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ATARI USER

Vol. 3 No. 5

September 1987

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MicroPrint

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MicroPrint



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Vol. 3 No. 9 September 1987

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Published by:
Database Publications Ltd,
Rugby House, 88 Chester Road,
Rugby, Warwick, Warwick CV21 3PP



ABC 0521 January-June 1987

Subscription rates for
12 issues, paid free:

UK - £8
USA - Europe (incl. Post)
CAN - Overseas
ISSN 0264-838X

"Atari User" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by source tape or disk. Please enclose stamped, self-addressed envelope, offering the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all-rights basis.

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News trade distribution: Business Sales and Distribution Limited, Unit 1, Burgess Road, Institute Lane, Haringey, East Sussex TN30 4AP. Tel: 0424 434422

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Mini Office II



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Budget nasties

A ROW and arrow is the only weapon available to fight off the warty nasties in Forbidden Forest, just re-released for the Atari 8 bit on the Top Ten budget label.

The player controls a small character who has to venture deep within a creepy swirling forest space.

The quest is to defeat the evil Demogorgon - visible only during flashes of lightning. But along the way there are giant spiders, lurching bees, dragons, phantoms and skeleton soldiers. Price £1.99.

Orc on the rampage

SPILLS and a cast of more than 70 characters are all part of the new adventure game Knight Orc for the Atari 8 bit from Rainbird Software 001-240 8838B.

In these parts it sets you loose as an oppressed Orc rampaging across adventuresland trying to find a way out.

One object of the interactive game is for the Orc to get its own back on the generations of adventurers who have persecuted it. Each of the 70 characters makes its own decisions and lives its own life.

Communication with the other characters, learning spells and solving puzzles are all a vital part of the adventure. Price £19.95

More disc-based games are due

A 6580 revolution may be on the cards for Atari 8 bit users. With a new drive due to be launched this month, Atari has begun in depth research into potential boom markets for disc-based software.

This year's launch of the 6580 games machine, with the option to add a keyboard, encouraged the production of cartridge based software as well as the more usual cassette.

But with the return of Atari's own software publishing company label and the increasing list of titles, the prospect of producing disc-based games seems more attractive, says the company's technical director, Les Player.

He said Atari had a lot of new 8 bit software going through its testing department at the moment.

This was mainly new arcade games but there were a couple of conversions.

"Most are cassette-based, but we are looking to see how soon we can begin to concentrate on disc-based programs", he said. "If there's a market, we're happy to lead the way".

He explained that in the US cassettes were not used with the 8 bit machines. Over there, discs were the order of the day.

The new drive will be double sided, 5.25in, but pro-

ing and availability details were still being worked out.

Les Player said he had been impressed by the quality of games coming into Atari from smaller software houses and individuals.

"We are really happy to encourage these people. We will have a good look at their work and put it through the testing department. If it's good enough we'll put it out on our own label," he said.

"With the new 6580 selling so well, and a pre-Christmas boom expected, we have got to put out as much good quality 8 bit software as we can.

"And if it works out that people want this on disc, then so much the better".

Deal brings new hardware line

SOLE distribution rights for a range of products from ICD of Ripon has been announced by Frontier Software 0423 671401.

The first product - LG Double Chip - is a two chip upgrade for the Atari 1050 disc drive which gives true double density for greater storage and an accelerated I/O rate. It is designed to triple the speed of disc operations. Price £29.95.

To complement the Double upgrade is SportsDisc which supports 810 disc drives, tape discs and hard discs.

A menu allows rapid transfer, erasure and locking and unlocking of files using only the spacebar, Option, Start and Select keys.

A utility package is also supplied and features a 32

character keyboard buffer, intelligent switching between disc densities, sub-directories and a timesharing file stamping. Price £28.95.

The third ICD product to be distributed by Frontier Software is PFI Connection which plugs into the serial disc drive port of any Atari 8 bit computer and provides a standard Centronics printer interface and two RS-232C serial ports. Price £69.95.

Sports simulation

DECATHLON, the new sports simulation from Rainbird 001-233 87551, however allows only two players to compete against each other in the track events at any one time.

The game, from Rainbird 001-233 87551, however allows only two players to compete against each other in the track events at any one time.

The 10 events are: the 100, 400 and 1500 metre races, long jump, high jump, shot put, discus, javelin, pole vault and the 110 metre hurdles. Price £1.99.

FOLLOWERS of Sherlock Holmes will be pleased to hear that LG Gold 001-254 3388 has released an Atari 8 bit version of Dorian's 221B Baker Street.

The player takes the part of either Sherlock Holmes, Doctor Watson, Irene Adler or Inspector Lestrade - all characters from Conan Doyle's Holmes stories.

Like all good detective stories the player has to put his or her wits against other players in order to solve a number of crimes. Price £2.95 on cassette and £14.99 on disc.

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Gateways – Get through to New York in just five seconds – or try into the EEC computer in Luxembourg, which links you to 600 databases throughout Europe.

All you need – apart from your Atari – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided two possible options on the left.

Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.



Two recommended packages

If you have an 800 interface:
Please Register your personal modem
+ cable (714.76) PLUS Atari
Office 8 (279.85)
Total price: £138.50

If you don't have an interface:
Modem W52000 V31, V33 modem
+ Station interface + cable +
Vendorm's software
Total price: £143.85

With either combination you can also log on to other databases and bulletin boards all round the world.



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Address: _____

Postcode: _____

Send to: MicroLink, Europe House, 61 Chester Road, Road Grove, Stockport SK7 5AT.

The tender touch

THOSE with a sense of romance and a tender touch on the keyboard of an Atari 8 bit may welcome Plundered Hearts from Infocom.

The romantic adventure is set on board the Laford Deux, a sailing ship bound for the West Indies, where the heroine is trying to reach her ailing father on the island of St Simons.

Pirates attack the ship and amid the destruction and plunder the heroine is snatched from danger by Nicolas Jamison, the pirate

captain, who not only saves her life but wins her heart as well.

Plundered Hearts is an interactive fiction game that features drinks, proverbs and exotic locations as well as pirates. It is the first game from Infocom to be aimed specifically at women.

The story was written by Amy Briggs who read dozens of romance novels and researched 17th century ships and costumes to make the story line as realistic as possible.

Frightening freeways

A FUTURISTIC strategy role-playing game for Atari 8 bit machines has been released by Origin Systems (0800 54308).

In Autoduel the player drives along the freeways of the future where the night of war goes to the driver with the biggest gun.

Somewhere in a total of 18

cities and outlaw-infested highways there are clues to help the player bring Mr Big to justice, but before that a series of other missions have to be undertaken.

The ability to decipher clues is required along with gambling skills, money, and a super car. Price £10.95 on disc.

Competition winners

THE first prize of a full range of MicroProse titles, a framed Silent Service poster and a T-shirt goes to Jason Peacock from Wigton.

Second prize goes to Mrs A. Kinella of Peterlee who will be receiving a selection of six MicroProse games, a framed poster and T-shirt. Mr. Gail from Ebbw Vale will receive the third prize of a framed poster, copy of Silent Service and T-shirt.

Runners-up prizes of a copy of Silent Service and a T-shirt go to: J.P. Hallis, Chesham Holmes; B. Spickett, Hemel Hempstead; C.M. Taylor, Harlow; E. Micklethorn, Watlington; A. Docherty, Wicksteed; A. MacMillan, Cerevey; T.B. Bushnell, Widdow; C. McFike, Spaythill; C. Marshall, Sheffields; P. Stone, Harrogate; K. Harding, Hockley; S. Lusk, Bridle; P. McChesney, Glasgow; G. Mason, Barnstaple; B.U. Stannay, Blackpool; P. Bond, Sutton-on-Trent; D. Nayler, Causton; B. Briscoe, Market Broom; C. Warburton, Beaffield; S. McFarlane, Chelmsford Wood.

A further 100 people will receive a Silent Service T-shirt. C. Samford, Preston; G. Goslin,

Ramford; A. Gempster, Baffins; R. Rowlands, Huddersfield; B. Vine, Sarnham; M. Nelson, Old Basing; S. Muddle, Aldershot; A. Goodwin, Duxbury; C. Penn, Aberdeen; J. Johns, Plymouth; D. Smith, St Ebbe; M. Perkins, Ramon; A. Clark, Sarsfield; D. Garter, Castleford; A. Brown, Birmingham; B. Tuplin, Market Rasen; J. Bennett, Underwood; M. Pynn, Peterlee; A. Houghton, Ebbw; S.A. Turner, Faversham; J. Harrington, London; C.B. Goff, Abington; S. Benke, Upminster; N. Sisson, Ipswich; P. Adfield, Widnes; J.A. Gortie, Redhampton; D. Reysing, Warrington; E. Waterhouse, Swinsford; R. Johnson, Sheffield; M. Manning, Baxford; A. Smith, Seaton; G. Hanson, Wilmsham; B. Mason, Rannemouth; S. Agustinis, Huddersfield; M.J. Oliver, Cress; H. Forbes, Leek; L. Fortington, Rye; P. Pross, Stroud; C. Fawcett, Preston; B. Gresham, Ipswich; T. Weaver, Seaford; D. Davies, Amble; K. Joyce, Sheffield; S. Jughlan, Barnsley; A. Thompson, Newton

Abbey; M. Spanding, Corston; J. Burdell, Skipton; J. Pearson, Newbury; G. Diogo, Seaton and M. Watson, Darlington.

THE GALLUP CHART

TOP 20

ATARI SOFTWARE

RANK	TITLE	PRICE
1	GAUNTLET USF Gold	9.95
2	MILK RACE Mastertronic	2.99
3	MICRO RHYTHM Firebird	1.99
4	HOVER BOYVER Mastertronic	1.99
5	UNIVERSAL HERO Mastertronic	1.99
6	INVASION Bulldog	1.99
7	COLONY Bulldog	1.99
8	ASTROMEDIA Bulldog	1.99
9	SILENT SERVICE Microprose-USF Gold	9.95
10	POWERDOWN Mastertronic	1.99
11	FORBIDDEN FOREST Top Ten	1.99
12	AZTEC CHALLENGE Top Ten	1.99
13	GRIDRUNNER Mastertronic	1.99
14	DEEPER DUNGEONS USF Gold	4.99
15	FOUR GREAT GAMES Micro Value	3.99
16	LEADERBOARD Jensen-USF Gold	9.95
17	GUN LAW Mastertronic	1.99
18	ATTACK OF THE MUTANT CAMELS Mastertronic	1.99
19	LA SWAT Mastertronic	2.99
20	ANALROTE Mastertronic	2.99

Compiled by Gallup/Microprose

Gauntlet holds the top position for yet another month, despite nine new entries and one re-entry - LA SWAT at number 19. Budget titles are well in evidence with Mastertronic having four new titles in the Top 15.

High tech facts on tap

MICROLINK is helping to speed the flow of information produced by a leading industrial and commercial monitoring organisation.

The Brussels-based European Registry of Commerce keeps tabs on all the Continent's high tech industries, producing monthly reports on everything from printed circuit board manufacturing to industrial lasers.

It also logs all computer-related new products and patents, gives reports on important exhibitions, seminars and conventions, and undertakes market research projects for clients.

"Most of our 380 subscribers are UK based and they will now be able to receive our intelligence services more quickly and economically thanks to MicroLink electronic mail", said Registry managing director Ivoend Andersen.

"Eventually we intend to establish an online database so that as soon as our reports are prepared they can be accessed by our clients".

Star news flashed online

WHEN discovery of the first supernova for three centuries was confirmed earlier this year, UK astronomy enthusiasts received the exciting news via MicroLink.

The main international astronomical clearing house at the Smithsonian Institute in America flashed the news by telex to the MicroLink office at The Astronomer magazine, information centre and association of Britain's engaging amateur scientists.

"Detailed details of the

massive exploding star were then relayed to the organisation's 300 plus members at home and abroad.

Apart from the supernova's importance, it was a routine operation. For The Astronomer has forged an impressive partnership with MicroLink to forward the news of heavenly discoveries like comets and neas and increase opportunities for their observation.

"Quick announcement is vital if our people are to have a chance to see dis-

coveries before they move away", said Gary Hunt, editor of The Astronomer.

"MicroLink ensures that we can now receive news from the Smithsonian Institute 24 hours a day - a facility enhanced by radiopaging which alerts us to messages arriving in our mailbox.

"This means our people can often observe the same night it is discovered - which was something that was impossible in the old days before MicroLink".

Help for the helpers

COMMUNICATIONS analyst Alastair Kennedy is pressing the world to show one of Britain's biggest international aid agencies how MicroLink could help in the Third World.

"While he is on a 10-day tour of the Far East and Pacific area he'll use MicroLink to demonstrate the feasibility of electronic mail communications over long distances.

Alastair is Far East programme manager for Vol-

untary Service Overseas - founded 29 years ago to employ skilled volunteers to "help and help the underdeveloped countries. The organisation currently has 1,200 staff working in 41 countries of Africa, Asia, the Caribbean and the Pacific.

"As a personal initiative I'd be testing MicroLink's ability to improve communications between VSO in London and its local representative overseas", he said.

Teaching comms

COMPUTERS play a big part in degree courses at the Gloucester School of Management in London, where MicroLink is the chosen medium for teaching communications.

The institution has 500 students from all over the world taking courses leading to degrees in law, economics and business administration. There are also diploma courses in a variety of subjects related to the world of business and commerce.

"What they all have in common is information technology and its efficient use as a medium of communications. The school has a fully equipped computer science and information technology laboratory.

"We use MicroLink to portray for our students how electronic mail can be an advantage in business", said Dr Asha Dixon, Dean of the school.

Faster delivery for postmen

MICROLINK is helping the people who deliver the mail to discover the benefits of computer communications.

The Post Office Unions Council has joined MicroLink so that it can improve communications with its four components - these

consist of the Union of Communications Workers, the National Federation of Sub Postmasters, the National Communications Union and the Communication Managers Association.

Secretary of INCU, Steve Connelly said: "Our

job is to co-ordinate all activities involving two or more of our member unions. Previously we have had to rely mainly on face to face and telephone to communicate with their offices. If we wanted to send a telex we had to use an outside agency".

Do you get the message?



LEN GOLDING makes sense out of Basic's obscure coded advice

IT'S a sad fact of life that most Basic programs don't run correctly the first time — even if you've copied them from our listings. Often this is due to relatively minor typing errors such as using the letters O and I instead of zero and one, typing two commas together in a DATA line or misspelling a variable name.

It's also easy to miss out a vital statement, or even a complete line. Faults of this kind are relatively easy to trace once you know what you're looking for, but Basic's error messages don't help much — "ERROR 13 AT LINE 200" is not particularly illuminating, especially if you don't have a code book handy.

This program makes the job of debugging a lot easier by printing genuine, understandable error messages, alongside Basic's own cryptic clues.

The program autoboots so the cassette and disc versions are not identical, since they use two different systems. Program 1 makes an autoboot cassette, while program 2 creates an AUTORUN.SYS disc file — we explained the difference in the April, May and June issues of *Alan User*.

All the cassette version also leaves out all messages relating exclusively to disc drives and RS232C interfaces, so it takes up less memory and loads in about 50 seconds.

The routine works by checking address 165 every fifthth of a second to see if Basic has stored an error number there. If so, it sorts through the error messages in sequence until it finds the one which corresponds to that number. Since these messages

vary in length, it must be able to tell where one ends and the next begins, and we provide this information by typing the last character of each message in inverse.

If you fail to do this you will get some weird results.

Whichever version you choose, take great care in typing the numeric line statements, since they contain machine code programs which will crash if you make even the slightest typing error. And be sure to save a copy before you try running it.

Also remember that we're dealing with a two-stage process — the Basic program is not itself the error generator. It just makes a master file containing the error generator routine. It's this master file which must be loaded into memory before the routine will work.

To make the cassette version, run Program 1 and when the two beeps sound follow the usual SAVE procedure. To load the resulting master file, switch power off, rewind the tape, switch on again while holding down the Start key, then press any key to load the program.

When READY appears the new error routine is ready for action. The disc version is even easier. Just run Program 2 to make an AUTORUN.SYS master file which will install itself automatically on power-up.

With the master file safely loaded, you can test the system by generating a few deliberate errors. Try:

```
10 PRINT PEEK(-1)
or 10 POKE 106,PEEK(344)+10
:GRAPHICS 0
```

When you run them the first should

give you: "ERROR 3 AT LINE 10", followed by "Illegal numeric value". The second should give "ERROR 147 AT LINE 10", followed by "Too little RAM for GRAPHICS mode". Disc users should also try:

```
10 LOAD "D:REBLICH"
```

This should give ERROR 178 and "File not found". If you get the wrong message, the chances are that you've forgotten to end one or more messages with an inverse character, or have left out an inverse asterisk.

If the computer locks up completely, or won't accept any lines of Basic, check your original typing of the program and especially the machine-code data statements and all lines which contain variables M, MI and MH.

If you have to correct any mistakes, save the corrected Basic program and then run it to make a new master file.

When using or modifying the error message generator, there are a few important points to bear in mind. First, it uses stage one of the vertical blank interval. If your Basic program alters the addresses which control immediate VBIs — notably 946 and 947 — the error routine will stop working. Fortunately most programmers prefer to use the deferred stage two VBI, which won't affect the error messages.

Second, the cassette version is set as low as possible in RAM (1782 onwards), to leave maximum space for your Basic programs. This means that you cannot use it in conjunction with any peripheral which appropriates this same memory area.

The only common one likely to

Save us Page 10 ▶

As more and more of you are becoming interested in the communications revolution and the advantages of electronic mail we have been receiving lots of letters asking about downloading our listings from the MicroLink mainframe computer.

MicroLink is a vast electronic storage and mail system which is also linked into many other computers giving you access to a whole range of online services. One of the facilities offered is the ability to obtain computer software from the system - otherwise known as downloading telesoftware. Among the programs you can download are listings from Atari User.

But how do you go about it? Well, assuming you are online to MicroLink you can access the download section by typing TS from the main > prompt. The main telesoftware menu allows you to choose programs for your particular computer, or to go straight to the latest software.

You can download your programs in one of three modes. The first two are variations of standard Ascii text which are very straightforward to use but can occasionally be corrupted if you get a bad phone connection. The other mode - Kermit - is a special error-correcting protocol but is rather slower in transmitting files.

However, unless your communications software supports Kermit - and most 8-bit Atari programs don't - you will not be able to take advantage of this development. If you do have access to a Kermit supporting communications package you can get more information by typing HELP KERMIT at the > prompt.

All of MicroLink's telesoftware can be downloaded in the form of Ascii text files and, in order to do this, all you need is a communications program (sometimes known as a terminal emulator) which has the ability to capture the incoming text and save it to disc or tape for later viewing. You might find this is related to an application to disc in your manual. The Xmodem system provided on some communications devices isn't at present work with MicroLink.

There are many software packages you can use, including the new Mini Office II communications which is designed specifically to make it easier to talk to MicroLink and similar systems.

Beware of using software which can only store incoming text in a memory buffer. Many of the download files are quite long and would quickly fill up the available store unless there is a facility

Painless programs . . .

ANDRÉ WILLEY shows how to download them from MicroLink

to dump (or speed) to disc as the buffer fills up.

MicroLink is a text system and, as such, cannot handle any of the Atari graphics characters or machine code files. To get around this a special system known as Expanded Ascii has been developed.

The procedure for downloading both types of file is very similar. We'll look at the procedure with Mini Office II, but similar procedures apply to all software and your manual will show you the relevant commands for your own.

The latest software is stored in a way that makes it much easier to find the program you want and saves all the software will be stored that way. So let's look at how to download software from this section.

After typing TS enter the appropriate menu number at the first telesoftware menu (currently on number 7). You will then see:

```
<S>search <A>ascii <K>kermit
<H>help <Q>quit
```

Enter S followed by the type of file you're looking for. So, for example S ATU would find any Atari user programs, S ATAPII 88 lists Atari 8 bit programs. After confirming your choice you will now see a list of programs available with any relevant information.

Choose the file you want, then to download it enter A followed by the file number given. For example, ATU207 would download file P1282. Both Ascii and Expanded Ascii files are downloaded with the A option.

You are next presented with some details of the program and given a chance to save them if you wish. After this helpfile you are told to prepare to save the program and it's at this point that you turn on your capture-to-disc facility.

On Mini Office II this means typing Control+Shift+R for Receive File, entering a filename and then selecting

the mode. This should be 2 for a standard Ascii file and 3 for an Expanded Ascii one. Files with a type shown as A are Ascii and 8 are expanded Ascii.

You are now ready to begin the download, so hit the Start button to begin the capture and press Y+Return to let MicroLink know it can start sending. The text will now be displayed on your screen, with occasional pauses as your Atari sends a block to the disc file.

When the incoming text stops completely, press the Start key to close the capture file and hit Return to tell MicroLink to go back to the menu.

If your communications software doesn't support Expanded Ascii you can download it as standard Ascii and then convert it into a binary file. There is a short Ascii program called Expanded Ascii on MicroLink to enable you to do this quickly and easily. See the Help information on that program for more details.

When you have logged off MicroLink you should re-boot your computer and go to Basic. An Ascii file may be loaded by using:

```
LOAD "filename".
```

Expanded Ascii files are usually saved Basic programs and are loaded normally with:

```
LOAD "filename".
```

Some files are machine code binary files and these should be loaded by going to the Dos menu and typing L for Binary Load and then entering the filename. More information about the type of file can be obtained from the Help file associated with each program.

This should have given you an insight on MicroLink's telesoftware facility as there's no need to spend hours and hours typing in our programs when you can do it online in minutes. ■

ARE you tired of people using your computer without permission? Here's a gadget that could be useful at home, school, in computer groups, youth clubs or charity organisations.

It locks your computer by blocking the power supply until you enter a secret five-digit code.

There's no key to be lost, stolen or copied. The choice of code number is entirely up to you and can be changed easily if the need arises.

The gadget fits neatly into your power supply lead.

It doesn't require software and several fail-safe features are built in, it can control any Atari 8 bit computer, disc drive or program recorder - in fact anything that uses either a 5v DC or 5v to 8v AC power supply, at up to 3 amps.

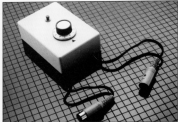
Figure 1 shows the circuit. It's quite complicated, and you don't need to understand how it works in order to build and use it, but for electronics buffs here's the operating theory.

The lock must be able to detect when a digit is being entered, and to discriminate between correct and incorrect entries. These three states are indicated by different voltages on the signal line: No digit = 2.5v, correct digit = 5v and an incorrect digit = 0v (or threeboards!). IC2a and IC2b are wired as comparators, to monitor the signal-line voltage.

If it is held at 2.5v nothing much happens. If it rises above 2.5v, IC2a sends a clock pulse to IC1. If it falls below 1.7v, IC2b sends a reset pulse to IC1.

IC1 is a decade counter with 10 outputs, though we use only five in this application. They are normally held low (0v), but go high (5v) in sequence from 0 to 9 when clock pulses are received at pin 14.

If the count reaches five, pin 12 goes from high to low, and we use this as the success signal. Any incorrect digit



Code lock

A device to keep unauthorised hands away by LEN GOLDING

along the way will generate a reset pulse (via IC2b) which sets the counter back to zero, wiping out the memory of anything previously entered.

The trick is to ensure that only the correct sequence of five digits can generate five clock pulses in succession. To see how this is done, let's trace the operation of Figure 1, where the correct combination is 24579.

When you first switch on, C3 sends a brief positive pulse to pin 10 of IC2 and, via S1 and R1, to pin 12 of IC1.

This does two things. First it latches the output of IC2c high, so TR1 turns on and RL1 pulls into its closed position. No current can flow to the computer when the relay is in this state.

Second, it ensures that IC1 is set to zero, so pin 3 will be the only high output.

Now this output is connected to the S1 pin which corresponds to two on the dial. So if you rotate the dial to two and press S2, the 5v at output 0 will appear on the signal line, generating the first clock pulse.

Output 0 now goes low, and output 1 goes high, so the second clock pulse will be generated only if you enter the digit which is wired to output 1 - in this case four. This sends output 2 high, ready for the third digit (five), and so on, until the entire combination has been correctly entered.

When the count reaches five, IC1 pin 12 goes low. This drives the output of IC2c low, and R7 ensures it stays that way. TR1 turns off, so RL1 clicks into its open position. Current can now flow through the relay contacts, and the computer switches on.

Connecting the outputs of IC1 to different pins on S1 will program the lock to accept different combinations. Almost any five-digit code can be used

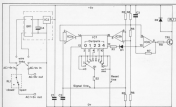


Figure 1 The Code Lock circuit diagram

Turn to Page 14 ▶

4 From Page 12

— the only restriction is that no digit may appear more than once.

There are a few components we haven't mentioned so far. C1 reduces electrical noise on the supply lines which might otherwise cause IC1 to count incorrectly. R1 and R6 produce reference voltages for IC2a and IC2b. C2 helps to de-bounce S1, and D2

protects TR1 from voltage spikes generated by the relay.

C4, BR1 and IC3 are needed only if you want to control 486/800 computers, disc drives, 415 program recorders or other items of equipment which use a 5v to 5v AC supply. The PSU for A1 and XE models delivers 5v DC, so it can power the code lock directly.

Figure 11 shows the PCB pattern for

these of you who like to etch your own, but a ready etched and drilled PCB is available from BH Design, as always. Holes for the terminal block and BR1 should be 1mm diameter. Sixing holes are 3mm, and all other pads should be drilled 0.8mm.

Now let's look at construction. Figure 12 shows the component layout for the version which operates with AC power supplies. If you're using an AL02E power pack, omit BR1, C4 and IC3, and fit the two short wire links from A to B and D to E, instead of from A to C and D to F.

Several of the components are polarised, so they must be soldered the correct way round. BR1 has + marked, C4 has an indentation at the positive end, and the diodes have a coloured band to mark their cathodes.

Take particular care that IC1 and IC2 are inserted with pin 1 in the correct position, and that IC3 (if you're using it) goes with its flat metal side towards C4.

S1 and S2 are mounted on the case, and connected to the board via the terminal block. Fig 13 shows how they are wired for the combination 24679. S1 is a 12-way switch, but the recommended control knob has only 11 positions marked 0 to 10. However, if you remove the fixing nut and shake-proof washer, you will see a small ring with a tooth which limits the spindle's rotation.

File this out and move it round until the tooth points at 11, then reinsert it. Now the switch will rotate to only 11 positions, matching the control knob markings.

The contacts on S1 are numbered, so it's easy to see where you are. One corresponds to zero on the control knob so, when you've chosen your combination, add 1 to each digit and solder a wire to the pin with that number. That's why in Figure 14, the combination 24679 appears to be wired for 3,5,8,8,10. The common pin is taken via S2 to the signal input, while all unused pins are connected together and taken to the Rest line.

When everything is assembled, fit the unit into its case, then attach the power supply input and output leads. The simplest, cheapest and safest way is to break into your existing lead.

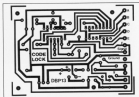


Figure 11
The PCB pattern
for Code Lock

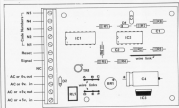


Figure 12: Component layout

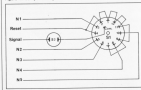


Figure 13
S1 (shown
wired for
24679)



Figure 14: View into plug
fitted to AL02E PSU

You could fit an extra plug and socket but in this case remember that unless your power supply plug is well taped into the socket the gadget is pointless.

In AC mode, it doesn't matter which way round the two power leads are connected, so long as you get the

input and output right.

Note that if you're using an XL or XL power pack, the positive and negative leads for both input and output must be connected the right way round, or you will almost certainly damage the code lock, your computer, or both.

Positive is the striped lead, negative

is all black, and Figure V shows the pin connections.

For security reasons, you might like to run a line of white insulating tape around the crack between the case and its lid. It won't keep determined people out, but at least you will know if anyone has been tampering.

PARTS REQUIRED

	Maplin Code	Maplin Code	Maplin Code
R1	30k orange/orange/orange	R23R	10-pin DIL socket
R2-P5	40k yellow/violet/orange	R23K	10-way PCB terminal block
R7	100k brown/black/yellow	M100K	Plastic box PCB (white)
R8	2.2k red/red/red	M100K	Control knob type RK2
C1-C3	0.1µF disc ceramic	M100K	Pack 654 x 1/2" spacers
C4	330µF 25V axial	M100K	Pack 654 x 1/2" pins bolts
C5	481 750 decade counter	FB80Y	Pack 654 nuts
IC1	LM324 quad op-amp	CO00K	
IC2	uA7805 +5V regulator	LF25D	
IC3	H9008 bridge rectifier	OL37J	
DR1	H9008 bridge rectifier	OL71N	
D1-D2	1N914 signal diode	OR02K	
TR1	6C150C transistor	FF70D	
S1	1 pole 12-way rotary switch	TH60P	
S2	Push-to-make switch	TH60W	
RL1	50mA miniature 6V relay	BL18U	
	14 pin DIL socket		

* Not needed for XL05F computers - see text

All components available from Maplin Electronic Supplies, PO Box 2, Keyleigh, Essex, SS9 2BB

Printed circuit board (order code 08PT03) price £7.95 incl VAT and postage. Available from AM Design, 137 Stonehill Avenue, Harrogate, North Yorks, Tel. 0423 480520.

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Floyd is back!

Program: *Stationfall*
Price: £26.99
Supplier: Infocom, c/o
Advision, 23 Ford Street,
Hampstead, London NW9
0PW
Tel: 01-431 2327

"LET'S play a game of *Hide-and-Seek!*" Now who would say that? Who could almost drive you to drink one minute and in the next stimulate an overwhelming sense of affection?

Who would carry out an act of heroic proportions and lay down his life for you? And who, if you were so entranced as to give him an undeserved kick, would mutter "Why did you do that? I think a wife's status loses", and go off into a corner and sulk?

It could be no one but Floyd, the scattered robot from Infocom's *Planetfall*. No one who has met Floyd is ever likely to forget him. And if you haven't had the pleasure, now's your chance.

For the good news is - Floyd's back! This lovable, maddening mess of mischievous returns with a bang in Steve Meresky's brilliant sequel, *Stationfall*.

The author of *Planetfall*, in which Floyd made his illustrious debut, won an award for Best Computer Software Designer. Make no mistake, we are talking real quality here.

You don't need to have played *Planetfall* to enjoy *Stationfall* (but why play one superb game when you can play two!). As a result of your freedom in *Planetfall*, you have been promoted.

Before you were just a scurrier of decks and dealer of gishy eggs, in *Stationfall* you are now... well, although you're a much higher rank, the job is just as mind-numbingly boring.

Your tedious scrubwork has been replaced with tedious paperwork. Forms, forms and more forms. Take

today's - the 15-minute assignment, for example.

You have to pop over to Gamma Delta Station and pick up a supply of Regulation Black Form Binders. Recover Forms. Ho, hum.

Aboard your ship the SFS Duffy is your former arch-enemy Blather (who has since been demoted to desk-scrubbing duties) and a trio of robots in the robot pool. There's Rex and Helen and - gipped! - your old playmate Floyd. You can only take one from the pool and, of course, it's got to be Floyd.

Try picking one of the others and just see what happens. Even if it were technically right to pick Rex or Helen, would you bear to see Floyd's lower jaw begin to quiver as though he were about to cry? I couldn't.

With the aid of the documentation included in the package, it doesn't take too much effort to plot your course and find the way to the massive Space Station complex. The 50 blueprints that are also included with the game certainly come in handy with the mapping once you've arrived.

You and Floyd are not alone on the station for long in weeks another robot, a bit of a bookworm apparently since he's reading a volume of poetry.

Turn out this is Plato who is rather like an older, wiser version of Floyd - fortunately he's just as friendly.

Royl and Plato are very much in the mould of all good comedy double-acts - RIDD and CIRD spring to mind. It is one of the great pleasures of this game to watch them at work and play (which they do incessantly, readily without taking any notice of you).

There are other inhabitants, too - an eskim and an Arabian (whose creature (what's of Dark Star?). Your mission is certainly turning out to be a far cry from the prosaic paper hunt you thought it would be, even if



it does at the moment seem to be lacking in mystery and mayhem.

But it soon becomes apparent that all is not well. The Commander's detailed log makes sense reading as it charts a gradual decline of the normally smooth running of machinery and procedures. The problems all seemed to begin with the arrival of that strange alien orb...

You discover at first hand that things are indeed going very wrong. Automatic sliding doors begin to open much more slowly as you approach but slam shut with an alarming suddenness as you pass, endangering your life.

Roving android mechanics start mistaking you for something that needs a quick bit of spot-welding. And even Floyd acts more strangely than normal.

Stationfall has much going for it. As well as the expected deep level of detail, fulsome prose, wide vocabulary, superb games, and the usual high standard of Infocom packaging (a Stellar patrol patch and three pieces of bureaucratic bumph are included in the edition to the items mentioned above), the adventure itself is a cracker.

There are *Planetfall* to read (remember High-heer?) and even our old

friends the Greys put in an appearance. But above all, *Stationfall* has the single ingredient which, with one exception, no other Infocom adventure has - Floyd!

Try to save your game position and Floyd's eyes will light up as he exclaims, "Oh boy, are we gonna try something dangerous now?"

Attempt a Restone and Floyd looks disappointed but understanding - "That part of the story was more fun", he sighs. He has equally cheeky comments about quitting, restarting, and many other topics.

Just when you think Infocom has reached the high peak in quality and humour, leaving the rest of the competition in the dust, it ups the stakes. *Stationfall* is going to take some beating.

Let the last word be Floyd's. When you next go into your local computer store and spy *Stationfall*, heed these words, when you first clapped eyes on him in the robot pool: "Oh boy, oh boy, oh boy, pick Floyd, pick Floyd!"

Rob Chappell

Presentation	50
Atmosphere	50
Puzzlement	50
Value for Money	50
Overall	50

Golden oldie

Program: Gridrunner
Price: £1.99
Supplier: Megasoft, 8-10
Paul Street, London EC2A
4SA
Tel: 01-277 6980

HERE'S another of Jeff Minter's golden oldies. Unlike *Hover Bover*, this one belongs to the blast-em-out-of-the-universe-before-they-blast-you-kind, that is the hallmark of a Minter game.

The screen is filled with a five-mesh grid along the bottom seven lines of which your craft (the Gridrunner of the title) may move freely.

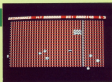
The main idea is to fire up the grid, destroying anything that moves and anything that doesn't until you've cleared the area. Fortunately, your plasma cannon has a repeat fire

facility – and you'll need it.

Public enemy number one, and traversing the grid from the top at a rate of knots, are the Gridsearch Squads. These are segmented caterpillar-like droids which, on reaching one side of the grid, drop down a line and zoom back along it.

They come in assorted lengths and if the leading segment is hit, the squad is reduced by one but keeps on inching. If any segment other than the front one is blasted, it splits into two independent squads at the point of impact.

In each case, any depressed segment immediately turns into a pod. These lodge in the nooks of the grid and gradually change shape. When the metamorphosis is complete, they drop a bit of energy down the grid which are



fatal to your craft – a single hit will slow a pod's growth while repeated hits will destroy it.

Pods can be generated another way, flanking along the X and Y axes of the grid are the Zappers. These cheerful little aliens periodically stop and hurl a plasma beam along the grid. When the two beams meet, a new pod is formed. While the Y Zapper's beam is harmful to Gridrunner's health, the X beam is lethal – both should be avoided.

When you've cleared the first grid there are another 30 to follow, each nastier and meaner than the last.

Gridrunner is a classic, a rip-roaring, noisy, machine-gunned shoot-em-up. They don't come any more frantic than this – go get it and get gridrunning.

Rob Chappell

Sound	5
Graphics	7
Playability	5
Value for money	10
Overall	5

Crowd puller

Program: Brian Clough's
Football Fortunes
Price: £74.95 (instant)
£17.95 (club)
Supplier: CDS Software,
CDS House, Buxton Road,
Doncaster DN6 4AS
Tel: 0302 21124

ONE of the best things about *Football Fortunes* is that you don't have to like or understand football to enjoy it. It helps, of course, but if you enjoy Micropoly, then you should get a kick out of this one.

It is in no way an arcade type of simulation, but a computer interactive board game on the theme of soccer management, aiming for success on the field and in the bank.

The pack includes the program disc, a well designed 8" square firmy board, player cards, bank notes, counters and clearly laid out instructions.

Each player types in his name and chooses a team to manage. There is a choice of 18 First Division sides, but any other team can be nominated, even an amateur or school team.

The computer then allocates 11 player cards and two substitutes to each team, each having a nominal value of between one and five points.

Players "throw" the computer dice and move accordingly. There are possibilities for player auctions, increasing attack and defence ratings, selection problems, sponsorship, manager's hub – good and bad – loans, transfers, injuries, wage demands and so on.

The team strengths are reassessed and entered into the computer, which determines the match results. These then come through on the teleprinter, the gate money is allocated and the

league table formulated.

Matches are generally decided by the team strength, but there can be upsets. As managers often say on the tee "There's nothing certain in football".

Points are allocated according to your team's position in the league, its progress through the cup competitions and money held. The winner, naturally, is the player with the most game points at the end of an agreed number of seasons.



CDS has come up with a great game and presented it really well, purely as a board game, and it would lose something for being a micro-only game.

The balance achieved is just right, making for a great family game – and no crowd trouble.

Nick Reynolds

Graphics	8
Playability	7
Value for Money	7
Overall	8

Mixed bag

Program: *Four Star Compilation, Volume 7*
Price: £7.95 (casualist £2.00)
Info:
Supplier: Red Hat, 11 Avenue
 Street, Manchester M4
 3SU.
Tel: 061-426 1699

FOLLOWING their successes with *Crumbly's Crisis*, *Space Lobsters* and *Astro-Droid*, Red Hat has decided to jump on to the compilation bandwagon with a collection of four earlier games: *Escape from Doomworld*, *Paric Express*, *Domain of the Undead* and *Laser Hawk*.

Escape from Doomworld involves you in a mission to save a team of scientists from a planet about to attack Earth.

Game-play is divided into a platform game, a flying shoot-em-up and a landing run. The platform section has you leaping over Dalek-like robots and electric poles in order to collect

containers of air, a rocket and a small block marked GO.

Once you have mastered this section you are taken into a game which reminded me of *Choplifter*. Avoiding enemy fighters and collecting fuel along the way, you must rescue the 12 scientists, returning them to your starting position.

Though not spectacular the graphics and sound are adequate. Although the controls take getting used to I found *Escape from Doomworld* had an addictive quality and well worth playing.

Paric Express is well named – the train is out of control and you must get to the engine to stop it. Leaping over carriages and avoiding balloons, lightning bolts, laser grids and shark-infested pools you reach your goal.

A note of warning – take care over the last three screens, it took me nearly three hours to get through these to the engine. "Well

done! you stopped the train" is the final message – and an anticlimax. Once completed it is not a game I would return to.

Laser Hawk is completely different and as enjoyable now as when I first played it. Great graphics and appropriate sound.

The evil forces of Proc Ions have attacked and you are chosen to launch the counter attack using the most advanced helicopter available – *Laser Hawk*.

The plan is simple – destroy everything. Points are awarded for blowing buildings and enemy fighters/raft while avoiding missiles and lava eruptions.

This is a shoot-em-up pure and simple. It's the best game of the compilation and it soon converted me to a shoot-em-up fan.

Domain of the Undead is disappointing, attempting to be a clone of the arcade *Ghosts 'n' Goblins*, it falls miserably.



With appealing graphics, sparse sound and difficult gameplay you make your way through a haunted graveyard. With four cruicifixes and a gun for protection against evil spirits, ghosts, skeletons and bats, you tear the area.

Despite *Domain of the Undead*, this compilation is very good – a good buy if only for *Laser Hawk*. I am waiting for volume two.

Robert Sewer

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

Fast and furious

Program: *Astromeda*
Price: £7.99
Supplier: Badly Software,
 Ring Mariner, 1 Orange
 Street, Sheffield S1 4SR.
Tel: 0742 755700

IT may be another space shoot-em-up, but this one makes up in slick graphics and smooth, fast action what it lacks in originality.

These pretty aliens are at it again – they are about to destroy Starbase Astromeda. Many of your fellow astronauts have been cast adrift in space and it is your task to pick them all up.

While you're about it, you must avoid deadly meteorites and annihilate the menacing alien hordes on your way to smashing their mother ship. And all this before breakfast and with

one hand tied behind your back, I suppose?

The game shows an overhead view of a 10 screen-wide playing area, set against black and starry heavens. You pilot your two-wheeled craft from left to right while the scenery scrolls smoothly and smoothly to the east.

In front of the backdrop is a huge and impressive grey, metallic-looking ship, presumably the mother ship. I can't say for sure because I never completed the 10 screens.

When you see the number and speed of the aliens and meteorites coming at you from the right, perhaps you, too, will have a few problems making it through to the climax. Don't forget that you're supposed to pick up your compatriots as they

free-fall past your portholes. There are 10 types of aliens but you do have the capability of dropping one of your edge-out bombs when the going gets rough. Trouble is, they don't come cheap – you have to amass 10,000 points to get another. You'll also get an extra life with every 10,000 points as well.

The game is for play with joysticks only. Sound effects are pretty good and com-

plement the sleek graphics, making a nicely polished product.

One of the better space arcade games around and at a budget price, too, *Astromeda* is well worth a whirl.

Bob Chappell

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



Penalty box

Program: Footballer of the Year
Price: £8.95
Supplier: Emerald Graphics,
 Alpha House, 10 Carver
 Street, Sheffield S7 4TG
 Tel: 0742 76242

ALREADY released on other formats, Footballer of the Year now makes its debut on the Atari.

As a young 17-year-old apprentice footballer you start your career. With a set amount of money and a choice of division and club you make your debut.

You have a set number of goal cards. By using one of them in a game you are given the chance to score goals and increase your season's tally. Sometimes your card will present you

with a penalty with the chance to score without any hassle, otherwise you get two defenders rushing at you.

Usually you are given three or four chances a match to score and the final score appears teletype fashion. After the game, you are able to assess the league data including your position this season (goals for the national team, in the FA Cup, League Cup and in the League).

You can change your financial picture by using an Incident Card. You may win or lose the roulette table or break a leg for instance. Transfer Cards can also be bought, the price depending on which division you are playing in. If the talent-scout is not interested you have



wasted your money.

Almost everything is text and the poor graphics are all monochrome on an unchanging background. I was disappointed too, by the lack of sound - the occasional cheer would have been nice.

The transfer procedure is ridiculous. With a rating of Excellent, in the First Division, and with over 100 goals scored after two seasons I was turned down by a Third Division scout

looking for an average player.

Footballer of the Year is quite addictive, but a little too easy to score goals and to get a high rank. At £8.95 I found it overpriced.

Robert Snow

Sound	1/5
Graphics	2
Playability	7
Value for Money	4
Overall	7

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Your HINTS & TIPS

One Man and his Droid

IN the February 1987 issue of *Afterglow* Colin Rayner gave you the first eight level passwords for *One Man and his Droid*. Well, here are all 28 of them.

Not Applicable	Seaside
Bubble	Game
Asah	King Kong
Flinders	Hologram
Genetic	Curry Rice
Tapped	Coffee
Megasonic	Cassette
Time Warp	Telescope
Unopium	Computer
Gorgeous	Edwards

— Nicky Alford, *Stourbridge, West Midlands*

Starquake

WHEN you enter the transports in *Starquake* use the following codes to move to various areas of the game:

Cisco	Tried
Kimo	Atar
White	Pania
Miles	Arto
Crash	Sabo

— Stephen Beale, *Upton, Essex*

Spellbound

HERE are some tips for *Spellbound*. To light the candle, take it and cast *Candelabrum Illuminatus*. The candle can then be used to read the Ancient Scrolls.

On the ground floor, stand on the yellow puddle and cast *Aemoria Photonica* to make your armour glow. This means that you can drop the glowing bottle and release the Banshee. Command it to help for hints. Use the broken glass to read the writing on the needle.

Give the jewels to Sarason and summon him to the pit. Command him to help and he will place a useful platform in the pit for you to use.

To avoid the broken Tallman,

give it and the tube of glue to Hovis and command him to help.

To release Gimbal it is complicated, but here goes...

Take the three coloured crystals (red, green and blue) and the white gold ring. Give the Book of Shadows to Orlis the Clerk and summon him to the Most Magic Room where Gimbal is trapped.

Holding the ring, the three crystals and the repaired Tallman, go to the Most Magic Room and cast the *Crystallium Spectralis* spell and throw the crystals at Gimbal in any order to release him.

Cast the *Release* spell and he'll be ready to send the characters home. — Mark Powell, *Lewes, East Sussex*

Warhawk

WHEN you get to the fourth screen a flashing spacecraft will appear. If you fire at it once you will find that it changes shape. You can now do this with it. When you do this press the once and you will now have rapid fire. — Richard Alder, *Harriet, Kent*

Racing Destruction Set

WHEN you design a track the best area to lay a lamppole or oil is on a slope or on the ice patches. The best car to choose when playing the game is the fastest, lightest jeep you can get (but not too light — get some weapons and shielding).

If you are driving on paved surfaces with no hazards go for the racing car. If there are a lot of slopes use the street bike. It is possible with a little luck to do a three point turn and go back the way you came. — Patrick Marshall, *Harrogate, South Yorkshire*

Zorro

WHEN you come to the bull tower jump from the end of the road and keep Zorro jumping. He will then jump the gap between the door and the road. Don't forget to collect the key near the gate. — Stephen Austin, *Newmanby, Cleveland*

Spy Vs Spy II

IT is possible to lay traps around the base of trees and also put up a tree screen. This allows you to trap your opponent, and when he is let down he will land on a trap. The best one for him to land on is a bomb. — Sue Dowling, *Westbury, Cheshire*

Gauntlet

ARE you having trouble with the poisoned food in *Gauntlet*? The answer is easy. Take a look at the food before you collect it and if the handle is square then the food is safe. If it is triangular the bottles contain poisoned food. — Steven Robb, *Central Region, Scotland*



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Dos discs at your fingertips

FOR the last two months we have been examining the workings of Dos 2.0 and Dos 2.5, and perhaps some of you will have become a little daunted by the complexity of the bit-mapped data storage system used in order to save space on the disc.

This system of using all eight bits within each byte to represent separate items of information is actually quite simple, but calculating the results can prove long and laborious. If you have tried Bruce Woodland's disc sector editor from the last issue you will have noticed just how incomprehensible some of the data looks.

For those who would like to have a go at modifying the disc format but who don't feel up to writing out all the numbers then DISVIEW is for you. Type it in exactly as shown, and save a copy to disc. You can use the Get It Right! checksum program to be sure you haven't made any mistakes. Watch especially for the DATA parameters starting at line 21286.

When you run the program it will take a few moments to set up some strings and other variables before presenting the main menu where selections are single-key entry as you don't need to press Return. Each selection lets you examine or edit different portions of the disc, and each has its own set of commands.

D) View/Edit Directory: The eight directory sectors will be read into memory in one operation and you may then scroll through the file entries by using the cursor up and down arrow keys. If you hold down Control with these keys the selection will move forwards or backwards by four entries.

The screen will also show the surrounding 8 file entries, with an arrow pointing to the current selection. The various bit-mapped information bytes are decoded at the bottom of the screen. Typing N or E will allow you to change the name or extender while S and T will accept new values for the First Sector and Total Sector Count items, respectively. If you make a mistake in entering any of these you will be asked to re-enter the item. The file information flags shown on the right may be toggled on

Part 8 of ANDRÉ WILLEY's series on the Atari's input/output facilities

and off as indicated on the screen menu.

Enter W to write the modified directory to disc, and Escape or Q to quit and return to the main menu.

V) View/Edit Volume Table of Contents: This will read the VTOC sector(s) containing the map of free disc space and allow you to view or modify it. If the disc is in enhanced density then the two VTOC sectors will be combined by DISVIEW and displayed as one table for your convenience.

Use the cursor keys to move the cursor around the table - hold down Control to move five spaces at a time. You may also use the N and B keys to go on to the next sector or back to the last one. The number of the one you are currently viewing will be displayed at the bottom of the screen, along with the current free sector count. Pressing the spacebar will toggle a sector between being in-use and free.

Enter W to write the VTOC back to the disc, and Escape or Q to quit and return to the main menu.

S) View/Edit Sector Links: This section of the program will allow you to view any sector on the disc, and perhaps alter its forward reference information contained within the last three bytes. If you wish to edit the actual data portion of the sector then you should use Bruce Woodland's program from the August issue of Atari User since DISVIEW was not designed for this purpose.

Once a sector has been displayed you may use the B, F or D keys to input new values for the Byte Count, File number or Next sector pointer respectively. The file number should always be the same as that given by the Directory View/Edit section or you

will get a 164 error when attempting to access the file from Dos.

You may continue to the next logical sector (following the next sector pointer value whenever possible) by pressing C, but this will not write any modified data back to the disc. Use W for write if you wish to save the data before continuing. Be careful of using the sector write option unless you are sure of your modifications, because it does not prompt you before updating the disc. Q or Escape will simply quit the current edit and take you back to the main menu.

B) View/Edit boot sector: The first sector on a Dos 2.0/2.5 disc contains important information about the way Dos will perform. Much of this is not user-alterable, but you may toggle the active drive allocation values by pressing keys 1 to 8 accordingly. Pressing B will allow you to change the number of disc file buffers to be used.

Once again, you may then use W to write the sector back again, and Q or Escape to quit back to the menu.

C) Change drive number: This simply allows you to enter a new drive number (between one and four). The disc in the new drive will then be checked and you will be warned if it is not in the correct format. All future operations will then take place using this new disc drive.

E) Exit: This will halt the program and return you to Basic. Pressing Q or Escape from the main menu will also quit the program.

DISVIEW is certainly not the final answer to disc editing - but at least it will allow you to examine the way that Dos works without getting too much of a headache trying to sort out the numbers. As with all programs of this nature, don't forget to only view and edit a backup of your data disc or a wrong keypress could end up ruining hours of work in error.

Well, this concludes our tour through the CIO and disc handler systems, but in a future issue I'll take a deeper look into the operating system to reveal how the Serial Input/Output (SIO) routines transfer your data to the various peripherals.

Turn on Page 24

MAIN VARIABLES

BUFFER	Input sector buffer
BARFOOTS	Output sector buffer
VTOCC	Full length VTOC table (combines sectors 200 and 1000)
BRANDS	Binary AND machine code routine
BRANDS	Binary OR machine code routine
QSECTS	Get-sector machine code routine
QSECTS	Put-sector machine code routine
PRCTS	Full directory information from sectors 201-209
PRCTS	Five digits 0-F
FILE	Temporary filename storage
FILE	Strings containing special print characters
ESCL, DS, CR, RS, ULN	16 or 32 sectors per track (single advanced density)
TYPE	Number of free sectors between 1 and 773
FREE1	Number of free sectors between 773 and 1020
FREE2	Total number of free sectors
FREE	Current working sector number
SECT	PMG base address
PMBASE	Register address for Player 0 horizontal position
PCSB	Keyboard character store
OP	Status flag for sector IO routines (1 = OK)
ERR	Current directory entry number

PROGRAM BREAKDOWN

10-500	Memory check
2000-2180	Draw VTOC map on Graphics 10 screen
2200-2240	Move PMG cursor to new position
2300-2370	Print VTOC sector information
2500-2530	Calculate VTOC and write to disc
3000-3160	Viewfile VTOC (Main routine)
4000-4080	Viewfile Directory (Main routine)
4700-4730	Input new sector number
4800-4850	Modify directory entry flag byte
4900-4980	Input new filename/extension
5000-5070	Viewfile Boot sector (Main routine)
5000-5080	Input new active drive details
5700-5730	Input new buffer allocation
5800-5830	Write boot sector to disc
5900-5980	Print four digit hex number
6000-6000	Viewfile Sector link data (Main routine)
6000-6070	Enter new value for sector link data
6000-6080	Write sector to disc and move to new logical sector
10000-10020	General read sector routine
10100-10120	General write sector routine
10200-10230	Pause for error message, then return
10300-10340	Check for valid Dos 2.02.0 disc and detect density
11000-12100	Plot numbers/text on Graphics 10 screen (for VTOC)
20000-20020	Main menu routine
27000-27100	Initialize variables, machine code strings, PMG, and so on

```

1 000 0000 000000
2 000 01 0000 0000
3 000 000000 0000
10 01 000001-0200 0000 1 001 000000
00000 0000
20 000 000 0001000 0000000000100001
100 0000000100 000000001 00000001 0
0000000100 000000000 000000000
30 000 000110 000010 00000 000110 001
11 000000 000000 000000
40 000000 0000 000 000000000 10 1
01 000110010000
10 0000 0000
50 000 01 0 0 0 0 0 0
60 000 000000
7000 000 000001 0000 000 000 000
8000 1 000 000 00000000 00100
9000 00010000 00001 000000000 0
0 000110000
001 0000 0000000000010000 10 10
100010000000
1000 0000000000 0 0001000001 1010
2000 01 000 00 00 000 0000
3000 00000000-000000-000100
2000 0001 00000000 0 000000 000 0
00000 000 000
2000 00 000100 0000 00000-00000-1
0000 00 000000 0000 000000000-1
1000 0000000100000101 00000 0000
000 0000000000 0000 000100 000000
000 00 000 0000000000000000 0000
2000 00 00 0000 00000000 0000
3000 00000100 00000100 0000000000
000000-000001-0110 100000 0000 00
7000 0000 10000 01 00000000 01 0000
00 00 01 000000 00 000000 00
000000 00 100 00 00 00 00
2700 00 0000 10 00000000 000 0
3000 0001 00 000000 000000 0
4000 000 000 000
5000 000 000000 000000
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Micro route to the sun

ANDY DORAN finds a new use for the Mini Office II spreadsheet



Most people see spreadsheets as boring programs to use for accounts. This means that lots of interesting uses are overlooked. Let's explore a different use of a spreadsheet using Mini Office II.

If you glance through the glossy pages of a holiday brochure you'll see weather reports and tables which give an indication of the amount of sunshine or rain that a particular resort can expect during the summer months. Such a table can be displayed using a spreadsheet - and with Mini Office II the results can also be shown graphically.

Take the typical British week shown in Figure 1. These figures can easily be

and enter 0 followed by Return. From now on we will assume that you remember to press Return as you make an entry. Once this has been done, pressing Escape takes you back to the spreadsheet menu.

Pressing Escape once more will take you to the spreadsheet itself (at present blank). You use the arrow keys to move the cursor around and at the top of the screen you'll notice the status area.

As the cursor is moved this changes to indicate which cell the cursor currently occupies (such as A1 or B6). When data has been entered other sections of the status line such as contents change to show what is actually

need to enter the labels for Sun, Rain and Temp so use the GOTO function to move to cell A3.

The column width at present is 7 which is not big enough to allow the label Rain (which) to be entered.

The width of column A (or any other column) can easily be altered by pressing Control+W. You will be prompted for the new column width so enter 13 to allow room for the label. Now you can enter the labels for Sun, Rain and Temp in the same way as you did for the days.

Now your spreadsheet is labelled and ready for you to enter data - except for one thing. You need to enter some formulae to get the information you were originally looking for - averages and so on.

Use the GOTO command to move to cell B1 and label it AVERAGE. Label cells B1 and B1 MAX and MIN respectively and now move to cell C2. This cell will contain a formula to calculate the average daily sunshine (in hours) over the week. The formula is:

$$B2+(B3+C3+D3+E3+F3+G3+H3)/7$$

Fortunately Mini Office II allows you to abbreviate this formula using # to stand for sum of. So the formula becomes:

$$B2=(B3#H3)/7$$

Pressing Control+F allows you to enter the formula. The left hand side of the formula (B2=) appears in the status area and by typing B2#D3/7 you will have entered a formula into cell C2. This will read 0 as first no data has been entered.

The formulae for cells D3 to H3 are

	MON	TUE	WED	THU	FRI	SAT	SUN
Sun (hours)	8	7	7	8	9	8	9
Rain (inches)	3	2	3	3	1	0	1
Temp (best)	29	28	27	31	32	28	33
Temp (worst)	14	14	25	25	35	26	27

Figure 1: A typical week's weather

entered into the spreadsheet and produce useful figures such as averages.

Now we'll move on to the program. Once you've loaded it you need to make some changes to the default values given. For instance, there is no point in having two decimal places for numbers. To make these changes select Alter screen display from the main menu and you will move to second menu. The options given are clearly explained on pages 46 and 56 of the Mini Office II manual.

You need to alter the number of decimal places to 0 so simply highlight the option decimal places

in each cell.

The first thing that you need to do is to enter the labels for the spreadsheet - so you know what the values mean later on. To do this we need to move the cursor to cell B1 either by using the cursor keys or the GOTO command - pressing Control+G together gives the prompt. Cell in the status area and to move to cell B1 just enter B1.

Now you are at cell B1 you can enter the relevant label. Just type the letters MON and move to cell C1 where you type TUE. Continue until all the days have been entered and you should end up with SUN in cell H1. You now

4 From Page 29

similar to the one you have just entered so rather than enter them again, copy them. Make sure the cursor is in cell B and press Shift+H.

A message in the status area tells you to move the cursor to the cell you wish to copy to so move the cursor to cell D and press Return. The status area now asks if the formula is to be copied. Absolutely, exactly the same with no changes or Relatively Invariant, but with changes such as B2 becomes B3.

We need to copy the formula Relatively so press R for each part of the formula (twice in this case). The new formula D3=(B3#H3#I) will now be shown in the status area and can be copied to J4 and K5 in a similar way. The formula for M4 is in J5. In J5 you require the formula for the maximum of the numbers between B2 and B3. This is: J5=-(B2#B3).

Enter this in the same way as you entered the formula for B and copy it into the other cells in the column L3 to J5.

The formula for M5 is similar to the

formula for M4, except that the less than (=) sign is used instead of the greater than (>) sign so enter the last of our formulae into column K starting with K2=-(B2#K2).

It is a good idea at this point to save the spreadsheet. This is done by pressing Escape to return to the spreadsheet menu and choosing the Save Spreadsheet option which then causes the computer to prompt:

D1:

At this point enter the name under which this file will be saved. It is best to give a descriptive filename so that in future there is no need to guess the contents of the file. Make sure that there is a formatted disc in the drive – and not the Mini Office II disc. If you haven't already got one a disc may be formatted by using the option from Mini Office II which is available after a directory. Type WEA/THER/VOL (as this is the first version of the spreadsheet). Your spreadsheet will now be saved to disc.

Once you have reached this stage most of the hard work has been done. All that remains is to enter the actual

data by moving to the relevant cell and typing the number.

For example move to cell B2 and type 8 Return. When you have entered all the data, save the spreadsheet again and you're then ready to print it.

From the main menu choose Print Spreadsheet to move to the print options. You'll have noticed that your spreadsheet has empty rows and columns at the bottom and right-hand edges. It is wasting time printing the whole thing so choose the option Print Part Spreadsheet and enter the following:

Rows:1#5
Columns:A#K

The result will be that only the relevant part of the spreadsheet is printed and when this is completed you will be returned to the print spreadsheet menu. Press Escape to return to the spreadsheet menu and you're ready to save graphics data.

● Next month we'll look at how to present this small spreadsheet portably. You'll then create some spreadsheets and save them.

The truth about TELEX

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine, the cheapest will cost you £1,444 (plus charges), the lowest £2,680 (plus charges). You will also need a dedicated telephone line, costing £100 to install, plus £408 a year rental. That's a total outlay over the first year of a minimum of £1,139. (All prices include VAT.) Or you could do what most and many other users are doing – use your money to double up a Telex machine. And just use your ordinary telephone!

How do I turn my Atari into a Telex machine?

All you need is a modern and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to Minitelnet. Telex is just one of a growing number of services available to Atari users on Minitelnet. With Minitelnet you can also read the news as it happens, go shopping, create your own closed user groups, send messages, and electronic mail right round the world, download free spreadsheet programs, direct into your store... and much more.

But why use Telex?

Because it's a (partly) instant of instant communication between business. Today there are 1,500,000 Telex machines in use in Britain – and more than 2 million worldwide. It's used to dramatically speed up business communications – just as quick as using the phone but far more efficient, because you have a hard copy of every "conversation" for your records. But there's a big bonus you get when you use Minitelnet for Telex that the conventional way doesn't offer. With Minitelnet you don't HAVE to be in your office to send or receive Telex messages. You can put it easily on your computer at home for such a portable computer, anyone. Here's that for your business efficiency!

How to join
See Page 6

An amazingly easy way out

by
Rouloc

WELL all you fellow adventurers, it's your old pal Rouloc back again to hold court on the world of *Adventuring*. It's good to put my feet up and enjoy a fine ale while I talk to you of high adventure and after the month I have just had it's about time I rested.

For three weeks solid I was fighting the evil gargoyle Malach before my trusty sword beheaded the foul creature. But now on to a subject that all adventurers hate ... mazes.

Why do adventure writers still persist in using the infernal things? We all know how to map them (don't we!) and that once they are mapped the route through them is obvious. So the whole exercise is pointless.

The real reason for the dreaded maze is that the programmer wants an easy get out when he is stuck for another puzzle. Instead of finding another trick he throws in a quick maze just to use up playing time.

There are exceptions, of course, and the original *Cave* adventures from *Croverter* and *Woods*, with its "twisty little passages" and "little twisty passages", is one of them.

It was the first one of its type and also it had the added problem of the plate coming and taking any steps that were dropped. This made mapping very trying indeed.

In *Infocom's* *Multiworld Hijinx* the maze is justified because there's a puzzle attached to it. It takes the form of a hidden map of the maze you have to find and, believe me, if you have had to sit through as many mazes as I have, you would not retain your sanity.

What do you think of the maze situation? Write in and tell me, but in the meantime if anybody is writing an adventure and is about to put in a maze - don't!

Yet more *Infocom* releases are in the pipeline. *Plundered Hearts* is a true romance story and there's also a rather weird game which goes by the name of *Head 'n' Bart*.

I couldn't make *Head or Tail* of it but I'm led to believe it comprises eight short stories built around the village of *Parasser*, where everything has a

double meaning, and things are not quite what they seem.

It all sounds very strange to me, but rest assured if it's *Infocom* it's got to be good.

Remember *Floyd* the lovable little robot in *Planetfall*? Well the good news is that he has returned in a new adventure written by Steve *Planetfall*, *Leather Goddesses of Hitchhiker's Massacre*.

Starfall carries on the story of your meteoric rise since your salvation of the planet *Resilia* which earned you a promotion to Lieutenant First Class. No more scrubwork or bathroom details for you, instead you you are in charge of the paperwork routine, which ensures that all types of forms are in good supply.

The story starts after you have been ordered to go to a nearby space station to collect more forms. The orders are that a duty robot should be assigned to aid you, and as you go to the robot pool to choose one there is still *Floyd* sitting in his lab playing dice!

The game is quite user friendly and feels quicker and more playable than its predecessor, with some excellent puzzles mixed in with good humor. If you add this to the new-style packaging, which still contains all the usual *Infocom* bits and pieces, it is a game you will be proud to put into your collection. You can read a full review of *Starfall* on page 18 of this issue.

Write to: Page 32 *

See you next month



Postbag



DARREN, Careless from Dublin is stuck in Return to Eden. He keeps getting tried when he tunnels underground and finds the shovel.

The answer, my friend, is that you only have a set number of moves before the Snowball spaceship lands you and blasts you. So start again and go straight to the shovel, then go down and find a leafy cave underground and sleep until the ship passes by.

Kevin replies to Lee's letter about Ultima IV with information on the characters. John will join you in Trinsic, Paladin Geoffrey in Shaeren and Shamara in Skara Brae. Also a black stone can be found at Moon-glassed moon gate. When it comes up go and press SEARCH.

M. White is in trouble in Alternate

Reality because he keeps running out of food and dying. The reason he cannot enter the arena or the palace is that they are extension clues to be released in the future. As far as eating is concerned, try going to an inn and sleeping the night.

L.C. Williams has a problem in Secore, which is a real shame as he has 200 points. He is stuck after he enters Balbor's hideout because Fearer keeps killing him with a spell. Has anyone got the answer?

Finally Colin Chambers can't work out the wester garden in Return to Eden. Just wait one hour after it arrives for it to discharge its load, then enter it and wait three moves until it arrives in the NW corner, then leave it.



Hints & Tips

HERE are the answers to Graunch's riddles in Return to Eden:

Gently in the box.
COMPUTER

What goes on four feet then three then two but more than the weaker?
A cat!
MAN

Rich man wants it, the poor man has it.
NOTHING

Our blood is cold; beneath our arms men walk.
TREES

This blind god compares all.
LOVE

You all know me, you don't trust me yet you give me life.
NEWS

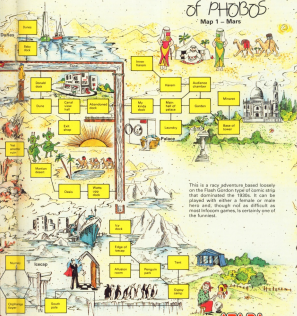
A great healer; beaten, he runs out and flies away.
TIME

When I come you didn't feel me; I am there though you can't see me.
LIFE

A jar to make for belongings, to welcome us he lifts our fingers warmly.
PURE

LEATHER GODDESSES of PHOBOS

Map 1 - Mars



This is a race adventure based loosely on the Flash Gordon type of comic strip that dominated the 1930s. It can be played with either a female or male hero and, though not as difficult as most infusion games, is certainly one of the funnest.

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Knockout Whist

OLIVER CHAPPELL
revamps an old favourite

BEAT your Atari computer in this familiar card game. You need a combination of luck and skill — luck is involved when you are dealt your hand, skill as you decide which cards the computer still has left and you choose the card to lay.

The object of the game is to win tricks so you can choose trumps for the next hand. Once you take all the tricks in a hand you win the entire game.

You start with seven cards — in each subsequent hand you'll have one less. Whoever takes the most tricks in a hand chooses trumps next time — a considerable advantage. In the event of a draw (you both have the same number of tricks) the computer will randomly determine trumps.

When the game has loaded and is run you will be presented with seven cards — trumps will already have been randomly chosen and indicated in the bottom left of the screen. Also, the message "My trumps" or "Fear Trumps" indicates whether the computer or you have control of that particular hand.

To lay a card, press keys 1 to 7 which correspond to the cards displayed from top left. The computer will then display its card, and decide who's won.

When you have to choose trumps, use Option, Select and Start as explained on the screen.

The game will give you hours of fun as you challenge the computer. Good luck.



PROGRAM BREAKDOWN

10-1400	Main routine — sets up variables
1000-1120	Shuffles pack and deals cards
1500-2110	Routing to save numbers to represent cards
2000-2000	Sets up screen for cards dealt
4000-4100	End of hand routine—decides who chooses trumps
4500-4550	Checks if game is won outright
5000-5140	Checks who lays first and prompts them to lay their card
5500-5160	Allows you to lay your hand and displays it on-screen
6200-6260	Checks who won trick
6260-6260	Produces sound if computer wins trick
6400-6460	Produces sound if you win trick
6500-6600	Checks for wrong keypress
6600-6660	Decides trumps
7000-7100	Works out which card to lay
7000-7090	Tells you they have no more
7000-7090	Displays symbol when trumps have been chosen and who program who should lay first
8100-8160	Deals with computer choosing trumps
8200-8260	Prints trumps and who has chosen them
8300-8360	Lets you choose trumps, obtain trump advice or select random trumps
8500-8600	Allows you to get computer's advice about trumps
10000-10070	Introduction screen
10000-10090	Redefine certain characters for the game

Turn to
Page 28

If you're frustrated by the difficulty of combining short machine code routines with Basic on the Atari here is a routine to solve your problems.

Writing the code is no trouble, using, for example, an Atari Assembler-Editor cartridge. Atari Basic does allow calls to machine-code programs via the USR function. The problem is getting the machine code into memory.

Disk drive owners can do this by using the Dos LoadBinary function (L) to load the assembled object code before loading the Basic program that uses it.

This is, however, a little cumbersome, and you can easily forget to load in the machine code routine before running the Basic program that calls it. Cassette users are not even that lucky: Atari Basic doesn't support binary load from cassette at all.

You can convert the codes by hand to decimal and poke them directly into memory or into data statements, but this is hard work (not to mention tedious) and takes a long time.

Machine Code Merges overcomes all these problems in a relatively quick and easy-to-use fashion. It takes the assembled machine code from an object file on cassette or disc and creates Basic data statements containing the codes, together with a loader routine. This can be merged with a Basic program so the machine code is loaded by the program itself.

When you run the routine you will be presented with a menu containing three options - Load binary object code, Write Basic code and Quit.

Select 1 to load in your machine code routine. You can load from cassette or disc and the program will tell you the start address of the code and the number of bytes it contains. You will then be returned to the main menu.

The second option creates and writes the Basic code ready to merge with your Basic program. You will be asked what Basic line you want the DATA statements to start at. If you just press Return, the default of line 10000 - which is out of the way of most Basic programs - will be chosen.

You will then be asked if the machine code is relocatable. If you select relocatable, you will be asked for the name of the Basic string you wish to hold the machine-code data in - the default is MCS.

You are then asked for the output device. Any of the standard Atari devices can be used, such as E: to list to the screen, P: to print on a printer, C: to list to cassette, or D: filename to list to disc.

If you have a disc drive then you

Packing code into memory the easy way

MARTIN MALE shows how to include machine code in Basic data

need only write the filename and can leave off the D: device specifier if you wish. If you hit Return only, the data will be listed to the screen. When the Data statements have been written, you will be returned to the main menu again.

To use the routine you must first assemble your machine-code using any assembler and save the object code to cassette or disc. Then load and run Machine Code Merges. Type 1 to load the object code, then 2 to create the Basic code.

You can list it to the screen first if you wish to see what the code looks like by entering E:, or just Return as the output device. Then select 2 again at the main menu to write the code to disc or cassette this time entering D: filename or C: as the output device.

To merge this file into your Basic program, first load in your Basic program, then type ENTER "D:filename" or ENTER "C:". If you then list the program you will see that the loader routine and the machine code data has been added to your program.

At the beginning of your Basic program add a GOSUB to the loader routine (GOSUB 10000, if you have used the default starting line). When the program is run this will load the machine code held in the data statements into memory.

To call the routine use the statement:

```
GOTOstart.pwr,par2,par3...
```

The start address (START) of your machine code routine can be found with ADDR(MCS) if the routine has been specified as relocatable. The other parameters, par1 and par2 and so on, are variables you may be passing to

your routine.

Your routine can also pass a single two-byte (0 to 65535) number back to Basic using the variable X by storing the number in locations (decimal) 212 (0:byte) and 213 (1:byte).

Finally, here's some points about the program:

- Machine Code Merges will write two different loader routines and store the machine code differently depending on whether you say your code is Absolute or Relocatable.

- If your code is relocatable (that is, it contains no absolute references to itself) the machine code is stored in a Basic string called MCS. If the routine is not relocatable it is POKE'd directly into memory at the address it was assembled with.

- You should note that if you do write absolutely located routines be sure to locate them where they will not interfere with Basic (page 6 is usually a safe place to put them).

- The program cannot handle composite object file boxes that have been appended using Dos or programs assembled using multiple originals.

- You can have more than one routine in your program by specifying a different starting line number for each routine you convert. Remember, however, when the routines are relocatable, to make sure that the names of the strings that contain the machine code are different (MCS1, MCS2 and so on) before you run your final program.

- They can be changed after you have merged them if you did not choose different names when running Machine Code Merges.

Turn to Page 40 >

4 From Page 38

```

70 DIM .....
80 DIM .....
90 DIM .....
100 DIM .....
110 DIM .....
120 DIM .....
130 DIM .....
140 DIM .....
150 DIM .....
160 DIM .....
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250 DIM .....
260 DIM .....
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290 DIM .....
300 DIM .....
310 DIM .....
320 DIM .....
330 DIM .....
340 DIM .....
350 DIM .....
360 DIM .....
370 DIM .....
380 DIM .....
390 DIM .....
400 DIM .....
410 DIM .....
420 DIM .....
430 DIM .....
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890 DIM .....
900 DIM .....
910 DIM .....
920 DIM .....
930 DIM .....
940 DIM .....
950 DIM .....
960 DIM .....
970 DIM .....
980 DIM .....
990 DIM .....

```

```

1000 DIM .....
1010 DIM .....
1020 DIM .....
1030 DIM .....
1040 DIM .....
1050 DIM .....
1060 DIM .....
1070 DIM .....
1080 DIM .....
1090 DIM .....
1100 DIM .....
1110 DIM .....
1120 DIM .....
1130 DIM .....
1140 DIM .....
1150 DIM .....
1160 DIM .....
1170 DIM .....
1180 DIM .....
1190 DIM .....
1200 DIM .....
1210 DIM .....
1220 DIM .....
1230 DIM .....
1240 DIM .....
1250 DIM .....
1260 DIM .....
1270 DIM .....
1280 DIM .....
1290 DIM .....
1300 DIM .....
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1920 DIM .....
1930 DIM .....
1940 DIM .....
1950 DIM .....
1960 DIM .....
1970 DIM .....
1980 DIM .....
1990 DIM .....

```

```

1000 DIM .....
1010 DIM .....
1020 DIM .....
1030 DIM .....
1040 DIM .....
1050 DIM .....
1060 DIM .....
1070 DIM .....
1080 DIM .....
1090 DIM .....
1100 DIM .....
1110 DIM .....
1120 DIM .....
1130 DIM .....
1140 DIM .....
1150 DIM .....
1160 DIM .....
1170 DIM .....
1180 DIM .....
1190 DIM .....
1200 DIM .....
1210 DIM .....
1220 DIM .....
1230 DIM .....
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1690 DIM .....
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1710 DIM .....
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1760 DIM .....
1770 DIM .....
1780 DIM .....
1790 DIM .....
1800 DIM .....
1810 DIM .....
1820 DIM .....
1830 DIM .....
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1850 DIM .....
1860 DIM .....
1870 DIM .....
1880 DIM .....
1890 DIM .....
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1910 DIM .....
1920 DIM .....
1930 DIM .....
1940 DIM .....
1950 DIM .....
1960 DIM .....
1970 DIM .....
1980 DIM .....
1990 DIM .....

```



LINE	GROUP	LINE	GROUP	LINE	GROUP
10	421	38	440	58	459
48	363	58	457	100	1000
58	350	100	476	150	1000
70	389	100	470	160	1000
78	471	160	474	180	1000
88	500	190	474	200	450
210	500	200	474	210	470
230	480	200	474	240	1000
240	480	200	474	260	1000
260	480	200	474	280	1000
280	480	200	474	300	1000
300	480	200	474	320	1000
320	480	200	474	340	1000
340	480	200	474	360	1000
360	480	200	474	380	1000
380	480	200	474	400	1000
400	480	200	474	420	1000
420	480	200	474	440	1000
440	480	200	474	460	1000
460	480	200	474	480	1000
480	480	200	474	500	1000
500	480	200	474	520	1000
520	480	200	474	540	1000
540	480	200	474	560	1000
560	480	200	474	580	1000
600	480	200	474	620	1000
640	480	200	474	660	1000
680	480	200	474	700	1000
740	480	200	474	780	1000
820	480	200	474	860	1000
900	480	200	474	940	1000
1000	480	200	474	1040	1000
1080	480	200	474	1120	1000
1200	480	200	474	1280	1000
1360	480	200	474	1460	1000
1540	480	200	474	1740	1000
1740	480	200	474	1940	1000
1940	480	200	474	2140	1000
2140	480	200	474	2340	1000
2340	480	200	474	2540	1000
2540	480	200	474	2740	1000
2740	480	200	474	2940	1000
2940	480	200	474	3140	1000
3140	480	200	474	3340	1000
3340	480	200	474	3540	1000
3540	480	200	474	3740	1000
3740	480	200	474	3940	1000
3940	480	200	474	4140	1000
4140	480	200	474	4340	1000
4340	480	200	474	4540	1000
4540	480	200	474	4740	1000
4740	480	200	474	4940	1000
4940	480	200	474	5140	1000
5140	480	200	474	5340	1000
5340	480	200	474	5540	1000
5540	480	200	474	5740	1000
5740	480	200	474	5940	1000
5940	480	200	474	6140	1000
6140	480	200	474	6340	1000
6340	480	200	474	6540	1000
6540	480	200	474	6740	1000
6740	480	200	474	6940	1000
6940	480	200	474	7140	1000
7140	480	200	474	7340	1000
7340	480	200	474	7540	1000
7540	480	200	474	7740	1000
7740	480	200	474	7940	1000
7940	480	200	474	8140	1000
8140	480	200	474	8340	1000
8340	480	200	474	8540	1000
8540	480	200	474	8740	1000
8740	480	200	474	8940	1000
8940	480	200	474	9140	1000
9140	480	200	474	9340	1000
9340	480	200	474	9540	1000
9540	480	200	474	9740	1000
9740	480	200	474	9940	1000
9940	480	200	474		

SPECIAL FX



Scrolling... Scrolling... Scrolling

WELCOME to the third instalment of Special FX. We'll follow on from last month's article with another DU and explain the Atari's scrolling features. The Atari is still the most powerful 8 bit graphics computer and even the ST has no hardware facilities that can simulate effects produced with the dedicated graphics chip, Antic.

So scrolling is this month's subject for a special effect and again, even if you don't understand the theory, you'll still have a Basic program that can be used in your own programs.

Scrolling can be defined as the movement of information around the screen when new material appears on one of the edges. For example, each time you list a Basic program the data scrolls on to the screen from the bottom and off at the top. This is a very simple type of scroll and many computer games have far more complex routines.

Arade games even have more than one level of scrolling to give a 3D depth effect. Atari User has already covered the subject of scrolling so there is no need for a full explanation but if you missed the articles that are in volume 1 issues 6 and 7 (October and November 1985).

Basic has no reserved word support for controlling scrolling and so all work has to be done with the POKE and PEEK statements. If the scroll routine is written in Basic and not machine code you will then find it is too slow and the result is a jerky screen with very slow movement.

Machine code is the only answer

In the third part of his series on amazing effects RICHARD VANNER takes a look at scrolling messages

and in fact the Atari only really excels in performance when programmed in machine code.

Now you've heard the bad news don't get disheartened because this program is designed to help you understand it all. Program 1 is in Basic and is a scrolling banner routine that works in a DU.

All you have to do is put your text string into A8 and call the routine. The machine code finds the text in A8 and starts a DU running. This continually takes data from A8 and scrolls it from right to left. Once this DU is set up it works on its own and leaves the rest of the processing time for your Basic program.

A couple of small points about the routine are to make sure the text in A8 is in upper case and terminate it with the $\text{chr}(0)$ character. This informs the DU when to start retrieving data from the start of A8 again.

This may seem a very easy routine to write but the problem with scrolling is knowing exactly where the screen data is. Basic is not the best language for letting you know this so it makes life a great deal harder.

If you do want to explore scrolling then you should use an assembler as it's a lot easier. So let's have a look at

the machine code. It's all stored in page 8 - that over-used area of memory which is safe from the friendly memory-eating Basic.

Listing 11 is the source code of the program and creates much smoother scrolling. The display list (label DLIST) is a copy of the GRAPHICS 0 display list with a few alterations.

A DU bit is set at the beginning to allow for the DU to take place, then the third blank line is replaced with the scroll line. This is in Antic mode 8 or Graphics 1.

The rest of the screen is the same as it is in the operating system. The code is called at label START and here the address of A8 is pulled off the stack and the address of the screen is stored into my display list.

Finally the DU vector is set to point to DU1 and NUMBER (\$D408) is set to recognise DUs. Finally the RTS returns the system to Basic. The next routine DU1 is then called each time Antic finds a DU bit set in the mode line it is drawing. In our case this is right at the start of the screen.

The DU itself keeps fine scrolling the scroll line until it needs to do a coarse scroll when it takes 40 bytes from A8 and places it on to the scroll line.

Turn to Page 62 ▶

Series

Listing 1: Basic Program

```

100 REM *****
200 REM *****
300 REM *****
400 REM *****
500 REM *****
600 REM *****
700 REM *****
800 REM *****
900 REM *****
1000 REM *****
1100 REM *****
1200 REM *****
1300 REM *****
1400 REM *****
1500 REM *****
1600 REM *****
1700 REM *****
1800 REM *****
1900 REM *****
2000 REM *****
2100 REM *****
2200 REM *****
2300 REM *****
2400 REM *****
2500 REM *****
2600 REM *****
2700 REM *****
2800 REM *****
2900 REM *****
3000 REM *****
3100 REM *****
3200 REM *****
3300 REM *****
3400 REM *****
3500 REM *****
3600 REM *****
3700 REM *****
3800 REM *****
3900 REM *****
4000 REM *****
4100 REM *****
4200 REM *****
4300 REM *****
4400 REM *****
4500 REM *****
4600 REM *****
4700 REM *****
4800 REM *****
4900 REM *****
5000 REM *****
5100 REM *****
5200 REM *****
5300 REM *****
5400 REM *****
5500 REM *****
5600 REM *****
5700 REM *****
5800 REM *****
5900 REM *****
6000 REM *****
6100 REM *****
6200 REM *****
6300 REM *****
6400 REM *****
6500 REM *****
6600 REM *****
6700 REM *****
6800 REM *****
6900 REM *****
7000 REM *****
7100 REM *****
7200 REM *****
7300 REM *****
7400 REM *****
7500 REM *****
7600 REM *****
7700 REM *****
7800 REM *****
7900 REM *****
8000 REM *****
8100 REM *****
8200 REM *****
8300 REM *****
8400 REM *****
8500 REM *****
8600 REM *****
8700 REM *****
8800 REM *****
8900 REM *****
9000 REM *****
9100 REM *****
9200 REM *****
9300 REM *****
9400 REM *****
9500 REM *****
9600 REM *****
9700 REM *****
9800 REM *****
9900 REM *****

```

```

001,100,2,177,200,24,001,31,197,10,4,2
00,101,110,20,200,201,100,101,100,1,20
0,104,104,0
0000 0475
111,200,200,04,200,06,173,101,4,100,20
1,110,100,4,100,200,111,101,4,104,1,20
1,104,104,0,0
0000 0475,100,200,04,1,0,0,0,-1

```



LINE	CODE	LINE	CODE	LINE	CODE
10	0011	30	0200	50	0311
40	0110	50	0111	60	0100
70	0117	80	0101	90	0111
91	0011	100	0000	200	0001
310	0111	320	0100	330	0111
340	0001	350	0011	360	0100
370	0000	380	0101	390	0111
400	0010	410	0011	420	0101
430	0000	440	0111	450	0100
460	0011	470	0111	480	0100
490	0000	500	0111	510	0100
520	0000	530	0010	540	0001
550	0000	560	0010	570	0001
580	0110	590	0100	600	0101
610	0110	620	0100	630	0101
640	0100	650	0101	660	0100
670	0100	680	0101	690	0100
700	0100	710	0101	720	0100
730	0100	740	0101	750	0100
760	0100	770	0101	780	0100
790	0100	800	0101	810	0100
820	0100	830	0101	840	0100
850	0100	860	0101	870	0100
880	0100	890	0101	900	0100
910	0100	920	0101	930	0100
940	0100	950	0101	960	0100
970	0100	980	0101	990	0100

Listing 2: Machine Code Program

```

0000 *****
0100 * 1000 *
0200 * 00010000 *
0300 * 00011100 000000 *
0400 * 00000010 * 0000 000 *
0500 *****
0600 * 000000 000000 *
0700 *
0800 00001 + 000
0900 0000 + 010
1000 000010 + 000
1100 000010 + 000
1200 000010 + 000
1300 000001 + 010
1400 00 + 010
1500 01 + 000
1600 0000 + 010
1700 000010 + 00000
1800 000010 + 00000
1900 000000 + 00000
0000 *****
0100 *let program run address.
0200 *
0300 ** 00000
0400 *****
0500 *display list
0600 *****
0700 01117 0010 01,000,000 / 0 0000
0800 0000 0010 00110+00+000000
0900 *graphics / scrolling message line
0100 01,000000
0200 0000 01,00 00,000000
0300 0010 0010 00110+000 / graphics 0
0400 01,000000
0500 0000 0010 0111 / screen data
address
0600 0010 0,1,1,0,0,0,0,0,0
0700 0010 0,1,1,0,0,0,0,0,0
0800 0010 0,1,1,0,0,0,0,0,0
0900 0010 0001 / program
0100 0000 01117 / address
0200 01,00 0010 0,0,0,0,0,0,0,0,0
0300 0010 0,1,1,0,0,0,0,0,0
0400 0010 0,1,1,0,0,0,0,0,0

```

```

0000 *****
0100 *start of code.
0200 *****
0300 01000 PLA
0400 *****
0500 PLA
0600 010 01000+1
0700 010 01000-1
0800 *****
0900 PLA
1000 010 01000
1100 010 010000
1200 010 01000
1300 010 010000
1400 010 0100000
1500 010 01000000+1
1600 *****
1700 010 display list pointer
1800 /> Point to top BLIST.
1900 *****
0100 *****
0200 010 0 001101
0300 010 0100101
0400 010 0 001101
0500 010 0100101+1
0600 *****
0700 /
0800 010 010 pointer
0900 *****
1000 010 0 001101
1100 010 0100101
1200 010 0 001101
1300 010 0100101+1
1400 *****
1500 010 010 010
1600 010 010 010
1700 010 010 0100
1800 010 010 0100+1
1900 010 010 0100+1
0000 *****
0100 010 010 0100+1
0200 010 010 0100+1
0300 010 010 0100+1
0400 010 010 0100+1
0500 010 010 0100+1
0600 010 010 0100+1
0700 010 010 0100+1
0800 010 010 0100+1
0900 010 010 0100+1
1000 010 010 0100+1
1100 010 010 0100+1
1200 010 010 0100+1
1300 010 010 0100+1
1400 010 010 0100+1
1500 010 010 0100+1
1600 010 010 0100+1
1700 010 010 0100+1
1800 010 010 0100+1
1900 010 010 0100+1

```

TECHNOLOGY SO ADVANCED ...

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- 100% expandable graphics
- 100% expandable software
- 100% expandable support

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5 LINERS

G.A.D. PICTURE LOADER

from Granville Darby

HAVE you ever written a program and wished you could create fancy title screens like some of the commercial software available? With this program you can load in picture files created on Graphics Art Department.

The package contains an art show, but unfortunately it won't let you use the pictures within your own programs. This five-liner uses a machine code routine to load and display G.A.D. files that are saved in uncompressed format - 31 sectors long with the first 5 bytes representing the colour registers. To use this listing within your own program just change `PNB` in line 10 to the filename of the picture you want to load. You could even adapt the routine to create a continuous art show within your own program.

ASSEMBLY LISTING

START ADDR - GOSUB END ADDR - 0417

```
0900  A9 03    LDA #907
0901  A2 70    LDX #870
0902  9D 42 03  STA ADDRMS,X
0903  A8 58    LDA BAYMISC
0904  9D 44 03  STA CBALLO,X
0905  A4 58    LDA 888
0906  9D 48 03  STA KCBARMS,X
0907  A4 58    LDA #88C
0908  9D 49 03  STA CGBLHX
0909  A9 58    LDA #888
090A  9D 49 03  STA CBBLLO,X
090B  2D 44 04  JBR C479
090C  88      PLA
090D  80      RTS
```

MINI-PACMAN

from Robin Edwards

HERE'S a version of an old arcade classic. When you run the program a matrix of dots (power pills) is drawn on the screen and you're asked for the level of play - 1 is easy and 5 is impossible. Your man appears at the top left of the screen and the ghost at the bottom right. It will automatically start flaming in on you.

The object of the game is to eat all 100 of the power pills to give you enough strength to be able to eat the ghost. Movement of your man is via the joystick plugged

into port 1. Due to the length of certain lines the commands within them must be shortened as you type them in.

PROGRAM BREAKDOWN

- 10 Draws Matrix, gets skill level, turns off cursor.
- 20 Draws ghost and man and checks joystick. Makes beep.
- 30 Moves man, writes score and sleep beep.
- 40 Moves ghost.
- 50 Checks for collisions. Game over routine.

TYPING-IN NOTES

- 10 Abbreviate `GRAPHICS` to `GAD`. Abbreviate `POSITION` to `POS`.
- 20 Type it in as it appears.
- 30 Type it in as it appears.
- 40 Abbreviate all `POSITION`s to `POS`. Abbreviate all spaces out. There are eight spaces between the quotes.



LINE ADDR LINE ADDR LINE ADDR

10 1895C 20 2007F 30 1F34E
40 1E78E 50 21333

PROGRAM BREAKDOWN

- 10 Opens file to disc
- 20 Gets colour register information
- 30 Reads and Pokes in machine data
- 40 Endless loop
- 50 Machine code data

PROGRAM VARIABLES

PNB Picture filename
C1 - C5 Colour Register Information



LINE ADDR LINE ADDR LINE ADDR

10 1895C 20 16884 30 1189F
40 1862D 50 18673

If you've written any useful or interesting five line programs why not send them to us to grace our pages?

You should give a full description of the routine and any other details that are relevant.

If you want your

Win £25

material returning please enclose a suitably stamped envelope.

We pay £25 for each one published.

Simply send a copy of the program on disc or tape together with the documentation – preferably as a word processed file – to:

Atari User, Europe House, 98 Chester Road, Hazel Grove, Stockport, SK7 8NY.

ORGAN II

from Andy Wood

In the July 1987 issue of Atari User there was a five liner called Organ by Len Golding. Well here is another based on that program but with some added features. As with Organ it uses the internal key code for the character pressed but it also acts the unused space and allows the use of semicolons within it. A FOR...NEXT loop adds more realism to the code of any given note and for a little added fun, the colour register 210 is poked when a key is pressed.

PROGRAM VARIABLES

P: Internal key code used to locate character in table.
M: Volume in FOR...NEXT loop.

```

IN THE YEAR 1987 ON THE 10TH OF JULY
I'M PROUDLY PRESENTING TO YOU ANOTHER
ORGAN BY LEN GOLDING, BY THE WAY HE
IS PROBABLY THE ONLY ONE IN THE WORLD
WHO DOES THIS IN A WAY - I DON'T KNOW EXACTLY
HOW BUT HE
DOES IT. I'M SURE YOU'VE SEEN THE ORIGINAL
IN THE AUGUST 1986 ISSUE OF ATARI USER.
I'VE ADDED SOME NEW FEATURES TO
THE ORIGINAL AND I'VE CHANGED SOME OF
THE PARAMETERS - CHECK THE COMMENTS
IN THE DOCUMENTATION FILE THAT COMES WITH
THIS DISK. BYE BYE!
-L.W. (2000) 2000-2000-2000

```

PROGRAM BREAKDOWN

- 10 Sets trap to line 10 and CLR in case of a wrong key input. Location 209 is poked with 1 to speed the delay between key hit and key repeat.
- 20 (Initial) key code placed into P. Value of ASCII-REF.PY is placed into M. Location 268 is poked with 255 before the setup of a FOR...NEXT loop to direct a key press during decay.
- 30 Sets sound channel 1 to use M for pitch and V for volume. But sound 2 is optional. Also colour register 210 is poked.
- 40 Waits for key press before continuing.
- 50 Sets up screen.



LINE COLUMN LINE COLUMN LINE COLUMN

10 2000	20 2000	30 2000
40 2000	50 2000	60 2000

FAST MOVER

from Peter Dean

FAST mover is a program designed to move data a page at a time between specific areas of memory. Copying just 43 bytes it makes use of the indexed Y addressing mode of the 6802 microprocessor.

Furthermore, the program can gain access to the 66 end of ram through Basic ram by a process known as bank-switching. The area begins at location 40960 and allows plenty of data to be stored for later retrieval without affecting user ram.

Unfortunately, the routine uses location 84312 and so is incompatible with the old 800880 series of Atari computers. When you type the program be make sure you save it first

before you run it as it uses a machine-code routine placed in page 8 so if the data is typed in wrongly then it may crash and lose your program.

When you call the routine the following parameters must be passed to the stack - The address of the machine-code (which is negotiable and can be stored in a string), the address of the data to be moved, where it is memory it will finish up and the number of pages involved (one page equals 256 bytes). So the following expression does all the work:

```

FASTMOVER,From,to,number of pages to
move)

```

Finally a word of warning: When you use fast mover make sure the area of memory to which the data is sent is not required for any other application.



LINE COLUMN LINE COLUMN LINE COLUMN

10 8000	20 8000	30 8000
40 8000	50 8000	60 8000

CHOPPER RESCUE

By GEOFFREY STOREY



ON a mission into an enemy country five of your marines have been captured into the sea and you have to fly in to rescue them. You have one of the fastest super helicopters, equipped with the latest armament, and your task is to rescue the men as they struggle ashore.

This may sound easy but you have limited fuel and an enemy bomber is covering the area dropping bombs and large rocks in an attempt to destroy your helicopter and stop the rescue.

Your helicopter is controlled by the joystick plugged into port one and you fire by moving it in the appropriate direction and pressing fire. By shooting downwards you can blast a tunnel to the trapped men.

Once a passage is clear you can manoeuvre the helicopter through the narrow tunnel. You pick a man up by positioning your helicopter over the man and once he has boarded the craft you fly him to the safe landing platform on the left of the screen.

Watch for the plane which is dropping rocks and bombs - shoot it if you can. Once you touch down on the pad the man will jump out and you can return to rescue the next one. Remember, you can only collect one man at a time.

You start the game with three lives and lose one if you are hit by a bomb or rock or if you crash into any other object on the screen.

The man can also be killed by the bombs and rocks. It's okay to land on a dead man but not surprisingly, you cannot pick him up. If you crash when carrying a man he dies and you lose a life.

There are 18 screens on the first level and you have to collect five men on each one. When these screens have been completed you move to level two where you have to rescue six men... and so on.

After 10 levels the game restarts at level one, but this time considerably faster.

SCORE TABLE

Action	Scores
Shooting sail or rocks	1
Picking man up	30
Shooting the bomber	50
Taking man to safety	80
Shooting falling bomb or rock	100

Turn to Page 48 ▶

PROGRAM BREAKDOWN

700-799	Main loop
800-899	Fire routine
900-999	Reduce fuel
1000-1099	Move aeroplane
1100-1199	Button pressed fire rockets
1200-1299	Explosion helicopter
1300-1399	Collision detection
1400-1499	Bullet collision detection
1500-1599	Explosion routine
1600-1699	Falling bombs and rock routine
1700-1799	Bombs or rock landed
1800-1899	Update score
1900-1999	Pick up main routine
2000-2099	Drop man on safe pad
2100-2199	New level
2200-2299	Bullet hits bombs or rock
2300-2399	Man dies
2400-2499	Tune for completing level
2500-2599	Aeroplane hit routine
2600-2699	Game over
2700-2799	Draw loops
2800-2899	Player missiles and VBI routine
2900-2999	Initialise variables
3000-3099	Fetch new character set data
3100-3199	Display hit interrupt

VARIABLES

DIFF	Difficulty of each level
D	Man killed variable
LEV	Mode current screen level
LIM	Number of men left to rescue
MS	Number of men rescued
FU	Fuel limit
MAY	Man rescued on particular level if you have Man Est=1 or 0 otherwise
CM	Score
SC	Score
H	High score
LI	Lines left
F	Has bullet been fired flag
EXP	Explos parameter for explosion
BO	Bomb drop flag
S	Plane move flag
P	For next loop counters
L.M	Clear out for player/missiles
CLEAR	Load player missiles
L	PMO's memory address
PM	New character's memory address
CMOST	Memory variable for reading data
NS/SP	Display score
S	Variable for joystick read
X,Y,Z	Used for locate function
DL	Start of display list
ST	Falling object status
X1/Y1	Location of PMOs on screen

4 From Page 47

```

380 100 100000 00000
390 100 100000 00000
400 100 100000 00000
410 100 100000 00000
420 100 100000 00000
430 100 100000 00000
440 100 100000 00000
450 100 100000 00000
460 100 100000 00000
470 100 100000 00000
480 100 100000 00000
490 100 100000 00000
500 100 100000 00000
510 100 100000 00000
520 100 100000 00000
530 100 100000 00000
540 100 100000 00000
550 100 100000 00000
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920 100 100000 00000
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970 100 100000 00000
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990 100 100000 00000

```

```

380 100 100000 00000
390 100 100000 00000
400 100 100000 00000
410 100 100000 00000
420 100 100000 00000
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950 100 100000 00000
960 100 100000 00000
970 100 100000 00000
980 100 100000 00000
990 100 100000 00000

```


Just the stuff to speed your output

ROLAND WADDILOVE assesses a 64k printer buffer designed to increase your system's efficiency

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 holiday 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 Atari process information at quite a high speed, yet 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 chatters 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 there's room a signal is sent to the micro telling it to send some more text. The micro sends characters until the printer again signals the buffer is

full and waits for it to print more text.

When the buffer has space 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 quickly dumps all the text in to the buffer and you can start on your next task straight away. The printer will print all the text in the buffer regardless of what the micro is doing (in fact you can even switch it off so



you can get on with the rest of your work).

So this is the idea behind the MicroStuffer — a large buffer is added between the computer and printer and the micro dumps all the output in it. The printer prints while the micro is free to process the next document, screen dump or report.

The unit is small, unobtrusive and can be tucked away in a corner of the desk. It comes complete with its own power supply.

The socket on the back of the cream coloured case is identical to the one on the printer and this is where you plug in your printer lead. A short cable runs to a plug which fits into the printer's socket.

All you do is plug in, switch on and it's ready to go — it couldn't be simpler. In fact you won't notice it's there — except for the time saved.

There is an on/off switch, and two buttons on the front of the unit. One is a repeat button which reprints the contents of the buffer, the other is a panic button.

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.

To its credit, it isn't micro-specific and will work with any computer and printer combination with Centronics type ports.



Product: MicroStuffer
Price: £99.00
Supplier: Sigma Corporation, c/o Frontier Software, PO Box 713, Harrogate, North Yorkshire HG5 0JG
Tel: 0422 87192

SUNARO

Apple II	12	3-D Graphics	28
Apple IIc	12	3-D Graphics	28
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Apple II SE	12	3-D Graphics	28
Apple II SE/30	12	3-D Graphics	28
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Apple II SE/30 Plus 2	12	3-D Graphics	28
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Apple II SE/30 Plus 40	12	3-D Graphics	28
Apple II SE/30 Plus 41	12	3-D Graphics	28
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Apple II SE/30 Plus 48	12	3-D Graphics	28
Apple II SE/30 Plus 49	12	3-D Graphics	28
Apple II SE/30 Plus 50	12	3-D Graphics	28
Apple II SE/30 Plus 51	12	3-D Graphics	28
Apple II SE/30 Plus 52	12	3-D Graphics	28
Apple II SE/30 Plus 53	12	3-D Graphics	28
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Packing in the routines

LET'S kick off with a question from Roger Bowering of Darford in Kent. Roger has been using lots of machine code routines, many of which reside in page 8 of memory. He asks if there is any way to enable him to use several routines within one program.

As you know, page 8 is the spare area of memory at \$800 which neither Basic nor the operating system access. Because of this many programmers tend to store small machine code routines and data here — but this can cause a conflict if more than one routine needs to be used at the same time.

Well, there are a number of ways round this problem, but they all depend on the way the routine is written. Some of our Five Liner programs will have been assembled to be position independent, which means that they can reside anywhere in memory and still work.

In such cases you simply alter the loop which POKES the data into memory, adding perhaps 126 to the value.

Don't forget to add the same amount to the USR address used to call the routine. Page 8 is only 256 bytes long, so watch that there is space for everything you want to store there. You should never let your POKING loop extend beyond location 1791 (\$8FF) or you will start to overwrite Doc or Basic's workspace.

A lot of machine code can't be moved in this manner, especially if it

involves storing a lot of working data in the page 8 area. Code such as this must be relocated in order to do this you will often have to reassemble it from the original source code.

In the case of a previously written program this will involve a complicated process of converting the data bytes back into the memory system (which uses LDA, STA, BCL, JMP and so on rather than just numbers) and then adjusting the code to allow you to use it somewhere else in memory.

In effect you will be changing the ~\$800 line telling the assembler where to place your final machine code.

A much better idea is that everyone writes position-independent code in the first place. This sort of machine code routine is often stored in a string and thus may be placed anywhere in memory. This leaves the whole of page 8 free — possibly for those odd bytes of non-relocatable data storage!

In order to convert from page 8 to a string (assuming the routine will work in a string) you must first work out the length of the routine, then DIM the string to that length. Next, you must move the machine code into the string using PEEK and SUBSTRING\$. Finally you must find the new address of the routine with ADDR.

To use this in practice, consider the following:

```
10 DIM STR(155) TO 156
20 STR(155) = PEEK STR(155)
30 NEXT STR
40 ADDR(STR(155),P1,P2,1)
50 STR(155,111,112,113,114,115,116)
```

This would READ the data from line 80 and POKÉ it into the start of page 8, then run the routine. Memory locations 1536 to 1540 are used, which means that the machine code itself is eight bytes in length. Obviously this is far shorter than any real program is likely to be, but it makes the example very much simpler. In fact, all it does is to tell you how many parameters you used.

To use the routine in a string you would alter it as follows:

```
1 DIM STRING$
10 FOR C=1 TO 8
20 STR(STR) = CHR$(112),CHR$(113)
30 NEXT C
40 ADDR(STR(155),P1,P2,1)
50 STR(155,111,112,113,114,115,116)
```

Line 1 sets the string up for eight characters, then lines 10 to 30 go through it, one character at a time, placing the DATA values in as CHR\$ numbers. Line 40 finds the address of the string (and hence the routine) for use in the USR call. Line 50 is the same DATA as before.

This technique can be modified for the various different methods people employ to store their data, and so long as the routine is relocatable it will work. Don't forget to save a copy before you RUN it, just in case it isn't and it doesn't.

Player missile registers

The next question is from Jamie Cowan from Fenwick in Ayrshire who

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Programming

4 From Page 63

wants to know why many locations in memory seem to have two functions. In particular, he wants to know about the player missile registers at \$D000.

If you cast your mind back to the June issue of Atari User you will remember that I answered a question on shadow registers and how they work. Well, all the locations you are talking about are actually hardware registers — that is to say that they directly control the operation of the computer and don't require the operating system to pass values from them to somewhere else.

Each of these locations is actually a memory-mapped control register for one of the Atari support chips — in this case the GTA chip. Each time a value is placed into one of these locations it adjusts the operation of GTA in the same way as you would adjust the controls of your television set.

In a similar way, locations \$C200 controls control POKE's, \$C300 to \$C360 control the two IRA V/D chips and \$D400 onwards control the

wonder-chip ANTIC.

Because of the complexity of circuit board and chip design, many registers only work 'one-way'. If a register is designated as write-only then you can POKE to it but you won't be able to PEK the number back again.

This applies to the colour registers at \$D018, the five scroll registers and many others. In some other cases (read-only mode) you can read data about the functioning of the chip, but you can't write anything. This includes such locations as VDCOUNT and the control key register at \$D01F.

Indeed, in many cases one register may have a completely different function when you read it to the one it has when you write to it.

For example, all of the Player/Missile position registers double up as collision detection locations. Thus, if you POKE (write) to \$D060 you will adjust the position of Player Zero. Yet if you PEK (read) it you will find the Missile-One-to-Playfield collision location.

It is not good practice to try to read a hardware register you have just writ-

SOFTWARE Solutions

ten because very often you will receive a completely different answer to the one you expected. Only try to PEK locations which you know to be available in read mode.

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europe House, 83 Chester Road, Hazel Grove, Stockport SK7 5NT. We will answer as many as we can within the pages of Atari User but, unfortunately we cannot give personal replies.

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Connecting up for those free games

I WAS looking for a computer magazine to help me with my Atari computer when I came across Atari User and I was very pleased with it.

I think the game ratings are brilliant - but it can get a little frustrating seeing the long listings in it was then that I saw the advert for free games from MicroLink.

What do I need to get these and how do I go about it? - **Steve Spink, West Newwood, London.**

Firstly, you will need a readers and the correct cable to go to your computer or interface box.

You will also need communications software, and you will have to join MicroLink. You can do this by filling in the application form in Atari User.

An ideal piece of software to buy to allow access to MicroLink is Mini Office II, as it is designed for ease of use - and the communications software allows very easy access to MicroLink.

You'll find an article on page 12 of this issue of Atari User explaining how to download software.

Atari's new disc drives

AFTER saving up for quite a while to buy an Atari 1050 disc drive I was very upset when I phoned Compuserve and they informed me that it was no longer available and

No Elite on horizon

I HAVE been a proud owner of an Atari computer for four years now and I am very happy with the software. I recently got in touch with Finland to ask them when they are going to release the classic game Elite which is available on many other micro's. So why not the Atari?

The software houses

Atari are bringing out a new disc soon.

Could you please tell me if this is correct and how much this new drive will cost?

Also could you tell me if there is a cartridge based language available that will allow re-numbering, auto-file numbering, save and a variable dump. - **Andrew Road, Doncaster, South Yorkshire.**

Atari is bringing out a new disc drive - the XSD651 will replace the old 1050 drive. You may also be interested to know that as well as bringing out the new drive they also plan to bring out a new dot matrix printer - the XMM401.

The XSD651 disc drive is going to be double sided and have twice the storage capacity of the old 1050 drive as well as having a superior loading time (a speed similar to the 1050 with a US Doubler chip installed).

It will retain full compatibility with present software and probably sell for around £200.

Basic XL is a cartridge based language that will allow you all the commands from Basic you require. It also allows you to obtain a

stand that an Atari version will be far superior to any other version. If this game was written for Atari it would break all records of software sales. - **Trevor Harrison, WIMBOR, Dorset, c/o BAYO Ships, London.**

As far as we know there are no plans to release Elite for Atari computers.

disc directory from Basic without going to Dos.

The cartridge is made by D.S.S (Optimized System Software) and can be bought from several of the advertisers in Atari User for approximately £75.

Not one of ours . . .

RECENTLY a staggering piece of software has been circulating around computer clubs in the Leicester area.

It carries the name Jiro Software of Leicester, but this name is in no way to be linked with the actual company Jiro Software and we would like to disassociate ourselves completely from it.

We would also like to state that if the individual concerned can prove that they have a prior claim to the name Jiro Software then we will gladly consider changing our name. - **Brookfield, Claptonville Magna, Leics.**

Suitable for TAB

COULD you please tell me if the Atari computer has the equivalent commands to INKEY and TAB on the BBC micro. - **G. Fawcett, Rugeley, Nottingham.**

Unfortunately Atari Basic does not have an INKEY command.

It is possible for you to make the computer look at the keyboard for an input by opening a channel using the command OPEN #1,4,3,"", where A is the reference to the key input.

Once this channel has

been opened you can then use the GET#1,A to obtain a value for A. Remember to close the channel to the keyboard once you have finished with it.

Atari Basic does not have a TAB command but does have a POSITION# statement. This works in the same way as the BBC micro's TAB command, for example by using:

```
10 POSITION 1,1,TWO
```

The first number is the horizontal position on screen and the second is the vertical position on screen.

Low priced games

I'VE been a dedicated Atari user for over eight years now but now I am getting fed up of the companies selling games for £7.99 - most of them are rubbish.

Admittedly there are exceptions, but on the whole they appear to be filling off the market for good software.

I am unemployed but would rather save the money and buy a piece of software that I was going to get satisfaction from.

In my opinion the Atari is still one of the best computers around, and if the software houses don't stop selling these silly budget priced games then they are going to fill the market for quality software.

On a similar point, could you please tell me if there are any plans to bring out World Class Leaderboard on the Atari as I am a great fan

Turn to Page 88 P

4 From Page 88

of this game - A.M.P. Hall, North Humberdale.

■ The budget games are designed to sell at a price that is affordable to most people and the quality can be very below the expensive software.

However, software that sells for ten times the price is occasionally no better than the cheaper software.

It is really unfair to state all software houses for dropping prices so that everyone can obtain games without breaking the bank. And it is very unlikely that the sale of budget games is going to ruin the market.

World Class Lasterboard is not available for the Atari computers at present, and we know of no plans for it to be brought out.

Reviewing the oldies

I WAS very pleased to receive my prize which I won in your birthday competition in Atari User. I just thought I would write to say thank you for the prize and for writing such a great magazine.

My favourite part of the magazine is the review section and I was wondering if it would be possible for you to review some of the older games that have been out on the software market again, as there are quite a lot about. - **Trisla Morris, Oadby, Somerset.**

Saving to disc

I AM a novice on Atari computers and I have just bought myself a disc drive, but I don't know I am totally confused as to how to use it.

I have typed in several program listings from Atari User and try as I do I cannot manage to save them to

ATARI USER Mailbag

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

The address to write to is:

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disc. Can you please explain how to do it? - **P. Letch, Bouldon, Essex.**

■ Firstly, for you to use your Atari disc drive you will need a disc operating system (DOS). This piece of software is the lifeblood of your disc.

Place your Dos disc into the drive and switch on your computer. The disc drive should start and eventually Ready should appear on screen. .

At this point type DOS, press Return and your disc operating system will be loaded. A menu will appear and at this point take out your Dos disc and place a blank disc in the drive.

Select option 1 for format disc and follow the prompts. Once your disc has been formatted you will need to write Dos files to it. Do this by selecting option H and

following the prompts.

Now switch the computer off and load your disc up by powering on. When the Ready comes up this time type in the listing and when you're ready to save it to disc type:

```
SAVE(1)!!(NAME).XX
```

The filename can be any name you want to call the program but doesn't be more than eight characters long. The x's is an extender and is used to label the files this is a maximum length of three characters, but you do not need to use it.

It is good convention to use .BAS for Basic files, .TXT for word processor files and so on.

To load a file once you have saved it you type: LOAD"D filename.ext".

Try to remember the

filename you chose but, if you forget, type Dos and select the directory option then return to Basic and proceed as before.

Helpful notes

I AM writing to tell you about a discovery I made while using Organ by Len Gosting from the July 1987 of Atari User.

Once I had typed in the program and run it I found that, while having hours of fun playing tennis, if you press one of the notes and then press Help the note will be repeated until you either change the note or take your finger off Help. - **D Ringhall, Boreley, Kent.**

Matter of opinion

I DISAGREE completely with the review you gave *AtariSoft* in the July issue of Atari User. It is reviewed like a file that makes software reviews - in this case *AtariSoft* - a wonder why they even bother to write or convert software for the last few Atlantes left on the earth.

It is not as good as the ST version, but I think it is still one of the better pieces of software for the *Atari*. And so think most of my

THOSE BOUNDER CHARACTERS

I OBTAIN an Atari 800XL and enjoy typing the listings from your magazines. In the June 1987 issue of Atari User you published a game called *Bounder*.

Is it possible to obtain the characters printed on line 22 on an 800XL. I am having a lot of trouble finding them. - **A. Pawley, Parkham, London.**

■ The characters that

appear on line 22 in the listing for *Bounder* are obtainable on an 800XL. You must use a combination of keys to obtain them.

These key combinations need the use of the Control, Inverse key and various other keys.

Here is a list of the Atari code for the characters you are looking for.

In the first set of quotes

the Atari code for the characters are as follows: 104, 102, 0, 103, 5, 100, 7, 02, 7, 030, 90. In the second set they are 104, 100, 90, 102, 030, 100, 7, 70, 7, 020 respectively.

By locking up the Atari code of these characters in one of the many tables available you'll be able to see the key combinations you need to obtain the characters.

RIGHT LOUD AND CLEAR

fellow Atarians.

The graphics are adequate for such a game. Sound isn't really needed and the playability is out of this world.

I therefore urge other readers to follow my example and write to imagine and thank those for finally writing and converting some software for the Atari if bit errors — which still rates as one of the best. — **Rob Nangerman, Zephyr, Holland.**

Reviews are a matter of opinion, and in this case the reviewer's disagreed with yours. Do any of our readers have any views they would like to express?

Faulty recorder

I bought an Atari 800X 4.5d tape recorder from Dixons and have had nothing but trouble with it. When the first one broke I took it back to the shop and they replaced it.

But when the replacement broke not long after and I took it back they would not replace it saying that they did not stock it any more.

When I checked a friend's desk I discovered that his is an Atari 1010 and mine is a Pleigamark. Have Dixons made a mistake or is there a fault with Pleigamark tapeheads? — **N H Hollypak, Richmond, Surrey.**

Dixons have not made a mistake in giving you a Pleigamark tapehead as quite a lot of the 800X1 package deals had this particular recorder in it.

Unfortunately, although they work, they are not the best tapehead to use with your Atari — the Atari 1010 is the better of the two.

Atari now makes a new tapehead, the XC12 data recorder, which is of a very high standard and it can be bought from several of the advertisers in Atari User for around £22.

After reading your Gadgets article in the July 1987 issue of Atari User about the speech synthesiser I decided to build it, and to my delight it worked first time.

After this I began to consider possible applications for it. I decided that the Get it Right! program would be

ideal to experiment with, as I made the needed modifications to the program, which are unfortunately too long to list in this letter.

I am now the proud owner of a talking Get it Right! computer. So could you please give my regards to Len Gidding for his wonderful gadget. I am sure it

will give me many more hours of fun. — **Peter Webb, Solihull, Cleveland.**

We are always happy to hear from Atari users who have success with their projects and the idea of a speaking Get it Right! is certainly very original. If you have any more ideas on this subject then let us know.



Tasty fruits

I HAVE just finished typing in the excellent Fruits program from the March issue of Atari User. It took about five days to type in all those nice statements but in the end it was worth it.

So to all you gambling fanatics out there who have seen the thing but have been put off it because of the size, I recommend you to type it in because, as Atari User mentions, it will certainly satisfy your gambling habit!

Give the program 9 out of 10 and congratulate David White.

How does the Insert command on AtariArtist affect the loading of a picture file with the Dump 15 program published in the July edition of Atari User?

And will the Insert command work with a cassette system, as I have purchased a picture and would like to use the loader routine from the Dump 15 program. — **A. Raber, Fairway, Cardiff.**

The Insert option on AtariArtist is an un-

documented feature of the program.

When a file is saved using the SAVE command it is saved in tabicoded form with the colour register information, but when the Insert option is used the file is saved as a 10 sector file to drive 1 but with no colour information.

This option will not work with a cassette system as the program defaults to drive 1 automatically when the file is saved.

The loader routine from Dump 15 is slow due to the fact that it has to calculate the printer plots for each line.

It would therefore be unsuitable for you if you only want to load a single picture file.

Data mistakes

I HAVE typed in the above-mentioned listing from the July 1986 issue of Atari User and found that when I ran it and came up with the message "Wait a moment" followed by an error — it at line 90.

When I checked the program line 80 was typed in correct according to your listing. I hope you can help me with my problem. — **Martin Rhinco, County Down, Northern Ireland.**

Most problems with listings come from the same source — typing errors. Error 8 at line 90 indicates that you are attempting to read a

alphabetic character for a numeric value.

This means that somewhere in your data statements you have made an error and you will probably find that you have placed an extra comma in the data.

Remember that error reports do not always report the actual line where the error is.

Controller board fitting

In the June 1987 issue of Atari User there is an advertisement for the D.S. Controller board by Computehouse. The list of its functions seems endless and some of the features seem too good to be possible.

All in all it would appear that this is a must for all Atari computers. Could you please tell me if it fits inside a 1050E or does it plug in the back. — **Craig Baskin, Norcross, Cleveland.**

The board sits on the motherboard of your computer and requires the removal of two chips. This task is a little tricky, but as long as you take care when you do it there should be no problems.

If you can't solder it in yourself then Computehouse will fit it free. The board is software controlled and allows you to alter the parameters of the operating system. We hope to review it soon.

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"The program took three man years of programming time to produce - and it shows. The Pawn is the stuff from which cults are made."

- Anthony Ginn, writing about the Atari ST version in the May 1986 issue of the Atari User

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