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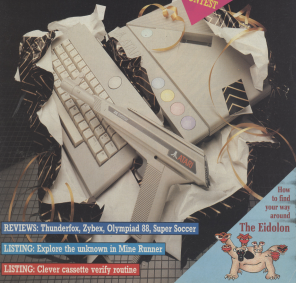
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Vol. 4 No. 1 May 1988

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All major listings in this issue are accompanied by checksums to help overcome typing mistakes. For full details of how they work, see the article on page 33 of the November 1987 issue of Atari User.

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Cashing in on price rises

THE Atari 8 bit could be heading for a boom — courtesy of price increases which have hit the ST range.

While Atari has consistently cut production costs and pared its own margins, it has now announced that it can no longer absorb the financial difficulties caused by the world shortage of memory chips.

The shortage stems from Japanese restrictions on chip production — prompted by trade disputes with the States.

And particularly affected are dynamic random access memories (DRAM) which are at the core of more powerful computers — and for users this translates as the higher the power, the higher the price.

In turn, this means that the \$20 and 1640 STs have been hit by a hefty £180

each. Trade sources are positive this will boost 8 bit sales.

"We expect the recent price increase on the ST to make the Atari games machines a more attractive proposition", one leading dealer told Atari User.

"After all, you can now buy a complete Atari games system for little more than the amount of the price increase".

Atari has been trying for some months to buy out a chip manufacturing company "so that we are not subject to the whims of third party suppliers" according to one company spokesman.

And should the venture prove successful, prices could again fall.

But in the interim, the 8 bit market seems set for a resurgence.



Joystick is going a bomb...

WHEN is a joystick not a joystick? When it's a hand grenade of course. And that's the problem with *Robot's* latest offering for the Atari 8 bit market.

The unusual design of the Terminator joystick has already caused security officers at Heathrow airport to refuse to let the device on board an aircraft.

"The trouble is that the Terminator is too realistic", said a spokesman for Ropec 80-887 4473.

"Airport authorities at Heathrow called us and asked if we would warn our customers not to try and take the grenade-shaped device on board planes as hand luggage.

"Rightly they are concerned about the possibility of someone removing the cables from the joystick and disassembling the flight crew with what looks for all the world like a real hand grenade".

Robot is now embarking on a battle with all new deliveries of the Terminator joystick warning customers not to try to take it on board as hand luggage.

Price £19.95.

Silica backing for 8 bit Atari

A MASSIVE commitment to the 8 bit games market has been made by Silica Shop with the purchase of 50,000 units.

"The reputation was built on the Atari 8 bit and we have no plans of dropping it in favour of the ST", said John Hambly, Silica's buying controller.

"We have a warehouse full of software for the machine with a tremendous selection of both old and new titles", he said.

The announcement from Silica comes as Atari is trying to set up a dealer network of 20 shops to promote greater support for the 8 bit market.

Plans to introduce new software display shelving in selected dealers stores are at an early stage, but some retailers are treating the new initiative with a little scepticism.

Harry Neale of Red Bat Software said: "It is a great idea if it works. Had this happened about two years ago then the Atari 8 bit computer may have had a higher profile in the market place than it has today".

Conversion

AFTER a successful debut on the Commodore 64 and Spectrum, *Metabius* — from Huxman (0393 933988) — is being converted for the Atari 8 bit.

"Originality pays hand-some dividends", said managing director Andrew Huxman. "We've had a number of approaches for the various conversion rights".

Gadgets Goulding 'joins up'

REGULAR contributor Len Goulding has landed a plum job — thanks to his articles in *Atari User*.

Len, who has been writing for the magazine since its early days, is perhaps best known for his gadgets series.

And it was this that caught the eye of Carl Morse, who is the science coordinator for American forces in Germany and provides materials for USAF schools throughout Europe.

The 147 schools, with thousands of pupils of all

ages, all have computers installed — 3,800 of them.

Carl was so impressed by Len's articles that he's signed him up for a contract to assist school teachers with science-related projects in the classroom.

Regular readers need not worry however, Len will still be contributing to *Atari User* and has a host of gadgets in the pipeline.

X marks comms blackspot

COMMUNICATIONS problems caused by British Telecom's new System X appear to be on the increase.

Difficulties arise when the new digital system is connected to the older analogue exchanges. To make the two compatible BT has had to attenuate the signal.

One outcome of the drop in level is that modems have difficulty in maintaining the line once logged on.

Rob Flemming of Pace Micro Technology said: "We have had a number of complaints from Atari users who are using our Nightingale modems. After a good deal of research, as well as a large number of expensive phone calls, BT admitted to causing the fault".

According to Flemming,

communication difficulties appear to get worse when dialling from one System X exchange to another.

"Not only are outgoing lines attenuated, but incoming lines as well. Between two new exchanges the loss in signal level is dramatic", he said.

A spokesman for British Telecom told Atari User: "We are aware of the difficulties being caused by our modernisation program. Once System X is in use nationwide it will actually improve data transmission and reception.

"To overcome the immediate problems, Atari users in a System X exchange can request British Telecom to undertake the line".

Loading chart leader

THE latest budget title from Atlantis - League Challenge - rocketed straight to the top of the Gallup Chart. However, as several readers have pointed out, the loading instructions on the play card are incorrect - instead of holding down the Start and Option keys, it's only necessary to hold down the Start key.

Drive delay rapped

ATARI UK is letting the side down, according to Karen Sutherland, manager of computer dealer Atari World in Manchester.

The latest games after repeated enquiries to Atari about the availability of disc drives for its 8 bit games machines.

For despite Atari's announcement of its 10701 drive last summer, supplies still haven't reached the shops.

"I am furious about the situation", said Karen. "If a disc drive was readily available I could sell at least 30 to

40 a week. Every time I contact the people at Atari to find out when supplies will be available they just say they are waiting for a boat-load to arrive from Singapore. It must be a very slow boat".

One outcome of the shortage is that the older 1050 drive is maintaining a high second-hand value with prices in the region of £26.

An Atari spokesman said: "We are still waiting for the disc operating system to be finished, which it should be in the next couple of weeks.

THE
GALLUP
CHART

TOP 20
ATARI 8-BIT GAMES

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	▲	SPEED ACE Zagorin	2.99
2	●	ROCKFORD Mastertronic	2.99
3	●	STEVE DAVIS SNOOKER Blue Ribbon	1.99
4	▲	SPACE SHUTTLE Firebird	1.99
5	▼	POLE POSITION Atari	12.99
6	▲	MILK RACE Mastertronic	2.99
7	●	FOOTBALL MANAGER Addictive	2.99
8	●	SPOOKY CASTLE Atlantis	1.99
9	▲	PLATFORM PERFECTION US Gold	9.95
10	●	NINJA MASTER Firebird	1.99
11	▼	LEAGUE CHALLENGE Atlantis	1.99
12	●	GAUNTLET US Gold	9.95
13	▼	PANTHER Mastertronic	1.99
14	▼	FEUD Mastertronic	1.99
15	▼	HENRY'S HOUSE Mastertronic	1.99
16	▼	GHOSTBUSTERS Mastertronic	1.99
17	●	WINTER OLYMPIAD Pyrasoft	9.95
18	●	FREDDYWAY Addictive	9.95
19	●	AGE OF ACES US Gold	9.99
20	▼	180 Mastertronic	2.99

Compiled by Gallup/Microscope

These are also new entries this month, including a few old games making their appearance in the chart. The first game from Zagorin goes to number one, followed by the entry of two old favourites in second and third positions.

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I START this month's final look into the inner workings of Atari Basic with a small apology. If you read my Checksum Buster article in the April issue, as a good many of you did judging by the mail we have received, you might have been a little upset to find the message APRIL FOOL, splashed all over your screen.

Sadly, re-assembling a line of text from a three digit checksum is impossible — there are many different permutations which can generate the same value. Apart from being a lesson in never trusting anyone — not even me — it does teach us quite a few useful things about how Basic works.

When you used the program, typing LIST just raised a page of jumbled text with no line numbers or command words to be output. So, how can a program exist in a tokenised — or SAVE format — file if it contains nothing that could have been correctly tokenised in the first place?

The answer is that Basic only checks for the validity of a program line when you type it in or use LIST. It therefore assumes that any SAVE'd tokenised file must have been error checked at the original time of entry and is now uncorrectably corrupt.

What Checksum Buster does is create a file which is correct in terms of the individual tokens and pointers, but makes no sense as a logical program.

To understand it further, let's take a look at the file format used by Basic — when you type SAVE or CLRA.

The bulk of it consists of the tokenised program lines themselves in the format that we have been looking at so far. The variable name table must also be saved because the tokenised version of a program holds only the variable reference numbers and is meaningless without the corresponding names.

For some reason a SAVE'd file also contains the complete variable value table. I really don't see why it couldn't have been re-generated at LOAD time, saving a couple of hundred bytes on even the shortest of files, but if you know, why not drop us a line?

The only other information required by Basic is the contents of the zero page run pointer table which is saved at the start of the file — see Figure 1.

One problem with saving this address pointer table is that it is only applicable to the current system setup. If, for example, you decide to move from a cassette system to a disc one, the value of LOMEM will be much higher due to the presence of Dos.

Since the first entry in the zero page table is LOMEM itself the first two

bytes in a SAVE format file will always be zero — calculated from LOMEM minus LOMEM. Similarly, the second two bytes — which represent the address of the variable name table — will always be 256 because this table is 256 bytes from LOMEM.

These seven offset values take up the first 14 bytes of the file, and are followed by the variable name, value and statement tables containing all the actual program lines.

The final element of the file is the current statement line — numbered 32768 — which contains whatever command Basic was currently processing.

Normally the last thing being worked on before a file is written is the SAVE command itself, and this is what you would usually expect to be found here.

This file format is shown in Figure 1, but you might like to see it in action for yourself by typing in the listing. As written it will only work on disc files

because there is no facility for random access within a tape file. However, cassette users might like to try modifying it to read a complete file into memory and examine it from there.

Type it in and check it with Get it Right! before running it. Be especially careful with lines 8480 to 8520 which contain a machine code routine.

After you type RUN, the program will check which version of Basic you are using and read the various rom-based test tables into the pseudo string arrays CMD8 and CPE. These will later be used to display the correct text for each available token.

Once this is complete you will be asked to enter a filename. Use the full name — such as D:\FILE.BAS — of the Basic SAVE'd file you want to view. The first 14 bytes will then be read in and the rest of the file scanned to obtain the correct ROUTE and POINT

Turn to Page 12

Learn your token tables

ANDRÉ WILLEY ends his look at Atari Basic by giving you a program to investigate listings

Address	Name	Function
128/129	LOMEM	Lowest memory address accessible after Dos.
130/131	VNTP	Variable name table pointer (start address of VNT)
132/133	VNTD	Variable name table dummy (end address of VNT)
134/135	VNTP	Variable value table pointer (contents of variables)
136/137	STMTAB	Statement table (start address of tokenised program)
138/139	STMCUR	Current statement (address of final tokenised command line)
140/141	STRAPP	String/array pointer (address of string/array contents)
142/143	RUNSTE	Runtime stack (internal GOSUB FOR, NEXT addresses)
144/145	MEMTOP	End of current Basic program space

Figure 1: Basic's zero page pointer table

(All addresses shown as two bytes, in standard 8080 low-high format)

4 From Page 8

values for each of the file segments we are interested in – the variable name, value and statement table.

You will then be shown the information obtained from the first 16 bytes and be asked if you wish to view the variable name table or a program line. At this point you may also toggle between printer output and screen display by pressing the spacebar, or press the Escape key to select a new filename.

The variable listing will show the full name and reference number for each variable in the table, including those which may no longer be in use in the main body of the program. You will also see what type it is and the data stored in the variable value table.

Numbers are shown in an expanded

BCD layout, although you could change lines 1180 to 1220 to print them in normal numeric form if you wish.

The program listing will look very different to the form you are used to seeing from the LIST command. Individual statements on a single program line are shown separately, with an overall header for each and with each statement being numbered.

I've also limited much of the normal expansion of string and numeric constants – so all numbers will be shown as `###` and all strings will be shown as `###`.

Equally, lines containing standard Ascl text – such as `ROM` and `DATA` – will be shown as `###-EOL` in place of the text itself. Variables will be displayed as `Var1`, `Var2` and so on. Implied commands will be shown

inside square brackets – such as the implied `LIST` as a line title.

output##

which would be shown as:

output###

These changes have been made to help you see the structure of the program without being distracted by the finer details. After all, if you'd wanted to see a normal listing, all you needed to do was type `LIST`.

If you try out this program on the Basic file created by last month's Checksum Buster you'll start to see how the seemingly impossible was created. All the lines of text were stored in the variable name table, with the final character of each in inverse video to fool Basic into thinking they are just long variable names.

So you've discovered that a complete program can't be made from its checksums, but you might have learnt more about the way that Basic functions and also that the tokenising system is not quite as rigid as it first looked.

There is a well known saying which applies very well to computers, and especially to Basic: it's impossible to make anything completely foolproof because fools are so ingenious.

PROGRAM BREAKDOWN

10-70 Initialise, dimension strings, and so on
80-90 Print the file message
100-250 Get filename, open file scan and store NOTE values
260-350 Print file's header information
360-470 Menu choice and printer/screen select function

Printing out variable name table information

1000-1120 Get variable name and value data and print the name
1130-1180 Check for which type of variable
1190-1260 Print numeric variable information
1270-1360 Print numeric array information
1370-1470 Print string variable information

Printing out program listing from statement table

2000-2080 Get line number and print length details
2090-2100 Print segment number and length
2110-2130 Get command token and print expanded version from `CMDS`
2140-2220 Get each operator token byte in turn, print expanded version from `OPS` and check for special cases such as `23-EOL` – and so – end of statement
3000-3040 Subroutine to call Get-bytes routine from `GETBYT`

Initialising strings

5000-5040 Test for Revision A, B or C and gives a Basic error if none of these
5100-5170 Create `CMDS` from command token table in Basic rom
5200-5270 Create `OPS` from operator token table in Basic rom
5300-5360 Add special cases such as implied `LET` and so on
5400-5430 Read `GETBYT` data for binary Get-bytes routine
5500-5520 Data for machine code binary Get routines
10000-10010 File format error handler

Part I: These values will be added to `LODMEM` to form the zero page ram table.

Bytes	Contents	Function
8/1	0	File format flag (zero)
2/3	254	Displacement of the variable name table from the beginning of part two, plus 254
4/5	DVWTC	Displacement to the end of the variable name table from the beginning of part two, plus 255
6/7	DVVT	Displacement of the variable value table from the beginning of part two, plus 255
8/9	DST	Displacement of the statement table from the beginning of part two, plus 254
10/11	DSTC	Displacement of the current statement line from the beginning of part two, plus 254
12/13	DEND	Displacement to the end of the file from the beginning of part two, plus 254

Part II: Starts at byte 16 of the file

0	VNT	Variable name table
DVVT-255	VVT	Variable value table
DST-254	ST	Statement table
DEND-254		End of file

Figure 4: SAVE and GETBYT file format


```

10 NEW PROGRAMMER BASIC PROGRAM FINDER
20 NEW OR EXISTING FILE?
30 NEW OR EXISTING FILE?
40 NEW
50 NEW PROGRAMMER BASIC PROGRAM FINDER
60 NEW OR EXISTING FILE?
70 NEW OR EXISTING FILE?
80 NEW OR EXISTING FILE?
90 NEW OR EXISTING FILE?
100 NEW OR EXISTING FILE?
110 NEW OR EXISTING FILE?
120 NEW OR EXISTING FILE?
130 NEW OR EXISTING FILE?
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980 NEW OR EXISTING FILE?
990 NEW OR EXISTING FILE?
1000 NEW OR EXISTING FILE?

```


MUG

THE INDEPENDENT MicroLink User Group NEWSLETTER

Bulletin Board update

The MicroLink Bulletin Board has just had a spring clean, and a backlog of 8,000 old messages removed. But at the rate at which it's being used, it won't take more than a couple of months to replace them.

The Bulletin Board is an area where anyone can leave a public message, start or join in a discussion on any topic or just ask for help.

The range of subjects covered is huge and always changing: cars are bought and sold, philosophy, pop music and preaching argued about and the reasons why somebody's software doesn't seem to work are recorded.

There are even the occasional trivia quizzes (well, do YOU know how many electric trainways are still running in the UK?).

There's nothing quite like it outside the world of computers, but be warned, it can be very addictive.

Preparing for Prime time

EVERYONE upgrades their hardware occasionally, and MicroLink is no exception. But it's not an Amstrad PC1640 they're getting.

For some time now, the rate at which people are joining has put a bit of a

strain on the old Prime 850 computer, and many users would agree that sluggish is perhaps a mild way to describe MicroLink at peak times.

New work is underway to install a Prime 9815 - not only has it got a larger name but it's faster and better able to cope with the increased demand.

There's a lot of things to be done before the switch-over can happen, software has to be changed and the digital detritus collected on the old computer in its years of dealing with us humans has to be cleared up.

Exactly how much better the new service will be isn't clear, although technical people tend to use words like "massively" and get quite excited.

More all eager to find out...

The MicroLink User's Manual

ONE of the projects that MUG is coordinating is the production of the MicroLink User's Manual. Designed to complement the information given to every MicroLink subscriber on old fashioned paper, the manual sets out to be an online way of describing the many facilities available on MicroLink from the point of view of the people who use them.

At first, MicroLink can

appear to offer a bewildering selection of things to try, and even for experienced users the different options can be confusing. And there's always a way to do things faster, or at less cost.

Of course, the information to help people do this has always existed. But it's been hard to find, and until now there hasn't really been any way for users to share their discoveries in such a way that others will be able to make use of them. The MicroLink User's Manual sets out to remedy this problem.

At the moment MUG is collecting the information. Sometimes the amount of data collected by users can be staggering - one subscriber mailed in over 3000 of hints and tips saved up over years. Of course, we're just as happy to hear from anyone with one good idea.

All the data will be indexed and made available; the smart design is still being discussed, but like anything else MUG does, it will be free to use.

User groups are good news

THE MicroLink User's Group came about as a result of various subscribers asking whether there was any organisation run to help users.

User groups in any area

are usually good news; they form a focus for ideas, opinion and self-help and give the users a collective voice.

The flexibility provided by MicroLink and Telecom Gold make MUG particularly useful. There are no printing costs for newsletters and there's almost instant access to everyone in the group through the mail system.

MUG's been going for about a month now, and we've already formed a team of people who have volunteered to answer queries and help anyone with MicroLink-related problems.

It's a small world...

... but full of Telecom Gold computers, it seems. The UK Telecom Gold system, of which MicroLink is the most active part, is just one sector of a global network called Dialcom.

While MicroLink is System 72, and other UK computers are in the range 70 to 80, there are Dialcom computers almost everywhere. And like international telephone exchanges, they've all got their own numbers.

MUG'er Adrian Mann is trying to find out just which computers are where. This might seem an eccentric, if harmless, hobby, but such information as is available on MicroLink is difficult to find and (apparently) out of date.

And it could be the first step to organising an international group of Dialcom users, which really would be a first and another step towards the electronic community of tomorrow.

If you know anything about the Dialcom network, numbering schemes, then Adrian (MANN.ADRIAN on the mail system) and MUG would be glad to hear from you...

Odd offers

THE price for the most unusual use of MicroLink goes to ... well, nobody knows. But the last month has seen some odd goings-on.

There have been people advertising for games shooting, others looking for burned out buildings and the usual range of online floral orderings to persuade moth-

ers and lovers that computers aren't so bad after all.

But you have to take your hat off, if nothing else, to Keith Channing. He helps run CDRAL, Clothes Optional Recreation and Leisure, a naturalist organisation dedicated to promoting the various activities enjoyed by those who feel happier without their

clothes on. And with a bit of advertising on the Bulletin Board and a touch of help from MicroLink themselves he's gathering together all those on the system who are similarly inclined.

Now that has to be the most original use for MicroLink.

Unless (of course) you know better...

MUCH MORE THAN A MAGAZINE



PAGE 8 has been supporting Acari computers for 5 years - coverage now includes both 8-bit and ST. Get the latest copy from your local newsagent or by subscribing.

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3.80" Lockable - Height 20	\$7.40
3.80" Lockable - Height 40	\$7.40
3.80" Lockable - Height 60	\$8.00
3.80" Lockable - Height 80	\$8.40
3.80" Lockable - Height 100	\$10.00
3.80" Lockable - Height 120	\$7.40
3.80" Lockable - Height 140	\$8.40
3.80" Lockable - Height 160	\$10.00
5.5" Clearing Disc	\$4.95
5.5" Clearing Disc	\$5.99
Disc Holder	\$2.49
2" Plastic Discs	\$3.99



PROFESSIONAL PRINTER STAND

The new printer stand is only \$199.95 (street \$249.95). It gives you a very secure, low cost printer that is the ultimate combination of the paper guide technology and other components that is well above the other low cost units in efficiency tested. The space saving design allows easy access to the computer and other items, the space that most other paper based systems will not allow. The design allows you to use the paper guide technology to create a paper guide and other components.



1999 HONOLULU



95.1-95.2-Copy Holder with Adjustable Arm.
Size 9.5" x 11.5" with smooth slide top guide - C 95.195

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7.5 10000 + 1.075(10000) = 10750

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Age Group	Total (%)	Male (%)	Female (%)	Non-binary (%)
18-24	15	10	20	5
25-34	25	15	30	10
35-44	30	20	35	15
45-54	20	15	25	10
55-64	10	5	15	5
65+	5	2	8	3

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1.5" TOP QUALITY BULK BACKED DISK S

	1997	1998	1999	2000	2001	2002
Original United Kinetix P.L.	100.00	100.00	100.00	100.00	100.00	100.00
Subsequent Kinetix P.L.	0.00	0.00	0.00	0.00	0.00	0.00

Balinese Batik of five colours – New product!

Realization	Costs for the subproject	Actual production
Single Order 1000 P 1	20000	20000
Multiple Order 1000 P 1	20000	20000

Package of 10 15" Dishes comes with Free Plastic Utensils. Save money! \$1.49

(5) These are treated with acids and are certified 100% pure base

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HAVE A Nice DAY

GREGORY BENHAM
provides a routine
to plot the ups and
downs of your life

This easy-to-use program is based on a simple theory put forward by research scientists that the physical, mental and emotional states of the human body are constantly undergoing three fluctuating cycles.

These are very similar to each other but differ in their frequency. Physical, emotional and mental states have 28, 28 and 30 day periods respectively, so they are not usually in phase with each other.

They are said to be dictated on the day we are born and controlled by a



kind of built-in biological clock. The listing here represents these changing moods by sketching standard sinusoidal waves in graphical form for any month since a person's birth date.

The critical periods for us are at the highest and lowest peaks on the

curves, when our moods will be correspondingly strong and weak. When all three peaks coincide we are therefore to be regarded as on the best and luckiest of, in the second case, better off staying in bed all day.

Since these cycles apply to everyone it therefore means that the three horoscopes are running parallel, but individually with those of other people with the same constant phase lag depending on the difference between their birth dates.

Biorhythm calculates this difference for each of the three categories and computes the combined average to give a figure as a percentage for how any two people's overall mood status compares, and hence determines their compatibility.

The three main screen displays are all different display lists stored in page 8 of memory enhanced by a customized character set used throughout. If you study lines 2000 to 2060 you will see a number of techniques used to make keyboard input easy yet idiosyncratic.

When entering dates you must use the format DDMM/YYYY. For example, 01/05/1988 or 1/5/1988 — the slash sign must separate the numbers. If you make a mistake the computer will either prompt you to re-enter the date or refuse to accept the input. You can erase any entry using the Delete key.

The program contains many useful routines which add to the overall presentation: A flashing cursor, a totally re-defined character set and display lists have been used wherever possible to enhance the graphic screens.

R.M. I cannot be held responsible if you run the program and find out that you are not compatible with your wife.

```

10 DIM *****
20 DIM # BIRTHDAY #
30 DIM # PHYSICAL BIRTH #
40 DIM # EMOTIONAL BIRTH #
50 DIM *****
60 FOR I=1 TO 12:GOTO 1000
70 FOR J=1 TO 31:GOTO 1001
80 DIM # J=1 TO 31:GOTO 1001
90 DIM *****
100 FOR I=1 TO 12:GOTO 1000
110 FOR J=1 TO 31:GOTO 1001
120 DIM *****
130 DIM *****
140 DIM *****
150 FOR I=1 TO 12:GOTO 1000
160 FOR J=1 TO 31:GOTO 1001
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2980 DIM *****
2990 DIM *****

```

Turn to Page 10

OVER the years many programs have been written that load 62 sector uncompressed picture files and then allow you to alter them. However, none of them has ever let you to simulate a jigsaw puzzle.

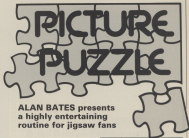
Jigsaw is a program which does just that. When it is first run you are presented with the title page — shown in Figure 1 — that tells you how to alter the colours of the picture once it has been loaded.

Next you are prompted to place a disc containing Atari-format picture files into a drive. Pressing any key will give you a directory of the disc — only files with the extension .JPG will be displayed.

You are prompted for the number of pieces — 8, 32 or 128 — you want the jigsaw to consist of and once the picture is loaded you press RETURN for the computer to juggle the pieces.

A square cursor appears on the screen above the top left-hand piece and it can be moved using a joystick plugged into port one.

Place the cursor over the initial piece to swap and press fire. Now move it to the place you wish to swap it with and press fire again. If you have moved to the correct place within the



jigsaw you'll hear a beep.

When the whole puzzle has been completed correctly the computer displays a short message and then returns you to the disc directory section of the program.

That's all there is to it — so have fun making jigsaws with your favourite pictures.

Keys	Function
B-Z	Select colour
C	Changes the selected colour
- +	Change a colour's luminance

Figure 2: Colour selection options

```

10 REM JIGSAW
20 REM BY A. BATES
30 REM SCENARIO 0000
40 F:OPEN:[J17:PICTURE].JPG
50 OPEN F%
60 GET F%
70 GET F%
80 GET F%
90 GET F%
100 GET F%
110 GET F%
120 GET F%
130 GET F%
140 GET F%
150 GET F%
160 GET F%
170 GET F%
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910 GET F%
920 GET F%
930 GET F%
940 GET F%
950 GET F%
960 GET F%
970 GET F%
980 GET F%
990 GET F%

```

```

400 GET F%
410 GET F%
420 GET F%
430 GET F%
440 GET F%
450 GET F%
460 GET F%
470 GET F%
480 GET F%
490 GET F%
500 GET F%
510 GET F%
520 GET F%
530 GET F%
540 GET F%
550 GET F%
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790 GET F%
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810 GET F%
820 GET F%
830 GET F%
840 GET F%
850 GET F%
860 GET F%
870 GET F%
880 GET F%
890 GET F%
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920 GET F%
930 GET F%
940 GET F%
950 GET F%
960 GET F%
970 GET F%
980 GET F%
990 GET F%

```

Turn to Page 26 in

Game

[illegible][illegible][illegible][illegible][illegible][illegible]

How to get your Atari to talk to a BBC Micro

for a Spectrum or a Commodore
or an Amstrad or an IBM ... or
ANY other computer!

Language problems become a thing of the past when you join MicroLink. Now you can use your Atari (plus your telephone) to send messages to any other computer user, with no restriction on make of machine — or even on distance.

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[illegible]



It's a challenge!

I HAVE kept the program to solve the gambling problem simple. When run, an evening at the roulette table just flies by. Line 100 defines how much money you have in your pot, with line 110 setting the size of the initial bet. If you like, you can put input statements in both these lines to vary the amounts when run. We can keep track of the largest bet we have placed with the variable LBET.

Next we read in all the red numbers from the DATA statements into the array RED(). The casino might close before we are through so the total number of spins of the wheel possible is tracked in the variable TSP. Similarly the number of spins actually used is recorded in SPIN. A logic variable WIN/LOST indicates if we have enough money to cover our bet and line 210 sets up the victory pot — the amount we have when we decide to give up for the night.

So now we enter the casino and

OVER the last couple of months we have been outlining a problem for you to solve — together with some hints on how to go about writing a program to give the required answer.

I asked you to test out a roulette gambling strategy: To bet on the red numbers and, if you lost, to keep doubling the bet until you won. Many of you will have written your own routines to solve the puzzle, and mine is shown below. It follows the method described last

month, but is just one of the infinite ways that you may have approached it.

If you've solved the problem in a completely different way we'd like to see it, so send it to:

Mailbag, Alien User, Europa House, Arlington Park, Addington, Mansfield, SX10 4NP.

We'll give £10 for the best solution that matches exactly the problem as it was originally defined in the March issue of Alien User.

In the third part of this series Mike Cook presents his solution

start our first cycle of bets. Line 330 generates the random number as a result of spinning the roulette wheel. Lines 340 to 370 see if we have won and then we must take the appropriate action if we have won or lost. If we have won we add our winnings to our pot and end the current cycle of bet doubling. If we have lost we need to double our bet if we have enough money — if not we are bust.

Then if the casino is still open we can place our bet again. After a winning cycle of bets we decide whether to call it a night or carry on.

So there you have it: You can see whether you will win. I made an adjustment to the program to run it continuously — keeping a count of how many nights I won and lost. I kept a

record of 1,800 spins of the wheel and won 521 times.

However, before you rush off to win a fortune consider a few more points. First of all most casinos have house rules which limit the maximum and minimum bets and some tables limit the number of times you can double your bet. In addition you will have to subtract your entrance fee and any drinks you buy from your winnings. Some casinos might not get through as many as 200 spins a night, so you will have to change that.

Finally, it is rather a slow and boring way to make money. It's much better to hone your programming skill and make that pay.

So are you ready for next month's Programmers' Challenge?

```
10 REM PROGRAMMER'S CHALLENGE
20 REM THE SOLUTION
30 REM TO THE PROBLEM
40 REM SOLUTIONS USED
50 DIMPOSED 50:GOTOEND 1,0,0
60 POSITION 1,17:PRINTPROGRAM TITLE
60,END
70 POSITION 1,17:PRINT"-----"
80:PRINT
90:PRINT"THE ROULETTE WHEEL"
100:PRINT"COLOR"
100:PRINT"RED=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32"
110:PRINT
120:PRINT
130:PRINT
140:PRINT"THE WINNING NUMBERS"
150:PRINT"WIN TO BE DECIDED"
160:PRINT
170:PRINT
180:PRINT
190:PRINT
200:PRINT"THE WINNING NUMBERS"
210:PRINT"WIN TO BE DECIDED"
220:PRINT
230:PRINT
240:PRINT
250:PRINT
260:PRINT
270:PRINT
280:PRINT
290:PRINT
300:PRINT
310:PRINT
320:PRINT
330:PRINT
340:PRINT
350:PRINT
360:PRINT
370:PRINT
380:PRINT
390:PRINT
400:PRINT
410:PRINT
420:PRINT
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890:PRINT
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990:PRINT
```

```
100:PRINT"THE WINNING NUMBERS"
110:PRINT"WIN TO BE DECIDED"
120:PRINT
130:PRINT
140:PRINT
150:PRINT
160:PRINT
170:PRINT
180:PRINT
190:PRINT
200:PRINT
210:PRINT
220:PRINT
230:PRINT
240:PRINT
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300:PRINT
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```

```
100:PRINT"THE WINNING NUMBERS"
110:PRINT"WIN TO BE DECIDED"
120:PRINT
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170:PRINT
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210:PRINT
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400:PRINT
410:PRINT
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840:PRINT
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860:PRINT
870:PRINT
880:PRINT
890:PRINT
900:PRINT
910:PRINT
920:PRINT
930:PRINT
940:PRINT
950:PRINT
960:PRINT
970:PRINT
980:PRINT
990:PRINT
```

Missing in Oxide



Load and save errors?
LEN GOLDING gives
answers to prayers
with a verify utility

THE Atari cassette system is beautifully designed and always works perfectly every time. And if you believe that you'll believe nothing.

How often have you typed in a long program and **CTRL**-S, only to find later that there's a fault on the tape? A cassette file can be tested in only one way - by trying to load it. But this destroys the original program in memory, so if the file happens to be faulty you've lost all your hard work.

3.1.1.1. *Modeling and simulation of the system*

The connecting plug may have worked loose, especially since the minis are fitted to only five of the 10 pins. There may be dead spots on the tape - perhaps from too much re-recording - and some tapes designed to record music are inherently unsuitable when used for computer data.

The cassette unit itself can develop hardware faults - keys get stuck, heads get dirty or drift out of alignment and drive capacitors develop flat spots - especially if you leave the

recorder for long periods with Play
locked down.

On some older computers there's a bug in the operating system which interferes with the cassette handler routine - the usual fix for this is to do an LPRINT before saving anything to cassette, and ignore the ERROR 130.

There's even the possibility of pilot error - you might have forgotten to plug the recorder in or, on 412 models, left the power supply disconnected, or neglected to press both Play and Record.

The cassette handler has no way of knowing what, if anything, is plugged into the serial port – you could attach an electric toothbrush, for all it cares.

Whatever the cause, the result is likely to be ERROR 142, described in the manuals as a Data base check-out error and in many other flat language by users who have to analyze it.

This little assistant program provides an answer, it simulates the **LOAD** or **LOAD "C"** or **ENTER "C"** commands, without disturbing the contents of memory. You will hear the beeps and whistles from the TV speaker, just as though the file was loading on usual, and any problems are therefore easily detected.

But if a fault occurs your original Basic program will still be there in memory, so you can keep on trying until you produce a perfect copy.

Making the autoboot cassette file is very easy - Program 1 does it all for you. Lines 30 to 140 are identical to

[illegible][illegible]

100	100%	100%	100%	100%	100%
90	90%	90%	90%	90%	90%
80	80%	80%	80%	80%	80%
70	70%	70%	70%	70%	70%
60	60%	60%	60%	60%	60%
50	50%	50%	50%	50%	50%
40	40%	40%	40%	40%	40%
30	30%	30%	30%	30%	30%
20	20%	20%	20%	20%	20%
10	10%	10%	10%	10%	10%
0	0%	0%	0%	0%	0%

those used in several previous cassette autoboot routines are explained in our articles in *April User*, so you may already have a file with them on. The DATA at lines 40 to 60 holds the autoboot master code and lines 168 onwards contain the Verity routine itself.

Type in Program I and – with fingers crossed – **CSAVE** a copy. Insert a blank, fully re-wound cassette and run the program. After a few seconds you will hear the familiar double beep. Now follow the usual **CSAVE** procedures and the machine code routine will be written to cassette in autoboot format. From now on you'll use this new tape, so Program I shouldn't be needed any more. But keep it in case you've made any typing errors and need to change it later.

Before you can use the Verity routine however, it has to be loaded into memory. Rewind the tape with the autoboot program on it, switch power off then switch on again while holding down the Start key. When the single beep sounds, proceed as for **LOAD** and the autoboot program will install itself before Basic takes control, changing the screen border colour to prove it.

Incidentally, if you don't like the colour change, replace the 148 at line 180 with 2 and make a new autoboot tape. You can always double-check that the routine is installed, by typing **PRINT PEEK(187)** – the result should be 104.

You can now carry on programming just as though the new routine wasn't there. When you've finished use the usual **CSAVE**, **SAVE "C:"** or **LIST "C:"** commands, and your program will be saved to tape.

Now's the time to check that it's a good copy. If the file was made using **CSAVE**, then type **R=USR(1921)**. This simulates **LOAD**, with its short inter-record gaps. If you used **SAVE "C:"** or **LIST "C:"**, then type **R=USR(1921,1)**. This lets the routine work with long inter-record gaps, to simulate **LOAD "C:"** or **ENTER "C:"**.

In all cases the file is loaded 128 bytes at a time into the cassette buffer. A top-notch Verity routine would check each byte against the Basic program in memory. However, this would make the code much more complex, and greatly increase the autoboot loading time. Apart from which, it's extremely rare for just one or two bytes to be corrupted – if the file will load at all, it's almost certain to be a good copy.

To keep things simple and minimise typing, we've taken the safe option – our routine simply reads the file and does nothing with it. During the reading process you will hear the

HOW THE PROGRAM WORKS

If you're into machine code you might like to take a look at the source listing. If nothing else, it will remind you what a cassette autoboot file looks like. The header starts with 3, then contains the file length in 128-byte sectors, followed by the load address and initialisation address.

On power-up, and before Basic takes control, the operating system does a **JSR** to the sixth byte after **LOADADDR**. This puts it at **CS005F** where the cassette motor is turned off and the Carry flag cleared to indicate a successful load.

The RTS at line 380 returns control to the operating system, which then does a **JSR** to the initialisation address. This resets **MEMALO** and changes the screen border colour to let you know that the routine is installed. Pressing **Reset** repeats the **JSR** to **187**, reinstating the new **MEMALO** and border colour values.

The RTS at line 380 hands control to Basic, leaving the rest of the machine code routine safely tucked away and ready for your **USR** command.

The **USR** routine itself starts at line 410 with a **PLA** to detect whether or not a parameter was inserted. If not, it assumes that the file to be checked uses short **RGs**. If any parameter was passed then long **RGs** are selected. The specified mode is programmed by

storing either 280 or 30 into the second auxiliary byte of **KOCR** at 7. We chose the 3008 since it's the one used by the operating system for most external **IO** transactions.

Lines 630 to 760 load the file, 128 bytes at a time, into the area reserved for cassette **IO** – **CS000F**. So long as no error occurs, the 6662 processor's Sign flag remains at zero until the end-of-file. Consequently line 760 will loop back for another chunk of data. When the reading process stops for any reason the Sign flag is set, so the routine drops through to **END757** with the error number automatically stored in the 6503's Y register.

If it's error 586 – end of file – everything is alright, so we exit via **CS0067** without keeping the speaker. If the error number is anything other than 588, lines 810 and 820 simulate the pressing of Control+2 on the keyboard, and this produces a beep. The error number is copied into **ERRNCLD** at address 5762 – decimal 1932 – in case you need to inspect it when Basic gets control again.

The last few instructions from 840 to 880 close **KOCR** at 7 and ensure that there will be no continued whistling from the speaker when cassette **IO** is finished. Control is then handed back to Basic by the final RTS.

usual sounds from your TV speaker, so any problems are easy to detect and any fault will produce an extra loud beep. When the test is either successfully completed or aborted the cassette motor is switched off and control passes straight back to Basic, which prints the usual **READY** message.

If you're desperate to discover what type of error occurred, you can find out by typing **PEEK (1925)**. An error-free file will leave 136 here, but any fault will insert its own identity number – usually 140.

Once you have a cassette copy which tests out successfully you should be safe to try loading it back into your micro's memory using **LOAD**, **LOAD "C:"** or **ENTER "C:"** as appropriate. The Verity routine does not need to be in memory for this operation, though it can be if you wish. And that's all there is to checking that you've made a good copy of your program on your tape.

```

10 CS000F=1000
20 CS0100=
30 CS0200=1000
40 CS0300=1000
50 CS0400=1000
60 CS0500=1000
70 CS0600=1000
80 CS0700=1000
90 CS0800=1000
100 CS0900=1000
110 CS1000=1000
120 CS1100=1000
130 CS1200=1000
140 CS1300=1000
150 CS1400=1000
160 CS1500=1000
170 CS1600=1000
180 CS1700=1000
190 CS1800=1000
200 CS1900=1000
210 CS2000=1000
220 CS2100=1000
230 CS2200=1000
240 CS2300=1000
250 CS2400=1000
260 CS2500=1000
270 CS2600=1000
280 CS2700=1000
290 CS2800=1000
300 CS2900=1000
310 CS3000=1000
320 CS3100=1000
330 CS3200=1000
340 CS3300=1000
350 CS3400=1000
360 CS3500=1000
370 CS3600=1000
380 CS3700=1000
390 CS3800=1000
400 CS3900=1000
410 CS4000=1000
420 CS4100=1000
430 CS4200=1000
440 CS4300=1000
450 CS4400=1000
460 CS4500=1000
470 CS4600=1000
480 CS4700=1000
490 CS4800=1000
500 CS4900=1000
510 CS5000=1000
520 CS5100=1000
530 CS5200=1000
540 CS5300=1000
550 CS5400=1000
560 CS5500=1000
570 CS5600=1000
580 CS5700=1000
590 CS5800=1000
600 CS5900=1000
610 CS6000=1000
620 CS6100=1000
630 CS6200=1000
640 CS6300=1000
650 CS6400=1000
660 CS6500=1000
670 CS6600=1000
680 CS6700=1000
690 CS6800=1000
700 CS6900=1000
710 CS7000=1000
720 CS7100=1000
730 CS7200=1000
740 CS7300=1000
750 CS7400=1000
760 CS7500=1000
770 CS7600=1000
780 CS7700=1000
790 CS7800=1000
800 CS7900=1000
810 CS8000=1000
820 CS8100=1000
830 CS8200=1000
840 CS8300=1000
850 CS8400=1000
860 CS8500=1000
870 CS8600=1000
880 CS8700=1000
890 CS8800=1000
900 CS8900=1000
910 CS9000=1000
920 CS9100=1000
930 CS9200=1000
940 CS9300=1000
950 CS9400=1000
960 CS9500=1000
970 CS9600=1000
980 CS9700=1000
990 CS9800=1000
1000 CS9900=1000

```

Turn to Page 24 for

Listing II: Machine-code version of Program I

Software

SCENE

Thunder from the heavens...

Platform: Thunderfox
Price: £4.99 (unrated)
Supplier: Alan Corp (UK),
 41201 Mosses, Railway
 Terrace, Slough, Berkshire
 SL2 8GQ.
Tel: 0753 333444

A HEAVILY armed energy transporter ship is carrying Galactic energy crystals for the approaching Photon war machine.

Once these have been installed in the deadly Photon war machine they will turn it into the most powerful destructive force in the Universe. Capable of destroying entire solar systems in minutes, it must be stopped.

You have been chosen to represent the Federation forces. The new Thunderfox - an ultra-sleek and incredibly manoeuvrable space fighter - has been given to you in a last ditch attempt to destroy this evil threat to mankind.

All you have to do is locate the crystals and destroy them to stop the war machine from being finished. They are situated inside the transporter and are guarded by the crystal guardian. Obviously if you think about it.

Your way into the transporter is restricted by two anti-gravity stabilisers located at the far right of the ship. You must bomb each five times before it is destroyed - not an easy task even for an avid games player.

It is very easy to run out of

bombs while you're trying to knock out the stabilisers so an option to reload is built into the game.

When you have used all your bombs, fly to the far left hand of the transporter and land on your death-strip where your supply will be replenished.

When you have destroyed both stabilisers, fly to the left of the transporter and land on the pad. You will then be transported to the towers of the ship and enter the thermonuclear laser room.

If you come into contact with any of the lasers or the walls you will be instantly disintegrated.

Remember to watch the level indicator at the top of the screen. The intense radiation generated by the lasers will destroy your Thunderfox if you take too long getting through.

Once you manage to get past the lasers you enter the energy crystal room where the guardian is waiting for you.

The Galactic crystal is located in the head and you must shoot it 10 times to free it up. This is hindered by the mobile wall that moves up and down in front.

The playfield uses a split screen and in the bottom quarter is the long range scanner - which indicates how close the Photon war machine is to the transporter.

This distance is constantly closing, so time is of the essence - don't mess around shooting enemy



vessels that you can just ignore. Also at the bottom of the screen is a status line showing your score, lives remaining, weapon in use and the current level.

The main action takes place at the top of the screen.

An extra ship is awarded for every 5,000 points scored, and your total score is calculated depending on a number of factors, such as destroying the guardian head and blowing up ground installations.

The game is joystick controlled, allowing you four directions of movement - up, down, left and right. If you are travelling flat out when you push forward or backwards you will accelerate or decelerate relative to the movement.

However, when your craft is moving at its slowest speed, when you pull in the opposite direction it will flip over and reverse its travel.

The fire button is used to activate the on-board lasers

but it also switches from lasers and bombs when you hold it down and move in the opposite direction.

The graphics are nice with lovely scrolling. The sound effects are well implemented and there is a catchy main tune.

When your fighter launches from its hangar you get a superb side on view of it - an original feature. Also, when your craft is hit by enemy fire it doesn't explode straight away. It plummets to the surface of the transporter - another nice idea.

The game is quite difficult to get to grips with, but after the initial hiccup it got me hooked. I would recommend Thunderfox to lovers of shoot-'em-ups.

Neil Fawcett

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

Software

SCENE

Winter frolics...

Program: Winter Olympics
From: Tynes (casual) CMUS
Price:
 Tynesware, Unit 3,
 Addison Industrial Estate,
 Alton, York and Near
 YO21 4QJ
 Tel: 090 494 0911

COMING hot on the heels of the recent Winter Olympics is this new sports simulation from Tynesware.

Although this style of game is now a little old hat, and similar ones were on the scene at least 12 months ago – notably Winter Games by Eys – this fresh product from Tynesware has a lot going for it.

It kicks off with a lively rendition of the signature tune from the BBC Ski Sunday programme, then offers up to six players the chance to participate in any or all of five different events – the downhill race, ski jump, bobsleigh, slalom and bobsled.

Each player can represent any country from 12 given, although this has little bearing on the game. The selection process is followed by a picture of the Olympic flame in full blaze and then it's on to the simulation itself.



The Downhill

All the events rely on judicious and timely joystick wiggling to control the participant's movements and, sometimes, speed.

In the downhill race you view your skier from behind as he prepares to hurt himself down the slope. The objective is to manoeuvre him in and out of trees and

sundry obstacles and deposit him safely across the finish line.

It's not easy and, since you only get the one attempt, mistakes such as crashing yourself on a pine spruce are costly – not to mention probably fatal.

Next comes the ski jump. If you ever thought you could do better than Eddie the Eagle, now's your chance.

Your man shuffles out from a hut and positions himself at the top of the long and menacing ramp. Your view is from behind him. Then it's all systems go as he launches himself down the jump.

When he reaches take-off point the picture changes to give a side-on view of the



The Ski Jump

competitor as he flies through the air.

Unless you manipulate your joystick correctly, chances are the poor chap's legs and skis will go every which way and he'll make an ungainly landing, usually last first.

Unlike Eddie, the jumper doesn't get up and smile when he goes base over peak but instead beats the ground with his fists.

My older must have had hands like steel because this is not one of the easier events to complete successfully, even though you do get three attempts at it.

The bobsleigh is somewhat boring and easy in comparison. It involves making two laps of a course on ice, the course consisting of a couple of flat tracks – one just a little complete



The Bobsleigh

with motorboat – a short uphill climb, followed by a pretty bridge and then a short downhill run.

The view during this is from the side. However, during each lap you have two opportunities to shoot a lead with your rifle and hit five static targets – 38 targets and 20 bullets in all. Here the view is from behind the competitors.

The slalom is particularly difficult. Your view is from the side but moving downhill from right to left. You are supposed to weave



The Bobsleigh

past the appropriate poles but I found it only too simple to crash into the side barriers.

Finally comes the two man bobsled event. The sled is first pushed from left to right to the top of the run when the picture changes to give you a view looking down the run.

This is rather like Polo Position on ice with the run swirling towards you and

the backdrop scenery whirling across from side to side as you go round bends.

A small display to the left of the main scene shows an overhead view of the course.

The sled has a natural tendency to veer to the banks as it hurtles round bends and it is your job to see that it doesn't overturn. The ride seemed to go on forever but this event turned out to be the easiest in my experience.

The game's main strength lies in the very picturesque graphics – lots of lovely Alpine scenery here for you to enjoy, and some good animation, too. Sound effects and music are also used to the benefit of the game's atmosphere.

While the gameplay may not boast of anything new or novel, and perhaps lacks lasting interest, there's no doubt that Tynesware has done a good job on this one and you certainly get your money's worth of thrills and spills.

Bob Chappell

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

Software

SCENE

Two player destruction

Product: Zybex
Price: £2.95
Supplier: Japanese Games,
 25 Osborne Road, New-
 castle upon Tyne NE2 3LL
 Tel: 091-281 4407

AFTER taking a look at the pre-release version of Zybex in the March 1988 issue of Atari User I was delighted when the finished version arrived. Believe me, it was well worth the wait.

The game revolves around the tale of two rebels, Klexar and Cassalana. You control them in their bid to escape death row and execution - and before you think of me anything, not the one in Alcatraz.

To do this you have to undertake an almost suicidal mission to the Cretan System.

Once there you have to win 18 strange worlds and do battle with waves after waves of alien hordes.

If you survive you will be awarded a teleport crystal which allows you access to other planets in the system.

Eventually you will reach the optimum levels and the ultimate challenge - the Zybex itself.

As well as needing the crystals for access to the other planets you are also governed by how many tokens you have collected.

After completing the initial level it is possible to advance up to level 12 in any order you want without a token, but after that you will need three tokens to get to the restricted areas. These are awarded after the completion of a level.

If you survive and retrieve the Zybex, the death rings - placed around your necks by your captors - will be returned.

To help you on the mission you have been given the Orbit weapon with its

lowest power level.

As the mission progresses you can increase the destructive force of the Orbit by picking up debris of the same shape that appears on screens after you have blasted an alien wave.

Many different instruments of destruction can be collected including the Rail Gun, the B-Miss, the Wall and the Pulse.

Extra lives are awarded in the same way - simply fly over the space man when he appears.

The game has an original shooting system. You have built-in auto-fire which allows you to select any of the weapons you have collected by pressing fire to stop through them.

In later stages you can have them all going at once - it was a real pleasure watching aliens explode all over the screen under a hail of laser fire.

Your weapons are displayed in two status screens that sandwich the main playfield - one for each player.

Another status line near the bottom of the screen shows lives remaining, score and which weapon you are using.

You can have both players



You will need your arm of weapons

on screen at the same time, and luckily you can't shoot each other.

The play area uses a number of graphics modes with a carefully thought out use of colour and superb scrolling. The alien landscapes for the different planets have been beautifully designed.

Similar games are often criticised about the design and animation of the hero and aliens, but Zybex doesn't suffer from any of these faults.

The animation and design of your player is excellent.

My arm jerks back as he fires his weapons and he swings and tucks his legs as he thrashes upwards or backwards.

Every alien wave that attacks you is animated in its own way. Some rotate and others pulse as they roam across the screen.

The game differs far everything you would ever want. The high score table has a dual entry mode - two players with two joysticks can enter their names at the same time.

All game options are controlled using the joystick - all you need to do is simply highlight the icon you want on the main title screen and away you go.

One of my favourite features is the music. Several pieces are used throughout, but the main tune is so catchy I found myself whistling it all day.

A fine finishing touch to a wonderful shoot-'em-up.

Neil Paworth



The Cretan System - one of 18 worlds

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

Software

SCENE

Double trouble...

Programs: Double Pack I and II
Price: £7.99 (suggested), £9.99 (RMS)
Distributor: Mad Rat Software,
 11-15 Parnell Street, Manchester M2 3PP
Tel: 061-234 4341

DOUBLE Pack I contains two games, Mad Jax and Planet Attack. In the first you control a car driving through horizontally scrolling scenery and your objective is to travel as far as possible.

Out to stop you are a number of unsavoury road hogs, which can either be shot or avoided.



Mad Jax - road jockeying

Various items along the roadway can be picked up by driving over them. These include fuel, weapons and a couple of objects which appeared to have no discernible effect on anything.

One of the weapons on offer is a rearward shooting cannon. Although I scored what appeared to be direct hits on vehicles behind me many times, not one of them blew up. Most upsetting.

There are two sections of road, desert and city. In the former there are the road hogs, while in the latter there are additional hazards in the form of moving road barriers.

To survive the city section you must have collected enough fuel during your drive through the desert.

I found the graphics all

right, but movement was perhaps a little on the slow side. The gameplay isn't varied or interesting enough to hold the imagination for long.

The two sections - although getting progressively more difficult - are rather short and, as far as I could see, repeated ad infinitum.

Planet Attack is the better game of the two. Earth is under attack from Titanian forces which have established a base on Mars and are being kept in our time zone by the installation of Time Scales.

It's your job to destroy these by attacking them from the ship Star Eagle, but you seem to have about as much chance of succeeding as Stockport County has winning the FA Cup.

Graphics are an improvement on Mad Jax. The background scrolls by on six different levels and gives a possible illusion of dimension in depth.

Forward progress of your ship is at a preset pace and movements available are



Planet Attack - off Mars and after Triton

up, down and sideways. Your relative position is indicated by your shadow on the ground.

Armaments available are forward shooting lasers to defend against attacking Titanian Auto Droids, Space Cruisers and missiles.

The Star Eagle also has bombs which you can use to destroy ground installations, Titanian settlements, radar sites and the all important Time Scales.

Bombing a fuel dump

increases your own fuel level, but if you do run out you can eject to safety. The game then continues as before, with you now controlling your ejector seat.

This amazing device also appears to be equipped with laser cannon and bombs and needs refuelling in the same way as your spaceship did.

After a short run - around 35 seconds - the landscape scrolls back to the launch pad and you must land your craft to gain bonus points. Re-launch for more of the same, but with additional hazards to contend with.

Double Pack II includes the games Space Wars and Dreadnaught.

Space Wars really is looking a little long in the tooth. You control a spaceship at the bottom of the screen and have to fight off successive waves of aliens or monsters.

If you collide with one your shield loses effectiveness and the latter cannot be shot, but must be dodged.

This concept can still work if there is something in it to take it out of the ordinary and bring it alive. I didn't think Space Wars made that jump. The graphics are at



Software

SCENE

test only average, response is a little sluggish and detection of a missile hit on the aliens seemed suspect at times.

The game's simplicity may appeal to younger children, perhaps just starting out on careers in Universe-saving, but more experienced players will probably lose interest after a short while.

The other game *Dreadnought*, is a sort of sub-

aquatic *Dreadnaught*. You control a submarine, blasting enemy subs and negotiating traps and underwater hazards.

You can move deeper into the water or towards the surface. Hitting the sea bed, or indeed surface waves, costs you a life.

Horizontal speed can be delicately controlled and I found that I was more successful when releasing the urge to belt round at a rate

of knots blasting everything.

A slower pace made for more controlled accuracy and more reaction time if the enemy ships suddenly turned in front of you – as they had a habit of doing in the later stages.

Although not possessing the frenetic, frenetic action or same-quality graphics of *Dreadnaught*, *Dreadnought* is not a half-budget game in its own right.

Niels Reynolds

Pack 1	
Sound	B
Graphics	C
Playability	C
Value for money	C
Overall	C

Pack 2	
Sound	A
Graphics	C
Playability	C
Value for money	A
Overall	C

Kicking into touch...

Program: *Super Soccer*
Price: £29.95 (recommended),
£14.95 (low)
Suppliers: Pyramat Ltd 3,
Addison Industrial Estate,
Marston, York and West
Midts 410.
Tel: 0814 416 417

WHEN all matches are off due to adverse weather conditions and Subbuteo sets have long since been stowed to all four corners of the loft, soccer fans might well be tempted to try a football game on their Atari.

Super Soccer gives you the opportunity to play a match against a team controlled by your computer or by another player.

Team colours can be cycled, although both teams end up looking much the same and even the goalkeepers wear the same colours as their team.

You can choose which country you want to represent, but this seems to have no bearing on the game and is not referenced elsewhere – for example, the scoreboard merely titles the sides as home and away.

Your view of the action is from the side with the pitch set against a backdrop of static spectators and

ground-level advertisements.

The two teams – quite large figures – troop out, a whistle sounds and play begins. As players advance towards either goal – only a part of the pitch is visible at any time – the screen scrolls rather jerkily.

The player currently under control from each team is highlighted by a pair of brackets surrounding his head. Players and ball move slowly, particularly when two players are close to each other – essential when one player is trying to gain possession of the ball.

It is sometimes difficult to see who is who and quite what is going on.

The goalies can be controlled to a limited extent but only when the ball is nearby. At the press of the fire button, the appropriate one will immediately execute an unballistic dive.

The goalkeepers are likely to find themselves on the free transfer list before long – on several occasions they faced their goal when a goal kick was being taken.

I don't know if the invisible referee was off buying a packet of peanuts whenever it happened, but

the teams have an untoward habit of taking a goal kick when opponents are still in the goal area.

There is a good sporty opening tone, but apart from that and the playing whistle, sound effects are lacking.

The roar of the crowd is nothing more than a constant hiss which rises and falls in volume in relation to the action and the ball looks unrealistically when it bounces.

No, much as I love football, I really couldn't take to this game. It plays a little too slowly for my liking and didn't generate enough

feeling of a real match. If it's a football simulation you want – I use this word because a graphical representation is not the same – you would be better off getting *Addictive Games'* ancient *Football Manager* – it's still the best soccer simulation.

But if you actually want to see 22 men running around a pitch you might give this one a try.

Bob Chappell

Sound	B
Graphics	B
Playability	B
Value for money	B
Overall	B



THE LATEST AND



ARCHON - ROM - \$14.99 1-2 players
A battle between the forces of light and darkness; you (don't take a square, you have to fight for it.



BALLBLAZER - ROM - \$14.99 1-2 players
Can you shoot the Pussies through the moving goalposts while gloom your Redshift the one or two players.



RESCUE ON FRACTALUS - ROM - \$14.99 1-2 players
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Atari have always had the greatest arcade games in the galaxy, now they're adding even more winners to the collection. From the high speed skills of handling a WWT biplane, to the brain-aching Archon battle of wits. Whether

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THE FIDOLON

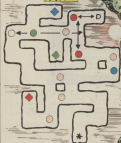
by BRYAN STEVENS



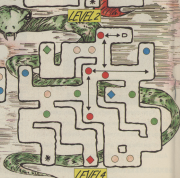
LEVEL 1



LEVEL 2



LEVEL 3

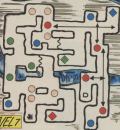


LEVEL 4



LEVEL 5

LEVEL 6



LEVEL 7

ATARI
USER

LEGEND

- * START
- D DOOR
- ⊙ STAIRCASE
- ↑ DIRECTION OF RED FREDDIE
- ~ FORCE FIELD
- ◇ JEWEL
- FREEBALL



WE welcome letters from readers giving their help with games on the Atari that they would like to pass on to other readers. The address to write to is:

Hints and Tips
Atari User
Europe House
Addington Park
Addington
Macclesfield SK10 4PP

The Extremes

THIS month's map on page 32 shows you the levels of Activision's entertaining game *The Extremes*, as to complement it here are some useful tips:

- On the lower levels the Jewel Guardians are not very dangerous, but they can still drain your energy. So when you approach one, to make it up, shoot your fireballs at it quickly while moving backwards.
- If you do manage to get lost, press P to pause the game and then refer to the map.
- Shooting a blue fireball at a creature will freeze it, but a green one

first five levels you can bypass all the creatures in levels six and seven. That is if you don't get killed by a dragon, in which case you lose all the jewels.

- If you run out of time you will have to start again on level one. So if time is running out you have two options: Face any wall and shoot at it — the fireballs will rebound and kill you — or let a creature or dragon kill you.
- On level eight, collect as many gems as you can to give you a high energy level. Avoid all the red fireballs — you can't shoot them, as the roof is too low.
- Finally, when you reach the



One of the dragons you encounter in the game

will change it into something else. But beware, the monster it changes into may be more dangerous than the one you faced in the first place.

● When you're fighting something dangerous and your energy level gets too low don't panic — just run away. Amass more energy by collecting fireballs and return for another go.

● When confronting a dragon, you can still collect the fireballs it spits at you by pressing the spacebar. Unusual hint: If you need both hands to hold your joystick, take your shoes and socks off, put the computer on the floor and use your left big toe to press the spacebar and your right one to press the P key.

● If you collect all the jewels in the

dragon on level eight, don't panic.

Next month we'll introduce you to the demonic and strange monsters that inhabit the underground caves and tell you in detail how to kill them. — *Bryan Stevens, Andover, Hants.*

Universallters

FIRST of all you need to get the remote switch, which can be found in what looks like a car. Go to the fence field where the floppy disc is and use the switch, then get the disc.

Next, get to the tap on the surface and go as far as possible to the right. You will see a white object sticking out of the cliff. Use the tap

Your HINTS & TIPS

to stop the fountain. Now go all the way down the cliff and get the wire. Go to the dynamite, near the start and down to the right.

Get the plunger and go to the room with all the rocks piled up. Use the plunger to clear the door.

Go through this door and use the plug and the floppy disc. When asked to identify yourself type SLARTBARTFAST and the fence door will now open. Go through it to the pinapple.

Get the oil and go to the fountain room. Two screws on from this you will find a real machine. Get the fuel and go to the spaceship, but make sure that you have the ID card.

Use the fuel and the ship will launch while you get ready for the next puzzle. — *Gary Gough, Fingles, Dublin.*

Spy Hunter

WHEN the spy car is first placed on the road from the weapons van it can travel on the rough ground to the right of the screen — this normally causes your car to explode later in the game.

To do this you must go forward at the slowest speed and pull right as far as the car will go.

The noise is pretty bad but it gets you out of some pretty tight spots on the expert level.

When the mad helicopter starts attacking the spy car, watch for the small square on the side of it to flash before you move away. Then, unless you hit a screen boundary, your car will not be destroyed.

When one of the enemy vehicles goes under the helicopter wait until the chopper tries to drop a bomb and fire at the car. Both of them will explode. — *Andrew Patterson, Basingstoke, Hants.*

WITH few new adventures being released for the 8-bit Atari just now, I suggest you rummage around in your sack and pull out a few of those golden oldies and revisit old acquaintances.

And what better way to start with than with an Infocom adventure — there is so much in them that they always repay a return visit. The classic Zork trilogy should be high up on your list, as should Planetfall, Deadline and Wishbringer.

For cassette owners, I would recommend Level 7's Colossal Adventure for a replay. This is the best version of the famous Crowther and Woods original Colossal Cave adventure that I know, and still gives me a real kick every time I go back to it.

One new adventure for 48k Atari machines has come to my attention, but due to the fact that my dog drive has been showing signs of old age, I have been unable to give it the Rouloc razor-sharp review treatment. The game is DCI — Operation Computer Industries — and is produced by a company called Teasoft.

The plot concerns one Professor Decker who has kidnapped a bunch of programmers attending a software conference. His plan is to hold them hostage while you go off and recover a talisman which will prove that the professor's car was filled in a lighter test crash in 1980.

To keep the authorities at bay and the town clear while you accomplish your task, the professor has built an atomic bomb and has other aggressive tricks up his sleeve — so bath-measures for this guy!

DCI is a text-only adventure using a simple vocabulary. It costs only £3.99 on cassette and £2.99 on disc, so you can't really go wrong. Copies are available direct from Teasoft at Seawalls, Croft Road, Loochannon, Ross-shire IV44 8PA.

Lots of help has been supplied by readers in response to Dave Hall of Sheffield's plea for assistance with Alternate Reality: The Dungeon. Although Dave has since written to say that he is well on the way to solving all the secrets of this adventure, I think it would help other readers to print some of the advice received from those adventurers who have taken the time and trouble to write in.

David Luge of Burton-Upon-Humber says that he has found it better to start off with a new character, as imported ones seem to get killed off too easily. He brought in a really good Level 11 character from the city but that too suffered the same early demise.

The progression of statistics is much better if you start off from scratch, says David, and by using

Back to the Golden Age of Adventures

good weapons found in special places, you can have a better character at Level 8 in the Dungeon than by importing a higher level one from the City.

David recommends that if you find a silver key on a corpse or elsewhere, you should take it to the prison in the palace dungeon area. There you can free Abrisimind's assistant who will give you a spell called Temporal Fugue which speeds you up in combat, makes you hit harder and lets you pick up dropped weapons.

The oracle doesn't appear to know what your abilities are, but simply lists the quests in order. There's nothing for it but to keep on throwing in gold and spending. The first clue to the Gan-goye's riddle is S&P&R&R&C and you can only cross the River Storm at mid-night.

Susan Fairhurst of Ashton, near Wigan, adds to this by saying that the other words needed to answer the Gan-goye's riddle are ORACLE and BLOODSTONE. She warns to take care as there is something nasty on the other side of the river.

Susan and others also advise that you check that you have version 2.1, as version 2.0 has two FBI agents that prevent you from transferring a city

character to the dungeon.

Susan would like to know the solution to the three doors. She knows that going to the first three doors opens the one to the corridor and going to door two shuts it — but what does door three do? The answer is something to do with two other minor quests — but does anyone know what?

Peter Laurence of the month award has to go to Dave Fox of Kemsing in Kent. He has sent in a number of

Fun to Page 58 ▶

by
Rouloc



4 From Page 35

rhyming dog for The Dungeon. For example:

A bear with fangs and fearsome gaze,
Whose hide will stop the keenest blades.
All types of magic it withstands,
Yet show might conquer with bare hands.

Good, eh? What it actually means is that to gain the Bloodstone you must kill the Basilisk using the mirrored shield and your bare hands.

In return for his magnificent poetic efforts, the bard Dave Fox would like to know what is the Axiom of Truth in Ultima IV. Can anyone help? And, in addition, Dave Hall of Sheffield will have one question unanswered – what is the name of the Geryonid?

Finally, in response to requests from other readers including Chris Leighton of Sherwood in Nottingham and Andrew Barnes of Worthing, Sussex, I have given some hints for Guild of Thieves and The Price of Magic.

Until next month, exciting adventuring!

GUILD OF THIEVES

To cross the room of coloured squares starting on the black square, follow the colours of the rainbow backwards – violet, indigo, blue, green, yellow, orange and red – then move to the white square. You should have noticed that WORMHOLE is the word Rainbow spelled backwards! To return across the room, reverse the order.

To enter the Bank of Karavnia, you must place all the treasures in one of the night safes – the sign outside the bank will change, depending on how many treasures have so far been deposited.

The pick is used to get the chips of mineral from the rock face near the waterfall.



PRICE OF MAGIC

To recover the sword stuck through the ceiling, push the secret panel in one of the rooms – 5 then 55 from the Heavy Corridor – in the oak paneled corridor then pull the lever. To read

the inscription on the ceiling, cast the fly spell on yourself.

To deal with the glowing gateway, try giving any spell focus – the gem-datum, for example.

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NOW WE ARE THREE

This month Atari User is three years old and much has happened in the last 12 months. The quality of software continues to improve as games players expect more and more from their computers. Indeed Atari itself has stepped in addition to its range with the Atari XE Games System.

So to celebrate the success of the Atari as a games machine we are offering you the opportunity of winning:



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"A sophisticated games playing console with an amazing range of software and the possibility of upgrading to a full computer at a later stage."

Amie Wiley, Atari User, February 1988



2nd PRIZE

From Tynesoft comes follow up to the hit 88. This exciting new release contains five games with first-rate graphics and excellent gameplay. There are 16 copies to be won. Value: £14.00 each

"One of the best games for you to enjoy, and some great animation too. Sound effects and music are also used to the benefit of the game's atmosphere."

Rob Chappell, Atari User, May 1988



3rd PRIZE

Three copies of Miss Fox and Phantom - two more games of quality from Tynesoft. Value: £5.00 each

Miss Fox: "The sound, graphics and speed-reading complement each other - with numerous levels ensuring the very best of the Atari's graphics capabilities."

Neil Forsyth, Atari User, January 1988

Phantom: "Character animation is superb both for speed and your player character. Phantom is original and well worth buying for the sheer pleasure of playing it."

Neil Forsyth, Atari User, July 1987

WHAT YOU HAVE TO DO

Simply answer the following four questions, complete the entry form and send it to arrive no later than May 29, 1988.

QUESTIONS

1. Which event did Mike Edwards enter in the 1988 Winter Olympics?
2. In which year did Tomill and Dean win their last Gold Olympic medal?
3. How many Championships were there by the end of the first?
4. Which film is famous for the phrase "May the Force be with you"?

ENTRY FORM

ANSWERS:

1. _____
2. _____
3. _____
4. _____

Name: _____

Address: _____

Postcode: _____

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Removes a single or block of unwanted Basic lines quickly.

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Converts numbers between decimal, hexadecimal and binary.

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Calculates and presents the useful Atari User checksums instantly.

CHANGE

Alters the name of a variable at every occurrence in a program.

STRIP

Removes all PEEKs and rewrites the size of the program.

LISTING

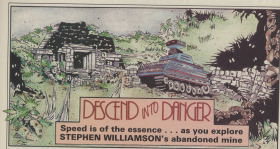
Prints and includes the Atari special characters on an Epson printer.

LMVR

Gives the name of all used variables and a list of all their occurrences.

£5.95 tape
£7.95 disc

TO ORDER PLEASE USE THE FORM ON PAGE 61



DESCEND INTO DANGER

Speed is of the essence . . . as you explore
STEPHEN WILLIAMSON's abandoned mine

HERE'S a very addictive game set in an abandoned mine which you explore in your UV - Underground Exploration Vehicle. You descend from the top of each level - mine in all - avoiding radioactive isotopes, stalagmites, and evil ghosts on the prowl for victims.

A joystick plugged into port one controls the UV's movements and the fire button accelerates it in case of trouble. You start the game with nine lives - and you'll need them - with extra ones being given as you clear levels four, six and eight. Touching walls, ghosts or various obstacles costs you of one life.

Once you've completed a level you are awarded a bonus which is calculated according to the time it took you - the quicker you do it the more you score.

Each successive level gets harder and some require a lot of thought before you can complete them. After you have finished press Start to begin again.

The layout for levels one to four can be found between lines 560 and 1080, with levels five to seven between 1560 and 1940. These routines are re-defined characters which makes it very easy to customise your own version of the game.

If you delete line 480 you can have infinite lives, while changing line 420 to read:

480 LIFE=0

will remove all collision detection for your UV and allow you to travel through walls and see the whole game from start to finish.



Level one of the game

```

10 REM NAME: DANGER
20 REM BY: STEPHEN WILLIAMSON
30 REM VERSION: 1.00
40 REM [REDACTED]
50 REM [REDACTED]
60 REM [REDACTED]
70 REM [REDACTED]
80 REM [REDACTED]
90 REM [REDACTED]
100 REM [REDACTED]
110 REM [REDACTED]
120 REM [REDACTED]
130 REM [REDACTED]
140 REM [REDACTED]
150 REM [REDACTED]
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SOFTWARE *Solutions*

Your programming problems solved by ANDRÉ WILLEY

THIS month the first letter comes from Bryan Kamberley who is based at Rhyl in Wales. He has a few questions about some puzzling aspects of the Atari floppy disc system.

*I am currently writing a disc sector editor and while doing so I have uncovered a few unusual phenomena. Firstly, on reading the directory of *Alternate Reality - The City* (disc 3, side 1), two directories appear to be displayed in a random order.*

Investigation reveals that on reading the directory sectors (DIR to 364) the same thing occurs. Here too these sectors hold one set of data in one pass and a completely different set on the next?

Also, while writing the DLI routines I made extensive use of the Dos 2.5 services on my 130XE, and in doing so I discovered a seemingly pointless function: if a working DLI is disabled by setting bit 7 of location \$4286 to zero (using POKE \$4286,0) before accessing a disc random file, the DLI miraculously springs back into life again. Is this essential to the ramdisk's operation, or is it just a bug?

I would like to include in my program the capability to delete, examine and create bad sectors - but to do so I need to know what one is. What makes them different to ordinary sectors and how are they created?

As far as the DLI part of your question goes, the answer is probably a slip up on the part of the authors of Dos 2.5. When the ramdisk is accessed various portions of ram and rom are switched in and out of the memory map, and the operating system must always be deactivated before attempting to do such bank selection operations.

This involves turning off both the Vertical Blank and Display List Interrupts (VBL and DLI) by setting location \$4286 to zero. Normally the

original contents would be stored temporarily on the stack, but in this case that doesn't seem to happen and the value 182 is restored after the Dos call - re-activating any DLIs as well as the required VBL system.

The other part of your letter requires a greater understanding of the way in which an Atari disc drive works.

Although we tend to think of disc sectors as being numbered sequentially from 1 to 720, the disc drive actually sees them rather differently. It deals with the disc as 40 separate tracks with each containing 18 sectors of data (or 26 if you're using an enhanced density disc).

Each sector within a track is assigned a number between 1 and 18 so when you ask to read a given disc sector, the number you specify must first be converted into track and sector references - and only when the disc drive's read/write head is positioned over the correct track can the sector offset value be used to read in the correct data.

For example, if you try to access sector 18 the drive looks on track 0 for the sector numbered 18. Similarly, sector 18 would actually be at track 1 (sector 1) and so on up to sector 720 which is really track 40 (sector 18).

Some manufacturers use a special timing hole punched into all 5.25in discs to work out where each sector occurs within a track. Atari, however, opted for a software approach and each sector has a short block of header data which provides the sector reference number and some error prevention checksum data.

What you have come across is a method of copy protection used by some disc manufacturers. As you have observed, the first directory entry is located at sector number 361, which is in fact the first sector of track 20. Whenever you ask for a directory (from sector 361) the drive head moves straight to track 20 and starts

reading each sector in turn until it finds one with a header value of one.

As soon as it finds the correct header it knows that it must read the next 126 bytes of data directly to your micro. Finally, all the data bytes are added together and compared with the original checksum digit found in the header, and only if the two numbers match will the transfer be considered complete.

The drive expects there to be 18 individual sectors, each with a unique number, but it is theoretically possible to have more than one sector with the same reference number - it being just luck which one the drive arrives at first. Some discs even contain 18 sectors, all with the same number - giving 18 possible sets of data for one official sector number.

There are obviously some devious ways of contriving to read a specific sector out of the 18 present, but there is no point going into detail because there is absolutely no way in which you can create a disc like this with a normal drive. Software manufacturers use some very special pieces of equipment to make such discs, and the program won't run unless this custom format is present.

The same applies to so-called bad sectors, which are often physically damaged or given incorrect checksum digits - thus returning a disc read error even when there may be 126 bytes of good data present. Once again, you can't create these with a normal drive - indeed Atari has provided you with an awful lot of facility to prevent the possibility of any bad data being recorded on a disc.

Of course, you are a responsible Atari owner, and wouldn't be interested in actually copying such things anyway, would you? That would be both illegal and immoral, and is the

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From Page 48

reason why such weird and uncooperative data formats were created in the first place. Here endeth today's lecture!

SuperScript puzzle

On how to a letter from the Netherlands, from Th.P.J. Blais:

“Last August I bought the SuperScript word processor which I had seen advertised in Atari User, and which I am generally very happy with. However, a few days ago I was re-reading your March 1988 issue containing the SuperScript review in which the reviewer mentions a bug with the Return character (13) versus the normal Atari code of 105. As I had already encountered the problem of printing a text file to disc I was glad to get an answer to this problem, so I decided to follow the reviewer's advice and alter the 13 on my work disc default file, and in the Epson file on the master disc.

I loaded up SuperScript and loaded the Epson printer driver and changed the Return number 13 to 105. Then I used the Document Replace option to write the printer driver back to my disc and just the program away. The following day I tried to load SuperScript and I could only get the READY prompt or the Self-Test menu. Upon checking the disc I found that the first three files, the ones with hearts in the directory, had been deleted. I then used the Restore option from my modified Disc 3.3, and now the default file seems to contain some 800 sectors – but the disc still doesn't boot.

I hope that you can offer me a solution as to how to get SuperScript working again, or print a warning in your magazine for other readers so it won't happen to anyone else.”

As you have by now realised, it's always a mistake to write anything to a master disc unless you've first made a backup of it. Since SuperScript is heavily copy-protected, it's best to assume that you just don't write anything to it at all.

What you should have done is to

write your new defaults file on to your work disc, and not used the original version on the master disc at all. As you have discovered, your master is now corrupted and you should send it back for a replacement (although you will probably have to pay the media cost – somewhere around £3 to £5 sounds reasonable).

The first three boot files on the disc were originally hidden from view by altering their respective directory entries, so when you tried to write a new file on to the disc the first blank entry was assumed to be empty and re-used, thus corrupting the hidden DOS.SYS file.

I reckon that such techniques should not be used on business programs, and you should not only be allowed to but be positively encouraged to take backups of your master discs. After all, you've paid out your £50 and the program is now useless through no real fault of your own. I hope you get it sorted out soon, and perhaps software houses will ensure that future versions of such programs will be released in non-protected forms, as they already are on the ST.

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5 LINERS

PERCEPTION from George Postler

TEST your reaction speed to a given situation by playing this fun-to-use program. Processing Start begins the game and the micro displays two numbers on the screen for a short time. If you recognize them as being the same, press the fire button on your joystick, which should be plugged into port one.

If you are quick enough and the numbers are still the same the computer will award you one point but if you are wrong your attempts left will be reduced by one. After five games the game will end and your final total will be displayed.

PROGRAM BREAKDOWN

- 1 Sets up a Graphics Mode 24x16 screen and tests for Start to be pressed
- 2 Generates and prints the two random numbers and tests for the trigger to be pressed
- 3 Specifies up the game, prints the score and your number of attempts
- 4 Tests whether X is the same as Y, subtracts attempts and returns to line two
- 5 Adds one point and returns to line two

Recently our readers have been sending us Five Liners that have been getting more clever and imaginative by the day. They're finding lots of ways to cram more and more code into the tight space available. So here are a couple of tips to help you enter the long lines.

Firstly, enter POKE 83,0 to remove the left hand screen margin. This allows you to enter four lines of

Basic on the screen. You should also leave out all unnecessary spaces.

Whenever possible use the abbreviated form of the commands. Some common ones are:

GRAPHICS ON	G.
FOR	F.
NEXT	N.
SOUND	SD.
GOTO	G.
DATA	D.

ENHANCED ON-SCREEN EDITOR from Karl Fitzhugh

HOW often have you been sitting up a Graphics 0 title screen when you've had to strain your eyes to count the characters to the left of the cursor in order to work out coordinates for a POSITION statement?

Or how many times have you had to dig out your trusty manual to look up the internal code for a character when you needed to POKE it directly to the screen?

This Five Liner solves both of these problems. It sets up a machine code routine residing in Page 8 — locations 1536 to 1573 — that calculates during the vertical blank period — VBI — so make sure that your program doesn't use this area of memory. An extra line of text is added at the top of a Graphics 0 screen which shows the current row and column of the cursor, as well as the internal character set code for the character currently under the cursor.

Once you have typed it in, save a copy before running it as any mistakes in the DATA statements could cause the computer to crash. After

the program is run you can type NEW to delete the Basic from memory and call the routine by typing X=USR1576.

If you press Reset or execute a Graphics 0 command you will have to call it again but don't call it from any other mode or you will just get garbage on the screen.

```

1 REM 0,10,20,30,40,50,60,70,80,90,100,110,120,130,140,150,160,170,180,190,200,210,220,230,240,250,260,270,280,290,300,310,320,330,340,350,360,370,380,390,400,410,420,430,440,450,460,470,480,490,500,510,520,530,540,550,560,570,580,590,600,610,620,630,640,650,660,670,680,690,700,710,720,730,740,750,760,770,780,790,800,810,820,830,840,850,860,870,880,890,900,910,920,930,940,950,960,970,980,990,1000,1010,1020,1030,1040,1050,1060,1070,1080,1090,1100,1110,1120,1130,1140,1150,1160,1170,1180,1190,1200,1210,1220,1230,1240,1250,1260,1270,1280,1290,1300,1310,1320,1330,1340,1350,1360,1370,1380,1390,1400,1410,1420,1430,1440,1450,1460,1470,1480,1490,1500,1510,1520,1530,1540,1550,1560,1570,1580,1590,1600,1610,1620,1630,1640,1650,1660,1670,1680,1690,1700,1710,1720,1730,1740,1750,1760,1770,1780,1790,1800,1810,1820,1830,1840,1850,1860,1870,1880,1890,1900,1910,1920,1930,1940,1950,1960,1970,1980,1990,2000,2010,2020,2030,2040,2050,2060,2070,2080,2090,2100,2110,2120,2130,2140,2150,2160,2170,2180,2190,2200,2210,2220,2230,2240,2250,2260,2270,2280,2290,2300,2310,2320,2330,2340,2350,2360,2370,2380,2390,2400,2410,2420,2430,2440,2450,2460,2470,2480,2490,2500,2510,2520,2530,2540,2550,2560,2570,2580,2590,2600,2610,2620,2630,2640,2650,2660,2670,2680,2690,2700,2710,2720,2730,2740,2750,2760,2770,2780,2790,2800,2810,2820,2830,2840,2850,2860,2870,2880,2890,2900,2910,2920,2930,2940,2950,2960,2970,2980,2990,3000,3010,3020,3030,3040,3050,3060,3070,3080,3090,3100,3110,3120,3130,3140,3150,3160,3170,3180,3190,3200,3210,3220,3230,3240,3250,3260,3270,3280,3290,3300,3310,3320,3330,3340,3350,3360,3370,3380,3390,3400,3410,3420,3430,3440,3450,3460,3470,3480,3490,3500,3510,3520,3530,3540,3550,3560,3570,3580,3590,3600,3610,3620,3630,3640,3650,3660,3670,3680,3690,3700,3710,3720,3730,3740,3750,3760,3770,3780,3790,3800,3810,3820,3830,3840,3850,3860,3870,3880,3890,3900,3910,3920,3930,3940,3950,3960,3970,3980,3990,4000,4010,4020,4030,4040,4050,4060,4070,4080,4090,4100,4110,4120,4130,4140,4150,4160,4170,4180,4190,4200,4210,4220,4230,4240,4250,4260,4270,4280,4290,4300,4310,4320,4330,4340,4350,4360,4370,4380,4390,4400,4410,4420,4430,4440,4450,4460,4470,4480,4490,4500,4510,4520,4530,4540,4550,4560,4570,4580,4590,4600,4610,4620,4630,4640,4650,4660,4670,4680,4690,4700,4710,4720,4730,4740,4750,4760,4770,4780,4790,4800,4810,4820,4830,4840,4850,4860,4870,4880,4890,4900,4910,4920,4930,4940,4950,4960,4970,4980,4990,5000,5010,5020,5030,5040,5050,5060,5070,5080,5090,5100,5110,5120,5130,5140,5150,5160,5170,5180,5190,5200,5210,5220,5230,5240,5250,5260,5270,5280,5290,5300,5310,5320,5330,5340,5350,5360,5370,5380,5390,5400,5410,5420,5430,5440,5450,5460,5470,5480,5490,5500,5510,5520,5530,5540,5550,5560,5570,5580,5590,5600,5610,5620,5630,5640,5650,5660,5670,5680,5690,5700,5710,5720,5730,5740,5750,5760,5770,5780,5790,5800,5810,5820,5830,5840,5850,5860,5870,5880,5890,5900,5910,5920,5930,5940,5950,5960,5970,5980,5990,6000,6010,6020,6030,6040,6050,6060,6070,6080,6090,6100,6110,6120,6130,6140,6150,6160,6170,6180,6190,6200,6210,6220,6230,6240,6250,6260,6270,6280,6290,6300,6310,6320,6330,6340,6350,6360,6370,6380,6390,6400,6410,6420,6430,6440,6450,6460,6470,6480,6490,6500,6510,6520,6530,6540,6550,6560,6570,6580,6590,6600,6610,6620,6630,6640,6650,6660,6670,6680,6690,6700,6710,6720,6730,6740,6750,6760,6770,6780,6790,6800,6810,6820,6830,6840,6850,6860,6870,6880,6890,6900,6910,6920,6930,6940,6950,6960,6970,6980,6990,7000,7010,7020,7030,7040,7050,7060,7070,7080,7090,7100,7110,7120,7130,7140,7150,7160,7170,7180,7190,7200,7210,7220,7230,7240,7250,7260,7270,7280,7290,7300,7310,7320,7330,7340,7350,7360,7370,7380,7390,7400,7410,7420,7430,7440,7450,7460,7470,7480,7490,7500,7510,7520,7530,7540,7550,7560,7570,7580,7590,7600,7610,7620,7630,7640,7650,7660,7670,7680,7690,7700,7710,7720,7730,7740,7750,7760,7770,7780,7790,7800,7810,7820,7830,7840,7850,7860,7870,7880,7890,7900,7910,7920,7930,7940,7950,7960,7970,7980,7990,8000,8010,8020,8030,8040,8050,8060,8070,8080,8090,8100,8110,8120,8130,8140,8150,8160,8170,8180,8190,8200,8210,8220,8230,8240,8250,8260,8270,8280,8290,8300,8310,8320,8330,8340,8350,8360,8370,8380,8390,8400,8410,8420,8430,8440,8450,8460,8470,8480,8490,8500,8510,8520,8530,8540,8550,8560,8570,8580,8590,8600,8610,8620,8630,8640,8650,8660,8670,8680,8690,8700,8710,8720,8730,8740,8750,8760,8770,8780,8790,8800,8810,8820,8830,8840,8850,8860,8870,8880,8890,8900,8910,8920,8930,8940,8950,8960,8970,8980,8990,9000,9010,9020,9030,9040,9050,9060,9070,9080,9090,9100,9110,9120,9130,9140,9150,9160,9170,9180,9190,9200,9210,9220,9230,9240,9250,9260,9270,9280,9290,9300,9310,9320,9330,9340,9350,9360,9370,9380,9390,9400,9410,9420,9430,9440,9450,9460,9470,9480,9490,9500,9510,9520,9530,9540,9550,9560,9570,9580,9590,9600,9610,9620,9630,9640,9650,9660,9670,9680,9690,9700,9710,9720,9730,9740,9750,9760,9770,9780,9790,9800,9810,9820,9830,9840,9850,9860,9870,9880,9890,9900,9910,9920,9930,9940,9950,9960,9970,9980,9990,10000,10010,10020,10030,10040,10050,10060,10070,10080,10090,10100,10110,10120,10130,10140,10150,10160,10170,10180,10190,10200,10210,10220,10230,10240,10250,10260,10270,10280,10290,10300,10310,10320,10330,10340,10350,10360,10370,10380,10390,10400,10410,10420,10430,10440,10450,10460,10470,10480,10490,10500,10510,10520,10530,10540,10550,10560,10570,10580,10590,10600,10610,10620,10630,10640,10650,10660,10670,10680,10690,10700,10710,10720,10730,10740,10750,10760,10770,10780,10790,10800,10810,10820,10830,10840,10850,10860,10870,10880,10890,10900,10910,10920,10930,10940,10950,10960,10970,10980,10990,11000,11010,11020,11030,11040,11050,11060,11070,11080,11090,11100,11110,11120,11130,11140,11150,11160,11170,11180,11190,11200,11210,11220,11230,11240,11250,11260,11270,11280,11290,11300,11310,11320,11330,11340,11350,11360,11370,11380,11390,11400,11410,11420,11430,11440,11450,11460,11470,11480,11490,11500,11510,11520,11530,11540,11550,11560,11570,11580,11590,11600,11610,11620,11630,11640,11650,11660,11670,11680,11690,11700,11710,11720,11730,11740,11750,11760,11770,11780,11790,11800,11810,11820,11830,11840,11850,11860,11870,11880,11890,11900,11910,11920,11930,11940,11950,11960,11970,11980,11990,12000,12010,12020,12030,12040,12050,12060,12070,12080,12090,12100,12110,12120,12130,12140,12150,12160,12170,12180,12190,12200,12210,12220,12230,12240,12250,12260,12270,12280,12290,12300,12310,12320,12330,12340,12350,12360,12370,12380,12390,12400,12410,12420,12430,12440,12450,12460,12470,12480,12490,12500,12510,12520,12530,12540,12550,12560,12570,12580,12590,12600,12610,12620,12630,12640,12650,12660,12670,12680,12690,12700,12710,12720,12730,12740,12750,12760,12770,12780,12790,12800,12810,12820,12830,12840,12850,12860,12870,12880,12890,12900,12910,12920,12930,12940,12950,12960,12970,12980,12990,13000,13010,13020,13030,13040,13050,13060,13070,13080,13090,13100,13110,13120,13130,13140,13150,13160,13170,13180,13190,13200,13210,13220,13230,13240,13250,13260,13270,13280,13290,13300,13310,13320,13330,13340,13350,13360,13370,13380,13390,13400,13410,13420,13430,13440,13450,13460,13470,13480,13490,13500,13510,13520,13530,13540,13550,13560,13570,13580,13590,13600,13610,13620,13630,13640,13650,13660,13670,13680,13690,13700,13710,13720,13730,13740,13750,13760,13770,13780,13790,13800,13810,13820,13830,13840,13850,13860,13870,13880,13890,13900,13910,13920,13930,13940,13950,13960,13970,13980,13990,14000,14010,14020,14030,14040,14050,14060,14070,14080,14090,14100,14110,14120,14130,14140,14150,14160,14170,14180,14190,14200,14210,14220,14230,14240,14250,14260,14270,14280,14290,14300,14310,14320,14330,14340,14350,14360,14370,14380,14390,14400,14410,14420,14430,14440,14450,14460,14470,14480,14490,14500,14510,14520,14530,14540,14550,14560,14570,14580,14590,14600,14610,14620,14630,14640,14650,14660,14670,14680,14690,14700,14710,14720,14730,14740,14750,14760,14770,14780,14790,14800,14810,14820,14830,14840,14850,14860,14870,14880,14890,14900,14910,14920,14930,14940,14950,14960,14970,14980,14990,15000,15010,15020,15030,15040,15050,15060,15070,15080,15090,15100,15110,15120,15130,15140,15150,15160,15170,15180,15190,15200,15210,15220,15230,15240,15250,15260,15270,15280,15290,15300,15310,15320,15330,15340,15350,15360,15370,15380,15390,15400,15410,15420,15430,15440,15450,15460,15470,15480,15490,15500,15510,15520,15530,15540,15550,15560,15570,15580,15590,15600,15610,15620,15630,15640,15650,15660,15670,15680,15690,15700,15710,15720,15730,15740,15750,15760,15770,15780,15790,15800,15810,15820,15830,15840,15850,15860,15870,15880,15890,15900,15910,15920,15930,15940,15950,15960,15970,15980,15990,16000,16010,16020,16030,16040,16050,16060,16070,16080,16090,16100,16110,16120,16130,16140,16150,16160,16170,16180,16190,16200,16210,16220,16230,16240,16250,16260,16270,16280,16290,16300,16310,16320,16330,16340,16350,16360,16370,16380,16390,16400,16410,16420,16430,16440,16450,16460,16470,16480,16490,16500,16510,16520,16530,16540,16550,16560,16570,16580,16590,16600,16610,16620,16630,16640,16650,16660,16670,16680,16690,16700,16710,16720,16730,16740,16750,16760,16770,16780,16790,16800,16810,16820,16830,16840,16850,16860,16870,16880,16890,16900,16910,16920,16930,16940,16950,16960,16970,16980,16990,17000,17010,17020,17030,17040,17050,17060,17070,17080,17090,17100,17110,17120,17130,17140,17150,17160,17170,17180,17190,17200,17210,17220,17230,17240,17250,17260,17270,17280,17290,17300,17310,17320,17330,17340,17350,17360,17370,17380,17390,17400,17410,17420,17430,17440,17450,17460,17470,17480,17490,17500,17510,17520,17530,17540,17550,17560,17570,17580,17590,17600,17610,17620,17630,17640,17650,17660,17670,17680,17690,17700,17710,17720,17730,17740,17750,17760,17770,17780,17790,17800,17810,17820,17830,17840,17850,17860,17870,17880,17890,17900,17910,17920,17930,17940,17950,17960,17970,17980,17990,18000,18010,18020,18030,18040,18050,18060,18070,18080,18090,18100,18110,18120,18130,18140,18150,18160,18170,18180,18190,18200,18210,18220,18230,18240,18250,18260,18270,18280,18290,18300,18310,18320,18330,18340,18350,18360,18370,18380,18390,18400,18410,18420,18430,18440,18450,18460,18470,18480,18490,18500,18510,18520,18530,18540,18550,18560,18570,18580,18590,18600,18610,18620,18630,18640,18650,18660,18670,18680,18690,18700,18710,18720,18730,18740,18750,18760,18770,18780,18790,18800,18810,18820,18830,18840,18850,18860,18870,18880,18890,18900,18910,18920,18930,18940,18950,18960,18970,18980,18990,19000,19010,19020,19030,19040,19050,19060,19070,19080,19090,19100,19110,19120,19130,19140,19150,19160,19170,19180,19190,19200,19210,19220,19230,19240,19250,19260,19270,19280,19290,19300,19310,19320,19330,19340,19350,19360,19370,19380,19390,19400,19410,19420,19430,19440,19450,19460,19470,19480,19490,19500,19510,19520,19530,19540,19550,19560,19570,19580,19590,19600,19610,19620,19630,19640,19650,19660,19670,19680,19690,19700,19710,19720,19730,19740,19750,19760,19770,19780,19790,19800,19810,19820,19830,19840,19850,19860,19870,19880,19890,19900,19910,19920,19930,19940,19950,19960,19970,19980,19990,20000,20010,20020,20030,20040,20050,20
```

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

We pay £25 for each one published.

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

Win £25

are relevant. And remember if you want your material returning please enclose a suitably stamped package.

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

Atari User, Europa House, Addington Park, Addington, Maresfield S11 9AP.



BOUNCE DEMO

from Keith and Joel Goodwin

THIS program proves that you can achieve smooth fine scrolling without having to use complex assembly language. Instead it simply manipulates the Display List to do the trick equally as well.

When you first run it, the message, ATARI USER MAGAZINE, will bounce up and down the screen very smoothly with none of the jerkiness that usually occurs with on-screen character animation. After a short while it slows down and it stops at the bottom of the display. Then it starts all over again.

```

3 0000 0000 0000 0000 0000 0000 0000 0000
4 0000 0000 0000 0000 0000 0000 0000 0000
5 0000 0000 0000 0000 0000 0000 0000 0000

```

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6 0000 0000 0000 0000 0000 0000 0000 0000
7 0000 0000 0000 0000 0000 0000 0000 0000
8 0000 0000 0000 0000 0000 0000 0000 0000

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9 0000 0000 0000 0000 0000 0000 0000 0000
10 0000 0000 0000 0000 0000 0000 0000 0000
11 0000 0000 0000 0000 0000 0000 0000 0000

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12 0000 0000 0000 0000 0000 0000 0000 0000
13 0000 0000 0000 0000 0000 0000 0000 0000
14 0000 0000 0000 0000 0000 0000 0000 0000

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```

15 0000 0000 0000 0000 0000 0000 0000 0000
16 0000 0000 0000 0000 0000 0000 0000 0000
17 0000 0000 0000 0000 0000 0000 0000 0000

```

PROGRAM BREAKDOWN

- 1 Sets up the display list, disables the screen and sets up the variables.
- 2 Finishes the display list and prints a message.
- 3 Re-enables the screen and flashes in the message with sound effects.
- 4 Scrolls the message down, lowers the height of the next bounce and checks whether the message has stopped bouncing at the bottom.
- 5 Makes the sound of the message hitting the bottom, scrolls the message up and makes the sound of hitting the top of the screen.



```

1 4P4 (P)
2 5L4 (P)
3 4B1 (P)
4 4LCT (P)
5 4P1 (P)

```

VARIABLES

- Q, I Low and high bytes of the display list
- D Location of the display list
- L, H Low and high byte pointers to the screen memory
- P Holds the height of the current bounce
- Q, B FOR...NEXT loop counters

LACE

from Damon Burroughs

HERE'S a super little program that will show you just how easy it is to create colourful graphics on your Atari. The finished three-colour picture is drawn in eight parts - mirrored in the specified colour.

When the program has finished it holds the pattern for a short while and then starts it again. Also included is a short sound effect which can be heard as the screen is drawn.

PROGRAM BREAKDOWN

- 10 Sets up sound, colour and graphics mode and then draws the first stage of the computer face.
- 20 Draws the second stage, changes the colours for the next two and then draws stage three.
- 30 Draws the fourth stage, changes the colour for the next four and then draws stage five.
- 40 Draws stages six and seven.
- 50 Draws stage eight, switches off the sound, holds the face design for a few seconds and then loops back to line 10 to re-draw the pattern.

```

10 0000 0000 0000 0000 0000 0000 0000 0000
11 0000 0000 0000 0000 0000 0000 0000 0000
12 0000 0000 0000 0000 0000 0000 0000 0000

```

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13 0000 0000 0000 0000 0000 0000 0000 0000
14 0000 0000 0000 0000 0000 0000 0000 0000
15 0000 0000 0000 0000 0000 0000 0000 0000

```

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16 0000 0000 0000 0000 0000 0000 0000 0000
17 0000 0000 0000 0000 0000 0000 0000 0000
18 0000 0000 0000 0000 0000 0000 0000 0000

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19 0000 0000 0000 0000 0000 0000 0000 0000
20 0000 0000 0000 0000 0000 0000 0000 0000
21 0000 0000 0000 0000 0000 0000 0000 0000

```

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22 0000 0000 0000 0000 0000 0000 0000 0000
23 0000 0000 0000 0000 0000 0000 0000 0000
24 0000 0000 0000 0000 0000 0000 0000 0000

```

```

25 0000 0000 0000 0000 0000 0000 0000 0000
26 0000 0000 0000 0000 0000 0000 0000 0000
27 0000 0000 0000 0000 0000 0000 0000 0000

```

```

28 0000 0000 0000 0000 0000 0000 0000 0000
29 0000 0000 0000 0000 0000 0000 0000 0000
30 0000 0000 0000 0000 0000 0000 0000 0000

```



```

18 5G4 (C)
28 7A4 (C)
30 7U1 (I)
40 6A4 (C)
50 5F4 (C)

```

Now you see it, now you don't

LEN GOLDING continues his look
at animation using Atari Basic

As we saw last month, it's quite easy to make a keyboard character move around the screen by just printing a blank space over it, then re-printing it somewhere else.

This is fine as long as the background is blank, but suppose the character has to move across a terrain map, or other scenery? If you print a blank space every time the character moves, it will leave behind a trail of missing background.

The theory behind overcoming the problem is straightforward: We first look to see where our moving character is about to land, find what's currently printed there and store the information in a safe place.

Next we print our character, which

will then erase the background at that position. When the time comes to move it, we re-print the original background data, which erases the moving character and restores the background — all in one go.

Although it sounds fairly simple, it's a very complicated thing for a computer to do. Consider the statement:

LET C=PEEK

In ordinary English, it means: Move the cursor to a position 10 columns in from the left and 20 rows down. Read the character currently occupying that spot and store its code number in a variable called C.

If, for example, the letter A is cur-

```
10 REM Program 1: 8-directional joystick
20 REM controlled movement over a background
30 REM
40 REM (optional) 4096 memory for LOCATE
50 REM
60 REM 100,100 coordinate system for ball
70 REM
80 REM 200,200 coordinate system for ball
90 REM
100 REM 100,100 coordinate system for ball
110 REM
120 REM 100,100 coordinate system for ball
130 REM
140 REM 100,100 coordinate system for ball
150 REM
160 REM 100,100 coordinate system for ball
170 REM
180 REM 100,100 coordinate system for ball
190 REM
200 REM 100,100 coordinate system for ball
210 REM
220 REM 100,100 coordinate system for ball
230 REM
240 REM 100,100 coordinate system for ball
250 REM
260 REM 100,100 coordinate system for ball
270 REM
280 REM 100,100 coordinate system for ball
290 REM
300 REM 100,100 coordinate system for ball
310 REM
320 REM 100,100 coordinate system for ball
330 REM
340 REM 100,100 coordinate system for ball
350 REM
360 REM 100,100 coordinate system for ball
370 REM
380 REM 100,100 coordinate system for ball
390 REM
400 REM 100,100 coordinate system for ball
410 REM
420 REM 100,100 coordinate system for ball
430 REM
440 REM 100,100 coordinate system for ball
450 REM
460 REM 100,100 coordinate system for ball
470 REM
480 REM 100,100 coordinate system for ball
490 REM
500 REM 100,100 coordinate system for ball
510 REM
520 REM 100,100 coordinate system for ball
530 REM
540 REM 100,100 coordinate system for ball
550 REM
560 REM 100,100 coordinate system for ball
570 REM
580 REM 100,100 coordinate system for ball
590 REM
600 REM 100,100 coordinate system for ball
610 REM
620 REM 100,100 coordinate system for ball
630 REM
640 REM 100,100 coordinate system for ball
650 REM
660 REM 100,100 coordinate system for ball
670 REM
680 REM 100,100 coordinate system for ball
690 REM
700 REM 100,100 coordinate system for ball
710 REM
720 REM 100,100 coordinate system for ball
730 REM
740 REM 100,100 coordinate system for ball
750 REM
760 REM 100,100 coordinate system for ball
770 REM
780 REM 100,100 coordinate system for ball
790 REM
800 REM 100,100 coordinate system for ball
810 REM
820 REM 100,100 coordinate system for ball
830 REM
840 REM 100,100 coordinate system for ball
850 REM
860 REM 100,100 coordinate system for ball
870 REM
880 REM 100,100 coordinate system for ball
890 REM
900 REM 100,100 coordinate system for ball
910 REM
920 REM 100,100 coordinate system for ball
930 REM
940 REM 100,100 coordinate system for ball
950 REM
960 REM 100,100 coordinate system for ball
970 REM
980 REM 100,100 coordinate system for ball
990 REM
```

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690 REM
700 REM 100,100 coordinate system for ball
710 REM
720 REM 100,100 coordinate system for ball
730 REM
740 REM 100,100 coordinate system for ball
750 REM
760 REM 100,100 coordinate system for ball
770 REM
780 REM 100,100 coordinate system for ball
790 REM
800 REM 100,100 coordinate system for ball
810 REM
820 REM 100,100 coordinate system for ball
830 REM
840 REM 100,100 coordinate system for ball
850 REM
860 REM 100,100 coordinate system for ball
870 REM
880 REM 100,100 coordinate system for ball
890 REM
900 REM 100,100 coordinate system for ball
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960 REM 100,100 coordinate system for ball
970 REM
980 REM 100,100 coordinate system for ball
990 REM
```

Program 1: Example of joystick control

rently sitting at coordinates 10,10 the value stored in *Q* will be 80 – the Ascii code for *A*.

As always, you can change either or both coordinates to any value within the corresponding screen boundary, and variable *Q* can have any legal name you choose.

Here's how it works in practice, using the ball – April 30 – as our moving character. We'll let the ball's current position be *H1,V1* and its new position *H2,V2*. Also, for convenience, let's pretend the values for *H2* and *V2* are updated by an imaginary subroutine at line 1000. Our program might look like this:

```
10 GOTO 8
20 GOTO 1000
30 GOTO 40
40 GOTO 1000
50 POSITION 10,10:PRINT "BALL"
60 LOCATE 10,10:A
70 POSITION 10,10:PRINT CHR$(Q)
80 GOTO 1000
90 GOTO 30
```

We start the program by telling the computer what graphics mode we're using. It's essential to do this, or the LOCATE command won't work. Next we specify the ball's starting position *H2,V2*, then jump into the middle of the main loop at line 60.

This line reads the background character at our ball's initial position and stores it in *Q*. Line 70 prints the ball, and line 80 sets *H1* and *V1* to the ball's current coordinates. Line 90 then sets the game loop running. Line 40 executes our joystick subroutine, and returns with the ball's new coordinates in *H2,V2*.

Line 50 erases the ball by restoring the original background data – the character whose Ascii code is held in *Q*. Line 60 identifies the background character which is currently sitting at the ball's new destination – *H2,V2* – and stores its Ascii number in *Q*, replacing the previous value. Line 70 prints the ball at *H2,V2*, and this is where we jump to.

The whole process will repeat until we stop the program by pressing Break or Reset, or switching power off. Program 1 is a fully working demonstration that's similar to last month's Program IV, but we've reorganized things to give you a bit more practice with subroutines. Notice that the joystick control system – lines 180 to 340 – is new material. The first subroutine (180 to 268) calls other subroutines (270 to 340) as necessary, before

returning to the main-line code at line 110.

Because lines 180 to 340 are now a self-contained mini-program, you can incorporate the routine easily into your own games.

The screen background – a pattern of capital letters – is also drawn by a subroutine, this time at line 350. You can easily change it to draw any pattern or background you choose – a haunted house or dungeon floor plan, for example – using control characters. The utility program we gave you in Part 61 – the March 1988 issue of

Turn to Page 62 >

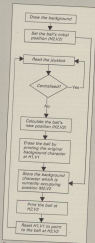


Figure 1. Flow chart describing Program 1

4 From Page 87

Atari User — takes the drudgery out of this.

Another use for LOCATE is to detect when your moving character has hit a target at some time. Try adding these lines to Program 1:

```
111 IF G=11 THEN GOTO 1000:END
100 GOTO 8,158,8,8
110 IF G=11 THEN GOTO 8
111 GOTO 8,8,8,8
100 RETURN
```

Now you'll get a short beep whenever the moving ball lands on a letter H. If you want the ball to produce a more exciting result, just change the code at line 100. Aren't subroutines wonderful?

If you want your moving character to destroy only certain symbols in the background picture without disturbing the rest, that's easy too. Try changing line 100 to read:

```
100 GOTO 8,8,8,8 IF G=7 THEN GOTO 8
```

If the ball now lands on a letter M, the value stored in G will be changed from 77—the ASCII code for M—to 32—the code for a blank space. So next time the ball moves it will leave a blank space behind it. You'll find, therefore, that the ball wipes out every M but doesn't disturb anything else.

We're fast approaching the stage where we can write real arcade games, and our programs are consequently becoming more complex. Computers can follow the most tortuous listings without difficulty, but human programmers tend to get lost in the maze. So now's a good time to introduce a system of diagrams which makes it much simpler to keep track of things.

Look at Figure 1 on the previous page. It shows the operation of Program 1 in simplified pictorial form. Notice how the diagram corresponds to BASIC in the listing, and the checking the program's operation against our written explanation. The pictorial flow chart is much easier to follow and saves an awful lot of writing.

Professional programmers use a whole range of symbols in their flow charts, but we can get a long way with just two, rectangles for operations and diamonds for decisions. Diamonds always have two outputs, corresponding to yes and no, while rectangles

have only one, corresponding to done.

BASIC is one of the few languages that doesn't demand an accurate flow chart before you start programming—it's very tolerant of variations in construction and layout. As your programs become more complicated, however, you'll find that time spent on designing it—by flow chart or other methods—will save many hours of trial and error and the end result will be tidier, shorter and probably faster.

Now let's turn to a topic that will help you to produce more realistic games—the use of colour. Deep inside your Atari is a group of memory addresses called colour registers. Whenever the computer draws a screen, they tell it which colours to use and what to use them for. You can change the contents of the registers, and consequently the colours displayed by using SETCOLOR.

For convenience—and to avoid misspelling—this command can be abbreviated to SR. BASIC will write it out in full when the program is LISTed: its format looks like this:

```
SETCOLOR 1,1,1
```

The first figure after SETCOLOR identifies which register we want to alter. In Graphics 0 we can use only registers 1, 2 and 4 but these enable us to change text brightness, background colour and border colour respectively.

The second figure specifies the colour—in hex—to be used and can have any value from 0 to 15. Figure 1 shows the hues available using Atari's own words, but you may disagree with the descriptions. In any case there's no absolute standard—many TVs and computers will inevitably produce different results.

The third and final figure is a SETCOLOR command controls the colour's brightness, and it can be any even number from 0 to 14. Changing this level has a marked effect on the perceived colour. For example:

```
SETCOLOR 1,1,0
```

will turn the background a dark green, whereas:

```
SETCOLOR 1,15,16
```

will turn it bright yellow, even though the hex number is the same—12—in both cases.

Program 2 lets you use a joystick to

experiment with colour registers 1, 2 and 4. Press the trigger to stop from one register to the next, move the stick up or down to change the hue value, and move it left or right to change the brightness level. If things get out of hand, pressing Reset will automatically restore the screen to its normal condition.

All our programming so far has been done in Graphics Mode 0, which is comparatively limited in its use of colour.

Text is always printed in the same hue as its background, but at a different brightness level. You can make it very dark, very bright or invisible, but that's about the limit to special effects.

For genuine multicolour displays

we must enter a new dimension:

```
10 GRAPHICS 1
20 RESET KEY TEST
```

When you run this something very peculiar occurs: The screen first goes black then splits into two parts – a large black area, and a smaller blue one at the bottom – with the normal READY message printed in the blue area as it would be in a Graphics 0 screen.

The word TEST appears in large letters at the top of the black area, but instead of being printed exactly as in line 20, all the letters are in upper case and each is a different colour.

Change line 10 to GRAPHICS 2 and something similar happens, but this time the coloured letters are twice as large.

If you've followed this series from the first part you now know enough to write your first action game, and that's the best way to practice what you've learned.

Turn to Page 66 in

0	Black
1	Red
2	Red-Orange
3	Dark Orange
4	Red
5	Dark Lavender
6	Cobalt Blue
7	Ultramarine Blue
8	Medium Blue
9	Dark Blue
10	Blue-Gray
11	Olive Green
12	Medium Green
13	Dark Green
14	Orange-Green
15	Orange

Figure 10: Colour values – second parameter in a GRAPHICS statement

```
10 REM Program 11: Experimenting with
  Colour registers in Graphics 1
20 RESET POLY ON GRAPHICS 1:GOTO 100
30 REM and make colour invisible
40 REM and make colour visible
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60 REM and make colour visible
70 REM and make colour invisible
80 REM and make colour visible
90 REM and make colour invisible
100 REM and make colour visible
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990 REM and make colour invisible
1000 REM and make colour visible
```

Program 11: Colour demonstration

£10

LETTER

DEEPER INTO THE DUNGEON

I THINK that I may be in a position to help Mr C. V. Howarth solve his problem with *Alternate Reality: The Dungeon* that he mentions in the *Hints and Tips* section of the March 1988 issue of *Amiga User*.

Firstly, the item which he needs to use to pass through double doors is the portal access card.

This will be given to him by *Artemis* in exchange for the staff pieces from the prisoner on level one, King Dagon on level two and the dragon on level three - it requires the bloodstone before it will give up its piece.

Secondly, the *Room Sheet* may be accessed at any time after midnight and before the first hour, provided that the footman is paid with copper.

Thirdly, Morgan's dice should not be given up to the clothes horse on level two. By returning the dice lost hit points are restored.

The clothes horse will settle for a sweater or a cloak provided you have nothing better, otherwise it will take your finger ring of clothing - especially if it's magical.

Finally, does anyone know the name of the gypsy on level three? - Mike Ward, Watley, West Midlands.

Crashing worksheets

AFTER reading the review of the Swift Spreadsheet from *AudioGraphic* in the March 1988 issue of *Amiga User* I thought I'd point out a problem that I am having with it.

When you are saving and loading worksheets they appear to save accurately and load every cell properly. However, problems occur when the worksheet is then worked on further - the pro-

gram is prone to crashing with odd garbled messages appearing.

This bug does not occur all the time, but is quite common and very frustrating.

The spreadsheet is potentially powerful and easy to use, and offers good value for money when you compare it to the more expensive *MultiCalc* and *SimCalc*.

I have written to *AudioGraphic* but received no reply and I have talked over the phone to *Metamorphosis Development* - the designers of the spreadsheet - who were helpful but unable to cure my problem. - W. Charles, Wincb Wess, Swansea.

■ Have any of our readers experienced this problem? If you know the cure, please write in.

Getting that hash

I AM very flattered that my letter was chosen for publication in the March 1988 issue of *Amiga User*. I found your attached comment, however, didn't seem to square with my experiences at the keyboard.

I have an 80080 linked to a 1080 disc drive chained to a Panasonic KDP-1081 printer via a graphics interface.

If I use the *AtaXMinix* word processor I found, as you say, that the hash sign is printed out as a # but displayed on screen and again in preview mode as a hash.

Using *Mini Office II*, however, if I key hash - *Shift+J* - the pound sign appears on the screen, even if the printer is switched off and disconnected from the micro. It is also output in both preview and print

modes. Finally, your reply to one of the letters in the March issue surprised me.

Although the *SHAR* is not a commonly advertised printer for the 8 bit Amig, it will work correctly for text if a Centronics type interface is connected. - J.L. Robinson, Milnes, Cumbria.

Keys still available

WHEN I read the mailbag section in the March 1988 issue of *Amiga User* I noticed a letter from someone who is having the same problem as me - broken keys on their 1070 tape recorder.

I wrote to *Slings Shop* - enclosing a postal order for the required amount - but I was most upset when they wrote back to inform me that they had stopped selling replacement 1070 keys.

After a dozen or so phone calls I found someone who sells them - A. S. Whelan & Son, 116 Johnson Road, Green, CM2 3ND. The keys are £3.50 each and £7.50 postage and postage for up to four keys is included.

Could you please tell me if a tape version of *Monopoly*

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is available and where I can get it? - Bryan Pelt, Barnsley, South Yorkshire.

■ We've checked with *Slings Shop* and it will sell the keys. They are £1.12 each and £1.50 postage and packaging must be included.

We don't think there is a tape version of *Monopoly*.

Mini Office II on SpartaDos

I HAVE a 1080 disc drive with a US doublet drive and

Turn in Page 58

DOUBLE TROUBLE

I HAVE just typed in the doublet 3D Printer program from the March 1988 issue of *Amiga User* and I came across what seems a slight error in the listing: Line 800 has been duplicated and it re-appears on line 793. It should read:

```
790 NEXT I1=0,1,11,110,1110,11110,111110,1111110,11111110
```

Once this has been altered

it runs correctly. Thanks for a superb program - it has brought many hours of fun.

Has any reader figured out how to dump the 3D image to an Epson or 1024 printer? - Mark White, Merleby for the Sea.

■ Unfortunately, as the magazine was put together the listing was scrambled slightly.

We are sorry for any inconvenience caused.

I was wondering if it is possible to transfer my Mini Office II files to a SpartaDOS format.

It would be nice to have the high speed load facility on such a super program. — Alexander Miller Brooks, Cheshire Holmes, Cheshire.

■ Mini Office II works very well on nearly all disc operating systems including SpartaDOS.

Cartridge connection

I USE an assembler/compiler cartridge quite a lot and find that I am having to continuously plug it in or out to program in Basic.

I am concerned that the wear and tear on the edge connector will ultimately lead to unreliability.

Would it be possible to build a gadget which would mount a cartridge and sit semi-permanently outside the micro? It could then be brought in or out of action by use of a simple switch.

Also, a more complex system could be built to accommodate more than one cartridge and allow them to be switched in or out as required. — R.G. Syme, Ashford, Surrey.

■ The subject of this gadget

I WOULD like to thank you for the excellent article about Spectrabound that appeared in the March 1985 issue of Atari User.

Not only was the map very well presented, but the hints and tips were very useful in allowing me to complete this paper mini-

adventure for the first time.

Also in the same issue was the map of Monastery: The Second City. Although I have never played this particular graphics adventure I am now thinking about getting it as the map makes it look like a very enjoyable game. The reviews section

is always a firm favourite of mine and I was surprised when you started to use colour pictures again. The new layout looks superb as does all the magazine.

Thanks for a very interesting and informative read. — Sean Ganning, Manchester.

has been looked at before and only a simple circuit is needed to allow a number of cartridges to be mounted together on one cable.

The components would make this a rather expensive device, but if enough readers write to us to prove that demand is sufficient we'll reconsider it.

More gadgets on the way

IN recent issues of Atari User there haven't been any gadgets by your resident expert Ian Gidding. Has he stopped building them? — Dave Manning, Reddish, Stockport.

■ Ian has been having a rest recently, but he promises to build us some

more interesting and innovative gadgets soon.

Pascal alternative

I OWN an Atari 1050X and 1050 disc drive. Can you please tell me whether or not there is a software package that would enable me to use Thompson Pascal and, if so, how much it is and where I can buy it from? — J. W. Brzesinski, Spital Tongues, Newcastle-Upon-Tyne.

■ Unfortunately, this particular program is not available for the 8 bit Atari. At one time Ryan Pascal was really obtainable, but it is now very difficult to get hold of.

You could try getting the Action! cartridge-based language. Although it's not identical it does offer similar features to Pascal.

It is a sort of hybrid Basic/C and is available from several advertisers in Atari User.

Happy beginner

UNFORTUNATELY I was late in discovering Atari User, but I now have a regular order with my newspaper so I don't miss it.

I recently bought the book drive pack of magazines

from May 1985 to November 1985 and was absolutely delighted with Mike Riley's articles for beginners.

I'm physically disabled and so started using a computer when I could no longer walk. Being a novice at computing, the series was a great help to me.

Please convey my thanks to Mike for explaining things so clearly. Also, thanks for a really terrific magazine. — Hilma Smith, Aberdeen.

XMM801 printer problem

I RECENTLY bought an Atari XMM801 printer and it was superb for word processing and filing Basic programs. However, a friend lent me the First Step by Broderbund and I have found it impossible to get it to print out.

I have tried all combinations of options to no avail, so could you please tell me what the XMM801 is equivalent to? And is it possible for this program to work on my printer? — Karen Seger, Stockport, Cheshire.

■ Unfortunately, as with all Atari printers, the XMM801 is unique. Atari has for some reason designed printers that don't work with commercial software, and Print Shop will not work with your printer no matter what preferences you choose on the set-up menu.

Cartridge-only cable

IS there an effective way of interfacing software like After Burner II to a printer without an expensive interface unit?

I successfully built and installed the Epson interface from the April 1985 Gadgets series in Atari User but the software seems to overwrite the driver routine that I installed. — P.G. Lord, Sutton Coldfield, West Midlands.

■ Whenever your micro is switched off anything that is

in ram is lost. When you load most machine code software you must initiate a boot load by switching off your micro and holding down Do/Save when you switch on.

This means that the original driver software is lost so, as the article states, the cable will only work with commercial cartridge-based software and unfortunately not with disc-based software like Mini Office II.

Italic on tap

WHILE I was working with Micro Office II on my 80085, I discovered that pressing the inverse video key causes any typing that you do after it to be printed out in italic. Pressing this key again switches you back to normal print style. — A.R. Hazzard, Swindon, Wilts.

Dipping into the toolkit

AFTER reading the advert for the Atari User Toolkit I decided to send off for the disc version. I'm very pleased with it and I now use it every time I program or type in magazine listings. The renumber ability is very useful and the variable name change feature is an

excellent idea. I find the way that it switches itself out when you run a program is great, and it's no pity to forget once it has been loaded — just press System Reset. — Philip Marsh, Mid-Devonshire, Cleveland.

The catch

I BOUGHT my children an Atari home computer for Christmas and a copy of the January 1988 issue of Atari User. I found it an excellent publication, but I didn't understand one of the instructions on a Plus User program — an unusual character in line 3 of Char3.

Can you please help? — Peter Brown, Harpenden, Hertfordshire.

■ The character you are having problems with can be obtained by pressing the inverse character key and

Long wait for a drive

WHY on earth did Atari stop producing the 1080 disc drive, especially since the new one isn't even available?

Each month I am allowed out of my straightjacket to read your masterpiece of a magazine, but with dismay I find no mention of the 1080, and no news of the release of the new drive ever grazes

the pages. Please could you tell me what exactly is happening? — Martin Tiller, Oxford.

■ Atari has had some problems with the new drive, but claims it will be available soon. The classified section of Atari User contains many bazaar offers, including 1080 disc drives.

then Control 4 R. A full list of these control characters was in the February issue of Atari User.

Epson drive

I OWN an 800XL and 1050 tape deck. Recently I was offered an Epson 525 floppy disc drive and was told that it was double-sided with a

one megabyte storage capacity. Could you please tell me what interface I would need to get it working on my Atari? — D.J. Fogarty, Salisbury, Wiltshire.

■ Unfortunately this disc drive will not work easily on your Atari and an interface to make it work would probably cost more than a new Atari drive.

The truth about TELEX

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,500 (the Whizard), the dearest £2,500 (the Cheesley). You will also need a standard telephone line, costing £121 to install, plus £400 a year rental. That's a total outlay over the first year of a minimum of £2,100 (all prices include VAT.)

Or you could do what more and more Atari users are doing — use your Micro to double as a Telex machine. And just use your ordinary telephone!

How do I turn my Atari into a Telex machine?

All you need is a modem and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to MicroLink. MicroLink is just one of a growing number of services available to Atari users on Telex. It's just one of a growing number of services available to Atari users on Telex. MicroLink, Telex MicroLink, you can also read the news as it happens, go teleshopping, create your own closed user group, send telemessages and electronic mail right round the world, download free telesoftware programs directly into your Micro ... and much more.

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But there's a big bonus you get when you use MicroLink for Telex that the conventional way doesn't offer.

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The trilogy



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What the press have said:

LORDS OF TIME: "Destined to become a classic" – *Computing with the Amstrad*.

RED MOON: *Best Graphical Adventure or Best Adventure of the Year* – *Crash 64*, *Crash*, *Amiga*, *CS&G*, *CC*, and *Amstrad Computer User*.

THE PRICE OF MAGIK: "Another superb adventure ... their best yet" – *Commodore User*, *Also a Crash Smash*.

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ONE of the best known software houses producing games for the Atari is Tynesoft. Based in Maydon, Tyne & Wear, it is constantly bringing out quality new software to add to its already impressive range.

So it was with eager anticipation that I went to have a chat with David Croft, Tynesoft's head of software development.

The main topic of conversation was the development of its new sports simulation. Said Croft: "We were determined Winter Olympiad '88 would surpass all other sports simulations in terms of realism, playability and visual presentation". He said this was Tynesoft's most ambitious project to date, with versions being produced across as many computer formats as possible.

To make this possible all other in-house work was halted and programmers, graphic artists and freelance people alike got together to devise the game's format. The first step towards creating it was to spend lots of time watching videos of winter sports and deciding which events would appear. They eventually settled for the downhill, bob sleigh, ski jump, slalom and biathlon.

The actual programming fell on the heads of Brian Jobling (downhill), Chris Murray (bob sleigh), Mike Hedley (ski jump, slalom and biathlon) and Philip Scott was their graphics artist. It took the team three months to finish the program.

While all this was going on, managing director Colin Courtney was busy negotiating permission to use the BBC Television theme music from Saturday. He also managed to get program presenter David Vine to write an introduction to the 1988 Winter Olympics to be included in the final packaging.

Tynesoft is very optimistic about the game's future. It has already sold the



The Tynesoft team with head of development David Croft (bottom right)

The Winter of content . . .

NEIL FAWCETT meets the programming team behind Olympiad '88

rights to Mindscape, an American company that will produce it under the name Winter Sports. So just how good is the game? You can find out by reading this full review by Bob Chappell on Page 28.

Now let's take a look at some of Tynesoft's more established games and their authors. Brian Jobling, who has now moved on to his own company, Zeppelin, wrote many of the company's successful games as the Atari Atari. His first for Tynesoft —

another sports simulation — was Winter Olympics, which sold nearly 4,000 copies in its first month of sales.

Phantom was another of Tynesoft's success stories. Written originally for the BBC Micro, it was converted for the Atari by Brian with music by Ian Waugh — a widely recognised micro music expert. It's an excellent game with everything you need — good sound, stunning graphics and, above all, addictiveness.

One of the best programs to come out of the company is Moss Force by Chris Murray, a very talented writer with many games under his belt. He wrote this one as a freelance programmer but Tynesoft now has him under contract. Moss Force is a wonderful sideways scrolling shoot-'em-up with digitised speech which really has you wanting just one more go.

As well as producing very good software Tynesoft wraps its products in superb packaging. This is probably because it has facilities to do its own printing and make all the cassettes and disc inlays.

The future is looking very rosy for Tynesoft with the release of Winter Olympiad '88, Super Soccer — also reviewed in this issue — and the Microplay II pack. These Grande kids definitely seem to know what they are about.



A scene from Phantom

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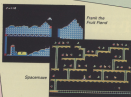
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Fig. 10. (continued) with some
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