

A Database Publication

ATARI USER

Vol. 3 No. 4

August 1987

£1

*How well does
James Bond
translate to
the Atari?*

THE LIVING DAYLIGHTS



Protect your own software

ReNUMBER your Basic Programs

Explore those hidden disc sectors

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I enclose charges made payable to Database Software, or debit my Access/Visa card.

NAME

Exp. date

Signed _____

Name _____

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More titles for VCS

GAMES for the new Atari VCS 2600 console are reported to be in plentiful supply according to Atari's spokesman Peter Walker.

More than 25 titles are currently being supported by the company, but the games base is much larger than that.

Crystal Castles, Solaris, Star Wars and Midnight Magic are just some of the new releases that are available with a retail price of £9.95.

However, cartridges that fitted the old VCS games console are also compatible with the new machine.

60 new games for the XEGS have also been released, with prices ranging from £4.99 to £9.99.

Atari drive in big High Street stores

NEGOTIATIONS are under way with a number of major High Street stores to secure distribution contracts for Atari computers and games consoles in time for the Christmas market.

So far there has been a cautious response from some retailers, but Deane and Curry have confirmed that they will be

stocking the VCS 2600 games console as well as the XEGS.

Atari UK sales and marketing manager Paul Welch said: "We are also talking to Woolworths, but they are waiting to see our AE machines before deciding just what to take".

The other High Street giant, Boots, has made a

firm commitment to Atari as it is currently evaluating the machines to see where they would fit in to their overall sales policy.

A computer magazine report that Atari had done a deal to dump a large quantity of machines with Deane and Curry has been officially denied by Atari spokesman Peter Walker.



Piracy cuts the price of

games in Spain

ATARI games players in Spain would seem to be getting a better deal than their English counterparts.

Along with cut price holidays and cheap drinks, software for the Atari has now joined the list of bargains to be had by British tourists.

Games that would normally sell for around £9 here can be bought quite legally for a little over £4 in Spain.

Audilogic, US Gold, Imagine, and Allegate software are just some of the top brand names that can be bought at the budget prices.

According to a spokesman for one leading software house the reason for the discounting lies in the fact that

piracy in Spain is rife.

"If the Spanish can rip off a game then they will. The only way we could combat the pirate tapes was by reducing the price to a point where it was not economic for illegal copies to be made", he said.

Erbe, the Spanish company which produces games for many British software houses under license, pointed out the situation and suggested that a price cut was the only way to boost sales.

The policy has obviously worked. Many of the British

software houses have reported Spanish profits up by as much as 200 per cent.

Daryl Bell of Audilogic said: "Our games have sold well in Spain for years, the only trouble is that they have been illegal copies.

"The only way that we could make our presence felt was by reducing our prices.

"And it's not just Spain, we are having an even worse time in Italy. Our games have been selling well there for a long time, but not one of them is a legal copy".

Serious suite hits the charts again

FCU can't keep a good program down... which is why the serious software suite which sells at least 50 games keeps popping up in the charts.

After Office 3, the six programs in one package from Database Software for Atari 8 bit machines, is making a big impression in the Atari Top 20 compiled by Gallup.

It is currently at number eight - the only serious product to get within a mile of the best-selling software charts.

This is after coming back in at number 17 the previous week after briefly slipping out of the Atari Top 20.

Launched at the Atari User Show in London in April, the £29.95 also - with its word processor, spreadsheet, database, graphics, communications and label printing modules - was an instant hit.

Since then it has frequently outdone some of the leading Atari entertainment software to earn a Top 20 place.

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

When you join MicroLink you've got the world of communications at your fingertips – 24 hours a day. You'll have immediate access to ALL the facilities offered by Telecom Gold ... and a great deal more besides.



Two recommended packages

If you have an AT&T interface:
Pace Nightingale Inland Modem
+ cable £115.95 PLUS Mini
Office II £19.95.
Total price: £135.90

If you don't have an interface:
Mitsumi 882800 V21, V22 modem
+ Serial interface + cable +
Modem software.
Total price: £149.95

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

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.



More than 90 per cent of subscribers can connect to the MicroLink computers at local call rates.

To find out more

Fill in the coupon and send it to the address below. You will receive full details of services and costs, together with an application form. Complete this and we'll send you our guide. And your Atari will be able to use all the services of MicroLink and Telecom Gold.

Please send me full details about MicroLink, and information sheets about the following hardware and software options (please tick):

Pace package Mitsumi package

Name

Address

Postcode

Send to: MicroLink, Europa House, 65 Denham Road,

Harlow Essex, SSG1 5BT.

Atari joins in the race game

ATARI has taken its place on the starting grid with a host of other fast reavers by sponsoring racing car driver David Brodie's BMW works Starion Turbo.

The vehicle has been specially set up for top performance. It can reach speeds of up to 180 mph and can go from 0 to 60 in just 2.8 seconds.

"The Starion Turbo is a very fast machine, matching in many ways the attributes of the Atari personal computer range - it's fast and reliable," said David Brodie.

The BMW was seen for the first time at this year's touring car championship at Silverstone where it came an impressive second out of 18 competitors.

Atari's sponsorship is part of an overall policy to increase the company's public image. This year alone it plans on spending £3 million in press and TV advertising.

Atari used the event to confirm that it is to relaunch the 5288 computer as a tutorial machine for first-time computer users.

The package will contain the 645 1300E, data recorder and bundled software. Price £139.99.

The VCS 3800 and 6500 games machines will sell for £48.99 and £75.99 respectively.

A 6500 with an upgrade which turns it into a fully operational computer was also announced at £119.99.



David Brodie with his BMW: "Fast and reliable - like the Atari"

Domain of the Undead comes back to life

FOUR popular games for the Atari 8-bit series have been bundled in a new compilation by Red Rat Software (081-835 7655).

Laser Haze, Domain of the Undead, Paris Express and Escape from Dozer World are the first in a new series of Four Star software releases priced at £7.95 on cassette

and £8.95 on disc.

Don Rigby, director of Red Rat, told Atari User: "The games on this compilation have been very popular in the past. Domain of the Undead is the highest number two in the software charts. Now that it is being sold with three other titles it is tremendous value for money".

THE GALLUP CHART

TOP 20

ATARI SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	▲	GAUNTLET <i>US Gold</i>	9.95
2	+	ASTROMEDA <i>Budgie</i>	1.99
3	▲	MICRO RHYTHM <i>Fineline</i>	1.99
4	▼	ATTACK OF THE MUTANT CAMELS <i>Mastertronic</i>	1.99
5	▲	SILENT SERVICE <i>Microspace/US Gold</i>	9.95
6	▼	DEATH RACE <i>Atlanta</i>	2.99
7	•	GUN LAW <i>Mastertronic</i>	4.99
8	▲	GUN LAW <i>Mastertronic</i>	1.99
9	▲	LEADERBOARD <i>Access/US Gold</i>	9.95
10	▲	STRATOSPHERE <i>Playarc</i>	1.99
11	▲	FOUR GREAT GAMES <i>Micro Value</i>	3.99
12	•	LOD <i>Allgate</i>	2.99
13	•	FOOTBALL MANAGER <i>Addictive</i>	2.99
14	▼	COLONY <i>Budgie</i>	1.99
15	▲	MINI OFFICE II <i>Database</i>	19.95
16	▼	ARKANOID <i>Imagine</i>	8.95
17	▼	FRENESIS <i>Mastertronic</i>	1.99
18	▲	GREEN BERET <i>Imagine</i>	8.95
19	•	TOURNAMENT LEADERBOARD <i>Access/US Gold</i>	9.95
20	▼	NINJA <i>Mastertronic</i>	1.99

Compiled by Gallup/Microspace

Gauntlet stays at the top of the poll for the second month running. Look out for Greaser Dungeons which is now available. It enters the charts at number seven and is released in this issue. Another sequel, Tournament Leaderboard, enters this month at 19.

The name's Bond...

NIEL FAWCETT takes on the mission to test game-of-the-film **The Living Daylights**

Program: *The Living Daylights*
Price: £9.95 (SAS) £17.95 (other)
Supplier: Demand, 204 Minerva Road,
London SW20 0PQ
Tel: 01-847 5637

JAMES Bond, the super-smooth secret agent who's licensed to thrill, now turns up on the Atari in a new game based on his latest film, *The Living Daylights*.

And it's been well worth waiting for.

The eight levels of the game are based on actual locations from the film. Your job is to guide 007 on his daring missions.

The tasks are very similar to those that Bond has to complete in the film itself.

So into the drive with the disc and prepare yourself for the first of Bond's missions - testing the defence system of Gibraltar.

Armed with a point-gailet gun you



Timothy Dalton takes aim in a scene from the film

are poked against the SAS. To attack you simply press fire, to exit from the gun sight to the top of the screen.

The point gun is being used because it is not sporting to shoot your own men. But you can change to the faithful old Walther PPK when the Russian agent appears.

To do this simply move your gun-sight to the bottom of the screen and press fire to select your weapon from the scrolling windows.

As you run to the right Gibraltar swells off very smoothly to the left, with the background shifting at different rates so as to heighten the realism.

007 is nicely animated too - missed you if the SAS kept popping up from bushed rocks and bushes for a pet when I would be nicely animated too.

Actually they've only supposed to have point pistols as well, but one of them may be a Russian assassin's lined out with real slugs.

As you run along you must negotiate rocks which can trip you up, leaving you a strong duck for anyone who fancies a shot. A hit also tests your strength and eventually leads to the loss of a life.

Levels are completed by reaching the extreme right. Between one level and the next Bond has five seconds in 0's workshop to pick one of three wonderful gadgets or weapons. This is in addition to the standard Walther PPK that he always carries. Only one from the selection will be effective so some trial and error is in order.

As the game progresses Bond has to contend with a hostile helicopter, a musical milkman, killer balloons, guards and the villain of the piece - Brad Whitaker.

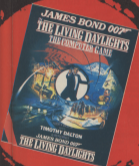
If *The Living Daylights* has a failing it's the fact that the gameplay is almost the same on each level. The scenery changes but basically you're always contending with the earlier hazards in different guises and combinations. More variety would have made it an even better game.

As it stands the game is nicely packaged with a lovely title page

showing Timothy Dalton and his old chum, Watter. The graphics are clever, with very effective scrolling. The sound effects leave a little to be desired during the game but the title music more than makes up for this.

All in all this is a good piece of software, well worth the price. So if you feel like taking on the world this is the game for you.

Living Daylights is the work of John Kinnaman and Patrick McCormick. Aged 19 and 21, of Green Barrer from Brighton fame. At present they are working on games for the Atari ST and Amiga - so look out for a sporting special 'em up from this pair due to be announced soon.



Level 1 - Slaughter



Level 2 - Pipeline



Level 3 - Walkover's House

Gun Logo symbol © Danjaq SA and United Artists Company, 1991. © 1987 Danjaq SA and United Artists Company. All Rights Reserved. Distributed by MGSIMULATIONS Distribution Co.

Tape and disc security

HOW many of you suffer from mad-diers who love to tamper with Basic programs you've spent weeks perfecting? We are constantly being asked for advice on how to make such listings harder to crack, and various dodges have appeared in *After User*.

This month we bring together several of the best ideas in a couple of programs that will do all the work for you.

Programs 1 and 2 provide several layers of protection for cassette and disc-based software respectively. With this system, your Basic programs are converted into autoboot files which can be loaded only at power-on time and don't appear in disc directories.

The Break key is disabled, and cannot be accidentally re-enabled by any standard Basic command such as GRAPHICS 0 or END. The System Reset routine is modified, so that pressing the Reset key will simply run the program again.

Finally the variable space table is assembled, so that even if a user manages to break into your listing, it will be extremely difficult to decipher.

We won't bore you with all the machine code details - just use the Basic listings and take our word for it that they work.

Here's how to use Program 1 to protect cassette-based software. Type in the listing and save it. You should not need this version again, but it is always wise to save your work in case any errors made as you keyed the program in cause problems later.

Now run the program and after a few seconds you will hear the familiar two beeps. Insert a new tape and follow the usual **CREATE** procedure to create a master file, which you will use from now on.

When the cassette master stops spinning the tape and load the master file. It's in autoboot format, so you must switch the computer off and on again while holding down the Start key.

When the single beep sounds follow the usual **LOAD** procedure, and the master file will load into memory before the **READY** message appears. You can check that it's safely installed by typing:

```
PRINT FILE$(100)
```

The result should be 104.

Now load the Basic program you want to protect just as though the

LEN GOLDING shows you how to keep the pirates off your Basic programs



master file wasn't there. When it's loaded from a blank, fully rewound tape and type:

```
PRINT FILE$(100)
```

Follow the **CREATE** procedure, and your Basic program will be written in protected form to the cassette. That's all there is to it.

To load the protected file follow the autoboot procedure as described above using the Start key. The autoboot and protection routines will increase the loading time by about 40 seconds.

Program 2 protects disc-based programs using similar techniques, although the machine code is substantially different. Type it in, save a backup copy and run it to create a master **AUTODIR.DYS** file. Switch

power off then on again to load this master file, and check it is correctly installed by typing:

```
PRINT DIR$(0)
```

You should get 104.

Now load the Basic program you want to protect, just as though the master routine wasn't there. Insert a new disc which is formatted but doesn't contain any files - not even **DOS.SYS** or **DUP.SYS** - then type:

```
PRINT DIR$(1)
```

Your Basic file will be written to disc in autoboot format so there will be no sign of it on a disc directory and none of the **DIR** commands can be used to break into it.

Turn to Page 12 in

I HAVE found Mini Office II a most useful addition to my office. However as I only use it at home, I felt that some of the more powerful features would be of little use to me, so I never tried them.

Of course I use both the word processor and communications modules frequently, and the database spreadsheet and graphics present data in a form that impresses friends and colleagues. However the label printer program and the mail merge facility never seemed to be of any use to a home user like me. How wrong I was.

When I heard of proposals to change the structure of local schools I decided to write to several local councillors expressing my concern. At last I had a chance to put the Mini Office II mail merge facility and label printer to real use.

Talk about hiding your light under a bushel. The manual just skirts the surface of the topic, which is a pity because it couldn't be easier. For those of you tempted to try it here's how it's done.

The first task is to set up a database of the names you want to write to. I assume that you have read the Data Protection Act and are registered if necessary - mind you if you understand its complexities you'll find mail merging a doddle.

For those new to databases there are three terms you must understand before going any further:

- **File:** All the names and addresses that you are using.
- **Record:** One of those names and addresses.
- **Field:** One part of a name and address, such as the surname.

After deciding on the format of your records you edit the structure of the

There's so much more to mail merge

LOUISE COLINSON explores the capabilities of Mini Office II

database to make it similar to Figure 1. Note that three fields are used for the full name - title, initials and surname. This is so that when you merge the database into the word processor you can use the full name - Mr J. Smith - or part of the name - Mr Smith - by using the appropriate fields.

Once you have edited the structure it is a good idea to save the database with no records entered, so that the structure can be used for other applications. You then enter the names, using edit records, and when you have entered them all save the database under, say, the filename "names". If you are entering a lot of names it would be wise to save every few entries.

You can easily print the names from the database but now I have discovered how easy and flexible it is to use the word processor I doubt if I'll use the database printout routine for

anything except a quick viewing of what I have typed in.

To print database files from the word processor you use the embedded command **FL**. Embedded commands are instructions to the micro to do something, but they do not appear when the actual text is printed out.

You enter them by pressing the insert/undo key before and after each command. They should then show highlighted on the screen. Each should be followed by a space to indicate the end of the command.

FL is an abbreviation of Field and is followed by its number. So to do a mail merge you use FL several times throughout the text and ask for several copies of the letter. As the list is printed you will be prompted for the name of the file to use and the first

Turn to Page 16

1	Title	Initials	Surname
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Record Name: Title Initials Surname

Figure 1: The new database structure

Page 001 of 01:29 55 Words 17815 Bytes
Insert Lower Case

Dear

Mr J. Smith

Mr J. Smith, Elmwood House,
123, 456, 789, 101 Chesham Road,
123, 456, 789, 101 Chesham Road,
123, 456, 789, 101 Chesham Road,
123, 456, 789, 101 Chesham Road,
123, 456, 789, 101 Chesham Road

Yours faithfully,
123, 456, 789, 101 Chesham Road

Figure 2: The start of the letter

Wars for all

Program: Wargame Construction Set

Price: \$79.99

Supplier: Strategic Simulations Inc/US Gold, Units 2
812 Mallard Way, Hayward,
Birmingham B6 7AL
Tel: 021 368 2388

WHETHER your taste is for the American Civil War, battles of ancient Rome, or modern warfare, all wargame buffs should be delighted with this one.

As the title indicates, this superbly designed package lets you purpose-build your own battlescapes and scenarios.

There are two programs: the editor and the game. The editor allows you to design your own wargame from scratch or alter an existing one and offers a wide range of options and parameters.

You can construct your battleground map, filling it with a variety of features such as roads, trees, rivers, buildings, minefields, hills and woods. The map colours can be edited to your own tastes.

Up to 31 friendly and 31 enemy units can be selected and placed in position. An individual unit can be chosen as infantry, tanks, engineers, merms, guns, special units, boats, helicopters or trucks.

Each can be assigned its own attributes (power) — assault, firepower, defence, movement, strength, range and fire type.

Having designed your scenario, you select the scale, set artillery to on or off and print out the map if you wish. All completed scenarios can be saved and reloaded from disc.

The game program lets you play through any scenario, whether of your own creation or one of the eight ready-to-play battles supplied with the package.

A game can be for one or two and consists of a series of phases. The phases for a one-player game (the enemy is controlled by the computer) have to be played in strict order.

They follow the usual traditions of wargames and are: Observation, friendly fire, friendly move, enemy fire, friendly fire, enemy move, enemy fire, victory and save game. Each complete set of phases is one game turn.

Points are awarded at the victory phase while the save game phase gives you a chance to save the game state to disc. The two-player game has more phases.

The package is attractively boxed and includes two discs and an excellent 20-page manual. A disc con-



tains the editor program on one disc and the game program on the other. The second disc has pre-designed scenarios on both sides.

Graphics and sound are fairly simple but the program's variety, flexibility and design are marvellous. Although the editor program has a multitude of options and features, it is simple to use and the player is guided at every step.

Wargame Construction Set is an impressive and

versatile (possibly unique) product. It has been superbly designed and, though sophisticated, is extremely easy to use. If you've never given wargames a try, now's your chance.

With this product, you could be hooked for life.

Rob Chappell

Sound	7
Graphics	7
Playability	10
Value for money	8
Overall	8



Great Gauntlet

Program: Gauntlet - the
Desper Dungeons
Price: £4.99 (retail) £2.99
(sale)
Supplier: US Gold, Unit 20,
Halford Way, Halford,
Birmingham B37 7JX,
Tel: 021-358 3336

ANYONE out there who doesn't know what Gauntlet is, go to the bottom of the class.

It was originally an arcade game with simultaneous four-player action and proved a great success. Many other companies have used this format since.

The basic plot is that evil creatures have invaded your land and you, with three other intrepid heroes, venture forth to do battle. A total of 512 levels of

music battling follow, including hand-to-hand fighting, magic-using, eating, drinking and other mayhems.

All very similar to the arcade original, in which the first seven levels are set. But then the screens are cleverly played in the same order twice. This aspect is carried over to the Atari version.

Now US Gold has released an additional 512 levels of the same mad warfests.

The same rules apply except that now your hero is dead whatever happens. Beware of poisoned food and be careful not to shoot poisons.

You should collect as many extra abilities as possible and generally kill



anything that moves.

I thoroughly enjoyed Gauntlet the first time round, and with this new batch of levels anyone who hasn't bought this game should go straight out and buy both Gauntlet and the Desper Dungeons.

Unfortunately, you do need to buy both as the new levels in Desper Dungeons

will not run without the original.

If anyone wants me I will be down a dungeon...

Robert Swan

Sound	3
Graphics	3
Playability	3
Value for Money	10
Overall	3

Unite to win

Program: Head over Heels
Price: £8.99 (retail) £7.99
(sale)
Supplier: Datasoft, 8 Central
Street, Manchester M2
4NE,
Tel: 061-202 6633

JON Birman, who wrote *Barnes*, has now produced *Head Over Heels*. Although this is another 3D maze runabout, it is quite a different game.

The Blacktooth Empire has been growing steadily for many years, taking over other planets and ruling by oppression.

You now have the opportunity to free these enslaved planets by subverting the Empire and finding the lost crowns. To do this you take control of two agents, Head and Heels from the planet Freedom.

Head is descended from a flying reptile and retains his wings, while Heels has evolved from an animal and has powerful legs but no arms. Both creatures can

operate separately but only you unite them they become a powerful adversary.

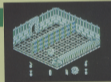
Your two heroes start the game in separate cells in Blacktooth's castle. The cells are equipped with exercise equipment including a wall ladder which Head must learn to climb.

You must free and unite them in the market place so they can reach Moon Base headquarters. From there you can teleport to the planets to search for the missing crowns. All four must be found before you can embark on the final quest.

The first planet in the system is Egyptus, a strange world where civilisation seems to revolve round people wrapping corpses in bandages and placing them in pyramids.

The Penitentiary is the Empire's prison planet, from which few return. It also holds the secret of the Ps.

A densely vegetated planet known as Safari is the



third in the system. Here the natives live in wooden houses and set traps for animals.

The final planet is Book World. This is a huge Western library used only by the Emperor and his minions, who are keen on the old West.

The task before you is not as impossible as it first appears, and you will find several objects to help you.

Teleports sometimes provide the only access to certain rooms, while springs, switches and conveyor belts can help or hinder you.

Magic items and creatures, such as scaly bur-

ries, will also help you for a limited time but they do not always have the same effect on both characters.

Joining Head and Heels and picking up a special power will result in both characters obtaining the new ability.

Swins if you are not a buyer of 3D games, look at this one - somehow it feels very different from any other game of this type I have played.

Neil Fawcett

Sound	3
Graphics	3
Playability	3
Value for money	3
Overall	3

Dashed difficult

Program: Boulder Dash
Construction Set
Price: £3.99 (Acad), £14.99 (Jale)

Supplier: Gamelite, 19
 Wilton House, Keston
 Road, London NW6 2JX,
 Tel: 07-482 1700

BOULDER Dash Construction Set is the ultimate challenge to fans of the relentless Rockford, as well as for newcomers to the neat, pushing, critter crushing, diamond collecting world of Boulder Dash.

The hero is the one and only Rockford who must push his way through the dirt and boulders of crater-infested caves to collect the required number of diamonds that will reveal the exit.

There may be as many as 30 diamonds or as few as one but either way you will

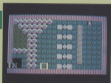
need your reactions and learn in top gear to save each one.

They are packed with such hazards as boulders that fall when you dig out the dirt from under them, fireflies and butterflies that are deadly to the touch. Added to this is a growing ameba that threatens to swamp the screen.

You will also have to guide Rockford through indestructible walls, opening walls and walls that turn boulders into diamonds - but you'll have to be quick to collect these.

This is the fourth in the Boulder Dash series and features caves that are fiendishly difficult. The files and boulders combine to form a few neat impossible routes to the exit.

But Boulder Dash IV is



only half the story. The other side of the game tape features an easy to use, joystick-controlled, construction set.

By building up caves from the joystick selected components you can create your own Boulder Dash games and make them as challenging as you like by adding hidden doors and mine Rockfords that do nothing except cost you a life if they're destroyed.

You can then test your

creations until you've got the timings and gameplay exactly right before saving your new caves to tape or disc.

The antics of Rockford pose a unique mixture of strategy and skill that will challenge both beginners and addicts alike.

Tony Hetherington.

Sound	4
Graphics	4
Playability	4
Value for Money	4
Overall	4

Nuclear no-no

Program: Joe and the Nuclear Caverns
Price: £3.99 (Academy), £7.99 (Jale)

Supplier: JTY Software, 9
 Chiswell Walk, Chislebury
 Road, Birmingham B37
 0YA,
 Tel: 071-779 1963

THE nuclear power plant at Sizewell is dangerously near to overloading and has to be shut down before the anticipated Big Bang which would reduce the population to 30 million hunks of well done steak.

Fires are raging round the reactor building due to the violent overheating and events is no longer possible.

Someone has to go down there and stabilise the system.

Joe, the Minister Hester of the nuclear disaster, steps forward - although frankly his vote would be for the Minister for Energy to be the

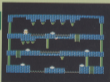
volunteer. The only way in to the reactor core is via a series of tunnels and caverns built under the reactor for just such an emergency.

Defence systems were built in, including statics and stalagmites, acid pools and laser beams.

Apart from the security measures, the isolation has mutated strange jelly like creatures that creep out of the ground and radioactive birds which will attack anything that moves.

And so Joe sets off in a desperate quest to save us all. I must say with that build up I was surprised that the opening scene was so tame - I felt more threatened in Chuckle Egg.

This is very much a budget game and, for all the scene-setting, a rather unimaginative platform hopping variation. The action is on the slow side, the graphics rather



unimpaired and to make matters worse, the music is horrendous.

There is no choice in the levels of difficulty, nor are you given the option for two-player mode.

Personally I think it is of rather dubious taste. Of course death and destruction feature strongly among the best of games and, while wholesale slaughter of millions of innocent aliens, germs and general nasties can in no way be condoned, overheating nuclear reactors are somewhat more disturbing. Goodbye and

adieu! Live in our imaginations, exploding nuclear reactors live not only in our nightmares but the all too recent past.

There is nothing new on offer in Joe and the Nuclear Caverns. The game plays itself in DX, but overall loses out for having only the one level of difficulty and no two-player option.

Nicola Reynolds

Sound	2
Graphics	2
Playability	2
Value for Money	2
Overall	2

Addicts' choice

Freedom 27 M Baker Street
Price: £19.99
Supplier: Datasoft, c/o UK
Data Units 7 B.S. Redford
Way, Redford, Birm-
ingham B26 2AE
Tel: 011-266 2288

THE game is definitely about
in Baker Street, though
whether Dr Watson would
consider it elementary is
another matter.

Datasoft's interpretation
of the Sherlock Holmes
stories places you straight
into smog-board London,
recreating the scenes of the
crimes.

The name of the game is
detection. Hunt the clues,
find the numbers, name the
weapon, identify the motive.
But there's a little more to it
than that...

With joysets (or keyboard
if you must) at the ready,
asked the number of players
(1-4) - and note that it's a
case of the more the merrier
as you can get in each
other's way.

To make life complicated,
you can then opt to receive
your clues in code. Codes
are not uncracked, and the
other players can attack
there - but you can always
change your code later to
thrive them off the scent.

Your next task is to select
a character - Holmes,
Watson, Inspector Lestrade
or Irene Adler.

Now all you have to do is
select a case to crack from
the 30 available (more if
you've got the additional
library discs) and read the
casebook carefully for clues.

At this stage it's as well to
have pen and paper to hand
otherwise you'll rapidly lose
track of what's going on.

Groundwork done, move
on to the playing screen, a
scrolling map of London
with the interesting build-
ings picked out. This toggles
with a "helium-balloon"
view of the whole city which
reveals your opponents'
locations and lets you plan
better.

Each building contains a
clue or a playing aid. Your
job is to do the rounds,
collecting as few clues as
you need to solve the crime.

You'll also need to acquire
a badge from Scotland Yard
en route, otherwise you'll
not be able to get back into
221B.

Mission accomplished
you head back to Baker
Street as quickly as possible
- on foot, by cab or even by
underground passage - and
announce your solution.

Take care in going
underground though. The
secret passages are fast but
unpredictable, dumping you
out at random locations.

And if any part of your
solution is wrong you'll be
back on the streets again -
and you won't know where

221B BAKER ST.

A Clueless System Adventure

NEW
Based on the
Original Best Selling
Board Game



Datasoft

you went wrong either.

The concept is sound
enough, but plodding
around the streets to get the
clues does get tedious.

There are distractions and
you can "lock" buildings
behind you to make life diffi-
cult for the other players.

Bear is misled though that
you might need keys on
occasions too, when your
opponents have beaten you
to a location. Still, you can
always replenish your
supply at the Locksmith's
shop.

Speed of movement is
determined by an on-screen
die, which is perhaps too
fanciful a rendition of the
original board game -
surely something a little
more sophisticated could
have been contrived.

The sound effects and
graphics are competent and
colorful, but hardly
exciting, and the novelty of
entering strange buildings
soon wears off.

It does help to plan ahead

and to choose economical
routes between objectives.
And strategy of a sort is
called for in throwing your
opponents of the scent.

But it's a game for Holmes
addicts really, for the clues,
casebook and games all lov-
ingly recreate the atmos-
phere of the original stories.

As a computer game it
doesn't quite stand on its
own two feet.

As a mental exercise, or
as a board game, with the
family clustered round
parting in each other's way
(ironically) it does.

Full marks for effort and
fun marks for translation,
but most players will find it
clues for them what Conan
Doyle's dog was remarkable
for doing in the night.
Nothing.

W.P. Millarance

Sound	B
Graphics	B
Playability	B
Value-for-Money	A
Overall	A



JAMES BOND 007™

IN

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THE COMPUTER GAME



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TIMOTHY DALTON

as IAN FLEMING'S

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Produced and Designed by **PETER LAMONT** Music by **JOHN BARRY** Associate Producers **TOM POWISER** and **BARBARA BROCCOLI**

Produced by **ALBERT S. BROCCOLI** and **MICHAEL G. WILSON** Directed by **JOHN GLEN** Screenplay by **RICHARD MARRAUM** and **MICHAEL G. WILSON**

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Alan User, Europa House, 58 Chester Road, Hazel Grove, Stockport, SK7 5BY.

CODE LOADER from Haasan Mehmet

This program solves the problem of many programmers converting the Assembler Editor and attempting to CLUMP object listings that they have created.

The manual says that an object listing of your machine code can be loaded into Basic. But when you do this a file error occurs and trying to SWITCH "C" does not help. When you peek the location where your code is meant to be stored there is nothing there.

When you use the Assembler Editor cartridge, save your program in the normal object listing way!

292 411112488 address 7,
081410 2

This is to load your object listing into Basic simply run the five line program and it should do the trick. Once you have the object code in memory you can save it into machine code strings or data statements using a data making routine.

PROGRAM BREAKDOWN

10 - Sets a flag in case of an error and prompts the user, then opens the cassette port and clears the first two bytes.

20 - Gets two bytes into D and I, and calculates start and end address. Assigns start to the location to start pointing to ADDR.

30 - Gets a byte and puts it into start, checks it and checks to see if there are any more bytes to read.

40 - Goes to 20.

50 Checks if an error occurred while loading or if stopped, closes file-

RAMDOS from Paul Cracknell

THIS program is a utility to do the time taken for Dos 2.05 to load from Basic after the Dos command. It can be particularly annoying if you only want to read a disc directory.

Very little is seen of this program, which remains on the disc as an AUTORUN.SYS file and therefore automatically executes on power up.

The ready prompt appears and Basic programming may proceed as usual. When the Dos command is first typed, the Disc Utilities Package is loaded and the menu appears as

loaded.

The Acorn's MEMLO pointer has been moved up in memory, thus protecting Dos. So all its functions may be carried out as normal. Returning to Basic is easy and, up to now, you will not have realised that Ramdos is present.

On the next and all subsequent Dos calls, however Dos appears instantly. And when you return to Basic your program will still be present if you hit System Reset prior to the Dos call.

If you fail to do this the program will be deleted as normal. If you remember to hit the reset key Ramdos makes MEM.SAV pointers and so it does not have a MEM.SAV feature.

The program will automatically set the disc drive to write without verify as it writes faster and this does not usually result in faulty saves.

To create a Ramdos disc you must load the Basic program, then insert a disc that has Dos and Dup present but without any AUTORUN.SYS file on it. You can now run the Basic program and an AUTORUN.SYS file will be cre-

```

00 1047 0017 0000 0047 00 0000 000 0
01 10470000+0000 0000 0000 0000 0000
-001 0000
02 001 0000 0001 01101000+0000+0001
03 0001 0010 0000 0000+0000+0000
04 001 0000 0000 0000+0000+0000+0000
0000+0000 0000 00
05 0010 00
06 01 0000+0000+0000 0000 00000000
RAMDOS 1000 0000+0000 000000
    
```



LINE ORDER LINE ORDER LINE ORDER

10 10487 20 10491 30 10495
40 10499 50 10503

ated. The disc will then auto boot on power up and set up Ramdos. This works with Dos 2.05 writing programming in Basic or Assembler Editor and will function with most ram-based languages.

```

00 00000000 001 01 01 00000000 000000
01 00000000 00000000 00000000 000000
02 0000 0000 0000 0000 00000000 000000
03 0000
04 0010 0000 0000 0000 0000 0000 0000
05 0000 0000 0000 0000 0000 0000 0000
06 0000 0000 0000 0000 0000 0000 0000
07 0000 0000 0000 0000 0000 0000 0000
08 0000 0000 0000 0000 0000 0000 0000
09 0000 0000 0000 0000 0000 0000 0000
10 0000 0000 0000 0000 0000 0000 0000
11 0000 0000 0000 0000 0000 0000 0000
12 0000 0000 0000 0000 0000 0000 0000
13 0000 0000 0000 0000 0000 0000 0000
14 0000 0000 0000 0000 0000 0000 0000
15 0000 0000 0000 0000 0000 0000 0000
16 0000 0000 0000 0000 0000 0000 0000
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90 0000 0000 0000 0000 0000 0000 0000
91 0000 0000 0000 0000 0000 0000 0000
92 0000 0000 0000 0000 0000 0000 0000
93 0000 0000 0000 0000 0000 0000 0000
94 0000 0000 0000 0000 0000 0000 0000
95 0000 0000 0000 0000 0000 0000 0000
96 0000 0000 0000 0000 0000 0000 0000
97 0000 0000 0000 0000 0000 0000 0000
98 0000 0000 0000 0000 0000 0000 0000
99 0000 0000 0000 0000 0000 0000 0000
100 0000 0000 0000 0000 0000 0000 0000
    
```



LINE ORDER LINE ORDER LINE ORDER

10 10499 20 10503 30 10507
40 10511 50 10515

PROGRAM BREAKDOWN

10 - Restores data, prints a message and opens a file on the disc.

20 - Reads data and places it on the disc.

30 - closes and locks the disc file before the program ends.

40 to 50 - Machine code data.

HERE'S a program that allows up to 64 players on the screen. Yes, that's right, 64.

In last month's FX program you'll notice that the routine limited you to four beam sprites and no other processing bits was available. Let's move on to setting up a Display List Interrupt that will do all the work, and leave your Basic program free to do other jobs.

A Display List Interrupt (DLI) will interrupt the processor flow for a few microseconds at any display line that has the DLI bit set. It allows you to do small routines like sound, graphics or counters.

This information is set up in the Display List, which describes the type of mode lines that make up the display and also tells the Antic chip where to fetch data that is to be displayed to the screen a function unique to the 68k Bit Array.

It can also set any line for line scrolling and set a line to indicate where a DLI is to take place. This is the function we need.

If for example, we want a colour change DLI to occur half way down the screen, we would first find the Display List. It can be found via the pointer at \$0157E, \$60-\$61 (\$8230-\$0231). We would then add 120 to the mode bytes in the display list which described the middle lines.

Next we tell Antic about the DLI and where it is. Changing pointer VDSLST 512-513 (\$0200-\$0201) to the DLI start address will set the non maskable interrupt vector (call ANTIC where your DLI is). Then all you have to do is set the DLI bit in NMIEN 54288 (\$C40E).

The bit number that enables DLIs is bit 7 (\$28-\$80). Also remember to keep



SPECIAL FX

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the VBI (Vertical Blank Interrupt) enabled. To do this we add bit 6 (\$40) to our 120 value to give 180 (\$BC). Poking this into NMIEN informs Antic that both VBI & DLI interrupts are enabled.

Now that you can see how a DLI is set up and left to run, we shall see how these DLI routines can enhance programs and save programmers the fuss of keeping things running themselves.

Program I is an assembly listing and Program II is the Basic listing that sets

up a Display List Interrupt to split the four player graphics in equal lengths down the screen. Each new section of the players has its own new X position and colour. Table I gives a breakdown of the Basic program showing how it sets up the routine and Table II is a detailed account of the assembly listing.

Notice that although the Y register is saved and restored it isn't changed in any way during the DLI. This may seem strange, but if the routine is

160	Sets up the string sizes.
180 to 210	Copies a machine code routine into A6 and calls it via the X=USRADR1A01 command. This routine places random numbers into the sprites X position and colour tables.
230 to 240	Lowers memory so as to make room for the 1k of PNC data.
260 to 280	Locates the Display List from locations 600 and 641 and then alters the bytes that describe the mode types to allow for Display List Interrupts. Twenty lines in all are set for interrupt.
300 to 330	Set up PNC system variables and clear all player ram.
410 to 440	Pokes in the character data for "ATARI USER" down each player, you can change this to cars, aliens or whatever you need.
450 to 440	This data for the "ATARI USER" splitting.

580 to 590	Copies the Display List Interrupt routine into page 6 (1130-\$660E). This is a safe page of ram (256 bytes in a page).
610	Sets player widths.
630 to 660	Prints up a small message.
680	Will set the DLI off and running, it first tells Antic the address by poking the low and high bytes of \$8600 into \$80 and \$81. Remember LOW byte first then HIGH byte. NMIEN is then set to 180 and the DLI will run.
710	Gets a key and calls the random number routine stored in A6 which resets the X positions and colours of the players. This shows that Basic can continue while the DLI is enabled.
730 to 740	Data for the console number routine.
750 to 770	Holds data for the DLI.

Table I: The Basic program breakdown

changed and the Y register used without updating the start and end of the DLI, the system will crash.

So take it from me its good programming practice to push all registers.

You can use this routine now to estimate 80 sprites but remember that only four can be on one line at a time. You can also change lines 730 to 732 to read the following for extra speed:

```

710 GOTO 100,170,200,11,100,70,100,100
    110,20,200,1,100,0,110,100,100,100,0
    141,0,200,100,100,0
720 GOTO 141,10,200,100,100,0,141,1,2
    04,100,100,0,141,10,200,100,100,0,141
    1,100,100,100,0,101
730 GOTO 20,200,100,100,0,101,1,100,1
    01,100,0,141,11,200,200,100,20,10,0
    20,110,0,210,100,0
740 GOTO 202,100,0,202,100,0,202,100,
    0,104,170,104,104,100,0
  
```

This article should have opened up a new area for many of you. You will find the DLI tricky to start with, and make sure your routines are quick and simple, but it's well worth mastering.

Next month we'll start tinkering with scrolling and use a DLI to control it.

- 290** Start of the DLI. Each DLI must begin with a 601 generated 6502 interrupt.
- 300 to 340** Pushes the Accumulator, X and Y registers on to the stack. This must be done *before* the interrupt must return control back to the 6502 with all registers intact.
- 350 to 430** Knows track of which DLI call has taken place and sets X equal to the line at which the DLI is running from.
- 430 to 460** Sets a new X position and a new colour and stores them into the HARDWARE registers of player1. Now player1 has been set to a new X position and a new colour. This continues to happen as each DLI line calls the DLI routine. So the more lines that call a DLI the more sprites you can achieve.
- 470 to 500** Makes the same changes to the three other players.
- 520** Increases the index counter for the next DLI call.
- 540 to 600** Resets the 6502 registers and returns from interrupt.
- 720 to 830** Defines the storage address of the X position and colour tables.

Table 1: The assembly listing breakdown

The assembly listing

```

0000 0000 00000000
0010 00000000
0020 00000000
0030 00000000
0040 00000000
0050 00000000
0060 00000000
0070 00000000
0080 00000000
0090 00000000
00A0 00000000
00B0 00000000
00C0 00000000
00D0 00000000
00E0 00000000
00F0 00000000
0100 00000000
0110 00000000
0120 00000000
0130 00000000
0140 00000000
0150 00000000
0160 00000000
0170 00000000
0180 00000000
0190 00000000
01A0 00000000
01B0 00000000
01C0 00000000
01D0 00000000
01E0 00000000
01F0 00000000
0200 00000000
0210 00000000
0220 00000000
0230 00000000
0240 00000000
0250 00000000
0260 00000000
0270 00000000
0280 00000000
0290 00000000
02A0 00000000
02B0 00000000
02C0 00000000
02D0 00000000
02E0 00000000
02F0 00000000
0300 00000000
0310 00000000
0320 00000000
0330 00000000
0340 00000000
0350 00000000
0360 00000000
0370 00000000
0380 00000000
0390 00000000
03A0 00000000
03B0 00000000
03C0 00000000
03D0 00000000
03E0 00000000
03F0 00000000
0400 00000000
0410 00000000
0420 00000000
0430 00000000
0440 00000000
0450 00000000
0460 00000000
0470 00000000
0480 00000000
0490 00000000
04A0 00000000
04B0 00000000
04C0 00000000
04D0 00000000
04E0 00000000
04F0 00000000
0500 00000000
0510 00000000
0520 00000000
0530 00000000
0540 00000000
0550 00000000
0560 00000000
0570 00000000
0580 00000000
0590 00000000
05A0 00000000
05B0 00000000
05C0 00000000
05D0 00000000
05E0 00000000
05F0 00000000
0600 00000000
0610 00000000
0620 00000000
0630 00000000
0640 00000000
0650 00000000
0660 00000000
0670 00000000
0680 00000000
0690 00000000
06A0 00000000
06B0 00000000
06C0 00000000
06D0 00000000
06E0 00000000
06F0 00000000
0700 00000000
0710 00000000
0720 00000000
0730 00000000
0740 00000000
0750 00000000
0760 00000000
0770 00000000
0780 00000000
0790 00000000
07A0 00000000
07B0 00000000
07C0 00000000
07D0 00000000
07E0 00000000
07F0 00000000
0800 00000000
0810 00000000
0820 00000000
0830 00000000
0840 00000000
0850 00000000
0860 00000000
0870 00000000
0880 00000000
0890 00000000
08A0 00000000
08B0 00000000
08C0 00000000
08D0 00000000
08E0 00000000
08F0 00000000
0900 00000000
0910 00000000
0920 00000000
0930 00000000
0940 00000000
0950 00000000
0960 00000000
0970 00000000
0980 00000000
0990 00000000
09A0 00000000
09B0 00000000
09C0 00000000
09D0 00000000
09E0 00000000
09F0 00000000
0A00 00000000
0A10 00000000
0A20 00000000
0A30 00000000
0A40 00000000
0A50 00000000
0A60 00000000
0A70 00000000
0A80 00000000
0A90 00000000
0AA0 00000000
0AB0 00000000
0AC0 00000000
0AD0 00000000
0AE0 00000000
0AF0 00000000
0B00 00000000
0B10 00000000
0B20 00000000
0B30 00000000
0B40 00000000
0B50 00000000
0B60 00000000
0B70 00000000
0B80 00000000
0B90 00000000
0BA0 00000000
0BB0 00000000
0BC0 00000000
0BD0 00000000
0BE0 00000000
0BF0 00000000
0C00 00000000
0C10 00000000
0C20 00000000
0C30 00000000
0C40 00000000
0C50 00000000
0C60 00000000
0C70 00000000
0C80 00000000
0C90 00000000
0CA0 00000000
0CB0 00000000
0CC0 00000000
0CD0 00000000
0CE0 00000000
0CF0 00000000
0D00 00000000
0D10 00000000
0D20 00000000
0D30 00000000
0D40 00000000
0D50 00000000
0D60 00000000
0D70 00000000
0D80 00000000
0D90 00000000
0DA0 00000000
0DB0 00000000
0DC0 00000000
0DD0 00000000
0DE0 00000000
0DF0 00000000
0E00 00000000
0E10 00000000
0E20 00000000
0E30 00000000
0E40 00000000
0E50 00000000
0E60 00000000
0E70 00000000
0E80 00000000
0E90 00000000
0EA0 00000000
0EB0 00000000
0EC0 00000000
0ED0 00000000
0EE0 00000000
0EF0 00000000
0F00 00000000
0F10 00000000
0F20 00000000
0F30 00000000
0F40 00000000
0F50 00000000
0F60 00000000
0F70 00000000
0F80 00000000
0F90 00000000
0FA0 00000000
0FB0 00000000
0FC0 00000000
0FD0 00000000
0FE0 00000000
0FF0 00000000
  
```

Program 1

```

0000 0000 00000000
0010 00000000
0020 00000000
0030 00000000
0040 00000000
0050 00000000
0060 00000000
0070 00000000
0080 00000000
0090 00000000
00A0 00000000
00B0 00000000
00C0 00000000
00D0 00000000
00E0 00000000
00F0 00000000
0100 00000000
0110 00000000
0120 00000000
0130 00000000
0140 00000000
0150 00000000
0160 00000000
0170 00000000
0180 00000000
0190 00000000
01A0 00000000
01B0 00000000
01C0 00000000
01D0 00000000
01E0 00000000
01F0 00000000
0200 00000000
0210 00000000
0220 00000000
0230 00000000
0240 00000000
0250 00000000
0260 00000000
0270 00000000
0280 00000000
0290 00000000
02A0 00000000
02B0 00000000
02C0 00000000
02D0 00000000
02E0 00000000
02F0 00000000
0300 00000000
0310 00000000
0320 00000000
0330 00000000
0340 00000000
0350 00000000
0360 00000000
0370 00000000
0380 00000000
0390 00000000
03A0 00000000
03B0 00000000
03C0 00000000
03D0 00000000
03E0 00000000
03F0 00000000
0400 00000000
0410 00000000
0420 00000000
0430 00000000
0440 00000000
0450 00000000
0460 00000000
0470 00000000
0480 00000000
0490 00000000
04A0 00000000
04B0 00000000
04C0 00000000
04D0 00000000
04E0 00000000
04F0 00000000
0500 00000000
0510 00000000
0520 00000000
0530 00000000
0540 00000000
0550 00000000
0560 00000000
0570 00000000
0580 00000000
0590 00000000
05A0 00000000
05B0 00000000
05C0 00000000
05D0 00000000
05E0 00000000
05F0 00000000
0600 00000000
0610 00000000
0620 00000000
0630 00000000
0640 00000000
0650 00000000
0660 00000000
0670 00000000
0680 00000000
0690 00000000
06A0 00000000
06B0 00000000
06C0 00000000
06D0 00000000
06E0 00000000
06F0 00000000
0700 00000000
0710 00000000
0720 00000000
0730 00000000
0740 00000000
0750 00000000
0760 00000000
0770 00000000
0780 00000000
0790 00000000
07A0 00000000
07B0 00000000
07C0 00000000
07D0 00000000
07E0 00000000
07F0 00000000
0800 00000000
0810 00000000
0820 00000000
0830 00000000
0840 00000000
0850 00000000
0860 00000000
0870 00000000
0880 00000000
0890 00000000
08A0 00000000
08B0 00000000
08C0 00000000
08D0 00000000
08E0 00000000
08F0 00000000
0900 00000000
0910 00000000
0920 00000000
0930 00000000
0940 00000000
0950 00000000
0960 00000000
0970 00000000
0980 00000000
0990 00000000
09A0 00000000
09B0 00000000
09C0 00000000
09D0 00000000
09E0 00000000
09F0 00000000
0A00 00000000
0A10 00000000
0A20 00000000
0A30 00000000
0A40 00000000
0A50 00000000
0A60 00000000
0A70 00000000
0A80 00000000
0A90 00000000
0AA0 00000000
0AB0 00000000
0AC0 00000000
0AD0 00000000
0AE0 00000000
0AF0 00000000
0B00 00000000
0B10 00000000
0B20 00000000
0B30 00000000
0B40 00000000
0B50 00000000
0B60 00000000
0B70 00000000
0B80 00000000
0B90 00000000
0BA0 00000000
0BB0 00000000
0BC0 00000000
0BD0 00000000
0BE0 00000000
0BF0 00000000
0C00 00000000
0C10 00000000
0C20 00000000
0C30 00000000
0C40 00000000
0C50 00000000
0C60 00000000
0C70 00000000
0C80 00000000
0C90 00000000
0CA0 00000000
0CB0 00000000
0CC0 00000000
0CD0 00000000
0CE0 00000000
0CF0 00000000
0D00 00000000
0D10 00000000
0D20 00000000
0D30 00000000
0D40 00000000
0D50 00000000
0D60 00000000
0D70 00000000
0D80 00000000
0D90 00000000
0DA0 00000000
0DB0 00000000
0DC0 00000000
0DD0 00000000
0DE0 00000000
0DF0 00000000
0E00 00000000
0E10 00000000
0E20 00000000
0E30 00000000
0E40 00000000
0E50 00000000
0E60 00000000
0E70 00000000
0E80 00000000
0E90 00000000
0EA0 00000000
0EB0 00000000
0EC0 00000000
0ED0 00000000
0EE0 00000000
0EF0 00000000
0F00 00000000
0F10 00000000
0F20 00000000
0F30 00000000
0F40 00000000
0F50 00000000
0F60 00000000
0F70 00000000
0F80 00000000
0F90 00000000
0FA0 00000000
0FB0 00000000
0FC0 00000000
0FD0 00000000
0FE0 00000000
0FF0 00000000
  
```

Program 2

The Basic program

```

100 REM *****
110 REM = 10 00000000
120 REM = 10 00000000
130 REM = 10 00000000
140 REM = 10 00000000
150 REM *****
160 REM *****
170 REM *****
180 REM *****
190 REM *****
200 REM *****
210 REM *****
220 REM *****
230 REM *****
240 REM *****
250 REM *****
260 REM *****
270 REM *****
280 REM *****
290 REM *****
300 REM *****
310 REM *****
320 REM *****
330 REM *****
340 REM *****
350 REM *****
360 REM *****
370 REM *****
380 REM *****
390 REM *****
400 REM *****
410 REM *****
420 REM *****
430 REM *****
440 REM *****
450 REM *****
460 REM *****
470 REM *****
480 REM *****
490 REM *****
500 REM *****
510 REM *****
520 REM *****
530 REM *****
540 REM *****
550 REM *****
560 REM *****
570 REM *****
580 REM *****
590 REM *****
600 REM *****
610 REM *****
620 REM *****
630 REM *****
640 REM *****
650 REM *****
660 REM *****
670 REM *****
680 REM *****
690 REM *****
700 REM *****
710 REM *****
720 REM *****
730 REM *****
740 REM *****
750 REM *****
760 REM *****
770 REM *****
780 REM *****
790 REM *****
800 REM *****
810 REM *****
820 REM *****
830 REM *****
840 REM *****
850 REM *****
860 REM *****
870 REM *****
880 REM *****
890 REM *****
900 REM *****
910 REM *****
920 REM *****
930 REM *****
940 REM *****
950 REM *****
960 REM *****
970 REM *****
980 REM *****
990 REM *****
  
```

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Series

430 100 000 100 000 100 000 100 000
 430 100 000 100 000 100 000 100 000
 440 100 000 100 000 100 000 100 000
 450 100 000 100 000 100 000 100 000
 460 100 000 100 000 100 000 100 000
 470 100 000 100 000 100 000 100 000
 480 100 000 100 000 100 000 100 000
 490 100 000 100 000 100 000 100 000
 500 100 000 100 000 100 000 100 000
 510 100 000 100 000 100 000 100 000
 520 100 000 100 000 100 000 100 000
 530 100 000 100 000 100 000 100 000
 540 100 000 100 000 100 000 100 000
 550 100 000 100 000 100 000 100 000
 560 100 000 100 000 100 000 100 000
 570 100 000 100 000 100 000 100 000
 580 100 000 100 000 100 000 100 000
 590 100 000 100 000 100 000 100 000
 600 100 000 100 000 100 000 100 000
 610 100 000 100 000 100 000 100 000
 620 100 000 100 000 100 000 100 000
 630 100 000 100 000 100 000 100 000
 640 100 000 100 000 100 000 100 000
 650 100 000 100 000 100 000 100 000
 660 100 000 100 000 100 000 100 000
 670 100 000 100 000 100 000 100 000
 680 100 000 100 000 100 000 100 000
 690 100 000 100 000 100 000 100 000
 700 100 000 100 000 100 000 100 000
 710 100 000 100 000 100 000 100 000
 720 100 000 100 000 100 000 100 000
 730 100 000 100 000 100 000 100 000
 740 100 000 100 000 100 000 100 000
 750 100 000 100 000 100 000 100 000
 760 100 000 100 000 100 000 100 000
 770 100 000 100 000 100 000 100 000
 780 100 000 100 000 100 000 100 000
 790 100 000 100 000 100 000 100 000
 800 100 000 100 000 100 000 100 000
 810 100 000 100 000 100 000 100 000
 820 100 000 100 000 100 000 100 000
 830 100 000 100 000 100 000 100 000
 840 100 000 100 000 100 000 100 000
 850 100 000 100 000 100 000 100 000
 860 100 000 100 000 100 000 100 000
 870 100 000 100 000 100 000 100 000
 880 100 000 100 000 100 000 100 000
 890 100 000 100 000 100 000 100 000
 900 100 000 100 000 100 000 100 000
 910 100 000 100 000 100 000 100 000
 920 100 000 100 000 100 000 100 000
 930 100 000 100 000 100 000 100 000
 940 100 000 100 000 100 000 100 000
 950 100 000 100 000 100 000 100 000
 960 100 000 100 000 100 000 100 000
 970 100 000 100 000 100 000 100 000
 980 100 000 100 000 100 000 100 000
 990 100 000 100 000 100 000 100 000
 1000 100 000 100 000 100 000 100 000

470 000 *** TELL ME THE NEWS ***
 480 000 *** TO FIND THE NEWS ***
 490 000 *** TO FIND THE NEWS ***
 500 000 *** TO FIND THE NEWS ***
 510 000 *** TO FIND THE NEWS ***
 520 000 *** TO FIND THE NEWS ***
 530 000 *** TO FIND THE NEWS ***
 540 000 *** TO FIND THE NEWS ***
 550 000 *** TO FIND THE NEWS ***
 560 000 *** TO FIND THE NEWS ***
 570 000 *** TO FIND THE NEWS ***
 580 000 *** TO FIND THE NEWS ***
 590 000 *** TO FIND THE NEWS ***
 600 000 *** TO FIND THE NEWS ***
 610 000 *** TO FIND THE NEWS ***
 620 000 *** TO FIND THE NEWS ***
 630 000 *** TO FIND THE NEWS ***
 640 000 *** TO FIND THE NEWS ***
 650 000 *** TO FIND THE NEWS ***
 660 000 *** TO FIND THE NEWS ***
 670 000 *** TO FIND THE NEWS ***
 680 000 *** TO FIND THE NEWS ***
 690 000 *** TO FIND THE NEWS ***
 700 000 *** TO FIND THE NEWS ***
 710 000 *** TO FIND THE NEWS ***
 720 000 *** TO FIND THE NEWS ***
 730 000 *** TO FIND THE NEWS ***
 740 000 *** TO FIND THE NEWS ***
 750 000 *** TO FIND THE NEWS ***
 760 000 *** TO FIND THE NEWS ***
 770 000 *** TO FIND THE NEWS ***
 780 000 *** TO FIND THE NEWS ***
 790 000 *** TO FIND THE NEWS ***
 800 000 *** TO FIND THE NEWS ***
 810 000 *** TO FIND THE NEWS ***
 820 000 *** TO FIND THE NEWS ***
 830 000 *** TO FIND THE NEWS ***
 840 000 *** TO FIND THE NEWS ***
 850 000 *** TO FIND THE NEWS ***
 860 000 *** TO FIND THE NEWS ***
 870 000 *** TO FIND THE NEWS ***
 880 000 *** TO FIND THE NEWS ***
 890 000 *** TO FIND THE NEWS ***
 900 000 *** TO FIND THE NEWS ***
 910 000 *** TO FIND THE NEWS ***
 920 000 *** TO FIND THE NEWS ***
 930 000 *** TO FIND THE NEWS ***
 940 000 *** TO FIND THE NEWS ***
 950 000 *** TO FIND THE NEWS ***
 960 000 *** TO FIND THE NEWS ***
 970 000 *** TO FIND THE NEWS ***
 980 000 *** TO FIND THE NEWS ***
 990 000 *** TO FIND THE NEWS ***
 1000 000 *** TO FIND THE NEWS ***

100 000 100 000 100 000 100 000
 110 000 100 000 100 000 100 000
 120 000 100 000 100 000 100 000
 130 000 100 000 100 000 100 000
 140 000 100 000 100 000 100 000
 150 000 100 000 100 000 100 000
 160 000 100 000 100 000 100 000
 170 000 100 000 100 000 100 000
 180 000 100 000 100 000 100 000
 190 000 100 000 100 000 100 000
 200 000 100 000 100 000 100 000
 210 000 100 000 100 000 100 000
 220 000 100 000 100 000 100 000
 230 000 100 000 100 000 100 000
 240 000 100 000 100 000 100 000
 250 000 100 000 100 000 100 000
 260 000 100 000 100 000 100 000
 270 000 100 000 100 000 100 000
 280 000 100 000 100 000 100 000
 290 000 100 000 100 000 100 000
 300 000 100 000 100 000 100 000
 310 000 100 000 100 000 100 000
 320 000 100 000 100 000 100 000
 330 000 100 000 100 000 100 000
 340 000 100 000 100 000 100 000
 350 000 100 000 100 000 100 000
 360 000 100 000 100 000 100 000
 370 000 100 000 100 000 100 000
 380 000 100 000 100 000 100 000
 390 000 100 000 100 000 100 000
 400 000 100 000 100 000 100 000
 410 000 100 000 100 000 100 000
 420 000 100 000 100 000 100 000
 430 000 100 000 100 000 100 000
 440 000 100 000 100 000 100 000
 450 000 100 000 100 000 100 000
 460 000 100 000 100 000 100 000
 470 000 100 000 100 000 100 000
 480 000 100 000 100 000 100 000
 490 000 100 000 100 000 100 000
 500 000 100 000 100 000 100 000
 510 000 100 000 100 000 100 000
 520 000 100 000 100 000 100 000
 530 000 100 000 100 000 100 000
 540 000 100 000 100 000 100 000
 550 000 100 000 100 000 100 000
 560 000 100 000 100 000 100 000
 570 000 100 000 100 000 100 000
 580 000 100 000 100 000 100 000
 590 000 100 000 100 000 100 000
 600 000 100 000 100 000 100 000
 610 000 100 000 100 000 100 000
 620 000 100 000 100 000 100 000
 630 000 100 000 100 000 100 000
 640 000 100 000 100 000 100 000
 650 000 100 000 100 000 100 000
 660 000 100 000 100 000 100 000
 670 000 100 000 100 000 100 000
 680 000 100 000 100 000 100 000
 690 000 100 000 100 000 100 000
 700 000 100 000 100 000 100 000
 710 000 100 000 100 000 100 000
 720 000 100 000 100 000 100 000
 730 000 100 000 100 000 100 000
 740 000 100 000 100 000 100 000
 750 000 100 000 100 000 100 000
 760 000 100 000 100 000 100 000
 770 000 100 000 100 000 100 000
 780 000 100 000 100 000 100 000
 790 000 100 000 100 000 100 000
 800 000 100 000 100 000 100 000
 810 000 100 000 100 000 100 000
 820 000 100 000 100 000 100 000
 830 000 100 000 100 000 100 000
 840 000 100 000 100 000 100 000
 850 000 100 000 100 000 100 000
 860 000 100 000 100 000 100 000
 870 000 100 000 100 000 100 000
 880 000 100 000 100 000 100 000
 890 000 100 000 100 000 100 000
 900 000 100 000 100 000 100 000
 910 000 100 000 100 000 100 000
 920 000 100 000 100 000 100 000
 930 000 100 000 100 000 100 000
 940 000 100 000 100 000 100 000
 950 000 100 000 100 000 100 000
 960 000 100 000 100 000 100 000
 970 000 100 000 100 000 100 000
 980 000 100 000 100 000 100 000
 990 000 100 000 100 000 100 000
 1000 000 100 000 100 000 100 000



100 000	110 000	120 000	130 000	140 000	150 000	160 000	170 000	180 000	190 000	200 000	210 000	220 000	230 000	240 000	250 000	260 000	270 000	280 000	290 000	300 000	310 000	320 000	330 000	340 000	350 000	360 000	370 000	380 000	390 000	400 000
100 000	110 000	120 000	130 000	140 000	150 000	160 000	170 000	180 000	190 000	200 000	210 000	220 000	230 000	240 000	250 000	260 000	270 000	280 000	290 000	300 000	310 000	320 000	330 000	340 000	350 000	360 000	370 000	380 000	390 000	400 000

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ADDRESS _____

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LAST month we started to examine Atari's disk operating system (or Dos), and saw how each disc is split up into 720 or 1040 sectors, each of which contain 128 bytes of data.

This time we will see how Dos 2.5 uses these sectors to store and keep track of programs and data files.

There are basically three types of information which Dos can store in any given sector - directory information, the files themselves or a special table of free space known as the Volume Table of Contents (VTOC).

The directory is restricted to sectors 361 to 368 and the VTOC data is in sector 369. We take a rather simplified look at the VTOC, but Figure 1 gives a much better idea of the true Dos 2.5 disc layout - including the special extended VTOC at sector 1024 used in enhanced density mode.

The first three sectors of a Dos disc are used for boot information only (see panel) and can't be accessed for storage, but all other sectors from four onwards are used for files.

Due to a quirk in the design of Dos 2.0, sector 720 was unused and so Dos 2.5 mimics this to maintain full compatibility. Sector 719 is thus the final available sector on a single density disc, with 1023 being the maximum when using enhanced density.

By the time you subtract the eight directory sectors, three boot sectors, the VTOC table and sector 720 you are left with 707 or 1010 free sectors for file storage.

Let's now look at the way Dos handles these sectors. The VTOC data in sector 369 is probably the easiest to understand, and is shown in Figure 1.

The first 10 bytes contain general information about the disc. Byte zero is a code sign to indicate the Dos type (normally 2 for Dos 2.0/2.5). Bytes one and two contain the total sector count - 707 (82P1) or 1010 (82P2) in low/high format.

Bytes three and four contain the number of currently available sectors.

Sectors	Contents
1-3	Boot information.
4-368	Free for files.
369	VTOC.
361-368	Directory information.
369-719	Free for files.
720	Not used.
721-1023	Free for files (enhanced density Dos 2.5 only).
1024	Extended VTOC (enhanced density Dos 2.5 only).
1025-1040	Not used.

The Dos map explained

Part 7 of ANDRE WILLEY'S series on the Atari's input/output facilities

Each time data is written to a file this number is modified to show the new number of free sectors - and it is this number that is returned at the end of a directory listing.

To maintain full compatibility with Dos 2.0 this only gives the number of free sectors which are accessible by both systems - 707 for an empty disc.

Bytes 10 to 26 contain a table of bit-mapped values representing the last 710 sectors on the disc. The rest of sector 369 is unused and filled with zeros. For this reason the extended VTOC information was moved to 1024 - otherwise any use of Dos 2.0 to write files to the disc would corrupt the extended free sector map.

Each byte of free sector information contains eight bits of data, representing one of eight sectors on the disc. The high bit (bit 7, with a value of 128) represents the first of the eight sectors and the low bit (bit 0, with a value of 1) is the last.

If a bit is set (1) then the sector is

free and if it is clear (0) then the sector is in use. Whenever Dos assigns sectors for a new file it clears the relevant bits in the VTOC table to stop the sectors being used again. If the file is later deleted the bits are set back to 1 again.

Byte 10 contains the bit-mapped data for sectors 0-7, byte 11 refers to sectors 8-15 and so on up to byte 99 which refers to sectors 712-719.

To give you an idea of how this works, byte 10 of the VTOC table on a newly formatted disc will contain the value 10 (82P) showing that sectors 0 to 3 are unavailable (the boot information) and sectors 4 to 7 are currently free.

On an enhanced density Dos 2.5 disc this VTOC information is extended into sector 1024, shown in Figure 10. Bytes 0 to 83 are simply copies of the last 84 bytes of the main VTOC table, with byte 0 referring to sectors 48 to 55 and byte 83 covering sectors 712 to 719.

Byte 84, the first of the new entries, covers sectors 720 to 727 and thus the high bit (the sector 720) is always one since it should never be written to. Byte 85 refers to sectors 728 to 735, right up to byte 121 which completes the disc with sectors 1016 to 1023.

Bytes 122 and 123 of the Extended VTOC data supply the free sector count for the enhanced segment of the disc. This would be 303 (812P) for an

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Byte	Contents
0	Type code (= 2 for Dos 2.0/2.5).
1-2	Total number of sectors on disc (707 or 1010).
3-4	Number of free sectors (on main disc space).
5	Reserved.
6-9	Unused.
10-99	Sectors 0-719 usage bit-map (1=free, 0=in use). Byte 10, bit 7 = sector 0 (does not exist). Byte 10, bit 6 = sector 1, ...and so on... Byte 10, bit 0 = sector 7. Byte 11, bit 7 = sector 8, ...and so on... Byte 99, bit 7 = sector 712. Byte 99, bit 6 = sector 719.
100-123	Unused (zero).

Figure 10: The Volume Table of Contents (VTOC) Sector 369

Figure 1: Disc sector map for Dos 2.0/2.5 discs

empty disc, which when added to 207 gives the expected 1010. When using Dos 3.5 the two sector count values must be added together before a true Free Sectors result can be obtained.

Sectors 201 to 208 are always flagged as being unavailable for files because they contain the eight directory sectors. Each one of these can contain up to eight filenames, providing the 64-file limit experienced when using Dos 7 or 3.5. Each entry is made up of 18 bytes - five for internal data, eight for the main filename and three for the extension.

Byte 0 provides various bit mapped information as shown in Figure IV. Bytes 1 and 2 give the number of sectors used in the file (low/high format) and bytes 3 and 4 indicate the first sector used. Bytes 5 to 12 contain the main filename and bytes 13 to 15 contain the extension.

When a file is erased Dos flags the entry in the directory as deleted and frees the relevant sectors from the FAT table. The entire file will remain intact until another file is written over it, which enables you to recover an accidentally deleted file if you catch your error quickly enough.

The directory entry gives the first sector used in the file and from then on each sector contains 126 bytes of file data followed by three bytes of Dos information.

Bytes 0 to 124 contain the file itself, which may be data, programs, text or anything else you wish to store on disc. In certain cases this area will not be completely full - such as the final sector of a file or after an append operation has taken place. Byte 125 holds the total number of bytes actually used, which is normally 126 (07D).

The next two bytes contain two pieces of information. The highest six bits of byte 126 hold the file number (0-83), which corresponds to the number of the directory entry for the file. The first bit in the directory, for

example, would have a value of zero here and the second would give a value of one.

If this number does not match in each of the sectors making up a file then Dos knows that the file has been corrupted and returns an Error 184 (File number mismatch).

The final two bits of byte 126 and the whole of byte 127 are put together to give a 10-bit number which is a pointer to the next sector in the file. This value will be set to zero if there are no more sectors in the chain - at the end of the file.

■ Next month I'll give a basic program which will allow you to view the various types of sector we have been discussing. But even if you don't look at the new data by using the Data Editor from the October 1988 Alan User.

You can modify some of the parameters present in the Dos boot information sector to suit your own needs. Once loaded into memory this first disc sector resides at 0700 and is laid out as follows:

Byte	Address	Contents
0	0700 (1700)	Boot flag (=0).
1	0701 (1701)	Number of boot sectors 1-08.
2	0702 (1702)	Address to load boot sectors (=0700).
4	0704 (1704)	Initialisation address (=0600).
6	0706 (1706)	Jump to continue load (=JMP 0714).
8	0708 (1801)*	Number of sector buffers (=03).
10	070A (1802)*	Drive enable bits (bits 0-7 = drives 1-8 (=00)).
11	070C (1803)	Unused.
12	070E (1804)	Start address for buffers (=019CC).
14	0710 (1808)	DOS flag 00=No DOS.SYS, 01=DOS.SYS on disc.
16	0712 (180C)	First sector of DOS.SYS file (=04).
17	0713 (180D)	Offset to Sector link data (=126).
18	0714 (1810)	Start of main DOS.SYS file (=0700) (transfer table).
20	0714 (1810)	Start of boot loader code.

You might like to experiment by altering the values marked with an asterisk (*). You could also try POKEing 0708 (070A) with 07 to turn the write-protect mode off. POKE 0613,00 will turn it back on again. Location 070E (070E) contains the disk type for the drive number to load the DOS.SYS file from.

On a 720K* with Ramdisk this should be set to 04 (disk code for the disk itself) but you should alter it to 40 (disk code for emul) to make DOS.SYS load from the floppy again.

It is not advisable to change any other values without a more thorough knowledge of the system. After POKEing in the new values, go to Dos and set options F and H to make a modified Dos boot disc.

Byte	Contents
0 - 127	Sectors 48-1023 usage bit map (1 = free, 0 = in use). Byte 0, bit 7 = sector 48. Byte 0, bit 6 = sector 49. ...and so on... Byte 0, bit 0 = sector 55. Byte 1, bit 7 = sector 56. ...and so on... Byte 84, bit 7 = sector 720 (never used, set to 0). Byte 84, bit 6 = sector 721. ...and so on... Byte 121, bit 7 = sector 1016. Byte 121, bit 0 = sector 1023.
122 - 123	Number of free sectors on enhanced area only.
124 - 127	Unused (zero).

Figure 8: The Extended FAT (Dos 2.0 Enhanced density sector 0204)

Bit	Decimal	Use
0	1	File opened for output/Dos 2.0 "hidden" file flag
1	2	File created by Dos 2.0/2.5
2	4	Not used.
3	8	Not used.
4	16	Not used.
5	32	File locked.
6	64	Entry in use for normal file. (Dose 2.0 access available).
7	128	File has been deleted.

A normal Dos 2.0/2.5 file entry would have a value of 66, a "hidden" Dos 2.0 entry would have a value of 2.

Figure 9: Directory file type flag (byte 0 of directory entry)

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Dungeons abound - on TV, too

by
Rouloc

WELCOME! It is good to meet you all again - adventurers everywhere are always welcome at my door as long as they have a good story to tell.

Sit with me and we shall talk of puzzles past and traps to come and heraldic twists to frustrate your mind as well as your best sword arm.

First, thank you for all your letters. I'm pleased to see that so many are able to correlate with me in solving those brain-teasing adventures. I may well ask you to accompany me on one of my quests and do all the donkey work while I sit around all day and sing about gold (have I ever someone else do that somewhere?).

Now, on to some of the latest gossip from the Inn. I'm pleased to report that

I have in my possession the very latest copy of *Alternate Reality - The Dungeon*. This is the sequel to *The City*, and gives you the chance to explore four levels of dark, dank and decidedly dangerous dungeons.

There are multitudes of new monsters to bash, plenty of quests to undertake, and over a third more to map out than the previous game. With the package comes a message from a fellow victim called, funny enough, *Trilog* (no relation) and a handsome manual which by all accounts is very informative.

More episodes are planned, including *The Arena*, *The Palace*, *The Wilderness*, *Revolution* and *Destiny*. By next month I shall have got well into the *Dungeon* and will bring you news of my findings.

Another slice of hot gossip in the tavern is of a major new television programme all about adventures, called *Knighthood*.

It is from Anglia and features teams of adventurers who have to explore a *Dungeons and Dragons* scenario created on screen by the use of a 24 bit Supermode computer.

The producer acts as *Dungeon Master* and decides which scene the brave bunch should work through next. If they complete the quest, they return the next week to play at a higher level. Sounds great fun.

Thanks to Darren Frogley, this month's map to Level Nine's Worm in Paradise. The map isn't complete, but it shows some convenient locations and should prove invaluable to anyone stuck in the early stages of the game.

See you next
month



Jinx hints

Here are some clues for Hollywood Hijinx sent in by Mark Powell:

- To enter the house by reading the poems in the package and turn to the statue.
- In the closet, try pulling pegs to get to different floors. Lift the banding to find a safe, and the statue should give you a hint with the combination.
- Attack in the maze? Look in the water box for only half of the map.
- Can't find all the punch cards? Try the piano, painting, fireplace, the bathroom rug and the closet shelf.
- Tokyo is a problem? Save the red button and eat, and just keep moving west. Stamp the tents and swipe the planes. Forget the rocket jet like cars off the form.
- Spots proving dangerous? Try winter scores.
- Can't get up the stairs in the house? Look at number two then turn to one of your Uncle's sheets.
- Punch cards won't work? Examine the business card and note the name. When you realize the correct order search for all the cards insert them into the computer in order.

Postbag



MARK Watson noticed in the June issue of *Adrii Linn* that Donna Thatcher is having problems with Ten Little Indians. He has kindly given me this list of hints: To leave the train type "Wait" and don't leave the train at the wrong station.

You only get eight moves in the maze. **GO WINDOW** is the blue bedroom, take notice of the ads but ignore the gamekeeper.

Ian Spald says he is a very frustrated adventurer because he is stuck in *The River* at the gurg location. Well let's hope you saw the clues in the June issue of *Adrii Linn*.

If not, the answer lies with you. If you cover your windows, the guru will give you a bowl. You then go up the mountain and fill it with

water - it's all downhill from there.

C.M. Dunn tells of a neat way to keep the door open in *Clash of Death*. The door is at the bottom of the stairs and if you leave the chest against its open side it will not slam shut.

Mark Powell, from East Sussex, has given me a lot of clues on Infopop's *Hollywood Hijinx*, but is himself stuck in a few places. He wants to know how to get a light

source under water, and also in the screening room, he cannot read the film as its all washed out. Also he can't get the left ladder up the cliff or find out what pushing the piano does.

Finally, P. Carey (otherwise known as Arathorn, Fallos, Furrow or Sparrow) has been playing *Ultima III* for nearly a year and still can't find the Mark of the Snake. Neither does he know where to use the BEO or [8] commands.

Well weather, I'm only an expert on *Ultima IV* and my friend Dingo, who managed to finish *Ultima III*, unfortunately perished last summer in a major freeze involving his good self and 16 ones who didn't like his on-head show. Well there life.

BRISTSTONE is the first Electric novel from Bradward released via LIS Gold. It is a text only game with a hard back book depicting the characters and giving general background information about the story to accompany it.

The game is a very steady piece - well coded and bears a striking resemblance to (I dare I say it!) Infopop's style - long descriptive passages and very humorous interchanges with the characters.

The story is in fact a dream by Sir Gawain, one of Arthur's Round Table knights, who thinks he has found the gateway to Hell in an old castle.

It is divided into chapters and as you progress through the adventure different leads will present themselves to get you to the next chapter. So each time you play it a different route will lead to a different event.

That is the first difference. The second is a quick resume of what you have achieved so far - a sort of "what happened in last week's episode?" type of summary which lets you know how you are doing in relation to finishing the game.

There are in fact two parts to the story. The first involves getting to the gateway, which is pretty tricky, and the second is in Hell - where your troubles really start.

There is one other new idea: The program will sense if you are in trouble. It will decide that the puzzle is too hard for you, and put forward a gentle hint by itself. Very subtle. A case in point is that when I was stuck in ice and after a few blank moves it threw up a line "You think of summer".

This was a clue, and by thinking of another word that belongs with summer I was able to get on my way.

This game, along with *Mindwheel* and *Beasts*, are first class adventures. A bit pricey, but well worth the investment.

Troubles really start in Hell

Program: *Briststone*
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r'throat

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library

City
Square

Leifhard
drive

Thames
Park
recreation
area

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valley
where
bird
and
road

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winding
road

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pigeon
and pig

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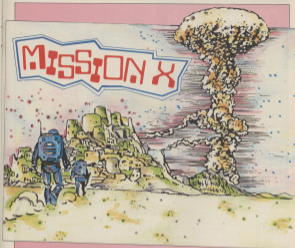
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By DAVID RAWLINGS

It is the year 2999 and Earth has been at war with the evil Verucan Empire for almost 25 years. There is nuclear fallout over most of Earth and many survivors have moved to vast underground caves on the Moon.

But now the ultra evil and blood-thirsty nasty Verucan leader Vyrucas has discovered where the survivors are and has hidden a proton bomb at the far reaches of the caverns.

You have been chosen to disarm the bomb. Unfortunately you are flying a bomb-trapped Verucan fighter which means that the hidden defenses in the caves will attempt to destroy you.

Your task is to negotiate the underground caverns, rising lava zones and the wicked space plunger in an attempt to reach the

proton bomb. When you have reached the device, it has to be activated and your ship is then paralyzed for 30 seconds while the bomb trap is made safe. You then have to exit the cavern backwards and land on the right of the launch zone.

If you achieve this before the bomb explodes it will be deactivated. If you don't escape or crash the whole lunar hemisphere will be destroyed and Vyrucas will have the satisfaction of seeing you die along with the remainder of the human race.

That's the challenge - your freedom and the survival of the human race is guaranteed if you manage to deactivate the bomb.

You have five lives and each collision on the way in loses one. One on the way out detonates the bomb.

The joystick is used to move the ship left or right and the fire button provides thrust to vary the speed of descent.

Unfortunately the Moon now has an exceptionally strong gravitational field, so your ship requires extensive and very heavy fuel supplies. This leads to great momentum and slower stick response. The time you have to get out is not revealed but an ever-rising tone gives some indication as to your expected doom.

The program is written mainly in Basic but machine code routines have been added for player missile movement, collision detection and some special effects. So climb into your fighter and save the human race from the evil Vyrucas.

Back to Page 37 >

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Autodesk 2000 66D	12.99	12.99	12.99
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Autodesk 2000 84D	12.99	12.99	12.99
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Autodesk 2000 87D	12.99	12.99	12.99
Autodesk 2000 88D	12.99	12.99	12.99
Autodesk 2000 89D	12.99	12.99	12.99
Autodesk 2000 90D	12.99	12.99	12.99
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MEANINGFUL speech can be generated from 64 different sounds, known as allophones. Let's see how we can program the voice box you produced last month to generate these sounds and string them together to produce any word in the English language.

Programming the box is just a matter of sending the appropriate code numbers in correct sequence.

The full allophone set with descriptions of the sounds produced by each code is shown in Table 8. These are only approximations, since the allophones will often behave differently when they are used at different positions in real words.

Where possible, the examples show each allophone in its most usual position. For example, an initial D is best produced by code 33, while code 31 sounds better at the end of a word. Characters at the end of words are shown by, for example, -O.

Allophones marked with asterisks can be used twice in succession to provide longer sounds or emphases. For example, the G sound (55) can be short, as in *git* or longer, as in *Hisss*.

Some consonant sounds - P (36), B (38&39), T (13), D (33), K (34&42), G (38&41), CH (50) and J (10) - need a brief pause before them. Some silence has already been built-in to these allophones, but you can add more by using the pause codes (0 to 4). These pauses can also be used to separate words and sentences.

In most cases you will need to try several alternatives before hitting on the right sound combination for your chosen word. For example, for the O

Speech Synthesiser:

LEN GOLDING gives you the software for last month's DIY voice box

sound in computer can be produced by allophone 34 (O as in *hot*). But number 23 sounds just as good, even though it is supposed to generate *OH* as in *light*.

As you might expect, the synthesiser has a slight American accent. This is most noticeable for words ending in ER, OR and ARE, but also colours some of the vowel sounds.

Program 1 shows an easy way of stringing allophones together to produce the word computer. To insert your own words simply change the data at line 80. This is straightforward, and keeps programming to a minimum. But long strings of numbers are tricky to work with, and it's almost impossible to tell what word is being represented making fault-finding tedious.

Program 2 makes the job easier. It allows you to select any allophone by typing a single Ascii letter, which loosely corresponds to the sound produced. For example, the letter A will generate allophone 26 - A as in *hat*. The translator routine is in machine code for speed.

Your desired word starts as an Ascii string (line 120), and is sent to the machine code routine one letter at a time, via the USB function (line 140). This routine translates the Ascii letter into its corresponding allophone code and puts the result into address 1701. Lines 180 to 190 retrieve this and send it to the voice box as in Program 1.

The allophone-to-Ascii conversion data for Program 2 are at Table 1. To use this, first find the required sound by examining the sample words. The left hand column tells you which letter

Program 1

```

10 P000 3436,343900 1400,110:000 3
20 000,0000 set up ports for output
30 scan 1:1 00:1 000 000
40 P000 3434,3-13:000 send code via
  3:0000 100 0:00
45 10 P000 3431:1 100 10:000 set for
  'ready' signal
50 P000 3434,3-000 1400,1:10:000 3
  use signal line then high again
60 0:10 00
70 0:1 for following code produce 'O'
  output
80 0:10 01,11,14,1,11,11,11,1,1-1

```



LINE	CODE	LINE	CODE	LINE	CODE
10	1400	30	4000	50	11000
40	11000	60	11010	80	1110
70	10110	90	4100		

Program 2

```

10 P000 3436,343900 3434,23:000 3
20 000,0000 3434,3-000 set up ports
  for output
30 0:10 000:000 machine number of a
  4:000000 - change 0:10 to 0:11 0:000 0
40 P000 340 to 110:000 0:000 110:0,1
  0001 0:000 input translator routine
50 0:000 00,10,10,00,10,11,14,11,10,1
  11,11,11,11,11,11,11,14,10,11,10,11
60 0:000 00,11,11,11,11,11,11,11,11,11
  10,11,11,11,11,11,11,11,11,11,11,11
70 0:000 00,11,11,11,11,11,11,11,11,11,
  11,11,11,11,11,11,11,11,11,11,11,11
80
90 0:000 100,110,110,100,100,100,100,100
  10,110,100,00,100,100,100,100,100
100 0:000 100,0,0,0,0,0,0,0,0,0,0,0,0,0,0
  10,10,10,10,10,10,10,10,10,10,10,10,10
110 0:000 100,0,0,0,0,0,0,0,0,0,0,0,0,0,0
  10,10,10,10,10,10,10,10,10,10,10,10,10,10
120 0:000 10,0,0,0,0,0,0,0,0,0,0,0,0,0,0
130 0:000 00:0000 0:0000 0:1100,11
140 0:000 00:0000 0:0000 0:1100,11
150 0:000 0:000
160 0:00 0:1 to 0:0000:1:0000:1:0000,0:001

```

```

401,111:1:0001:1:001
10 14000:1701:000 correct allophone
  code, translated from Ascii form
20 100 1400,1:10:000 send code at
  3:0000 high
30 1:1 0:11:0:0001 1000 170:000 set 1
  or 'ready' signal
40 P000 1400,1:1:000 1400,1:10:000 3
  pulse strobe line low, then high again
50 0:001 0
60 10 0:00 0:1 0:0001 0:000 short pulse
  to 0:00 and 0:0000
70 P000 1400,1:1:000 1400,1:10:000 3
  to sound off
80 0:00 100

```



LINE	CODE	LINE	CODE	LINE	CODE
10	14000	30	10000	50	11100
40	11000	60	10010	80	11101
70	10000	90	0000	110	11000
100	0000	130	1001	160	11010
150	11000	180	00001	210	11010
190	10010	220	11101	250	10000
280	1001				



will produce this sound, and the top row shows whether it should be upper or lower case, normal or inverse. For example, OY is produced by an inverse uppercase Y, and -R by a normal lowercase R.

Although this system cannot interpret real words, the ASCII string will usually be recognizable, which makes

it much easier to find your place in a large block of text.

Don't be discouraged if your first attempts produce unintelligible noises and grunts. A couple of hours experimentation will show you which allophones go best together, and you should soon be able to produce speech that anyone can recognize.

Table 1: Allophone-8400 controller for use with Program 1

		Normal lower case	Inverse upper case	Inverse lower case
A	Best	aBAs		
B	Comb	CB	YAY	
C	On	CB		
D	End	CB		
E	Food	CB		
F	Give	CB		
G	He	CB		
H	an	CB		
I	spoke	CB		
J	late	CB		
K	was	CB		
L	do	CB		
M	to	CB		
N	the	CB		
O	the	CB		
P	the	CB		
Q	the	CB		
R	the	CB		
S	the	CB		
T	the	CB		
U	the	CB		
V	the	CB		
W	the	CB		
X	the	CB		
Y	the	CB		
Z	the	CB		
0	10 millisecond pause			
1	30 millisecond pause			
2	50 millisecond pause			
3	100 millisecond pause			
4	200 millisecond pause			

Note 1: For 0 and 1-4 use 0-4
Note 2: For 5 use 2, or C=5 or R=5

Code	Sound	Example
0	10 millisecond pause	
1	30 millisecond pause	
2	50 millisecond pause	
3	100 millisecond pause	
4	200 millisecond pause	
5	OY	Boy
6	AYE	Say
7	EH	End
8	E	Comb
9	PP	Pow
10	J	Dodge
11	NN	Thin
12	I	Sit
13	T	To
14	R	Read
15	UH	Success
16	M	Milk
17	TT	Fort
18	TH	Then
19	EE	See
20	AY	Try
21	DD	Played
22	YU	Compute
23	AW	Aught
24	C	Hot
25	Y	Yes
26	A	Wait
27	H	He
28	EE	File
29	TH	Thin
30	U	Book
31	DD	Food
32	OW	Out
33	D	Do
34	GG	Peg
35	V	Yest
36	G	Give
37	SH	Ship
38	SH	Spin
39	H	Brain
40	F	Food
41	CK	Speak
42	K	Karen
43	Z	Zoo
44	NG	Angry
45	L	Late
46	W	Wool
47	AR	Repair
48	WH	White
49	JY	Cute
50	CH	Church
51	LR	Bird
52	FR	Letter
53	OH	Over
54	TH	Then
55	S	Yes
56	M	No
57	SH	How
58	OR	Stone
59	AR	Alarm
60	EAR	Clear
61	G	Girl
62	LL	Saddle
63	R	Beast

* These allophones can be doubled to make longer sounds for stressed syllables.

Table 2: Allophone set for speech synthesizer



THE pictures are still flooding in. This month we feature efforts from Ray Allen, Martin Fibbick and Anso.

If you would like to see your masterpiece in print, send them to: Palette, Atari User, Europa House, 48 Chester Road, Hazel Grove, Stockport, S67 5WY.

We don't mind whether you send one picture or 100. If they're good we'll print them - But remember to enclose your name and address.



Drawn by Martin Fibbick



Landscape by Ray Allen



Manor by Ray Allen



Ferrari by Anso



Logo by Anso



Psychedelic Journey

A colourful extravaganza
from **STEPHEN WILLIAMSON**

In the sixties pop groups such as Pink Floyd and Genesis used light to dramatic effect. At the back of the auditorium stage images are to a giant screen behind the band.

Swirling patterns of colour were created by a technique using coloured air that moved as it blew. Kaleidoscopes created symmetrical patterns of moving colour, while slide projectors provided images of needle flames or trails of speeded up car lights.

By today's standards the techniques used were primitive. Using computer graphics it is now possible

to integrate music and light images in a far more flexible and spectacular way.

Perhaps the state of the art in computer light shows is Colourspace, described by its writer Jeff Minter as a light synthesiser. On the 8 bit Atari computer Colourspace is very impressive, especially when it's linked to synthesiser music.

Although Psychedelic Journey is nowhere near as spectacular as Colourspace, it creates intriguing, hypnotic graphics that can be used to accompany your favourite music.

When you first run the program a series of symmetrical shapes are dis-

played on the screen. Colour rotation animation gives the illusion of movement. To change the display use the keys shown in Table 1 and to draw shapes use the keys in Table 2.

The best way to use the program is to experiment with the various options. Mix shapes, colours and rotation directions to create various effects.

The program is liberally sprinkled with help statements, so you should have no difficulty in working out how it works. Why not try changing the program to create other effects?

So turn the lights down low, the stereo up high and run the program to enjoy a Psychedelic Journey.

A	Switches on and off the automatic colour change sequence which changes the colours to a random value every few seconds. With this feature switched off you have to make your own colour changes.	D	Switches on a display list interrupt routine that puts lines of alternating colours on to the screen to give a dither effect. This is best seen if you change the colour to grey using Shift+C before pressing D.
B	Cycles through the 128 available background colours.	E	Erases the current display.
Shift+B	Performs the same operation as pressing B, but the colours cycle in the opposite order.	Shift+D	Increases the speed of colour rotation.
C	Changes the foreground colours in a random way.	+ and *	Decreases the speed of colour rotation.
Shift+C	Changes to a single colour.		Change the direction of colour rotation in and out. They should be used before drawing a new shape.

Table 1: Display control keys

1	Medium wide ratio - top left hand corner	6	Large wide ratio - centre of screen
2	Medium wide ratio - top right hand corner	7	Large standard ratio - full screen
3	Medium wide ratio - left bottom corner	8	Medium standard ratio - centre of screen.
4	Medium wide ratio - right bottom corner	9	Draws 15 small wide ratio shapes.
5	Medium wide ratio - centre of display.	0	Draws 15 small standard ratio shapes.

Table 2: Shape control keys

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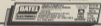
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More to follow
See Page 4

Edit those hidden disc sectors

BRUCE WOODLAND offers his disc sector editor

DISC editor allows you to examine and alter any disc sector. The contents are displayed on screen both as an indexed hexadecimal table, and as a *Minidump*. The latter is mainly useful in highlighting text content. A printer output is also provided.

The applications are limited only by your imagination and ingenuity. Minor changes to data and text of disc files is probably the most obvious serious application of the utility but there are many others.

Perhaps a few off-beat examples will stimulate your imagination. The *Disc 3.5* system is not wholly bug free and will accept quite illegal disc LIST filenames, thereafter refusing to allow them to be altered or loaded. Minor operations on the directory sectors (such as *355*) rapidly restore them.

For the unashamed cheat, try scanning the text of your disc based adventure games. You won't get all the answers, but you often find a fair number of clues.

The intellectual might try perusing sectors as an aid to learning how programs are indexed, numbered, collated, and so on. A lot of information on how your computer functions, and how to get the best from it can be found in this way.

Much of the program is concerned with presenting the disc data in a satisfactory screen and printer layout. The heart is the disc sector read and write subroutines which are quite

straight forward.

The CIO operating system call (Central Input/Output utility) is used and this carries out the disc read/writes when it is given the correct command codes and addresses. Since this is potentially very useful, these sections are especially well commented internally. The data is displayed in hexadecimal notation and user inputs (except the segment number) is expected in this form.

Hexadecimal is preferred by most machine code programmers and takes up less display space. Conversions between decimal and hexadecimal are handled by short machine code routines.

In first running the program you will be asked for a disc segment number. Provide this in normal decimal form from 1 to 719 for single density and up to 856 for enhanced. The sector content will be loaded into the string *SECTORS* and displayed on the screen.

A sector contains 128 bytes of data and the position of a particular byte in it can be determined from the index at top and sides of the sector dump.

This is hexadecimal with the figures on the left showing the high digit and the top ones the low. Once the sector has been displayed, you are provided with five menu options - View, Edit, Write, Print and Exit.

The View option allows another sector to be displayed and you are

allowed the same options that you have just used.

If you select the Edit option you are prompted to supply the indexing code of the byte concerned. By simply cross referencing the inverse number on the left row with the inverse letter on the top row to give a hexadecimal code any byte displayed on the screen can be altered.

Once this code is provided the cursor will move to the selected byte and you simply supply the new value (in hexadecimal) and press Return. You may make as many changes as necessary before returning to the menu.

The changes are reflected in the *ASCII* display and the sector storage string but not on the disc so don't be afraid to experiment as no damage can be done to any disc unless you actually choose the write option and write faulty data to the disc.

The Write option causes the data displayed on screen to be written back to the sector concerned. You will be asked to verify this request. Failure to do so simply returns control to the menu. Be very careful about writing anything to the disc and make sure that you first have a backup copy.

The Print option is used to output sector data to a printer. The format of the data table is better than on screen

Turn to Page 49 P

Your HINTS & TIPS

The Price Of Magik

HERE is a list that should help you if you are having problems with *The Price Of Magik*. It contains some spells you need to help you complete the game.

FOCUS	SPELL
Crystal ball	ESP
Grimoire	MAD
Periculous	ODD
Priars	RAM
Brooms	FLY
Trumpet	ROM
Foldback lens	SEE
Ashes	ZAP
Stuff	HYP
Cross	DET
Chandle	SPY
Axe	KL
Wheel	DED
Box	IBM
Claw	SLM
Valerian	FIX
Focus	SPELL
Mirror	LITORN

— David McWah, *Pink*

Fight Night

If you press Escape and keep it pressed you will get slow motion boxing. In the main event remember to get your boxer out immediately and try to push your opponent back with a string of blows.

This is essential because when they do their characteristic blow you need enough ground to retreat or you'll be slaughtered. You can

tell when they are about to use the super punches as their movement slows down. When you see this jerk your joystick back and then forwards again to recover your ground.

The only way to win is not to worry about defense. Just get in there and land a quick succession there and land a head and body — or punch to the head and body — so go out there and crack some skulls. — Stephen Denslow, Hitchin, Hertfordshire

Game

Spellbound

HERE are some tips for *Spellbound* by Mastertronic.

- To get past the wall on the second floor collect the trumpet and the oil horn from the last screen on the first floor. Go to the wall, summon Grand and command him to help. He will knock over the wall.

- To get past the tower collect the jumps of stone from either side of the wall once it has been knocked down. Position them in front of the tower and you will be able to jump over it.

- The crystal ball can be used to locate people except when you are in the lift.

- Tell Theo to sleep or he will die.
- You need the red feather and the pointer going from the giant in the basement to cast the *Formatus Protection*.

- Stand in the sticky liquid on the ground floor to cast the *Armsatus Phantonus* spell.

- Go to the last screen of the ground floor and pick up the laser and summon Lady Rosmar. Give her the laser and command her to help. She will blow a hole in the wall to reveal a secret tunnel.

— Paul Shaw, Royston, Essex

Ninja

TO complete the game you have to search all six rooms of the first level before moving up a level. There are six idols to collect. If you encounter any thugs or karatekas you can kill them by continuous high kicks — so they will just walk into them. Any evil ninjas can be killed by throwing three stars at them — much safer than fighting them.

Once you have all six idols, a secret door to Akuma's chamber will appear in the grey wall rows. Take three stars with you and kill the four karatekas using high kicks, then throw your stars at the ninja.

Collect the idol and go back down to the Tank by the sea where you will be proclaimed the winner. — Michael A. West, Caversham, Wiltshire

Gauntlet

WHEN you are playing *Gauntlet* always select the two player option so that if one of your players is about to die simply press the button on the player two joystick and the second player will appear. If this player is about to die press if the player one fire button. By alternating joysticks you can prolong the game play. — Stephen Denslow, Hitchin, Hertfordshire

as there is more room for an elegant layout. As a number of Atari codes represent actual commands to the printer, only text, numbers and certain symbols are presented in the Atari printer dump.

The Exit option simply returns you to Basic.

The program was written on an Atari 800RL with 10MB disc drive but it should function perfectly well on all Atari 8-bit disc systems. Similarly, the printer dump was written for the 1000 printer but should give suitable results with any Atari compatible, 60 column minimum printer.

```

1 REM *****
2 REM *****
3 REM *****
4 REM *****
5 REM *****
6 REM *****
7 REM *****
8 REM *****
9 REM *****
10 REM *****
11 REM *****
12 REM *****
13 REM *****
14 REM *****
15 REM *****
16 REM *****
17 REM *****
18 REM *****
19 REM *****
20 REM *****
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87 REM *****
88 REM *****
89 REM *****
90 REM *****
91 REM *****
92 REM *****
93 REM *****
94 REM *****
95 REM *****
96 REM *****
97 REM *****
98 REM *****
99 REM *****
100 REM *****

```

MAIN VARIABLES

SECTORS	Stores data read from a disc sector and destined for storage on it.
HDB	Holds the hexadecimal value of operand in decimal/hex conversions.
DEC	The decimal counterpart of HDB.
HE	A general purpose string used in configuring data and text for display.
HEE	A transient store used in configuring hexadecimal figures.
SPCH	A blank string used to erase old prompts in the main/command screen area.
CODE	Holds the code for the disc handling CG call.
HDX	A store for machine code for hexadecimal to decimal conversion.
DHE	A repository for code for decimal to hexadecimal conversions.
CO	The address in ram of CODE.
SE	The address in ram of sector store (SECTORS).

```

1000 PEEK 100,1:GOTO 10000:GOTO 10000
1001 PEEK 100,2:GOTO 10000:GOTO 10000
1002 REM *****
1003 PEEK 100,3:GOTO 10000:GOTO 10000
1004 PEEK 100,4:GOTO 10000:GOTO 10000
1005 PEEK 100,5:GOTO 10000:GOTO 10000
1006 PEEK 100,6:GOTO 10000:GOTO 10000
1007 PEEK 100,7:GOTO 10000:GOTO 10000
1008 PEEK 100,8:GOTO 10000:GOTO 10000
1009 PEEK 100,9:GOTO 10000:GOTO 10000
1010 PEEK 100,10:GOTO 10000:GOTO 10000
1011 PEEK 100,11:GOTO 10000:GOTO 10000
1012 PEEK 100,12:GOTO 10000:GOTO 10000
1013 PEEK 100,13:GOTO 10000:GOTO 10000
1014 PEEK 100,14:GOTO 10000:GOTO 10000
1015 PEEK 100,15:GOTO 10000:GOTO 10000
1016 PEEK 100,16:GOTO 10000:GOTO 10000
1017 PEEK 100,17:GOTO 10000:GOTO 10000
1018 PEEK 100,18:GOTO 10000:GOTO 10000
1019 PEEK 100,19:GOTO 10000:GOTO 10000
1020 PEEK 100,20:GOTO 10000:GOTO 10000
1021 PEEK 100,21:GOTO 10000:GOTO 10000
1022 PEEK 100,22:GOTO 10000:GOTO 10000
1023 PEEK 100,23:GOTO 10000:GOTO 10000
1024 PEEK 100,24:GOTO 10000:GOTO 10000
1025 PEEK 100,25:GOTO 10000:GOTO 10000
1026 PEEK 100,26:GOTO 10000:GOTO 10000
1027 PEEK 100,27:GOTO 10000:GOTO 10000
1028 PEEK 100,28:GOTO 10000:GOTO 10000
1029 PEEK 100,29:GOTO 10000:GOTO 10000
1030 PEEK 100,30:GOTO 10000:GOTO 10000
1031 PEEK 100,31:GOTO 10000:GOTO 10000
1032 PEEK 100,32:GOTO 10000:GOTO 10000
1033 PEEK 100,33:GOTO 10000:GOTO 10000
1034 PEEK 100,34:GOTO 10000:GOTO 10000
1035 PEEK 100,35:GOTO 10000:GOTO 10000
1036 PEEK 100,36:GOTO 10000:GOTO 10000
1037 PEEK 100,37:GOTO 10000:GOTO 10000
1038 PEEK 100,38:GOTO 10000:GOTO 10000
1039 PEEK 100,39:GOTO 10000:GOTO 10000
1040 PEEK 100,40:GOTO 10000:GOTO 10000
1041 PEEK 100,41:GOTO 10000:GOTO 10000
1042 PEEK 100,42:GOTO 10000:GOTO 10000
1043 PEEK 100,43:GOTO 10000:GOTO 10000
1044 PEEK 100,44:GOTO 10000:GOTO 10000
1045 PEEK 100,45:GOTO 10000:GOTO 10000
1046 PEEK 100,46:GOTO 10000:GOTO 10000
1047 PEEK 100,47:GOTO 10000:GOTO 10000
1048 PEEK 100,48:GOTO 10000:GOTO 10000
1049 PEEK 100,49:GOTO 10000:GOTO 10000
1050 PEEK 100,50:GOTO 10000:GOTO 10000
1051 PEEK 100,51:GOTO 10000:GOTO 10000
1052 PEEK 100,52:GOTO 10000:GOTO 10000
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1059 PEEK 100,59:GOTO 10000:GOTO 10000
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1061 PEEK 100,61:GOTO 10000:GOTO 10000
1062 PEEK 100,62:GOTO 10000:GOTO 10000
1063 PEEK 100,63:GOTO 10000:GOTO 10000
1064 PEEK 100,64:GOTO 10000:GOTO 10000
1065 PEEK 100,65:GOTO 10000:GOTO 10000
1066 PEEK 100,66:GOTO 10000:GOTO 10000
1067 PEEK 100,67:GOTO 10000:GOTO 10000
1068 PEEK 100,68:GOTO 10000:GOTO 10000
1069 PEEK 100,69:GOTO 10000:GOTO 10000
1070 PEEK 100,70:GOTO 10000:GOTO 10000
1071 PEEK 100,71:GOTO 10000:GOTO 10000
1072 PEEK 100,72:GOTO 10000:GOTO 10000
1073 PEEK 100,73:GOTO 10000:GOTO 10000
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1077 PEEK 100,77:GOTO 10000:GOTO 10000
1078 PEEK 100,78:GOTO 10000:GOTO 10000
1079 PEEK 100,79:GOTO 10000:GOTO 10000
1080 PEEK 100,80:GOTO 10000:GOTO 10000
1081 PEEK 100,81:GOTO 10000:GOTO 10000
1082 PEEK 100,82:GOTO 10000:GOTO 10000
1083 PEEK 100,83:GOTO 10000:GOTO 10000
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1089 PEEK 100,89:GOTO 10000:GOTO 10000
1090 PEEK 100,90:GOTO 10000:GOTO 10000
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1095 PEEK 100,95:GOTO 10000:GOTO 10000
1096 PEEK 100,96:GOTO 10000:GOTO 10000
1097 PEEK 100,97:GOTO 10000:GOTO 10000
1098 PEEK 100,98:GOTO 10000:GOTO 10000
1099 PEEK 100,99:GOTO 10000:GOTO 10000
1100 PEEK 100,100:GOTO 10000:GOTO 10000

```

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1101 PEEK 100,101:GOTO 10000:GOTO 10000
1102 PEEK 100,102:GOTO 10000:GOTO 10000
1103 PEEK 100,103:GOTO 10000:GOTO 10000
1104 PEEK 100,104:GOTO 10000:GOTO 10000
1105 PEEK 100,105:GOTO 10000:GOTO 10000
1106 PEEK 100,106:GOTO 10000:GOTO 10000
1107 PEEK 100,107:GOTO 10000:GOTO 10000
1108 PEEK 100,108:GOTO 10000:GOTO 10000
1109 PEEK 100,109:GOTO 10000:GOTO 10000
1110 PEEK 100,110:GOTO 10000:GOTO 10000
1111 PEEK 100,111:GOTO 10000:GOTO 10000
1112 PEEK 100,112:GOTO 10000:GOTO 10000
1113 PEEK 100,113:GOTO 10000:GOTO 10000
1114 PEEK 100,114:GOTO 10000:GOTO 10000
1115 PEEK 100,115:GOTO 10000:GOTO 10000
1116 PEEK 100,116:GOTO 10000:GOTO 10000
1117 PEEK 100,117:GOTO 10000:GOTO 10000
1118 PEEK 100,118:GOTO 10000:GOTO 10000
1119 PEEK 100,119:GOTO 10000:GOTO 10000
1120 PEEK 100,120:GOTO 10000:GOTO 10000
1121 PEEK 100,121:GOTO 10000:GOTO 10000
1122 PEEK 100,122:GOTO 10000:GOTO 10000
1123 PEEK 100,123:GOTO 10000:GOTO 10000
1124 PEEK 100,124:GOTO 10000:GOTO 10000
1125 PEEK 100,125:GOTO 10000:GOTO 10000
1126 PEEK 100,126:GOTO 10000:GOTO 10000
1127 PEEK 100,127:GOTO 10000:GOTO 10000
1128 PEEK 100,128:GOTO 10000:GOTO 10000
1129 PEEK 100,129:GOTO 10000:GOTO 10000
1130 PEEK 100,130:GOTO 10000:GOTO 10000
1131 PEEK 100,131:GOTO 10000:GOTO 10000
1132 PEEK 100,132:GOTO 10000:GOTO 10000
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1136 PEEK 100,136:GOTO 10000:GOTO 10000
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1142 PEEK 100,142:GOTO 10000:GOTO 10000
1143 PEEK 100,143:GOTO 10000:GOTO 10000
1144 PEEK 100,144:GOTO 10000:GOTO 10000
1145 PEEK 100,145:GOTO 10000:GOTO 10000
1146 PEEK 100,146:GOTO 10000:GOTO 10000
1147 PEEK 100,147:GOTO 10000:GOTO 10000
1148 PEEK 100,148:GOTO 10000:GOTO 10000
1149 PEEK 100,149:GOTO 10000:GOTO 10000
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1151 PEEK 100,151:GOTO 10000:GOTO 10000
1152 PEEK 100,152:GOTO 10000:GOTO 10000
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1154 PEEK 100,154:GOTO 10000:GOTO 10000
1155 PEEK 100,155:GOTO 10000:GOTO 10000
1156 PEEK 100,156:GOTO 10000:GOTO 10000
1157 PEEK 100,157:GOTO 10000:GOTO 10000
1158 PEEK 100,158:GOTO 10000:GOTO 10000
1159 PEEK 100,159:GOTO 10000:GOTO 10000
1160 PEEK 100,160:GOTO 10000:GOTO 10000
1161 PEEK 100,161:GOTO 10000:GOTO 10000
1162 PEEK 100,162:GOTO 10000:GOTO 10000
1163 PEEK 100,163:GOTO 10000:GOTO 10000
1164 PEEK 100,164:GOTO 10000:GOTO 10000
1165 PEEK 100,165:GOTO 10000:GOTO 10000
1166 PEEK 100,166:GOTO 10000:GOTO 10000
1167 PEEK 100,167:GOTO 10000:GOTO 10000
1168 PEEK 100,168:GOTO 10000:GOTO 10000
1169 PEEK 100,169:GOTO 10000:GOTO 10000
1170 PEEK 100,170:GOTO 10000:GOTO 10000
1171 PEEK 100,171:GOTO 10000:GOTO 10000
1172 PEEK 100,172:GOTO 10000:GOTO 10000
1173 PEEK 100,173:GOTO 10000:GOTO 10000
1174 PEEK 100,174:GOTO 10000:GOTO 10000
1175 PEEK 100,175:GOTO 10000:GOTO 10000
1176 PEEK 100,176:GOTO 10000:GOTO 10000
1177 PEEK 100,177:GOTO 10000:GOTO 10000
1178 PEEK 100,178:GOTO 10000:GOTO 10000
1179 PEEK 100,179:GOTO 10000:GOTO 10000
1180 PEEK 100,180:GOTO 10000:GOTO 10000
1181 PEEK 100,181:GOTO 10000:GOTO 10000
1182 PEEK 100,182:GOTO 10000:GOTO 10000
1183 PEEK 100,183:GOTO 10000:GOTO 10000
1184 PEEK 100,184:GOTO 10000:GOTO 10000
1185 PEEK 100,185:GOTO 10000:GOTO 10000
1186 PEEK 100,186:GOTO 10000:GOTO 10000
1187 PEEK 100,187:GOTO 10000:GOTO 10000
1188 PEEK 100,188:GOTO 10000:GOTO 10000
1189 PEEK 100,189:GOTO 10000:GOTO 10000
1190 PEEK 100,190:GOTO 10000:GOTO 10000
1191 PEEK 100,191:GOTO 10000:GOTO 10000
1192 PEEK 100,192:GOTO 10000:GOTO 10000
1193 PEEK 100,193:GOTO 10000:GOTO 10000
1194 PEEK 100,194:GOTO 10000:GOTO 10000
1195 PEEK 100,195:GOTO 10000:GOTO 10000
1196 PEEK 100,196:GOTO 10000:GOTO 10000
1197 PEEK 100,197:GOTO 10000:GOTO 10000
1198 PEEK 100,198:GOTO 10000:GOTO 10000
1199 PEEK 100,199:GOTO 10000:GOTO 10000
1200 PEEK 100,200:GOTO 10000:GOTO 10000

```


Getting a start

I AME just bought one of the bargain price 80001 computers after having owned a Dragon 32 for years. Overall I'm really impressed — especially by the games — but I'm having a couple of problems with the string handling facilities.

I'd like to write a small program to store names and telephone numbers, but I can't seem to get the string array system to work. I have dimensioned NAMES and PHONES for 50 elements each, but when I try to access part of one of them — such as NAMES(5) — I seem to get various different positions of elements out.

Also, does Atari have anything like the MID, LEFT and RIGHT commands on other computers? All I seem to be able to find is the LEN command.

I hope that you will be able to help as I can't seem to start my program until I work it out. — J. Grant, Llanfairfach, S. Wales.

▶ Atari Basic doesn't support string arrays in the way that you are used to. First, the DIM statement when applied to a string specifies the maximum length of a single string, not the number of elements to be used for a string array. Thus DIM NAMES(50) allows for up to 50 characters within the string NAMES, not 50 separate strings. The maximum length allowed, for one string is 256, or 25768 bytes.

Although there are no string arrays as such, you may split up a single string into many smaller portions known as substrings.

PRINT NAMES(1,5) would print out the first to fifth characters of NAMES (i.e. just the same manner as LEFT\$NAMES(5)) would have done on the Dragon.

PRINT NAMES(15,20) would print out the portion of NAMES starting at the tenth character and finishing at the twentieth (in a similar way to MID\$ on the Dragon).

PRINT NAMES(50) would print the rest of NAMES starting with the 50th character. By combining this with the LEN function you can obtain the equivalent of the RIGHTS command. So PRINT\$LEN(NAMES)-15) would return the final 35 characters of the string.

With all of this at your disposal it is relatively simple to emulate a string array by splitting a long string into a set of substrings. For example, characters 1 to 40 could be your first element, 41 to 80 the second element and so on. Don't forget to DIM the string beforehand, and fill it up with

SOFTWARE Solutions

Your programming problems solved by ANDRE WILLEY

blanks, for an array of 5 elements, each of up to 2568 characters; you would use:

```
10 DIM NAMES(5)
20 FOR INDEX(1) TO INDEX(5) = 1
30 NAMES(1) = "" : NAMES(2) = ""
```

This is a quick way to initialise a string to spaces and element 5 can now easily be accessed with NAMES(5)+MAX\$(0,MAX\$(5)). As an example, the following program will input 10 strings and then print them back out again in reverse order.

```
10 FOR INDEX(1) TO 10: INPUT S1
20 NAMES(1) = S1 : NAMES(2) = S2 : S = S1 + S2
30 S1 = S2 : S2 = S : S = S1 + S2
40 S1 = S2 : S2 = S : S = S1 + S2
50 PRINT "STRINGS REVERSE" : GOTO 10
60 NAMES(1) = S1 : S1 = S2 : S2 = S3
70 S1 = S2 : S2 = S3 : S3 = S4
80 PRINT "STRINGS" : GOTO 10
90 NEXT INDEX
100 END
```

It may look a little complicated to start with, but since you've got the hang of it you can forget the way the string system works and just use the formulae in the same manner as you would a normal string array.

Names on call

I AM a self-employed salesman and have to refer to all clients constantly. I have just bought an Atari 80001 complete with 7080 disc drive and cassette recorder. Could you tell me if there is a program available to enable me to list and call up names, addresses and accounts of customers on file.

Also, can I buy a disc program to convert pre-recorded cassette games

to disc, as we all know that by the time the cassette has loaded you've forgotten what the games were. — Mr J. Sayers, Warden Bay, Kent.

▶ There are a number of ways to store the information you require. You could always use a full accounts package, but probably more useful for the purposes you outline would be a good database program.

The database module from Mini Office II would probably suit your needs and also give you other useful features for your business — word processing, mail merging and so on.

There are a number of more powerful but more expensive databases available and the best is probably SuperFile, from Synapse Software. Although this is an American product it can be easily obtained from Atari software importers such as Software Express.

Your second question is less easy to answer. Firstly, to copy a tape or to disc is not strictly legal, even if you own the original. Also, most commercial tapes use various systems to prevent copying of any type including transferring to disc.

You would do far better by buying your software on disc rather than tape in the first place, or contact the companies concerned for a disc version if you already have the tape.

There are many so-called backup programs advertised, but these aren't able to copy most of the protected titles available — besides breaking the copyright laws.

Are you having problems getting your programs to work? Write to: Software Solutions, Atari User, Europe House, 85, Cheater Road, Basingstoke, Hants RG7 5NY.

We will answer as many as we can within the pages of Atari User but, unfortunately we cannot give personal replies.

Take off with MicroLink

The British Airline Pilots Association - (BALPA) - has marked its golden jubilee by joining MicroLink.

Trade union for 8,000 commercial pilots, BALPA negotiates with 30 UK airlines and a similar number of foreign flag carriers who employ its members.

"We celebrate our 50th birthday this year, so it seemed an appropriate time for us to log on to the new information technology", said a spokeswoman. "Until now we've depended on the telephone - our office didn't even have tele."

"A very high proportion of our members are computer and communications enthusiasts when they're not flying. They'll be happy now. MicroLink has provided facilities for two-way electronic messaging between themselves and BALPA.

"Apart from improving contact with our members, we'll be able to use electronic mail and telex to communicate with airlines and other pilot associations throughout the world."

Legal advice goes online

MICROLINK has scored yet another world first by taking on board a unique electronic legal and financial service for firms and individuals.

Insight provides round-the-clock legal advice, help with tax and VAT problems, and insurance cover against the cost of litigation.

It serves a wide range of personal and business needs resulting from minor problems like disputes with neighbours up to full scale Customs &

Excise investigations.

A team of 50 solicitors and barristers provides a 24-hour legal advisory service. Any legal problem can be dealt with either by electronic mail or telephone. Full written advice on complicated matters is provided within 24 hours.

There is a legal fees insurance package covering solicitors' and barristers' fees, court costs, witness expenses, and opponents costs in certain cases.

Personal financial advice

- on banking, pensions, insurance and tax - is offered during office hours and available in most cases through a local number. Written reports can be provided within 24 hours and consultants are available for personal visits.

Business membership of Insight also includes a wide range of special assistance for companies, covering such areas as staff insurance, tax, cash flow forecasting, pension scheme analysis and employee benefits.

Companies can also buy an Inland Revenue and VAT protection service. In the event of Inland tax, PAYE or VAT investigation.

Company accountants can draw on advice from former Inland Revenue and Customs & Excise inspectors and get professional representation at hearings and tribunals. Up to £25,000 towards professional fees for preparing a case is included in the protection.

Two brand new Insight services will benefit from the immediacy of MicroLink communications. The first provides on-line mortgage quotations and information for property buyers.

The other supplies details about commercial finance, venture capital and other forms of commercial funding for established businesses and start up schemes alike.

Insight, operated by Investment Marketing Services, is an electronic mail extension of the IFFC legal and tax advisory service which has been operating for seven years and has half a million UK subscribers.

Calling all subscribers

The latest technological advance on MicroLink allows subscribers to enjoy all the communications benefits of radiocopying for as little as 30p a day.

Thanks to a link-up with British Telecom's national radiocopying service, it means that MicroLink electronic mail and telex transmissions need no longer stay unattended reaching their destination. And users won't be put to the trouble of accessing their mailbox when it's empty.

As soon as an Email or telex message arrives the radiocopying service is automatically alerted and the subscriber gets a "beeper" call.

The same procedure takes place in the opposite direction - messages to other people can't be ignored or overlooked if the addressee carries a radiocopying device.

There are also all the other advantages of radiocopying - like keeping users constantly in touch with their base.

CONSORTIUM FOR COMMS

A UNIQUE association of community groups involved in computing has gone on-line with MicroLink.

Hackney Info Tech Consortium is a non-profit company formed by 45 adult education institutes, training schemes and local voluntary organisations in the London borough.

It supports member

organisations - including the City of London Polytechnic - that use computers for administration, maintaining databases, and courses in programming, business computing, design and desktop publishing.

Consortium executive director David Chatham said: "MicroLink will help our assessment of socially

useful applications of new technology - particularly the potential for development of a local online community database.

"We envisage starting with a directory of education, training and leisure information then gradually allowing local organisations, co-operatives and trade unions to set up closed user groups".

Error reports are not always correct

I *Advent* just spent several hours typing in the program *Bouncer* from the June 1987 issue of *Amiga User* and was very disappointed when an error appeared at line 168.

I checked and rechecked this line and found no error in my typing, so I am writing in desperation to ask if there is a mistake in the magazine.

Also in the *Monobags* program from the same issue I found an error in the listing. The *DIR* checks out perfectly and so I was very surprised when I got an error on line 1820.

When I checked this line I discovered that the line reads:

```
11...1100 1110
```

This confused me as there is no line 1820. So I did the next logical step and changed it to read:

```
11...1100 1100
```

To my pleasure I found that this cured my problem. — **Wayne Page, Kent.**

■ There are no mistakes in the listing for *Bouncer*, so it appears that you have made a typing error. Remember that even though the error message states line 1680 the fault may be somewhere else in the program listing.

Once you have checked that line again and made sure that you have typed the control characters in the print statement correctly check that the variables in the line are receiving the

correct values from the program as it executes.

The variables to check are *H4*, *H8*, *R*, and *N8* as one of these could be passing the wrong value and thus cause the error. So look at references to these in other lines.

Your second point concerning *Monobags* is the same issue is correct. Unfortunately line 1820 was missed out, but as it was only a *RDM* statement it does not affect the running of the program providing you make the change you mention.

Printing at last

I *Drive* an Atari 1300X and disc drive and an Atari 1050 graphics printer in the July 1987 issue of *Amiga User* I was pleased to see the *Jump 19* printer utility for my printer.

I received great jubilation because for a long time I have found that all the printer utilities on the market ignore my trusty printer. Now I will be able to produce some wonderful prints thanks to the superb program you printed.

I would also like to say

that *Mini Office* is a splendid piece of software. Since buying it I have hardly left it alone and coupled with the fact that it fully supports my 1024 printer and only costs £19.99 it is a superb bargain. — **Keith Pattison, Yorkshire.**

Easier listings

My friends and I all use the *Get it Right!* when we type in your listings and find that we have no problems.

Admittedly a novice may have a little problem at first, but with practice he will soon see it expertly.

So thank you for a great utility that has made my task of typing in your listings a lot easier. — **Richard Black, Glasgow.**

A pit problem

In the May 1987 issue of *Amiga User* there were some tips from Neil Richardson for *Spellbound* by Mastertronics. I found that some of his instructions were not

quite right.

The correct procedure is to go to to the secret tunnel entrance on the ground floor, summon *Lady Rosemar* and then command her to help. She will then blow the doorway of the secret tunnel open but unfortunately I have not figured how to get past the pit on the ground floor. So if any readers know how to get past this could they please help? — **Paul Moberly, Gosport.**

What a bounce

I *AMM* just typed in the game *Spender* from the June 1987 issue of *Amiga User* and found to my horror that when the *Amiga* menu bounced up and down the screen he leaves a trail of bounced letters! — **Tom.**

My computer is an old 600 and I use an 870 disc drive. Is there an error in the listing or does the error lie within my equipment? — **A.T. Allen, Essex.**

■ Unfortunately the program is written for X1000 computers, and due to certain differences in the computers operating systems the program will not run correctly on old ones with the revision A operating system.

Synthesiser components

In the July 1987 issue of *Amiga User* you published an article showing how to make a speech synthesiser. I decided to build this particular gadget and set about ordering the components

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ERROR LOADING PROBLEM SOLVED

I READ the mailing section of *Amiga User* every month and find it very interesting. But I found an error in the reply to Mr. Juan Proust from the June 1987 issue about the *LOADERR* loading problems.

Line 21 indicates that he is attempting to *LOAD* a file that has been saved under the *LIST"0"* or *SAME"0"* command. So if

even tries to *ENTER"0"* or *RAW"0"* the program he used he may well get the file back.

Also I was wondering if it is possible to use the international character set on the *2000X* within the *Mini Office* if word processor as I find this would be very useful in my business. — **Bob Anthony, Surrey.**

■ It is possible to use the

international character set from *Mini Office* it.

Look in your printer manual for the appropriate printer codes for the set you require and then go to the printer set up menu on *Mini Office* it and enter the code string.

For example, on an Epson compatible printer 27, 82, 2 selects the English character set.

from *Magpie's Electronics Supplies*.

I spotted that two of the components are not listed on the parts required table. I know a little about electronics and figured out that the item BR1 is a bridge rectifier but which one to order is still a mystery.

The second component is X1, which is a crystal of some description. Could you please print the component codes and the Magpie's order codes. — **Graham Harding, Cleveland.**

■ You are correct in your choice of component. BR1 is a Bridge Rectifier. Its component code is WS08, its Magpie order code is QJ370 and it costs 25p. The component X1 is a 3.2 MHz crystal. Order number F9867 costing £1.40.

Pictures appreciated

THANKS for the introduction of the Palette page in *Atari User*. It shows what Atari computers (and what those models can do).

The pictures highlight the availability of a multitude of colours and the superb resolution of the Atari machines. I especially liked the *Blotto* and the dog picture in the June 1987 issue. — **Andrew Howelwyn, Ebbw Vale, Gwent.**

No Snoopy

COULD you tell me if Snoopy and the Red Baron,

ATARI USER Mailbag

will welcome letters from readers — about your experiences using the Atari mouse, about tips you would like to pass on to other users ... and about what you would like to see in future issues.

The address to write to is:

**Mailbag Editor
Atari User
Europe House
66 Chester Road
Hazel Grove
Stockport SK7 5NY**

originally written for the 2600 game console, is available for the 2600 range of computers. Could you also tell me if the game *Shao-Lin Kung-Fu* is available for the X68000. — **Bernard Hatten, Liverpool.**

■ The answer to both of your questions is very simple no. Although many titles for the 2600 and the early XGS have been converted for the X68000 computers unfortunately the games you mentioned haven't.

Why the error?

I FRASED in the listing for *Dump 15* (from the July 1987 issue of *Atari User*) and when I ran the program I got an error at line 125. Could you please explain to me the problem as my listing according to your Oct 87 issue is correct. Is there an

error in the listing? — **R.J. Chandler, Manningtree, Essex.**

■ The listing of *Dump 15* is correct and you will find that line 125 is looking at the keyboard for you to enter 'Z'. This variable holds the name of the file you are loading and it must be entered in this form.

D:\filename.extension

Filename can be up to eight characters long and the extension up to three. They must both be in capital letters and if the same is not entered in this form then an error will occur at line 125.

Wider spreadsheets

I RECENTLY bought *Mini Office II* and I am amazed at its capabilities.

It is possible to create a

spreadsheet with more than 40 characters in width so I am wondering if the Atari 1020 printer, which is fully compatible with this program, will accommodate 80 character printouts.

If it doesn't will I have to buy an Epson compatible printer to do so. — **M. Fairburn, Harrogate, North Yorks.**

■ The Atari 1020 is fully compatible with *Mini Office II* in all ways and so it will print out the spreadsheet 80 characters wide.

If the width of the spreadsheet exceeds this, *Mini Office II* splits it into parts so that the printer can still handle it.

Printer software

I WANT to buy a dot matrix printer and I'm quite awayed towards the Star 60-70.

I want to be able to produce a newsletter which includes graphics, patterned borders and various text styles and sizes. Is my Atari 5 bit computer capable of this?

Also, I have looked at the bewildering array of printer software available and I am totally confused.

I have a touch table and AtariArt software, and was wondering if there is any way I could utilize it to create patterns to stamp to the printer. — **D. Muir, Paisham, Kent.**

■ Let's start with software. Print Shop from Broderbund Software will allow you to create a multitude of different borders and gives a large choice of text and text sizes.

Unfortunately it will not dump AtariArt patterns, but you have the option to create certain graphics within Print Shop using the touch tablet or joystick.

These can then be printed in various sizes and in various positions on the paper.

If you use this package you should find your 5 bit

IN SEARCH OF A CHARACTER

All the Oct 87 listing in the August 1986 issue of *Atari User* I am having problems finding two of the characters — an upward pointing arrow coming to the left on a black background and a similar arrow without the black background.

Could you please tell me how to get these characters

and what do they do within the program? — **A. Shortell, Cheshire.**

■ The first character is obtained by pressing inverse Video which is at the bottom right button of the keyboard, then press Escape and finally the Control and 3 together. The second is obtained by pressing

Escape followed by Control and Clear together. When you run the program the first character will make a beep sound when the character is encountered.

The second character is the clear screen character and when you run the program it simply clears the screen.

Lose yourself in the magical world of Kerovnia!

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