modem are now as much a part of the scene at Scampston Hall as the family portraits.

"Whether I'm at home or in one of my offices, computer communications keep me constantly in touch with what's going on elsewhere", said Sir Charles.

Communicating to cut unemployment

TWO organisations at opposite ends of the spectrum are using MicroLink communications as they attempt to reduce unemployment.

Camden Jobtrain in North London provides local youngsters with opportunities to learn the specific skills which surveys have revealed are most wanted by employers in the area.

There are 120 places on courses in motor mechanics, carpentry and joinery, office skills, catering, and care for the elderly and young children – all leading to City and Guilds or other qualifications.

At the other end of the scale, the Mid-Career Development Centre in Croydon helps business and professional people who have been made redundant or want a more fulfilling job.

The Centre's experienced career counsellors provide individual help to restore confidence and practical assistance in getting a new job.

"Many people find that being made redundant turned out to be a lucky break because it galvanised them into action they might otherwise never have taken", says principal Kieran Duignan.

**Your chance
to join
MicroLink
– turn to
Page 17**

BR BOOKING EASIER

MICROLINK's convenient British Rail telebooking service has been given a complete update.

It allows subscribers at any hour of the day or night to order train tickets for journeys between London and more than 20 major UK centres from Aberdeen to York.

Subscribers can book their journeys via MicroLink after studying the electronic timetables in the comfort of their own home or office, and charge them to their Access, Barclaycard, American Express or Travel Key account. Tickets are sent by return post.

Memory Zapper

MEMORY Zapper is a full screen memory editing program, written in Atari ST Basic that will work in either high or medium resolution mode.

Before detailing how the program works, a look at how the memory of the ST is organised may be useful.

The 68000 microprocessor used in Atari ST's can directly address 16 Megabytes of memory but, because only a small portion of this address space is used in the current ST's, Atari has developed some custom chips which look after such things as memory addressing and various other functions.

These are known as MMU, GLUE, DMA and SHIFTER. Of these, MMU and GLUE are responsible for looking after the memory addressing. If an attempt is made to read or write to memory which is "non-existent", a bus error is invoked.

The 68000 then jumps to an exception handling routine via a set of vectors held in the first page of memory. The usual result of this is a crash with a number of bombs appearing on the screen and the only way out is to press the reset button.

Interestingly, on the 520ST where you would expect ram to end at \$7FFFF (512k), it is possible to read and write to locations above this without crashing (although nothing will be happening).

In fact a bus error does not occur until you try to access memory above \$3FFFFFF, which is Mb - it seems Atari has been planning the Mega ST's for some time!

Memory Zapper will allow you to view all memory from address zero to \$FEFFFF. The area of memory in the range \$FF8000 to \$FFFFFF is the memory mapped I/O area. In theory it should be possible to read and write to this area, but it seems to be sensitive to reading and writing by Basic, the outcome usually being a crash, so the program will not allow you to enter addresses in this range.

The subroutine *type* determines how much ram is available and sets *himem* accordingly. The first eight pages of ram (that is from address zero to \$7FFF) contain such things as the exception vectors and other system variables which if altered would almost certainly crash the system.

To guard against this the program does not write back to these locations (Line 1800 in subroutine *putmemory*).

The next area of memory needing mention is the rom area from \$FA0000 to \$FBFFFF (the cartridge slot) and \$FC0000 to \$FEFFFF (operating system). Rom, (read only memory), as its name

Take a PEEK at your ST's memory with John Spink's utility

implies can only be read from and not written to and so the program will allow you to view the contents of this area but will not attempt to write anything back.

One note of caution. The program works by peeking and poking memory two bytes at a time so when entering the starting address you should ensure that it is an even address otherwise incorrect values will be poked back into memory.

In order to present a neat screen layout, extensive use has been made of the VT52 emulator built into the operating system. This is called from Basic by the command:

```
OUT 2,x
```

where 2 is the port number (in our case the screen) and x is the data to be sent. The subroutines have all been given meaningful names in order to make the program easy to follow.

Atari Basic has some interesting quirks so some points to watch out for when entering the program are: Some vari-

ables are specified as integer by the addition of a per cent sign, for example *value%* in line 940, *hb%* and *lb%* in line 960.

These must be entered as shown for the *HEX\$* function to operate correctly (missing off the per cent sign results in *HEX\$* always returning the value \$50).

When entering line 1890 make sure the first three characters of *text\$* are spaces, otherwise when returning to Basic the headings at the top of the screen will not line up correctly.

The subroutine *displayonepage* is used to PEEK the contents of memory and display them as hex bytes and Ascii characters. The subroutine *showaddress* is called first to display the addresses being listed.

It works by first splitting the address into high, middle and low bytes and then converting these bytes to strings, padding with zeroes as necessary before finally joining them and displaying the resultant string.

This may seem a roundabout method but it is needed because the *HEX\$* function can only work with integers in the range -65535 to +65535.

PEEK actually reads two consecutive bytes of memory as a single value and so lines 950 and 960 are needed to convert this into a high byte and low byte. The subroutine *asciistring* is used to build up a string of characters which represent the hex bytes as Ascii characters. This is ▸

ADDRESS	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	0123456789ABCDEF
000010	04	FC	0A	1A	00	FC	07	24	06	FC	0A	1A	07	FC	0A	1A	.^...\$.^...^.
000020	08	FC	0A	1A	09	FC	0A	1A	00	FC	9C	48	00	00	A3	0E	.^...^...H...
000030	0C	FC	0A	1A	0D	FC	0A	1A	0E	FC	0A	1A	0F	FC	0A	1A	.^...^...^...
000040	10	FC	0A	1A	11	FC	0A	1A	12	FC	0A	1A	13	FC	0A	1A	.^...^...^...
000050	14	FC	0A	1A	15	FC	0A	1A	16	FC	0A	1A	17	FC	0A	1A	.^...^...^...
000060	18	FC	0A	1A	19	FC	0A	1A	00	FC	06	1E	1B	FC	0A	1A	.^...^...^...
000070	00	FC	06	34	1D	FC	0A	1A	1E	FC	0A	1A	1F	FC	0A	1A	.^..4.^...^...
000080	20	FC	0A	1A	00	FC	4C	EE	00	FE	37	4C	23	FC	0A	1A	.^...^LE..7L#...
000090	24	FC	0A	1A	25	FC	0A	1A	26	FC	0A	1A	27	FC	0A	1A	\$.^..%..&^...^...
0000A0	28	FC	0A	1A	29	FC	0A	1A	2A	FC	0A	1A	2B	FC	0A	1A	(^..)^...%..+^...
0000B0	2C	FC	0A	1A	00	FC	07	4E	00	FC	07	48	2F	FC	0A	1A	.^...^..N..H/^...
0000C0	30	FC	0A	1A	31	FC	0A	1A	32	FC	0A	1A	33	FC	0A	1A	0^...1^...2^...3^...
0000D0	34	FC	0A	1A	35	FC	0A	1A	36	FC	0A	1A	37	FC	0A	1A	4^...5^...6^...7^...
0000E0	38	FC	0A	1A	39	FC	0A	1A	3A	FC	0A	1A	3B	FC	0A	1A	8^...9^...:..;^...
0000F0	3C	FC	0A	1A	3D	FC	0A	1A	3E	FC	0A	1A	3F	FC	0A	1A	<^...=^...>^...?^...
000100	40	B0	3B	04	35	58	2F	AC	00	FC	26	B2	1E	A8	18	FC	eä;.5X/2.^&B.i.^

Use cursor keys to move around the edit area
Use TAB to toggle between hex and ASCII input
Ctrl-N to list the next page, or ESC to quit

Figure 1: The memory edit screen

◁ useful for spotting embedded text when examining memory.

The next major subroutine is *edit-memory* starting at line 1240. The loop between lines 1260 and 1340 check whether any of the keys Escape, Control+N, Tab or cursor keys have been

pressed and if so then call the appropriate subroutine. If none of these have been pressed then the routine drops into the hexadecimal editing mode.

If the Tab key is pressed then the editing switches to Ascii mode and Ascii characters may be entered directly from

the keyboard. The routine starts at line 1450 and follows the same lines as hex entry except that this time Ascii characters have to be converted to corresponding hex bytes before being stored in the array and displayed in the hex section. □

```

10 REM *****
20 REM *   MEMORY ZAPPER   *
30 REM *   by John Spink   *
40 REM *   (c) Atari ST User *
50 REM *   ST Basic       *
60 REM *****
70 OPTION BASE 1:DIM memloc(16,16)
80 GOSUB hidemouse
90 FULLW 2:CLEARW 2:GOSUB type
100 true=0:false=-1:crlf$=CHR$(13)+C
  HR$(10)
110 begin:
120 escape=false:GOSUB titlescreen
130 WHILE escape=false AND finish>start
140 GOSUB displayonepage
150 GOSUB editmemory
160 start=start+256
170 WEND
180 GOSUB cls:GOSUB cursoff:GOTOXY 0,0
190 PRINT "Do you want to leave the
  program (Y/N) ?"
200 a=INP(2):IF a=89 OR a=121 THEN G

```

```

OSUB tidy:END
210 GOTO begin
220 titlescreen:
230 GOTOXY 0,0:GOSUB cls
240 PRINT TAB(26)"FULL SCREEN MEMORY
  EDITOR"
250 PRINT TAB(26)STRING$(25,CHR$(255))
  ):PRINT
260 PRINT TAB(30)CHR$(189);" John Sp
  ink 1987"
270 PRINT TAB(30)STRING$(17,CHR$(255))
  ):PRINT
280 PRINT TAB(26)"Do you want instru
  ctions?":a=INP(2)
290 IF a=89 OR a=121 THEN GOSUB inst
  300 x=1:y=19:GOSUB movecursor:GOSUB
  cursor
310 text$="Enter start and finish ad
  dresses in hexadecimal :":GOSUB textou
  t
320 x=7:y=20:GOSUB movecursor:OUT 2,
  27:OUT 2,75:text$="Start &H"
330 GOSUB textout:GOSUB getaddress:I
  F ok=FALSE THEN OUT 2,7:GOTO 320

```

```

340 start=address
350 x=7:y=21:GOSUB movecursor:OUT 2,
  27:OUT 2,75:text$="Finish &H"
360 GOSUB textout:GOSUB getaddress:I
  F ok=false THEN OUT 2,7:GOTO 350
370 finish=address:IF finish=start T
  HEN finish=finish+256
380 GOSUB cls:OUT 2,27:OUT 2,112
390 text$="ADDRESS 00 01 02 03 04 0
  5 06 07 08 09 0A 0B 0C 0D 0E 0F"
400 GOSUB textout
410 text$=" 0123456789ABCDEF":GOSUB
  textout
420 x=0:y=20:GOSUB movecursor
430 text$=" Use cursor keys to move
  around the edit area "+crlf$
440 GOSUB textout
450 text$=" Use TAB to toggle betwee
  n hex and ASCII input "+crlf$
460 GOSUB textout
470 text$=" Ctrl-N to List the next
  page, or ESC to quit "+crlf$
480 GOSUB textout:OUT 2,27:OUT 2,113
490 RETURN

```

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```

500 inst:
510 GOSUB cls:GOTOXY 0,0
520 PRINT TAB(32)"INSTRUCTIONS":PRIN
T TAB(32)STRING$(12,CHR$(255)):PRINT
530 ?" This program allows you to ex
amine the contents of memory and to al
ter"
540 ?" them, if desired."
550 ?" You are prompted for a start
and end address which should be given
in"
560 ?" hexadecimal (the program supp
lies the leading &H)"
570 ?" One full page of memory is th
en listed and by using the cursor keys
,"
580 ?" you can move around the editi
ng area, altering the contents of memo
ry"
590 ?" by simply over-typing what is
already there. To switch between hex"
600 ?" and ASCII input, press the TA
B key. To move on to the next page of"
610 ?" memory press CONTROL-N, or to
exit the program press ESC."
620 RETURN
630 textout:
640 FOR i=1 TO LEN(text$)
650 OUT 2,ASC(MID$(text$,i,1))
660 NEXT i
670 RETURN
680 movecursor:
690 OUT 2,27:OUT 2,89
700 OUT 2,ASC(CHR$(32+y)):OUT 2,ASC(
CHR$(32+x))
710 RETURN
720 cls:
730 OUT 2,27:OUT 2,69:RETURN
740 curson:
750 OUT 2,27:OUT 2,101:RETURN
760 cursoff:
770 OUT 2,27:OUT 2,102:RETURN
780 getaddress: address$=""
790 key=INP(2):GOSUB legal
800 IF ok=false AND key<>13 AND key<
>8 THEN OUT 2,7:GOTO 790
810 IF key=13 THEN address=VAL("&H"+
address$):GOSUB limit:RETURN
820 IF key=8 THEN OUT 2,8:address$=L
EFT$(address$,LEN(address$)-1):GOTO 79
0
830 OUT 2,key:address$=address$+CHR$(
key)
840 IF LEN(address$)=6 THEN address=
VAL("&H"+address$):GOSUB limit:RETURN
850 GOTO 790
860 limit:
870 IF address > &H3FFF00 AND addres
s < &HFA0000 THEN ok=FALSE:RETURN
880 IF address > &HFEFF00 THEN ok=FA
LSE:RETURN
890 ok=TRUE:RETURN
900 displayonepage:
910 y=2:FOR addr=start TO start+240
STEP 16
920 x=0:GOSUB movecursor:GOSUB showa
dress:x=6
930 FOR offset=0 TO 14 STEP 2
940 location=addr+offset:value%=PEEK
(location)
950 hb%=(value% AND 65280)/256:hb$=H
EX$(hb%)
960 lb%=value% AND 255:lb$=HEX$(lb%)
970 memloc(offset+1,y-1)=hb%:memloc(
offset+2,y-1)=lb%
980 WHILE LEN(hb$)<2:hb$="0"+hb$:WEN
D:hb$=RIGHT$(hb$,2)
990 WHILE LEN(lb$)<2:lb$="0"+lb$:WEN
D:lb$=RIGHT$(lb$,2)
1000 x=x+3:GOSUB movecursor:text$=hb$

```

```

:GOSUB textout
1010 x=x+3:GOSUB movecursor:text$=lb$
:GOSUB textout
1020 GOSUB asciistring
1030 NEXT offset
1040 x=58:GOSUB movecursor:text$=a$:G
OSUB textout
1050 y=y+1:NEXT addr
1060 RETURN
1070 showaddress:
1080 a$="":h%=addr/65536:h$=HEX$(h%):
WHILE LEN(h$)<2:h$="0"+h$:WEND
1090 m%=(addr AND 65280)/256:m$=RIGHT
$(HEX$(m%),2)
1100 WHILE LEN(m$)<2:m$="0"+m$:WEND
1110 l%=addr AND 255:l$=HEX$(l%):WHIL
E LEN(l$)<2:l$="0"+l$:WEND
1120 text$=h$+m$+l$:GOSUB textout
1130 RETURN
1140 asciistring:
1150 IF hb%>31 THEN high$=CHR$(hb%) E
LSE high$=""
1160 IF lb%>31 THEN low$=CHR$(lb%) EL
SE low$=""
1170 a$=a$+high$+low$
1180 RETURN
1190 legal:
1200 IF key>47 AND key<58 THEN ok=TRU
E:digit=key-48:RETURN
1210 key=key AND 223
1220 IF key>64 AND key<71 THEN ok=TRU
E:digit=key-55 ELSE ok=FALSE
1230 RETURN
1240 editmemory:
1250 GOSUB curson:x=9:y=2:GOSUB movec
urson
1260 hexloop:
1270 key=INP(2)
1280 IF key=27 THEN GOSUB putmemory:e
scape=TRUE:RETURN
1290 IF key=14 THEN GOSUB putmemory:R
ETURN

```

```

1300 IF key=200 THEN GOSUB up:GOTO he
xloop
1310 IF key=208 THEN GOSUB down:GOTO
hexloop
1320 IF key=203 THEN GOSUB left:GOTO
hexloop
1330 IF key=205 THEN GOSUB right:GOTO
hexloop
1340 IF key=9 THEN GOTO askyentry
1350 enterashex:
1360 GOSUB legal:IF ok=false THEN OUT
2,7:GOTO hexloop
1370 OUT 2,key:hi=digit
1380 key=INP(2):GOSUB legal:IF ok=fal
se THEN OUT 2,7:GOTO 1380
1390 OUT 2,key:lo=digit
1400 memloc(x/3-2,y-1)=hi*16+lo:tx=x:
x=x/3+55:GOSUB movecursor
1410 IF hi*16+lo<32 THEN OUT 2,46 ELS
E OUT 2,hi*16+lo
1420 x=tx:GOSUB right:GOTO hexloop
1430 askyentry:
1440 x=x/3+55:GOSUB movecursor
1450 askyloop:
1460 key=INP(2)
1470 IF key=27 THEN GOSUB putmemory:e
scape=true:RETURN
1480 IF key=14 THEN GOSUB putmemory:R

```

```

ETURN
1490 IF key=200 THEN GOSUB up:GOTO as
kyloop
1500 IF key=208 THEN GOSUB down:GOTO
askyloop
1510 IF key=203 THEN GOSUB left:GOTO
askyloop
1520 IF key=205 THEN GOSUB right:GOTO
askyloop
1530 IF key=9 THEN x=(x-55)*3:GOSUB m
ovecursor:GOTO hexloop
1540 OUT 2,key:memloc(x-57,y-1)=key:t
x=x:(x-55)*3:GOSUB movecursor
1550 hi=(key AND 240)/16:IF hi>9 THEN
hi=hi+55 ELSE hi=hi+48
1560 OUT 2,hi:lo=key AND 15:IF lo>9 T
HEN lo=lo+55 ELSE lo=lo+48
1570 OUT 2,lo:x=tx:GOSUB right:GOTO a
skyloop
1580 up:
1590 IF y=2 THEN y=17 ELSE y=y-1
1600 GOSUB movecursor
1610 RETURN
1620 down:
1630 IF y=17 THEN y=2 ELSE y=y+1
1640 GOSUB movecursor
1650 RETURN
1660 left:
1670 IF x=58 THEN x=73:GOSUB up:RETUR
N
1680 IF x>57 THEN x=x-1:GOSUB movecur
sor:RETURN
1690 IF x=9 THEN x=54:GOSUB up:RETURN
1700 x=x-3:GOSUB movecursor
1710 RETURN
1720 right:
1730 IF x=73 THEN x=58:GOSUB down:RET
URN
1740 IF x>57 THEN x=x+1:GOSUB movecur
sor:RETURN
1750 IF x=54 THEN x=9:GOSUB down:RETU
RN
1760 x=x+3:GOSUB movecursor
1770 RETURN
1780 putmemory:
1790 address=start:IF address>=himem
THEN RETURN
1800 IF address<=2048 THEN RETURN
1810 FOR y=1 TO 16
1820 FOR x=1 TO 15 STEP 2
1830 value=memloc(x,y)*256+memloc(x+1
,y)
1840 POKE address,value:address=addre
ss+2:IF address>=himem THEN x=15:y=16
1850 NEXT x:NEXT y
1860 RETURN
1870 tidy:
1880 GOSUB cls:GOSUB cursoff
1890 text$=" Desk File Run Edit
Debug":GOSUB textout:GOSUB showmouse
1900 RETURN
1910 type:
1920 phystop=&H42E:himem=PEEK(phystop
)*&H10000
1930 RETURN
1940 hidemouse:
1950 POKE CONTRL,123
1960 POKE CONTRL+2,0
1970 POKE CONTRL+6,0
1980 POKE CONTRL+12,2
1990 VDISYS(1)
2000 RETURN
2010 showmouse:
2020 POKE CONTRL,122
2030 POKE CONTRL+2,0
2040 POKE CONTRL+6,1
2050 POKE CONTRL+12,2
2060 POKE INTIN,0
2070 VDISYS(1)
2080 RETURN

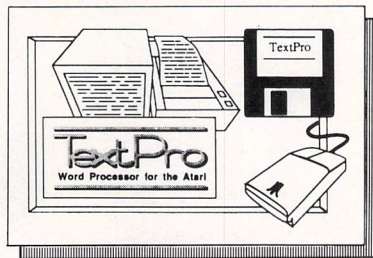
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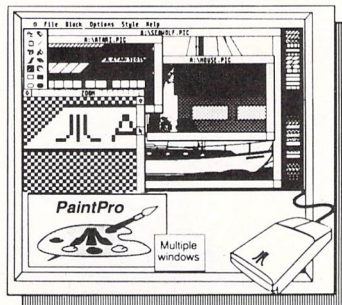


TextPro

"...TextPro is the best wordprocessor available for the ST." — Randy McSorley
Pacus Report Dec '86

The professional wordprocessing package designed for the ST by professional writers ST TextPro combines great features with flexibility, speed and easy operation – but at a very reasonable price! ST TextPro offers full-screen editing with mouse or keyboard shortcuts, as well as high-speed input, scrolling and editing. You can create multiple columns of text, and choose up to 180 characters per line. ST TextPro even generates an automatic index and table of contents! Other features include 30 user-defined function keys; flexible printer installation; sideways printing; loading and saving to RS232 port; and much more.

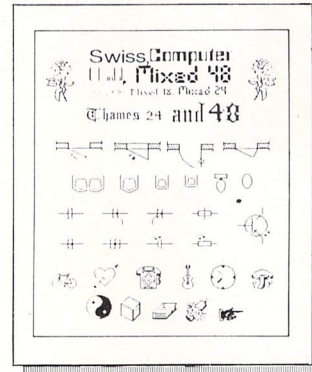
AB 490 Unbeatable value at only **£39.95!**



PaintPro

A true GEM™ among ST graphic design/paint programs. ST PaintPro is very friendly and economical – but very powerful. PaintPro supports up to three active windows, and has a complete toolkit of functions: free-form sketching, lines, circles, ellipses, boxes, text, fill, copy, move, zoom, spray, paint, erase, undo, help, as well as extensive text capabilities. You can even import "foreign" pictures for enhancement using PaintPro's double-sized picture format, and send hardcopy to most popular dot-matrix printers. Works with either monochrome or colour ST systems. ST PaintPro is a must for everyone's artistic or graphics needs.

AB 620 **£49.95**



PaintPro Library # 1

A companion to the ST PaintPro package (and compatible with Degas as well). This complete graphics library includes five new original fonts that can be used with PaintPro – Swiss, Computer, Chantal, Mixed and Thames (Old English) – and hundreds of symbols, borders, ornamental lines, etc. for use in electronic, architectural and graphics design.

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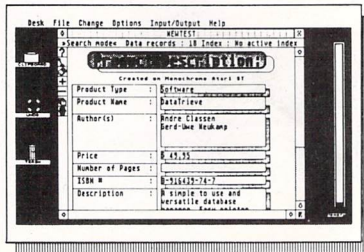
AssemPro

"The whole system is well designed and makes the rapid development of 68000 assembler programs very easy."

— Jeff Lewis
Input
Dec. '86

ST AssemPro is a complete machine language development tool for the professional developer. The AssemPro package makes assembly language programming easier and quicker than ever before, because it takes full advantage of the ST's GEM environment. AssemPro includes a full-function screen editor with search and replace, block operations, upper/lower case conversion, and user-definable function keys. The fast 68000 macro assembler assembles to either disk or memory, and features interactive error correction. AssemPro sends an assembler and/or symbol table listing to printer or disk, and features a powerful debugger with single-step, breakpoint, 68020 emulator, and much more. ST AssemPro gives the programmer online help including instruction address mode and GEM parameter information, disassembler and reassembler, and a comprehensive 175-page manual.

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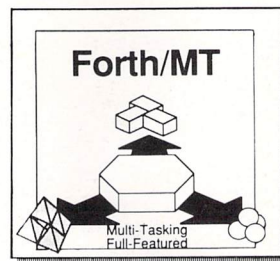


DataRetrieve (Formerly DataTrieve)

"DataRetrieve is the most versatile, and yet simple, — Bruce Mittelman
data base available for the Atari 520ST/1040ST
Atari Journal
Nov. '86
on the market to date."

A simple-to-use and versatile database manager, ST DataRetrieve's drop-down menus allow you to quickly define your file and enter your information through screen templates. ST DataRetrieve has fast search and sorting capabilities, a capacity of up to 64,000 records, and allows numeric values with up to 15 significant digits. This package indexes up to 20 different fields per file, and has complete, built-in reporting capabilities. Lets you access up to four files simultaneously. Supports multiple files and seven different-sized RAM disks on the 1040ST for lightning-fast operation. DataRetrieve includes seven prepared data base templates that you can customize to your own uses. Interfaces to TextPro files. Easy printer control, many help screens, and complete manual.

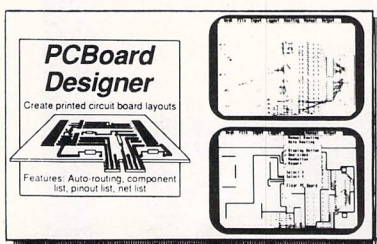
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Forth/MT

A powerful, multi-tasking Forth package designed exclusively for the ST. Forth is not only a programming language, but an operating environment – you can program, assemble and edit. Used for more than 15 years in industrial and scientific applications, Forth dramatically reduces program development time compared to assembly language or the high-level programming languages. Since Forth is so fast, compact, flexible and efficient, it is particularly well-suited to solving real-time problems. Our ST Forth/MT is a complete, 32-bit implementation based on the Forth-83 standard. Features include a full screen editor, monitor, and macro assembler. Forth/MT has over 750 words in the kernel, with a 1500 + disk-accessible word library. Complete TOS commands, LINEA commands, floating point and complex arithmetic available. Utility descriptions are stored on disk – you can change them to suit your needs. Machine language sections added for high speed.

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PCBoard Designer

PCBoard Designer is a powerful, interactive computer-aided design tool that automates the layout of printed circuit boards. The remarkable PCBoard Designer drastically cuts the cost, long hours and tedium of producing a working circuit board. PCBoard Designer has a wide range of sophisticated features and remarkable speed found only on systems costing thousands more. Exclusive to PCBoard Designer is its automatic routing capability – all traces are automatically drawn on the screen and redrawn as you delete, modify your board design. In addition, it has options of 45° or 90° angle traces, different trace widths, routing from pin to pin, pin to BUS, BUS to BUS, as well as two-sided boards.

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Enter the world of Knight Orc.

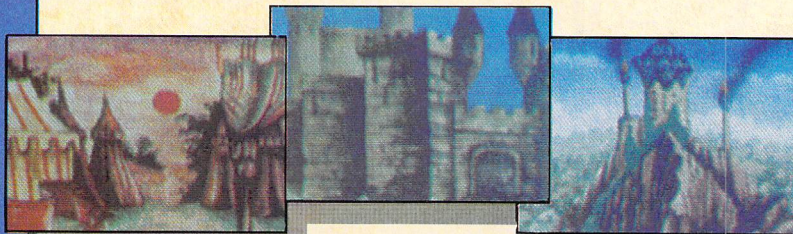
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cunning if you are to reap your ultimate revenge.

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appears in ... Knight Orc!

Screen shots taken from the Amiga version.



AFTER winning a million pounds with our Football Pools Predictor in the September issue of *Atari ST User* and investing it in the stock market using our Portfolio Manager in the October issue you've now bought a stake in a South African diamond mine.

As Miner Bill, your aim is to dig out all the earth from the mine and collect the diamonds. Having done this you will move on to the next, more complex mine.

The mine contains many large boulders embedded in the earth. Take care when digging around them because they will fall when the earth below is dug out. If you're standing underneath when this happens you'll be crushed to death.

The air supply is very poor deep down in the mine and you'll have to run round collecting the gems as fast as possible before the oxygen runs out. A timer on-screen ticking down to zero shows how long you've got.

You are fairly strong and can push a single boulder left or right providing there's nothing on the other side to prevent it from moving, though two or more boulders are too heavy to push. (Hint: You can push falling boulders and knock them aside as well if you're quick, but be careful they don't fall on your head!)

There are many devious puzzles in the mine and these will take a little thought to solve. Note that all the screens are possible with practice, even though they may seem impossible.

When you've solved all six mines included in the listing you can design your own and swap them with friends. They are stored at the end of the listing in data statements.

The asterisk is a brick, a full stop is earth, + is a diamond, S is a skull and O is a boulder. Tag on to the end as many new mines as you wish, then alter line 570 to:

```
IF D%=0 THEN screen=(screen+1)MOD n
```

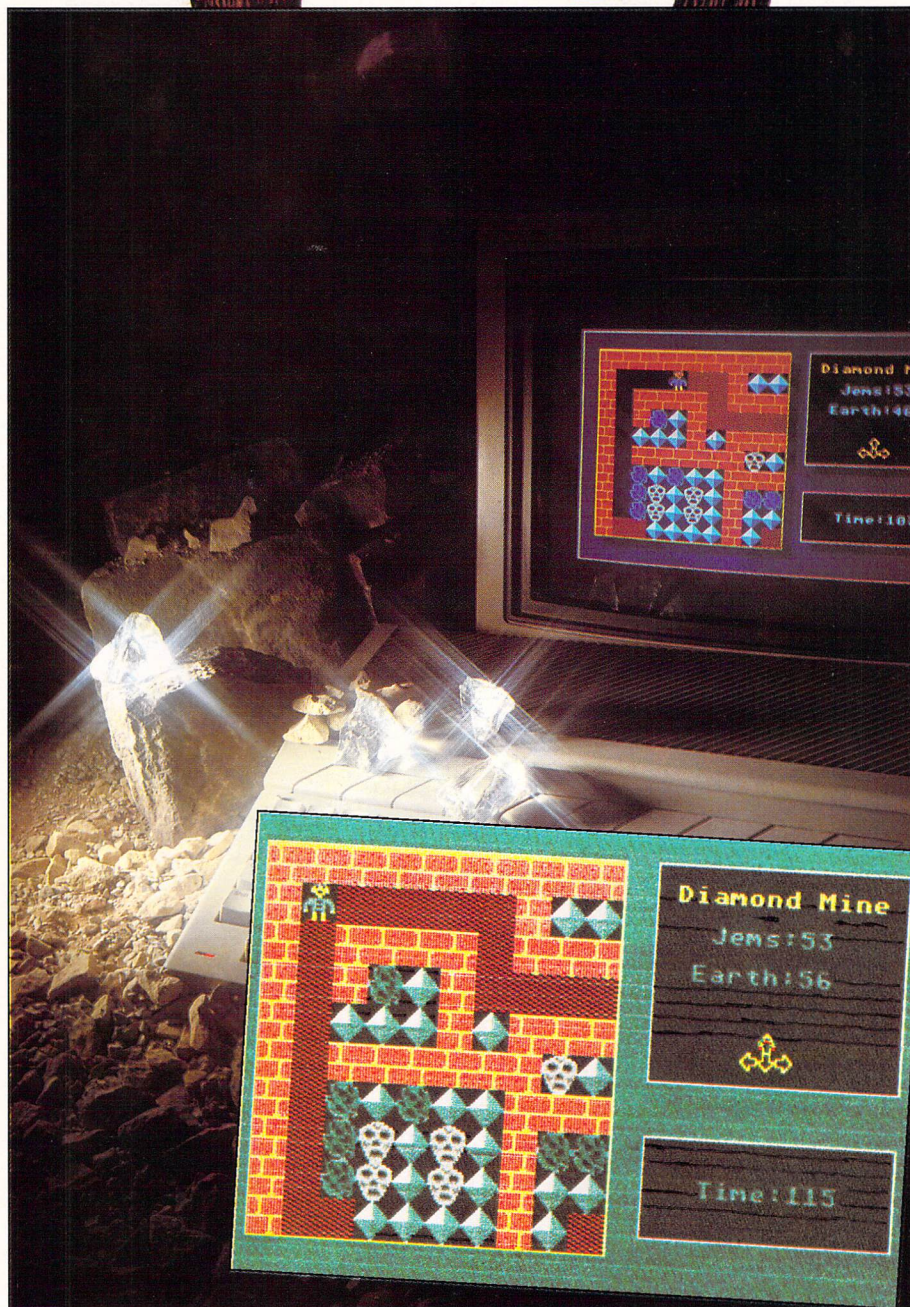
where n is the number of mines. Finally add new CASE commands between lines 670 and 680.

You can move left, right, up and down using the cursor keys. Only a small section of the mine is shown on screen – it is in fact quite large. As you near the edge of the screen the mine will scroll in the appropriate direction to reveal the next portion.

This multi-screen arcade game is written in Computer Concepts Fast Basic and includes several machine code subroutines for speed. Don't enter the line numbers when typing it in, and remember to save it before running it.

The game runs in low resolution colour (using a TV or monitor) only and will work on a 520 or 1040ST.

The sprites were designed using Pro Sprite Designer and merged into the pro-



gram. The mines were created in 1st Word and tagged on to the end.

At the start of the game the current mine is read into the single dimension array `map%` in PROCstart and the in-direction operators `?` and `!` are used to access it during the game.

The machine code section is in two parts. The first moves the falling boul-

ders. The address of `map%` and the coordinates of the top left corner on screen are passed to the code in the pseudo variables `D0`, `D1` and `D2`.

The second part of the machine code updates the mine display on screen by directly accessing the screen memory for speed – the sprite data is poked straight in.

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```

10 \ ***** Diamond Digger*****
20 \ *   By R.A.Waddilove  *
30 \ *   (c) Atari ST User  *
40 \ *   Written in Fast Basic *
50 \ *****
60 \
70 \ Don't enter line numbers
80 \
90 IF SCREENMODE THEN PRINT "Low res
only!":END
100 PROCinitialise
110 PROCassemble
120 HIDE MOUSE
130 REPEAT
140 screen=0
150 REPEAT
160 PROCstart
170 PROCdraw_screen
180 PROCgame
190 UNTIL dead%
200 FOR delay=1 TO 5000:NEXT
210 SHOW MOUSE
220 REPEAT:UNTIL INKEY<0
230 A%=ALERT("[1][You're dead!! Try
again?][Yes|No]",1)
240 HIDE MOUSE
250 UNTIL A%=2
260 END
270
280 DEF PROCmove_man
290 K%=INP(2)>>8
300 IF K%=1 THEN dead%=TRUE
310 REPEAT:UNTIL INKEY<0
320 man%=M%-(K%=77)+(K%=75)+(16 AND
K%=80)-(16 AND K%=72)
330 IF (?man%=4 OR ?man%=7) AND (K%=
77 OR K%=75) THEN
340 IF (?man%-(K%=77)+(K%=75))=0 THE
N (?man%-(K%=77)+(K%=75))=?man%:man%=
0
350 ENDIF
360 IF ?man%>3 THEN ENDPROC
370 ?M%=0:M%=man%
380 IF ?M%=3 THEN ENDPROC
390 manx%=(M%-map%)MOD 16
400 many%=(M%-map%)DIV 16
410 X%=X%+(manx%=X%)-(manx%=X%+9)
420 Y%=Y%+(many%=Y%)-(many%=Y%+9)
430 IF ?M%=2 THEN D%=D%-1:BEEP:PRINT
TAB(32,5);D%," "
440 IF ?M%=1 THEN E%=E%-1:PRINT TAB(
32,7);E%," "
450 ?M%=6
460 ENDPROC
470
480 DEF PROCgame
490 TIME=0
500 REPEAT
510 FOR delay=1 TO 600:NEXT
520 PRINT TAB(32,18);120-(TIME DIV 2
00);" "
530 IF INPSTAT(2) THEN PROCmove_man
540 D0=X%D1=Y%D2=map%:CALL code
550 IF ?M%<>6 OR TIME>24000 THEN dea
d%=TRUE
560 UNTIL dead% OR (D%=0 AND E%=0)
570 IF D%=0 THEN screen=(screen+1)MO
D 6
580 ENDPROC
590
600 DEF PROCstart
610 SWITCH screen
620 CASE 0:RESTORE scr0
630 CASE 1:RESTORE scr1
640 CASE 2:RESTORE scr2
650 CASE 3:RESTORE scr3

```



```

660 CASE 4:RESTORE scr4
670 CASE 5:RESTORE scr5
680 END SWITCH
690 D%=0:E%=0
700 FOR I%=0 TO 15
710 READ a$
720 FOR J%=1 TO LEN(a$)
730 b$=MID$(a$,J%,1)
740 IF b$="M" THEN M%=map%+I%*16+J%-
1
750 D%=D%-(b$="+")
760 E%=E%-(b$=".")
770 ?(map%+I%*16+J%-1)=INSTR("."+S0*M
",b$)
780 NEXT
790 NEXT
800 X%=0:Y%=0
810 dead%=FALSE
820 ENDPROC
830
840 DEF PROCdraw_screen
850 FILLCOL 5
860 FILLSTYLE 1,0
870 LINECOL 1
880 RECT 0,0,320,200
890 PROCbox(2,2,22,22)
900 LINECOL 7
910 LINE 0,0 TO 319,0
920 LINE 319,0 TO 319,199
930 LINE 319,199 TO 0,199
940 LINE 0,199 TO 0,0
950 PROCbox(24,2,38,13)
960 INK 1
970 PRINT TAB(25,3)"Diamond Mine"
980 INK 11
990 PRINT TAB(27,5)"Jems:";D%
1000 PRINT TAB(26,7)"Earth:";E%
1010 GTXT 240,88,CHR$(1)
1020 GTXT 240,96,CHR$(2)
1030 GTXT 232,96,CHR$(4)
1040 GTXT 248,96,CHR$(3)
1050 PROCbox(24,16,38,21)
1060 PRINT TAB(27,18)"Time:"
1070 ENDPROC
1080
1090 DEF PROCbox(a,b,c,d)
1100 FILLSTYLE 2,4
1110 RECT 8*a+8,8*b+8,8*c+8,8*d+8
1120 FILLSTYLE 0,0
1130 RECT 8*a,8*b,8*c,8*d
1140 LINE 8*a-1,8*b-1 TO 8*c,8*b-1
1150 LINE 8*c,8*b-1 TO 8*c,8*d
1160 LINE 8*c,8*d TO 8*a-1,8*d
1170 LINE 8*a-1,8*d TO 8*a-1,8*b-1
1180 ENDPROC
1190
1200 DEF PROCassemble
1210 RESERVE code,2000
1220 FOR pass=1 TO 2
1230 [ OPT pass,"L-W-M+F+"
1240 ORG 0,code
1250 LEA xpos(PC),A0
1260 MOVE.L D0,(A0)+
1270 MOVE.L D1,(A0)+
1280 MOVE.L D2,(A0)+
1290 BSR move_rocks
1300 BSR display
1310 RTS
1320
1330 move_rocks
1340 MOVE.L map(PC),D0
1350 MOVEA.L D0,A0
1360 MOVE.L #240,D0
1370 loop
1380 MOVE.B 1(A0,D0),D1
1390 CMPI.B #7,D1
1400 BEQ moving
1410 CMPI.B #4,D1
1420 BNE mrnext
1430 TST.B 17(A0,D0)
1440 BEQ falling
1450 mrnext

```



```

1460 DBRA D0,loop
1470 RTS
1480 moving
1490 CLR.B 1(A0,D0)
1500 MOVE.B 17(A0,D0),D1
1510 BEQ falling
1520 CMPI.B #4,D1
1530 BEQ bounce
1540 CMPI.B #6,D1
1550 BEQ falling
1560 thud
1570 MOVE.B #4,1(A0,D0)
1580 BRA mrnext
1590 bounce
1600 MOVE.B 2(A0,D0),D1
1610 OR.B 18(A0,D0),D1
1620 BEQ right
1630 MOVE.B 0(A0,D0),D1
1640 OR.B 16(A0,D0),D1
1650 BNE thud
1660 MOVE.B #7,16(A0,D0)
1670 BRA mrnext
1680 right
1690 MOVE.B #7,18(A0,D0)
1700 BRA mrnext
1710 falling
1720 MOVE.B #7,17(A0,D0)
1730 CLR.B 1(A0,D0)
1740 BRA mrnext
1750
1760 xposDC.L 0
1770 yposDC.L 0
1780 mapDC.L 0
1790
1800 display
1810 LEA PHYSBASE+8,A6
1820 MOVE.L #160,D0
1830 ASL.L #4,D0
1840 ADD.L D0,A6
1850 MOVE.L ypos(PC),D0
1860 ASL.L #4,D0
1870 ADD.L xpos(PC),D0
1880 ADD.L map(PC),D0
1890 MOVEA.L D0,A5
1900 MOVE.L #9,D7
1910 dloop1
1920 MOVE.L #9,D6
1930 dloop2
1940 CLR.L D0
1950 MOVE.B (A5)+,D0
1960 ASL.L #7,D0
1970 LEA sdata(PC),A1
1980 ADDA.L D0,A1
1990 MOVEA.L A6,A0
2000 BSR sprint
2010 ADDA.L #8,A6
2020 DBRA D6,dloop2
2030 ADDA.L #6,A5
2040 ADDA.L #2480,A6
2050 DBRA D7,dloop1
2060 RTS
2070
2080 sprint
2090 MOVE.W #15,D0
2100 sloop
2110 MOVE.L (A1)+,(A0)+
2120 MOVE.L (A1)+,(A0)
2130 ADDA.L #156,A0
2140 DBRA D0,sloop
2150 RTS
2160
2170 sdata
2180 DS.L 32,0
2190
2200 \Earth
2210 DC.W 13107,13107,0,13107
2220 DC.W 52428,52428,0,52428
2230 DC.W 13107,13107,0,13107
2240 DC.W 52428,52428,0,52428
2250 DC.W 13107,13107,0,13107
2260 DC.W 52428,52428,0,52428
2270 DC.W 13107,13107,0,13107
2280 DC.W 52428,52428,0,52428
2290 DC.W 13107,13107,0,13107
2300 DC.W 52428,52428,0,52428
2310 DC.W 13107,13107,0,13107
2320 DC.W 52428,52428,0,52428
2330 DC.W 13107,13107,0,13107
2340 DC.W 52428,52428,0,52428
2350 DC.W 13107,13107,0,13107
2360 DC.W 52428,52428,0,52428
2370
2380 \Diamond
2390 DC.W 256,128,256,128
2400 DC.W 768,192,768,192
2410 DC.W 1792,224,1792,224
2420 DC.W 3840,240,3840,240
2430 DC.W 7936,248,7936,248
2440 DC.W 16128,252,16128,252
2450 DC.W 32512,254,32512,254
2460 DC.W 65280,255,65280,255
2470 DC.W 43605,21760,0,65535
2480 DC.W 21930,10752,0,32766
2490 DC.W 10836,5376,0,16380
2500 DC.W 5544,2560,0,8184
2510 DC.W 2640,1280,0,4080
2520 DC.W 1440,512,0,2016
2530 DC.W 576,256,0,960
2540 DC.W 384,0,0,384
2550
2560 \Skull
2570 DC.W 0,0,2016,0
2580 DC.W 576,576,7680,0
2590 DC.W 384,384,32382,0
2600 DC.W 0,7224,58311,0
2610 DC.W 0,8772,49539,0
2620 DC.W 0,8772,49539,0
2630 DC.W 0,7224,58311,0
2640 DC.W 0,384,65151,0
2650 DC.W 8196,8772,23610,0
2660 DC.W 14364,15324,17442,0
2670 DC.W 4104,4104,12276,0
2680 DC.W 960,0,15420,0
2690 DC.W 1056,0,6168,0
2700 DC.W 2016,0,6168,0
2710 DC.W 0,0,4080,0
2720 DC.W 0,0,2016,0
2730
2740 PROCrock
2750
2760 \Brick
2770 DC.W 0,65535,65535,65535
2780 DC.W 0,3072,65535,65535
2790 DC.W 2,1026,65533,65535
2800 DC.W 16416,17440,49119,65535
2810 DC.W 0,1024,65535,65535
2820 DC.W 0,1024,65535,65535
2830 DC.W 8324,9348,57211,65535
2840 DC.W 0,3072,65535,65535
2850 DC.W 0,65535,65535,65535
2860 DC.W 0,48,65535,65535
2870 DC.W 4,36,65531,65535
2880 DC.W 2048,2080,63487,65535
2890 DC.W 0,32,65535,65535
2900 DC.W 16386,16418,49149,65535
2910 DC.W 256,288,65279,65535
2920 DC.W 0,112,65535,65535
2930
2940 mandata
2950 DC.W 2016,2016,0,0
2960 DC.W 2064,4080,2016,1440
2970 DC.W 0,4080,4080,4080
2980 DC.W 0,4080,4080,3696
2990 DC.W 0,960,960,960
3000 DC.W 0,384,384,384
3010 DC.W 8184,0,0,8184
3020 DC.W 15996,384,384,15996
3030 DC.W 32750,0,0,32750
3040 DC.W 26214,384,384,26214
3050 DC.W 26598,0,0,26598
3060 DC.W 1632,24966,24966,26214
3070 DC.W 1632,1632,1632,1632
3080 DC.W 1632,1632,1632,1632
3090 DC.W 1632,1632,1632,1632
3100 DC.W 7800,7800,0,7800
3110
3120 PROCrock
3130 J
3140 NEXT
3150 ENDPROC
3160
3170 DEF PROCrock
3180 I
3190 DC.W 4080,0,0,4080
3200 DC.W 12816,2592,2592,13776
3210 DC.W 8972,2864,2864,13516
3220 DC.W 8450,2864,2864,13518
3230 DC.W 8202,920,920,15462
3240 DC.W 4122,664,664,7270
3250 DC.W 57865,568,568,64967
3260 DC.W 35329,31280,31280,34255
3270 DC.W 34817,6192,6192,59151
3280 DC.W 19506,3120,3120,29646
3290 DC.W 20482,5632,5632,27102
3300 DC.W 22530,6924,6924,24818
3310 DC.W 11354,3520,3520,12862
3320 DC.W 4326,192,192,7974
3330 DC.W 3884,0,0,4076
3340 DC.W 224,0,0,224
3350 J
3360 ENDPROC
3370
3380 DEF PROCinitialise
3390 POKE $484,6:;no keyclick
3400 ESCAPE OFF
3410 KBRATE 4,4
3420 RESERVE map%,256
3430 TXTRECT 0,0,320,200
3440 GRAFRECT 0,0,320,200
3450 RESTORE colours
3460 FOR i=0 TO 15
3470 READ a,b,c
3480 PALETTE i,a*142,b*142,c*142
3490 NEXT
3500 ENDPROC
3510
3520 colours:
3530 DATA 0,0,0,7,7,2
3540 DATA 2,2,2,3,3,3
3550 DATA 6,6,6,0,0,3
3560 DATA 4,4,4,7,7,7
3570 DATA 0,0,5,0,2,7
3580 DATA 2,4,7,3,6,7
3590 DATA 7,2,1,7,5,2
3600 DATA 7,0,0,7,4,2
3610
3620 \----- Screen data -----
3630 \M=man .=earth +=diamond
3640 \S=skull 0=rock *=brick
3650
3660 scr0:
3670 DATA "*****"
3680 DATA "M.....++00000*"
3690 DATA "S.....++++++*"
3700 DATA "S.*0+*....++++*"
3710 DATA "S.+++++*****.*"
3720 DATA "S.*****S+....*"
3730 DATA "S.0+0+*****+.+*"

```


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by Timothy Purves

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3740 DATA ".0S+S+00S+S*"
3750 DATA ".0S+S+++++.+"
3760 DATA ".+++++.+"
3770 DATA "*****.*****"
3780 DATA "+S.00....00..*"
3790 DATA "SS++++SS++++.+"
3800 DATA "+SS.*****.+"
3810 DATA "++++.++++.+"
3820 DATA "*****"
3830
3840 scr1:
3850 DATA "*****"
3860 DATA "00000.....0+*"
3870 DATA "++++.+.+.+.+"
3880 DATA "*****.++++.0+*"
3890 DATA "SOS.....*****"
3900 DATA "++++.0M0.000+*"
3910 DATA "*****.+++++S*"
3920 DATA "+*00*.+S+.0000*"
3930 DATA "+++++.+++++*"
3940 DATA "S*****.++.+"
3950 DATA "00+0.....*"
3960 DATA "++S+SSS.00+S.+"
3970 DATA "++S+++++.00+S.+"
3980 DATA "00SSSSS.00+S+*"
3990 DATA "+++++SSS+"
4000 DATA "*****"
4010
4020 scr2:
4030 DATA "*****"
4040 DATA "0++++0++S++0*"
4050 DATA "++S+++++SSS++*"
4060 DATA "+OSSSS.SSS+SS.+"

4070 DATA "+0S.S.M.S...S*"
4080 DATA "+++S...SSS.SSS*"
4090 DATA "+S....S.SOS.+"
4100 DATA "S.SSSSS.S.S...*"
4110 DATA "S.S+00S.S.S.SS*"
4120 DATA "S.....S...*"
4130 DATA "S.SSSSSSSSS.S*"
4140 DATA "S.....00+00S0*"
4150 DATA "S.SSSSS.+++++*"
4160 DATA "S.0000S.SSS.S.+"
4170 DATA "S.....*"
4180 DATA "*****"
4190
4200 scr3:
4210 DATA "*****"
4220 DATA "M...+0000+....*"
4230 DATA "S...+0+++0+...*"
4240 DATA "S.*+0+++++0+..*"
4250 DATA "S.*+0+++0+..*"
4260 DATA "S.*+0000+++.*"
4270 DATA "S.0*****.+.+"
4280 DATA "S.0.+++0000S00*"
4290 DATA "S.0*+0+0000S00*"
4300 DATA "S.+++++*****"
4310 DATA "S.*****.0.0.0.+"
4320 DATA "S.0+****.0.+0.+"
4330 DATA "S.S+S*.S.S.S+*"
4340 DATA "S.....S.S.S.+*"
4350 DATA "S+S+S+...S+S+..*"
4360 DATA "*****"
4370
4380 scr4:
4390 DATA "*****"

4400 DATA "S....S++++000+*"
4410 DATA "S.SSSSSSSS000+*"
4420 DATA "S.SM...00S00+*"
4430 DATA "S.SS.S.00S0+*"
4440 DATA "S.S.S+++++*"
4450 DATA "S.SSSSSSSSS.S*"
4460 DATA "SS.S.....*"
4470 DATA "S...SS0+SSSSS.+"
4480 DATA "S....S+0000..*"
4490 DATA "S.00SSSS++++S.+"
4500 DATA "S.00.....S.+"
4510 DATA "S.00.SSSOSS00S.+"
4520 DATA "S.00.00....00..*"
4530 DATA "S+++++S+S++++*"
4540 DATA "*****"
4550
4560 scr5:
4570 DATA "*****"
4580 DATA "M+00.....+S+*"
4590 DATA "S.+++++*.+.+"
4600 DATA "S.+0*0*0+*.S.0*"
4610 DATA "S+S+...+.+.+"
4620 DATA "S.+0*.0**.*S.+"
4630 DATA "S.+++.....+S.+"
4640 DATA "S.+0*****+S.+"
4650 DATA "S...0+0+0...+*"
4660 DATA "S.....SS*"
4670 DATA "S.+0*****.+.+"
4680 DATA "S.+++0*0+*.S.S*"
4690 DATA "S+0*...+.+.+"
4700 DATA "S.+++*0**.*S.+"
4710 DATA "S.+0.....S+*"
4720 DATA "*****"

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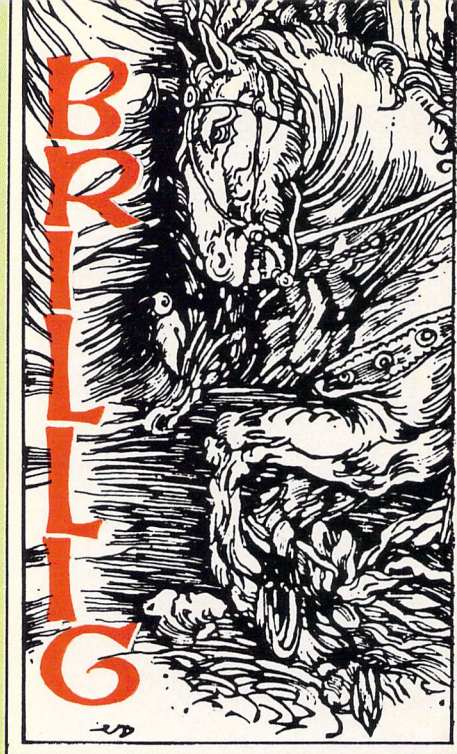
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AST 11



Romantic fiction on the ST?

GOOD grief! Is nothing sacred? Can my rheumy old eyes really believe what they see? Has Infocom had a sudden rush of blood to the head? I'm sorry to prattle on like this, but the news I have just received has sent me all of a quiver.

I hope my female readers don't think I'm being sexist but, you see, if the press release announcing their newest adventure, *Plundered Hearts*, is to be believed, Infocom has come over all Barbara Cartland.

Plundered Hearts (I suppose the title should have alerted me) heralds Infocom's entry into the world of female passion and romance, and is based on the sort of fiction so beloved by readers of said Dame Barbara, Mills and Boon, *True Confessions* and others of that popular ilk.

This is purportedly an adventure in which action and romance are the main themes and is unashamedly aimed squarely at the hearts and minds of the gentler sex.

But fear not, masculine adventurers, you too, may find you enjoy it. I have it on good authority Infocom's male adventure-testers have all reported favourably on the game.

The blurb says this is the first Infocom story in which you, the main character, are a woman. Not so! You had the chance of playing a female role in *Leather Goddesses of Phobos* as I recall.

Not that I ever did, of course, oh no, oh my goodness me, not old Brilliant the virile, he of the hairy chest and ... oh, all right, perhaps I did just the once ... or twice, possibly. But don't tell a soul - my macho image would be severely damaged if my cronies down at the White Warlocks Spells and Social Club ever found out.

Plundered Hearts is a 17th century tale of treachery and torrid dalliance on the high seas, where the tropical nights steam, the air is filled with the tang of salty breezes and passionate

romance is but a bird-of-paradise's hop away (I think they hop).

On the schooner *Lafond Deux*, your female thoughts are with your ailing pater who awaits your tender, loving care. Hungry crocs, dangerous coral reefs and explosions are but a few of the perils that will cause your heart to flutter - I wonder if you get to swoon and have the old sal-volatile (smelling salts to the uninitiated) waved under the nostrils?

What is supposed to make your heart change gear from fluttering bird to demented tomtom and to make your knees become as strong as custard is handsome, square-jawed, pirate captain Nicholas Jamison. (Blast - I had hoped he'd have a name like Cap'n Bloodlust or Darkguts the Disembowler. Should have known he'd have a monicker like Dirk Steel or Grant Ashby - they always do, somehow).

This is a brave move for Infocom. I know from my postbag there are plenty of female adventurers out there, but I wonder if they'd rather be slaying orcs, having a giggle with Floyd or messing around with the Frobozz company's magic products than being passionate with Captain Nick. And I wonder how male chauvinist porkers like me will take to it. We will see.

Whether *Plundered Hearts* will be successful in appealing to both sexes is an interesting speculation. Male or female, I suppose it all comes down to whether you prefer reading something like "Whither Goest My Love?" by Cynthia Slushlightly or "Knuckle Sandwich In The Kisser" by Rick Hardboiled.

● Pleas for readers' help are asked this month on behalf of Mr D P Martin of South Shields and Mr Ofir Gal-Mor. Mr Martin is playing Alternate Reality

HINTS AND TIPS

LEATHER GODDESSES OF PHOBOS

Ion beam causing you to come to grief?

Let the barge steam ahead without you to the icy dock. When it has stopped, transport yourself there by visiting a well near the harem.

Wonder what the Tee-remover is for?

Try out the untangling cream on it!

STATIONFALL

Drill bit too hot to handle?

Ask Floyd to get it for you

Can't get on with the Balloon creature?

Move next door and use the item from the pawn shop.

GUILD OF THIEVES

Need some help with the spider?

Take the jam jar to the manure in the stable to catch some flies.

Can't enter the undertaker's?

Break the window to get inside.

THE PAWN

Palace guards won't let you pass?

Give them the note from Kronos.

Can't find the blue key?

Hit the wall of Riverside Chamber, cross the lava river and get to the pedestal before the adventurer does.

Need some lead?

Scrape the lumps in the rockface with the trowel.

and would like to know how to enter the Tavern without being called a worm and thrown out and how to sleep in the Inn without being told he is wicked (presumably with the same result).

Mr Gal-Mor wishes to know how to continue onwards from the acid pool in Space Quest. Any help from readers would be appreciated.

I would also be obliged for some advice from readers on how to use the coloured dice with the four slots in the opaque case in the white room in Guild Of Thieves. What on earth am I and many other players doing wrong? The case just refuses to give up its secret.

Among many others, Richard Burfoot is having trouble with The Pawn (well, it is a difficult, and, dare I say it, occasionally obscure adventure). Some succour is provided in Hints and Tips along with tips on Stationfall, Guild of Thieves and Leather Goddesses of Phobos. Happy adventuring!

Program: Knight Orc

Price: £19.95

Supplier: Rainbird, 74 New Oxford Street,
London WC1A 1PS

Tel: 01-240 8838



Arise Sir Grindleguts!

ADVENTURERS may get into a lot of scrapes, such as falling into an evil sorcerer's clutches or plunging base over apex down a concealed mineshaft in the dark, but just because they are daring (some would say foolhardy) doesn't mean to say they are dim. So there's no need for me to point out that, as you can well deduce from the title, Knight Orc is an adventure about orcs.

Level 9's latest release, courtesy of Rainbird Software, thus appears to follow a well travelled path. And if that were all there was to it, I might be tempted to join in the chorus of "Not another adventure about wizards, trolls and suchlike familiars. I've just about had it up to here with orc and ogre bashing".

But be careful before rushing to judgement, fellow adventurers – Knight Orc has more than one surprise concealed up its cloak. For a kick-off, any adventure that dares to have as its hero a cowardly orc by the name of Grindleguts has got to have a lot going for it.

This is what you (Grindleguts) look like: "You are a fine specimen of orcantry with touselled grey hair, closeset bloodshot eyes beneath joined bushy eyebrows, a pock-marked nose with flaring nostrils, filed teeth in a wide, thin-lipped mouth and a generous supply of chins. You are clad in clotted furs and spattered punkskin". Robert Redford you are not!

And there's one other thing you should know about this adventure, but I'm afraid I can't tell you what. My lips must remain

sealed on pain of being slowly roasted over an open spit up at Rainbird HQ.

As with all recent Level 9 adventures, Knight Orc includes graphics. Although I can take or leave illustrations in an adventure, those in Knight Orc are a major improvement on Level 9's previous efforts.

These are framed, digitised screens of hand drawn pictures, each changing with a dissolve technique and give the appearance of faintly smudged work done with pastels or watercolours. Not up to the standard of Rainbird's best (such as The Pawn and Guild of Thieves), but very acceptable nevertheless and one or two are quite outstanding.

The massive game has been split into three parts – Loosed Orc, A Kind of Magic and Hordes of the Mountain King. You must solve part one before moving on, but parts two and three are linked and you can move without let or hindrance between them.

Knight Orc starts with you, a craven orc, being pitched straight into a fight. Among the anti-orc establishment are Sir Cecil De Breeze, an army, assorted knights, volunteers from Ambridge (mostly archers!) and members of the local ladies bowling team, the Orc's Head Taverners. Said Taverners like nothing better than to collect a new set of orc heads to use as bowls.

You have been volunteered to represent the orcs in a fight of champions (your cronies tied you to a horse while you slept

in a drunken stupor, put your name forward and then scarpered).

The background to the events leading up to this opening is very humorously described in the accompanying short story, The Sign of the Orc, by Peter McBride. Now normally such scene-setting material is a load of tosh, but Mr McBride's tale is a golden exception, a giggle on every line. Make sure you read it.

Very briefly, once the opening scrap is at an end, Loosed Orc sets you the task of seeking out enough lengths of rope in order to make one long enough to cross a chasm.

Not as simple as it seems. You'll need a lot of lengths and they could be made of anything (reins or a halyard, for instance). In A Kind of Magic and Hordes of the Mountain King, you'll learn how to use magic, recruit followers and escape.

There's one feature I must mention, since it is an essential component of the game. Knight Orc is choc-a-bloc with characters, all doing their own thing (much of which centres on duffing up one cowardly orc – you).

The list includes such luminaries as the Knight in White Satin, Boadicea, The Annihilator, Synonym the Wizard, The Phantom of the Opera, Susan (how did she get in there?), Genghis and The Gripper. Not to be taken too seriously, you see.

I must make quick mention of my favourite character so far encountered – ▷



◁ the Green Knight. He has a poetic turn of phrase (note the literary connotation) and demolishes half a hedge with a single sweep of his battleaxe.

Not all of the 70 (yes, 70 – almost a Cecil B De Mille production) characters are unfriendly and you can interact sensibly with most of them, though for the most part you'll be running away from them.

For example, you can issue commands to characters and continue with the game while they execute your orders (you hope).

On one occasion I commanded Denzyl, a gullible, stupid-looking, but amiable enough chap to nip up to the castle and open the drawbridge for me (since when were drawbridges ever left down for adventurers?).

I followed behind at a safe distance and when we eventually arrived, he turned and said "Nope, I won't do it". So much for cooperation.

I can't quite make up my mind about this huge cast list. For a great deal of the time I found I was being followed and harried by what seemed like an inexhaustible supply of people who were just getting in my way.

It's all rather reminiscent of Valhalla (remember that?) where characters kept toddling on stage, messed about a bit, pinched things, hit each other or you, and toddled off again. Or to bring it more up to date, Knight Orc's characters are like those in Melbourne House's *The Hobbit*, only on a much vaster and zany scale. I think I would have preferred rather less characters – their continual interruption began to become wearisome.

Scattered around Knight Orc are Level 9's own personal and ascerbic comments on various topics under the sun. Many such observations are witty but one or two strike an unnecessarily harsh note, particularly since they do not directly impact on the plot.

As with some other Level 9 games, you'll either love or loathe this idiosyncratic aspect.

A number of other features cry out to be mentioned. You don't need to map Knight Orc, except in very general ways, since you can go directly to a location or an object simply by FINDing it or GOing or RUNning to it.

You can also FOLLOW people around and may even WAIT for them. How about

WAIT FOR DENZYL AND ATTACK HIM as an example of the power of this command system?

Multi-tasking enables you to type on while a picture loads and a picture cache cuts down on disc accesses. The graphics window may be shunted up and down the screen, exposing more or less of the text.

Ram save and restore is available as well as the usual disc save and load, and you can back track and edit previous commands. The total game contains a reputed 240k of compressed text and the game can be copied to a hard disc.

Level 9 have clearly gone to great efforts to produce a better adventure product. The result is a fun and action-packed game which, while not as engrossing or cohesive as the best Infocom adventures, is certainly a big step forward in size and sophistication.

I could have done with less character intervention and a few more interesting locations (there's an awful lot of boring forest in part one). Even so, Knight Orc is a first rate and innovative adventure that will delight players everywhere. □

Brillig

Presentation	9
Atmosphere	8
Puzzlement	8
Value for money	8
Overall	8

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LIGHT		WIDE

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The official UK version of Publishing Partner has a pound (£) sign as a standard part of its character set. Other versions have also been imported unofficially from the USA and have a dollar (\$) sign instead of a £ sign. These versions will not be supported by the UK distributors or their dealers. The UK version also contains clip art, different fonts and a full range of printer drivers. Ensure that you buy the official UK version, not an unofficial import with incorrect characters.

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DTP



Don't be

all at C

Title: ST Basic to C

Price: £14.95

Supplier: Abacus, c/o Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ

Tel: 01-330 7166

ONCE the intricacies of ST Basic have been mastered, many programmers are often tempted to learn a new language. The most logical choice, apart from 68000 assembly language of course, is C as this is the language used by Digital Research to write Gem – the ST's Graphic Environment Manager.

All the WIMPs – windows, icons, pull down menus and pointers you see on the ST are created by Gem, which, apart from a few machine code subroutines, is a compiled C program.

It makes sense to learn this language as there are many procedures, functions and subroutines within Gem that you can call from your own programs, making them much easier and simpler to write.

ST Basic to C from Abacus is intended to be an introductory text for Basic programmers wishing to learn this fascinating, though complex language.

There are many program examples – almost one on each page in fact – and these are supplied on a disc, though they are so short it's only a 10 minute job typing most of them in. Of course, you'll need a C compiler to use them, and as the examples are very basic, almost any will do.

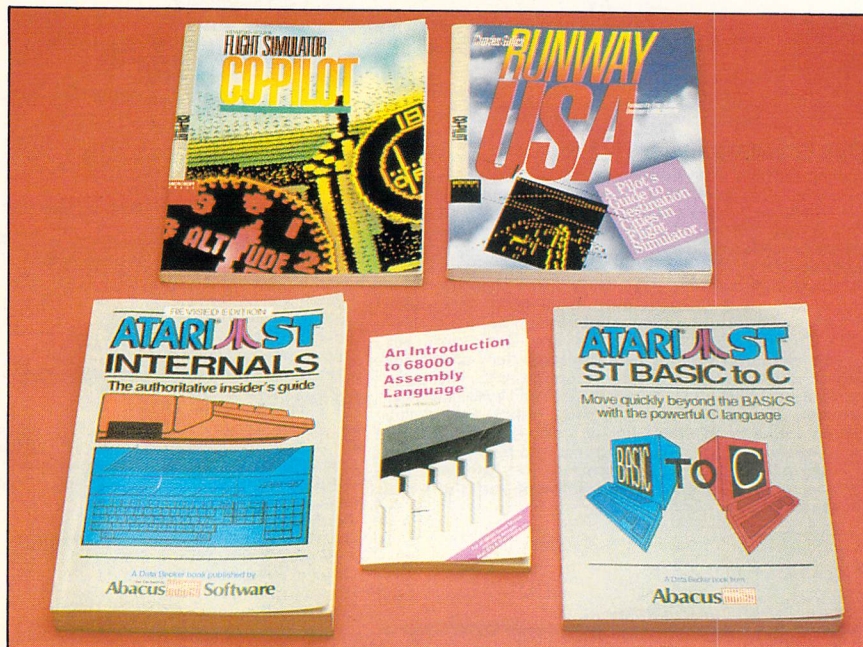
The book explains all the standard C commands, functions, structures, pointers and variables by first showing an ST Basic program followed by an equivalent C version. Unfortunately, it doesn't show you how to access Gem, as this is far beyond the scope of an introductory text such as this.

If you've never used C before, you may experience a little difficulty following some of the program examples. Although they are simple, C is a very complex language and I feel the author hasn't really got down to the level of the absolute novice.

If you have a little knowledge of the language already, you should find the book well written and easy to read. If you haven't, but don't mind hard work, it's well worth considering.

Julie Boswell

LIBRARY



Mine of

information

Title: Internals

Price: £14.95

Supplier: Abacus, c/o Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ

Tel: 01-330 7166

INTERNALS is an essential book for all serious ST owners. It's mainly aimed at the programmer, but there is also valuable hardware information too.

Almost 200 of this 480 page book is devoted to a complete documented disassembly of the rom containing the Bios (February 1986 version).

Almost every instruction is followed by a comment and each subroutine is clearly labelled. If like me, you enjoy browsing through the rom you'll find this a mine of information.

Quite a large section of the book is dedicated to the Gemdos, Bios and Xbios calls available from C and machine code. The function of each one is described and there's either a short assembly language

program showing how to call it, or a longer example showing its use within a program or subroutine.

The Line-A routines are explained and there are some good example programs here showing how to plot points, fill polygons and transform the mouse from assembly language.

The commented list of system variables stored at \$400 and table of exception vectors are useful items to have at hand.

The hardware section includes diagrams and pin-outs of all the ports on the ST and brief discussions of the sound chip, floppy disc controller, ACIA, 68901 MFP and other chips.

The chapter on 68000 assembly language is a waste of space – it's impossible to provide even a brief introduction to machine code programming in just 10 or so pages. These could be put to better use.

My only criticism of the book is that it attempts to cover too much and the hardware section really needs taking out and expanding into a separate book. The space gained in Internals could then be used for more programming examples. These minor grumbles apart though, it's an excellent book and is strongly recommended.

Julie Boswell

Into the wide

blue yonder

Title: Flight Simulator Co-Pilot

Price: £7.95

Title: Runway USA

Price: £7.95

Supplier: Microsoft Press, 27, Wrights Lane, London W8 5T2.

Tel: 01-938 2200

IF you're the owner of Microsoft/SubLogic's Flight Simulator II (and if not, you're really missing out on an experience – go and buy it), Runway USA and Flight Simulator Co-Pilot should be of major interest to you.

Both were written by Charles Gulick, an American who seems to have dedicated his life to flying all versions of the illustrious Flight Simulator program. As a consequence of such devotion, he probably knows all there is to know about the simulator – and then some.

Flight Simulator Co-Pilot is divided into three main sections. The first gives you plenty of sound advice on basic flight techniques including standard climbs and descents, taxiing, takeoffs, turns and landing.

The second section concentrates on navigation and instrument flying and gives much useful assistance on advanced flight, OMNI equipment and night flying.

The third and by far the longest section, is called Flying For Fun. In this, Gulick gives a richly-detailed description of 15 different flights you can take. He even teaches you new techniques as you fly.

Full information on all the starting parameters is supplied, and by clever narration and use of the pause facility, you can actually fly as you read.

Half of these excursions require use of the optional add-on scenery discs. Runway USA consists only of excursions (38 in all), the snag being each is taken from one of the optional scenery discs. So if you haven't got any of these, you probably won't have much use for the book.

Both books contain glossaries and appendices showing the different keyboard controls for each version (Atari, Apple, IBM and so on).

Unfortunately, the books were written before the ST version came out so most of the instructions refer to other micros. Since the ST edition is similar (though far,

far better) than the others, this is barely a problem in getting maximum enjoyment from the material.

The books are written in a friendly and engaging style and are thoroughly enjoyable as a read in their own right. My advice would be to rush out and buy Co-Pilot immediately, but wait until you've got the scenery discs before investing in Runway USA.

Bob Chappell

Assembling

the facts

Title: An Introduction to 68000 Assembly Language

Price: £2.95

Supplier: Bernard Babani (publishing) Ltd, The Grampians, Shepherds Bush Road, London W6 7NF

ASSEMBLY language is a subject most people shy away from. Many are put off by the strange looking instructions, total lack of floating point arithmetic, and so on.

However some, I suspect, when deciding to learn are discouraged by the size of most of the standard texts, many priced at over £20.

It is here this book really comes into its own. At a price that's not going to empty the average wallet, it gives an excellent grounding in programming the 68000. It's not micro specific, so it doesn't describe how to get your programs up and running on the ST.

For your money you get around 100 pages of useful information on most of the topics the average beginner will need to become acquainted with. I should stress that the book does not aim to teach, it gives more of an insight.

Topics covered include – binary, binary coded decimal (BCD) and hexadecimal numbering systems, stack structures and relocatable code. There's a full description of all the instructions along with their addressing modes.

Included in their own sections are a full description of all the addressing modes, a full list of instructions with descriptions and examples of simple arithmetic.

Anyone considering starting to program with a 68000 assembler should get this book first. I discovered more in two hours than I learnt from a standard text in a whole day.

Mark Smiddy

Programming

from all angles

Title: 3D Graphics Programming

Price: £14.95

Supplier: Abacus, c/o Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ

Tel: 01-330 7166

IF the August 1987 issue of *Atari ST User* whetted your appetite for 3D graphics with its spectacular demonstrations, 3D Graphics Programming from Abacus is an essential buy.

It teaches the techniques required for handling 3D objects and shows how to implement them in 68000 machine language. This is a very complex subject and the author, Uwe Braun, has tackled it well.

He begins by dealing with the mathematical basis of 3D graphics and then moves on to machine code fundamentals, before presenting a suite of programs illustrating the various topics covered.

The text remains informative and friendly throughout which is no mean achievement. Everything you need to know is to be found here: Hidden line removal, light and shade, rotation, scaling, line clipping and matrices are all covered in depth.

Given a reasonable grasp of mathematics and some basic knowledge of 68000 programming you can learn a lot. There is no reason why you should not be able to go on to produce your own 3D software.

Anyone just starting to learn machine code programming should also take a look. There is much to be learned from an assembly listing written by an expert in his field, especially when it is so extensively commented.

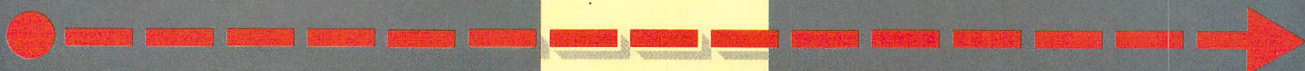
Over one third of the 351 pages are program listings. The prospect of typing in this much code is daunting, to say the least. I would recommend anyone buying this book also obtains the accompanying disc which contains all the listings both as source code and ready to run PRG files.

This book takes you from the basics of 3D graphics right up to finished software. If you are seriously interested in this topic and are ready to spend some time on the subject then I can highly recommend this book.

Charlie Dancey



Calligrapher.



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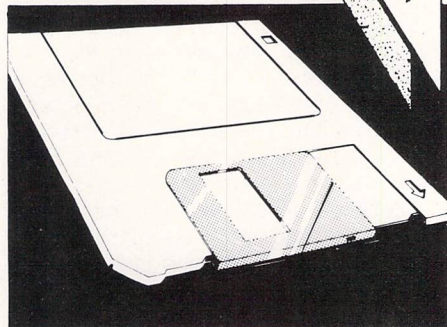
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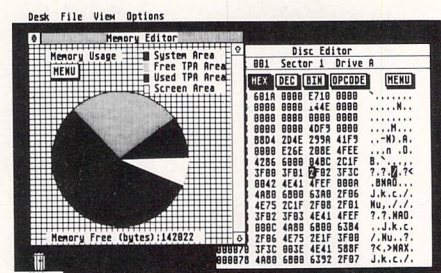
ST Doctor

The utility disc for the Atari ST. ST-Doctor is a Window-based desk accessory, available at any time whilst using other application programs.



Main features include:

- Complete scrolling window-based memory editor, allowing any area of ST memory to be examined in ASCII, Hex, Decimal, Binary or Disassembly listing. Associated features include Copy memory block, Print block, Save block, Fill block, Search, and a pie chart showing memory usage.



- Disc Editor: Similar editor to above, plus load/save file or sector, Advanced formatting, Search disk, Recover deleted file, show file size, show free disc space, etc...

- Key recorder: A unique 'function key definer', this allows up to ten sequences of key-strokes to be assigned to any keys.

- Supplied with fully illustrated instruction manual.

REVIEW

ST Doctor has to be described as one of the best, if not, THE best, low level programmer's utility.

ST WORLD

Price £19.95 incl VAT.

Back-Pack

A cartridge-based pack of general purpose utilities for every ST owner. When plugged into the cartridge port of any ST, all Back-Pack facilities are available whilst using GEM compatible applications and, because it resides in ROM, it occupies no valuable RAM space.



Scientific calculator

More comprehensive than most real calculators, this offers all the usual features such as Sin, Cos, Tan, Log, π , $X \times Y$, $X \div Y$, $1/X$, a memory store, etc. However, it also has programmer's features such as operation in Hex, Binary and Octal, plus logical operations. The result can easily be transferred into the current application.

Price: £49.00
incl.

Clock and alarms

Analogue/digital clock showing time and date. Two time zones, four separate repeatable alarm settings, etc.

Diary

A comprehensive diary allowing categorised entries on any day of the year. Simple controls make it easy to move forward or backward one day, month, or year.

Note Pad

Thirty selectable pages of any information can be stored in the note pad with cursor controlled editing and the ability to transfer information back to the current application or accessory in use.

Typewriter

A simple utility allowing direct output to a printer at any time.

Printer Buffer

Uses memory to 'queue' output for the printer, leaving the computer ready to use, whilst Back-Pack feeds the printer when it is ready.

Address book

A computerised database of names, addresses and telephone numbers, allowing fast 'search' facilities to locate any entry.

Ramdisc

Uses an area of memory, of specified size, to act as an extremely fast disc drive. A startup disc is easily configured to copy any list of files into the Ramdisc automatically.

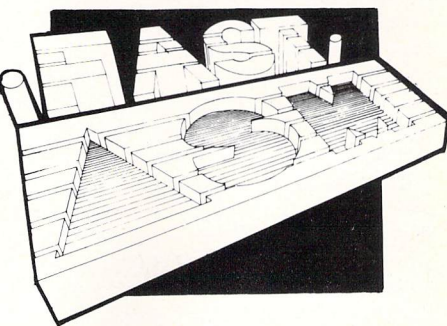
FAST ASM

Fast ASM is an ultra fast assembler, it provides a user friendly environment for both writing and assembling 68000 programs.

REVIEW

It is an excellent assembler, and at £19.95, sensational value for money too. I wouldn't SWAP it for anything!

ST WORLD



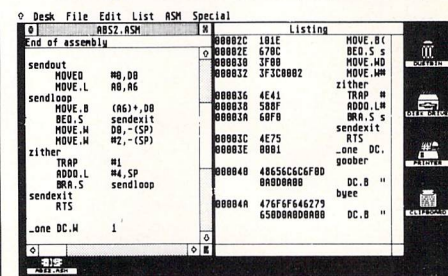
Main features include:

- Assembles up to 50000 lines per minute
- Program files are compatible with Fast Basic
- Able to run assembled programs without leaving assembler
- Provides fully relocatable PRG files
- Allows up to 10 source files in memory at one time
- Powerful GEM-based editor with mouse controlled cut, copy and paste facilities

REVIEW

Fast ASM is a very pleasant assembler to use, and at 50,000 lines per minute, it certainly is fast. The environment is good, thanks to an outstanding editor.

ST WORLD



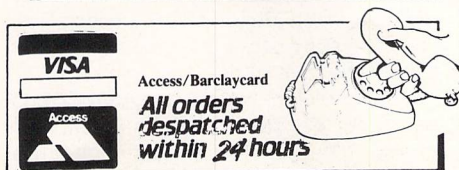
- Detailed source and object code listings
- Includes full instruction manual

Price £19.95 incl VAT.



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Strolling the boards

ONE of the most exciting uses of a modem is to access amateur bulletin boards. These are host computer systems set up to receive your calls, take email and provide information and public domain software, in much the same way as the big commercial systems such as MicroLink and Prestel.

The difference is they are not run by big companies, but usually by individual computer enthusiasts in their own homes. This means there is an enormous variety in what is available, and also in the quality and usefulness of the material on offer.

There are many thousands of boards all over the world, including several hundred in Britain. To use a bulletin board, you don't usually have to register in advance or pay a fee – you just log-on and if it's your first call, give your name and address and choose a password for future use.

What can you find on a bulletin board? The answer varies, but there are three main things you'll find on most boards – messaging, news and down-loadable software.

News is usually about the speciality of the board in question, so it could be about the world of Atari, computers in general, or a special interest. Most boards are dedicated to computer topics, but a sizeable minority cover areas such as photography, health, sport and so on.

The news items are usually written by the person running the board, known as the system operator or sysop. There will also be items of information about the board itself, such as when it is open, how to find your way around, and what is expected of you.

Messaging is like conventional email, but normally you can only send messages to other users of that particular board. However, there are a growing number of boards, running under a system called Fido, which transfer messages to each other, usually during the early hours of the morning when call activity is quiet.

With these boards you can send messages to anyone registered on any Fido board. This is particularly exciting as Fido is an international network, and you can correspond with people all over the world, including of course the United States and West Germany – the other great strongholds of the ST.

Bulletin boards contain open messaging systems where lists of messages, readable by all, are displayed. You can join in conversations by this method as

In Part 4 of his comms series, David Atherton looks at bulletin boards

well as sending private messages. This is how you meet other users – by just dropping in on a conversation they're having.

For the beginner, perhaps the hardest part of computer comms is discovering bulletin board telephone numbers. Some boards which specialise in the ST are listed in Table I. These will get you started.

They, like most boards carry details of other boards, and in this way it's fairly easy to collect a large list of telephone numbers. Some modem manufacturers and comms software publishers, have

City	021-353-5486	24hrs	V21
Haven	01-892-6712	24hrs	V21/V23
Lightfingers	0202-485723	24hrs	V21/V23
Place			
Microdeal	0726-65422	24hrs	V21
Star	01-586 6882	24hrs	V21

Table I: Bulletin board numbers to get you started

lists of boards which they supply to customers.

If you don't get a reply from some of the numbers in these lists, don't worry – boards come and go and lists quickly become out of date.

If you get a voice reply don't just hang up – politely explain the reason for your call and, in either case, tell whoever you got that particular number from that it is no longer an operational bulletin board.

Some boards are very popular and are almost constantly engaged. If you find such a board keep trying – it should be pretty good.

The ST boards are a good place to get help on ST topics. Most queries left on a board will get an answer, anything from a programming difficulty to a release date on a particular game.

Another great attraction of bulletin boards is public domain or shareware software. As you may know, there is a large amount of non-commercial software written for the ST, mostly from Germany and the US, which is either given away by

its authors, or more usually, issued as shareware.

The difference between these is that with the latter, you may obtain the software without charge, but if you use it regularly the authors ask that you send some payment. The author's address and payment requested are included as a message in the software.

There are many useful programs such as utilities which get round the limitations of Tos, or provide missing little features or patches. There are also improved terminal programs, simple games and other programs written by enthusiastic users.

Some commercial software houses will place demonstrations of their latest releases on bulletin boards. These can vary from games to major business packages.

These demonstrations are usually fairly complete, but will only allow small numbers of records, or no file saving or some other feature to make you buy the real one. The games may only have one or two levels.

On a recent call to the Star bulletin board, I counted 187 downloads, including some 1st Word utilities, a mail merge program, several text editors, a ramdisc utility, and even a game of chess. Many ST non-commercial programs are quite long – 50 or 60k is not uncommon – and some programs can be as long as 200k. Even at 1200 baud 60k will take nearly nine minutes to download, and every transmission error adds another second to the time.

To reduce transmission times and call charges, programs are usually offered on boards in a compressed form, reducing file sizes by up to 50 per cent.

A special decompression program is needed before you can run the files, but most boards offer this as a download as well. Even so, if your nearest ST board is a long distance call away, downloading large files may not only take up a lot of your time, (and prevent other callers from getting on), but will also cost you a great deal of money.

The other popular source of software is public domain libraries and dealers, who sell the software for a charge which covers the cost of the disc and copying.

For some of the longer programs, it can be cheaper getting them from this source. The price charged should be

around £5. Anyone who charges more than this is making a profit out of the process and that is definitely against the spirit of Public Domain software.

To download program software from bulletin boards, you need a comms program which supports file transfer. The normal transfer method used is called Xmodem and your terminal software must have this feature if you are want to download anything other than Ascii text files.

An alternative standard, just beginning to appear is Kermit, but not many terminals and even less boards support this at the moment.

When you call a bulletin board, always remember the sysop is running it for your benefit without payment, so courtesy should be your watchword. What a sysop likes is people who contribute to the discussions in the public messaging areas (even if you're asking for help rather than giving it), people who upload public domain or shareware software, and people who stay on for reasonable amounts of time.

Sysops' pet hates are people who log on under false names, send obscene messages, deliberately try to crash the system to show how "clever" they are, sit on the board for ages downloading everything in sight – without so much as a thank you message, and finally drop the line without bothering to log-off properly.

In the past, some sysops have been so annoyed by such callers, that they have closed their boards. If you use bulletin boards, be courteous and don't abuse them.

Running your own board is not very expensive, but it does take a lot of time. You will need a computer, an auto-answer modem – and a telephone line.

You don't have to have a dedicated telephone line, but it does make sense to do so. If you never use the line for outgoing calls you will get a low-user rebate, bringing the rental down to less than £1 a week. Installation entails a one-off charge of £90.

Your computer cannot do anything else while it's running the board so for a 24-hour board, you'll need a spare computer including disc drive and monitor.

If your board is not going to be online for 24 hours, which usually means you're sharing the household line, then make this absolutely clear to your callers.

You will need some bulletin board software. The package used by most UK Atari ST sysops is the Michtron BBS system, which is imported from the USA and sold through Microdeal for £49.95.

Being American, the Michtron software cannot support the 1200/75 speed, which it is essential to offer, so you'll need a speed-buffered modem – one that handles communication with the ST's

modem port at 1200/1200 baud. A suitable model would be the Pace Linnet or Miracle WS4000.

Having got your kit together and called yourself to see if it all works, what do you put on your board? Obviously all the items I've mentioned above, but most of all you must ask yourself what everyone involved in any media enterprise must ask – what will interest readers. I hope you've got some bright ideas!

Getting publicity for a board at the

beginning is done by writing to computer magazines and leaving messages on other boards (don't overdo it though). Also tell people through Prestel and the MicroLink bulletin board if you use either of these. In no time at all your phone will be permanently engaged.

There is an association for sysops which provides advice and support. The Bulletin Board Operators Association (BBOA), is at PO Box 57, Barnet, Herts EN5 2RS. □

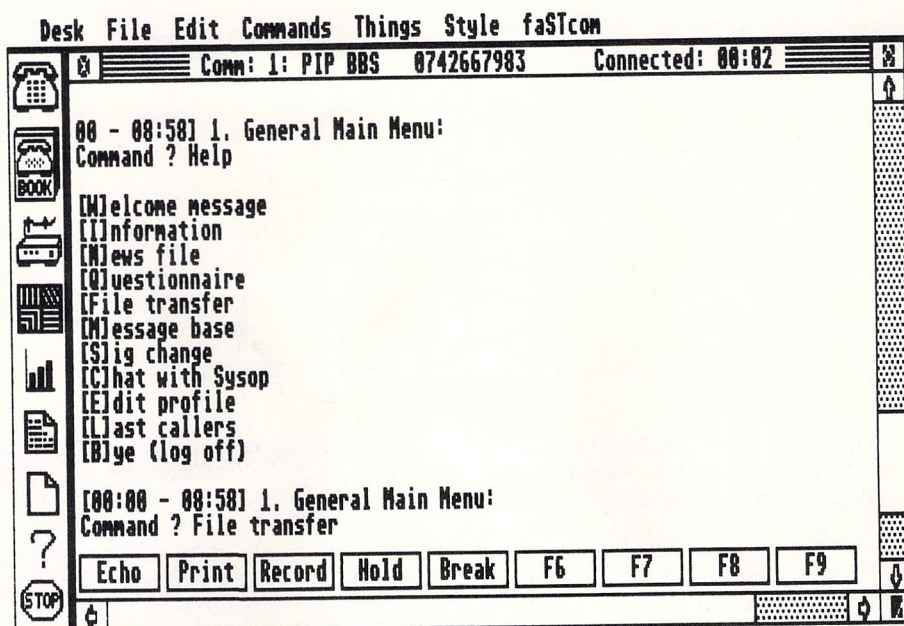


Figure I: Main menu of a typical bulletin board

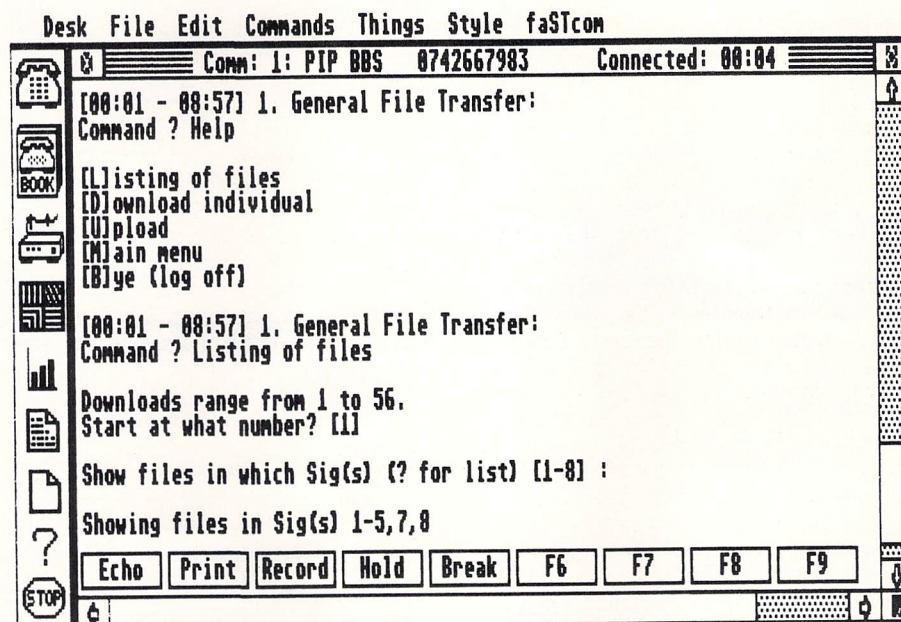
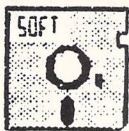


Figure II: File transfer menu



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Banish those payday blues

**Barbara Whitlock
reviews Microdeal's
flexible Payroll**

PERHAPS the most time-consuming operation undertaken by the small businessman is the weekly calculation of his employees' wages. Even a modest sized payroll can take up to two hours to calculate manually – time that could be much better spent by a busy executive.

The situation isn't improved by the ever changing legislation which puts an increasing burden on the employer to make payments for sickness, and more recently, maternity benefits. As well as making payments, extensive records have to be kept and these are subject to regular checking by the Inland Revenue and Department of Health and Social Security.

Government departments soon recognised the value of using computers to calculate wages and store records. Special end of year return forms, printed on tractor feed paper were approved by the Inland Revenue and a proliferation of payroll programs appeared from many software houses.

Now, ST users have the ability to computerise their payroll thanks to Microdeal's latest program. It's written in Modula 2 by Ian Murray-Watson of Wellbrook Computer Services and because it's new, it has all the latest legislation requirements built in.

In fact, I'd go so far as to say that the statutory sickpay (SSP), implementation is the best I've seen on any program of this type.

Calculating SSP can be quite a complicated business. You have to work out the periods of incapacity to work (PIW's), check if they're linked to a previous PIW and work out the amount to be paid.

With this program, all you need to do is enter the number of days your employee has missed due to illness. Rate and amount of pay and linking information is calculated from records stored on your data disc and the correct amount is entered on the payslip.

The records can be printed out at any time to provide the necessary evidence of payments for the DHSS inspectors.

The program runs entirely under Gem making full use of drop down menus filled with options. You can add passwords so access is restricted to authorised personnel only.

The usual setup screens for company details, special pension schemes and employee details are provided. Budget changes are catered for by a global tax code change facility.

This means when Mr. Lawson gives us say, an extra £1005 a year tax free allowance by increasing our tax codes by 100, all you need to do is select the code change option, enter +100 in the amount box and the code letter, for instance H, click on ok and all the appropriate codes are changed.

When you come to run the payroll calculation itself, you can select weekly,

monthly, fortnightly or four weekly paid employees. Any single group or combination of groups can be processed.

Running the program consists of entering pay variables such as hours worked on basic and overtime rates, time off due to sickness, maternity leave, or holidays and whether the company pension scheme applies to that particular earnings group.

If there are no wages due for an employee in that pay period, he can be excluded from the calculations by clicking on the box marked "Do not pay this period". Once you are happy with the data entered a click on the ok box takes you to the next record.

When an employee leaves, his record can be set to show that fact and the details required for a P45 will be printed out. Also, an employee who has reached the age where they are no longer subject to National Insurance contributions – because they have reached retirement age – is notified to you.

When all the records have been

updated, the payroll itself is processed and gross wages, tax, national insurance and other deductions such as, for instance, County Court deduction at source orders are calculated leaving a net wage figure.

The information can then be printed out on payslips, and according to method of payment, coin analysis forms, cheques or bank giros. Company reports will also be generated giving departmental breakdowns of all payments and deductions made.

At the end of the tax year – April 4 each year – all you need to do is load the P60 forms, select the year end option from the drop down menu, click on the ok button and all the information will pour forth ready for sending to the taxman.

The records will then be reset, clearing out the records of those employees who left during the year.

The savings in time will soon recover the cost of the program. You can even entrust the wages calculations to a more junior member of staff thus freeing your valuable time even more. □

Product: Payroll

Price: £99.99

Supplier: Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB

Tel: 0726 68020

The screenshot shows the 'Amend' screen for an employee's record. At the top, there are menu options: Desk, File, Print, Sort, Records, Wages, Company. Below this is a list of employees: Andrewes P.D., Bloggs F., Johnson K., Maguire J.S., Price H.D., and Salisbury A. The 'Mode' is set to 'Amend'. The selected employee is 'Johnson K.'. The 'Employee file' section shows details for 'Johnson K.': Surname: Johnson, Forenames: Keith, Address: (1) The Manor House, (2) Fownhope, (3). Works number: 0005, Date of birth: 11/11/40, Start date: 11/11/60, Leaving date: 00/00/00, Department: ADMIN., Last tax week: 3. Pension scheme: 0, Last tax month: 3. Mat Ins Number: 22 000000 2, Stand Con out RD 950 Redcd. Tax code: 0384 T, Stand PrefixD PrefixF BA NY. Pay frequency (wks): 1214, M, By: Cash Giro Cheque. There are buttons for OK, Cancel, and a 'Current Left' button.

Figure 1: Amending an employee's record

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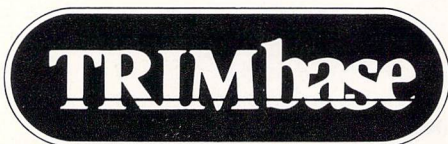
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A plot to cut grain

TANDY is not a name you would normally expect to see in an Atari ST magazine, but their latest flatbed plotter – the FP-215 – is certainly worth a mention.

At £399 it costs little more than a good quality dot matrix printer and if you need precise, clear drawings – from a CAD package for instance, a plotter can be a viable alternative to a laser printer.

Many drafting programs and CAD packages now come with plotter drivers included and the space shuttle illustration was created using GFA Draft and printed on the Tandy plotter.

Connection between your ST and the plotter is by a standard printer cable – the same one you use for your dot matrix printer. A serial connection can also be used by means of a four pin DIN connector and runs at speeds of 600 or 1200 baud.

The device can also be accessed directly from the many versions of Basic available on the ST.

Controlling the plotter from ST Basic is achieved by using LPRINT statements. The manual explains fully the use of the many commands and there is also a section of sample programs. Although these are in Tandy Basic, they will run in Atari ST Basic without any changes.

A standard Ascii character set is included which enables all characters

between Ascii 32 and Ascii 126 to be printed directly by a command such as:

```
LPRINT "PHello Fred!"
```

Graphics commands include draw, move, set origin, line type and draw x,y axes. These are specified by a single letter command, followed where necessary by the coordinates, in the LPRINT statement.

For example, to set the pen to a position 200 steps across the drawing surface and 40 steps down, the command:

```
LPRINT "M200,40"
```

would be used, where M means MOVE.

Absolute or relative positions can be specified so you can force the pen to move to a specific point or you can cause the pen to move x number of steps from its current position.

Lines can be drawn solid or broken and text can be rotated in 90 degree steps and printed in several sizes.

Although four different coloured pens are supplied by Tandy, only one can be used at any one time. If you are using

Ken Hughes reviews the Tandy FP-215 four colour printer plotter

Basic to control the output, the program could be stopped and instructions to change pens displayed on screen. Pressing a key would then restart the plotting with the new colour.

If you do change pens part way through a drawing you need to be careful you don't move the carrying arm when fitting the new one. Unless you are using absolute locations you may find you get out of sync with earlier parts of the drawing.

For the technical minded, the plotting speed is 100 mm/sec with a minimum step size of 1mm. Maximum plotting area is 298mm x 216mm (11.73 inches by 8.5 inches). The paper is held on the bed by a spring loaded metal bar at one edge and a sliding metal strip, magnetically attached to the bed, at the other edge.

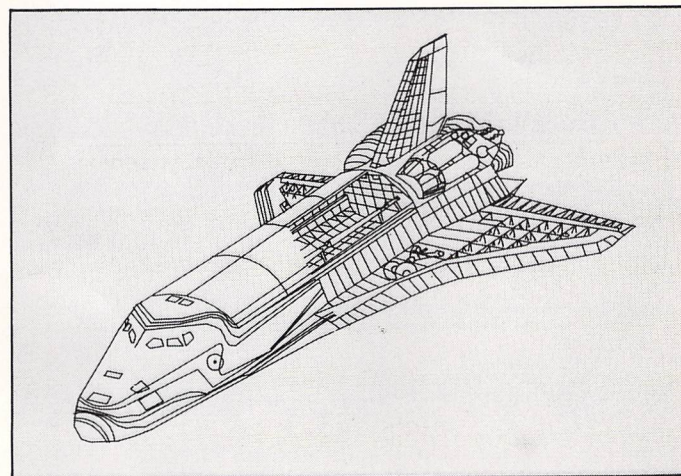
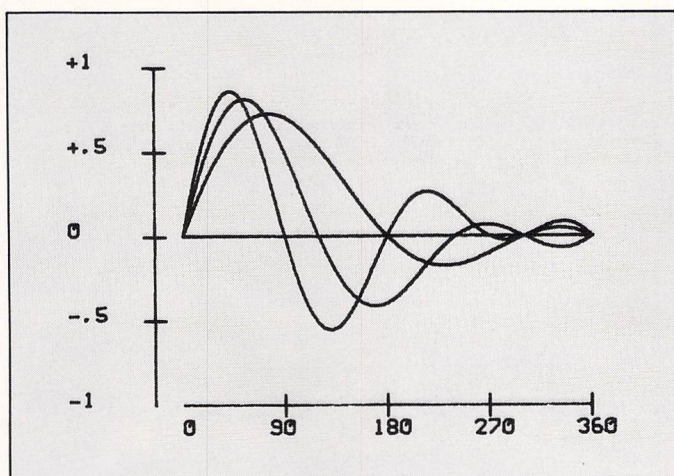
If you need good quality output and find a dot matrix too grainy, take a look at the Tandy FP-215. □

Product: Tandy FP-215

Price: £399

Supplier: Bizzel Computers, Walnut Tree House, Fornsett St Peter, Norwich

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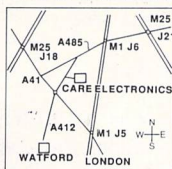
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ATARI ST USER, August '87

Review

"It is exceptional value for money."

MONITOR, Issue 16

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SCRAPBOOK

THIS month's first Scrapbook entry was sent to us by **Richard Jones** of Purley, Surrey. It's a useful routine which turns your ST into a stop watch – just the thing for checking Nigel Mansell's lap times.

It's written in ST Basic and will run in any resolution. Load ST Basic then type in and save Program I. When run, a dialog box will appear with brief instructions.

When the left button is pressed, a ping will be heard and the clock will start. The timer counts in 10th of a second units and displays these plus seconds, minutes and hours – up to a maximum of nine hours, 59 minutes and 59 seconds.

You can stop the timer at any time by pressing the right-hand mouse button. The counter will freeze and wait for the left hand mouse button to be pressed again when the counter will restart from zero.

One important point to note: Don't move the mouse while the clock is running. The time taken to read the new coordinates upsets the accuracy of the program.

The program can easily be customised so it is triggered from the keyboard, or other interface such as the joystick port. This would allow the timings to be controlled by sensors, such as pressure pads or another form of switch.

SCRAPBOOK is a regular feature consisting of short, simple programs sent in by our readers. It's a place where we can publish all of the interesting little routines that don't end up in our regular features but are too good for us not to share with other readers.

If you have a short program which you think other readers would find useful, send it to:

*Scrapbook, Atari ST User,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.*

Program I:

```

10 REM Timer
20 REM By Richard Jones
30 REM (c) Atari ST User
40 REM Written in ST Basic
50 FULLW 2
60 CLEARW 2
70 LINEF 82,10,82,18
80 LINEF 81,10,81,18
90 LINEF 170,10,170,18
100 LINEF 171,10,171,18
110 LINEF 81,09,171,09
120 LINEF 81,08,171,08
130 LINEF 81,19,171,19
140 LINEF 82,20,171,20
150 LINEF 76,5,320,5
160 LINEF 76,48,320,48
170 LINEF 76,48,76,5
180 LINEF 320,48,320,5

190 COLOR 1,1,1,4,2:FILL 0,0: COLOR
1,1,1,2,2:FILL 79,20
200 GOTOXY 9,3:" LEFT MOUSE BUTTON
... START "
210 GOTOXY 9,4:" RIGHT MOUSE BUTTON
... STOP "
220 GOTOXY 20,1:?" ";CHR$(9);" R.
P.JONES "
230 GOSUB mousebutton
240 IF button=1 THEN ?CHR$(7):GOTO 2
50 ELSE GOTO 230
250 FOR a=16 TO 21
260 FOR b=16 TO 21
270 FOR c=16 TO 25
280 FOR d=16 TO 21
290 FOR e=16 TO 25
300 FOR f=16 TO 25:FOR g=0 TO 30 :NE
XT g
310 GOTOXY 10,1: ? CHR$(a);CHR$(p);CH
R$(b);CHR$(c);CHR$(z);CHR$(d);CHR$(e);
" " ;CHR$(f);" "
320 IF e=16 OR e=18 OR e=20 OR e=22
OR e=24 THEN z=58:p=124 ELSE z=124:p=5
8
330 GOSUB mousebutton
340 IF button=2 THEN ?CHR$(7):GOTO 2
30 ELSE GOTO 350
350 NEXT a,b,c,d,e,f
360 GOTOXY 9,3:" TIME LIMIT REACH
ED PRESS "
370 GOTOXY 9,4:" RIGHT MOUSE B
UTTON ";CHR$(7)
380 GOSUB mousebutton:
390 IF button=2 THEN ?CHR$(7):GOTO 2
00 ELSE GOTO 380
400 mousebutton :
410 POKE CONTRL,124
420 POKE CONTRL+2,0
430 POKE CONTRL+6,0
440 VDISYS
450 button=PEEK(INTOUT)
460 RETURN

```


Our second Scrapbook entry is by **Julie Boswell** from Widnes in Cheshire. This short program is written in HiSoft Basic and should be compiled to disc and saved in an Auto folder with a .PRG file

extension. (Don't enter the line numbers).

When you reset the ST or switch on this utility will be run and will prompt for the current time and date. The ST's internal clock will be set and control is returned

to the operating system.

You can also click on the program from the Desktop and set the clock at any time, though it's more convenient in an Auto folder.

```

10 REM AUTO file to set
20 REM current time/date
30 REM By Julie Boswell
40 REM (c) Atari ST User
50 REM
60 REM **** HiSoft Basic ****
70 REM Don't enter line numbers
80 CLS
90 PRINT
100 PRINT " Set the current date and
time..."
110 PRINT
120 DO
130 INPUT " Month = ",month$
140 INPUT " Day = ",day$
150 INPUT " Year = ",year$
160 LOOP UNTIL month$<>" " AND day$<>" "
    AND year$<>" "
170 DATES=month$+"/"+day$+"/"+year$
180 DO
190 PRINT
200 INPUT " Hour = ",hour$
210 INPUT " Minute = ",minutes$
220 LOOP UNTIL hour$<>" " AND minutes$<>" "
230 TIMES=hour$+":"+minutes$
240 SYSTEM

```

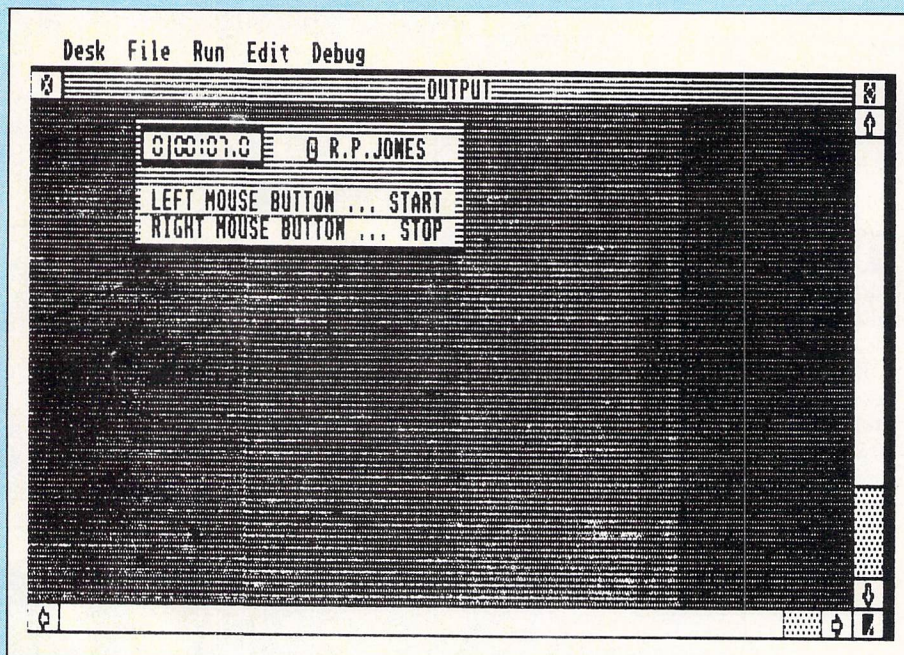


Figure 1: The clock in action



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Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built-in power supplies and built-in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 3 retail outlets at Sidcup, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £9 million and in excess of 80 staff, we offer you unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:
* BASIC Language Disk * BASIC Manual * ST Owners Manual * TOS/GEM on ROM
If you buy your ST from Silica Shop, you will also receive:

* NeoChrome Samples program * 1st Word - Word Processor
In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of several full-time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of over £½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA**.

AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 45 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. This information service is available **ONLY FROM SILICA**.

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We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No.1 Atari Specialist.

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ATARI 1040ST-F - NEW PRICE

We are pleased to announce a new reduced price point on the 1040ST-F which is now available for only £499 (inc VAT). The 1040 is a powerful computer with 1Mb of RAM and also includes a built-in 1Mb double sided 3½" disk drive. The 1040 has been designed for use on business and professional applications most of which require a high resolution monochrome or colour monitor. It does not therefore have an RF modulator for use with a domestic TV set. Modulators can be fitted for £49 (inc VAT).
1040ST-F Keyboard + High Res SM125 Mono Monitor £599 (inc VAT)
If you would like further details of the 1040ST-F, return the coupon below.

MEGA ST's NOW IN STOCK

For the user who requires even more RAM than the 520 or 1040 ST's offer, the new MEGA ST computers are now available. There are two MEGA ST's, one with 2Mb of RAM and the other with a massive 4Mb. Both new computers are fully compatible with existing ST's and run currently available ST software. The MEGA ST's are styled as an expandable Central Processing Unit with open architecture and a detachable keyboard. They are supplied with GEM, a free mouse controller and all extras as with the 520 or 1040. Prices are as follows:
MEGA ST 2Mb Keyboard + CPU £899 (inc VAT)
MEGA ST 2Mb Keyboard + CPU + SM125 Mono Monitor £999 (inc VAT)
MEGA ST 4Mb Keyboard + CPU £1199 (inc VAT)
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ATARI ST

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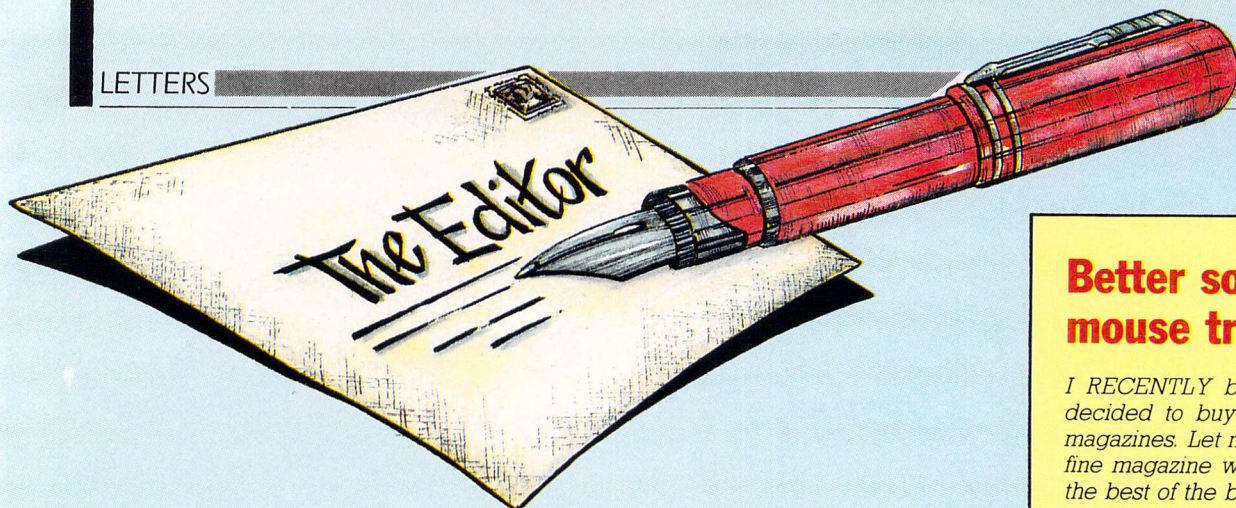
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Hints and tips, plus a few cheats

IS Atari ST User planning a tips and cheats feature as there is a fair amount of games software available for the ST? To start the ball rolling, here are a couple of tips for Psygnosis' *Barbarian* and Microdeal's *Airball*.

Barbarian: The shield is used to destroy Necron. When he fires a fireball, use your shield to defend yourself and the fireball will bounce off it and kill him.

Airball: The spellbook is in the room with the candle and crates. You'll have to move the crates because the book is buried underneath them. – **Jake Thornton, Drogheda, Co. Louth, Eire.**

● You'll find cheat modes and pokes for infinite lives for *Arkanoid* and *Hades Nebula* in the October 1987 issue of *Atari ST User*. Thank you for your tips. If any of our readers have cheats and pokes we would be very interested to hear from them.

Happy ending after a fire

I HAVE been the proud owner of an 520STFM since April 1987 and have taken your magazine from that time – I have a subscription and it is good to get the magazine before it appears in the shops. I like *Atari ST User* very much and have no criticism of it.

I have two reasons for writing, the first being to relate an experience and the second to ask for help.

My experience happened when my machine (and I) had a heart failure a few weeks ago – the power supply unit caught fire! I phoned Silica Shop and they sent a carrier to collect my machine the same day.

In under two weeks it was returned to me in perfect working order again. I also bought a printer cable from them and that arrived two days later. For excellent service I would like to give them a pat on the back via the magazine.

My plea for help concerns the Epson FX105 printer. I bought one of these second hand, but there wasn't a manual with it. Can any reader tell me where I

can buy one, or provide me with information about the machine? – **Les Pearce, Colchester, Essex. CO2 9PY**

● We haven't had any experience of the Epson FX105 printer. Can any readers help?

What's my language?

I BOUGHT the August issue of *Atari ST User* and enjoyed it immensely. For the benefit of new users like me, who open the magazine and cannot understand programs like the 3D demonstration, why should you not enter line numbers? What language is it written in and do I need software to use it? – **M. Davies, Cannock, Staffs.**

● The language used to write the 3D demonstration was Fast Basic from Computer Concepts. You'll need this either on disc or cartridge to run the program

The reason we add line numbers to this particular dialect of Basic and to others such as GFA or HiSoft Basic that don't require them is to make it easier to refer to a particular routine in the program.

It also makes it easier for you to see where each line starts and ends.

If you add them when you're typing in the program they will be seen by the interpreter as labels. This doesn't matter unless the program itself calls a label – then it will be confused by the line numbers and an error will result.

L driver seeks software support

I WANT to learn to program my Atari ST. At the moment I am just an average games player who would very much like to be able to write his own business and entertainment software.

Rather than trying to learn from books, I was wondering if you knew of any courses available which teach – intensively – Atari ST programming.

Unfortunately, I do not have any qualifications in maths or computing, but would like to take up computer programming as a career. I am 20 years old.

Have you any information on this subject or programming courses? – **Stephen Arnott, Brighton.**

● Your local College of Further Educa-

Better sort of mouse trap

I RECENTLY bought an Atari ST and decided to buy all of the available ST magazines. Let me congratulate you on a fine magazine which I have found to be the best of the bunch.

I am writing to make a few suggestions to add to the magazine – plus I need some help. First the suggestions:

- A new users' hints and tips section.
- More reviews and a better mix of games, utilities, art and so on.
- A bigger letters section.
- More normal ST Basic programs.

Can you help out with a problem? Is it possible to connect my Competition Pro joystick to my ST so each fire button acts independently – similar to the way the buttons on the mouse work?

I've had a look inside the mouse which has eight wires while my joystick has only six. – **Norman Tierney, London N16 8LN.**

● Thank you for your suggestions, we'll bear them in mind. We like to think the contents of the magazine reflect the requirements of all our readers, although we will never suit everybody.

There were 13 pages packed full of reviews in last month's issue and we're the only ST magazine publishing a regular Gallery section for readers'

tion may run courses in computer programming. If not, they'll be able to advise you of the nearest centre that does.

It's very unlikely they will be Atari specific courses, but if you can obtain a good grounding in general programming you should find little difficulty in applying the knowledge gained to your ST. Let us know how you get on.

Don't be put off by your lack of qualifications – many of the programmers who work for *Atari ST User* have no computing qualifications and are simply self-taught enthusiasts like yourself.

Star pilot first class

AFTER reading the *Starglider* tips in the June issue of *Atari ST User*, I had to write and tell you that I have actually completed the game. My final score was 361890 and my pilot rating was Cheat – although I didn't.

If you're wondering, *Starglider* has 34 levels and repeatedly plays level 34 once completed – not the ending I was hoping for after eight hours continuous play. I

artwork. We have also published many games listings, and in this month's issue you'll find a multi-screen arcade game written in Fast Basic and machine code.

Scrapbook is packed full of hints, tips and short programs dedicated to new users. We always welcome readers' letters so keep them coming.

When you say more normal Basic programs, we assume you mean Atari ST Basic listings, and not that our programs are abnormal in some way!

ST Basic is supplied free with the ST and is fine for a freebie, but for serious work you should consider upgrading to GFA, Hisoft or Fast Basic. We have published many excellent ST Basic programs in the past and will continue to do so in the future.

You have almost solved your joystick problem yourself. If you use port one, normally occupied by the mouse, you can read each fire button separately. Pin six carries the status of one button and pin nine the other.

As you look at your mouse/joystick port, both these pins are on the bottom row, pin six on the left and pin nine on the right.

The only puzzle with your joystick is its six wires – you need one wire for each of the four directions, one for each of the fire buttons and a common return – a total of seven. It may be that you have a braid screen which acts as the return link.

was wondering if I am the first person to complete the game.

Congratulations on a great magazine, keep up the good work. – **Peter Priestley, Dosthill, Tamworth, Staffs.**

● Can any of our readers beat Peter's score?

Bombed out by the cherries

PLEASE could you publish more Atari ST Basic listings as I don't have Fast Basic or any of the others?

When I run your Alert box program in the September 1987 issue of Atari ST User, some cherries appear on the screen and the program is lost. What is going wrong? – **Damyan Pepper, Bath, Avon.**

● Most of the programs we publish are sent in by our talented readers so the content reflects our readership. Unfortunately, Atari Basic isn't quite as good as it could be and it is a lot easier to program in one of the other dialects of Basic. However, we would like to see more ST Basic programs too and welcome all

submissions.

The cherries you see on your screen are actually bombs. They indicate the operating system has crashed because you've asked it to do something beyond its capabilities.

The Alert box program works as published so please check your typing very carefully. You are accessing the VDI – Virtual Device Interface – and the smallest error will cause the results you describe.

Printers probed

IN reply to your request in the April 1987 issue of Atari ST User for solutions to printer driver problems when using First Word or First Word Plus, I can offer the following:

My printer is an Epson-compatible, Panasonic KX-P1091 which supports NLQ output. However, I found the NLQ mode could not be activated by the software.

I examined the printer driver and found the codes were as follows:

Epson LX 80	nlq on	1B,78,1
	nlq off	1B,78,0
KX-P1091	nlq on	1B,6E
	nlq off	1B,50

Substitution of the appropriate codes in the Epson LX.HEX printer driver should solve the problem and NLQ can be printed on the Panasonic without hardware switching.

In addition, the Panasonic produces a better bold face with emphasised, rather than two pass mode. Replace 1B,47 (on) and 1B,48 (off), with 1B,45 and 1B,46 respectively.

Also, NLQ italic can be enabled by C, 1B,34 (on) and D, 1B,35 (off). I hope this is of some use to your readers. Perhaps now you can help me.

How can the international character set be accessed? The TEST.DOC file on First Word Plus uses many accented characters. How can I include them in my documents? – **Chris Marsh, Shipston-on-Stour, Warks.**

● Thank you for those useful tips Chris. In answer to your question, the characters you require can be accessed by resizing the edit window.

Click your mouse button with the pointer on the small, slashed square in the bottom right hand corner of the window. With the button still pressed, push your mouse forward.

The screen you see when you first run the program will be visible and on it is the table with the whole character set. Point to the character you require and click on it. It will be inserted into your document at the cursor position.

Right connections

I HAVE a Prism 1000 modem and want to connect it to a standard Atari 520STFM, also will the available communications software work with it? The manual that came with the modem had this to say on the subject of data connection:

Pin	Circuit	Name
1	104/RXD	Received data
2	103/TXD	Transmit data
3	109/DCD	Data carrier detect
4	102/COM	Common Ground
5	...	+12 volts (output)

It also says the data conforms to levels recommended by Ccitt V24/RS232. The main use would be for Prestel. Can you help? – **Graeme Robertson, Balnagask, Aberdeen.**

● On the ST, pin 2 is transmitted data, pin 3 received data, pin 8 data carrier detect, pin 7 signal ground and pin 4 is request to send. Wire your 25 pin D-type connector as follows:

Modem	ST
1	3
2	2
3	5 AND 8
4	7
5	4

Pen pals wanted

I OWN an Atari 520ST with a colour monitor and two disc drives. I would be very grateful if you could put me in touch with other ST users anywhere in Europe. – **Bobby Butt, H. Corsteds VEJ 20A, 1879 Fredriksberg C, Denmark.**

My name is Frank, I'm French and 16 years old. I would like to get in touch with other ST users. I can write in English without too much difficulty. As well as Ataris I am also interested in baseball. – **Frank Leloire, 8 Rue de la Croix, Pournoy-la-Grasse, 57420 Verny, France.**

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

The address to write to is:

**Mailbox
Atari ST User
Europa House
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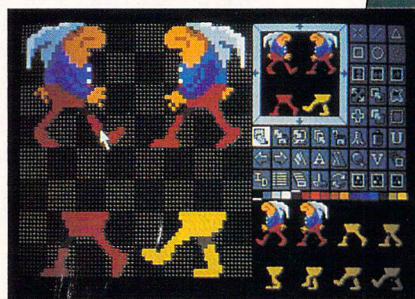
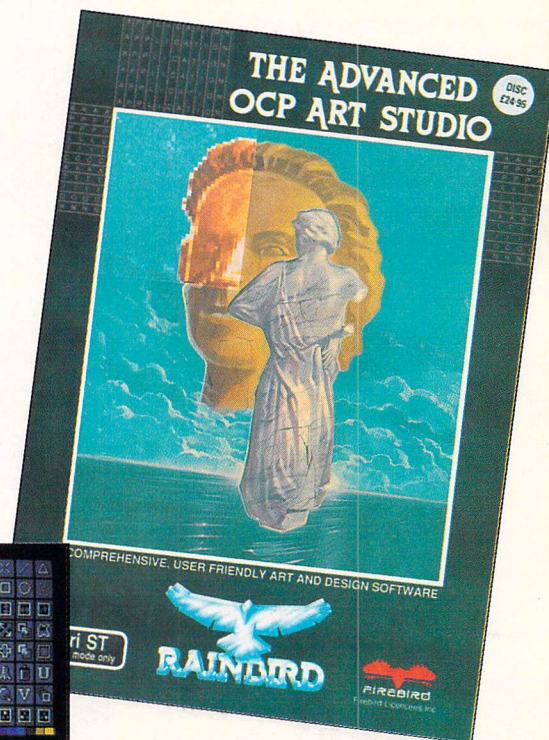
Icon-driven toolbox with on-screen help for each item

Two work screens (10 on the 1040ST)

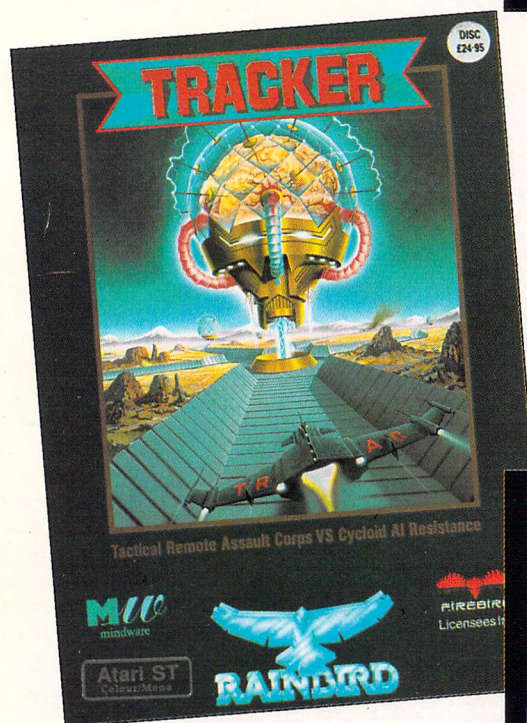
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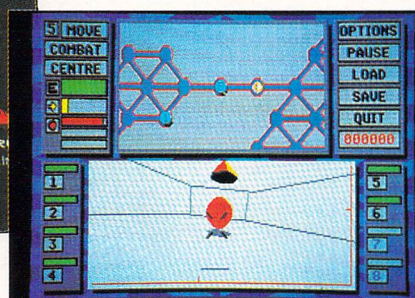


On the right track

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The package comes complete with colourful poster, Playguide and a short story by James Follett.



'The latest blockbusting game from Rainbird ... very addictive'
Hugh Michaels,
Atari ST User, August 1987

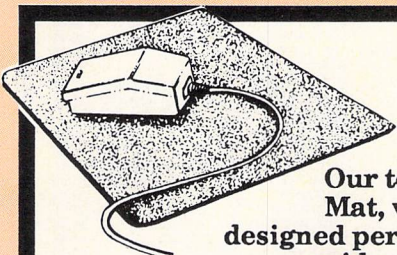
NB: Suitable for both colour and monochrome machines.

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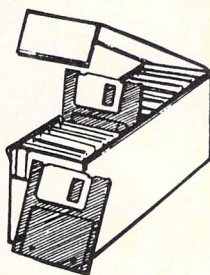
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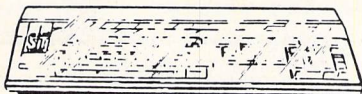


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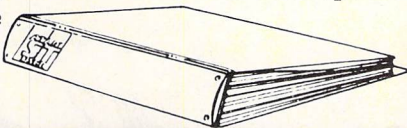
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by Larry Bank & Adam D. Sherer

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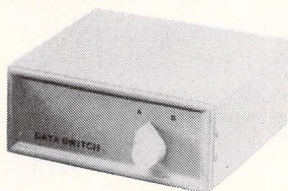
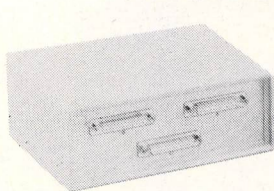
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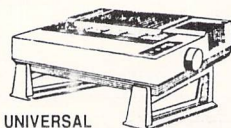


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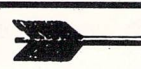
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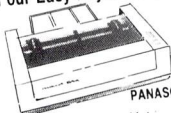


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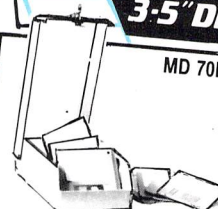


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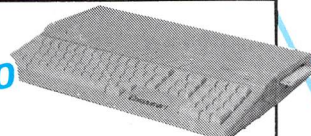
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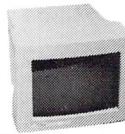
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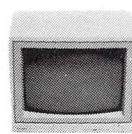
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