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Get it Right!

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 in the August 1986 issue of *Atari User*.

Link your Atari to the outside world with...

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Electronic mail – The cheapest and fastest form of communication possible. It costs the same to send a message to one mailbox as to 5000!

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If you have an 850 interface
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Miracle WS2000 V21/V23 modem + Datatari interface + cable + Viewterm software
Total price £149.95

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

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ATU 10

PRIZE CRASH

A NATIONWIDE electronic mail competition offering a magnum of champagne as the star prize resulted in a giant hangover when the winner unwittingly caused the software in the central computer to crash

When ex San Francisco police officer Cameron (Cam) Lacey posted the 10 000th message on the MicroLink bulletin board from his office in Grimsby all that should have happened was that he received a three litre bottle of Moet & Chandon to mark the milestone achievement

Unfortunately what no one realised at that time was that the BBS system was only designed to cope with a data field of four characters – up to and including 9 999

So when just one additional message was received, it was as if a giant fuse had blown

In fact, the only person left with a grin on his face was Cameron Lacey

Mind you – according to MicroLink boss Derek Meakin – it should have been a sheepish one For it seems that Cam cheated a little bit.

"He'd obviously written a program that started sending identical messages just as the number of messages on the board was approaching the 10,000 mark"

All the messages said was 'Is this the one?'

Atari gears up for Xmas boom

MASSIVE sales of video games and consoles have been predicted by Atari for the Christmas market

The prediction has been made following a huge increase in sales of video consoles and games in the American market last year

Figures just released show that the company a turnover was up by 39 per cent with profits of $13 5 million on sales of $70 million in just three months The American success is expected to be mirrored here this Christmas now that Atari s video games machines are to be sold in all the High Street multiples

For the past three years if parents with children aged 10 and under wanted a video games machine then they had to buy an expensive computer to do the job ' said an Atar spokesman

With the 2600 video consoles retailing at £49 99 parents have an inexpensive way of buying a games machine and getting their children used to the idea of using a computer

The two other machines which will also be on sale in the multiples are the new 65XE computer games console for £79 99 and the XE computer games system for £119 99 made up of the console and a keyboard

The list of games for the consoles grows almost daily Atari's own label software catalogue for the machines is already speeding towards the 100 mark

Lighter touches

HUMOUR has been injected into the latest Magnetic Scrolls adventure game released for the Atari 8 bit by Rainbird

Jinxter is set in Aquatania – a neighbouring country to the setting of top selling The Pawn

Rainbird (01 240 8838) say that the light hearted game is a quest for magic stolen by witches and hidden down seven mineshafts

Database heads for the States

A NEW transatlantic deal will see a British software house reverse recent trends by establishing a major presence in the United States

Database Software has reached agreement on a joint venture with ShareData pioneers of budget packages in the States and a public company valued at $28 million

The end result is the formation of Database Software Inc in Phoenix Arizona

The new corporation aims to market the best British and European titles through ShareData s 22 000 outlets in North America

Database Software is part of the Database Group, the UK s leading publisher of computer magazines including Atan User

As a software house it first sprang to prominence in Britain in October 1984 with the release of Mini Office – an Atan 8 bit favourite

Database Software is today recognised as one of the fastest growing companies in its field in the UK The last 12 months have seen its turnover increase more than five times

Similarly ShareData in the States has a track record second to none

It has become the paceset ter for the American industry, recording sales of more than 500 000 units in the last three months

Michael Meakin, joint managing director of Database, flew to Arizona to complete the British American deal

We have spent a long time looking for a suitable partner in the States to make us a truly international company", he said and In ShareData we believe we have found the perfect answer

'Now the search is on to find the hottest software properties in Europe and Britain to sell in America

It is a huge market with an insatiable thirst for good software said Michael Meakin

We intend to satisfy that demand with the help of the wealth of excellent software authors over here'

Playing to win

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

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

Speaking of his admiration for American WWII hero General George Patton, Tramiel said "In business whatever we do we go out there to win, not play the sport

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

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



The Controller Card

Desktop Management System

For the Atari 800XL/130XE Computers

One of the most powerful features of the ATARI ST and COMMODORE AMIGA is the DESKTOP this system allows the user to have a range of utilities in memory while running commercial software when you access the desktop system the commercial software will be temporarily frozen The Controller Card is an internal hardware modification that when installed into your Atari 800XL/130XE will give you the most advanced Desktop Management System available today

DESKTOP MASTER DISK

Snapshot Printer Dumpers with the SHQ

Printout screens from commercial game title pages to graphic application packages Will handle any graphics mode including mixed graphics modes Full A4 size printouts built in shade selector Included is our unique SHQ system which is an ultra high definition ter image printout comparable to a photocopy (for Epson and compatible printers)

Superdump II Memory Dumper

The perfect utility for software development, just dump the contents of memory where the error occurs then examine and rectify Can also be used to upgrade your cassette software to disk or make disk to disk backups

The O.S Boot Manu

A Desktop resident muleboot menu by simply pressing the HELP KEY you exit the main program at the menu

Disk I/O Analyser

A unique and very powerful disk debugging tool which prints out all the relevent information concerning the interaction between the disk drive and computer as the disk software is loading or reading/writing data.

The Control Panel

This utility will allow you to alter a wide range of system parameters such as Auto scroll I/O noise inverse flash key click fast cursor/keyboard debounce rate primary system colours the system baud rate and the system character set (14 alternative character sets to choose from)

400/800 Operating System Saver

This facility will allow tou to save the O S from the 400/800 Atari computers to create true emulators or upgrade customised roms such as OMNIMON to disk to run on the 800XL/130XE computers via the Desktop

Additional Desktop Library Disks

Library Disk #1 – 1029 Snapshot Printer Dumpers
Similar to the SHQ Snapshot printer dumpers but not dedicated for the 1029 printer

Library Disk #2 – SHQ Professional Print Package
Combines the SHQ Graphics converters and Text enhancers together on one menu disk. The Graphics converter will give your desktop publishing packages (e TYPESETTER (Xiant software) a printout that matches a photocopy using Epson 8 pin dot matrix or compatible printers with reverse line feed In fact the only competition we have is a Lazer printer !!!

Library Disk #3 – The Superdump III Toolkit
The ultimate backup system for standard and U S Doubler drives This disk is crammed so full of unique features it would take up the whole of this ad space to describe them Please ring for more info

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- Sector SKEW is now no longer required to obtain Hi speed as with US Doublers
- Other Special features are Slow down Fast write Fast read, Drive write lock Skew on/off Fast formatting
- Fast write with verify This system is faster than other systems which write without verify
- A double sided operating system disk is supplied which offers the following
  IS Doubler US Doubler Standard 1050 and Archiver emulation
  Track Tracer Diagnostic tester 48k and 128k Disk Backup utilities
- The PLATE can be made invisible to software detection by either Slow down or 1050 emulation
- Supplied with detailed information regarding software drive control to allow you to access the full potential of the PLATE
- Will run all available disk operating systems (Dos) including Spartados Happy warp speed Dos and other HIGH speed systems
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Gnome on the Range

THE gnerds at Level 9 Computing have been taken over by a gnome, according to recent correspondence discovered in a hollow oak

Don't tell the dozy-looking lads in the picture that they're posing with a cardboard cutout – they believe it is Ingrid Bottom low, their new managing directress and heroine of the latest Level 9 offering for Atari 8 bit machines

Called Gnome Ranger, it is a three part recreation of an epic journey with multi-player puzzles and a lot of what Level 9 calls "amusing text"

Characters, who all have their own lives, can be organised and ordered about by the player and there's a 48 page Journal to help Price £9.95 from Level 9 (0344 427697)

It's word perfect

BRITISH computer users can now have access to what is claimed to be the biggest and most up to date multi-lingual dictionary in the world

And it is already being viewed as a major breakthrough for groups as diverse as businessmen faced with foreign correspondence through to schoolchildren struggling with homework

It is all part of a new service being offered by MicroLink, the UK's fastest growing electronic mail network

Sitting at their keyboards all subscribers have to do is type in a word or a complete phrase and the Great European Dictionary does the rest.

Housed in an EEC sponsored mainframe computer in Luxembourg the electronic dictionary is the result of a massive collaboration between language experts throughout the community

The Great European Dictionary consists of more than 380 000 words and phrases in English German, Danish, Dutch French Italian, Portuguese and Spanish

Such is the sophistication of the computerised language facility that it offers translations from any one of these languages into any other – or into more than one at the same time

Nor does the service confine itself to straightforward translations It also provides detailed explanations of the word or phrase together with relevant notes about how and where it should be used – both in English and foreign languages

'Such explanations in the foreign language constitute an invaluable source of material for translators', says Derek Meakin head of MicroLink

'As it is being continually amended and updated it is far more accurate and up to the minute than any conventionally printed dictionary"

THE GALLUP CHART TOP 20 ATARI SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	•	DECATHLON *Firebird*	1.99
2	4	MILK RACE *Mastertronic*	2.99
3	1	GAUNTLET *US Gold*	9.95
4	•	LIVING DAYLIGHTS *Domark*	9.95
5	7	AMAUROTE *Mastertronic*	2.99
6	12	GUN LAW *Mastertronic*	1.99
7	8	HOVVER BOVVER *Mastertronic*	1.99
8	9	MICRO RHYTHM *Firebird*	1.99
9	•	JACKLE AND WIDE *Bulldog*	1.99
10	•	FRENESIS *Mastertronic*	1.99
11	•	NINJA *Mastertronic*	1.99
12	2	SILENT SERVICE *Microprose/US Gold*	9.95
13	•	BOULDERDASH *First Star/Prism*	2.99
14	17	LEADERBOARD *Access/US Gold*	9.95
15	5	COLONY *Bulldog*	1.99
16	6	UNIVERSAL HERO *Mastertronic*	1.99
17	•	TABLE FOOTBALL *Rhino*	1.99
18	10	INVASION *Bulldog*	1.99
19	•	DEATH RACE *Atlantis*	2.99
20	15	LA SWAT *Mastertronic*	2.99

Compiled by Gallup/Microscope

Decathlon from Firebird enters the chart this month at No 1, knocking Gauntlet from that position See the review of Decathlon in this issue of *Atari User* There is a great deal of movement with eight titles entering the Top 20 – while the majority are budget titles the full priced Living Daylights from Domark enters at No 4

MicroLink
in association with
TELECOM GOLD
NEWSLETTER

Spreading the word

IN the centenary year of the international language Esperanto, a new branch – or Grupo to be exact – has been formed in London, and MicroLink is its chosen electronic route to the rest of the world

About 52 million people worldwide – 6 million in Europe – speak the amalgam of Anglo-Saxon and Latinate tongues invented in 1887 by Polish doctor Ludovic Zamenhov

The Sud Londona Esperanto-Grupo has been going for five months

Secretary Gregory Porilo said "We believe the time is ripe for a revival of interest in Esperanto Not just because of its centenary, but also because it has been accepted as a subject for the new GCSE exams and is now the EEC's official language for basic translation

"The South London branch of Esperanto is using MicroLink to further spread the word about the benefits of learning the language"

Typesetting over the line

LOW COST, professional quality typesetting for everything from business cards to magazines is now available electronically on MicroLink

Wordstream provides a 24-hours-a-day, seven days-a-week service for companies and individuals who want to control their own printing and save on costs

All subscribers need do is key in the text on their micro and send it via MicroLink's electronic mail system. It is switched electronically to Wordstream in Bournemouth who typesat the material and return the finished product by first class post or special delivery

Text for typesetting can be prepared on an ordinary word processor by inserting special codes to specify typefaces, sizes and measures Then it is transmitted to the Wordstream mailbox on MicroLink

Special software automatically checks the text file to ensure that codes are correct, and initiates processing immediately Within 30 minutes a bromide repro for plate making or camera is produced for despatch to the customer

The service offers 155 typefaces from 4.5 to 72 point The range includes expanded, condensed and italic type variable letterfit, accents and fractions, and paper saving multi column text

Payment is by the foot length of repro and Wordstream registration is free on MicroLink

SPEEDING THE FACTS

NEARLY 30 of Scotland's largest local authorities and six local government trades unions are communicating electronically via MicroLink

The Scottish Local Government Information Unit was set up two years ago as an information research and publicity service for the organisations

"We feed facts and figures in easily digestible format to well over 1,000 key elected officials and administrators", said the Unit's director Archie Fairley

"In addition we are a source of local government information

"MicroLink telex and electronic mail facilities will help us move all this information a lot faster than before"

Aid to trade

MICROLINK technology is helping improve trade links between Britain and the Third World

Latest overseas businessman to take advantage of fast, efficient telex and electronic mail facilities is S S Wijayasinha

He is managing director of Bureau-Matic, based in Abidjan, capital of the Ivory Coast, a former French colony in West Africa

"My company imports computer accessories from various suppliers in the UK, but existing communications are not satisfactory", he said

"Letters can take up to three weeks to arrive and the telephone service is very erratic

"I plan to use MicroLink for all my international communications from now on because I know I can depend on its speed and reliability"

New Open University Club

LIKE many of the Open University's 70,000 plus students, electronics engineer Jim Hatton often feels a sense of isolation

"I can't get to evening classes every week, I have little or no contact with other OU students and though the instructors are very helpful they are also very busy and I dislike bombarding them with letters and phone calls , he said Jim's solution – for himself and other part-time students in the same situation – has been to form an Open University Club on MicroLink where people can communicate electronically about their courses

'At a recent summer school I discovered that a lot of people like me can't get to the tutorials', he said But lots of us have micros and modems so the technology for exchanging ideas and opinions is there to be tapped

The Open University has a policy of encouraging self help groups where students can discuss problems and gain a greater understanding of their courses

"I'm hoping that OU instructors will also log on to the Open University Club on MicroLink so that students can benefit from their input too"

YOUR chance to join MicroLink – turn to Page 4

Play the game of life

PHILIP MASSAM's program simulates cellular evolution

A PROGRAMMING assignment often set for would-be computer scientists is to write a program that simulates the evolution of life at cell level

The rules are simple. If an empty cell is surrounded by exactly three live cells a birth will occur in it, but if a live cell is surrounded by more than three or fewer than two live ones it dies of overcrowding or loneliness respectively.

The amount of calculation involved to determine the status of a cell makes Basic Life programs very slow, so here is a machine code version which can analyse approximately 1000 cells in less than one second – less time than it takes a Basic version to analyse one cell.

Type in the program as it stands and save it to tape or disc so that you have a backup copy. Then run the program, and if all is well the display will change to two graphics 0 lines sandwiching an area of graphics 12.

Now the program will allow you to set up the initial pattern of cells using the joystick. Move the cursor – shown by the cross – to the required position and to create or erase a cell press the fire button. When the cursor is on a cell, it will be red, otherwise all cells will be green.

If Option is pressed once you've set up the initial pattern the program will switch to single step mode instead of the default continuous generation mode.

Pressing Start will start the life process. All cells born in one generation will be coloured red and all cells surviving from one generation to another will be green. If the single step mode is used each generation will be created when the fire button is pressed.

At any time the Life process can be stopped by pressing Help. The number of generations that the life form has survived is shown at the bottom left of the screen.

As you experiment you'll find many interesting patterns of cells, but to start you off the two figures show well known ones. Figure I gives a pattern that appears to walk across the screen and is known as the glider. Figure II is known as the seed and is best seen in single step mode.

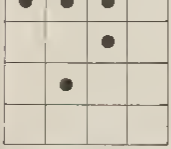


Figure I
The glider

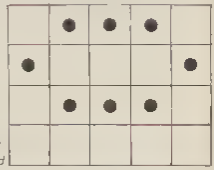


Figure II
The seed

```
10 REM Life by Phil Massam
20 REM (c) ATARI USER
40 GRAPHICS 8
50 ? CHR$(125)
60 ?                THE GAME OF LIFE
70 ?                   By Phil Massam
80 ?                   Data Loading
90 ?                      Wait a
95 POKE 752,1
97 ? ? ?
98 REM **** Data Load Routine
100 START=20000 INC=0
110 READ DTA IF DTA=999 THEN 150
115 POKE START,DTA
120 START=START+1 INC=INC+1
125 IF INC=58 THEN ?  , INC=0
130 GOTO 110
140 REM **** Call Machine Code
150 A=USR(20000)
160 END
290 REM **** Data for Life
300 DATA 169,25,133,196,169,82,133,199
,169,0,133,185,133,188,133,193,133,194
,133,195
310 DATA 133,196,32,117,79,32,224,79,3
2,250,79,32,13,80,32,0,80,169,0,141
320 DATA 220,2,32,98,79,165,188,240,28
,173,132,2,240,251,160,3,32,236,80,173
330 DATA 220,2,240,3,76,14,79,173,132,
2,208,243,32,0,80,162,8,160,0 132
340 DATA 205,132,208,32,156,79,132,186
,132,187,160,0,177,205,240,2,230,204,1
80,1350 DATA 177,205,240,2,230,204,160
,2 177,205,240,2,230,204,160,40,177,20
5,240,2
360 DATA 230,204,160,42,177,205,240,2,
230,204,160,80,177,205,240,2,230,204,1
80,81
370 DATA 177,205,240,2,230,204,160,82,
177,205,240,2,230,204,134,134,160,41,1
77,205
380 DATA 208,15,165,204,201,3,208,23,1
69,104,160,224,145 205,76,227,78,169,9
8,160
390 DATA 204,224,3,240,243,224,2,240,2
35,196,187 169,0,145,205,160,13,+,232,2
24,230
400 DATA 204,165,238,208,165 205,201,23
,208,71,32,156,79,165,185,73,255,,133,1
85 32
410 DATA 156 79,165,186,5,187,133 187,
240,4 173 220,2,208,3,78,74,78,32 156
420 DATA 79,165,187,240,11,160,1,32,23
6,80,32,22,81,76,32,79,169,0 13
3,204,169,1,133,205,32,73,79,76,192
440 DATA 78,160,0,133,204,169,3,133,20
9,162,0,32,73,79,76,122,78,24,165,205
450 DATA 101,209,133,205,144,2,230,206
,24,165,207,101,209,133,207,144,2,230,
208,96
460 DATA 240,91,160,3,185,193,0,105,0,
153,193,0,134,208,245,216,162,3,160,0
470 DATA 181,193,41,15,24,105,10,145,1
98,181,193,74,74,74,74,24,105,10,133,1
45
480 DATA 198,138,202,208,231,96,24,165
,191,101,209,133,191,165,192,144,2,230
,192,96
490 DATA 165,205,240,8,32,203,79,76,18
5,79,32,180,79,169,52,141,48,2,169,82
500 DATA 141,48,2,96,169,51,133,205,14
1,56,82,169,88,133,206,141,57,82,169,0
7
510 DATA 133,207,169,82,133,208,96,169
,87 133,205 141,56,82,169,82,133,206,1
41,57
520 DATA 82,169,51,133,207,169,88,133,
208,96,32,156 79,162 4,160,0,169,0,145
530 DATA 205,145,207,200,208,249,238,2
06,238,208,202,208,242,96,160,2,32,236
,80,96
540 DATA 32,156,79,160,39,169,0,145,20
5,136,208,251,96,32,156,79,165,205,133
,191550 DATA 165,206,133,192,162,255,1
60,1,76,74,80,169,164,198,72,165,6
03,145,191
560 DATA 104,201,14,208,21,224,0,240,5
7,56,165,191,233,40,133,191,165,192,23
3,0
570 DATA 133,192 202 76,104,80,201,13,
208,15,224,20,240,32,169,40,133,209,32
,142
```

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```
500 DATA 78,252,76,186,80,201,7,208,8,
152,38,240,13,208,76,186,80,201,11 ,208
,5 500 DATA 5,162,1,240,1,156,134,189,152
,198,24,177,191,135,207,208,5,169,11,7
6
600 DATA 124,88,73,128,145,181,162,120
,168,8,208,208,255,202,208,248,173,120
,2,201
610 DATA 15,208,146,173,51,208,201,5,2
08,3,32,186,80,173,31,208,201,6,208,5
620 DATA 165,205,145,191,96,166,189,16
4,190,173,152,2,208,218,165,203,240,4,
169,0
630 DATA 240,2,169,96,133,203,165,191,
175,152,2,240,251,76,186,80,165,188,24
0,11 660 DATA 169,8,133,128,168,5,32,25
6,88,240,9,169,1,133,128,168,4,32,256,
88
650 DATA 160,250,162,255,202,264,254,2
08,251,156,208,246,52,250,75,96,32,156
,79,169
660 DATA 28,155,184,169,81,133,187,192
,8,240,17,24,165,186,105,40,133,188,16
5,187
670 DATA 185,8,153,187,136,76,247,80,1
60,39,177,186,145,205,136,208,246,96,1
75,192
680 DATA 2,208,251,96,8,51,52,55,54,44
,57,26,0,68,50,57,51,51,0,38
690 DATA 41,50,57,0,34,55,52,52,47,46,
0,50,47,50,0,50,37,51,52,33
700 DATA 57,0,54,55,52,52,47,46,0,58,4
7,50,0,50,37,51,52,33,50,52
720 DATA 0,0,0,0,0,51,37,52,0,53,48,0,
41,46,41,52,41,33,44,0
730 DATA 47,35,52,52,57,50,46,26,0,40,
50,57,51,51,0,51,52,55,58,52
740 DATA 0,0,0,0,0,48,50,37,51,51,0,38
,41,50,57,0,34,55,52,52
750 DATA 47,46,0,50,47,50,0,46,37,56,5
2,0,39,37,46,37,58,33,52,41
760 DATA 47,46,0,0,0,46,47,55,0,47,46,
0,51,41,46,59,44,57,0,51
770 DATA 52,37,48,0,45,47,56,57,0,0,0,
0,0,0,0,0,0,0
780 DATA 0,0,0,0,0,0,46,47,55,0,47,46,0,
35,47,46,52,41,46,53,47
790 DATA 55,51,0,45,47,58,37,0,0,0,0,0
,0,0,0,0,0,0
800 DATA 0,0,0,0,0,36,37,46,37,58,55,5
2,41,47,46,26,0,0,0,0
810 DATA 0,0,0,0,0,0,0,0,0,0,168,165,172
,176,0,52,47,0,55,54,47
820 DATA 50,52,14,0,112,112,112,86,205
,206,4,4,4,4,4,4,4,4,4,4
830 DATA 4,4,4,4,4,4,4,4,4,4,4,4,4,86,
12,82,65,52,82,0
930 DATA 999
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5585	20	5385	40	2039
50	1757	60	4726	70	6219
80	5786	90	7259	92	1266
95	5714	100	3241	110	5408
115	5231	120	4677	125	4765
150	1611	160	5670	180	2111
190	856	200	4395	300	12346
310	10655	320	10864	330	10880
340	11425	350	11293	360	11525
370	11383	380	11180	390	11478
400	11716	410	10501	420	10575
430	10734	440	10747	450	11770
460	10700	470	11394	480	12110
490	10869	500	11159	510	11792
520	10957	530	11370	540	11568
550	11926	560	11205	570	11446
580	10979	590	11105	600	11775
610	10758	620	11677	630	11520
640	10756	650	12100	660	11629
670	12815	680	9574	690	9259
700	9058	710	9209	720	8568
730	9406	740	8605	750	9250
760	8671	770	7605	780	8613
790	7472	800	8298	810	8525
820	8776	830	7619	930	1569

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Put the boot in

Obtain direct access to disc directories with this program by LEN GOLDING

IF you've had your disc drive for more than a few months, you will know all about the joys of weeding. You load up Dos, read the directory to see if there are any old files you can get rid of, and discover that the names which seemed so appropriate when you invented them have lost all semblance of meaning.

What did WEENIES.BAS do? And do you still need it? To be on the safe side you return to Basic, try to load the file and discover you've forgotten the exact spelling.

So it's in and out of Dos again to get the correct file name, load the program, list or run it and make your decision. Then back to Dos to erase it if necessary, and refresh your memory about other files on the disc.

This little autoboot program makes life much easier, whether you're on a weeding expedition or just attempting to find a file whose name you can't quite remember. It lets you read the disc directory without leaving Basic, so you can do all the searching and checking in relative comfort.

There are simpler ways of reading disc directories from Basic – OPEN, GET and PUT, or XIO, can be made to do the job. But these involve writing extra lines of Basic which could get mixed up with the program you're checking, and will in any case be lost when you load anything new.

This machine code routine loads automatically at power-up time into a safe area of memory which cannot overlap into a Basic program, and is pretty well immune to anything Basic can do.

Once installed, it stays in place until you turn power off or enter Dos, and you can forget it's there until you need it. Then a simple direct mode USR call will print the directory and return to Basic as though nothing had happened.

Program I is the listing to type in. As with all machine code programs, it's essential to type in the DATA statements exactly as they appear, or the system will probably lock up. And be sure to save a copy before you try running it for the first time.

Insert a disc that contains a copy of DOS.SYS and make sure it doesn't also contain an AUTORUN.SYS file which you want to keep. Then run Program I, and the new AUTORUN.SYS file will be created for you automatically.

It needs to be loaded into memory before you can use it, and this is done simply by turning power off then on again.

Once the machine code is installed you can list the directory on screen with the command

X=USR(7650)

Alternatively you can send it to a printer by

X=USR(7650,1)

If anything goes wrong during execution of the routine – for example, if the printer is off line or the disc drive not switched on – you will hear a beep from the speaker, and control will pass back to Basic. In this event, the error number can be found in address 7662.

Program II is the source code, but this will be of interest only to machine code programmers who have a fair knowledge of CIO and are used to working with assembly language.

Program I: Basic program

```
10 OPEN #1,8,0,"D:AUTORUN.SYS"
20 READ D: IF D=-1 THEN END
30 PUT #1,D: GOTO 20
40 DATA 255,255,2,29,237,29
50 DATA 165,12,141,24,29,165,13,141,25
,29,169,23,133,12:169,29,133,13,76,26
60 DATA 29,32,34,29,169,4,141,231,2,16
9,30,141,232,2,96,104,141,239,29,240
70 DATA 47,104,104,162,32,142,239,29,3
2,229,29,162,32,169,5,157,66,3,169,80
80 DATA 157,67,3,169,29,157,69,3,169,0
,157,74,3,169,0,157,75,3,32,86
90 DATA 228,16,5,76,206,29,10,50,162,1
6,32,229,29,162,16,169,3,157,66,3
100 DATA 169,130,157,68,3,169,29,157,6
9,3,169,6,157,74,3,169,0,157,75,3
110 DATA 32,86,228,16,8,76,206,29,68,5
0,42,46,42,162,16,172,239,29,169,3
120 DATA 157,66,3,169,9,153,66,3,169,2
40,157,68,3,153,68,3,169,29,157,69
130 DATA 3,153,69,3,162,16,172,239,29,
169,20,157,72,3,153,72,3,169,0,157
140 DATA 73,3,153,73,3,32,86,228,48,8,
174,239,29,32,86,228,16,222,192,136
150 DATA 240,8,140,238,29,169,158,141,
252,2,162,16,32,229,29,174,239,29,240,
3
160 DATA 32,229,29,96,76,37,29,169,12,
157,66,3,32,86,228,96,224,2,225,2,2,29
,-1
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5105	20	4481	30	2873
40	4807	50	10934	60	10746
70	11009	80	10105	90	10410
100	10241	110	10547	120	10493
130	10622	140	10742	150	11178
160	11669				

Program II: Source code of Program I

```
10 CH=$2FC
20 CIOV=$E456
30 CLOSE=$0C
40 DOSINI=$0C
50 EOL=$9B
60 GETREC=$05
70 ICAUX1=$34A
80 ICAUX2=$34B
90 ICBAL=$344
0100 ICHLL=$348
0110 ICCOM=$342
0120 MEMLO=$2E7
0130 ORIGIN $06
0140 OPEN=$03
0150 PUTREC=$09
0160 WRITE $08
0170 *=$1DD2
0180 COLDST
0190  LDA DOSINI    Trap SYSTEM RESET
0200  STA WARMST+1
0210  LDA DOSINI+1
0220  STA WARMST+2
0230  LDA #WARMST%255
0240  STA DOSINI
0250  LDA #WARMST/256
0260  STA DOSINI+1
0270  JMP WMST2
0280 WARMST
0290  JSR INITDOS
0300 WMST2
0310  LDA #FINISH%255    Reset MEMLO
0320  STA MEMLO
0330  LDA #FINISH/256
0340  STA MEMLO+1
0350 INITDOS
0360  RTS
0370  The USR routine starts here
0380 USRCALL
0390  PLA
0400  STA FLAG
0410  BEQ SETDIR    Branch if no
                    parameter
0420  PLA           Discard parameter
```

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```
0430  PLA
0440  LDX #32       32  =  #0 F
0450  STX ELAG      select channel  2
0460  JSR CLOSEIT   Close #2
0470  LDX #32
0480  LDA #OPEN     then Open it again
0490  STA ICCOM,X   to read directory
0500  LDA #DNAME#255
0510  STA ICBAL,X
0520  LDA #DNAME/256
0530  STA ICBAL+1,X
0540  LDA #WRITE
0550  STA ICAUX1,X
0560  LDA #8
0570  STA ICAUX2,X
0580  JSR CIOV
0590  BPL SETDIR
0600  JMP ERROR
0610 DNAME  BYTE P
0620 SETDIR
0630  LDX #16
0640  JSR CLOSEIT   Close #1
0650  LDX #16
0660  LDA #OPEN     then Open it again
0670  STA ICCOM,X   to read directory
0680  LDA #DNAME#255
0690  STA ICBAL,X
0700  LDA #DNAME/256
0710  STA ICBAL+1,X
0720  LDA #OPDIR
0730  STA ICAUX1,X
0740  LDA #8
0750  STA ICAUX2,X
0760  JSR CIOV
0770  BPL SETREC
0780  JMP ERROR
0790 DNAME  BYTE 8 * *
0800 SETREC
0810  LDX #16       Set #1 to read the
0820  LDY FLAG      directory records
0830  LDA #GETREC   and set either
0840  STA ICCOM,X   #8 (screen) or
0850  LDA #PUTREC   #2 (printer)
0860  STA ICCOM,Y   to print them
0870  LDA #BUFF#255
0880  STA ICBAL,X
0890  STA ICBAL,Y
0900  LDA #BUFF/256
```

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```
0910  STA ICBAL+1,X
0920  STA ICBAL+1,Y
0930 NEXTREC
0940  LDX #16
0950  LDY FLAG
0960  LDA #28
0970  STA ICBLL,X
0980  STA ICBLL,Y
0990  LDA #8
1000  STA ICBLL+1,X
1010  STA ICBLL+1,Y
1020  JSR CIOV      Get a record
1030  BMI ENDTST    Branch on error
1040  LDX ELAG
1050  JSR CIOV      Print the record
1060  BPL NEXTREC
1070 ENDTST
1080  CPY #$03      End of directory?
1090  BEQ CLEANUP   Branch if so
1100 ERROR
1110  STY ERRNO     Store error type
1120  LDA #158      sound buzzer
1130  STA CH
1140 CLEANUP
1150  LDX #16       Close #1
1160  JSR CLOSEIT
1170  LDX FLAG
1180  BEQ EXIT
1190  JSR CLOSEIT   and #2 if necessary
1200 EXIT
1210  RTS           Return to Basic
1220  JMP USRCALL   Gives convenient
                    address
1230 CLOSEIT
1240  LDA #CLOSE    Close the channel
1250  STA ICCOM,X   whose number #16 is
1260  JSR CIOV      in the X register
1270  RTS
1280 ERRNO *=*+1
1290 FLAG * *+1
1300 BUFF *=*+28
1310 FINISH
1320  *=$02E0
1330  =WORD COLDST
```


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Don't get confused. PAGE 6 is a totally independent magazine for Atari users that will compliment and expand your Atari world.

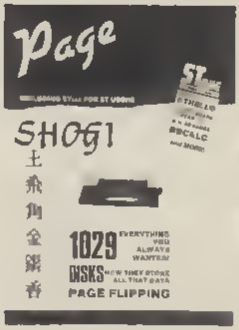
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TO nick this or to nick that that is the question Well it is if you want to join the notorious Guild of Thieves because make no mistake about it thievery is what this adventure is all about

In this excellent follow up to Rainbird s The Pawn you have applied to join the Guild and must qualify for membership by proving you have the necessary knocking off skills

Cast away on an island (in Kerovnia naturally) you have been tasked with stealing every bit of treasure you can lay your light fingers on

The game starts in a boat near to a jetty Nearby, the head of the Guild the Master Thief beckons you to jump ashore and begin ransacking the island

When you disembark the Mastar Thief disappears but that a not the last you ll see of him Throughout the game he reappears briefly at the most unlikely moments adding an extra bit of spice and fun to your escapades

Your first step is to get out of the boat and on to the jetty And because the parser seems a bit unhappy with this opening leaving the boat isn't as straight forward as it should be

But it doesn t really matter – failure to leave the boat fairly promptly causes the Master Thief to lose patience and drag you bodily from the boat anyway

Generally speaking the parser is very good at handling your commands What is odd is that it seems better at handling really complex input than some of the simpler commands

For example EXAMINE ALL (very useful) describes all the objects in a single location but not those which are inside another object even though they are clearly visible

Two commands that really make progress much easier are GO TO a place and FIND an object Provided you have already visited it, GO TO will take you directly to the location specified taking you through any intermediate locations on the way without halting (unless there is something that physically prevents you from going on)

The FIND command similarly takes you straight to the location of a previously discovered object – so handy if you have been lightening the island with items and failed to take a note of where each was last left

There are plenty of locations to explore on the island not least of which is an imposing mansion Getting inside calls for some suppression of your natural thieving tendencies – who said chivalry was dead?

The mansion is large and there are many unusual objects to discover and locations to search

You have to be careful what and how you smuggle items out of the mansion – the Gatekeeper is always on the alert

He is also a gambling man and will offer you the chance to bet on a real rat race Don t pass up or be late for the opportunity when it arrives – you could do with the winnings

Some of the puzzles you ll find here include a bear guarding a chalice a rat infested cellar and a secret laboratory

Make sure you visit the loo and stay a while there if only to see one of the sudden and humorous appearances of the Master Thief

Outside the mansion you ll come across a cave entrance leading to an underground complex Again puzzles abound and you ll need to learn for example how to cross a room of hot coals how to get a macaw to speak and how to deal with a venomous spider

The Bank of Kerovnia is nearby but always seems to be closed You should eventually discover how to demonstrate that there are still signs of life within (a nice touch this) but it will take some time to make the bank fully open up to you

Make sure you visit the cemetary not only for the picture accompanying the text but also to have a look at the three graves you ll find there Bet you didn t know that this is where they ended up!

And speaking of pictures, the 29 scene setting illustrations built into the game are well up to Pawn standard One or two are a little on the predictable side and add little to the atmosphere but most are good and some quite outstanding

Guild of Thieves comes on two discs with a die a Kerovnian credit card a Guild contract of service and a copy of What Burglar magazine

The latter serves as a guide to the game and will give you a few hints and belly laughs into the bargain The game needs a minimum of 64k to run it

I much preferred Guild of Thieves to The Pawn For one thing it is much more logical, for another it hangs together in atmosphere and detail so much better

The puzzles range in difficulty from easy to mind bending so there is plenty here for all adventuring skills

This is an absorbing funny and tantalising adventure and guaranteed to be another sure fire winner for Rainbird Don t delay – buy it The Master Thief awaits you

Bob Chappell

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

Mash a joystick



Program Decathalon
Price £1.99
Supplier Firebird 64-76 New Oxford Street London WC1A 1PS
Tel 01 379 6982

HOW many times have you wanted to be Daley Thompson when he steps up to receive his gold medal? Here is your chance.

The first screen presents you with two men racing down a track an unimpressive piece of music and a message scrolling down the screen telling you that it's not the winning that's important but the taking part. I would prefer a little gold medal to make me feel better.

You are offered the option of up to four competitors and in the track events two people may race against each other.

After choosing the number of players and entering your initials you can choose from ten events in a scrolling window.

The events – 100, 400 and 1500 metres long jump high jump shot putt discus javelin, pole vault and 110 metre hurdles – are all in their own way nice to play but I found the 400 and 1500 metre events a little tough on the hand as you try to pull your joystick apart.

Your time and distance are displayed as a digital clock. I made a 88 metre throw and the javelin moved a very short distance and the clock whizzed up far too fast.

If this had been slowed down and the javelin allowed to hang in the air longer the event would have had more atmosphere.

The graphics are reasonable but with poor sound though the animation is quite well done. You can choose which event you want to play and not have to follow a set order of events and this is a saving grace.

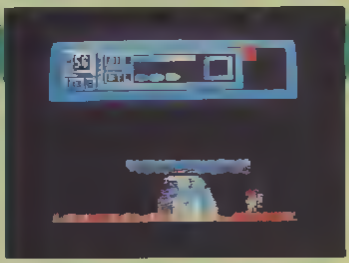
The pole vault is let down by poor animation but as a budget game the good points far exceed the bad.

The major drawback is the fact that it is one of those games where you have to rattle the joystick from left to right in a mad fashion to get the little man to run his socks off. So if you don't mind the risk of ruining your joystick you're all right to buy this one.

Neil Fawcett

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

Bargain time



Program Universal Hero
Price £1.99 (cassette)
Supplier Mastertronic, 5-10 Paul Street London EC2A 4JH
Tel 01 377 6880

ALL I found out about Universal Hero in the blurb was that it's an arcade adventure. But there are no clues and instructions are minimal. Still some people like to go into their adventures blind.

Our hero has a pretty everyday sort of chore to carry out by Superhero standards anyway – to save the planet from imminent destruction.

The culprit is an out of control space freighter which must be repaired to avert disaster.

No real problems – but for the fact that the nearest intergalactic Halfords is on a neighbouring planet and the interplanetary shuttle is itself in need of a 6,000 mile service and MOT.

To make things interesting, the freighter is due to smack into terra firma in one hour's time.

So the race is on to find the parts to the shuttle and work out what to do with them. Then to whiz off to find the parts for the freighter and fix it.

In your quest only nine objects can be held and displayed at any one time. Movement is via a jet pack hindered by occasional aliens of varying degrees of ferocity force fields and other obstacles.

Contact with the aliens may eat away at your air supply or kill you outright. Your powers of logic and deduction will get you through otherwise impassable barriers.

The game is nicely presented with good graphics and movement. Use of sound is minimal which is at least preferable to bad use of sound. I thought the game was immensely playable and addictive.

On reaching a control computer within the caves under the planet surface and having in my possession all the items necessary to work it I logged on and was asked to identify myself.

At this point my keyboard locked up and I could do nothing but reset the machine and restart the game. This happened every time and meant that I could not progress further.

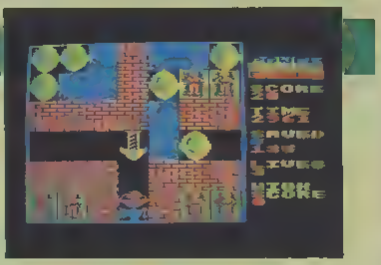
I mentioned this to Mastertronic who said that they had [illegible] the problem before. The suggestion being that perhaps I had a dud copy.

This reservation apart I really enjoyed Universal Hero – well as far as I got anyway. Full marks to Mastertronic for putting out a great game at under £2 – it's a lot of entertainment for the price and puts many more expensive games to shame.

Niels Reynolds

Sound	5
Graphics	8
Playability	10
Value for money	10
Overall	9

Triple trouble



Program Survivors
Price £2.99
Supplier Atlantis 2P Station Road London SE25 5AG
Tel 01 771 8642

MAZE games are usually complicated enough when you have to concentrate on moving one person around. Here you have the unfortunate problem of having to manoeuvre three droids each with its own ability.

Together you must rescue almost 1000 survivors scattered around seven levels in a hibernation dome damaged in a nuclear war. This is achieved by teleporting them to safety once you find them.

Your three droids have their own characteristics. The number one droid looks like two rows of teeth on a pole and is used to eat the earth to reach the survivors.

Number two droid looks like an abnormal corkscrew and this is your teleport droid.

Droid three looks like a cross between Hercules and a Chieftain tank and is used to move some of the many boulders scattered around the dome.

To succeed you must move all of the droids around the maze together (but only one at a time) as only their combined abilities can save the day. But don't keep losing them as I did.

Droids have individual energy levels if reduced to zero then you lose one of your three lives.

Energy can be lost by contact with one of the MK 1 Guardian droids that constantly patrol the dome.

Unfortunately their logic circuits have been fried by the radiation and they will attempt to destroy you on sight. Also beware of boulders.

Another problem is getting one of your droids trapped by falling boulders. If this happens then you simply hit Escape and forfeit a life. Boulders can also be used to trap or crush Guardian droids. Add to this a time limit and this rescue has plenty of problems.

Be very careful in what moves you choose as a mistake can make you pay very dearly. Try to keep all your droids together and don't disturb too many boulders if you can help it.

The graphics are quite nice but the sound effects are sadly lacking. the scrolling is quite well done and adequate for the job at hand.

If you are a fan of Boulderdash you will enjoy this.

Neil Fawcett

Sound	4
Graphics	7
Playability	8
Value for money	6
Overall	5

Aztec romp



Program Aztec Challenge
Price £1.99 (cassette)
Supplier Top Ten Software Chiltern Enterprise Centre Station Road Theale Berkshire RG7 4AA
Tel 0734 303663

THE Aztec gods have demanded a sacrifice. They inform you that you are among the chosen victims.

There is, however, an opportunity to escape by undergoing a series of physical trials pushing you to the limits of your agility and stamina.

It appears that the Aztec race has over the centuries developed running and jumping abilities that make Daley Thompson look like a seven stone wimp – and you are going to need to coordinate those abilities to survive.

I must say that on starting Aztec Challenge I was unimpressed. However the more I played the game the more it grew on me. Although easy to play it proved rather more difficult to complete successfully.

The concept is simple. You must run and jump your way through 99 levels of obstacles, which become progressively more difficult.

You run continuously with no control over your speed which is pre-set. The only control you do have is in choosing which of the three heights you are going to jump. But as you have no time to stop and consider a jump you must live by your reflexes.

There is an option for two players with both runners appearing on the screen simultaneously. In this case I found that the runner behind has a slight advantage being able to benefit from the mistakes of the first.

Another playing option is that when all your lives have been used you can choose to restart the game at the beginning or where you finished.

The graphics are unreasonable for a budget game and as screen shots are printed on the packaging you are able to form a realistic impression of the game. There is very little use of sound.

Aztec Challenge's appeal lies in its uncomplicated nature. The simplicity of controls and the gentle lead [illegible] the game make it particularly suitable for children while the higher levels should [illegible] experienced players for a good while.

I don't suppose it will go down as one of the classics, but I enjoyed it and feel it is well worth the money.

Niels Reynolds

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

Passive piracy

Program Pirates of the Barbary Coast
Price £9.95 (disc)
Supplier Cascade Games
13 Haywra Crescent Harrogate HG1 5BG
Tel 0423 525325

IN contrast to the impressive packaging artwork, this game turns out to be very dull indeed. The idea behind it is good if not entirely original but sadly the implementation is lacklustre.

What we have here is basically a trading game combined with some elements of arcade action, luck and strategy.

You are captain of the US trading frigate American Star which has been raided by the notorious Bloodthroat the pirate. (Rule one of pirate tales is always to give the villain a brutish name – it would never do to have the wicked pirate called Primrose or Buttercup for example).

Bloodthroat has your daughter and is demanding a huge ransom, to be paid within 30 days or else. You must sail the Barbary Coast trading and fighting in order to raise the necessary readies.

The game sets sail with a beeping nautical tune and switches to the main screen, a map of the Barbary Coast. Moving a rather stiff and sluggish pointer you place it on one of the several destinations you wish to sail to.

The disc drive then whirrs away for a not inconsiderable period and eventually the next scene appears, a view from behind one of the cannons on your ship at sea.

There are a number of cannons and you can move along the deck – the picture simply slides to the left or right to reveal an identical scene.

A pirate ship may come sailing slowly past and you can engage it in battle or not.

Cannons are your only weapon and must first be loaded before they can be fired.

All or any of the cannons can be loaded in one operation and while the procedure attempts to be technically realistic I suppose it is also a tedious and frustrating business.

It goes like this. Select load, select the numbers of the cannons to be loaded, move to any working cannon, point at powder, point at cannon, point at push rod, point at cannon, point at cannon ball, point at cannon, point at brush and finally (yawn) point at cannon again. Get any of this wrong and you must start all over again.

One of the pains of the cannon loading sequence is that having loaded every blooming one while at sea someone unloads them again whenever you dock so you have to go through the whole gimmick every time you sail.

To fire any loaded cannon you point at the fuse whereupon it will start to burn down. The ball will then be ejected with a feeble explosion. I stap me bum, they be firing at us with cap guns and tennis balls!!

The elevation of the gun can be altered and is necessary because the pirate ships sail past at different distances.

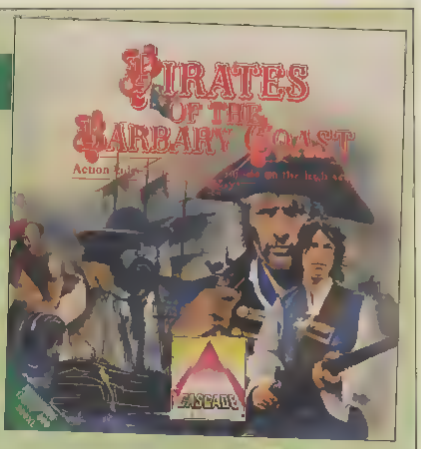
If you hit an enemy ship hard and long enough you may board her and either claim the booty or read her log, but not both. Stirring stuff eh?

Hits on your ship are shown by any number of your cannons going up in flames and thereafter becoming inoperable.

When you reach a destination the disc again whirrs and finally you will be told if there is anything at your chosen spot.

If there's nothing the message 'Captain, there be nothing here. Wish ye to set sail?' appears with the rather pointless single choice answer 'Aye'.

In other words there's no option but to sail to somewhere else. Long disc whirr and it's map time again. Dullsville.



If there is something there you are shown a treasure map and must pick up half several crosses. With luck you may find treasure, otherwise it's sailing time once more.

Pirates, gold, adrenalin and fame, matter will have decided that I won't be next aboard on this voyage and I am quite content to hit the pub instead. I'll be delighted to join them for there's not much more to it in this game.

Should you find it a port on the coast you are given an opportunity to do a very simplistic way to buy or sell food and goods, hire men, acquire cannonballs, make repairs and bribe the port officer (in return for a hint).

And really there is very little more to it than that. The game plays exceedingly slowly and is unredeemed by graphics (they are not bad but there are so few scenes) sound (crude) or content.

I don't enjoy having to put down a game by a new company but I am afraid Cascade Games is going to have to do much better than this if it is to succeed.

Bob Chappell



Sound	3
Graphics	4
Playability	3
Value for money	3
Overall	3

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5 LINERS

PAINT PICTURE LOADER
from E M Liddell

MOST Atari disc drives come complete with a graphics package called Paint. This five-line program allows you to load Paint picture files from Basic. The program works by loading the first five bytes of the file which hold the information for the colour registers and poking the colour registers with them. It then ignores the next 12 bytes and loads the next 3200 bytes which are the actual screen data.

You must remember that to load your own picture the filename within the program must be changed to the same as your picture filename. The program can easily be converted to create a running slide show of pictures.

```
1 GRAPHICS 7+16
2 SCREEN=PEEK(88)+PEEK(89)*256 OPEN #1
,4,0,"D:PICTURE.PIC
3 GET #1,COL POKE 712,COL GET #1,COL:P
OKE 708,COL GET #1,COL:POKE 709,COL GE
T #1,COL POKE 710,COL
4 FOR I=0 TO 11 GET #1,DUMMY NEXT I
5 FOR I=0 TO 3199 GET #1,A:POKE SCREEN
+I,A NEXT I:CLOSE #1 OPEN #2,4,0,"K:"
GET #2,KEY:CLOSE #2
```

PROGRAM BREAKDOWN

Line 1 Set graphics mode
Line 2 Finds start of screen and opens channel to disc drive
Line 3 Gets colour data and pokes colour registers
Line 4 Ignore next twelve bytes
Line 5 Loads and displays picture and then closes channel to disc drive

PROGRAM VARIABLES

COL Holds the information for the colour registers
A Holds all information for the screen registers to form picture
DUMMY Used to skip the twelve bytes not used

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	2495	2	10316	3	17861
4	5120	5	17862		

EXTRA COLOURS
from Malcolm Knight

THIS short routine uses a DLI (Display List Interrupt) to enable you to have eight different colours in Graphics 1 or Graphics 2 modes. This allows title screens and so on to become much more interesting with this new option of extra colours which can easily be altered to suit individual tastes.

```
20 FOR Z=0 TO 25 READ A POKE 1535+Z,A
NEXT Z GRAPHICS 17
25 POKE 512,0:POKE 513,6 POKE 54286,19
2 ADR=PEEK(560)+PEEK(561)*256 POKE ADR
+8,PEEK(ADR+8)+128
30 DATA 72,169,10,141,22,208,169,36,14
1,23,208,169,52,141,24,208,169,66,141,
25,208,141,10,212,104,64
40 ? #6;"AAAAAAAAAAAAAAAA"; POSITION 8,8 ?
#6;"AAAAAAAAAAAAAAAA"
50 GOTO 50
```

PROGRAM BREAKDOWN

10 Pokes DLI data into page six and sets graphics mode
20 Stores address of routine in interrupt vector and enables interrupt. Also calculates address of GR.1 display list. The addition of 8 to POKE ADD+8, PEEK(ADR+8)+128 determines which screen line the interrupt is called on. The addition of 128 in PEEK(ADR+8) calls the routine
30 Holds the data. Each number after the 169 is a colour value
40 Example text printed in Graphics 1
50 Closed loop

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
20	10868	25	16279	30	14643
40	14706	50	1424		

Win £25

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

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You should give a full description of the routine and any other details that 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, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY

CURSOR OPTIONS

from Darren Broome

THIS program sets up a VBI (Vertical Blank Interrupt) to scan both the joy stick port 1 and the function keys to give you some options for the cursor If Start is pressed the cursor will be turned off If both the Select and Start keys are pressed together then the cursor click is turned off

If Option is pressed both the cursor and the cursor click will be turned on Also the cursor can be moved around the screen with the joystick plugged into port 1 to allow you fast and comfortable movement of the cursor

The program stores machine code data in page 6 of memory so once you have typed the program in save it before you run it as it may crash if you make a typing error

To execute the program you call it by using the command X=USR(1536)

```
10 FOR P=1536 TO 1686 READ A POKE P,A
NEXT P:DATA 104,162,6,160,11,169,6,32,
92,228,96,76,85,6,173,120,2,201,14
20 DATA 240,19,201,13,240,23,201,7,240
,35,201,11,240,23,201,15,240,35,76,95,
228,169,142,141,252,2,76,37,6,169,143
30 DATA 141,252,2,76,37,6,169,134,141,
252,2,76,37,6,169,135,141,252,2,76,37,
6,169,85,141,12,6,169,6,141,13,6,76,37
40 DATA 6,24,173,31,208,201,6,240,10,2
01,4,240,22,201,5,240,26,173,120,2,73,
15,208,3B,76,95,228,165,1,141,240,2,76
50 DATA 108,6,169,1,141,219,2,76,108,6
,169,0,141,240,2,141,219,2,76,108,6,16
9,14,141,12,6,169,6,141,13,6,76,108,6
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
10 17638	20 14465	30 16727
40 16510	50 16781	



QUASI

from Robin Edwards

THIS game shows what you can get into five lines if you really try Here we have Quasimodo standing on the bat tlements with the royal guards climbing up to get him What is poor old Quasi going to do? Simple he thinks, throw some rocks down to knock them off

You move Quasi left and right via the joystick plugged into port 1 and by moving it down you will throw a rock at a guard The game ends when one of two things happens – a guard reaches the top or poor old Quasi loses his footing and falls off the bat tlement

As your score goes up the guards get faster and the challenge is to see how many of them you can get before they get you When typing in line 30 you must abbreviate all POSITION statements as POS and miss out all spaces Due to the length of certain lines it is not possible to supply a Get it Right! for this program

TYPING-IN NOTES

10 Type in as it appears
20 Type in as it appears
30 Abbreviate all POSITIONS to POS and miss out all spaces
40 Type in as it appears
50 Type in as it appears

PROGRAM BREAKDOWN

10 Draw battlements set variables
20 Routine to set up guards
30 Draw and move player and guard
40 Drop rock
50 Game over routine

```
10 GRAPHICS 0:POKE 752,1 FOR I=0 TO 20
:POSITION 5,I:? "
NEXT I:X=10 C=0:S=25
20 A=INT(RND(0)*25)+5:B=C:C=PEEK(84
30 S=STICK(0):X=X+(S=7)-(S=11):POSITIO
N X-1,4:? " ":POSITION X-1,5:? " ";
POSITION B,B:? " ":POSITION A,B+2:?
":POSITION B,B+2:? "
40 IF S=13 THEN FOR T=7 TO 20:POSITION
A,T:? " ":POSITION A,T-1:? ":NEXT T
IF A=B THEN Z=Z+1:GOTO 20
50 POSITION 8,8:? "SCORE ";Z:B=B-(B<>
(A-1) AND B<>A AND B<>(A+1)):GOTO 20 FOR T=B
TO 255:SOUND 0,T,10,10:NEXT T:RUN
```

An ideal companion

PETER DAVIDSON puts Panasonic's KX-P1081 printer through its paces

THE Panasonic KX-P1081 is a bi-directional dot matrix printer that is friction or tractor feed and has a switch to choose between standard, NLQ (near letter quality) or condensed print.

The printer reviewed here was supplied by Watford Electronics and came complete with a free printer cable. It's important to let Watford Electronics know you require an Atari cable when you order the printer.

The printer connects to an Atari 850 interface box or you'll need a Centronics to Atari interface cable in place of the standard one supplied.

There are three buttons on the right-hand side of the printer controlling the online status, form feed and line feed. The feed buttons work while the printer is online so it was not necessary to use the button controlling this, unlike many other printers.

Above these switches are three small lights – power, paper/error and online. Power and online remain lit while the printer is being used and the centre one indicates things like paper out or jammed.

The mains lead is permanently connected to the rear of the printer but needs a plug fitting. As it can't be removed it gets in the way slightly if you move the printer but at least you can't lose it.

The DIP switches are easily accessible under a piece of plastic near the print head. Flick it out of the way and the switches can be moved without searching for a screwdriver.

Epson compatibility is a feature advertised by many printer manufacturers. But just how compatible is compatible? Figure I shows the control codes and a P or E in the left hand column shows ones applicable to Panasonic or Epson printers only. The Epson codes shown are those for an FX80 together with the extra ones from the LX-86.

A feature I occasionally use that was not available on the Panasonic was reverse paper feed, but this was more than compensated for by all the extra ones offered over my Epson FX80. This printer has been so well accepted in the office that someone asked if another printer is Panasonic compatible.

The KX P1081 is rated at 120 characters per second. I compared the speed with an Epson FX80 rated at 160cps and found very little difference. In NLQ mode the speed drops to 24cps so it's a good idea to check the document in draft before moving to NLQ.

In some circumstances the Panasonic is faster than the Epson. A point to bear in mind when you choose a printer is that speed is affected by things like head turn around time so the cps, while being an indication, does not give the whole story.

There is a built-in 1k buffer so a small document can be sent to the printer whole and you can continue working as it prints. Unfortunately there is no flush buffer button so if you make a mistake you have to wait while it empties or switch off.

The print head has nine pins and these are used to give a 9x9 matrix. In NLQ the matrix is 18x18. You can see from Figure I that a wide variety of typefaces and styles are available. The Figure itself was printed after sending the codes 27 33 4,27 83 1 27,65 4 and is shown full size.

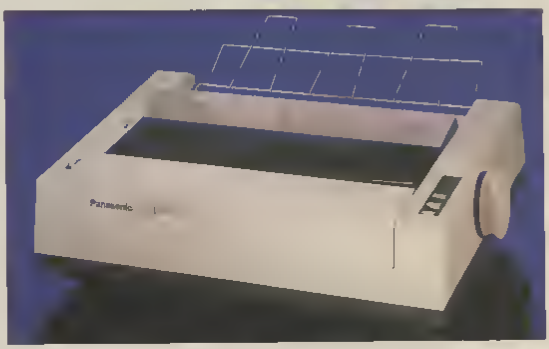
Figure II shows some of the many typefaces available and Figure III shows some NLQ text. As with all printers not all combinations of styles are available but all the important ones such as NLQ italics are.

If the character you want is not available you can easily define your own. If you've ever defined a character on a micro you should have no problem. The horizontal and vertical lines in tables can easily be created using underline to draw across and by redefining ! (character 33) using the codes 27 121,33,0 0,0,0,255,0 0,0,0 to give upright bars.

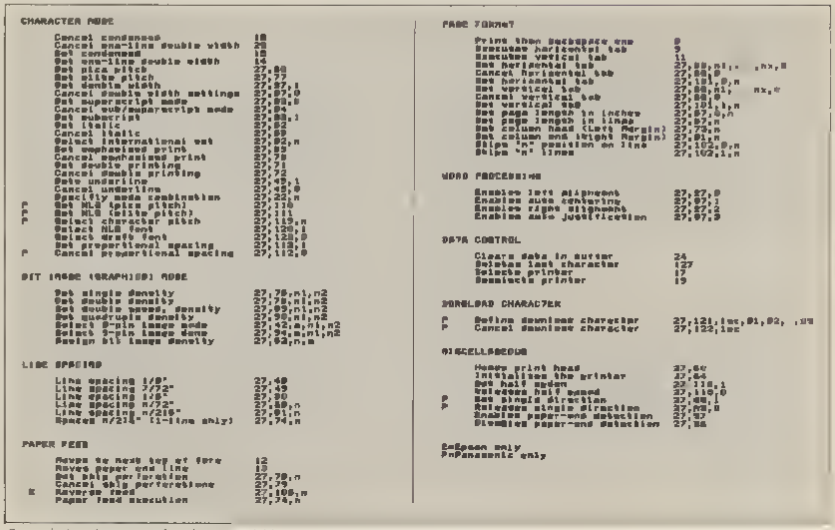
The NLQ feature can be implemented using the switch on the left hand side of the printer or by sending control codes. It is slower than draft because the printer outputs part of the letters, moves the paper slightly and then goes over them again to give four times the dot density. The last line of Figure III shows a line of text interrupted during the second pass of the print head.

Printing is rather noisy compared to more expensive printers, but it is acceptable. It can be quietened using the half speed and/or single-direction printing modes but I'd rather put up with the noise and benefit from the speed.

Fanfold paper feeds in easily but



Product KX P1081 Panasonic Printer
Price £171.35
Supplier Watford Electronics, Jessa House 250 Lower High Street, Watford WD1 2AN
Tel 0923 37774



```
CHARACTER MODE

      Cancel condensed                  18
      Cancel one-line double width      20
      Set condensed                     15
      Set one-line double width         14
      Set pica pitch                    27,80
      Set elite pitch                   27,77
      Set double width                  27,87,1
      Cancel double width settings      27,87,0
      Set superscript mode              27,83,0
      Cancel sub/superscript mode       27,84
      Set subscript                     27,83,1
      Set italic                        27,52
      Cancel italic                     27,53
      Select international set          27,82,n
      Set emphasized print              27,69
      Cancel emphasized print           27,70
      Set double printing               27,71
      Cancel double printing            27,72
      Make underline                    27,45,1
      Cancel underline                  27,45,0
      Specify mode combination          27,33,n
P     Set NLQ (also pitch)              27,120
P     Set NLQ (elite pitch)             27,121
P     Select character pitch            27,119,n
      Select NLQ font                   27,120,1
      Select draft font                 27,120,0
      Set proportional spacing          27,112,1
P     Cancel proportional spacing       27,112,0

BIT IMAGE (GRAPHICS) MODE

      Set single density                27,75,n1,n2
      Set double density                27,76,n1,n2
      Set double speed, density         27,89,n1,n2
      Set quadruple density             27,90,n1,n2
      Select 9-pin image mode           27,42,m,n1,n2
      Select 9-pin image mode           27,94,m,n1,n2
      Assign bit image density          27,63,n.m

LINE SPACING

      Line spacing 1/8"                 27,48
      Line spacing 7/72"                27,49
      Line spacing 1/6"                 27,50
      Line spacing n/72"                27,65,n
      Line spacing n/216"               27,51,n
      Spacing n/216" (1-line only)      27,74,n

PAPER FEED

      Moves to next top of form         12
      Moves paper one line              10
      Set skip perforation              27,78,n
      Cancel skip perforations          27,79
R     Reverse feed                      27,108,n
      Paper feed execution              27,74,n

PAGE FORMAT

      Print when backspace one          8
      Increase horizontal tab           9
      Executes vertical tab             11
      Set horizontal tab                27,68,n1,n2,...,nn,0
      Cancel horizontal tab             27,68,0
      Set horizontal tab                27,101,0,n
      Set vertical tab                  27,66,n1,    nn,0
      Cancel vertical tab               27,66,0
      Set vertical tab                  27,101,1,n
      Set page length in inches         27,67,0,n
      Set page length in lines          27,67,n
      Set column head (Left Margin)     27,108,n
      Set column end (Right Margin)     27,81,n
      Skips "n" perfs on line           27,103,0,n
      Skips "n" lines                   27,103,1,n

WORD PROCESSING

      Enables left alignment            27,97,0
      Enables auto centering            27,97,1
      Enables right alignment           27,97,2
      Enables auto justification        27,97,3

DATA CONTROL

      Clears data in buffer             24
      Deletes last character            127
      Selects printer                   17
      Deselects printer                 19

DOWNLOAD CHARACTER

P     Define downloac character         27,121,loc,01,02, ...nn
P     Cancel downloac character         27,122,loc

MISCELLANEOUS

      Memory print head                 27,60
      Initialises the printer           27,64
      Set half speed                    27,118,1
      Releases half speed               27,118,0
P     Set bingle direction              27,98,1
P     Releases single direction         27,98,0
      Enables paper-end detection       27,57
      Disables paper-end detection      27,56

E=Epson only
P=Panasonic only
```

Figure I A wide variety of styles is available

you must ensure you feed it straight in at the back otherwise it soon snarls up

There is no tear bar so you have to move forward to the next perforation to tear the paper easily

The ribbon is a cartridge type and drops in with no problems at all It's claimed to last for two million characters and there's a small button at the back of the cartridge you depress once printing becomes faint This re-inks the ribbon and allows a further one million characters to be printed

The manual is well written and far easier to understand than many I have seen One of the appendices gives a summary of the features available the code required to get them (in the form, for example, ESC+S+0) and a page reference That page translates this to 27 83,n where n=0 48 178 176. A little confusing and all the options for n don't help, but far more helpful than the more usual form that the Escape codes are given in

Each feature has a simple example to go with it Unfortunately, they're not written for an Atari computer and they're not even all for the same micro But in all of them it only needs a small change to allow the demonstration to be used on an Atari

Overall this printer is excellent value for money It does all the tasks you would expect of a low-cost dot matrix machine and works well with all the software I tried It's an ideal companion to your Atari computer

Here's Pica:	Here's Condensed.
Italic	*Italic*
Emphasised	Emphasised
Bold	**Bold**
Large	Large
Proportional	Proportional
Here's Elite:	Here's NLQ:
Italic	*Italic*
Emphasised	Emphasised
Bold	Large
Large	Proportional
Proportional	

Figure II Sample styles

This is a demonstration of NLQ printing in the Elite Typeface.

NLQ is obtained by the printer outputting part characters, moving the paper slightly and then printing the rest.

When the printer is stopped during NLQ output it looks like this

Figure III NLQ output

Your HINTS & TIPS

Gauntlet

THE best character for a solo game is the Wizard, with his excellent magic abilities. In a two-player game the wizard teamed with either the elf or the warrior works best. The Valkyrie, who seems to have the basics in all skills, loses out in that she is good at none of them.

All potions should go to the character with the best magic ability. If this seems unfair then the other characters should take care of the keys and be given the magic amulets.

Special potions that increase character abilities should be distributed very carefully. The armour potion should be given to the warrior or elf. Valkyrie doesn't need it and the wizard is given only minimal protection. The magic potion should be given to the elf or Valkyrie first. The wizard's power is not increased by it.

The shot speed potion is useful to anyone. The shot power can also be used by anyone as it increases damage done, but the fight power potion is best used by the elf. Valkyrie or the wizard – Thor the warrior is macho enough. The pick up power potion is best given to whoever is carrying the keys.

The maximum number of health points you can get is 9999. Some of the amulets can be shot, so take care.

To destroy bases in the later sections you have to shoot through the diagonals when this is possible. Death can be killed by transporting on to him, and when you use the transporters most of the time you move to the nearest transporter in the direction you are facing and you appear on the opposite side of the one you went in – *Paul Collins, Lewes, Sussex*

Kikstart

YOU will get maximum performance from your motorbike and start at top speed if you pull the joystick to the left as soon as you hear the starting tone – *Edward Harwood, East Grinstead, West Sussex*

Star Raiders II

IF you are having problems shooting the small Zylon fighters because they won't dive into your target sights when you are over a planet, simply change speed and they'll dive down into your sights. They are more willing to be shot when you vary your speed.

I have also noticed that you seem to be controlling the direction of the flagship. If you push your joystick down the flagship will respond in the same way. So if you move your joystick around quickly the ship will be more difficult to hit so use very smooth joystick movements to line it up in your target sights – and then let it have it – *Stephen Eversley, Hitchin, Hertfordshire*

Timeslip

IF you are short of time after having collected all the orbs and then have to play through each section to get the clocks to zero, then go for a timeslip and this will usually drop the totals a little.

If you miss an orb, crash and take it again to save you from having to go through the whole screen again – *Paul Collins, Lewes, Sussex*

Mercenary – The Escape

HERE are some tips for Mercenary to help novice players.

The first stage of your escape is to steal the Dominion Dart on the pad. Fly backwards at –625 to pick off the attacking Palyar. This will work for any attacking enemy.

Use the Anti Grav to pick up the Neutron fuel. It will also pick up the interstellar craft so you can relocate it outside the defence complex.

Carrying the Metal Detector changes the colour of Benson's communications panel when you enter Palyar or any Mechanoid-held locations – *Harry Sideras, Portsmouth, Hampshire*

The Great American Road Race

ON the straight section of the race, if you move your car to the far left of the road, getting as close to the grass as you can without actually going on it, you will find you can merrily drive along at 240mph no matter how many cars are on the road. You can only do this on a straight and when you encounter a bend you must drive normally – *Stephen Banks, Upminster, Essex*

Drelbs

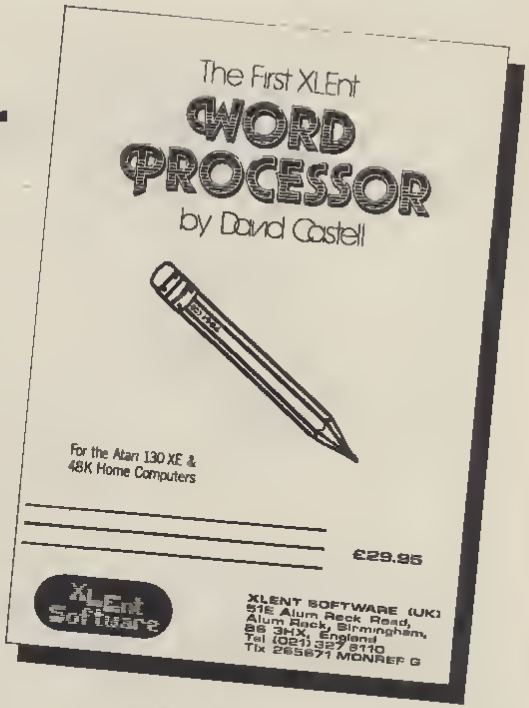
IF and when you see a blue diamond go around the flip grid and collect it. You will then enter the Drelbish corridor automatically – *Edward Harwood, East Grinstead, West Sussex*

Star Raiders

IF you find that one of your starbases has been surrounded hyperwarp into the sector next to the threatened one and wait until all the positions of the alien craft change. You then have 200 seconds to save the starbase from destruction – *Jonathon Evans, Finchfield, West Midlands*

Processor for all hands

ALAN GOLDSBRO tries it out



WHETHER you are a two finger typist struggling to reach 10 words per minute (wpm) or a fully fledged 80 wpm professional, a word processor can make all the difference to the production of your letters and documents

The First XLEnt Word Processor is a major shift from the "printer" programs XLEnt Software has previously offered. Many of you may be familiar with Megafont II, Typesetter and Rubber Stamp and if you were favourably impressed by those offerings I'm sure this latest one will find a place in your collection.

Disc based and requiring 48k it can work on both 400/800 and XE versions. The host of features include insert and overwrite text modes, advanced screen editing, print preview in 80 columns, cut and paste block moves, search and replace or delete, chaining of files, dual text windows, mail merge, joystick cursor scrolling and icon driven commands.

There are also special facilities for inserting pictures into your documents, and you can also define double column printing.

Typing is the same as using a typewriter but, apart from the obvious differences between word processing and typing, the major difference is in the speed you can move around your text. Both the standard cursor keys and the joystick will zoom you round the screen in seconds and by using the speed editor you can select a rate from one to nine, one being the fastest, three is the default speed.

You can easily set tabs to any predetermined place, while word wrap functions automatically and can be toggled off and on. A handy position marker will jump you directly to any of the five user-defined points in your document.

Background and text colours can be altered to suit individual tastes and even the cursor can be changed.

The cut and paste buffer will hold up to 800 characters, which is one screen (40 columns x 20 lines). Cut, copy and move functions are all operated from the icons seen at the bottom of the screen. The limitations of the text buffer can be offset by the ability to modify text within the buffer itself without harming the text in the document.

Dual windows can make a large document easier to edit, plus two separate documents can be displayed in this fashion. The text buffer luckily supports both windows thus enabling the transfer of text.

Searching through your document is quite easy but this function will only read text downwards, so cursor position has to be at the top of the text you need to search. Working through the icon menu again, the search facility will not only work in replace mode but also in delete – you can replace a word with one of your choice or alternately delete the word.

Wildcards are allowed throughout and both uppercase and lowercase can be selected without defining. Global replace/delete or manual confirmation are as standard.

Your margins can be altered at any time, both indents and outdents are allowed along with justification of lines. Line spacing and page size follow the same easy structure. In fact most of the commands are embedded directly into the text document.

Headers and footers can be blocked left, right or centred. There's also automatic page numbering as part of the header/footer set up. A valuable

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feature is the conditional page breaks which can be defined to protect para graphs from being split over two pages

When it comes to saving your work, you can either save the entire document or only select ve parts Files can be added to any document in memory and there is an insert command to let you insert a file into your current document

Viewing the disc directory or any other document can be done without losing the current document in memory The directory command will show you up to 40 filenames which can either be loaded or deleted at random regardless of what s in memory

There are very few word processors that will allow you to insert picture files in text documents The First XLEnt Word Processor has the ability to insert any 62 sector (Micro Painter) picture file in between your text

Other picture formats such as Typesetter Icons and B/Graph can also be used This feature is configured for Epson and compatibles only, but a printer driver construction set is included on the disc which may help 1029 owners print out their pictures within the document

Because the editing screen is only 40 columns wide a printer preview screen is brought into operation this feature doubles as the print formatter and lets you select how the page will be printed whether you require double columns number of pages to print and number of copies required Output can be to printer screen for previewing or disc for media transmitting

Mail merging can be undertaken with comparative ease and the program readily accepts data from Synfile+ All the usual text enhancements such as bold italics, super/subscript are controlled from the printer drivers These can be customised for the majority of printers available

The XL/XE has a facility to insert international characters into a document and custom fonts can easily be loaded as the default text although the standard Atari text is usually easiest to read

I've only scratched the surface of what the First XLEnt Word Processor can do As an avid user of Batteries Included's Paperclip, I'm impressed with the huge range of facilities available Standards like these are hard to come by in a bit word processing

Whether you're writing a short note to your granny or a full length review for *Atari User*, First XLEnt Word Processor will accommodate itself around your nimble fingers

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PIX 'XL' (TRANSLATOR) An excellent Translator for the XL & XE range that gives you the original 400/800 operating system so that you can run the incompatible software in Machine Code the program gives your XL/XE an extra 4k of ram by shifting the printer to high memory or on correct location (that XL/XE O.S. is 4k on). 2.95

DE CUPIER 2 ATARI FILE DEVELOPER – The XE copier is a one pass single density or two pass double density copier (not protected disks) THE ATARI FILE DEVELOPER works on ANY Atari computer with 32k or more. It enables you to batch copy files from a disk. No more duplicating a files part or more. Re-directory of files and from directory the ones not required or copying the files one at a time. Then can look, unlock, Delete files and format disks allows the program 4.95

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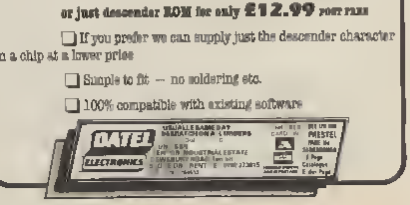
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Working with Full Print

MATTHEW DUNN gives enhanced printing and style on your Epson-compatible printer

HAVE you ever wished that you could print out all those funny little characters that you used in your program or text on your Epson-compatible printer? Well here's a utility which will print out your listings or Ascii files using the full Atari character set – or any other set you have loaded in your micro

First enter the listing. The lines of data have their own checksum on each line to help make sure that all the numbers are entered correctly. If there is anything wrong the program will tell you which lines are in error. You can also use the Get it Right! checksums as usual.

Next you will need to save your program by listing it to disc or tape using LIST" D:MYPROG.LIS" or LIST" C:". Check that your printer is on and ready... then run the program – Full Print.

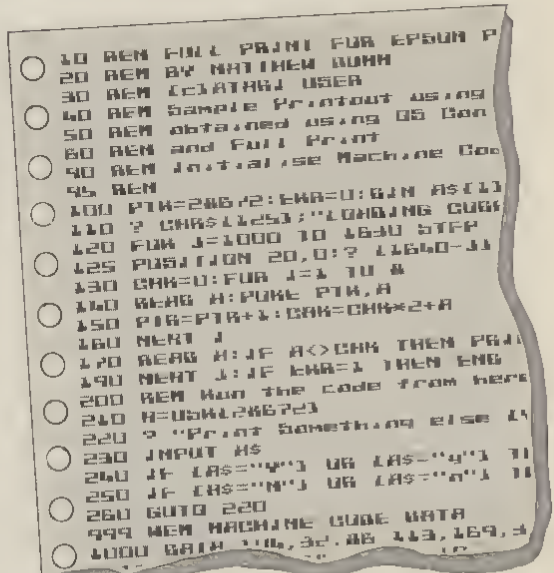
If it has been entered correctly it will ask for the name of the program to be listed. Put in the disc or tape with the listed program on it and then enter D:MYPROG.LIS or C: as appropriate. The printer will now start printing the program using the current Atari character set.

If you have other character sets they too could be used. To do this load one and set location 756 (CHBAS) to point to it as for any alternative character set. Now when you load and run Full Print it will use the character set you have just loaded.

If you wish to use this routine to present Mini Office II files in a new typeface, first save the file Ascii formatted to disc. Load in your special character set and run the Full Print program. When it prompts for the filename put the disc with the Mini Office II Ascii formatted file on it into the drive and enter the file's name.

The printer will then output your Mini Office II document using the special character set. Note the printer used must be Epson compatible and capable of printing graphics.

The program uses the ESC K (27,75) sequence to enable the graphics printing. These codes are held in the data statement on line 1630. If your printer uses different codes to enable the graphics change these two numbers (and the checksum) to the required values for your printer.



PROGRAM BREAKDOWN

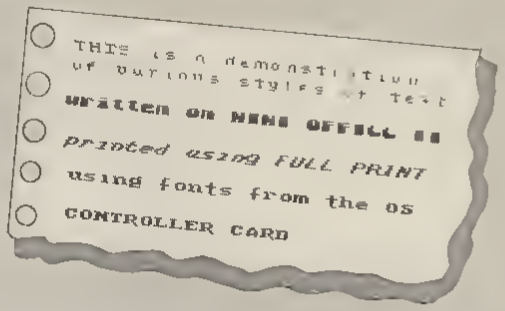
100-190	Read in and check the machine code data
200-260	Run the machine code from Basic until stopped
1000-1630	Hold the machine code data

```
10 REM FULL PRINT FOR EPSON PRINTER
20 REM BY MATTHEW DUNN
30 REM (c)ATARI USER
40 REM
90 REM Initialise Machine Code
100 PTR=28672 ERR=0 DIM A$(1)
110 ? CHR$(125), LOADING CODE
120 FOR J=1000 TO 1630 STEP 10
125 POSITION 20,0 ? (1640-J)/10
130 CHK=0 FOR I=1 TO 8
140 READ A POKE PTR,A
150 PTR=PTR+1 CHK=CHK*2+A
160 NEXT I
170 READ A IF A<>CHK THEN PRINT "ER
ROR IN LINE ";J ERR=1
190 NEXT J IF ERR=1 THEN END
200 REM Run the code from here...
210 X=USR(28672)
```

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```
220 ? Print Something else (Y/N) ,
230 INPUT A$
240 IF (A$="Y") OR (A$="y") THEN 210
250 IF (A$="N") OR (A$="n") THEN END
260 GOTO 220
999 REM MACHINE CODE DATA
1000 DATA 104,32,85,115,169,3,162,112,
21720
1010 DATA 157,66,3,169,192,157,68,3,29
425
1020 DATA 169,113,157,69,3,169,0,157,3
5045
1030 DATA 74,5,32,107,113,16,5,76,1345
8
1040 DATA 86,113,162,0,169,11,157,66,2
5200
1050 DATA 3,169,204,157,68,3,169,113,2
1247
1060 DATA 157,69,3,169,22,157,72,3,202
63
1070 DATA 169,0,157,73,5,32,107,113,28
305
1080 DATA 162,0,169,5,157,66,3,169,279
19
1090 DATA 224,157,68,3,169,113,157,69,
43507
1100 DATA 3,169,15,157,72,3,169,0,1511
8
1110 DATA 157,73,5,32,107,113,162,16,2
7024
1120 DATA 169,3,157,66,3,169,224,157,2
9213
1130 DATA 68,3,169,113,157,69,3,169,17
819
1140 DATA 4,157,74,3,32,107,113,48,139
34
1150 DATA 169,169,0,141,254,113,141,25
5,37725
1160 DATA 113,169,0,133,205,169,114,13
3,30869
1170 DATA 206,162,16,169,7,157,66,3,40
515
1180 DATA 169,241,157,68,3,169,113,157
,44251
1190 DATA 69,3,169,1,157,72,3,169,1616
7
1200 DATA 0,157,73,3,32,86,220,16,1350
4
1210 DATA 10,192,136,240,5,32,115,113,
22251
1220 DATA 76,86,113,173,241,113,201,15
5,24555
1230 DATA 208,37,160,0,145,205,162,112
,34520
1240 DATA 169,9,157,66,3,169,252,157,2
9649
1250 DATA 68,3,169,113,157,69,3,169,17
819
1260 DATA 144,157,72,3,169,2,157,73,32
579
1270 DATA 3,32,107,113,76,121,112,173,
9153
1280 DATA 241,113,74,74,74,74,74,41,62
709
1290 DATA 3,170,189,186,113,77,241,113
,22127
1300 DATA 141,241,113,169,0,133,209,17
3,40915
1310 DATA 241,113,41,127,10,38,209,10,
42084
1320 DATA 38,209,10,38,209,133,208,24,
21912
1330 DATA 165,209,109,244,2,133,209,16
0,43814
1340 DATA 0,162,8,177,208,10,62,243,15
271
1350 DATA 113,232,224,0,208,247,208,19
2,39152
1360 DATA 0,208,238,173,241,113,61,128
,27310
1370 DATA 240,13,162,0,189,242,113,73,
39643
1380 DATA 255,157,242,113,202,208,245,
162,55340
1390 DATA 0,180,0,189,243,113,145,203,
16155
1400 DATA 232,238,254,113,208,3,238,25
5,57271
1410 DATA 113,230,203,208,2,230,204,22
4,60576
1420 DATA 8,208,232,76,157,112,162,112
,24956
1430 DATA 169,12,157,66,3,32,107,113,2
8959
1440 DATA 162,16,169,12,157,66,3,32,28
918
1450 DATA 107,113,96,32,86,220,48,1,25
209
```




```
1460 DATA 96,169,48,141,202,113,141,20
1,29447
1470 DATA 113,141,200,113,238,202,113,
173,34807
1480 DATA 202,113,201,58,208,25,169,48
,42598
1490 DATA 141,202,113,238,201,113,173,
201,41087
1500 DATA 113,201,58,208,8,169,48,141,
35489
1510 DATA 201,113,238,200,113,136,208,
226,45808
1520 DATA 162,0,169,154,157,68,3,169,3
8951
1530 DATA 113,157,69,3,169,48,157,72,2
8666
1540 DATA 3,169,5,157,66,3,32,86,14698
1550 DATA 220,144,255,96,84,32,96,0,49
952
1560 DATA 80,58,69,82,82,79,82,32,1864
8
1570 DATA 68,65,48,155,85,111,117,114,
14681
1580 DATA 99,101,32,102,105,106,101,32
,23298
1590 DATA 70,105,101,101,115,112,101,9
9,22421
1600 DATA 32,58,32,32,32,32,32,32,9824
1610 DATA 32,32,32,32,32,32,32,32,8168
1620 DATA 32,0,0,0,0,0,0,0,4095
1630 DATA 0,0,0,0,27,75,0,0,552
2000 REM 27,75 ABOVE : ESC K FOR EPSON
 GRAPHICS
9000 END
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	8667	20	6148	30	3580
40	471	90	7159	100	4787
110	5170	120	6257	125	5117
130	3365	140	3668	150	4028
160	1345	170	10652	190	5245
200	7160	210	2230	220	7279
230	1644	240	5212	250	5400
260	1616	999	4020	1000	5925
1010	5869	1020	5845	1030	5422
1040	5734	1050	5762	1060	5571
1070	5632	1080	5630	1090	6060
1100	5455	1110	5710	1120	5849
1130	5731	1140	5533	1150	6292
1160	6204	1170	5661	1180	6260
1190	5571	1200	5424	1210	5875

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1220	6289	1230	6153	1240	5978
1250	5751	1260	5638	1270	5745
1280	5659	1290	6203	1300	6217
1310	5955	1320	5962	1330	6214
1340	5540	1350	6274	1360	6192
1370	5961	1380	6477	1390	5915
1400	6309	1410	6151	1420	6226
1430	5787	1440	5653	1450	5619
1460	6275	1470	6460	1480	6222
1490	6403	1500	6026	1510	6441
1520	5799	1530	5790	1540	5269
1550	5708	1560	5532	1570	6010
1580	6175	1590	6212	1600	5163
1610	5133	1620	5969	1630	4822
2000	7784	9000	836		

Fast access

ANDRE WILLEY takes the Supra hard disc drive for a spin

DO you remember the day when you finally scraped together enough cash to buy your first disc drive? Tapes suddenly became a thing of the past as you marvelled at the speed of your new acquisition

Operations which used to take 10 minutes were now finished in as many seconds But time passes and you start noticing that discs aren t perhaps all they were cracked up to be

Have you ever tried to re save a long file with Dos 2 5? Or copy such a file in append mode? Okay, so it s faster than tape but it still takes a while doesn t it?

The answer, as all business computer users will know is to use a hard disc unit – but until now such a thing has been difficult to get for an 8 bit Atari

Enter the Supra Corporation in America who saw the need for a high speed interface which would allow the use of a hard disc, and so designed one Marketed for the first time in the UK by Frontier Software, the Supra 20 Mb drive is now available from your local Atari dealer

So what is a hard disc, and how does it work? Well it s not really all that different from an ordinary floppy disc but it spins very much faster and is sealed inside an airtight container This single, non removable, unit can pack up 20 megabytes of data on to its surface

The access speed is also very much greater than an ordinary floppy with data being read and written many times faster than the serial drives are able Because a hard disc requires a far greater track reading accuracy than a floppy the disc itself is sealed inside an airtight box to avoid contamination from the dust and moisture in the air

The Supra contains a 3 5in mechanism which means that it is considerably smaller than a 1050 drive (albeit a little longer) measuring just 14 cm by 7 cm by 28 cm In addition to the drive itself you will need to find desk space for the SCSI interface module which plugs into the parallel port at the back of an 800XL

This module takes its power from the drive unit and so only one mains cable is required – and no more extra black boxes since the transformer is built into the casing As a bonus the interface also provides a high speed parallel Centronics printer port running at some 8 to 10 thousand characters a second

130XE users need not worry because a special converter board is also supplied for your machine which also extends the cartridge port making it much more accessible

Once you ve connected the unit to your computer you re ready to initialise the system Rather like floppy discs the hard disc must be formatted before you can use it

Firstly you should boot the Dos floppy disc which is provided with the drive My review sample was supplied with MyDos – a slightly modified version of Atari Dos 2 0 – which is frankly a bit of a muddle, and the whole Dos 2 0 file system is not really geared up to using 20Mb of space effectively

Frontier Software had obviously already come to this conclusion and the drive is now being packed with SpartaDos – probably the most powerful available for the 8 bit Atari

The interface is capable of deciding if the hard disc is ready for use and if not it will boot from floppy disc two (so don t forget to alter the drive select switch at the back of your 1050)

Once SpartaDos has loaded you should run the format program provided This will format partition and zero the drive ready for use Formatting will probably already be familiar to you, but partitioning may be a new concept

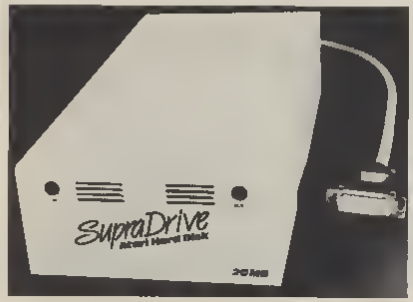
Since the hard disc can contain such a large amount of information it is split up into smaller more manageable units which the computer can treat as different drives Thus a small partition of 180k is set up as drive one (and will be booted from each time you power up the system) while the rest of the space is allocated equally between two fictitious drives numbered 3 and 4

Files may be accessed by using D1 , D3 and D4 respectively D2 refers to the real floppy disc drive you first booted from After each of these partitions has been zeroed you may write your Dos files to the fake drive one and you re ready to go

At this point it s best to re-boot the system from scratch to check you ve done everything correctly The computer will automatically load SpartaDos from the fake drive one unless you hold down the Help key to indicate a floppy boot is required (to load game discs and so on)

I tested the load time using SpartaDos with a standard 1050 and then using the Supra Drive – the 1050

Turn to Page 28 ▶



Test	1050	Supra
Load 18970 byte file	19 28	2 28
Save 18970 byte file	21 91	2 66
Open/close outputfile (20 times)	34 12	6 52
Open/close input file (20 times)	4 94	1 06
Write 50,000 bytes	48 92	5 08
Read 50 000 bytes	46 76	4 68

Figure 1 Speed comparison table

◀ From Page 27

loaded in about 18 seconds and the Supra took just 4 5 Both of these times include a 2 5 second poll to check for available drives, so the actual Dos loading times are more like 15 5 seconds and 2 seconds

When you start loading and saving files the speed differences are even more pronounced, with most operations running about 10 times faster on the Supra – see Figure I According to the manual date transfer runs at around 10,000 bytes a second and operations which used to take some considerable time now occur almost instantaneously

SpartaDos is ideally suited for using with a hard disc for two reasons Firstly it allows just about any length of file you want – if you want a couple of megabytes of data, so be it Secondly it supports sub directories which are vital when using such a high capacity drive

Within the main directory for each drive you may assign new directories which can be called at will Thus D1 may contain amongst its normal files the directory DATA which in turn might contain some more files and another sub directory called HELP and so on If the file WORDPRO INS was contained inside the directory HELP then it would be called up by using

D1 DATA>HELP>WORDPRO INS

Other features include a menu system that is almost entirely cursor and function key controlled, plus a whole host of other special files A read time clock/calendar is available on-screen, and all files are time/date stamped when written or modified SpartaDos has its own special disc format but it is also quite capable of reading and writing to standard Atari Dos 2 0 discs – in any density

Many machine code monitor and display routines are available plus batch execution files, disc management programs, various Ramdisc options and numerous other features It is also capable of running a 1050 at about three times normal speed if you've fitted a US Doubler chip (at £29 95)

Using a hard disc does have its drawbacks, though Copy protected programs can't be transferred onto the system, or non-standard format discs but so long as a program may be loaded from SpartaDos and uses the correct channels for its data storage there is no reason why it shouldn't work Also operations which are inherently slow because of the operating system (such as PUT and GET) will not show such dramatic speed improvements

The other crushing blow for dedicated Atarians is that the drive will only work with XL or XE computers, due to the fact that it requires access to the parallel port at the rear of the more recent machines

I've been using my Supra for a month now, and I can't envisage life without it any more That said, unless you use your machine mainly for programming or you run a bulletin board, the £750 price tag might seem rather difficult to justify

But if you can afford it and you would like to see your Atari disc access times improved, there would seem to be no better choice than a Supra drive

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More from Zork and the Ballyhoo man

by Rouloc

WELL here I am again after yet another adventure into the great unknown, and this time I have brought back some great news for Infocom fans

Dun out any time now is another new release from these masters of the text adventure Don t know about you, but I simply can t get enough of Infocom – they just seem to go from strength to strength

The most exciting part of this news is that the new adventure is called Beyond Zork Now in my book the Zork trilogy is an all time classic, so the fact that there will now be an addition to the series fills me with glee

Another release is one that I have mentioned before but here is some more gossip on it It is a real weird one and you couldn t really forget the title – Nord and Bert Couldn't Make Head Or Tail Of It

Jeff O Neill, author of that splendid circus mystery Ballyhoo, is the perpetrator of this highly unusual product

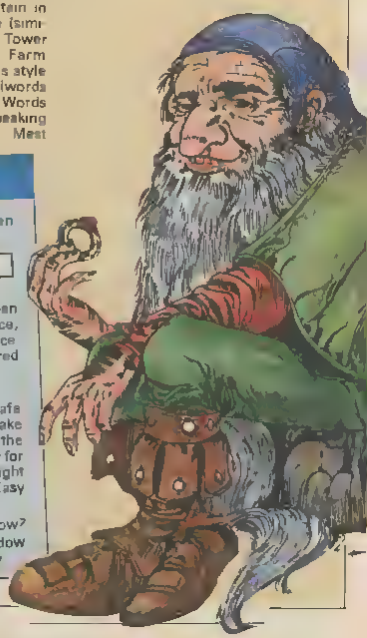
The program consists of eight vignettes, all set in a town called Punster As you might possibly guess from that, the tales are all concerned with English Language pyrotechnics The idea is for the player to solve the various plays on words that abound in each story

Nord and Bert is a long way from the usual Infocom adventure For a start each tale can be completed individually There is no mapping to be done and you may be pleased to know that there are built in hints for you to avail yourself should the going get too hard

The individual titles of this octet, with a hint of what they contain in brackets, are Shopping Bizarre (similar sounding words), Shake A Tower (Spoonerisms) Buy The Farm (cliches) Act The Part (Fifties style situation comedy), Play Jacks (words beginning with jac) Eat Your Words (idioms), Visit The Manor of Speaking (literal meanings?) and finally Meet The Mayor which can only be played when you ve solved all the others

If you like word games, an intellectual challenge spiced with plenty of

Turn to Page 30 ▶



Hints & tips

BUREAUCRACY

Old lady blasting you?
Ring the bell then sprint round the back and grab the portrait before she returns

Macaw won't give up the mail?
Show it the portrait – that should make it see red!

Puzzled by the llama?
Open the mailbox open the bag of llama treats put the bag in the box then look in the trough

Baffled by the postal stickers?
Jot down the order in which you found them and watch out – those items get shuffled about each time you start a new game The stickers are no use in themselves but you ll need to remember the order in which they were collected when you get further into the game

HOLLYWOOD HI JINX

Atomic chihuahua a problem?
Hit the buttons in this order Green thrice, black twice, white twice, green thrice, black once blue once green four times and lastly red three times Phew!

Safe won't open?
Look at the names on the safe plaque Levy Regan, Labling Take the initial letter for direction and the number of letters as the number for the combination Yep left to 4 right to 5 and right again to 7 Click! Easy when you know how!

Can t grab the sack in the window?
Hold the sack open the window then open the sack Easy peasy

◀ *From Page 29*

the traditional Infocom wit and humour, then Nord and Bert looks like a program you'll enjoy. Watch out for a full review in *Atari User* soon.

Turning to the cries for help that continue to pour in, I thought that I'd stick with Infocom this month and help you along the way with a few tips for Hollywood Hi Jinx and Bureaucracy.

Be back in a month – keep that brass lamp well filt until then!

See you next month

Review

Something nasty lurks ...

Program: The Lurking Horror
Price: £24.99
Supplier: Infocom c/o Activision, 23 Pond Street, Hampstead, London NW3 2PN. Tel: 01-431 1101

BY the pricking of my thumbs, something wicked this way comes". Perhaps you recognise that as a quotation from Macbeth or as a part title of a Ray Bradbury book (he borrowed it from our Will).

Whether you do or not (and even I was forced to look it up in my Wizard's Book of Knowledge for Dolts and Total Ignoramuses – Ruoloc may be pretty but he's not awfully bright), I'm sure you'll agree that those words beautifully convey the sense of something unspeakably nasty waiting just round the corner.

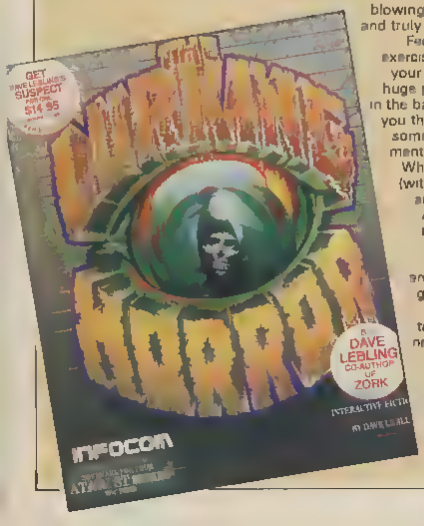
That quotation would be equally appropriate for Infocom's latest text adventure, The Lurking Horror. Now if, like me, you enjoy a good vicarious scare (always providing you're really safe at the time), then Infocom have got just the bag of creepy-crawlies for you.

You are a student attending the George Underwood Edwards Institute of Technology, about which many unwholesome rumours have been circulating, such as beware of ghastly goings on in the basement, young master.

One snowy night, you return to the college to finish off a long overdue Classics paper.

After a swift fainting fit while seated at your computer terminal (it was something you read, not what you had for tea back at the digs), you begin to wish you had stayed at home. Too late, old chum. There's now a blizzard blowing outside and you're well and truly stuck here for the night.

Feeling the need for a little exercise, you might care to try your hand at clearing away a huge pile of rotting junk down in the basement (I thought I told you there were rumours about something nasty in the basement – never learn, do you?). When the rubbish is shifted (with some mechanical aid), another room is revealed. And therein sits a closed manhole cover. Now just like those poor innocent twits who, when lost and soaked in a rainstorm, go knocking on the castle door at midnight telling to notice the 20 foot high neon sign that says "Chez Dracula", no doubt you will wish to open the cover and descend. Don't say you weren't warned. In a cave down below is what looks suspiciously like an altar. No cuddly toy for guessing what those red stains are (serves you right for climbing down manholes nosey). There's a knife lying nearby, its purpose obvious, wouldn't you say? But worst of all is the sliding iron plate embedded in the floor. Pull that to one side and the hairs on the back of your neck are likely to do handstands.



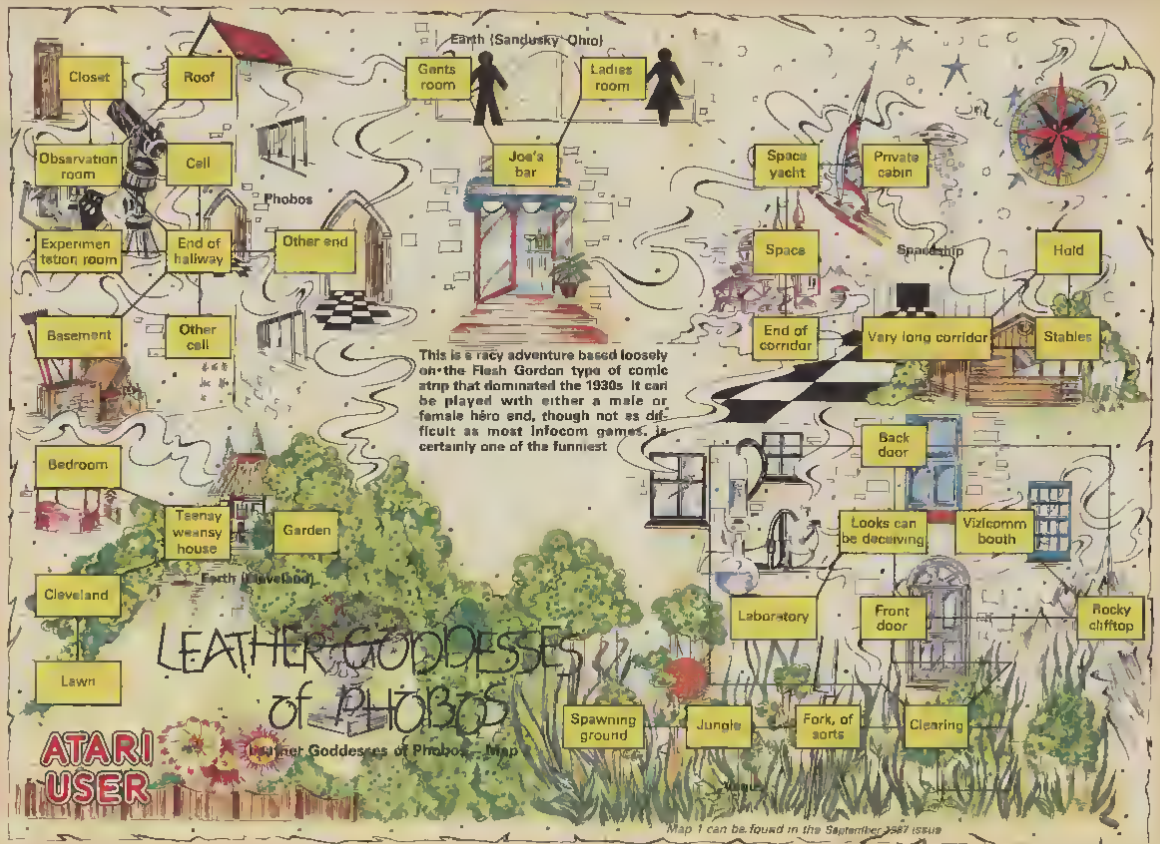
Greyfriars was never like this, master. As the fat owl himself might have said if he were in your current shoes. Oh, lor'! Oh, crikey! Given the nightmarish experiences you are about to undergo, you could be forgiven for using stronger language than Bunter's.

Elsewhere, down on one of the campus floors a maintenance man is polishing away on his mobile machine, a strange gleam in his eyes (if not on the floor). He will not let you pass. Taking an axe to him may seem like a petty over-reaction on your part to his unfriendliness but prepare to be shocked if you do decide to attack him. And, perhaps I should add in all fairness, prepare also to be throttled for your impertinence in assaulting what now appears to be one of the undead. Yep, a zombie.

And there's far more horrible things lurking around the campus. What IS going on? Among the treats in store are voracious rats, a loathsome slimy tentacled thingy, a winged watchyou-maycallit, something dead and unpleasant in a plant tub and a mob of cheering zombies for starters. Can you get out alive? Will you ever sleep soundly again?

The Lurking Horror was written by Dave Lebling, famed writer of the Zork trilogy and four other Infocom adventures. He has come up with a tale that brings together many of the elements found in the best horror stories like those by such notables as Stephen King, H P. Lovecraft and James Herbert.

This is another original triumph for Infocom who just can't seem to put a foot wrong, thank goodness. So turn down the lamp, shut the door and get down to playing The Lurking Horror. But try not to keep looking over your shoulder.

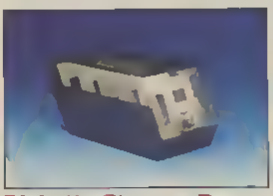


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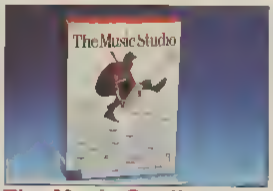




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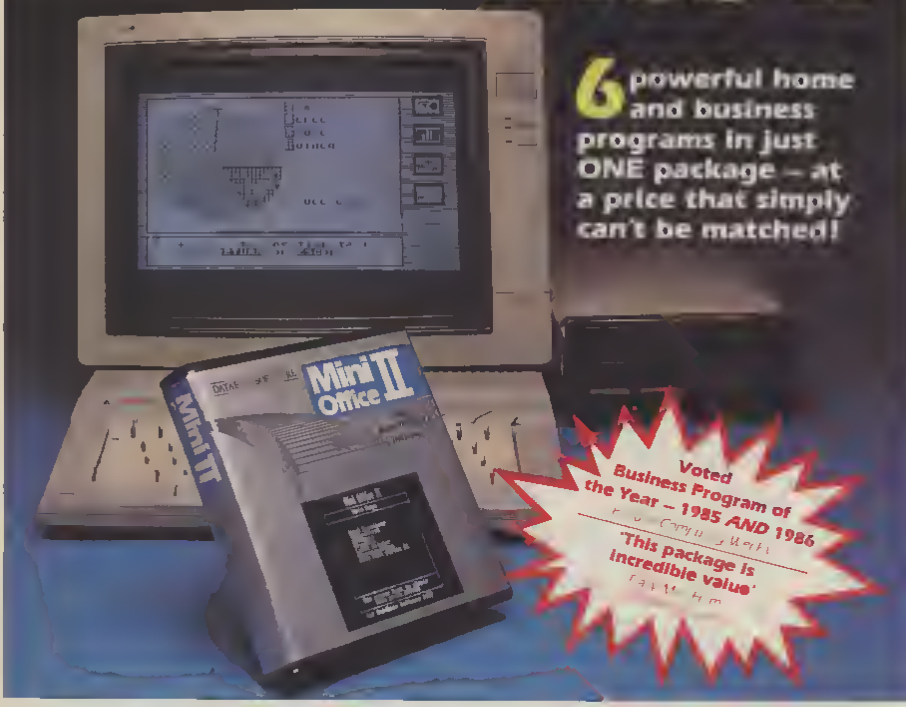
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AT10

Doctor Boris

Play ALEX DEWDNEY's game of the month

YOUR name is Doctor Boris. You have just graduated from medical school and have gone to work in a new hospital somewhere in the North of England. But the building work isn't complete and due to cutbacks in the NHS you have to go out there and do the work yourself!

Unfortunately the building site is littered with unexploded bombs so as you rush about constructing the hospital you have to stop to defuse them before the entire area goes up in smoke.

To make things even worse, the dreaded Mad Norman is constantly bouncing about making sure you're not slacking. One touch from his deadly skin and you drop dead.

The final problem you face — and things are getting pretty desperate by now — is that the site is also full of half buried skulls which glow with the a radioactive light. Like Norman these are fatal to the touch.

After the title page you find yourself in the middle of the screen surrounded by bushes, skulls and bombs. One of the bombs is slowly counting down from 10 to 0 and you must defuse it by walking over it.

As soon as one bomb has been defused another starts to count down and it's up to you to carry on until the area has been made safe. At this point you proceed on to the next level. If you let a bomb reach zero it explodes and you lose a life but an extra life is awarded when you reach level eight.

As you move you build the new hospital wall behind you and this sometimes blocks your path. If this happens you must use some of your limited supply of explosives by pressing the fire button and pushing the joystick in the direction required. Keep a careful watch on your dynamite gauge at the bottom of the screen as your supply is used very quickly.

Play the game as fast as you can as by doing this you gain more points. It is written entirely in Basic and is fairly short, so typing it in should pose no problems. Use the Get It Right! checksum to make sure you're correct. You'll find full details in the August 1986 issue of *Atari User*.



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◀ From Page 36

PROGRAM BREAKOOWN

80 70	Define arrays and main variables Set graphics mode and call title page
80-120	Move Mad Norman
130 230	Main loop Read joystick. Move Bons and advance bomb countdown
240 290	Detect collisions
300 320	Fire dynamite
330-450	Draw main screen
460 580	Defuse bomb and checks to see if screen complete
590-620	Set up PMG to form explosion gauge
630-880	Draw title page and effects
890 1000	Game over Reset main variables and print score
1010 1530	Redefine character set

PROGRAM VARIABLES

A	Value for joystick input
B	Number of the bomb currently counting down
C	Counter for bomb
D	Variable for locate commands
S	Sound flag
X	X position for Bons
Y	Y position for Bons
AA	value counter for when bomb is defused
DL	Start of display list
EX	Amount of dynamite remaining
LL	Current level of play
LV	Number of lives left
MX	X position of Norman
MY	y position of Norman
MH	Horizontal velocity of Norman
MV	Vertical velocity of Norman
NB	number of bombs on screen
SC	Score
DEC	Rate at which bomb counts down
CT$	Redefined characters used as numbers in countdown
BX(9)	X position of bombs
BY(9)	y position of bombs

```
10 REM SHOCKED BONES
20 REM BY ALEX BENNEY
30 REM (C)ATARI USER
40 DIM MX(19),MY(19),SET(4),CT$(10):CT
S="0123456789":GRAPHICS 17 :GOSUB 1000
50 N LL = 1:LV=3 :GOSUB 620 :GOSUB 880
60 GOTO 120
90 REM MOVE MEANIE
70 LOCATE MO+MH,MY,M:IF MO>12 AND MO<4
2 THEN MO= MO
80 LOCATE MO,MY+MV,M:IF MO>12 AND MO<4
2 THEN MV =MV
90 MO=MO+MH:MY=MY+MV:POSITION MO,MY ?
CH;"@":POSITION MO-MH,MY-MV ? CH;" "
100 RETURN
110 REM MAIN LOOP
120 ? #6;"@":POSITION M,N K=1:N Y 11 EX
 20 B 0 REC=N 1+(LL1/5)
130 A0 S:MY=3 MO=1 MV 1 :GOSUB 320
140 M 1 C=12:N I POSITION K,Y ? #6 "=" Y
MAP 920
150 A=STICK(0) IF S=1 THEN S 0 SOUND 1
,N,0,N
160 POSITION MX(N),MY(B):? #6 CT$(C,C)
:C=C-REC:IF C<0 ? THEN GOTO 920
170 IF A=11 THEN LOCATE K 1,T,0:IF D=3
2 THEN K=K-1 POSITION K,Y:? #6;"=" GH
TO 210
180 IF A=7 THEN LOCATE K+1,Y D=IF N 32
 THEN X=K+2 POSITION X-1,Y ? #6;"=" G
NTH 210
190 IF A 13 THEN LOCATE N,Y+1,N:IF N=3
2 THEN Y=Y-2 POSITION N,Y ? #6 "=" POS
ITION X Y 1 ? #6 "=" GOTO 210
200 IF N=24 THEN LOCATE K,Y 1 N IF D=3
2 THEN Y=Y-2 POSITION N,Y ? #6;"=":POS
ITION X,Y+1:? #6 "="
210 IF N=32 AND A<>15 THEN SOUND 1,50,
10,2# C C-8 RS S=1 GOSUB 700:GOTO 150
220 IF (D<>14# AND N<>32 AND N<>172) TH
EN GOSUB 450
230 IF STRIG(0)=0 AND EX>4 S THEN GOSU
B 290
240 IF B=234 AN N=232 THEN GOTO 900
250 IF (LL*20)>2 THEN GOSUB 70
260 IF MX=N AND MY Y THEN MX(N)=K BY(N
)=Y:GOTO 920
270 GOTO 150
280 REM DYNAMITE
290 EX EX N 5 POSITION X-(N 11)+(A=7),
Y N=1+(A 13):? #6;" " POSITION X,Y
? #6;"=" SOUND 1,50,N,25 S 2 POKE 5524
9,EX*N
300 A=N RETURN
310 REM DRAW MAIN SCREEN
320 POKE 559,# POKE 5524#,# COLOR 121:
PLOT #,2 HOANTO 19,1 PLOT 19,1 DRAWTO
N,2 DRAWTO N,22 DRAWTO 19,23
330 POKE DL+24,6 POKE DL+#,# POKE DL+2
N,7
340 PLOT 19,22 DRAWTO #,22 PLOT 19,22
DRAWTO 19,1 #0 INT(2+(LL*#0)+1):IF NB)99
 THEN NB=99
350 FOR T=1 TO #0:BX(T)=INT(3*RND(0)+2
7) BY(T)=INT(2+RND(0)*16) NEXT T
360 FOR T=1 TO NB POSITION BX(T),BY(T)
 ? #6;"@" NEXT T
370 FOR T=1 TH 5*RND(0):NX=1+RND(0)*N
17 YY 2+RND(1)*17 POSITION NX,YY ? #6;
"=" POSITION NX,YY+1 ? #6;"X" NEXT T
380 FOR T=1 TO 2+RND(1)*NX-1+RND(1)*N
17 YY 2+RND(1)*17 POSITION NX,YY ? #6
;"@" POSITION NX,YY+1 ? #6;"@" NEXT T
390 POSITION N,22 ? #6;" MORTON HUNTS/
",5C)
400 POSITION N,22 ? #6 '^^^^^^^^^^^^^^
^^^^^^"
410 POSITION #,#
420 ? #6;" LEVEL=";1+INT(LL*2#);" LIV
ES=" LV="
430 POKE 5324#,E24#:POKE 559,42 RETUR
N
440 REM DEFUSE BOMB
450 SOUND 1,40,10,15
460 IF A=22 THEN N=N-1 POSITION N,Y ?
#6;"= "
470 IF N 7 THEN X=X+1 POSITION X 1,Y ?
 #6;" "
480 IF N=15 THEN Y Y+1 POSITION N,Y ?
#6;"=" POSITION X,Y-1:? #6;" "
490 IF A=14 THEN Y Y-1 POSITION N,Y ?
#6;"=" POSITION X,Y+1 ? #6;" "
500 SOUND 1 N,N,N
510 AA C C=10 2 # N+1 IF #=#+1 THEN S
#10 510
520 SC=SC+(#A*30):POSITION 16,23 SC=ZA
T(SC) ? #6 SC, 9 32 RETURN
530 FOR T=255 TO 1# STEP -25 FHN U=10
TH # STEP .1:SOUND 2,T+N,1#,9:NEXT U N
EXT T:LL LL+N NS ELP 1
540 IF ELP=1 THEN ELP N IF 1+INT(LL*2N
1=N ANH EL=1 THEN EL # FHN T=15 TO # 5
TEP  N 2 SOUND 2 1#+T,1#,2#1NEXT T LV=
LV+1
550 SOUND 1 N,N,N
560 GOTH 210
570 REM SET UP SPRITE
580 A PEEK(106)-8 POKE 54279,P
590 POKE 53277,2 POKE 704 152 POKE 559
,42
600 PM#=PP256 FOR T P#0+512 TH P#0+2#N
 POKE T,N NEXT I FOR T P#0+#24 TH P#0+
610 POKE T 65 NEXT T RETURN
620 REM DRAW TITLE SCREEN
630 POKE 559,0:? #6 "K":SETCHLOR 1,3,8
 SETCOLOR 0 9,12 SETCOLOR 3,4,1# EL=1
640 DL=PEEK(560)+PEEK(561)*256 POKE DL
+24,7 POKE DL+3,7
650 ? #6;" 999999999999999999 ";
660 ? #6;"9                  99";
670 ? #6;"9   TOXIC WASTE   9";
680 ? #6;"9                  9";
690 ? #6;"9  BONES    #     9";
700 ? #6;"9                  9";
710 ? #6;"9  BRICK    9     9";
720 ? #6;"9                  9";
730 ? #6;"9  BOMB     +     9";
740 ? #6;"9                  9";
750 ? #6;"9  SCORE    2     9";
760 ? #6;"9                  9";
```



```
760 ? #6;"q    WAVE:    z        q",
770 ? #6;"q             x        q",
780 ? #6;"q                      q",
790 ? #6;"q   RADIO:     M       q",
800 ? #6;"qz             N       zq",
810 ? #6,"qxzxxxpress FirexxxxqZ",
820 ? #6," qqqqqqqqqqqqqqqqq ", POKE
559,42
840 SOUND 3 154,10,2 SOUND 0,255,10,2
POKE 710,PEEK(20) IF STRIG(0)=1 THEN 8
40
850 ? #6,"R":POSITION 8,8 SOUND 0,8,0,
8 SOUND 1,0,0,8 SETCOLOR 1,1,12
860 RETURN
870 REM GAME OVER
880 IF A 11 THEN X=X+1 POSITION X,Y:?
#6;"RQ"
890 IF A=7 THEN X=X+1:POSITION X-1,Y ?
 #6;"QR"
900 IF 0-13 THEN Y Y+1 POSITION X,Y ?
#6;"W" POSITION X,Y-1:? #6,"A"
910 IF A 14 THEN Y=Y-1 POSITION X,Y ?
#6 "W" POSITION X,Y+1 ? #6,"A"
920 POSITION 8X(0) 8Y(0) ? #6," "
930 FOR T 15 TO 0 STEP -8 Z SOUND 3,10
,0 T SETCOLOR 4 T,T NEXT T TRAP 930
940 LO LV 1 IF LV)6 THEN GOTO 50
950 POKE 53248 0 GRAPHICS 18 POKE 756,
CHS/256:POSITION 8,5 ? #6;"Game over"
960 POSITION 8,7 ? #6,"      SCORE:";SC
,
970 IF STRIG(0) 1 THEN 970
980 LO=3 SC=0 LI=0 GRAPHICS 17 POKE 75
6,CHS/256 GOSUB 520 GOSUB 580 GOTO 120
990 REM REDEFINE CHARACTERS
1000 POKE 77,0 DIM CH$(513),CH$="ZK+0JN
'=KY8'8(3(#-/?^PFUDW6BMKOCI8D3SLEV8123
456789VG,"
1010 CH$=CHR$(INT(1001-405)*256.CA0=57344
1020 FOR I=1 TO 53 CH0=CH$+(ASC(CH$(I)
) 32)*8 FOR J 0 TO 7 READ D:POKE CH0+J
,D NEXT J NEXT I
1030 FOR I 32 TO 39 POKE CHS+I,255-PEE
K(CH0+I) NEXT I POKE 756,CHS/256 RETUR
N
1040 DATA 16,84,84,170,170,84,40,16,16
,16,16,84,40,16,40,16
1050 DATA 66,231,110,30,56,110,231,66
1060 DATA 223,223,223,0,251,251,251,0
1070 DATA 56,124,214,146,186,238,68,84
,56,146,198,40,16 40,198,130
1080 DATA 0,24,24 24,24,16,8,0
1090 DATA 0,60,126,60,48,48,60,0
1100 DATA 0,60,12,12,12,12,60,0
1110 DATA 0,48,48,12,48,60,0,0
1120 DATA 0,60,48,60,12,12,60,0
1130 DATA 0,60,12,12,12,60,60,0
1140 DATA 0,60,12,12,12,12,12,0
1150 DATA 0 60,44,60,44,44,60,0
1160 DATA 0 60,16,16,60,12,12,0
1170 DATA 0,110,106,106,106,110,46,0
1180 DATA 126,153,36,153,126,36,36,102
1190 DATA 0,16,146,84,0,84,146,16
1200 DATA 0,24,14,24,24,0,24,0
1210 DATA 109,78,165,249,255,126,102,0
0
1220 DATA 255,128,0,0,0,128,255,0
1230 DATA 126,99,99,126,112 112,112,0
1240 DATA 127,96,96,124,112,112,112,0
1250 DATA 99,99 99,115,115,127,62 0
1260 DATA 126,99,97 113,113,115 126,0
1270 DATA 115,115 99,107,127,119,99,0
1280 DATA 99,115,123,111,103,115,115,0
1290 DATA 60,54,99,99,127 115,115,0
1300 DATA 99,119,127,107,99,115,115,0
1310 DATA 99,103,108,120,124 110,115,0
1320 DATA 62,115,115,115,115,123,62,0
1330 DATA 62,115 112,112,112 123,62 0
1340 DATA 127,24 24 24,28,28,28,0
1350 DATA 126,99 99,126,115 115,126,0
1360 DATA 126 99 99 126,115 115,126,0
1370 DATA 127,24,24 28,28,28,127,0
1380 DATA 62,115 112,62,7,107,62,0
1390 DATA 96,96,96,112,112,112,127,0
1400 DATA 127,96,96,124,112,112,127,0
1410 DATA 67,59,103 118,60,60,24,0
1420 DATA 62,115,103,111,123,116,62,0
1430 DATA 16,60,124,28,28,28,127,0,62,
127,127 32,16,62,127,0
1440 DATA 62,127,7,28,7,127,62,0,6,14,
30,54,127 127,6,0
1450 DATA 127,127,96,126,7,127,62,0,30
,62,112 126,115,115,62,0
1460 DATA 127,127,7,14,28,56,56,0
1470 DATA 62,127,99,62,99 127,62,0,62,
127,99,62,14,28,56,0
1480 DATA 124,254,198,198,198,206,126,
0
1490 DATA 62,115,96,96,103,126,62,0
1500 DATA 0,0,24,0,0,24,0,0
1510 REM THE END
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3336	20	3987	30	3340
40	22300	50	1614	60	7941
70	9387	80	9558	90	14206
100	1498	110	7075	120	10224
130	5720	140	7507	150	7240
160	13845	170	14038	180	15014
190	18893	200	17301	210	12058
220	7741	230	7256	240	5275
250	4375	260	8333	270	1623
280	5694	290	20125	300	2101
310	10464	320	18663	330	5733
340	15310	350	11991	360	8378
370	20762	380	21405	390	7519
400	9328	410	2345	420	7599
430	8713	440	7860	450	2730
460	7371	470	7647	480	14715
490	11714	500	2324	510	7295
520	11287	530	17112	540	20901
550	2324	560	1814	570	9521
580	4515	590	5533	600	19708
610	13795	620	13127	630	9155
640	7504	650	3459	660	9787
670	3454	680	6175	690	3454
700	6876	710	3454	720	6301
730	3454	740	7677	750	3454
760	8687	770	3688	780	3454
790	7431	800	4706	810	6308
820	7844	830	9504	840	13176
850	21552	860	1698	870	7827
880	7452	890	7728	900	12039
910	12038	920	5102	930	12593
940	5504	950	14026	960	4205
970	3769	980	13595	990	12081
1000	14797	1010	5567	1020	15813
1030	13453	1040	9384	1050	4995
1060	6913	1070	9351	1080	3968
1090	4185	1100	4042	1110	3959
1120	4002	1130	4068	1140	6025
1150	4054	1160	6862	1170	4815
1180	5216	1190	4441	1200	3458
1210	5507	1220	4358	1230	5005
1240	4981	1250	4799	1260	4959
1270	5059	1280	3138	1290	4793
1300	5023	1310	5144	1320	4483
1330	4937	1340	6440	1350	5026
1360	5038	1370	4696	1380	4638
1390	4802	1400	4891	1410	6711
1420	4955	1430	8412	1440	7837
1450	8575	1460	4457	1470	8049
1480	5427	1490	4761	1500	3386
1510	5458				

SPECIAL FX

In the fourth part of his series on amazing effects RICHARD VANNER takes a look at the use of load memory scan.

IN the last few months we have been looking at some features of the DLI (Display List Interrupt), and you should now have an insight about how this part of the computer works

This month let s consider another function of the display list the LMS (Load Memory Scan) This is a compli cated routine but if used correctly it can create some very useful effects quickly and without a lot of programming Its main job is to tell the Antic chip where to get data from when dis playing the screen information for any mode

Any line on the screen can have this option set and so allow screen data to be accessed from any place in memory and in any order

The importance and use of such a feature may not be apparent at first but it is in fact a very powerfull command

An example display list is shown in Figure I It is only a very small display list but from it you can see the way in which the LMS works

To start with, the first three bytes are blank lines to bring the start of the screen down to ensure that the first line of screen data is displayed on all TVs and monitors The next byte describes the type of mode to use for the next line – in this case Antic Mode 2 (Graphics 0) It also has the LMS bit set and this is essential for the first line in a display list so Antic knows where screen data starts from

Following this byte is a word address which Antic uses as a pointer from where screen data must be received This could, for example be an area in page six where a title is stored Setting a mode line with LMS followed by the low and high bytes of $0600 would result in data being dis played

The final command 65, tells Antic that the display list has ended and it must wait for vertical blanking before restarting a display list

The address following 65 is the start address of the display list This is ignored during normal operation of the Atari but is read when a printer is being used Don t worry too much about this but always make sure you finish a display list with these bytes

Before we go any further, type in Program I and run it. You will find that the top line of your screen has been re displayed many times This is achieved by making a new display list that keeps repeating the LMS on every line, with the same address for the screen data

What use is it I hear you ask Well imagine a game with split screens – player one at the top part and player two at the bottom These screens could scroll around memory independent of each other giving a wider scope for game design Many programmers have used this technique in games and an excellent example can be seen in Synapse's Shadow World

Let's now move on to another example of the LMS with Program II This listing inverts a Graphics 0 screen so when you run it everything goes upside down Try LISTing the program to test the effects

Again this is all due to the LMS function The new display list this time creates LMS addresses that start from the base of the screen and work backwards, creating a reversed memory format The program also changes the character mode register to display upside down characters

A useless program you might say but this idea can be used to invert a Mode 8 screen and this brings us on to Program III Again the display list is re-designed for a backward memory format but in this mode the picture on screen becomes flipped over Notice how the program switches between

Command	Description
112	Blank l ne
112	Blank line
112	Blank line
66	Graphics mode 0 (Antic Mode 2) with LMS (2+64)
LOW	Low byte of screen memory
HIGH	High byte of screen memory
65	Wait for VBLANK
LOWD	Low byte of display list address
HIGHD	High byte of display list

Figure I An example display list



A normal GR 8 screen

PROGRAM BREAKDOWNS

100-115	Sets up screen and memory pointer
120 140	Finds the display list address
141-190	Pokes the new display list into page six
192 220	Pokes in the mandatory end bytes of the display list
230	Tells Antic the address of the newly created display list
240	Prints a small message

Program I

100-140	Sets up screen, set pointer and find display list
141-190	Pokes new display list with backward format
200-230	Pokes in end bytes and tells Antic the address of the new backward display list
240	Sets character mode register for upside down characters
250	Prints a backward message

Program II

95	Lowers memory so that new display list can be stored in a safe place and so that it won't cross a 1k boundary
100 110	Sets up hi res mode and draws a patterns
120 140	Sets up display list pointers
141-190	Creates new display list for inverted screen
200 224	Pokes end bytes in
230 240	Switches to new display list and pauses
250-260	Switches back to original display list and pauses
270	Loops back to keep switching

Program III

96	Reserves memory
100 102	Sets up Graphics 8
104-110	Draws diagonal lines
120-140	Sets display list pointers
141 195	Creates display list with varying levels of depth
200-224	Sets end bytes
230	Switches to new display list

Program IV

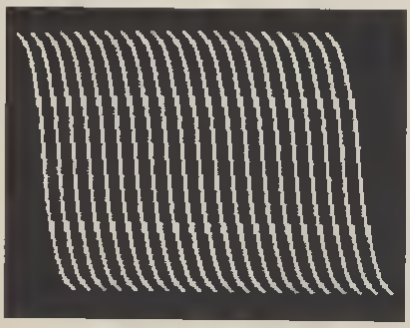
the two display lists at such a quick rate – much faster than moving the actual screen data. You may also find that when the screen changes there is a small flicker. This cannot be helped in Basic but a vertical blank interrupt would solve the problem.

Now on to the final listing, Program IV, which unlocks the hidden secrets of Colourspace. If you have ever seen this program you may have wondered how the curve modes are generated. Well it's all down to the LMS, which this time causes screen data to be displayed in varying steps.

The program sets up a display list that produces the same lines at increasing lengths giving them a curved effect.

The LMS is very important in the display list design and is quite a difficult subject, but even if you don't understand the theory you can use the useful routines from these programs in your own.

One final warning. Make sure that your display list never crosses a 1k boundary and that screen data never crosses a 4k boundary or else rubbish will be displayed.



The effect created by Program IV

Program I

```
10 REM ****************
20 REM *    PROG 1     *
30 REM * SPECIAL FX #4 *
40 REM *      by       *
50 REM *   R Vanner    *
60 REM * Atari User    *
70 REM * Messing with  *
80 REM *     LMS       *
90 REM ****************
100 GRAPHICS 0
110 SETCOLOR 2,0,0
115 PAGE6-1536
120 DL=PEEK(560)+PEEK(561)*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE PAGE6,112 POKE PAGE6+1,112 PO
KE PAGE6+2,112
150 A=3
160 POKE PAGE6+A,2+64 A=A+1
170 POKE PAGE6+A,LOWLMS A=A+1
180 POKE PAGE6+A,HILMS A=A+1
190 IF A<>51 THEN GOTO 180
192 POKE PAGE6+A,2 POKE PAGE6+A+1,2 PO
KE PAGE6+A+2,2 A=A+3
200 POKE PAGE6+A,65
210 POKE PAGE6+A+1,0
220 POKE PAGE6+A+2,6
230 POKE 560,0 POKE 561,6
240 POSITION 8,0:? "Have the cursor u
p here for a suprise!
```

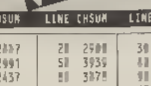
◀ From Page 39



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2887	20	2899	30	3621
40	2991	50	3939	60	4149
70	4783	80	2849	90	2887
100	2859	110	2730	115	1840
120	4453	130	3501	140	3183
141	8923	150	540	160	4231
170	5008	180	4838	190	3785
192	10146	200	2924	210	2982
220	2939	230	3781	240	14278

Program II

```
10 REM ******************
20 REM *     PROG 2      *
30 REM * SPECIAL FX #4 *
40 REM *       by       *
50 REM *    R Vanner    *
60 REM *  Atari User    *
70 REM *                *
80 REM * UPSIDE DOWN *
90 REM ******************
100 GRAPHICS 8
110 SETCOLOR 2,0,0
111 PAGE=1536
120 DL PEEK(560)+PEEK(561)*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE PAGE,112 POKE PAGE+1,112 PO
KE PAGE+2,112
150 A=3 LINES 23
152 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LINES*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE PAGE+A+2,2+14 A=A+1
170 POKE PAGE+A+4,LOWLMS2 A=A+1
180 POKE PAGE+A+4,HILMS2 A=A+1
185 LINES=LINES-1
190 IF A<>75 THEN GOTO 152
200 POKE PAGE+A,65
210 POKE PAGE+A+1,0
220 POKE PAGE+A+2,6
230 POKE 560,0 POKE 561,0
240 POKE 755,4
250 ? " WWOO ENISPU  VIT EHT REMRUT O
NN YAH
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2887	20	2900	30	3121
40	2991	50	3939	60	4149
70	2437	80	3378	90	2887
100	2859	110	2730	115	1840
120	4453	130	3501	140	3183
141	8923	150	2300	152	4513
154	3425	156	3915	158	4809
160	4231	170	525a	180	4894
185	2741	190	3731	200	2924
210	2982	220	2939	230	3781
240	1459	250	8705		

Program III

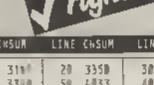
```
10 REM ******************
20 REM *     PROG 3      *
30 REM *  SPECIAL FX #4  *
40 REM *       by       *
50 REM *    R Vanner    *
60 REM *  Atari User    *
70 REM *                *
80 REM *INVERT GRAPHICS 8*
90 REM ******************
95 MEMRY=PEEK(106)-16 POKE 106,MEMRY M
EMRY=MEMRY*256
100 GRAPHICS 8+16
102 COLOR 1
104 FOR A=0 TO 191 STEP 5
106 PLOT 0,A DRAWTO 4,191
108 NEXT A
110 SETCOLOR 2,0,0
120 DL=PEEK(560)
122 DL2=PEEK(561) DL=DL1+DL2*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE MEMRY,112 POKE MEMRY+1,112 PO
KE MEMRY+2,112
150 A=3 LINES=191
152 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LINES*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE MEMRY+A,15+14 A=A+1
170 POKE MEMRY+A,LOWLMS2 A=A+1
180 POKE MEMRY+A,HILMS2 A=A+1
185 LINES=LINES-1
190 IF LINES> 1 THEN GOTO 152
200 POKE MEMRY+A,65
210 POKE MEMRY+A+1,DL1
220 POKE MEMRY+A+2,HILMS2
222 POKE DL+199,0
224 POKE DL+200,PEEK(106)
230 POKE 560,0 POKE 561,PEEK(106)
240 FOR A=0 TO 100 NEXT A
250 POKE 560,DL1 POKE 561,DL2
260 FOR A=0 TO 100 NEXT A
270 GOTO 230
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3181	20	3348	30	3984
40	3390	50	4033	60	4352
70	2481	80	4573	90	3181
95	9777	100	2498	102	1395
104	3643	106	4075	108	1329
110	2730	120	2291	122	5853
130	3501	140	3183	141	9328
150	2512	152	4313	154	3425
156	3915	158	4809	160	4574
170	5384	180	5024	185	2741
190	4756	200	3054	210	3578
220	4256	222	2382	224	3744
230	5399	240	3653	250	4480
260	3853	270	1819		

Program IV

```
10 REM ******************
20 REM *     PROG 4      *
30 REM *  SPECIAL FX #4  *
40 REM *       by       *
50 REM *    R Vanner    *
60 REM *  Atari User    *
70 REM *                *
80 REM * CURLING LINES *
90 REM ******************
95 MEMRY=PEEK(106)-16 POKE 106,MEMRY M
EMRY=MEMRY*256
100 GRAPHICS 8+16
102 COLOR 1
104 FOR A=0 TO 200 STEP 10
106 PLOT A,0 DRAWTO A+110,100
108 NEXT A
110 SETCOLOR 2,0,0
120 DL1=PEEK(560)
122 DL2=PEEK(561) DL=DL1+DL2*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE MEMRY,112 POKE MEMRY+1,112 PO
KE MEMRY+2,112
150 A=3 LINES=40
151 FOR LOOP=0 TO LINES-1 REAR SIZE
152 FOR LOOP2=1 TO SIZE
153 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LOOP*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE MEMRY+A,15+14 A=A+1
170 POKE MEMRY+A,LOWLMS2 A=A+1
180 POKE MEMRY+A,HILMS2 A=A+1
182 NEXT LOOP2
185 NEXT LOOP
190 DATA 1,1,1,1,2,2,2,3,3,3,4,4,5,5,6
,6,7,8,9,10
195 DATA 10,9,8,7,6,6,5,5,4,4,3,3,2,2
,1,1,1,1
200 POKE MEMRY+A,65
210 POKE MEMRY+A+1,DL1
220 POKE MEMRY+A+2,HILMS2
222 POKE DL+199,0
224 POKE DL+200,PEEK(106)
230 POKE 560,0 POKE 561,PEEK(106)
240 GOTO 240
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3178	20	3350	30	3984
40	3390	50	4033	60	4352
70	2481	80	4392	90	3181
95	9777	100	2498	102	1395
104	3643	106	4443	108	1329
110	2730	120	2291	122	5853
130	3501	140	3183	141	9328
150	2265	151	1142	152	4844
153	4313	154	3096	156	3915
158	4809	160	4574	170	5384
180	5024	182	2354	185	2304
190	6793	195	4812	200	3054
210	3578	220	4256	222	2382
224	3744	230	5399	240	1422

SOFTWARE Solutions

Your programming problems solved by ANDRÉ WILLEY

Trapped by a loop

WE VE got a really mixed bunch of questions this month – one of which had me a little puzzled for a time. Don't forget that this is *your* forum – so keep those questions coming in on any aspect of Atari programming.

Let s start the ball rolling with a letter from **Jim Colley** from Whirlow in Sheffield. He writes:

I would appreciate your advice on a problem I am having with my Atari. In fact, what I really want to know is whether or not I have a fault in my machine.

I am using a 130XE, O S S's Basic XE cartridge, two 1050 disc drives and two printers – a 1029 and a 1020, neither of which are turned on at the same time.

My problem concerns the TRAP statement. I find that when I use it from inside a loop to direct the program back within the loop I get Error 13 – NEXT without FOR. However I have only found it to happen when using GOSUB – for example:

```
10 FOR F = 1 TO 10
20 TRAP 30  GOSUB 1000
30 PRINT F
40 NEXT F
```

I would have expected that when the program attempts to branch to the non existent line 1000 that the TRAP would bring it back to the loop and execution would continue. But it gives the error 13 when plainly there is a FOR statement. None of the manuals comment upon this so I am wondering whether there is a bug in my rom. I hope that you might be able to set my mind at rest.

The problem you have encountered is not a bug as such, merely a slight misunderstanding of the way Atari Basic functions.

When a FOR statement is encountered the program stores the details of the loop by pushing them onto a special run time stack. Th s is simply a place in memory where numbers can be placed one at a time and then retrieved afterwards. Think of it like a pile of letters on a desk. Whenever you add a new letter to the stack you always place it on the top of the pile and whenever you take any off again you always start with the one on the top.

This is known as a first-in last-out (or FILO) stack because the first item you put on the stack will be on the bottom of the pile and hence be the last to come out again. Incidentally, some computer operations will use (first in first out) stacks which work the other way – rather like pulling the letters from the bottom of the pile and dealing with the oldest first and the most recent ones last.

Anyway, to get back to the point, Basic uses it s run time stack to keep track of where to go back to for FOR NEXT loops and GOSUB RETURN branches. Therein lies your problem. So let s look at what Basic does during your program.

Line 10 is a FOR statement, so it pushes all the information it requires onto the stack and goes on to the next line.

Ignoring line 20 for a moment, line 30 prints out the value of F and then line 40 pulls the FOR details back off the stack and thus returns to line 10.

Now when you add line 20 the follows sequence of events takes place.

The TRAP line is set to 30, but no action is taken on it at this point. Then the program comes across a GOSUB statement so it pushes the calling line number details (line 20 in this case) onto the stack and goes off to find line 1000.

At this point the error handler cuts in because there is no line 1000 to go to. It detects this error (Error 12) and also notices that a TRAP has been set to line 30 – so instead of printing an error message it branches and continues execution at line 30 (PRINT F).

Line 40 is a NEXT statement, so it tries to pull the information about the associated FOR command from the stack – and what does it find but the unused reference to the RETURN address for the non-existent GOSUB. Of course, it can't know that the next item on the stack is the one it wants, so it gives up and produces an error.

Now for the solution. All you need to do is remove the RETURN address entry from the stack before you get to the NEXT statement. The POP command will do this, so if you change line 30 to:

30 POP : PRINT F

your program will run as required. Don t forget to remove the POP statement if you decide to use the GOSUB to line 1000 because if the stack is already in order when you POP it then you ll remove the perfectly valid FOR reference and you ll get the same error!

Oh, and by the way – you CAN attach two printers at the same time, but be careful if you are trying to use a word processor or other similar program. The normal printer reference used by most software is 'P ' or P1 , either of which will drive any

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SOFTWARE Solutions

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printer on the serial bus However most Atari printers also have a unique device ID number built into their rom chips An 850 Interface for example, will also respond to "P2 and each new Atari printer has its own code (P3 P4 , and so on) I don't know the code for a 1020 off hand but the 1029 responds to P6

This is obviously only useful with programs which allow the use of printer ID numbers (so AtariWriter is out for example) and it also only works with the XL/XE operating system

Disc's density

A W Crawford of **St James's Gardens, Penicuik** has two questions

"Is there any way of checking, in machine language, the density in which a 1050 drive is operating? At the moment the technique I am using involves trying to read a sector outside the single density range, say 1000, and assuming that an error indicates single density which isn't a particularly elegant technique Is there a better way, perhaps one that involves interrogating the drive controller?

Also, to settle an argument, what is the clock speed of a PAL Atari? Mapping the Atari says that PAL Ataris run at 2 217 Mhz as against the 1 79 Mhz of NTSC machines Since the 1 79 Mhz rate was chosen to give two colour clocks on the display per cycle and PAL has a greater number of scan lines I can see the reasoning behind this statement However, the Hardware Manual while documenting many of the differences between PAL and NTSC machines, does not mention a change in the clock speed Which is the correct figure?"

Well the standard 1050 drive doesn't seem to have any register available from the Status call to indicate the density of the disc It's density sensing mechanism would seem to be totally internal and transparent to the user it doesn't even support the $4E and $4F SIO commands used to configure the access mode on true double density drives

However, all is not lost The US Doubler chip designed to give you faster disc access and true double density on a 1050 DOES have the capability you require These cost about £29 95 and are available from Frontier Software or your local dealer

The US Doubler returns far more information via the Status request command ($53) than a normal 1050 This data is placed into the four bytes starting at $2EA, and is mapped as shown in Figure 1 In addition the US Doubler also provides the full $4E and $4F modes plus some additional fast formatting commands

As far as the clock speed of a PAL Atari computer goes you are quite correct in your assumption that our machines run at 2 217 Mhz In fact the crystal which governs the speed of both British and American machines runs at exactly 3 Mhz but the amount of cycles stolen by ANTIC and GTIA during their DMA access to the screen varies depending on the television system in use at the time

A PAL picture is made up of 50 frames per second, each being some 312 lines deep An NTSC picture, on the other hand is made up of 60 frames of 262 lines each second This accounts for the difference in stolen clock cycles, and hence the variation of the two CPU speeds

● *That's all we've got room for this issue but there'll be more of your technical and programming questions next month*

$2EA	Bit 0	BUSY (Normally 1)
	Bit 1	DRQ (Normally 1)
	Bit 2	LOST DATA (Normally 1)
	Bit 3	CRC ERROR (1=Okay, 0=Read error on last sector)
	Bit 4	SECTOR NOT FOUND (0=Last sector read was not found)
	Bit 5	RECORD TYPE (Special write command used on last sector)
	Bit 6	WRITE PROTECT (0=Disc was write protected)
	Bit 7	NOT READY (0=Drive door still open)
$2EB	Bit 0	COMMAND FRAME (1=Error in last command frame) *
	Bit 1	CHECKSUM (1=Error in last checksum data) *
	Bit 2	OPERATION (1=Operation error, for example bad sector) *
	Bit 3	WRITE PROTECT (1=Disc is currently write protected)
	Bit 4	MOTOR ON (1=Disc spinning)
	Bit 5	SIZE (1=256 byte sectors 0=128 byte sectors)
	Bit 6	Unused
	Bit 7	1050 DD MODE (1=Dual Density (1050) mode)
$2EC		DRIVE TIMEOUT VALUE (50ths of a second)
$2ED		Unused (Always 0)

* Not used with the US Doubler

Figure 1 Status bytes returned by a US Doubler drive

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

We will answer as many queries as we can within the pages of Atari User, but unfortunately we cannot enter into personal correspondence



A sort of iso-bar chart

ANDY DORAN uses Mini Office II to chart our wonderful weather

LAST month we set up a spreadsheet containing lots of data about the weather. It would be nice to see the fruits of our labour pictorially, and this is the task for which the graphics program was written.

Let's take the data you've already entered into the Spreadsheet and display it graphically in preparation for a report or holiday brochure.

Before doing this it's a good idea to obtain a printout of the spreadsheet. This will make the collation of the graphics data much more simple, and is shown in Figure I.

A number of sets of data could be used to create the graphics. For instance, it would be interesting to see the average, best and worst results in each category compared.

Looking at the printout we can see that the columns that contain these items of data are I, J and K. The titles for each value appear in column A. This is all the information we need to save data ready to load into the graphics program.

After selecting the option to save graphics data, the first question that is asked is Select from Row/Column. As we have seen, the data is in columns, so enter C. You are then asked for the column in which the headings appear, so type A in answer to this question. Finally, you are asked to give the column in which the data is stored – column I.

Once you have answered these questions you will be presented with the values in individual cells, the cell number (I1) and the contents of that cell.

You have to state whether or not this cell is required by answering Y or N. Answer N for cell I1 and Y for cells I2 to I5 and then press Return. Finally you are asked for the filename. In the same way as when you saved the spreadsheet. Enter the filename as AVERAGE GRA.

Repeat the process for the two columns BEST and WORST. Again for easy reference, save these as BEST GRA (column J) and WORST GRA (column K).

You can now leave the spreadsheet and move on to the graphics module. Make sure you have the Mini Office II disc in the drive, select the Mini Office II menu and from the next screen choose graphics.

The three sets of data you saved – AVERAGE GRA, BEST GRA and WORST GRA – should be loaded into data sets 1, 2 and 3 respectively. This is achieved by selecting Load Data and then indicating the data set number and giving the filename (make sure that your data disc is in the drive).

Note that when you load data sets 2 and 3 the old filename must first be deleted or edited before the new one is entered.

With the data sets loaded, you can now draw some graphs so let's obtain a bar chart comparing all three sets of data.

Selecting Bar Chart gives a white screen with a set of icons down the right hand side. You need to tell the computer that you wish to use all the data, because if you don't only one set will be used. To do this, select the icon that reads Option (using the cursor keys and Return as we do to select a menu option).

Next, select the Data icon. This will prompt the computer to ask how many sets are to be used (the question appears near the bottom of the screen). Answer 3, to this question, and then define the primary second

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	A	I	J	K
1		SUN	BEST	WORST
2	SUN (HOURS)	0	0	7
3	RAIN (INCHES)	3	3	0
4	TEMP (BEST)	29	33	27
5	TEMP (WORST)	24	25	24

Figure I A typical week's weather

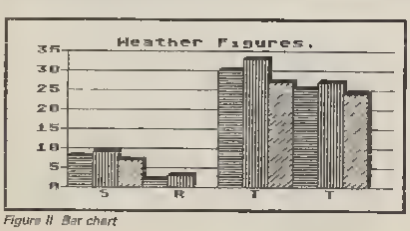


Figure II Bar chart

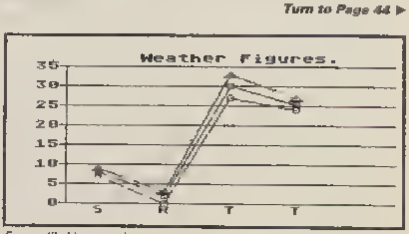


Figure III Line graph

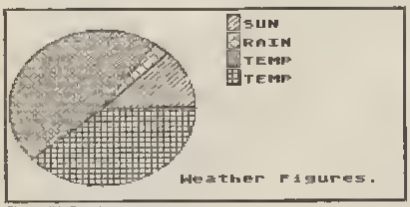


Figure IV Pie chart

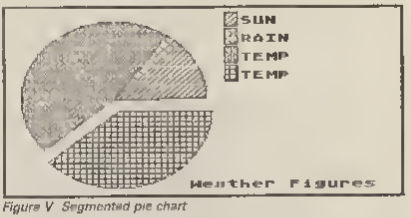


Figure V Segmented pie chart

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ery and tertiary data sets as 1 2 and 3 respectively

Once you have done this pressing Escape will take you back to the first set of options, with the top icon representing a bar chart Select this, press Return and the bar chart will be drawn on screen

Label it by choosing the pen and ink icon and entering the required text Press Return, and position it by using the cursor keys Confirm the position with Return

Now you've got a graphical display of the data, it might be useful to obtain a printout You do this by selecting the Screen options icon (the one with a picture of a TV screen on it) and you will be presented with a furthur set of icons

To print the screen select the one bearing a picture of a printer The computer will ask whether you want the printout on a printer or to disc – press P to indicate printer

You now have to answer the question Atari 1029 or Epson by pressing either A for Atari or E for an Epson or Epson compatible printer and once you do this the computer will dump the screen to the printer (see Figure II)

This method can be used to create a line graph like the one shown in Figure III As the primary secondary and tertiary data sets have been defined, there's no need to define them again

Only one set of data is used at any one time but experimenting with the various options produces results like those for the pie chart shown in Figures IV and V

Now that you have used the graphics program and spreadsheet together once, you should have no problems repeating the process again to create other spreadsheets – perhaps even an accounts spreadsheet with pie charts and bar charts to liven it up bit

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VISA

Extra memory and faster access

I RECENTLY bought a 130XE to add to my collection of Atari bits and bobs. This was mainly due to the idea that the extra 64k memory over my 800XL would be really useful for programming purposes.

When it came to using this extra memory the whole process seemed mind boggingly difficult and the manual seemed almost apologetic about how to use it.

I find that the only use of the memory is the ramdisc facility you get with Dos 2.5. Strangely I have seen very little about this extra memory in magazines, and was wondering if you or your readers could reassure me about it.

Also could you please tell me if you know of any software that will print musical notation onto a 1029 printer as I have searched for such a program and have up to now found none. – **Richard Martin, London**

● The 128k memory of a 130XE can only be used in sections and not all at the same time from Basic. This means that it can be used for storage space and you can then retrieve the information when you require it.

This allows very fast access to data and we'll show you how in a future issue of *Atari User*.

You could buy Basic XE which allows you a full 64k block of memory to use for programming and gives you a 38k block for variable workspace.

This comes on a cartridge and can be obtained from several suppliers including OSS (Optomised System Software) for around £70.

We have not seen any software that will print musical notation to an Atari 1029 printer, but if any of our readers can help please write in to Mailbag.

Groaning disc drive

I HAVE read the advertisement in Atari User for Font IV from Datel Electronics and was wondering if I fitted it to my 1029 printer would it then allow me to use Print shop with it?

I also have a problem with the amount of noise that my 1050 disc drive makes when in use. I have tried using sewing machine oil but it only helps for a short while.

How can I stop this as it is very annoying when loading or saving programs? – **Marcel Lammerse, Leeuwarden, The Netherlands**

● The Font IV chip fitted to Atari 1029 printers is a 16k rom that allows the inclusion of three new character sets as well as retaining the original Atari character set. But it will not make your Atari 1029 work with Printshop.

The idea of using sewing machine oil on your drive to reduce the noise is all right but you have to be very careful when applying it.

If it comes in contact with areas of the drive other than the arm that carries the drive head you can cause damage – especially if oil gets on the head.

The groaning noise that your drive makes is not actually a fault and if you can put up with it it's best not to go poking around inside your disc drive.

Revision update

MY Atari 800XL computer has a Revision B Basic and I have a cartridge with the Revision C Basic in it.

Is it possible to remove the Revision C chip from the cartridge and replace the chip in my computer with it and if not could you please explain why? – **H G Angel, Harrogate, North Yorkshire**

● Providing that your cartridge has a 24 pin 8k rom you should have no problem swapping it with your old Revision B chip.

Atari also issued this cartridge with two 4k roms and if this is the case you will not be able to replace the Basic roms.

But if the cartridge is left plugged in the computer it will disable your old Revision B Basic and replace it with the Revision C on the cartridge.

Basically it replaces the need to desolder your Basic rom from the computer and take your cartridge to pieces.

Squashed up pictures

I TYPED in Kevin Milford's Dump 15 program from the July 1987 issue of Atari User and find that pictures from the Paint Artist program are compressed into the top half of the screen as they load and are then printed in this way. Is this correct? – **D J Deeming, Gillingham, Kent**

● The Dump 15 utility is designed to be used with files created by the Atari TouchTablet and Micropainter programs. Unfortunately Paint files are in a format that the program doesn't interpret correctly and so can't be printed with this program.

Mission X blues

I TYPED in the Mission X listing from the August 1987 issue of Atari User and found that when I ran the program it came up with enter level(1–3).

I typed in level 1 pressed Return and the screen went blue in the top right corner and then simply did nothing else.

What is the problem? Is

Turn to Page 40 ▶

Protection pleases

I HAVE now obtained a copy of the August 1987 issue of Atari User and I am glad that I did, as it is the most interesting issue to date.

The article about protecting programs by Len Golding is very useful and also of great interest to me are the articles about Mini Office II and the Five Liner joystick device.

The article on the Dos map confirms my opinion that the people who wrote the Atari OS were put in separate rooms and not allowed to talk to each other. How else can all the different numbering systems within the OS be explained?

Keep up the good work supporting the Atari and thanks for giving us non games players so much to read this time. – **P Boulter, Tyneside**

◀ From Page 45

there a fault with the listing in the magazine? – **Kevin Wallace, Upton Wirral**

● The listing in the magazine is correct and you will find that you made an error as you typed it in Check your program very carefully, especially any DATA statements and you should find your error

It appears to be happening while the computer is setting up the playfield and this takes place between line 4000 and line 4990 so check these lines especially

You can use the Get it Right! checksum to help you find full details of how to use it are in the August 1986 issue of *Atari User*

Recipe for success

IS it possible to run a word processor system on an Atari with only a disc drive as I have not got a printer?

I am a chef and have a large selection of recipes and menu sets that I would like to keep a record of I have a varied selection of databases but none seem adequate for the job

Eventually I would also like to add a costing system to work out multiple recipe ingredients and was wondering what I would need to do this task

Also could you or any of your readers please tell me if there is an astrology data program suitable for the 800XL and disc drive system? – **John Upton, Brighton East Sussex**

● It is possible for you to enter your recipes into a word processor and store them The printer is only required when you decide to make a hard copy of a file

As to adding a costing system you will find that a spreadsheet package is ideal for this purpose An ideal package for you to use for both your word processing and for a spreadsheet is Mini Office II, which includes other programs such as a database that maybe of use to you

Unfortunately we do not know of an astrology program for the 8 bit Ataris but if any of our readers know of one please then just drop us a line

ATARI USER Mailbag

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

The address to write to is

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

Speeding Fast Mover

AFTER typing in the Five Liner program Fast Mover from the September 1987 issue of Atari User I was very disappointed to find it did not work properly Are there any errors in the listing? – **Ruth James, Heaton Chapel, Stockport**

● Sorry there is an error in line 20 The eleventh number – 105 – should be 205

Doubler difficulty

I OWN an Atari 1050 disc drive with a US Doubler chip installed and it was working perfectly

Then I attempted to load Graphic Art Department from Databyte and it simply wouldn't load and no error messages appeared All my other software loads all right so could you please help me – **Sarah Keates, Rhode Saint Genese, Belgium**

● The error may be caused by the protection on the disc Some forms of protection on discs time the disc access and if this time is not the usual one the program will not load

Because your doubler chip increases the speed of your drive it will return the wrong time and prevent the load

Short of a £ or two

AFTER buying Mini Office II I wrote a document and within it I used the pound sign

When it came to printing the article the pound sign came out on preview mode but when I printed it out on my 1029 printer it came up with a # where my pound sign should have been

Apart from this I find Mini Office II a superb piece of software, so can you please help me? – **Neil Doherty, Barnsley, South Yorkshire**

● To be able to print the pound sign on your Atari 1029 printer you must go to the printer setup section of Mini Office and set printer code 7 to the following codes 27, 23, 5 27, 24. Then whenever you require the pound sign in your text simply type Control + 7

Dumping pictures

I OWN an Atari 800XL disc system with 1029 printer and touch tablet with AtariArtist software Is there any software that will allow me to dump my touch tablet pictures to my 1029 printer?

Could you also tell me if it is possible to attach the Maplin DIY modem kit to my Atari using an Atari 850 interface and Mini Office II – **Peter Knight, Ashton Under-Lyne Lancashire**

● In the July 1987 issue of *Atari User* you will find a listing called Dump 15 that takes your AtariArtist pictures and dumps them to either an Epson compatible or Atari 1029 printer

The Maplin DIY modem kit will work on your computer using an Atari 850 interface box and the Mini Office II communications software

Unfortunately this modem is only 300 baud, so you could run up quite a sizeable telephone bill when you use it Also it is not BT approved so its connection to public telecommunication systems is prohibited

Missing level

I RECENTLY bought Domark's The Living Daylights after reading your review in the August issue of Atari User

When I loaded the game I was disappointed to find no title page and that there were only seven levels to

the game.

This intrigued me very much as you mentioned a title page and eight levels. Could you please explain why my game is different to your review copy? – **Stephen Buxton, Normanby, Cleveland**

● We reviewed an advance copy sent by Domark and it contained a title screen and level 6. Unfortunately in the release copy of the game the title screen and level six were removed due to memory problems.

Spectrum software

I WAS wondering if there is any device produced that will allow me to use Spectrum software like Barry McGuigan's boxing, Match of the Day or Monopoly on my Atari 800XL and 1010 tape recorder – **Scott Gallacher, Astley, Leicester**

● There are no devices available to allow you to use Spectrum software on the Atari but with the superb software available for the Atari why would you need one?

Keeping in touch

SOME time ago you were offering Dos 2.5 to your readers. Can you still supply it?

Also could you please tell me if it is possible to print out touch tablet picture files on to the Atari 1020 printer plotter and if so how?

Can the 1020 also be used to imitate a normal printer such as the Atari 1027 letter quality printer? – **R Bawden, Forest Gate, London**

● Unfortunately we have no more supplies of Dos 2.5 discs, but this does not mean you can no longer obtain one. Various advertisements in *Atari User* still offer Dos 2.5 for £2.

Your 1020 plotter will dump your touch tablet picture files and in the January 1986 issue of *Atari User* we published a dump program for this printer.

It was a little slow, but did the job. The 1020 can print your listings and work from within your programs but don't expect it to be able to imitate. Letter quality as it just isn't capable of it.

Pictures for Palette

I HAVE just created a picture using the Technicolour Dream art program and was wondering how I get it printed in the Palette page of Atari User. Do I send it in on a disc or as a photograph? – **Kevin Campbell, Livingston**

● Send your pictures in to us on a data disc or tape stating clearly which utility you used to draw them, your full name and address and a note saying it is your own work and you don't mind us printing them. We will assess them and consider them for publication.

T shirt ribbon

I UNDERSTAND from a friend that it is possible to obtain a printer ribbon which enables designs to be printed on T shirts. My printer is an Epson FX 80, so will the ribbon fit it?

I have spent some time looking through various magazines but can find no reference to it anywhere. Can you please tell me the phone number of the company which sells the ribbon? – **Andrew Godsell, Manchester**

● The ribbon is designed to work on Epson printers so you will have no problems with it. You can obtain one from MGA Microsystems 05806 4278.

Smudged paper

I HAVE a problem with my printer. Ever since I acquired a new ribbon it has been leaving marks on the paper where the head has been moving.

If I leave the printer for a day or so a large spot of ink appears on the paper underneath the printer head.

I have checked with the manual and the position of the head is correct. Any help would be gratefully received – **Andrew Smith, Chorleywood, Herts**

● On most printer heads there is a shield to prevent the ribbon touching the paper. Make sure your ribbon is behind the shield.

Bored by low baud

I ALWAYS read the mailbag section of Atari User and wonder if you can help me with a problem I have with the Atari tape system.

Why do the games take so long to load when other computer systems load so fast? And is it possible to speed the loading time of my games up? – **Andrew Blair, Balornock, Glasgow**

● The Atari tape system works via the serial port located at the rear of your XL/XE computer or on the side of the old 400/800 computers.

Unfortunately the system that Atari have used for loading/saving files on the tape uses a slow baud rate (600). It is possible to alter this and theoretically the input baud can range from 318 to 1407 baud.

To be able to load a program at a higher baud rate it must first be saved using the new baud rate so you could save your own programs or listings from *Atari User* at a higher speed but to resave commercial software that is already at the slow rate yourself at a higher speed would infringe copyright.

Although it is not easy to alter the baud rate it is possible because this rate is controlled by a routine called the SIO and this can be altered via software.

The OS uses it to account for different drive motor speeds or stretched tapes, and once a true baud rate is calculated then the hardware is adjusted to suit the load status.

Once the workings of this routine are known it is possible to alter the OS parameters that control the input of the serial port and increase the loading speed.

However it is not possible to explain how this is done within the confines of the letters page due to the complexity of the software required.

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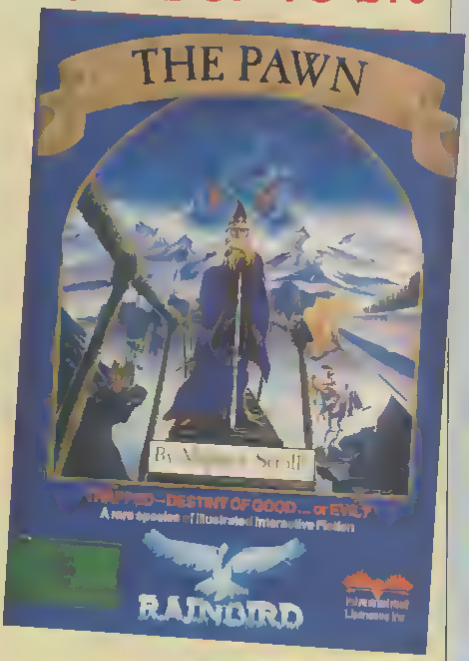
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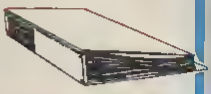
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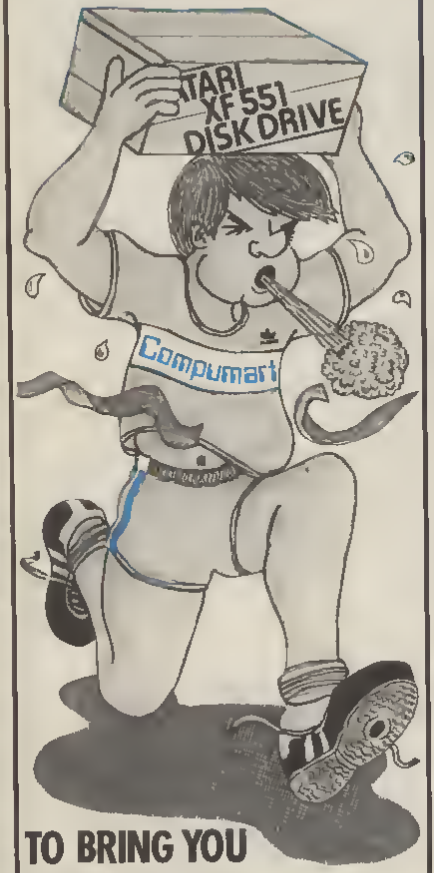
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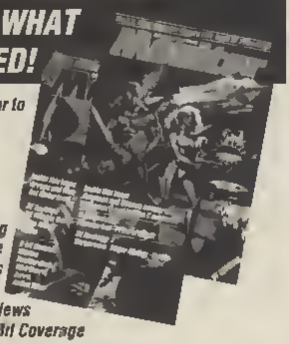
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The next unit that fits between your Atari and the joystick

Time gentlemen please!

LEN GOLDING shows how your Atari can help fund-raising

HAVE you ever thought of using computer games to raise funds for your favourite charity? Here s a little device which will prove invaluable if you do It's a joystick extension cable, games timer and computer-hog deterrent all in one

Our photograph shows the de luxe version with flashing lights and a bleeper, but it can be made in much simpler form if you need to keep costs down

Figure I shows the circuit which is built around a single IC chip containing four NAND gates This chip must be one of the new AC series since only that type has the necessary input and output characteristics

The time delay is provided by gates A and B which form a monostable whose output (pin 8) is connected to the joystick's common pin Pressing S2 starts the timing period and sends pin 8 low (0v)

The joystick then behaves normally for the pre set period when pin 8 goes high (5v) and the joystick stops working VR1 can adjust the on time from a few seconds up to about five minutes depending how generous you feel

Gates C and D are not needed for the basic timer but they don t cost any extra, so we might as well use them Figure I shows the two gates wired as an oscillator, which runs at about 0 5 Hz and can pulse an LED or buzzer on and off Choose a lower value for R3 if you want to speed up the pulse rate or a higher value to slow it down

S1 is optional and allows you to select one of three states On without time limit off or on with preset time limit If you don t want this facility just

Turn to Page 54 ▶

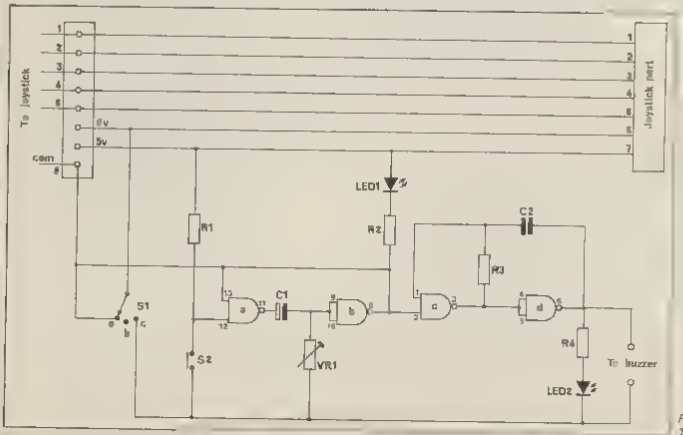


Figure I The circuit

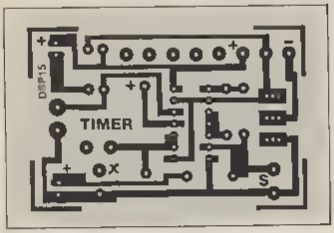


Figure II The PCB (full size)

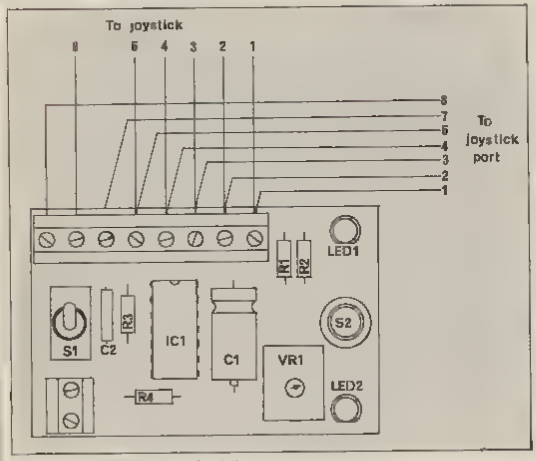


Figure III Component layout for de luxe version

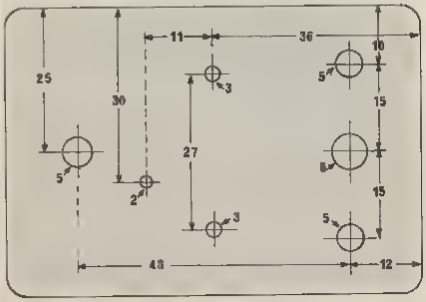


Figure IV The position of the holes in the case top

◄ *From Page 53*

link points b and c on the PCB. Because the joystick stops working when time is up you don't strictly need the LEDs or buzzer but they make the gadget friendlier to use

Buy a ready drilled PCB from RH Design or etch your own using the pattern given in Figure II Holes for S2 should be 2mm diameter while those for VR1 and the terminal blocks are 1.1mm

S1 requires rectangular slots for its pins so drill three 1.1mm holes at the positions marked in pads a b and c then remove the material between them using a craft knife

A 3mm hole is needed at the point marked X so that you can adjust VR1 from the back of the PCB when it is fixed into its case All other holes should be 0.8mm

Component layout for the de-luxe version is shown in Figure III If you don't require a pulsing light or buzzer leave out R3 LED2 C2 and the two pin terminal block. R2 and LED1 are also optional, but it's best to retain them unless cost is of paramount importance And you can dispense with the terminal blocks if you don't mind soldering wires directly to the PCB tracks

The board is designed to fit into a Verobox type 301, which is about the cheapest case you can buy Figure IV shows how to drill the case top and you will also need holes in the long sides for entry and exit of the extension lead These can be made by pressing a hot 4mm knitting needle downwards on to the case edge until the melted slot is just deep enough to take the joystick cable

Assembly is easiest if you do things in the following order First solder the resistors, capacitors and IC socket, taking care that C1 goes the right way round Next solder S1 in position, ensuring that it is vertical in both dimensions then slot the LEDs and S2 into place but don't solder them yet The LEDs must be fitted with their cathodes (flat section on the case) towards the bottom of the PCB, as shown in Figure III

Now offer the entire assembly into the case, making sure S1 and S2 locate properly in their fixing holes Don't worry about the LEDs at this stage Fix S1 and S2 firmly to the case using the nuts provided, then turn the whole assembly over and solder S2

Feed the LEDs into their 5mm holes pushing them through from the back until they project about 3mm, and solder them in place Then remove the

assembled PCB and fix the buzzer in position running its leads through the 2mm hole

Finally insert IC1 into its socket – making sure it's the right way round – connect the buzzer and joystick wires and assemble everything into the case

Plug the gadget into either joystick port and experiment with VR1 until you get a time delay that suits you, then screw on the case lid

Your timer will operate consistently and accurately every time you push the button

PARTS REQUIRED

		Maplin Code
R1	100k brown/black/yellow	M100K
R2	270 ohm red/violet/brown	M270R *
R3	1 megohm brown/black/green	M1M *
R4	270 ohm red/violet/brown	M270R
VR1	4 7 meg horizontal preset	UH11M
C1	100 mfd 10v axial	FB48C
C2	0 22 mfd polyester layer	WW45Y *
IC1	74AC00 quad NAND gate	UH67X
	14 pin DIL socket	BL18U *
LED1 2	5mm red LED	WL27E *
S1	SPDT centre off switch	FH01B *
S2	Push-to-make switch	FH59P
	6v 15mA buzzer	FL39N *
	8 way terminal block	RK38R *
	2 way terminal block	FT38R *
	Verobox type 301	LL12N *

** These components are optional – see text*

All components available from Maplin Electronic Supplies PO Box 3 Rayleigh Essex, SS6 2BR

Ready drilled PCB and joystick extension lead available from RH Design 137 Stonefall Avenue Harrogate North Yorks Tel 0423 880520 Prices including VAT and postage

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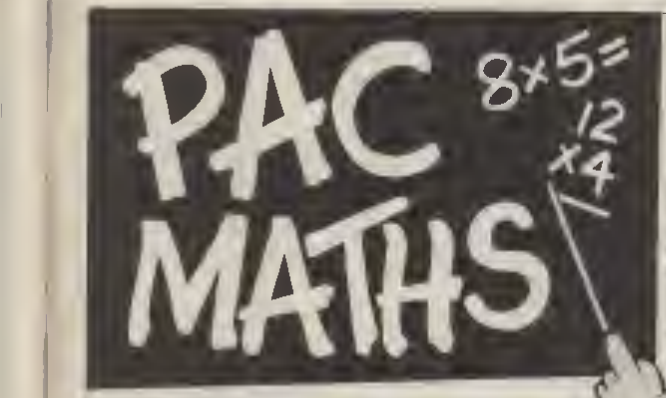
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PAC MATHS





GARY TINSLEY presents a maths tables game that's both educational and fun

RECENTLY someone asked me if I would write a program for them that would test children on their multiplication tables, but at the same time be fun to play

After a few hours of brain ache I presented them with Pac-matha which as you may have guessed is based on the very popular arcade game of Pac man complete with the hungry Pac man and the chasing Ghost When the program is run there is a short pause while a new character set is defined You are then asked for the number of the multiplication table that you are to be tested on (answer from 2 to 82)

You are then asked for the speed level and you reply between 1 for the fastest level and 5 for the slowest The speed is how fast the Ghost will chase the Pac man If you delay in answering the question

The child is then presented with the first of 12 random questions He must select the correct answer from a choice of three possible answers given on the screen by choosing A B or C If the correct answer is chosen the Pac man will advance one place towards the Powerpill and if he reaches it the Ghost will turn blue with fright and the Pac man will eat him

If the child chooses the wrong answer the Ghost moves one place towards the Pac man and if he reaches the Pac man he will get his own back and eat him instead

VARIABLES

DL	Start address of display list
L,L1	Loops
CH	Location of new character set POKE 756 CH
CHB	RAMTOP where the new character set will be placed
SPEED	How fast the Ghost will chase the Pac man
PACMANX	X position across the screen of the Pac man
GHOSTX	X position across the screen of the Ghost
MULT	The multiplication table to be tested on
MULTNUM	The number to multiply MULT by
R	Random answer position 1=A 2=B and 3=C
RA1,RA2	Random answers for the other two positions
GL	Actual game input loop
WW	Contains the Atascii value of the answer entered by the child
D	Data variable
CHSET$	Contains the machine code to move rom character set in to ram
ANSWERED	Array containing 1 if question is answered correctly or 0 if it is answered wrongly or has not been asked yet

```
10 REM PAC-MATHS BY
20 REM GARY TINSLEY
30 REM (C)1987 A.C.U.
40 REM
50 REM SETUP NEW DISPLAY
60 GRAPHICS 17:DL=PEEK(560)+256*PEEK(5
61)+6:POKE DL,7:FOR L=1 TO 6:POKE D
L+L,4:NEXT L:POKE DL+2,2:POKE 87,0
70 REM SETUP VARIBLES + COLOURS
80 POKE 106,PEEK(106)-8:POKE 752,1:POK
E 82,0:POKE 708,10:POKE 710,132:DIM AN
SWERED(12):CHSET$(134)
90 CHB=PEEK(106):CH=CHB*256:MULT=0:M
M=0:W=0:SPEED=0:MULTNUM=0
100 REM DRAW GAME SCREEN
```

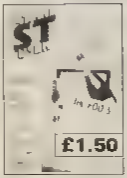
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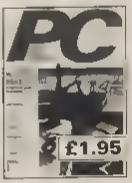












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```
110 POSITION 5,0 ? "PAC MAINS"
120 POSITION 2,14;? "        PLEASE WA
IT A MOMENT          " GOSUB 1000
130 FOR L=1 TO 12 OASMERGE@(L)=0 NEXT L
 PACMANX = 0 GHOSTX=0 POKE 711,54
140 FOR L=1 TO 13:POSITION 0,L;? "
                                  " N
EXT L
150 POSITION 5,0 ? "PAC-MAINS"
160 POSITION 4,1;? "wwwwwwwwwwwwwwww
wwwwwwwwwwwwwwww"
170 POSITION 19,2 ? "w"
180 POSITION 0,3 ? "    b b b b b b b
 b b b b b b b b b b  b"
190 POSITION 19,4 ? "w"
200 POSITION 4,5 ? "wwwwwwwwwwwwwwww
wwwwwwwwwwwwwwww"
210 POSITION 2,14 ? "(C)1982  GARY TIM
SLEY  &  ATARI USER" FOR L=1 TO 1000:N
EXT L
220 FOR L=1 TO 4:GOSUB 900:NEXT L:GOSU
B 750:GOSUB 750
230 FOR L=1 TO 500:NEXT L
240 REM  WHICH TABLE & LEVEL
250 POSITION 3,0 ? "Which X table"
260 INPUT 260 POSITION 6,9 ? "X=";
++++",I:PUT MULT IF MULT(2 OR MULT)83
 THEN GOTO 260
270 MULT=INT(MULT):POSITION I,0:? "Sle
ct level"
280 INPUT 280 POSITION 6,9:? "L=5     6
+++",I:PUT SPEED IF SPEED(1 OR SPEED)
5 THEN GOTO 270
290 REM  INSTRUCTIONS TO WHICH
300 POSITION 1,0 ? "Hit the PACMAN KE
 POSITION 3,9 ? "the POWER PILL"
310 FOR L=1 TO 8:POSITION 36,3 ? " " F
OR L1=1 TO 50:SOUND 0,100,10,6:NEXT L1
320 POSITION 36,3:? "a" FOR L1=1 TO 50
 :SOUND 0,80-10,6 NEXT L1 NEXT L:SOUND
 0,0,0,0
330 REM  ILL AN(MEMBER(0),CHOOSE QUEST
   PRINT QUEST & ANSWERS
340 FOR L=1 TO 12 OASMERGE@(L)=0 NEXT L
 GOSUB 900
350 REM  HAS QUEST. BEEN ASKED
360 MULTNUM=INT(RND(1)*12+1) IF OASMER
GE@(MULTNUM)=1 THEN 360
370 FOR L=6 TO 13 POSITION 0,L;? "
                                  "; N
EXT L
380 OASMERGE@(MULTNUM)=1
390 REM  CHOOSE RANDOM ANSWERS & POSI
400 R=INT(ONE@(81)*4)+1
410 ON R-1 GOTO 420,430,440,450
420 IF R=1 THEN R=2:MULTNUM=MULT*R2+R1+
R1 R2=R1+R2
430 IF R=2 THEN R2=MULTNUM-MULT R1=R2-
R2 R2=R1+R1
440 IF R=3 THEN R3=MULTNUM-MULT R1=R3+
R2 R2=R3-R1
450 IF R1=R2 OR R1=R3 OR R2=R3 THEN GO
TO 410
460 IF R1(1 OR R2(1 OR R3(1 THEN GOTO
410
470 POSITION 0,12 ? "  ";R1,"  "
480 POSITION 0,12 ? "  ";R2,"  "
490 POSITION 15,12:? "  ";R3,"  "
500 POSITION 35,? ? "K",MULTNUM, IF MU
LTNUM<10 THEN ? "  ",MULTNUM
510 POSITION L,7:? "WHAT IS        ",M
ULT, IF MULT<10 THEN ? "  ";MULT
520 POSITION 5,0:? "          _____"
530 POSITION 1,9 ? MULTNUM," X ";MULT
" _  "
540 POSITION 25,9 ? "          _____"
550 REM  CHECK FOR KEYBOARD INPUT
560 POKE 764,255
570 FOR GC=1 TO SPEED*50
580 IF PEEK(764)<>255 THEN GOTO 610
590 NEXT GL
600 GOSUB 750:GOTO 560 REM  MOVE GHOST
 1
610 REM  IS INPUT CORRECT ?
620 OPEN #1,4,0,"K:" GET #1,RV:CLOSE #
1
630 IF RV<65 OR RV>67 THEN GOTO 580
640 IF RV=65 AND O=1 THEN POSITION 15,
9 ? A1 GOTO 730
650 IF RV=66 AND O=2 THEN POSITION 15,
9 ? A2 GOTO 730
660 IF RV=67 AND O=3 THEN POSITION 15,
9:? A3 GOTO 730
670 REM  WRONG ANSWER !!!!
680 FOR L=1 TO 5 POSITION 0,12 ? "WRO
NG, the answer          IS ",MULT*MUL
TNUM
690 FOR L1=1 TO 60:SOUND 0,L1,12,10 NE
XT L1
700 POSITION 0,12 ? "
                                  "
710 FOR L1=1 TO 20:SOUND 0,L1,12,10 NE
XT L1:SOUND 0,0,0,0 NEXT L:OASMERGE@(MU
LTNUM)=0 GOSUB 750:GOTO 380
720 REM  ANSWER CORRECT !!
730 FOR L=1 TO 1 POSITION 0,12 ? "
   Right !          " FOR L1=50 TO 1 STEP
 -1:SOUND 0,L1,10,10:NEXT L1
740 POSITION 0,12:? "
    " FOR L1=1 TO 50:NEXT L1:NEXT L:GO
SUB 900:GOTO 380
750 REM  MOVE GHOST 1 POSITION
760 GHOSTX=GHOSTX+1:SOUND 0,GHOSTX*5,1
0,10
770 POSITION GHOSTX,2 ? " MMM++++ 220
++++ 511" SOUND 0,16+GHOSTX*5+5,10,10:
FOR L=1 TO 10:NEXT L:SOUND 0,0,0,0
780 IF GHOSTX<>PACMANX-2 THEN RETURN
790 REM  GHOST REACHES PACMAN
800 FOR L=6 TO 13 POSITION 0,L ? "
                                  "; N
EXT L:PACMANX=PACMANX+2
810 POSITION 3,8 ? "the ghost has"
820 POSITION 3,9:? "got the PACMAN"
830 POSITION 5,11:? "GAME OVER"
840 FOR L=25 TO 150 STEP 4:SOUND 0,L,1
0,10:SOUND 1,L+2,10,10:POSITION PACMANX
,2:? "db4++gf++++,;"":FOR L1=1 TO 10:N
EXT L1:POSITION PACMANX,2 ? "(c++
+je++++k" FOR L1=1 TO 10:NEXT L1:NEXT
L
860 SOUND 0,0,0,0:SOUND 1,0,0,0
870 FOR L=1 TO 6:POSITION 5,11 ? "GAME
 OVER"
880 FOR L1=1 TO 100:NEXT L1:POSITION 5
,11:? "Game Over"
890 FOR L1=1 TO 100:NEXT L1:NEXT L:GOT
O 140
900 REM  MOVE PACMAN ONE POSITION
910 PACMANX=PACMANX+1:POSITION PACMANX
,2 ? " c++++++ fx1+++++ ;,k"
920 FOR L1=1 TO 20:SOUND 0,L1,12,10:NE
XT L1:SOUND 0,0,0,0
930 PACMANX=PACMANX+1:POSITION PACMANX
,2 ? " c++++++ +gh4++++ ;,k":FOR L1=1
 TO 20:NEXT L1:IF PACMANX()34 THEN RET
URN
940 REM  PACMAN REACHES POWER PILL
950 FOR L=6 TO 13:POSITION 0,L ? "
                                  "; N
EXT L
960 POSITION 2,8 ? "the Pacman has"::PO
SITION 3,9:? "reached  the"
970 POSITION 3,10:? "power pill !"
980 POSITION 3,12 ? "HELL  DONE !"
990 FOR L=1 TO 3:FOR L1=100 TO 50 STEP
 -2:SOUND 0,L1+RND(0)*10,10,10:SOUND 1
,L1,10,10:NEXT L1
1000 FOR L1=50 TO 100 STEP 2:SOUND 0,L
1+RND(0)*10,10,10:SOUND 1,L1,10,10:NEX
T L1:NEXT L:SOUND 0,0,0,0
1010 SOUND 1,0,0,0:POKE 711,150
1020 FOR L=PACMANX TO 16+GHOSTX+3 STEP
 -1
1030 POSITION L,2 ? "cde 4++++fxI 4+++
+;,k "
1040 FOR L1=1 TO 20:SOUND 0,L1,12,10:N
EXT L1:SOUND 0,0,0,0:NEXT L
1050 FOR L=75 TO 150 STEP 4:SOUND 0,L,
12,10:SOUND 1,L+2,12,10:POSITION GHOST
X+1,2 ? "  5I+++MM++00" FOR L1=1 TO 10
1060 NEXT L1:POSITION GHOSTX+1,2 ? "  5
4++MM+++M" FOR L1=1 TO 10:NEXT L1:NEX
T L
1070 SOUND 0,0,0,0:POSITION GHOSTX+1,2
 ? "  4++  4++  4++" FOR L=1 TO 1000:N
EXT L:GOTO 130
1080 REM  NEW CHARACTER SET
1090 CHSET$="[illegible]":CHBAS=PEEK(
756):CHBAS=CHBAS*256:FOR L=0 TO 1023:P
OKE CHBAS+L,PEEK(57344+L):NEXT L:POKE
 756,CHBAS:RETURN
1110 DATA 20,85,69,81,69,81,85,20
1120 DATA 0,0,16,36,24,24,0,0
1130 DATA 0,0,0,0,0,2,2,10
1140 DATA 0,0,0,168,168,170,170,170
1150 DATA 0,0,0,0,0,0,0,128
1160 DATA 10,42,42,42,42,42,42,42
1170 DATA 170,170,170,170,128,160,160,
170
```

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```
1100 DATA 128,160,160 160,0,0,0,0
1110 DATA 16,10,2,2,0 0,0 0
1200 DATA 170 170 170 170,160 160 0,0
1210 DATA 128 128 0 0,0,0,0,0
1220 DATA 128,160,160,160,160 160,160,
160
1230 DATA 0 0 3,15,63 63,60,60
1240 DATA 0,252,255,255,255,255,124 12
4
1250 DATA 0 0 0 192,240,240,112,112
1260 DATA 60 63,63,63 63 63 63 61
1270 DATA 125 255 255,255,255,255 255
221
1280 DATA 112 240 240 240 240 240 240
240
1290 DATA 63,63,63,63,63,63,51,51
1300 DATA 119,255,255,255,255,255,51,5
1
1310 DATA 240 240 240,240,240,240,48,4
0
1320 DATA 51,51,51,51,51,51,51,51
1330 DATA 0,255,255,0,0,255,255,0
1340 DATA 170,170,170,170,170,170,170
170
1350 DATA 0 255,255,3,3 243,243 51
1360 DATA 51,243,243,3,3,255,255,0
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	8592	20	8881	30	8981
40	871	50	11886	60	10734
70	10092	80	10892	90	11522
100	10523	110	5553	120	10781
130	12630	140	10786	150	5873
160	17381	170	3723	180	10477
190	3731	200	17395	210	13958
220	9408	230	3901	240	12688
250	12311	260	17564	270	16896
280	16754	290	13874	300	12879
310	12988	320	14259	330	31746
340	8558	350	13415	360	10836
370	10721	380	4127	390	10823
400	3049	410	11584	420	4018
430	8634	440	8868	450	6922
460	4228	470	5	480	5311
490	5642	500	11957	510	12479
520	5418	530	7414	540	5401
550	15898	560	2121	570	3821
580	5431	590	1569	600	11377
610	12347	620	6049	630	5651
640	9214	650	9221	660	9228
670	41216	680	22776	690	7886
700	6913	710	16898	720	11532
730	172B4	740	14445	750	13071
760	7588	770	23902	780	7957
790	131=7	800	14536	810	12722
820	12781	830	9525	840	18833
850	14831	860	4715	870	11292
880	13858	890	7211	900	14078
910	13847	920	4939	930	22147
940	18311	950	18721	960	13597
970	5380	980	5324	990	15574
1000	17816	1010	4383	1020	6666
1030	7249	1040	18681	1050	21424
1060	17556	1070	14575	1080	11404
1090	23326	1100	14575	1110	4535
1120	3887	1130	3235	1140	6749
1150	5393	1160	6418	1170	5505
1180	6370	1190	3395	1200	5016
1210	3911	1220	5545	1230	3943
1240	5474	1250	4580	1260	4485
1270	5625	1280	5583	1290	6485
1300	5486	1310	5416	1320	6432
1330	6425	1340	5548	1350	6895
				1360	6878

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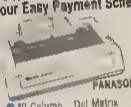
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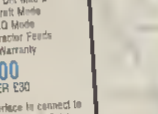
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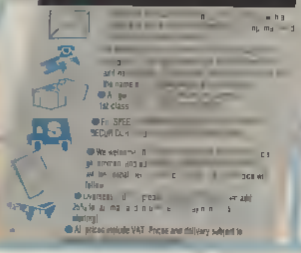
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