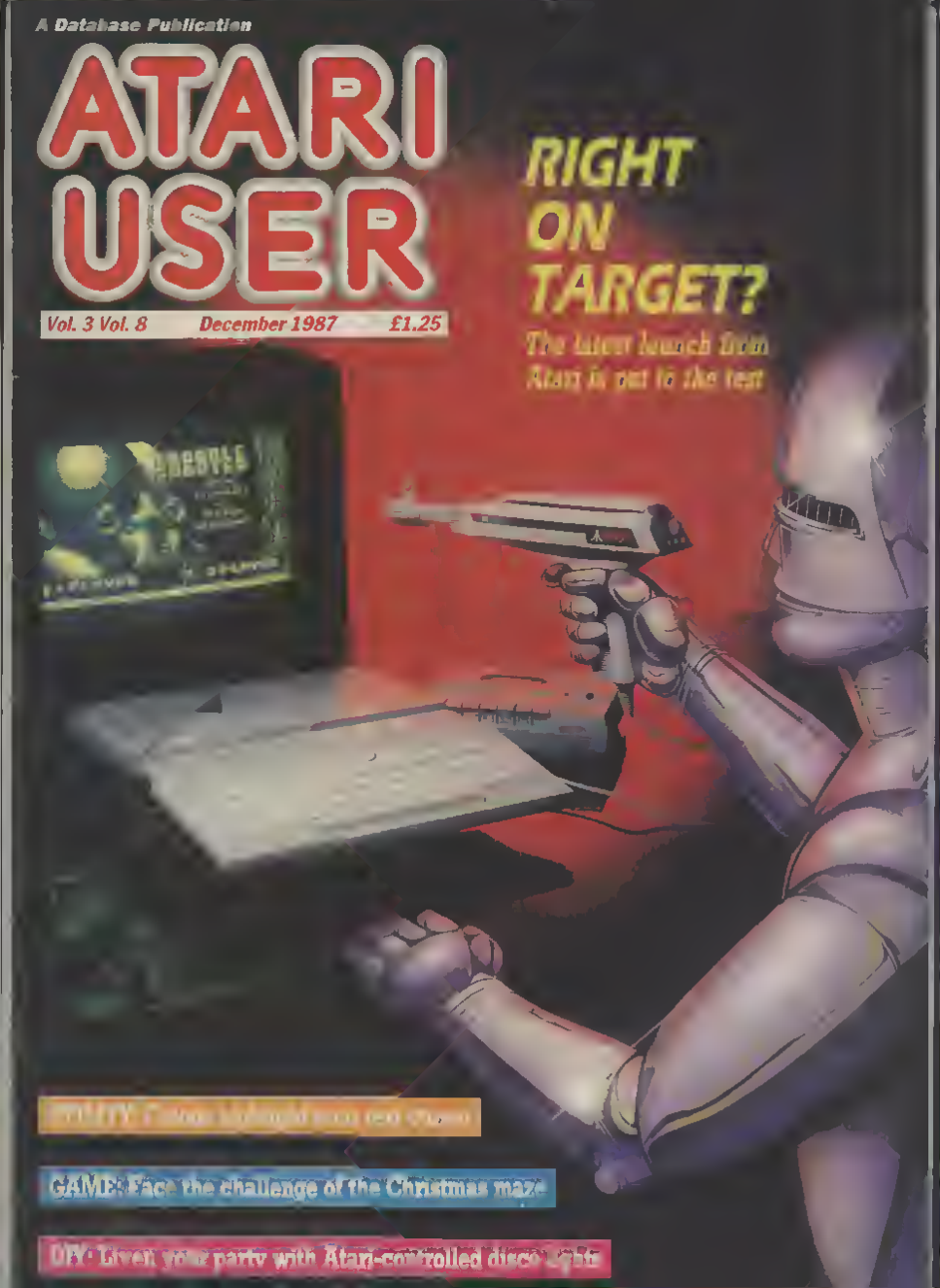
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The machine code secrets behind last month's superb utility

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The huge potential of Archimedes doesn't stop there. The 310M with its built-in PC emulator can run Lotus 1-2-3* DBASE III* MS WORD* and other popular business programs available under MS-DOS*.

With prices starting at £749 exc VAT for the 305 with mono monitor and rising to £1035 exc VAT for the 310M with colour monitor the Archimedes 300 series represents unparalleled value for a computer system of such capability.

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Atari in top gear at Motor Fair

ATARI UK caused a big stir at the MotorFair in Olympia by setting up a computer games stand

Centrepiece of the stand which embarrassed show organisers admitted was the best visited in the whole exhibition, was a line of racing cars inside which youngsters could play Pole Position

An Atari spokesman said 'We believe that many of the 300,000 people who go to the show are fathers with children under 10. We saw this as a perfect opportunity to introduce our games system to these youngsters many of whom might never have seen them before

"The organisers said we had one of the most exciting exhibits it became virtually an entertainment area for the youngsters

"We believe the introduction of the new games machine this Christmas has opened up a new market place to us. The youngsters of that market place certainly responded enthusiastically at this show', said the spokesman

£1.3 million deal brings big Email expansion

A MASSIVE expansion of MicroLink Britain's fastest-growing electronic mail service, is now being planned following the completion of a £1.3 million contract with Telecom Gold.

MicroLink – which has a section specifically for Atari users – was launched in April 1985 as a means of encouraging people to start exploring the exciting new world of electronic communications.

It became an instant success – and not only in Britain. Computer users in Europe, the Middle East and Australasia call the MicroLink service, which is housed on a Prime 750 computer in Telecom Gold's top security London head.

As part of the new deal, the service is being transferred to a machine that is four times more powerful – the Prime 9955.

The phenomenal development of MicroLink has meant that we have now outgrown the computer that has served us so well in the last two and half years' said MicroLink chairman Derek Meakin.

The new machine will give us much greater flexibility. It will allow us to provide a much faster service, introduce a variable charging structure to meet the different needs of our users and make possible the installation of many new and exciting facilities."



Pictured after signing the £1.3 million deal are Telecom Gold general manager Clem Jones (seated left) and head of MicroLink Derek Meakin. Looking on, from left, are MicroLink sales and marketing manager Mike Heyes, Telecom Gold sales and marketing head Philip Madden, MicroLink joint managing director Michael Meakin, MicroLink marketing director Peter Bramald, Telecom Gold northern sales manager David Bromley and Micro Link systems manager Tim Clarkson.

Parallel interface for Ataris

A LEADING supplier is aiming to make Atari 8 bit users fall in love with its new internal add-on.

The Computer House Universal Parallel Interface Device – or Cupid – will cost £39.95 and could open up the 8 bit machine to the world.

A series of handlers will be produced by Computer House (01 731 1276) to enable the interface to work with modems, printers and Midi, using a standard 25-way D socket. With a rom support system, the interface will be fully programmable.

Cupid is just one of a number of products on the cards as Computer House steps up its support for the 8 bit range.

A Help menu will be on offer which allows the user to put all the instructions about a program in a form which can be pulled up by a single keystroke.

CH boss John May said the company was importing a growing selection of software from the US.

A 130XE high resolution designer is on the cards which will work very well with CH's Snapshot.

Also to be released is Word Magic which John May describes as a word processor with built in graphics. It will cost £17.99.

Software developers rapped

ATARI 8 bit micro users are being given a raw deal by some software developers according to Essex based retailer Clive Pulman.

His firm Trybridge has sold computer software for more than four years and Pulman says he has had particular difficulty getting a regular supply of new titles for Atari 8 bit machines.

'The amount of new programs coming available is pathetic' said Pulman. 'The machines have so much potential it is a pity that software houses are not picking up on them the way they should.

Pulman says that although Americans have about 2,000 Atari 8 bit programs to choose from Britain is limited to 'a few hundred – of which many are re-issues of old titles that don't fully utilise the machines' capabilities.

One major software house was quick to deny the situation is as grim as Pulman describes it. US Gold marketing and product manager Richard Tidsall told *Atari User*: "Currently we have 65 games available on licence from America which isn't bad for just one publisher.

'American buyers may have a greater choice, but what is suitable for them may not be suitable for us".

But there is good news for users – Atari UK is back in the software market itself with Twilight Zone and has another 20 rom cartridge games due for release.

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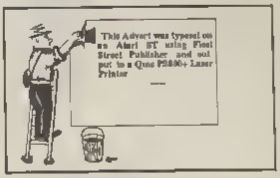


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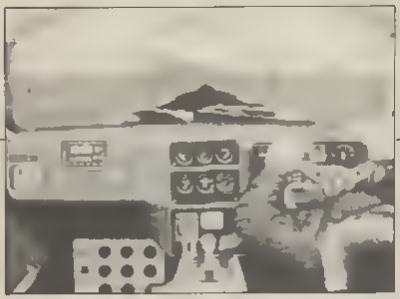
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Be a back seat driver

BACK seat driving takes on a new dimension in Speed Run, one of a series of Christmas releases from Red Rat

Unlike most racing games the player's point of view is behind an animated driver who turns corners and changes gear on command

Red Rat (061 835 1055) says it is the most ambitious motor driving game ever written for an 8 bit machine

The object is to complete the various stages of a motor rally in a Ford Sierra RS Cosworth with its five-speed gearbox

The company also has two double packs ready for release

In the first, Planet Attack is paired with Mad Jax. The former is a multi speed 3D scrolling shoot em up in which the player must guide a craft on a mission to destroy a series of outposts guarded by vicious aliens

Mad Jax gives a bird's eye view of an armoured tank which must negotiate a desert road and a city, taking on all opponents along the way

The second double pack features platform adventures Burglar Bill and Pot hole Panic

All Red Rat pre Christmas releases are being sold at £7.95 on cassette and £9.95 on disc

Colour-coded discs

A RANGE of 5.25in coloured discs for Atari computers has been announced by Centec.

The discs, which come in five colours, have been produced as a result of customer demand for an easier way to identify their date discs from program or back up discs.

John Taylor, managing director of Centec (0689 35353) told Atari User: 'Single colour discs have been causing problems for our customers. Now that they have a choice of colours it is possible for them to store data on red discs, back up discs on green and program discs on blue.

'With the addition of yellow and black it gives the customer greater flexibility in storage identification.'

DTP PACKAGE

A £20 desktop publishing package for Atari 8 bit machines is scheduled for release in the new year.

US software house XLent – now half owned by Software Express (021 328 3595) – has put together an disc Typesetter and Rubber Stamp.

Typesetter helps with page layout, while Rubber Stamp is essentially a font designer.

THE GALLUP CHART TOP 20 ATARI SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	1	OECATHLON *Firebird*	1.99
2	1	FEUD *Mastertronic*	1.99
3	2	180 *Mastertronic*	2.99
4	18	DIZZY DICE *Players*	1.99
5	1	GAUNTLET *US Gold*	9.95
6	•	MONKEY MAGIC *Alternative*	1.99
7	3	MILK RACE *Mastertronic*	2.99
8	4	ON CUE *Mastertronic*	2.99
9	•	HOVVER BOVVER *Mastertronic*	1.99
10	16	LEADERBOARD *US Gold*	9.95
11	9	STORM *Bulldog*	1.99
12	9	SILENT SERVICE *Microprose/US Gold*	9.95
13	•	ORUID *Firebird*	9.95
14	•	RED MAX *Code Masters*	1.99
15	14	BOULDER DASH II *First Star/Prism*	2.99
16	•	INVASION *Mastertronic*	1.99
17	•	FOUR GREAT GAMES *Micro Value*	3.99
18	•	FOOTBALL MANAGER *Addictive*	1.99
19	7	LIVING DAYLIGHTS *Domerk*	9.95
20	•	FOUR GREAT GAMES 2 *Micro Value*	3.99

Compiled by Gallup/Microscope

Decathlon retains the first position for another month, but there are eight new and re entries in the chart. The highest entry is the new Monkey Magic from Alternative. Watch out for Micro Value's two compilations which also enter the chart in time for Christmas.

Lost in your listings?

Colour your cursor with this superb utility from David Steele

HOW many times have you been editing a program on screen, then looked away for a minute, looked back and couldn't find the cursor? Well here s a program that tracks the normal cursor with a coloured player missile

It will help you find it in a screen full of text or you could even use the cursor to indicate an INPUT from the keyboard by chang ng its colour after each entry

The new cursor shows up particu larly well in reverse video strings, where it is often easily lost during editing It s visible on any Graphics 0 screen in Basic, Dos or Assembler, and w ll also appear in the text window It will remain even if you press Break or System Reset

There are two versions of the pro gram Program I creates an AUTORUN SYS file on any Dos disc while Program II creates an AUTOBOOT cassette Type in the pro gram you need and use the Get it Right III checksum to correct any typing errors

If you use disc save your program as a master, then Run it It will proceed to create a SYS file to disc which will boot into memory on power-up

Tape users should save a copy of the program as a master put a cassette in the recorder rewind it and press Record and Play together Run the program and when you hear two beeps press Return to save your autoboot version to tape When the program ends switch the computer off and rewind the cassette

Getting the coloured cursor is now just like boot ng a game Press Play hold down Start and switch on When you hear the beep press Return and after about 15 seconds the coloured cursor will appear Remember to stop the cassette

The cursor colour is initially set to orange/red but you can alter this in either program by changing the 240 – line 1050 of Program I line 1040 of Program II – to any number from 1 to 255 Some of the colours available are given in the panel below If you want to change the cursor colour once the program is loaded it is controlled by poking 705 with an even number from 0 to 254 For even better effects, try altering the text colours by poking 709 and 710

If you wish to use player missile graphics in your program, switch off the coloured cursor and when you have finished with them enter POKE 54279,4 POKE 53277,3 before switching them back on

The coloured cursor boots from disc or cassette into page 6 and the pro gram itself occupies the lower half of this area of memory The upper half is used as player 1 in double line resolution mode For machine code enthusiasts, Program III is the assembler source listing of the disc version Program IV shows the changes necessary for cassette booting

The program is protected against the Reset button and the Break key mesning that once installed the only way to totally disable it is to turn the power off If at any time you lose the colour of the cursor press Reset to bring it back

The cursor can be affected be poking directly into the code that controls it. Some useful ones are given in panel above

POKE	COLOUR
710,1	Black
710,54	Pink
710,64	Purple
710,94	White
710,164	Green
710,242	Red/Brown

Pokes to g ve d fferent colour to the cursor

Listing 1 – Program to create AUTORUN.SYS disc file.

```
10 REM COEDURER CURSOR
11 REM BY GLOBAL COMPUTER SERVICES
12 REM (c)ATARI USER
13 REM DISC AUTOBOOT
20 GRAPHICS 0 POSITION 9,11
30 ? "Setting up AUTORUN.SYS"
40 OPEN #1,8,0,"D:AUTORUN.SYS"
50 RESTORE 1000
60 READ D IF D<0 THEN 80
70 PUT #1,D GOTO 60
80 CLOSE #1
90 POSITION 15,13 ? "ALL DONE" END
100 REM ------------------------
1000 DATA 255,255,0,0,127,6,165
1010 DATA 12,141,22,6,165,13,141
1020 DATA 23,6,169,21,133,12,169
1030 DATA 6,133,13,76,24,6,32
1040 DATA 0,0 169,4,141,7,212
1050 DATA 169,3,141,29,208,169,240
1060 DATA 141,193,2,173,36,2,141
1070 DATA 126,6,173,37,2,141,127
1080 DATA 6,169,7,162,6,160,00
1090 DATA 76,92,228,216,169,0,168
1100 DATA 153,128,6,200,16,250,173
1110 DATA 240,2,208,50,169,46,141
1120 DATA 47,2,169,4,205,191,2
1130 DATA 240,6,186,87,208,34,240
1140 DATA 6,169,24,141,123,240,26
1150 DATA 26,101,84,10,10,168,162
1160 DATA 3,169,68,153,131,6,136
1170 DATA 202,16,249,165,85,10,10
1180 DATA 105,46,141,1,208,76,0
1190 DATA 0,224,2,225,2,0,6,-1
2000 REM - -- ----------------------
2010 REM The 240 in line 1050 is
2020 REM the initial cursor colour
```




```
10 CP1 (Y)   100 CUS (I)  1110 GJ5 (
11 CY5 (O)   1000 EE8 (L/  1120 ;JC (
12 CXC (X)   1010 EY3 (S)  1130 HHJ (
13 021 (O)   1020 F8M (M/  1140 HFA (
20 RUK (6)   1030 F8Q (3)  1150 GJA (
30 DOG (4)   1040 DPA (Y)  1160 FEW (
40 AF7 (2)   1050 P1Y (2)  1170 FK2 (
50 TCW (H)   1060 FJH (V)  1180 GWC (W
60 FWK (M)   1070 GW5 (5)  1190 EWO (A
70 4AM (F)   1080 FWK (6)  2000 CXP (G
80 LV4 (X)   1090 MY9 (K)  2010 DQP (4
90 8H1 (G)   1100 W2H (O)  2020 D2P (G/
```

POKE	ACTION
752,1	Cursor off
752,0	Cursor on
53277,0	Remove colour
53277,3	Restore colour

Pokes that affect the cursor

PROGRAM BREAKOOWN

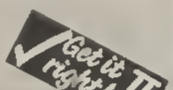
20 50	Set up screen and open file
60 70	Copy program data to file
80-90	Close file report all done

MACHINE COOE

470-690	Install coloured cursor into the disc or cassette init vector This protects against Reset
730-930	Define the player missile area and turn it on The cursor colour is set here but it can be changed at any time The position of the player is set during Vblank, so that routine is installed
970-1060	Erase the cursor from its current position
1080 1090	Check whether the coloured cursor is required
1110-1120	Force the player missile to appear, and also set double resolution mode This is done in every Vblank because a change of graphics mode will alter SDMCTL without warning
1170 1300	Test to see if a GR 0 screen, GR 0 text window or if no GR 0 screen showing at all Also decide the vertical position of the player-missile
1360-1560	Draw the cursor into the player, and position it horizontally This final exit is to any other Vblank code that may have been installed

Listing 11 Program to create AUTOBOOT cassette file

```
10 REM COLOURED CURSOR
11 REM BY GLOBAL COMPUTER SERVICES
12 REM (c)ATARI USER
13 REM CASSETTE AUTOBOOT
20 GRAPHICS 0 POSITION 9,11
30 ? " Setting up CASSETTE BOOT"
40 OPEN #1,8,128,C
50 RESTORE 1000
60 READ D IF D<0 THEN 80
70 PUT #1,D GOTO 60
80 CLOSE #1
90 POSITION 15,13 ? " ALL DONE ENJ
100 REM ---- ---- - -- -----
1000 DATA 0
1010 DATA 1,0,6,15,6,169,60
1020 DATA 141,2,211,24,56,169,4
1030 DATA 141,7,212,169,3,141,29
1040 DATA 208,169,240,141,193,2,173
1050 DATA 36,2,141,113,6,173,37
1060 DATA 2,141,114,6,169,7,162
1070 DATA 6,160,49,76,92,228,216
1080 DATA 169,0,168,133,128,6,200
1090 DATA 16,250,173,240,2,201,50
1100 DATA 169,44,141,47,2,169,4
1110 DATA 205,191,2,240,6,156,87
1120 DATA 208,36,240,6,169,24,166
1130 DATA 123,240,26,24,101,88,10
1140 DATA 10,168,162,3,169,80,153
1150 DATA 131,4,136,202,16,249,165
1160 DATA 85,10,10,105,66,141,1
1170 DATA 208,76, 1
2000 REM ---------- -------
2010 REM The 240 in line 1040 is
2020 REM the initial cursor colour
```




```
10 CP1 (Y)  100 CUS (F
11 CT1 (O)  1020 L1A (S)
12 CX1 (X)  1010 CVW (F)  1110 ENJ (P)
13 D21 (O)  1020 F2R (K)  1120 GUV (I)
20 NUK (G)  1030 F5E (C)  1130 FPS (J)
30 4HX (2)  1040 R25 (P)  1140 GVU (B)
40 3J3 (N)  1050 G0R (V)  1150 PGH (G)
50 TCW (7)  1060 FJB (3)  1160 FCS (O)
60 FWK (2)  1070 HDX (E)  1170 YHK (H)
70 4AM (S)  1080 HMV (6)  2000 CXP (N)
80 LV6 (W)  1090 GF4 (I)  2010 DOP (H)
90 EH1 (R)  1100 FJV (N)  2020 R2P (N)
```

Listing 12 MAC65 Source code

```
10 ;LIST#0  SOURCE LISTING
20 ;
30 ;  Coloured cursor for XL/XE
40 ;        DISK VERSION
50 ;
60 ;  By David Steele
70 ;  (c)ATARI USER
80 ;
90 ;
0100 ; This program will create an
0110 ; AUTORUN SYS file on a Dos
0120 ;    format disc
0130 ;
0140 ;
0150 ;
0160     OPT NO LIST
0170 ;
0180 ; BEGIN
0190 ;
0200 ; <This is a MAC65 source file>
0210 ;
0220 DOSINI   $0C
0230 ROWCRS = $54
0240 COLCRS = $55
0250 BUFADR   $57
0260 SWPFLG = $7B
0270 ;
0280 VVBLKD   $0224
0290 SDMCTL = $022F
0300 HOTSCR   $02BF
0310 PCOLR1 = $02C1
0320 RUNADR = $02E0
0330 CRSINH   $02F0
0340 ;
0350 HPOSP1 = $D001
0360 GRACTL = $D01D
0370 PMBASE   $D407
0380 ;
0390 SETVBV = $E45C
0400 ;
0410 ;----------
0420 ;
0430 PLAYER = $0400
0440 ;
0450     *   $0480
0460 ;
0470 ;Program runs here when loaded
0480 ;
0490 START
0500 ;
0510 ;Intercept DOS init vector to
0520 ;re-enable cursor after Reset
```

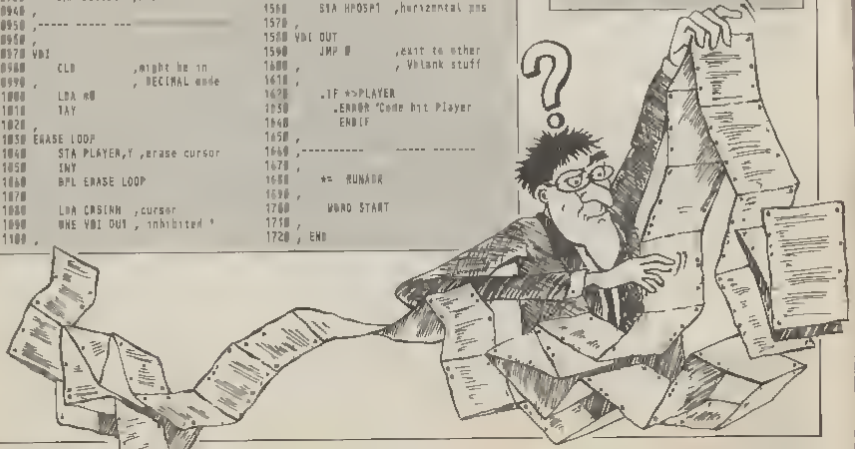
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```
0530 ,
0540     LDA DOSINI+0
0550     STA RESET+1
0560     LDA DOSINI+1
0570     STA RESET+2
0580 ,
0590     LDA # <RESET
0600     STA DOSINI+0
0610     LDA # >RESET
0620     STA DOSINI+1
0630 ,
0640     JMP INIT
0650 ,
0660 ;Comes here after Reset
0670 ,
0680 RESET
0690     JSR 0          ; old DOSINI
0700 ,
0710 ;---------  -  --
0720 ,
0730 INIT
0740     LDA #4
0750     STA PMBASE  ;player area  s
0760 ,              ;    page= 4  7
0770     LDA #3
0780     STA GRACTL   show p ayer
0790 ,
0800     LDA #$F0
0810     STA PCOLR1   cursor colour
0820 ,
0830 ;Player cursor will follow real
0840 ;cursor during deferred Vblank
0850 ,
0860     LDA VVBLKD+0 ,keep existing
0870     STA VBI OUT+1  Vblank stuff
0880     LDA VVBLKD+1
0890     STA VBI OUT+2
0900     LDA #7
0910     LDX # >VBI   ,install more
0920     LDY #  VBI
0930     JMP SETVBV   ,RTS
0940 ,
0950 ;----- ----- ---
0960 ,
0970 VBI
0980     CLD          ,might be in
0990 ,               ; DECIMAL mode
1000     LDA #0
1010     TAY
1020 ,
1030 ERASE LOOP
1040     STA PLAYER,Y ,erase cursor
1050     INY
1060     BPL ERASE LOOP
1070 ,
1080     LDA CRSINH   ,cursor
1090     BNE VBI OUT , inhibited ?
1100 ,
1110     LDA #$2E     ,enable playerm
1120     STA SDMCTL   , in single resm
1130 ,
1140 ;(any GR  alters SDMCTL so it
1150 , is constantly restored here)
1160 ,
1170     LDA #4
1180     CMP BOTSCR   ,4/24
1190     BEQ WINDOW   ,text window ?
1200 ,
1210     LDX DINDEX   ,full screen but
1220     BNE VBI.OUT , not GR 0 ?
1230 ,
1240     BEQ DRAW     ,always branch
1250 ,
1260 WINDOW
1270     LDA #24
1280 ,
1290     LDX SWPFLG   ,cursor in main
1300     BEQ VBI OUT , GR  screen ?
1310 ,
1320 ;Cursor is  n
1330 ; main GR 0 screen (A= 4)
1340 ; text window      (A=24)
1350 ;
1360 DRAW
1370     CLC
1380     ADC ROWCRS
1390     ASL A
1400     ASL A
1410     TAY          ;vertical pos
1420 ,
1430     LDX #3
1440     LDA #$3C     cursor data
1450 ,
1460 DRAW LOOP
1470     STA PLAYER+3,Y
1480     DEY
1490     DEX
1500     BPL DRAW LOOP
1510 ,
1520     LDA COLCRS
1530     ASL A
1540     ASL A        ,(CLC)
1550     ADC #46
1560     STA HPOSP1   ,horizontal pos
1570 ,
1580 VBI OUT
1590     JMP 0        ,exit to other
1600 ,               ; Vblank stuff
1610 ,
1620     .IF *>PLAYER
1630       .ERROR "Code bit Player
1640       .ENDIF
1650 ,
1660 ;----------    ----- -------
1670 ,
1680     *=  RUNADR
1690 ,
1700     WORD START
1710 ,
1720 ; END
```

Listing IV Modifications to listing III to create a cassette AUTORUN file

```
10 ,LIST"D PROGRAM3 LST
20 ;
30 ,  Coloured cursor for XL/XE
40 ,       CASSETTE VERSION
50 ,
51 ,*THESE PROGRAM LINES REPLACE THE*
52 ,*CORRESPONDING LINES IN PROGRAM2*
53 ,
0520 PACTL   $D302
0410 ;--  ----------------  --    ---
0420 ,
0430 PLAYER = $0600
0440 ,
0450     *=  $0480
0460 ,
0470 LOAD
0480 ,
0490  Header data for cassette boot
0500 ,
0510     .BYTE 0      ,unused
0520     .BYTE 1      ,# records
0530     .WORD LOAD   ,load addr
0540     .WORD INIT   ,init addr
0550 ,
0560 ;Boot continuation
0570 ,
0580     LDA #$3C     ,stop motor
0590     STA PACTL
0600     CLC          ,boot OK
0610     RTS
0620 ,
0630 ,
0640 ,
0650 ,
0660 ,
0670 ,
0680 , 0 5  nits here after boot
0690 ,           & on every Reset
0700 ,
0710 ;--------- --  - -------
```



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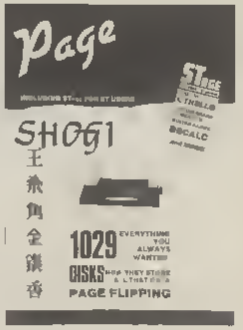
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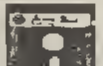
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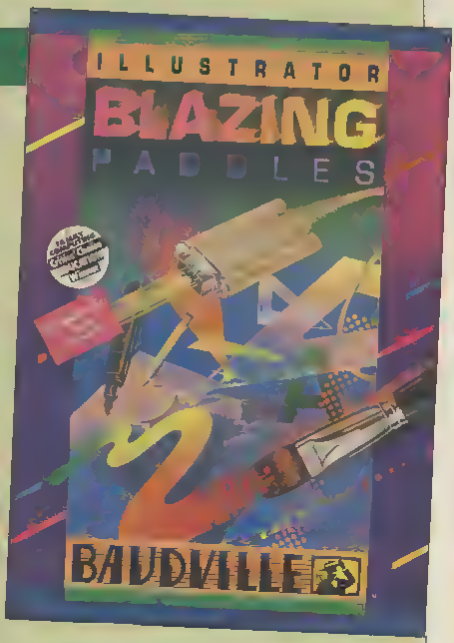
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OVER the last year there has been an increase in the amount of budget software available for the Atari micros

The popularity of these programs seems to have overshadowed the full capabilities of the micro so it was with interest that I viewed Blazing Paddles

This graphics package offers you more than 250 colours a range of pre drawn shapes stored on disc, three variations of text four different input drawing devices and an icon driven menu of commands

You load the program with Basic switched off and the first thing to appear is the Drawing Device menu This is where you choose your drawing tool – joystick paddles, touch tablet or trackball

I found the joystick easiest to use as the scrolling and medium pace takes you around the screen comfortably if a little jerkily

The Touch Tablet requires a Koala Pad – I tried to use my Atari Touch Tablet but as I moved the stylus up the crosshair cursor moved down As a result I stuck with the joystick option

Moving on to the drawing mode the menu icons are placed across the screen at the top and bottom This effectively leaves you with only half a screen for your drawing

Blazing Paddles has the usual range of drawing commands – Clear screen Text Lines Ovals Solid box Outline box Dots Spray can Fill and Zoom Attached to these are the pre drawn shapes and window features

The majority of commands are selected by placing the screen crosshair cursor on top of an icon and pressing the fire button Some of the commands speak for themselves but others will benefit from a brief explanation

Window is a visual cut and paste routine By dragging a dotted outline around a portion of the drawing you want to cut you can send it to a buffer

This allows you to move a chosen segment around the screen by simply picking the spot and hitting the fire button

Text can be selected in three sizes and each is double the height of the last with the smallest similar to the standard Atari character set

There are two additional styles – italic and bold But only one style at a time can reside in memory

Also on disc are three files containing various pre drawn shapes When first loaded the program defaults to a set of six shapes which includes buildings and vehicles

These can be moved using the cursor flipped from side to side and rotated in 60 degree increments before placing with the fire button There is also a file of more than 30 musical symbols ready for pasting

The Colour Selection menu displays 16 colours with up to 16 variations of shade in each You choose a colour by selecting a playfield register – 0 1 2 or 3 – then you must decide on a main colour and finally on a shade This procedure is a little time consuming

If you take advantage of the six pre set pattern boxes found at the base of the colour palette screen you can also mix two colours for the patterns These are a mixture of horizontal and vertical lines in a checker board design

The Spray command produces a stippled effect using a defined colour – although there doesn't seem any method of modifying the nozzle pattern

A more useful method of drawing is provided by the seven different painting brushes, and a mixture of these can give a very nice effect to your picture

The Fill option is linked to the colour spectrum and allows you to flood an area with a colour or pattern

Zoom works by splitting the screen in two The top half is a normal representation of the picture while the bottom shows an expanded view You can then carry out

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◀ From Page 13

close detail work on an larged area of the picture

It s essential that an art package allows you to save your creations and this one has a reasonable Load and Save feature – which allows you to process pictures or w ndows shapes and character sets

There are also facilities to view a disc directory erase a file and format a data disc – all the options you need are included

Each picture is stored as a 62 sector uncompacted file which is compatible with the Micropa ntar art pack

The windowing feature is handy for storing any size blocks of a picture By cutting a section from your drawing and storing it in the buffer you can move directly to the disc operations and save the block to d sc

This procedure also works in reverse so blocks can be cut from disc and pasted to the screen Probably one of the most useful features available is the Undo key, which will cancel your last command and revert to the original display

A Help f le that can be viewed at any time is also included on the disc but only gives very brief infor mation

There is one sample pic ture file and a useful Basic program with a short machine code routine to enable you to display p c tures from within your own programs

Printing your picture is all part of the fun of painting programs and Blazing Pad dles has drivers for Epson Gemin 10X Panasonic and Okidata

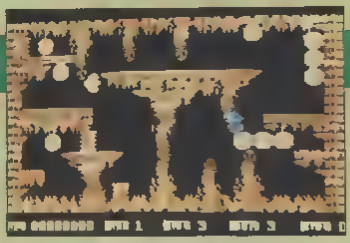
Unfortunately the 1029 dot matrix printer is not supported but as the pic ture file is saved in the 62 sector format you can always print it out by using the listing for the 1029 prin ter published in the July 87 issue of *Atari User*



Overall Blazing Paddles will be of limited use to experienced Atari users as only four colours can be dis played at any time and it doesn t have the range of commands that the Graphics Art Department bo[illegible] deal for exper[illegible] puter art is [illegible] introduct[illegible] superb fr[illegible] ages

Alan Goldsbro

Devilish fun



Program Little Devil
Price £9 95 (disc) £7 95 (cassette)
Supplier Red Rat Software 11 15 Fennel Street Man chester M4 3DU
Tel 061-835 1055

THE Little Devil in question is trapped in the very bowels of Hades

Now I had always thought that such a place would be the natural sort of habitat for devils of all sizes but for some reason Old Nick s protege wants out

To escape his eternal tor ment in this fiery furnace he must release the scores of lost and lonely souls suf fering down below Having done that he must rescue Lmarta the daughter of Earl Mordred

If successful he moves in to further realms taking him nearer to the Castle Despair where the fair Lmarta awaits rescue

The d m nutive demon materialises at the bottom corner of the screen and by jumping and dodg ng must collect the souls stuck in Limbo

Out to prevent him are a collection of ghastly ghouls ghosties and gremlins which defend their domain with diabolic devotion

He has the additional problem of lack of time – strange considering he is stuck in eternity

An indicat on of the time elapsed is shown on the souls of the unfortunates counting down from seven to zero and he will be hard pushed to clear a screen within one lifespan

Lucifer s demons jeal ously guard the lost souls Some home in on him while others wander around at random or follow set paths

Also floating around s an energy pill which gives your Bounding Beelzebub an extra life if you touch it You are able to gain extra lives a number of times on each screen

The power pill can occa sionally disable the grem lins and ghosties allowing them to be destroyed for a short per od of time – in much the same way as in Pac Man

The graphics are pleas antly drawn movement is smooth and game play rea sonably paced The sound effects are adequate which is more that I can say about the tune

I quite enjoyed what I saw of Little Devil although I only had a pre release copy and only the first level was available for inspection

Even on that rather lim ited basis I am sure this game will appeal to plat form addicts although bearing the music in mind perhaps with the proviso that they are tone deaf

Niels Reynolds

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

King-sized



Program Knight Orc
Price £14.95 (cassette and disc)
Supplier Rainbird Software First Floor 74 New Oxford Street London WC1A 1PS Tel 01 240 ####

KNIGHT Orc is Level 9's latest release under the Rainbird label and is a major step forward in adventure sophistication.

The game is large – so much so that it is split into three separate parts. Because it is so big there is no room left for graphics – for Atari 8 bit owners this version is text only.

In most adventures the role of the hero or heroine is normally taken over by the player. Not so in Knight Orc. True, you do play the main part but in this case the star is an ill-smelling, cowardly Orc by the name of Grindle Guts.

Orcs have been persecuted by adventurers for generations – is it possible that you now have a chance to get your own back?

The game starts in splendid style with you being challenged to a fight by a human knight. Only trouble is someone has tied you to your horse so you can't run away much as you'd like to.

Apparently your erstwhile Orc chums did this to you while you were intoxicated, volunteering you as their champion while you snored on.

Because you're a yellow streaked- somewhat rapeleint streak of Orcanity you'll be spending much of your time running away from potential duffings up. It seems at times as if the entire population has got a personal grudge against you.

And that's possibly one of the drawbacks with the game. Although a generous helping of personalities is to be desired in an adventure there are so many characters in Knight Orc (over 70 I believe) that at times you become a little bewildered by all the to-ing and fro-ing, fighting and fleeing.

The huge cast list includes such notables as Rapunzel the Green Knight, the Annihilator, Brunhilde, Green Sleeves, Jabberwock, Kris the Ant Warrior, Mrs Wallop, Synonym the Wizard and Professor Nutter. Not to be taken too seriously, you see.

Another unusual feature is that no mapping is required. You need simply state where you want to go (major locations are mentioned in the text), and the program will take you step by step along the appropriate route. Go run and find are the main commands for movement – you can also use them to locate objects which you have previously seen or misplaced.

Characters can be talked to, commanded, followed and even ambushed – the powerful parser allows you to carry out such interesting actions as: Wait for the innkeeper and attack him.

Simultaneous action is possible. For example, you can instruct a character to go off and find something. At the same time as that person is carrying out your instructions, you can continue with your own business.

Magic is also at work in Knight Orc. There are 21 spells to find and learn and they can be used in unexpected ways. In addition all is not as it first seems in this game.

Although the plot casts you in the role of an oppressed Orc whose prime objective in Part I is to stay alive long enough to collect enough lengths of rope to cross a bridge into Part II, once there the notion may slowly dawn on you that something very strange is going on.

There's a neat twist to this adventure but you'll have to discover it for yourself.

As well as a large cast list Knight Orc has a vast number of locations. Many are fairly predictable (a wide range of similar arboreal spots in Part I for example).

In this respect the game could have done with a bit of tightening up. Given the quantity of characters and locations the nature of your initial task and the arbitrary nature of the characters' appearances, Knight Orc has a somewhat unstructured and sprawling feel to it at the beginning. However, perseverance pays off – Parts II and III are better in this respect.

As well as detailed and stimulating text a powerful parser and a massive vocabulary the game also has the usual save and restore features including ram save and restore.

Knight Orc has its flaws, the too large cast list and the too frequent random appearances of the characters being chief among them.

But having said that the adventure has a lot to offer and is certainly one of the most sophisticated around.

On strict value for money terms you get a great deal of high quality material, entertainment and play for your cash.

Knight Orc can be a little frustrating and unsatisfying in its early stages but the game is so big and complex that if you persevere you'll be well pleased with this addition to your adventure collection.

Bob Chappell

Presentation	*8*
Atmosphere	*7*
Puzzlement	*8*
Value for money	*8*
Overall	*8*

COMING SOON...

To further augment your adventure library you should be on the look out for two new titles from Rainbird. They are offering the more adventurous of you Time and Magik and Jinxter.

Time and Magik is from the Level 9 team of Mike and Pete Austin. Indeed Level 9's heroine, Ingrid Bottomlow, will be making her adventuring debut any day now in her first role as the Gnome Ranger.

Plundered Hearts, and Nord and Bert Couldn't Make Head Nor Tail Of It, the two new Infocom titles, are also on the edge of release. Ruoloc is looking into them.

No jump for joy

Program Leapster
Price £9.95 (disc) £7.95 (cassette)
Supplier Red Rat Software
11 15 Fennel Street Manchester M4 3DU
Tel 061 835 1055

I HAD high hopes for Leapster as it loaded. The introductory screen was rather attractive and a nicely harmonised little tune was playing at a fair lick.

I pressed fire to start as instructed. I was greeted by a street scene a little naive in its rendition perheps but inoffensive enough.

The jaunty tune had slowed to a turgid drone and this was to get progressively more annoying as the game wore on.

Jimmy the Leapster was standing in the middle of the road on the way to school. Someone's mum hadn't taught him the Highway Code that's for sure.

He is apparently on his way to school to free his headmaster.

Anyway there he is under your control looking like some demented leprechaun, bowling down the street heading towards on rushing motor cars.

Looking at the houses you see various objects shown fleetingly at one of the four windows in which they may appear.

Jimmy must jump on to the cars riding them until next to a window with something in it and then leap at it to grab the object and be awarded points.

He needs to collect objects to progress to the next level.

As you have probably guessed, the level after the High Street is the Nuclear Missile Site. Most kids stroll through one on their way to school don't they?

After the missile site there is the Haunted Cemetery and then the school itself.

The pace is on the slow side and once the leaping or to car bonnet stunt is mastered there is little to offer a challenge.

I am afraid that I found the story line a little disjointed but maybe Red Rat will alter this in the production copy. The company has tried to make a dull game more [illegible] but I'm sorry to say that it doesn't work and I was left with the feeling that here was a game merely bashed out in time for Christmas.

Red Rat is capable of producing better than this.

Niels Reynolds

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

Don't nod off...

Program Nightmares
Price £9.95 (disc) £7.95 (cassette)
Supplier Red Rat Software
11 15 Fennel Street Manchester M4 3DU
Tel 061 835 1055

YAWN. It was two in the morning and I was feeling pretty drowsy. The disc drive whirred quietly and my eyes blurred. I'm not entirely sure what happened next but it was pretty weird.

I looked at my TV screen and there I was posing like some errant fairy godmother, with a lovely pair of golden wings flapping behind me.

Then things started happening. Blue Airflits started buzzing round me like wasps around a jam pot sapping my energy as they touched.

Fortunately my magic wand was loaded and I opened fire to try to persuade them to buzz off – but they kept on coming.

Things were to improve however as I slowly became accustomed to my surroundings. Somewhere deep in my subconscious I had the feeling that I must collect five little pink fairies in order to get into the next level of this strange experience.

Unaccustomed as I am to going round picking up fairies I nonetheless steeled myself and set off on my quest – although quite what the ultimate aim of it was I still didn't know.

Suddenly out of the ground emerged two Grunts. They were ugly beasts looking like giant eggs on legs.

These monsters spat globs of energy sucking venom at me and to make matters worse they were totally unaffected by my puny magic wand bolts.

Luckily I had noticed that every now and then the wand would shoot out a bomb which really cracked them up so some defence was at least possible.

This particular task was made more difficult by the fact that the Grunts would usually survive a direct hit. This was partly compensated by their falling to bombs dropping a short way ahead of them.

Having picked up the fairies and despatched sufficient Airflits and Grunts, I bolted for the doorway to the next level. Here I was confronted by enormous red dragons and long nosed flying sea horses which needed repeated shooting in order to kill them.

The [illegible] of the dragons wouldn't get me more often than not but I kept coming back for another go.

I woke up with a start. In front of me lay a pre-release copy of Nightmares a new title from Red Rat.

It was four in the morning and I was feeling pretty drowsy. The disc drive whirred quietly and my eyes blurred.

Paul Mills

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



Button up for the battle

GEORGE O'DONNELL takes a look at an alternative joystick

JOYSTICKS can cause endless problems – they don't move quickly enough and they also wear out rapidly. Star Trek is a small hand held pad which puts all possible stick-position and firebutton combinations on to individual keys to overcome these problems. So, for example, you can select "up-left" or 'up-left plus fire" with a single touch

It's not the first keypad to hit the market and some of the others have left a lot to be desired so I was initially sceptical about testing this one. However, after playing with it for an hour or two, I found myself getting hooked and wondering why no one has marketed anything quite like this before.

The first thing you notice is that the pad is easy and comfortable to use. It is equally suitable for left or right handed players and the buttons have a crisp, positive feel to them.

I expected that it would take an hour or two to get used to the key layout but in fact I was blasting away at full speed after only about 15 minutes – which was when I noticed how much it reduces wear and tear on the wrist and trigger finger.

The next thing that hits you is the pad's responsiveness. You know how tricky it can be to get Bounty Bob into precisely the right position before he jumps? Well it's a doddle with this controller – you can move him a couple of millimetres at a time, simply by touching the key briefly. Far more accurate and sensitive than a joystick.

The pad also eliminates a major bane of the arcade game player's life. Unreliable diagonal movement. Conventional sticks are prone to this problem because they contain only four switches: Up, down, left and right.

To get diagonal movement, two adjacent switches must be levered down simultaneously, and if you get the stick position slightly wrong, only one of the two gets pressed. The result is horizontal or vertical, rather than diagonal movement – very frustrating on games which give you limited space to manoeuvre.

With the Star-Trak pad this can't happen, since there is only one key to press for diagonal movement. An electronic decoder generates the correct signal, so you can't get it wrong.

Another useful feature is a central extra fire button which has three functions controlled by a slide switch. With this switch set to normal, a single touch on the central button produces a single shot which will always deliver, no matter how briefly you press the button.

Set the switch to Auto, and you get conventional auto fire which blasts away without your touching any key.

But there's also a centre position which gives you Burst action – press the button and you get auto fire, release it and firing stops.

Where this controller really scores, though, is on the latest generation of sports simulations – Karate and Olympics clones – which rapidly hammer joysticks to death and require complex position and/or fire button combinations.

It has now been extensively consumer tested – by me, my wife, two children and the cat – and with one furry exception, all participants managed to beat their previous high scores on several arcade games, so we're very happy with it.

The controller isn't perfect for every program, though. Conventional joysticks give a more authentic feel on flight and driving simulations, and one or two games involve rotating the joystick rapidly around its eight positions which is very tricky to do with Star Trak.

It's worth hanging on to your old joystick for games like these, but for many others, especially the latest generation, the new pad appears to have a definite edge. There are also two other things worth mentioning.

First, it comes complete with a three metre lead which plugs into the pad rather than being wired permanently in place. You can use this lead with conventional joysticks, or paddles, or anything else that plugs into a joystick port – including Len Golding's gadgets. Nice bonus, that.

Second, the pad is made entirely in this country and it is evident from the design and construction – yes, I took the back off – that it is built to last.

The switches are all genuine keyboard 'click' types – not a rubber membrane in sight – and the rest of the mechanism is solid-state, so there's very little to go wrong. In fact the manufacturers guarantee it for 12 months, which is a good measure of their confidence.

All this makes the price tag of £18.85 look quite reasonable – if it outlasts two joysticks, you've made a profit! And I can see these controllers turning up in a great many Chrstmas stockings this year.

Product Star Trak
Price £18.85
Supplier RH Design, 137 Stonefall Avenue, Harrogate, North Yorkshire HG2 7NS
Tel 0423 880520

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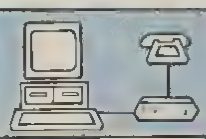
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ATUI2

SNOWBALL

By MATTHEW BERNSTEIN and CASPIAN PRINCE

HERE is a fascinating puzzle game where you take the part of Snowy, a small white snowball trapped inside an ice maze. You want to get outside to play in the snow, but to do this you must solve the secrets of the maze as you look for the solitary secret exit.

To move Snowy you can either use a joystick plugged into port one or the keyboard. The keys to use are Y for up, B for down, G left and H right. If you get stuck at anytime during the game press the spacebar to melt Snowy and start again.

As you roll around the maze you will notice that Santa has dropped some of his presents and you can pick them up. Each will allow you to traverse a different segment of the maze and may help or hinder you – but this is for you to figure out.

While you're empty-handed you leave a trail of snow behind you and this freezes creating an invisible barrier. Once you've picked up a present the trail becomes coloured.

Santa has also left these clues:

- Do you need all my presents?
- Think where you want to go.
- Some ice is melting.
- What colours are my presents?
- Merry Christmas!

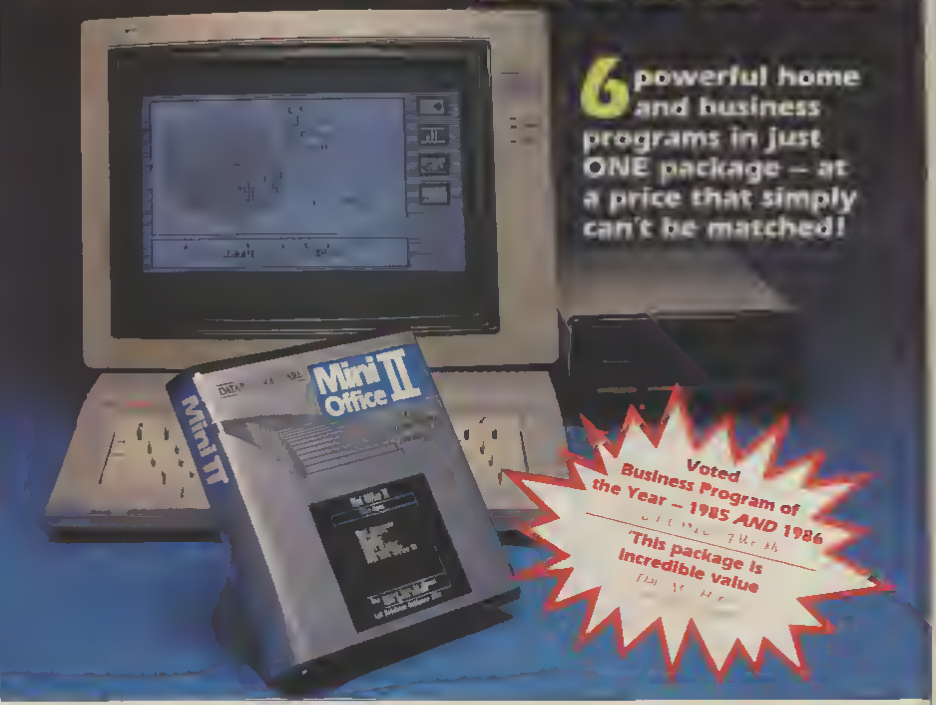
When you type in the program be sure to use Get it Right III to ensure that you have entered it correctly.

And don't forget to save a copy before you run it as the program uses DLIs which may crash the computer if you make an error.

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PROGRAM BREAKDOWN

90 – 140	Title
150 – 220	Character set redefined
230 – 280	DLI to flash title
290 – 580	Draw maze and presents
590 – 990	Main loop
1000 – 1210	Escape from the maze routine

VARIABLES

X, Y	Coordinates of snowball
XM, YM	Movement of the snowball
C, D, P	What the snowball is on
NO. OBJ	Presents the snowball has collected
SWF	Melting snow
CH	Type of snow trail
A, A$	Key input
DL	Display list pointer
RT, RM	Character set pointers

```
10 REM SNOWBALL
20 REM BY MATTHEW DEVONSHIRE
30 REM 600 CASPIAN POINTE
40 REM (C)ATARI USER
50 GRAPHICS 17 POKE 16,64 POKE 53774,6
4 POSITION 6,22 POKE 731,1 POKE 711,0
60 REM TITLE SCREEN
70 GOSUB 140 POKE 756,RT
80 ? #6;"▼▲▼▲▼▲" REM 100 CTRL-F,CTRL
-G,CTRL-H,CTRL-I,CTRL-J,CTRL-K,CTRL-L,
CTRL-L
90 FOR I=0 TO 15:SOUND 0,253,6,I SOUND
 1,0,0,I POKE 711,I FOR J=1 TO 20:NEXT
 J NEXT I
100 FOR I=15 TO 0 STEP -2 SOUND 0,253,
6,I SOUND 1,0,0,I:POKE 711,I FOR J=1 T
O 20:NEXT J NEXT I
110 POKE 559,0
120 GOTO 200
130 REM INSTALL THE SCREEN
140 POKE 559,0
150 REM DEFEFINE  MANA TER
160 REM  CHR FOR MEM SET?
170 DT PEEK(106) 0 GM=GM*256
180 DATA 0,0,0,0,0,0,0,0,0,192,60,126,
126,60,102,0,0,0,24,231,231,0,231,231,
0,16,100,100,0,100,108,100
190 DATA 0,102,60,126,126,60,102,0,0,6
0,122,126,126,126,60,0,0,0,127,192,204,
127,12,254,254
200 DATA 59,110,102,127,127,127,111,203,99
,62,127,127,115,115,127,127,62,99,107,
107,127,127,127,115,99
210 DATA 126,127,115,120,127,115,127,1
26,70,62,227,115,99,127,127,99,112,112
,112,112,112,112,127,127
220 FOR I=0 TO 10: DEBG 0*POKE GM+I,0*
NEXT I
230 REM SET UP A DLI
240 DATA 72,173,10,210,201,26,141,10,2
12,141,22,208,104,64
250 FOR I=1536 TO 1549:DEBG 0 POKE I,0
:NEXT I
260 DL=PEEK(560)+256*PEEK(561):POKE DL
+32,134:POKE 512,0:POKE 513,6 POKE 542
06,192:POKE 689,210
270 DE7000
280 POSITION 0,0
290 REM SPACE SCREEN
300 ? #6;"                    ";
310 ? #6;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀";
320 ? #6;"▌  ▌     ▗▄▖     ▐  ▌";
330 ? #6;"▌  ▌     ▜▛▘     ▐  ▌";
340 ? #6;"▌  ▌▗▄▖  ▐▌  ▗▄▖  ▐  ▌";
350 ? #6;"▌  ▌▜▛▘  ▐▌  ▜▛▘  ▐  ▌";
360 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
370 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
380 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
390 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
400 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
410 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
420 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
430 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
440 ? #6;"▌  ▌▐▌   ▐▌   ▐▌  ▐  ▌";
450 ? #6;"▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▟";
500 REM STORE 270 & 314 - CTRL-C
510 REM STORE 314 & 315 - CTRL-D
520 REM STORE 512 & 513 - CTRL-E
530 POKE 709,52 POKE 710,190 POKE 711,
134 POSITION 6,22
540 ? #6;"▼▲▼▲▼▲" REM INV CTRL-F,CTR
L-G,CTRL-H,CTRL-I,CTRL-J,CTRL-K,CTRL-L
,CTRL L
550 POKE 756,RT:POKE 708,0*POKE 559,34
560 FOR I=0 TO 15 SOUND 0,250,I,15-I P
OKE 708,I:FOR J=1 TO 10 NEXT J NEXT I
570 N=9 Y=1 C=7:D=0 SWF=0
580 OPEN #1,4,0,"K:" GIM 85(1) 0-7
590 REM MAIN LOOP
600 POKE 77,0 IF PEEK(764)<>255 THEN G
ET #3,A:OS=CHR$(A) GOTO 630
610 IF STICK(0)<>15 THEN A$="":GOTO 63
0
620 GOTO 600
630 IF A$="Y" OR STICK(0) 14 THEN YM=-
1*SM=0 GOTO 690
640 IF A$="N" OR STICK(0)=13 THEN YM=1
.SM=0 GOTO 690
650 IF A$="G" OR STICK(0) 11 THEN YM=0
:SM=-1*GOTO 690
660 IF A$="M" OR STICK(0)=7 THEN YM=0:
XM=1*GOTO 690
670 IF A$=" " THEN 900
680 GOTO 600
690 OC=0 LOCATE X+XM,Y+YM,P IF P=35 OR
 P=155 THEN 800
700 IF P=1 THEN O=1:GOTO 850
710 IF P=162 THEN O=2:GOTO 850
720 IF P=130 THEN O=3 GOTO 850
730 IF P=1 THEN O=4 GOTO 850
740 IF P=0 THEN O=5 GOTO 850
750 IF P=161 AND C=4 THEN O=6 GOTO 850
760 IF P=160 AND C=5 AND OBJ 6 AND SWF
 THEN 1020
770 IF P=240 THEN NO=1 GOTO 850
780 IF P=32 OR P=131 THEN NO 1 GOTO 85
0
790 IF P=1 AND OC=2 OR C=67 THEN NO=1
GOTO 850
800 IF P=129 AND C=1 THEN NO 1 GOTO 85
0
810 IF P=128 AND C=4 THEN NO=1 GOTO 85
0
820 IF P=36 AND C=6 THEN SWF=1 NO=1 GO
TO 850
830 IF P=161 AND C=5 THEN NO=1*GOTO 85
0
840 SOUND 0,0,4,8 SOUND 1,200,4,8*FOR
I=1 TO 60 NEXT I SOUND 0,0,0,0 SOUND 1
,0,0,0 GOTO 600
850 IF C=1 THEN CH=1 GOTO 920
860 IF C=2 THEN CH=161 GOTO 920
870 IF C=3 THEN CH=129 GOTO 920
880 IF C=4 THEN CH 1*GOTO 920
890 IF C=6 THEN CH=128 GOTO 920
900 IF C=5 THEN CH=161:GOTO 920
910 IF C=7 THEN CH=128 GOTO 920
920 FOR I=16 TO 0 STEP -2.5SOUND 0,0,0,
I NEXT I
930 POSITION X,Y ? #6;CHR$(CH) S=A+SM
 Y=Y+YM POSITION 0,Y ? #6;"Y" C=0
940 IF P=131 THEN OBJ=OBJ+1:FOR Z=255
TO 0 STEP -16 SOUND 0,I,10,6:NEXT I SO
UND 0,0,0,0
950 IF NO=9 THEN OBJ 09J+1 IF C<>5 THE
N FOR I 255 TO 0 STEP -16 SOUND 0,I,10
,6 NEXT I SOUND 0,0,0,0
960 IF ANO(0)<0 OR 9<0 THEN 600
970 SOUND 0,243,10,6 SOUND 1,121,10,6*
SOUND I,60,10,6 SOUND I I9,10,6 FOR I=
I TO 50 NEXT I
980 SOUND 0,0,0,0 SOUND 1,0,0,0 SOUND
I,0,0,0 SOUND I,0,0,0
990 GOTO 600
1000 REM INTELLIGENT HUMAN
```

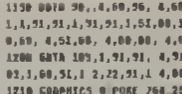
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```
1010 REM FINISHES THE GAME
1020 FOR I=15 TO 1 STEP -1
1030 FOR A=0 TO 255 STEP 10
1040 SOUND 0,P,4,1
1050 POKE 789,P:POKE 785,I*40:POKE 710
,I*12:POKE 711,I*20:NEXT P:NEXT I
1060 GRAPHICS 17:POSITION 6,8:POKE 711
,0:POKE 756,0:POKE 708,0
1070 ? #6;"WELL DONE!!!":REM INV CTRL-F CT
RL G,CTRL-H,CTRL I,CTRL J,CTRL K,CTRL
L,CTRL-L
1080 ? #6;" OH!? OH,":REM CTRL-M
1090 FOR J=0 TO 15:SOUND 0,255,6,I*SQU
RE 1,0,0,J:POKE 711,I:FOR J=1 TO 20:RE
XT J:NEXT I
1100 FOR I=15 TO 0 STEP -1:SOUND 0,255
,8,I*SQUARE 1,0,0,I:FOR J=1 TO 20:NEXT
J:NEXT I
1110 DL=PEEK(560)+256*PEEK(561):POKE 5
6206,64:POKE DL+6,114:FOR I=1536 TO 15
46:POKE I,PEEK(I+256):NEXT I
1120 DATA 72,169,224,141,10,212,141,9,
212,104,64
1130 POKE 512,0:POKE 513,0:POKE 54286,
192
1140 FOR I=0 TO 7:POKE 708,I:FOR J=0 T
O 10:NEXT J:POKE 709,I*21:FOR J=0 TO 1
0:NEXT J:NEXT I
```

```
1150 FOR I=1 TO 10:READ A0,A1,A2:SOUND
0,A0,10,8:SOUND 1,A0+1,10,8:SOUND 2,A1
,10,4:SOUND 3,A1+1,10,2
1160 FOR J=1 TO 2*20:NEXT J:SOUND 2,0,
0,0:SOUND 1,0,0,0:SOUND 2,A1,10,4:SOUN
D 3,A1+1,10,2:FOR J=1 TO 2*20:NEXT J
1170 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND
2,0,0,0:SOUND 3,0,0,0:NEXT I
1180 DATA 91,91,1,80,108,1,60,135,4,6
0,108,4,60,108,4,72,108,4,81,102,1,81
,102,1,81,102,1,80,58,1,60,96,4,53
```

```
1190 DATA 30,,4,60,96,4,60,96,4,72,9
1,1,91,91,1,91,91,1,91,91,1,53,80,4,5
0,60,4,51,80,4,80,80,4,60,102,1,81
1200 DATA 109,1,91,91,4,91,55,4,81,1
03,1,80,51,1,2,22,91,1,4,80,110,5
1210 GRAPHICS 0:POKE 764,255:END
```



10 CP1 (Y)	210 XG4 (F)	410 HPK (R)	610 75T (I)	810 ROH (E)
20 CP2 (S)	220 NK4 (X)	420 4JJ (P)	620 NMS (R)	830 GOM (P)
30 CP3 (A)	230 97I (K)	430 46L (4)	630 7GT (3)	840 L0L (P)
40 CP4 (4)	240 US0 (S)	440 4XH (9)	640 6XJ (U)	850 K77 (K)
50 NOT (0)	250 WKW (O)	450 4LP (U)	650 LR4 (G)	860 PTM (B)
60 CP6 (R)	260 8CA (P)	460 4QE (R)	660 UPC (I)	870 U4V (I)
70 4AX (N)	270 S26 (X)	470 4UF (S)	670 UXC (K)	880 83Y (P)
80 RPQ (J)	280 Y3H (T)	480 51E (R)	680 RWJ (F)	890 VF3 (U)	1090 7J1 (B)
90 C3H (E)	290 NYT (H)	490 5HC (S)	690 VF3 (U)	1100 78S (W)
100 P3K (Z)	300 40A (I)	500 CUW (L)	700 UFH (L)	1110 USV (K)
110 S8T (M)	310 874 (H)	510 CTW (S)	710 LR4 (G)	1120 747 (O)
120 8S7 (M)	320 45J (X)	520 83W (K)	720 LJA (A)	1130 4T3 (F)
130 47S (G)	330 8L9 (O)	530 3M5 (A)	730 M9F (W)	740 M3F (R)	1140 HW7 (G)
140 SMY (P)	340 47C (F)	540 0EK (A)	750 3J2 (G)	760 SWV (M)	1150 U4E (E)
150 9G5 (L)	350 4AN (M)	550 7SV (C)	770 RMJ (C)	780 SAF (K)	1160 913 (H)
160 0L5 (X)	360 W43 (T)	570 AG4 (E)	790 T3K (M)	800 CBV (H)	1170 UT4 (T)
170 RQ3 (P)	370 S4G (I)	580 ULK (K)	810 RSA (I)	820 RHG (E)	1180 A5M (J)
180 TYM (C)	380 C4K (J)	590 0YM (V)	830 4YX (U)	840 CXM (C)	1190 P01 (O)
190 84G (H)	390 59J (E)	600 GAC (X)	1200 XAA (P)
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ALAN GOLDSBRO expands his Atari's DTP capabilities with The Print Shop Companion



DESKTOP Publishing is all the rage now, but for many users it was the 8 bit Atari and Print Shop which gave them an insight into this field. Print Shop from Broderbund was made available in late 1985 and ever since then it's been the only usable Atari 8 bit program within the desktop publishing format.

Not to be outdone by its 16 bit cousins where this type of program is very popular, Broderbund has released The Print Shop Companion as the perfect partner for The Print Shop.

Like the Print Shop the Companion is easy to use, foolproof and a whole lot of fun. It expands the capabilities of Print Shop and adds a series of Editors, new Fonts, Borders and Icons. Even though you can use the Companion as a standalone program, to get the most from it you'll need to have The Print Shop.

To achieve true compatibility, the original Print Shop disc has to be modified by the Companion – this means updating selective files so it can recognise borders and fonts from the Companion, and the Companion copies the set up information from the Print Shop disc to the Companion disc.

Once this has been achieved the original blue background colour of the Print Shop should turn to black.

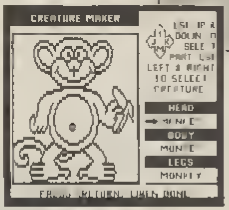
The Print Shop Companion is as easy to use as the original Print Shop and follows the same menu driven system. Working from the menu the first option is the Graphic Editor+. This has all the commands of the original editor – with one exception. The wraparound cursor.

The extra commands available make up for this though – four mirror modes, text, and numbers, insert/delete row/column, flip horizontal or vertical, negative (black) or positive (normal) line commands, rays, boxes and ovals. There is even a locking mode for drawing, plus 17 fill patterns, a flood fill and a very welcome undo key.

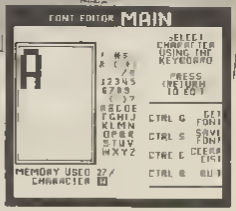
The best feature has to be the Super Impose key. Icons can be placed side by side or top to bottom on the one screen, then saved to disc as a complete icon – marvellous!



Main menu



Creature maker



Font editor menu

The best way to visualise this is when when working with the date format. There are 20 number graphics, 0 – 9 in both left and right positions and the four date endings – st, nd, rd and th. All can be superimposed and making a date such as 20th has never been so easy.

There are 50 new border selections to choose from on the Print Shop Companion disc and if you ever get tired of them you can always create your own with the Border editor.

The editing area consists of three edit boxes, representing the four corners, top and bottom, and the sides respectively. There are x and y coordinations to help you in placing the pixels in the grid. As you draw the border is displayed as a whole unit which gives you an overall view of how the completed unit will look.

You can copy any of the edit boxes to another one, but unfortunately this does not let you retrieve graphic icons and place them in the edit boxes.

There are a number of commands available such as Get, Save, Print, Clear and Look – these are standard features right the way through the Companion disc. Of the other commands, flip horizontal, vertical, or negative are as you would expect and the bottom and right sections of the border can be flipped to make a mirror image of the top and left sides of the border respectively.

The Companion's Font Editor lets you add your own personalised fonts, either by editing any of the 20 fonts from Print Shop and Companion or by designing your own. The creation of fonts is a complicated and time consuming process which can really test your dedication to computing!

If you wish to edit a font say to add a £ sign – because its an American

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program there's only the $ or perhaps a series of graphical characters instead of text, then load up an existing font and edit away

To create an entirely new font takes considerable patience and an understanding of how text is created in the first place – the best way is to use the built in reference font

This comes in three sizes Small, medium or large The larger the font the greater the memory used – a small font takes up about 27 per cent while a large font can use up to 90 per cent of file memory

Designing or creating fonts is difficult, but there are plenty of commands available to assist you Should you begin to master the font editor there is even a command to flip the font backwards

The Tile magic feature provides an array of 11 moving patterns very similar to the kaleidoscopes in the original Print Shop Unlike the kaleidoscopes though these can be saved to disc or passed directly to the Graphic Editor+ where you can add your own touches The tiles can be made to enhance backgrounds by flooding them together before superimposing text on your card and poster layouts

In similarity Creature Maker allows you to create original graphics by mixing and matching body parts There are 1000 possible combinations which can be saved to disc and like the tile magic passed instantly to the Graphic Editor+ for personalised touches

Print Shop Companion has an excellent calendar facility, creating either weekly or monthly calendars with Print Shop graphics and choice of fonts The calendar has a date range from 1753 to 9999 Graphics can be positioned across the top of the page in two sizes Text choices are from standard outlined or 3D and it can be placed in each day to highlight important events up to a 120 characters for each day in the weekly versions and 112 characters for the monthly one

Finally, not only can your designs be printed out but they can also be saved to disc and edited as and when required

There are a couple of mini features to Print Shop Companion which don't really fit a specific category For example there are 20 bonus graphics from Broderbund software characters and you have the opportunity to leave Print Shop Companion and load up the Print Shop disc without rebooting

Using Print Shop is tremendous fun and with the addition of Print Shop Companion, Broderbund has made an excellent package for the Atari 8 bit market. I feel the Tile magic and Creature maker are mainly for the kids – certainly they won't get used much by me – but on the other hand the calendar is brilliant, the Graphic Editor+ a wondrous improvement on the original and the border and font editors extremely welcome

If you've already got Print Shop then buying the compan on will be money well spent If you are without then there's a whole lot of exciting projects out there just waiting for you to try Your printer will never forgive you for missing it!

Product. The Print Shop Companion
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The USR function

LEN GOLDING concludes his look at this powerful command

LAST month we looked at USR in its simplest form: X=USR(ADDRESS) But you have probably come across listings which contain far more complex statements such as X=USR(ADDRESS,100,A,B*5) Let's look how extra numbers and variables like these can be used in your own programs

No matter how many things there are in the brackets, the first one is always the address of your machine code routine. It can be a real number, a variable name or an expression – such as ADR(A$) or 256*PEEK(106) – so long as its value is equal to the exact start address of your routine. All the other values in the brackets are called *parameters* or *arguments*.

As far as USR is concerned they are just ordinary numbers, not addresses or machine code instructions or anything else complicated. You can have up to 127 different parameters and each one can be a real number, a variable name or an expression, so long as its value does not exceed 65535.

The USR function automatically stores these parameters in a form that can easily be retrieved by your machine code routine. So you can use Basic to do calculations which machine code finds difficult – complex arithmetic, for example – then transmit the result to your machine code routine for action.

This simplifies the machine code programming enormously, so it's a worthwhile technique to master. Here's how it works.

The 6502 processor uses a special memory area known as the Stack – think of it as a long, vertical tube closed at the bottom end. Data can be pushed into it or pulled out of it one byte at a time, but you have access only to the one on top. If you wanted to retrieve, say, the third byte down, you would first have to remove the top two bytes.

Now the first thing USR does is to note its current position in the Basic program, so that it can return later and pushes this two byte address onto the stack, low byte first.

Next it takes the parameters in turn, reading from right to left, and converts each into a two byte integer. The parameter divided by 256 gives the high byte, and the whole number part of whatever remains is the low byte.

It pushes each of these two-byte values on to the stack, low byte first, and finally puts one more byte on top of the stack, to show how many parameters there were in the USR statement.

Let's look at some examples. Remember our simple colour change routine from last month? It changed the screen from blue to black when you typed X=USR(1536). By adding a parameter and modifying the machine code program slightly you can make the screen change to any colour you want.

Program I shows the new routine and Program II is the Basic translation.

The routine is called using X=USR(1536,C), where C is a number from 0 to 255 which will control the screen colour. On execution of this statement the stack will start off looking like this:

Top of Stack		
1		number of parameters
C	Hi	high byte of colour parameter (must=0)
C	Lo	low byte of 'colour parameter (0 to 255)
R	Hi	high byte of return address
R	Lo	low byte of return address

It is vital to remember that every parameter pushes two bytes on to the stack, even if it's only a one-byte number (less than 255), and that the number of parameters is pushed on to the top of the stack, even if that number is zero.

The machine code in program I starts with three PLA instructions. Each of these removes one byte from

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```
10 *=$600
20 PLA      Discard number of parame
            ters (=1)
30 PLA      Discard high byte of para
            meter (=0)
40 PLA      Low byte = required scree
            n colour
50 STA 710  Store it in the colour re
            gister
60 RTS      Return to Basic
```

Program I: Modified screen colour change routine

```
10 FOR X=0 TO 6 READ B:POKE 1536+X,B:N
EXT X
20 DATA 104,104,104,141,198,2,96
30 C=0:REM Desired screen colour, 0 t
o 255
40 X=USR(1536,C)
```

Get it right! II

```
10 NW6 (6)
20 JVE (7)
30 NHJ (K)
40 SNZ (C)
```

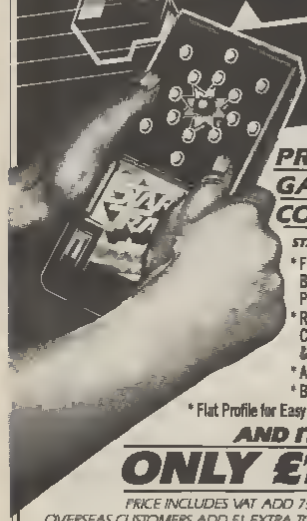
Program II: Basic loader for Program I

```
10 CBTMAZ=$228
20 CBTMV2=$21A
30 CHACT %2F3
40 *=$600
50 ;this routine is called by X=USR(1
536,SWITCH,RATE)  SWITCH controls the
 ON / OFF function, RATE controls th
e flash frequency  Neither number may
 exceed 255
70 SETVEC
80  PLA                    Number of
 parameters (-2)
90  PLA                    High byte
 of SWITCH (-0)
0100  PLA                  Low byte
of SWITCH
0110  STA CONTROL           - on or
 off command
0120  PLA                  High byte
 of RATE (-0)
0130  PLA                  Low byte
of RATE
0140  STA DELAY             - desired
 flash rate
0150  LDA #START%255        Tell the
computer where the
0160  STA CBTMA2            blink r
outine starts - it
0170  LDA #START/256        will JSR
through this address
0180  STA CBTMV2+1          when CBTM
V2 counts down to 0
0190 START
0200  LDA CONTROL           Flash rou
tine wanted?
0210  BNE BLINK             Branch if
 yes
0220  LDA #2                Else make
 sure cursor
0230  STA CHACT             is opaque
and retur
0240  RTS                   n to Basic
0250 BLINK
0260  LDA CHACT             Read cont
ents of 755
0270  EOR #2                Change fr
om 2 to 0
0280  STA CHACT
0290  LDA DELAY             Reset fla
sh rate every
0300  STA CBTMV2            time the
routine is called
0310  RTS                   Return to
 Basic
0320 CONTROL *=*+1
0330 DELAY *=*+1
```

Program III: Modified flashing cursor routine

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the top of the stack and puts it into the 6502 Accumulator. Line 20 removes the number of parameters byte, which is of no interest to us so we don't do anything with it.

Line 30 takes out the high byte of our parameter which in this particular case must be 0, since you can't store more than 255 in a colour register. So, again it is discarded.

The final PLA retrieves the parameter's low byte which is the true value of C, and line 50 stores it into colour register 2. The RTS instruction at line 60 pulls the two remaining bytes off the stack, converts them into a two byte address, and terminates the USR routine by jumping to that address in ram.

All being well, this will restore control to your Basic program at the statement immediately following the USR call.

Everything above the return address must be removed from the stack before the final RTS is executed, otherwise the computer will wander off into never never land and your program will crash.

That's why every USR routine must contain at least one PLA instruction – to remove the number of parameters byte – even if there are no parameters.

Programs III and IV are a bit more interesting. They are based on last month's flashing cursor routine. By using parameters you can gain control over the flash rate, and switch the routine on or off at will.

The variable *SWITCH* turns the routine off if it's zero or on if it's non zero, while *RATE* controls the flash frequency. Neither parameter may exceed 255, so at the start of this routine the stack will look like this:

```
      2 Number of parameters
SWITCH Hi High byte of SWITCH
       (must=0)
SWITCH Lo Low byte of SWITCH
  RATE Hi High byte of RATE
       (must=0)
  RATE Lo Low byte of RATE
     R Hi High byte of return
       address
     R Lo Low byte of return
       address
```

Notice in Program III how the parameters are pulled off the stack in turn, and used by the machine code routine.

Programs V and VI contain a simple routine for wiping a specified area of ram – useful when you're setting up player/missile graphics or page flipping. The example given clears four pages (1024 bytes) of ram starting at address 20000, but you can change the parameters to suit yourself.

```
10 FOR X=0 TO 46:READ D:POKE 1536+X,D
:NEXT X
20 DATA 104,104,104,141,47,6,104,104,1
41,48,6,169,21,141,68,2,169,6,141,41
30 DATA 2,173,47,6,208,6,169,2,141,243
,2,96,173,243,2,73,2,141,243,2
40 DATA 173,48,6,141,2h,2,96
50 SWITCH=1 REM Set flash routine ON (
0 means OFF)
60 RATE=8 REM Set flash frequency (0 t
o 255)
70 X=USR(1536,SWITCH,RATE)
```

Get it right! II

```
10 TSI (8)  | 50 UEL (D)
20 MBT (K)  | 60 UER (N)
30 EVS (G)  | 70 JLC (4)
40 HSL (E)  |
```

Program IV. Basic loader for Program III

In this example the parameter values exceed 255 so both bytes of the integer are relevant. If you can work out how the stack operates in this routine you've mastered the technique of parameter passing.

Having come this far, you will now want to write routines of your own and this involves translating machine language source code into Basic DATA statements.

Doing this by hand is tedious and error prone so as promised last month Program VII is designed to do all the hard work for you.

First write your source code and check that it assembles correctly. Next store it on disc or cassette in assembled form – this is the object code file. There's a bug in Atari's Assembler Editor cartridge which makes it difficult to assemble a program directly to cassette so assemble it to ram first then use SAVE #C to make the cassette file.

Disc systems do not have this problem: you can use ASM #D [filename] to create the object file in a single operation. Now go back into Basic, run

```
10 ;Call by X=USR(1536,A,N)
20 START=$CB
30 *=$6000
40 PLA                  Number of parameters
50 PLA                  High byte of A
60 STA START+1
70 PLA                  Low byte of A
80 STA START
90 PLA                  High byte of N (=
0100 STA SIZE+1         Number of pages)
0110 PLA                Low byte of N (=
0120 STA SIZE           remaining bytes)
0130 LDA #0
0140 TAY
0150 LDX SIZE+1         Branch if less th
an
0160 BNE REMAIN         1 page to erase
0170 LOOP
0180 DEY                Erase all complet
e pages
0190 STA (START),Y
0200 BNE LOOP
0210 INC START+1
0220 DEX
0230 BMI EXIT
0240 BNE LOOP
0250 REMAIN
0260 LDY SIZE           Erase remaining b
ytes
0270 BNE LOOP
0280 EXIT
0290 RTS                Return to Basic
0300 SIZE = *+2
```

Program V. Erase N bytes of ram starting at address A

```
10 FOR X=0 TO 40:READ D:POKE 1536+X,D:
NEXT X
20 DATA 104,104,133,204,104,133,205,10
4,141,42,6,104,141,41,6,169,0,168,174,
42
30 DATA 6,240,12,138,145,203,200,251,2
30,204,202,48,7,208,244,172,41,6,208,2
39,96
40 START=20000 REM Start of RAM area t
o be wiped
50 BYTES=1024 REM Number of bytes to c
lear
70 X=USR(1536,START,BYTES)
```

Get it right! II

```
10 ISF (A)  | 40 SAT (I)
20 T4D (S)  | 50 STA (E)
30 IMF (Y)  | 70 JYJ (7)
```

Program VI. Basic loader for Program V

Program VII and follow the instructions as they appear on the screen. Your source code will be turned into DATA statements, complete with line numbers, which you then store in LISTed form so that they can be merged into any Basic program.

Now you have mastered USR a whole new programming world is waiting. You can use system timers, write vertical blank interrupt routines, experiment with fine scrolling, customise parts of the operating system, talk directly to CIO, produce fast player/missile graphics and much much more.

In fact you've taken the first step along the road to becoming a fully fledged machine code programmer.

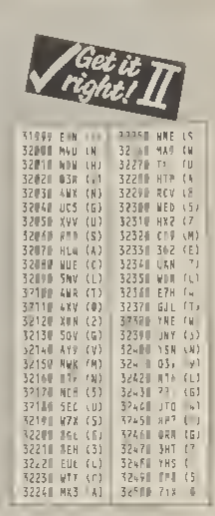
```
31999 REM PROGRAM 14: Converts object
'code files into DATA statements.
32000 DIM A$(1),B$(18),C$(8),N$(12)
32010 ? CHR$(125) ? 'Using disk or cas
sette? (D or C)':INPUT A$
32020 IF A$="C" THEN B$="t.' C$="casse
tte":B$="object file' GOTO 32070
32030 IF A$="D" THEN B$="D:":C$="disk"
:GOTO 32050
32040 GOTO 32010
32050 ? ? 'Input name of file ? 'con
taining object code'
32060 INPUT B$:N$(LEN(N$)+1)=B$
32070 ? ? 'Insert ';C$;' containing
';B$ ? 'and press START
```

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Program VII. Convert code into DATA

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```
32000 GOSUB 32470
32010 OPEN #1,4,0,"S
32100 GET #1,A GET #1,X
32110 GET #1,X GET #1,Y
32120 START X+256*Y :S=START
32130 GET #1,X GET #1,Y
32140 START=PEEK(186)-32 POKE 186,STAP
T GRAPHICS 0 :START=START+256
32150 ? CHR$(125) " START ADDRESS -
";S "
32160 TRAP 32190 X=0
32170 GET #1,A POKE START+X,A
32180 X=X+1 GOTO 32170
32190 CLOSE #1
32200 TRAP 32200 POKE 752,1 ? " NUMB
ER OF BYTES ";A EINISH-START+X-1
32210 POSITION 2,14 ? "Press START to
convert code into
32220 " DATA statements for use by Ba
sic
32230 GOSUB 32470
32240 TRAP 32240 ? CHR$(125)
32250 " At what line number do you wa
nt the " DATA statements to start?
32260 INPUT LINE LSTART-LINE " CHR$(12
5)
32270 BYTE=0
32280 " " " LINE, DATA ,
32290 " PEEK(START+BYTE),,,
32300 BYTE BYTE+1
32310 IF START+BYTE>FINISH THEN GOSUB
32490 GOTO 32350
32320 IF BYTE/80=INT(BYTE/80) THEN GOS
UB 32490 :LINE=LINE+10 " GOTO 32260
32330 IF BYTE/20=INT(BYTE/20) THEN " C
HR$(126) :LINE=LINE+10 GOTO 32280
32340 GOTO 32290
32350 " Data encoding finished at Lin
e ,LINE
32360 IF A$="" THEN A$ = DATAFILE TM
P
32370 ? " " 1 Insert new ,CAS, if ne
cessary
32380 " " 2 Press RETURN to create
the DATA file
32390 " " DATA statements recorded i
n this way
32400 " may then be merged with any e
xisting
32410 " program, using the command "
  ENTER ,CHR$(34),D$,CHR$(34)
32420 POKE 752,0 POSITION 2,20
32430 " LIST ,CHR$(34),D$ CHR$(34),
,,LSTART,,,LINE POSITION 2 18
32440 TRAP 32460
32450 END
32460 ? CHR$(125) " ERROR PEEK(195)
 GOTO 32370
32470 IE PEEK(53279)<>6 THEN 32470
32480 RETURN
32490 " CHR$(126) " CONV POSITION 2,
0 POKE 842,13 :STOP
32500 POKE 842,12 " CHR$(125) RETURN
```




```
31000 EAN ...  33350 WWE LS
32000 W4U LN   32 ... 4A9 CW
32010 NDW LHJ  32270 T... FU
32020 03R CWI  32280 HTP (A
32030 AWX (N)  32290 RCV LR
32040 UC5 (G)  32300 WED (5/
32050 XVV (U)  32310 HX2 (7
32060 FR0 (S)  32320 CN9 (M)
32070 HLW (A)  32330 362 (E)
32080 WUE (C)  32340 URN "J
32090 SNV (L)  32350 WOR (L)
32100 4WR (T)  32360 E7H (...
32110 4XV (O)  32370 GJL (T.
32120 XRN (Z)  32380 YNE (W
32130 SOV (G)  32390 JNY (3)
32140 AY9 (Y)  32400 Y5N (M)
32150 NWK (M)  32410 03, (9)
32160 0T9 (N)  32420 N7A (L)
32170 NC6 (S)  32430 ?? (G)
32180 SEC (U)  32440 JTO (W)
32190 W7X (S)  32450 AP7 (U)
32200 3GL (G)  32460 QRN (G)
32210 3EH (3)  32470 3HT (7
32220 EUC (L)  32480 YHS (
32230 WTY (C)  32490 IM8 (5
32240 MK3 (A)  32500 7IX  6
```


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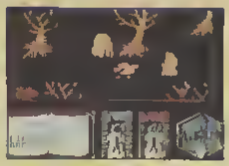
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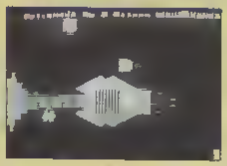
TO complete the game you must first go to the herb garden and try to collect as many herbs as you can before the gardener comes after you Then leave as fast as you can because your brother soon follows

Now go to the cauldron and mix the spells that are complete so you can use them against your brother – **William Gladwin, Doncaster, South Yorks**

Jet Boot Jack

WHILE playing this superb game from the English Software Company, if you are going across the slides and up the lifts push your joystick up then they will move faster Also play on the practice game as no monsters will appear to get in your way and annoy you – **Christopher Hussey, High Wycombe, Bucks**

Astromeda



THERE is a undocumented feature of the game If you stop your craft on top of the flashing area then your fuel will increase – **Kevin Campbell, West Lothian**

Atari Tennis

WHEN you are serving from the top of the screen in the one player game, always serve using a forehand as the opponent will have no chance of returning it – **Dinesh Bhudia, Harlesdon, London**

Alternate Reality

THERE are two healers and they work on alternate hours so, if a healer is out when you arrive wait until the next hour and try again It isn't worth fighting the brown mould as it only usually leaves you with a disease

There is nothing special about the clubs that you join, except that their prices are sky high The small green dragons and wraiths can be tricked, so you don't need to fight them

After using the healer his prices will increase so exit and walk back in again – **Granville Danby, Leeds**

Los Angeles Swat

ONCE you have fought your way to the crossroads you must fight off about four squads of men When the boss and the hostage appear, let them move on to the road When they are coming from the right just before the boss gets into your line of fire shoot and if you time it right and are very accurate, with luck you will kill him and miss the hostage – **Nigel Bowley, Hockley, Essex**

Pole Position



WHEN you start, keep the pause button pressed and this way your finishing time will be around 45 seconds – **Nicholas Atkins, Birstall, Leicester**

Scrolls of Abadon

PLUG a joystick into port two type POW and after the game has started you can then move the creatures To change men press fire – **David Baxter, Franny, Runcorn**

Krazy Kopter

HOVER above the platform on the right hand side of the screen This will protect you from being shot by the boat below If you are very accurate with your bombs you can get extra points by hitting the missile when it appears – **Nigel Bowley, Hockley, Essex**

Mercenary 2 – The Second City

HERE is a tip for getting into the programmer's special cheat rooms When you start board the Dominion Dart and fly to a height of over 350 metres then level out Press 9 and then keep > pressed until you reach a speed of around 1781 kph

Fire a bullet and as you fly close to it pick it up by pressing T Then fly back to location 08 08 and pick up the object that you started the game inside

At this point fly to any elevator – the one at location 08-01 is probably the easiest one to get to

Go underground and walk to the triangular door You don't get the usual 'locked' reply and you can walk straight in

You now have the key to every door and you can get into any hanger out of prison and amass millions of credits easily It will also be easy to find the Novadrive and the intergalactic starship and escape

Final quick tip In one of the complexes out in the wasteland is a room that is bright white inside If you walk around the room and along the walls after a while you will find the bar chart from the exchequers – **Paul Mylet- Woking, Surrey**

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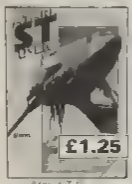


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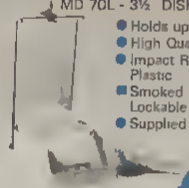
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Something old, something new . . .



NEIL FAWCETT takes a look at Atari's latest baby

IN nice time for Christmas, here s something new from Atari – the XE Games System With its low price it will be at the top of lots of present lists, so let s take a look at how it performs

This month we'll assess the new hardware next month we ll delve deeper and reveal how it compares with the rest of the 8 bit range

The first thing that hit me was the machine's new external design Atari has put a lot of thought into this and it has paid off The XE is very pleasing to the eye

Although there has been little change in the technical specification, both the overall design of the main board and the layout have changed

Atari is selling the XE games console in several forms (see panel on facing page) The three systems range from one that is only suitable for games up to one that can be used for any micro application and will even suit serious programmers

We'll take a look at the individual components so you can best choose which system is for you

The Game console

This is the heart of the system, and a rectangular case houses what I class as the best 8 bit technology on the market There is a serial port on the rear two joystick ports and sockets for cartridge keyboard and mains The DIN audio/video output socket found on earlier machines is replaced by two phono sockets

The parallel bus that featured on all XL micros has gone, and so has the expansion bus that appeared on the 130XE The cartridge socket, power switch Option, Start and Select switches are located on the top of the casing making them easy to access

The switches are coloured in pastel shades and add to the micro s overall looks

There's an extra bonus built into the console in the form of the old Atari Missile Command game a classic in its time The console also has a built in diagnostic test routine that will check the ram, rom, audio channels, screen display and keyboard switches

The console comes with 65 536 bytes of ram available to the user and an operating system of around 28k Contained within the OS is Basic, the game and a self test routine – not bad for a so-called games machine

Keyboard

A standard qwerty keyboard is supplied with the control graphics printed on the front of the keys as with the 130XE – this is designed to

save you time constantly referring to manuals

The keyboard has a lovely feel to it and I found typing at speed very easy Included is a Help key usually found with Start and Option on the 8-bit Ataris

It is detachable, so you can type in whatever position you find comfortable This adds a very professional feel to the system

If you POKE 756,204 you will be able to get an international character set if you use the control key in conjunction with key entries

XC12 Tape recorder

Atari tape units have with the exception of the very first 410 recorder been badly designed The XC12 is a vast improvement in a variety of ways

The power supply is now taken from the serial lead and most of the unit is of metal construction and so should last longer than the plastic keys and inserts on the older decks

The unit complements the system nicely, and will also match the 130XE When I plugged the tape deck into the back of my disc drive I had trouble loading tapes but when plugged directly into the console it performed perfectly

Light gun

The gun looks as though it has come straight out of a sci-fi movie and so should appeal to kids of all ages On a disc in the reviews package was a shoot-'em up game that uses the gun to plink at bugs on the screen and it worked fine at a fairly long range

At the moment there is doesn't seem to be any commercial software to take advantage of the gun However, it is easy to write your own because it works like a light pen

To get you started here is a short program to demonstrate the techniques used in reading the information sent from the gun to the micro

```
10 POKE 752,1 REM TURN OFF CURSOR
20 X=PEEK(564) Y=PEEK(565) REM READ X
AND Y COORDINATES OF GUN
30 PRINT CHR$(125) PRINT X ,X,Y  Y
  REM PRINT VALUES RETURNED
40 IF STICK(0) 15 THEN SOUND 1,64,6,11
  REM MAKE NOISE IT TRIGGER PRESSED
50 IF STICK(0)=14 THEN SOUND 1,0,0,0 R
EM SWITCH OFF NOISE IF NOT PRESSED
60 GOTO 20 REM REPEAT THE PROCESS
```

Joystick

The joystick supplied is a standard Atari design that dates back to VCS days While not being the best unit available it does its job and is fairly sturdy

When the system is powered up you are presented with the instantly recognisable blue screen with the message READY – Atari Basic is built into the console This means that all the listings from *Atari User* will work fine The loading and saving procedures for tape are the same as for the XL/XE micro

The system was fully compatible with all the commercial software packages I tried on it – and these ranged from Mini Office II to International Karate All the electronic add-ons tried also worked on the system, including an 850 interface box, Epson FX80 and Atari 1025 printers

The system will also support a disc drive – my old 810 and my new 1050 drives worked perfectly when loading games or Dos Atari is bringing out a new disc drive the XF 551 and hopefully its design will match the new console to give a very nice looking system

The console is controlled by a 6502 CPU and has the GTIA custom graphics chip and the POKEY custom sound chip both being custom chips dedicated to the Atari range

When these are combined you have at your fingertips some of the best 8 bit electronics to come off the drawing board in the last decade The computer still has the 6520 PIA chip, and so interlacing techniques are the same

Programmers have available to them a palette of 256 colours and with a minimum of effort all can be displayed at once There are 11 graphics and five text modes on offer

The graphic capabilities are superb and spectacular visual efects can be created using the DLI – Display List Interrupt

The POKEY sound chip allows you to control four channels independently with a frequency control ranging from 05Hz to 800Hz – so any sound effects created are quite stunning

Conclusions

The new design is superb, very sleek and smooth Picture quality via the TV output has been improved, giving a display that has lost the tendency to drift out of sync

Including disc software well over 2000 pieces of software will work on the new systems

- XE Computer Games Console

Includes 65XE, built-in Missile Command and joystick £79.95.

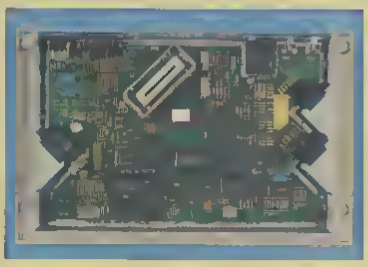
- XE Computer Games System

Includes 65XE keyboard light gun built-in Missile Command and joystick flight Simulator II and Bug Hunt games £119.99

- Starter Pack

Includes computing tutorial, 130XE XC12 cassette centipedes Star Raiders Missile Command and Atari Tennis cartridges £139.95

Heart of the new machine



His appetite whetted by our evaluation next month technical editor André Willey will take a detailed look at the fascinating technology behind the launch of the new machine

He will also assess how it compares with the rest of the 8 bit range and come to his own conclusions as to its future in the market

It's the Atari disco show!

LEN SOLDING makes time to brighten up the festive season

OUR offering for the party season is a programmable mains disco light controller. It can generate strobes, chasers, random flashes, pre-set sequences and many other instant atmosphere effects which cannot be matched by units available in the shops.

You can even set up your own sonet-lumière displays, switching from one lighting pattern to the next by a single touch on the keyboard.

Each channel can handle up to six 60 watt coloured reflector bulbs, so it's powerful enough for most clubs and school rooms, as well as for any home. And the design uses a special triggering system which eliminates radio interference so you can use it alongside your VHF tuner – unlike some commercial units.

Figure 1 shows the circuit. It's rather more complex than might at first seem necessary but this is because of the need to protect your micro from stray mains voltages and to minimise RF interference.

If you're into electronics you will probably see how most of it works without much difficulty. IC1 is used as buffer and amplify the tiny currents from the joystick port, making them powerful enough to drive four light emitting diodes in a quad opto-isolator.

Your micro can see only this section of the circuit – so far as it is concerned all the high voltage switching takes place in another universe.

To preserve the isolation we've powered the rest of the circuit from a small mains transformer (T1). This must be a centre-tapped type, with 6-0-6 volt output capable of delivering at least 50mA.

The outputs from the opto-isolators are fed to the inputs of a quad Nand gate (IC3). If pins 4 and 13 of the IC are high the input pattern is transferred to the four outputs, otherwise changes at the inputs have no effect.

TR1 [illegible] the mains AC [illegible] to negative voltage [illegible] 50 times a second, [illegible] zero volts on each swing. [illegible] downward cycle reaches [illegible] the collector of TR1 goes high.

This triggers a monostable [illegible] from IC2a and IC2b. Its output goes high for a few microseconds, enabling IC3 and allowing the input pattern to flow through to the outputs. When the monostable output returns to its low state IC3 becomes latched, so the outputs remain in their current pattern until the next zero-volt transition.

The combined action of TR1, IC2 and IC3 ensures that the disco lamps cannot switch on or off unless there is practically no voltage across them. This eliminates power surges and consequent RF interference. It also avoids the need for bulky and expensive suppression chokes and capacitors.

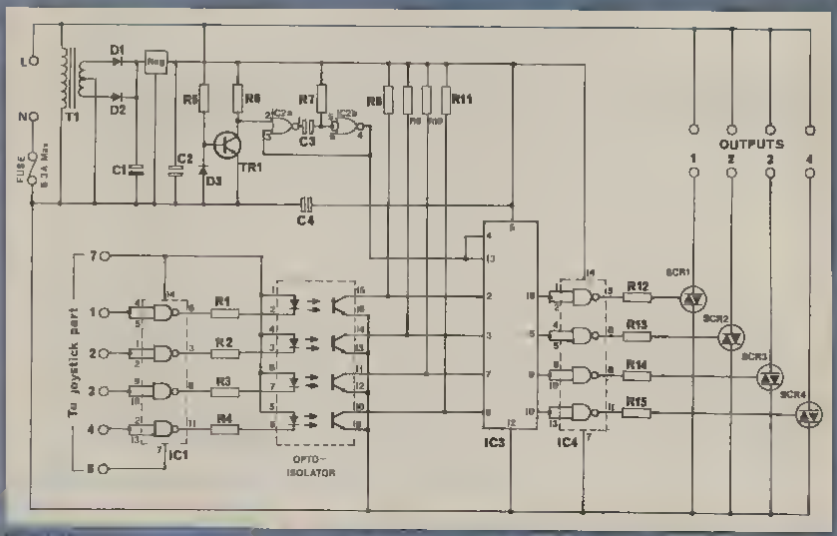
IC4 buffers the output signals from the [illegible] high, current can flow when it is low, current is blocked.

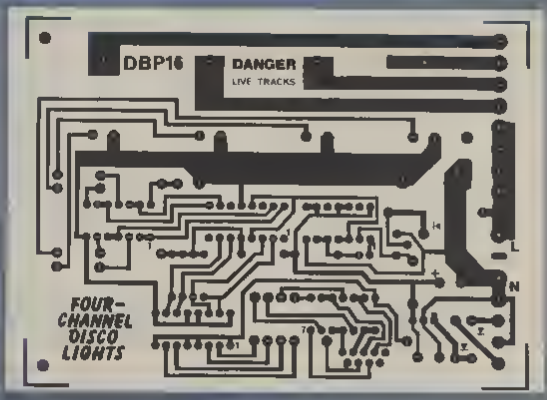
WARNING!

Once the mains supply is connected to the board, triac heat sinks and several other on-board components will become live and must not be touched!

Now on to the construction side of the article. The printed circuit board is available as always from RH Design who can also supply a ready built and tested module for you to connect up to the mains and mount in a suitable case.

Those of you who prefer to etch your own PCBs can use the pattern shown in Figure II. All holes are 1mm, [illegible]





TR1 will cable.

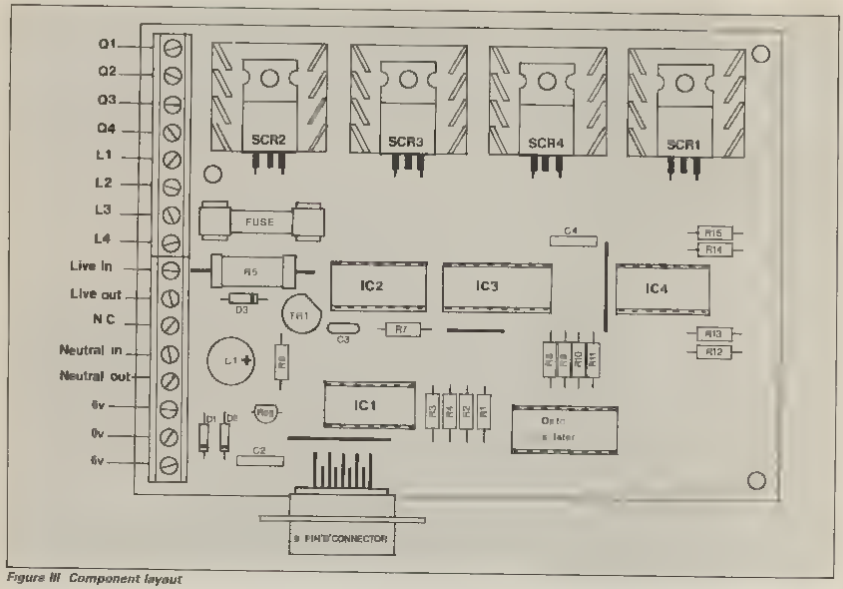


Figure III Component layout

◀ *From Page 35*

contact with the track

If you're planning to run only three or four lamps on each channel you can dispense with the heat sinks Otherwise, smear a little heat-sink compound on the back of each triac fit it to its heat sink and bolt the whole assembly tightly into place on the PCB

Use 6BA or 3mm bolts inserted from the reverse side otherwise there is a risk that the fixing nut will bridge across two tracks Do not solder the leads until you are satisfied that each triac is fitted correctly and that the heat sink vanes cannot touch each other

Now it's time to test the board, and for this you will need some kind of meter set to measure around 5V Start by inserting IC1 and connecting the joystick lead then plug into port 1 and run Program 1 Check each of IC1's outputs – pins 6, 3, 8 and 11 – they should all be high (about +5V)

Now type 1 and hit Return Pin 8 should fall low (0V), while the other three outputs remain high The same should occur for pins 3 8 and 11 when you type 2,4 and 8 respectively If these tests work correctly, it means that the first section is fully operational Now you need to power up the rest of the circuit.

The safest way of doing this is to connect a 9V battery to the terminal block, with its positive lead going to one of the points marked 6V, and its negative lead to 0V

Alternatively, wire your transformer to the mains via an external terminal block, and fit the secondaries to the PCB The specified transformer has three secondary wires Fit the two same coloured ones to the 6V points – it doesn't matter which way round they go – and the different one to 0V

Check that 5v appears at each IC

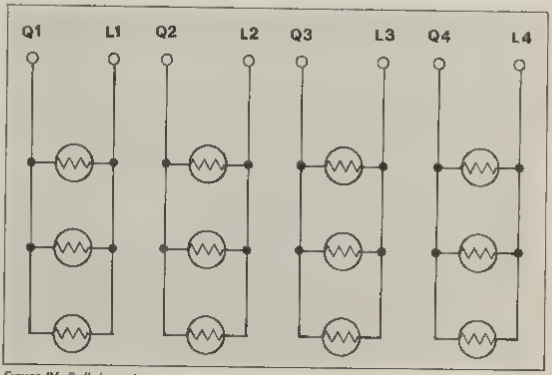


Figure IV Bulb layout

socket – pins 14 and 7 of IC2, 5 and 12 of IC3 and 14 and 7 of IC4. If not, you have probably inserted the voltage regulator incorrectly, or left out one of the wire links.

Insert the opto-isolator and repeat the 1, 2, 4, 8 testing sequence using Program 1, but this time check the inputs at the socket of IC4 (pins 2, 3, 7 and 6). They should go low in sequence.

Disconnect the power supply, insert IC3 and IC4, and reconnect the low voltage supply. Temporarily link pins 4 and 14 at the socket of IC2. This will unlatch IC3, so that section 3 can be tested.

Go through the 1, 2, 4, 8 sequence again, this time checking that the triac gates go high in the order 1, 2, 3,

WARNING!

Remember that potentially lethal mains voltages are involved so great care is needed in construction and testing!

4. If all is well, insert IC2 and attach a 60W or 100W mains lamp to each of the triac outputs, as shown in Figure III.

That's all that can be done without connecting the mains, but if everything is satisfactory so far there should be no further problems.

It's best to mount the board in some sort of case or enclosure – a cardboard box will do – to reduce the risk of touching live components while you're testing. And remember to unplug the unit from the mains before touching the board.

If everything has been wired correctly, the mains lamps should light in sequence when you type 1, 2, 4 and 8. You may like to wire a panel neon in parallel with each output, to act as a monitoring device. These can be wired to the eight-terminal block along with the lamp leads.

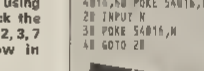
You will almost certainly want to design your own display, so there's little point in giving constructional details here. The prototype batten was made from square section plastic drainpipe which is very cheap and available from many builders merchants or DIY stores.

You might prefer to make up a number of smaller battens, say with four lamps each, so that they can be distributed around a large room. Whatever method you choose, all the lamps for each channel should be

Turn to Page 38 ▶

Program I Basic test program

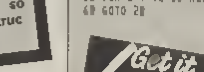
```
5 REM PROGRAM 1  TESL DISCO LIGHT UNIT
10 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
20 INPUT N
30 POKE 54016,N
40 GOTO 20
```




```
5 CAN (S)
10 CRP (Y)
20 PFF (B)
30 SBV (4)
40 KKK (9)
```

Program II Basic strobe program

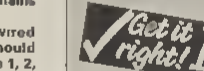
```
5 REM PROGRAM 2. SINGLE CHANNEL STROBE
10 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
20 POKE 54016,1 REM SWITCH CHANNEL 1 O
N
30 FOR W=1 TO 10 NEXT W:REM ON TIME
40 POKE 54016,0 REM SWITCH ALL CHANNEL
S OFF
50 FOR W=1 TO 50 NEXT W:REM OFF TIME
60 GOTO 20
```




```
5 CAN (S)
10 CRP (Y)
20 TYE (C)
30 MAF (4)
40 YYC (R)
50 NLQ (C)
60 KKM (4)
```

Program III Basic chaser program

```
5 REM PROGRAM 3  FOUR-CHANNEL CHASER
10 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
20 RESTORE 70
30 FOR CHAN=1 TO 4
40 READ D POKE 54016,D
50 FOR W=1 TO 100 NEXT W:REM SET SPEED
60 NEXT CHAN GOTO 20
70 DATA 1,2,4,8
```




```
5 CAN (S)
10 CRP (Y)
20 SYT (C)
30 JCY (U)
40 PMP (O)
50 KRS (2)
60 GU4 (E)
70 RKV (W)
```

Program IV Basic random flash with equal intervals program

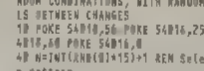
```
5 REM PROGRAM 4 - FLASHES LIGHTS IN RA
NDOM COMBINATIONS, WITH EQUAL INTERVAL
S BETWEEN CHANGES
10 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
20 SPEED=100 REM Controls the rate of
change (333 is approx 1 second)
30 N=INT(RND(0)*15)+1
40 POKE 54016,N
50 FOR W=0 TO SPEED NEXT W:GOTO 30
```




```
5 CAN (S)
10 CRP (Y)
20 SAD (F)
30 ACB (K)
40 SBW (5)
50 34H (R)
```

Program V Basic flash with random interval program

```
5 REM Program 5 - FLASHES LIGHTS IN RA
NDOM COMBINATIONS, WITH RANDOM INTERVA
LS BETWEEN CHANGES
10 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
40 N=INT(RND(0)*15)+1 REM Select Rando
m pattern
50 SPEED=INT(RND(0)*200) REM Select ra
ndom delay
60 POKE 54016,N
70 FOR W=0 TO SPEED NEXT W GOTO 40
```




```
5 CAN (S)
10 CPP (Y)
20 CRG (P,
30 SSY (*)
40 SHY (F)
70 34L (A)
```

Program VI Basic program to control flash from keyboard

```
10 REM Program 6 - Keyboard controlled
 sequencer. Press + to advance, -
to go back or ESC to start again
20 X=0 REM Load the DATA into Page 6
30 READ D IF D=-1 THEN 60
40 POKE 1536+X,D X=X+1 IF X>255 THEN ?
 "TOO MUCH DATA" END
50 GOTO 30
60 MAX=X-1
70 POKE 54018,56 POKE 54016,255 POKE 5
4018,60 POKE 54016,0
80 GRAPHICS 2
90 X=0
100 N=PEEK(1536+X)
110 POKE 54016,N
120 POSITION 0,2 ? #6;"CONTROL NUMBER
 ";N,
130 POSITION 0,5 ? #6;"SEQUENCE NUMBER
 ";X,
140 IF X=MAX THEN POSITION 0,7 ? #6;"(
LAST ONE)
150 IF X<MAX THEN POSITION 0,7 ? #6;"
          REM 12 SPACES
160 IF PEEK(764)=255 THEN 160
170 IF PEEK(764)=7 THEN X=X+1*(X<MAX)
GOTO 200
180 IF PEEK(764)=6 THEN X=X-1*(X>0) GO
TO 200
190 IF PEEK(764)=28 THEN X=0
200 POKE 764,255 GOTO 100
210 REM Each DATA item represents a pa
rticular combination of channels. Up t
o 255 may be programmed
220 DATA 0,1,5,3,12,7,2,14,4,15,8,-1
```




```
10 CP1 (Y)    90 B49 (D)    1E LOE (N)
20 DKL (E)   100 OBP (G)   170 UAZ (C)
30 PFF (I)   110 SBC (9)   140 KAJ (N)
40 RJG (V)   120 YPN (7)   190 TS5 (S)
50 KKM (J)   130 252 (A)   200 CND (S)
60 AUO (S)   140 66K (W)   210 CYT (8)
70 CRV (S)   150 VMM (K)   220 TAU (C)
80 UWS (V)
```

◀ From Page 37

wired in parallel, as shown in Figure IV

The lighting effects available are very easily programmed, and we have listed a few ideas to get you started Table I shows the numbers which must be POKEd into address 54016 to switch on any given combination of channels

Program II is a simple strobe, acting on one channel and Program III is a four-channel chaser Program IV flashes lights randomly at a constant rate, while Program V flashes them randomly at random rate Program VI shows how you can generate a pre-programmed pattern sequence

The unit can handle 500 watts per channel so long as the load is switched on and off every couple of seconds, and no more than two channels are on at the same time If the on period is likely to be longer than this, or all channels will be on simultaneously – however briefly – it's best to keep the total power drain to about 300 watts per channel

Number in 54016	PORT 1			
	Chan 1	Chan 2	Chan 3	Chan 4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Table I Output switching

	PORT 1				PORT 2			
Pin number	1	2	3	4	1	2	3	4
Control Number	1	2	4	8	16	32	64	128

Table II Switch control numbers

PARTS REQUIRED FOR 4-CHANNEL DISCO LIGHTS CONTROLLER

		Maplin Code
R1 R4	820 ohm (4 off)	M820R
R5	100K 1 Watt	C100K
R6	10k	M10K
R7	100K	M100K
R8-R11	4K7 (4 off)	M4K7
R12 R15	620 ohm (4 off)	M620R
C1	470 mfd 25v	FF16S
C2	0 1mfd miniature disc	YR75S
C3	1000 pf (1nf) ceramic	WX68Y
C4	0 01 mfd miniature disc	YR73Q
IC1 IC4	74AC00 (2 off)	UH67X
IC2	74HC02	UB01B
IC3	74LS75	YF32K
D1 D3	1N4004 (3 off)	QL76H
TR1	BC117	QB34M
SCR1 SCR4	C206D Triacs (4 off)	WQ24B
T1	6-0-6v transformer	WB00A
	Quad opto isolator	YY63T
	75L05AWC +5v regulator	QL26Q
	14-p n DIL sockets (3 off)	BL18U
	16 pin DIL sockets (2 off)	BL19V
	Right angle 9 pin D socket	FG25C
	8-way PCB block (2 off)	RK38R
	Fuse clips (2 off) *	WH49D
	6 3A anti surge fuse	RA13P
	Vaned heat sink (4 off) *	FL58N
1 pack	6BA x ¼" RH bolts	BF05R
1 pack	6BA nuts	BF18U
	Silicon grease *	HQ00A

All the above components are available from

Maplin Electronic Supplies P O Box 3 Rayleigh Essex SS6 8LR Tel 0702 552911

The printed circuit board (order code DBP16) at £4 65 and joystick extension lead (order code AT111) at £2 99 are available from

R H Design 137 Stonefall Avenue, Harrogate North Yorkshire HG2 7NS Tel 0423 508359

** These components may not be needed – see text*



Keystick

BRUCE WOODLAND provides a utility for a programmable interrupt driven joystick

WHEN you write programs it is often necessary to provide both cursor key and joystick options to widen their user appeal. If the micro could be fooled into interpreting a joystick input as a predesignated keypress the user would have the best of both worlds and you'd have less programming to do.

This utility allows you to ignore joy sticks as you write your program, but still make use of them in the final product. To do this first type in the listing, remembering to use Get it Right III and save a copy to disc or tape.

When the routine is run it will set up an interrupt driven machine code program residing in page 6. This new routine will constantly scan joystick port 1 and interpret all joystick movements as key inputs.

It accomplishes this by sampling input from the port, translating it into the required internal key code and writing this information to the keyboard register at regular intervals.

This sampling rate is normally matched to the keyboard auto repeat but if the fire button is pressed the time delay between the sampling is shortened. The routine has two modes of operation and you can toggle between them by pressing Option.

When the program is in memory and running you are presented with a menu of keyboard inputs against joy stick movements. At this point you are asked if you wish to accept the values as they are, or to enter new values.

The program will offer you all eight joystick movements and you enter the corresponding keyboard functions. The fire button is always linked to the spacebar.

At this time you are in the first of the two modes and this ties the Control key to all inputs from the joystick, allowing you on-screen editing features from the joystick.

To indicate that you are in the editing mode a flashing cursor is present and if the fire button is pressed the cursor will whizz around the screen. The second mode is without the link to Control and you simply get standard keyboard entry.

The machine code routine is not directly relocatable since a definite address must be inserted as a vector and the keyboard addressed by direct indexing methods. This means the routine is disabled by pressing Reset, but it can be re-implemented by

```
CALL=USR(1536)
```

If you find this utility useful you may wish to modify it as a non resettable AUTORUN.SYS file. The routine could then be stored above Dos and below LOMEM leaving page 6 free for other uses.

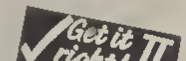
```
0 REM
1 REM ***KEYSTICK PROGRAMMABLE JOYSTICK***
2 REM  FOR CURSOR CONTROL MODE
3 REM  PRESS ANY KEY TO CONTINUE
4 REM  WRITTEN FOR ATARI 800/XL/XE
5 REM  BY BRUCE WOODLAND 1987
6 REM
7 REM
10 REM *MAIN PROGRAM*
20 GOSUB 100:REM MAKE DATA
30 GOSUB 400:REM USER PARMS
40 GOSUB 800:REM ENABLE JOYSTICK
50 REM
60 REM
100 REM *MAKE DATA & RELOCATE*
110 DIM KCODE(8)
120 ? CHR$(125) ; ? "Please wait ..."
130 OPEN #1,4,0,"K:" :GU=0:A=0.888:IS16
140 RESD DTD
150 IF DTA(1 THEN 180
160 POKE ADD+N,DTA.0.A+1
170 GU=GU+DTA:GNTO 140
180 RESTORE 1100
190 FOR LOOP=0 TO 7:READ DTA
200 KCODE(LOOP)=DTA:NEXT LOOP
270 IF GU=11654 THEN RETURN
280 ? "DATA ERROR  ..Recheck!":END
290 REM
400 REM *USER DEFINITION ROUTINE*
310 ? CHR$(125):POSITION 13,0
320 ? "KEYCODES" ; ?
330 ? "Present key assignment, " ;
340 ? "  L  R  U  D  F  ,  /  "
350 ? "KEYS:  Up Dn Lt Rt Lu Ru Ld Rd"
 ;
360 ? "CHAR :  ;+  *+  =+  -+  _  ^  |
 +" ;
370 ? "CODE :  -  =  +  *  &  N  A  5"
 ;
380 POSITION 2,14
390 ? "Change Assignments?":GET #1,A
400 IF A=ASC("N") THEN RETURN
```

Turn to Page 40 ▶

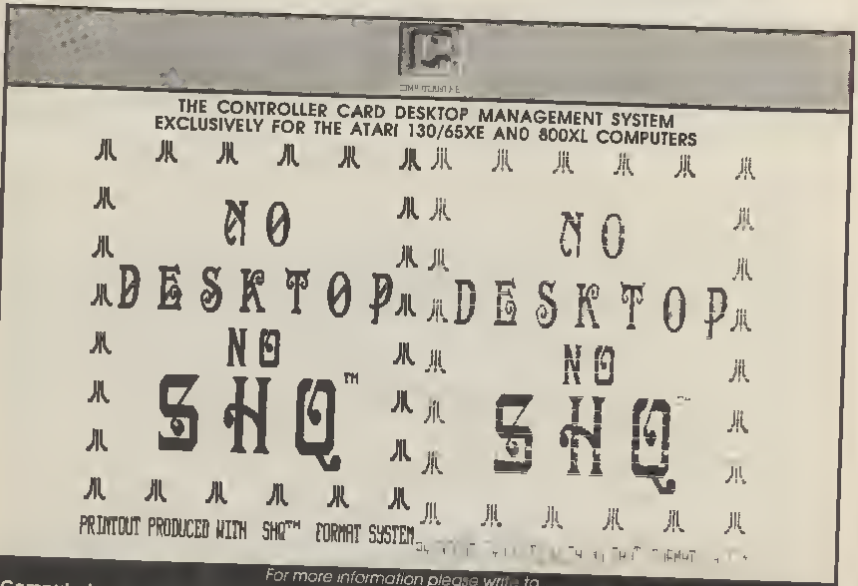
◄ From Page 39

```
410 REM Get User's Keystroke
420 FOR KEY=0 TO 7:POSITION 2,15
430 PRINT "Key ";KEY+1;:GET #1,K
440 SCODE(KEY)=PEEK(756)
450 POSITION 6+(KEY*11)+2,12
460 ? CHR$(K);:NEXT KEY:POSITION 2,16
470 REM Check For Edit Version
480 RESTORE 1100:LOOP=0
490 READ DTA
500 IF DTA<>SCODE(LOOP) THEN 535
510 LOOP=LOOP+1 IF L305(4 THEN 490
520 GOTO 540
530 ? "NOT SUITABLE FOR JOYCE 1":"
540 ? "OK? (Y/N)";:GET #1,KEY
550 IF KEY<>ASC("Y") THEN 300
560 REM Update Keyboard To RAM
570 A=0:A=0:FOR LOOP=0 TO 7
580 POKE ADD+A+LOOP,SCODE(LOOP)
590 NEXT LOOP:RETURN
599 REM
600 REM Portable Assembly Routine
610 COLL=USR(ADR
```

```
630 ? CHR$(125);:POSITION 0,10
635 ? "Joystick control now active."
640 RETURN
650 REM
1000 REM Machine Code Data
1010 DATA 104,169,17,141,48,2,104,6,14
1,41,2,169,1,141,38,2,96
1020 DATA 72,138,72,173,31,208,201,1,2
08,13,205,31,208,240,251,173,118
1030 DATA 6,72,173,119,6,141,118,6,220,76,2,
173,132,2,208,5,173,118,6
1040 DATA 208,14,169,6,141,26,2,173,13
2,2,208,4,169,33,208,21,162
1050 DATA 7,173,120,2,221,111,6,240,5,
202,16,248,48,9,169,119,6
1060 DATA 77,110,6,141,202,2,169,2,174
,110,6,240,5,169,3,77,283
1070 DATA 2,141,243,2,104,170,104,96,1
28
1080 REM Joystick Codes Table
1090 DATA 14,13,11,7,10,6,9,5
1100 REM Keyboard Codes Table
1110 DATA 14,15,6,7,47,46,63,62
1120 DATA -1
```



LINE CHSUM	LINE CHSUM	LINE CHSUM
0 CAN (V)	350 KLS (P)	540 PDT (R)
1 CAJ (I)	390 RYT (Y)	590 SSF (P)
2 CAK (Y)	380 CUU (L)	640 DLW (V)
3 CAL (O)	310 NGI (+)	570 BLC (G)
4 CAM (R)	320 GHS (I)	580 X4L (X)
5 CAN (I)	350 TBH (9)	590 LBU (K)
6 CAP (U)	340 RYF (N)	599 EJW (X)
8 CAR (G)	350 SLM (I)	600 CUX (R)
10 EP1 (H)	360 TF0 (F)	610 OSL (O)
20 S2P (L)	370 T4J (H)	620 WL4 (R)
30 SAG (H)	380 YSL (B)	630 FHX (S)
40 SPA (P)	390 MVG (I)	640 KPA (M)
50 DCW (N)	400 X55 (L)	650 RTX (S)
60 CP4 (S)	410 CYV (K)	1000 CXN (Y)
100 CUS (Z)	420 XMR (P)	1010 W3B (B)
110 WCT (F)	430 T4B (G)	1020 C3N (Z)
120 DTW (L)	440 AVH (S)	1030 Y3J (S)
130 TLP (T)	450 S07 (B)	1040 1GF (4)
140 VKS (4)	600 4JE (N)	1050 XWN (F)
150 SA5 (B)	470 UBV (W)	1060 12T (6)
160 HPS (G)	480 J9S (N)	1070 7U0 (H)
170 BWG (A)	490 WX8 (B)	1080 BFN (N)
180 XEM (X)	500 UEX (L)	1090 EY1 (L)
190 ULM (B)	510 Z9N (L)	1100 02M (N)
200 YH5 (J)	520 QWC (7)	1110 F06 (W)
270 V8U (A)	530 YV1 (H)	1120 MMX (G)



Green witches and lurking bugs

by Rouloc

PHEW! Never thought I was going to make it in time for this month's issue. There I was in Tervania (a small village – turn left just past Outer Mongolia and it's first on the right) surrounded by a thousand slavering orcs. I'd have preferred to have thwacked a couple of hundred or so before I took my leave, but time was pressing.

Unfortunately, my transportation spell came out a bit wonky for some reason I still can't fathom. I said Pockstorp at the place in the incantation where I should I should have said Stockport and found myself in an aborigine's hut somewhere in the Australian outback.

Since then my spell has become a little depleted in power so I had to fly back across the world on a broomstick – old-fashioned and undignified but at least it worked.

Still, it's an ill wind and all that. On the way back I stopped off for a quick oil change on the broomstick and bumped into my old friend Brillig from *Atari ST User* – he had just popped into the same garage for a rebore job on his wand.

We got chatting and he happened to mention that he'd found a bug in Infocom's The Lurking Horror and thought my readers might also be interested.

If you have the brass hyrax ring take it into the terminal room where the hacker sits and drop it. Then say 'Wear ring' and the program will respond by asking whether you mean the hacker's keyring or the hyrax ring.

If you then indicate that you want the keyring the program tells you that you can't wear it. But examine your inventory and you'll find you've got it – green keys, yale keys and all the rest. Nice bug, even if it's not much use to you.

Hot news from Rainbird – its next Magnetic Scrolls adventure called Jinxter is well under way and should be available soon – it may even be out by the time you read this.

Featuring the same superb graphics and sophisticated parser as The Pawn and Guild of Thieves, Jinxter is a modern and humorous tale set in Aquitania.

The green witches are gaining power in Aquitania thanks to the dispersal of the pieces of a lucky charm bracelet. Your task is to retrieve all seven pieces and link them together to stop the witches taking over.

The interesting thing is that you can't get killed while your luck holds out. Instead if you have a lethal encounter, you're dumped just past the hazard, thus allowing you to continue further into the adventure. Now that really sounds like good news for all accident prone adventurers.

The mailbag has been groaning ever louder of late and I'm afraid that I've a little catching up to do. Don't despair if you don't get a mention or have to wait a while before your name pops up in this column – I get so many letters it is simply not possible to find room to include all of them.

But rest assured that Rouloc reads every single one of your missives with great interest and admiration – and very grateful he is, too. The thought of getting back to read the latest batch of letters has more than once spurred me to greater efforts to escape from rat-infested dungeons in foreign climes.

My thanks this month go to Adam

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◄ From Page 41

Marshall of Penrith in Cumbria for his tips on The Price of Magick and Alternate Reality. I especially liked one of his tips for the latter – he advises that whenever you get the chance always try to trick giants as they are very thick and very rich!

Paul Clark in Positano was grateful for our map of Worm In Paradise in the August 1987 issue of *Atari User*, but is still having trouble with the Basic listing because using the Eden transport system he keeps getting a Dim error.

I thought the program was correct and that the error must be caused by Paul's typing, but is anyone else having the same problem?

I may have got his first name incomplete, but Ty Hays of Nuneaton was not impressed with the same map – but at least it gave him the incentive to get stuck back into the game.

He does mention one peculiarity of Worm which I haven't yet had time to check out for myself. He says that if you go to the police station, type 'give me" then "examine all", the program will list out all the items in the game.

Ty also wonders what race I come from. Well, you've seen my handsome picture printed on the previous page fairly regularly so you should have no trouble in guessing that I am a dwarf of the magical variety.

My feet really are that big – I do a lot of walking on account of my regular faulty recitation of transportation spells – and I have to have all my shoes specially made by the Seven League Boot and Shoe Company.

Speaking of small folk, Level 9 has written an adventure about one of my old flames – a young bossy gnome by the name of Ingrid Bottomlow. The adventure is called Gnome Ranger and it's a corker – watch these pages for a review.

Finally, in the hints and tips, I am pleased to be able to help Andrew Blair of Glasgow with Mordon's Quest, Bob Stacy of Cardiff with The Lurking Horror, Peter Goulden of Lincoln with Arrow Of Death Part II, Mike Proctor of Shrewsbury with The Pawn and Dean Reynolds of Solihull with Leather Goddesses of Phobos. For these and many other readers help is always at hand.

I'll try not to get lost next month – I plan to buy a new transportation spell. If I do manage to get here without a hitch, maybe I'll let you have a list of how all the points in The Pawn are awarded. How's that for a treat? Until then, exciting adventuring!

Hints & tips

LEATHER GODDESSES OF PHOBOS

● *Having a tough time in the cage with the gorilla?*

Throw the chocolate into the cage before being strapped down. Once in the cage eat the chocolate and you'll be strong enough to pull the bars and get out.

● *Sultan's riddle solution eluding you?*

The answer is "riddles".

● *Can't get into the igloo?*

Put the baby in the basket, put the basket on the stoop, hide and wait for the baby to be taken into the orphanage.

● *Coded message a mystery?*

Replace each letter by its third previous one in the alphabet, for example replace E by B and B by Y. Then read the whole message backwards.

THE PAWN

● *Five points adrift?*

Don't forget to ask the Devil "What is the wristband for?"

MORDON'S QUEST

● *Cannibal pygmy a problem?*

Make a blowpipe using the bamboo, thorns and berries and kill the pygmy with it.

Now you've defeated the pygmy you've got something to feed to the meat eating plant – gruesome stuff!

THE LURKING HORROR

● *Horrible monster keeps flying off with the hand?*

Drive the creature away by throwing the stone at it inside the dome, go down to the skyscraper roof and do it again.

ARROW OF DEATH Part II

● *Want to go somewhere from the bridge?*

Hold on to the support rope and cut it – then you'll really be swinging! Make sure you've got a soft landing – fluffy leaves?



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5 LINERS



CAPS LOCKS INDICATOR
from Matthew Bernstein

HAVE you ever had problems with the Atari's CAPS key? This five line program provides a cure by giving a visual indication of whether the computer is in uppercase lowercase or control lock

The utility places an extra line of text at the top of the screen which will indicate the state of the CAPS lock mode and this is shown in an abbreviated form on screen

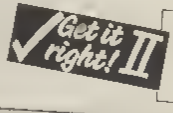
CAPS uppercase
LOWR lowercase
CTRL control lock

The routine is executed by A=USR(1624) and will work in any graphics mode When you change modes the line will be lost so you must re call it again with the USR command

The program contains its own check routine so it will not start the machine code routine if the totals do not match This prevents the program from crashing the micro if you make a mistake as you type in the program

The machine code sets up a VBI (vertical blank interrupt) which will scan location 702 every fiftieth of a second so the program appears to be working instantly but it only alters the screen display when the keyboard bendler registers are changed

```
1 DATA 112,78,7,6,1,0,0,0,0,0,35,33,40
,51,0,44,47,35,45,26,35,33,46,51,0,0,0
,104,162,6,160,30,169,7,32,92,228,96
2 DATA 173,190,2,201,120,208,5,162,6,7
6,41,6,201,64,208,5,162,0,76,61,6,162,
4,160,4,169,76,6,153,10,6,232,136,208
3 DATA 246,76,98,228,51,46,33,35,50,55
,47,44,44,56,52,35,174,48,2,232,232,14
2,5,6,174,49,2,142,8,6,162,0,142,48,2
4 T=0 FOR I=1536 TO 1650 READ D:POKE I
,D T=T+D NEXT I IF T<>8413 THEN ? "DAT
A error, please check again." END
5 I=USR(1624) DATA 162,6,142,49,2,76,2
7,6
```




```
1 A2L (7)
2 BOS (F)
3 CAC (Y)
4 UW1 (E)
5 YNB (T)
```

SCROLLING MESSAGE WINDOW
from Eric McGough

HERE is a simple Basic program which you can adapt to suit your own needs It prints a scrolling message in a window on a Graphics 0 screen It is just an example to fire your imagination and you could for example adapt it to print a number which would rise or fall depending on which way the joystick is moved and is then selected as an input when fire is pressed

PROGRAM BREAKDOWN

1 Selects Graphics Mode 0 and dimensions A$ The string is then defined The spaces on either side of the message determine the gap between the blocks of words as they pass through the window B and C are then set to the portion of the string you wish to display which is a chunk of 10 characters starting at the first in the string in this case The line ends with a POKE which switches off the cursor, otherwise it will flash when the message is printed

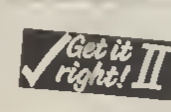
2 Beginning of the loop to display window The FOR NEXT loop is set to 600 to it keep running until the fire button is pressed and going back to the loop causes a slight blip The window is then positioned where you want it on screen Next the required portion of the message is printed There is also a short loop to slow the scroll

3 Checks to see if the pointer (B C) has come to the end of the string If it has it resets it to the beginning

4 Checks to see if the fire button has been pressed If it has we would then GOTO the desired action, in this case the scrolling will stop

5 Increments B and C so that the message keeps moving to the left and then returns to the beginning of the loop When it has reached 600 it starts again by going to line 2 The loop will keep going until the fire button is pressed

```
1 GRAPHICS 0:DIM A$(39) A$="
  HAPPY CHRISTMAS                " B=1 C=1
0:POKE 752,1:SETCOLOR 2,8,8
2 FOR A=1 TO 600 POSITION 15,12 ? A$(B
,C) FOR W=1 TO 60 NEXT W
3 IF B=29 THEN B=1 C=1:0
4 IF STRIG(0)=0 THEN END
5 B=B+1 C=C+1 NEXT A:GOTO 2
```




```
1 65V (O)
2 JKJ (A)
3 72E (W)
4 H2W (2)
5 KBE (9)
```

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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JET BIKE
from Daniel Welch

THIS is a version of the Light Cycle sequence in the Tron film The rules of the game are as for the film If you crash your cycle in to your opponent s trail you will die and the same applies if you crash into the electrified walls that enclose the playfield

The most remarkable thing about the game is the fact that you have a computer opponent racing against you – and all this is achieved in five lines

The program uses data statements to control the movement of the computer and uses Boolean statements to control movement of the player with the joystick The advantage of using these statements are that they are fast and do not take up much space in the program

VARIABLES

P, Q	Position of computer
DP DQ	Directions of computer
R	Locate value of computer
X, Y	Position of player
DX DY	Direction of player
Z	Locate value of player
S	Stick(0) value

```
1 P=1 Q=19 X=79 Y=79 DX=1 DY=0 GRAPHI
CS 7+1 COLOR 1 PLOT 0,0 DRAWTO 79,0 DRA
WTO 79,39 DRAWTO 0,39 DRAWTO 0,0
2 READ DP,DQ IF DP=0 AND DQ=0 THEN RES
TORE GOTO 1 DATA 0,1,1,0,0,-1,-1,0,0,
0
3 SOUND 0,200,12,2 LOCATE P+DP,Q+DQ,R
IF R<>0 THEN 2
4 S=STICK(0) IF S<>15 THEN DX=(S=5 OR
S=6 OR S=7)-(S=9 OR S=10 OR S=11) DY=(
S=13)-(S=14)
5 LOCATE X+DX,Y+DY,Z IF Z=0 THEN RESTO
RE 1 X=X+DX Y=Y+DY P=P+DP Q=Q+DQ COLOR
2 PLOT X,Y COLOR 3 PLOT P,Q GOTO 3
```

Get it right! II

1 GYN (S)
CJS (I)
? 402 (E)
NTD (S)
FWT (4)

CHRISTMAS MESSAGE
from Gary Cheung

THIS five liner is a simple program to demonstrate the graphics capabilities of Atari computers and it also sends a seasonal greeting The program draws a Christmas tree with lights and flashes them on and off

PROGRAM BREAKDOWN

10 Sets up graphics Mode 7, sets up colours for the background and the tree Makes the cursor invisible and sets the left margin The dummy PRINT statement enables the new left margin value to come into effect straight away when the message is printed in line 40 This combination enables the message in line 40 to be positioned without the POSITION command and thus reduces the length of the line

20 Draws the Christmas tree

30 Draws the tree lights using the colour in colour register 709

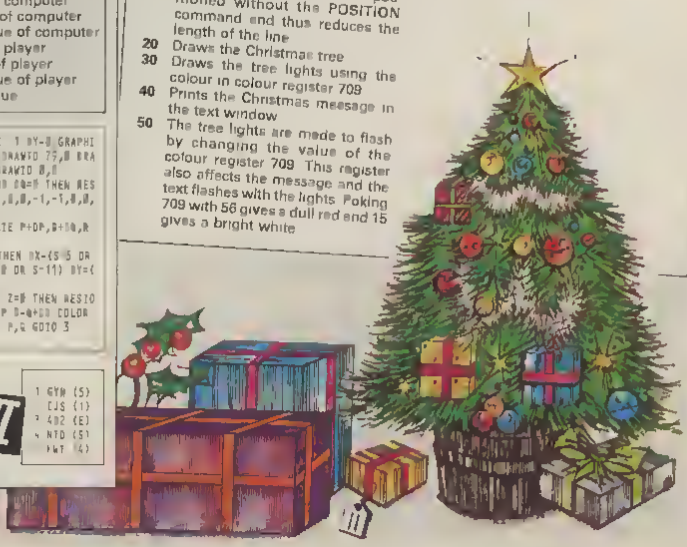
40 Prints the Christmas message in the text window

50 The tree lights are made to flash by changing the value of the colour register 709 This register also affects the message and the text flashes with the lights Poking 709 with 56 gives a dull red and 15 gives a bright white

```
10 GRAPHICS 7 POKE 705,196 POKE 712,10
 POKE 710,8 POKE 752,1 POKE 82,9 ? #6;
20 COLOR 1 FOR Y=10 TO 50 STEP 10 FOR
I=X-Y/2 TO X+Y/2 PLOT X,Y DRAWTO I,Y+2
0 NEXT I NEXT Y
30 COLOR 2 FOR Y=10 TO 50 STEP 10 FOR
I=X-Y/2 TO X+Y/2 STEP 2 PLOT I,Y+20 DR
AWTO I,Y+21 NEXT I NEXT Y
40 PLOT X,5 DRAWTO X,11 PLOT X-1,10 DR
AWTO X+1,10 ? #6; ** MERRY CHRISTMAS **
 ** from ATARI USER
50 POKE 709,56 FOR I=1 TO 300 NEXT I P
OKE 709,15 FOR I=1 TO 100 NEXT I GOTO
50
```

Get it right! II

10 FOR (M)
20 POI (V)
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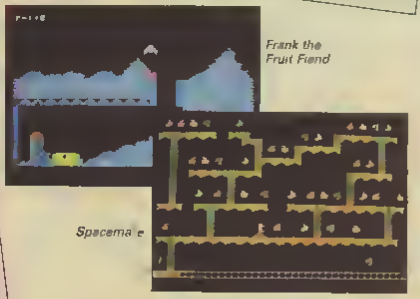
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Basic route to colourful triangles

I AM starting to learn Atari Basic and have written a program to draw and fill triangles in different colours But I have come across a problem

After drawing a red, orange, blue and green triangle in Graphics Mode 7 I found that when I tried to use different colours they didn't work Can you explain why this is? – **James Cox, Mowbray Leicestershire Age 11**

● Depending on the graphics mode you choose to work in, you are restricted to the allowed number of colours – this is usually proportionate to the resolution of the mode

For example in Graphics Mode 7 you have a screen resolution of 160 by 96 in four colours on a full screen

But in Mode 11 you have a resolution of 80 by 192 pixels in 16 colours, and this will take up roughly 8k of memory before you start But a Mode 7 display will only take up around 4k

When deciding what colour you wish a pixel to be on screen you must first know the limitations of the mode you are working in

It is also possible to alter the screen display by using the SETCOLOR command This will change depending on what mode you are using and full details can be found in any Atari Basic manual

Here are the effects created on a Graphics Mode 0 text screen

SETCOLOR 1,A,B *will alter the intensity of characters on screen*
SETCOLOR 2,A,B *will alter the screen colour*
SETCOLOR 4,A,B *will alter the border colour*

A is the colour you want, and can be a number from 0 to 15 B is the brightness or luminance of the colour and is an even number from 0 to 14

So by playing around with the COLOR and SETCOLOR commands you can produce various patterns and shades

Looping into trouble

I WAS playing around with my Atari 400 and wrote this simple program

```
10 FOR F=1 TO 255
20 PRINT CHR$(F),
30 PRINT F
40 FOR W=1 TO 200 NEXT W
50 NEXT F
```

When I ran it the computer seemed to go haywire and refused to do what it was supposed to do Is my computer broken? And if not can you explain what exactly is happening? – **G Abott Glenrothes Fife**

● Firstly your computer is not broken The answer is very simple As the program goes through its loop and prints CHR$(F) to screen it is encountering Ascii control codes

These codes will cause various different things to happen as shown in the table below As you can see, the control codes are scattered throughout the loop that you defined and the best way for you to view them is individually

Ascii code	Effect
27	Escape
32	Blank space
125	Clear screen
155	EOL or Return
253	Keyboard beep

If you add 128 to the Ascii of a character it will appear in inverse video For example ?CHR$(65) will give you A but if you add 128 then give ?CHR$(193) you will get an inverse capital A

Packing in a word processor

IN my first few computer lessons on a BBC Micro I noticed there is a built-in word processor Is it possible for me to fit one to my Atari 800XL in the same way? – **A Faulkner, Barnstaple, North Devon**

● The BBC Micro has space inside for several roms These work in a similar way to cartridges on your Atari, but you can have more than one present at once So a cartridge based word processor such as AtariWriter is the equivalent of a built in one

Getting it right

IN the November 1987 issue of Atari User you published Get it Right III Are the checksums that you published for the old Get it Right still compatible with this new super high speed version? – **Brenda Tennyson, Sandbach, Cheshire**

● The new Get it Right creates a different checksum to the old program and so makes the two incompatible We considered keeping the numbers the same, but decided that the advantages that could be gained by a completely new program outweighted the advantages of compatibility

For example a feature that the new program has that the old one didn't is a running cumulative checksum

Tweened cartoon

AFTER typing in the excellent Tweening program from the November 1987 issue of Atari User I drew a cartoon character and tweened him between

Turn to Page 48 ▶

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◀ From Page 47

two positions I then printed out the individual screens of the animation using the OS Controller card screen dump utility

Next I stuck the dumps together in book form and if I flick the pages quickly I have a simple animated cartoon

Thank you for a superb utility – I'm sure that with a little patience I could make a full length cartoon using it – **Philip Marston, Armitage, Wadd Soft**

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

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No trivial pursuit

IN my experience the majority of companies today consider customer relations to be a triviality I am very pleased to say that there is a company that can be bothered to be polite and helpful – Noahsoft

When I bought a product called the PL65 compiler from them I had trouble including library files that contain other library files on to my data disc I contected the company and they replied with the solution to my problem in a very efficient and helpful way – **Lee Fuller Romford, Essex**

Missing locations

I RECENTLY bought a tape version of International Karate I enjoy sport simulations and I was very keen to play the game

The instructions say that you fly to eight different locations around the world and fight in each but when I started to play I found to my horror that I only have two locations to fight in

Later I went to visit a friend who has a disc drive and I was surprised to find that his version has the eight locations

Why is it that tape owners always seem to lose out on games? – **Mark Haddon Hertford, Hertfordshire**

● The problem with the tape version of International Karate concerns loading time The game constantly loads new location screens which is easy on a disc version but if you were to load a new screen from tape the game would take far too long to complete

Assembler required

BEING new to computing and very willing to learn I was attempting to follow the I/O channels article by André Willey But try as I may, I just keep getting stuck

I don't know how to disable Basic and input the machine code program which you published in the March 1987 issue of Atari User

The article doesn't explain how to do this and so I was wondering if you could answer this for me? – **M Kloss, Tamworth, Staffs**

● To enter any machine code program you need an assembler language such as the Atari Assembler/Editor cartridge or Mac/65 from Optimised System Software These and others are available from several of the advertisers in *Atari User*

Cardsharp cornered

SOME people might have noticed something odd about the Knockout Whist program in the September 1987 issue of Atari User

Apart from the first round the computer always seems to win when random trumps are chosen I checked through the program and spotted where the problem occurred and corrected it with the following changes

```
8010 RET 0 IF CHOOSE THEN TR-
INT(RND(0)*4)+1 GOTO 8030
8020 GOTO 8040
```

This solves the problem of biased trumps – **Simon Bewyer, Winchester, Hants**

Sound of silence

I OWN an Atari 400 and was wondering how to turn off the noisy beeping sound I get whenever I save or load

I use my computer mostly at night when everyone is in bed and the [illegible] waking them

I was told [illegible] will turn this [illegible] Ataris, but [illegible] beep was still [illegible] you tell me how to get rid of this annoying sound? – **L J Hawkes, Southend, Essex**

● The beep that comes from from an XL/XE computer is generated through the TV speaker But on an Atari 400 there is a small speaker inside the micro

This can easily be turned off by unplugging the wire from the board altogether or placing a switch between it and the speaker

Nice line in language

I RECENTLY bought Turbo Basic from Stortsoft and was stunned by the quality of the product The package contains the Basic with a compiler and although it doesn't contain all the commands that you get with other Basics say for example Basic XL, it does leave the old Atari Basic language standing

So if you feel like a new language for your Atari I would recommend you try it – **A Griffith, Wimborne, Dorset**

Printing out a document

I HAVE had Mini Office II for four months now and think it's a great package but I do have one small problem with the spreadsheet

When I save data from that module and then try to load it into the word processor to print it out in a document all I get is a mess of characters Am I using the package wrongly? – **Monica Harris, Maidstone, Kent.**

● You're using the package correctly, but I'm sorry to

say that the spreadsheet only integrates with the graphics package. You could print out the part of the spreadsheet you want and then print the document.

Card for the 65XE

AFTER reading the review for the OS Controller card in the November issue of Atari User I decided to buy one and have it fitted to my 130XE by Computerhouse where I obtained very prompt and professional service.

I am about to buy a new 65XE games console to add to my collection of Atari computers and was wondering if the card will plug into it. – **Keith Pettison, Middlesbrough, Cleveland.**

● The card you bought is designed to work on your 130XE only but Computer house is planning to bring one out that will fit inside the 65XE.

Doctor Boris diagnosis

I TYPED in the program Doctor Boris from the October 1987 issue of Atari User and checked it very carefully but I still get an Error 8 at line 1020.

If I take out this line the program runs, but not correctly. Is there an error in this line? – **Michael Cain, Beeston, Nottingham.**

● The listing that appeared in the magazine contained no errors. The message for Error 8 is:

INPUT/READ type mismatch error. Attempting to enter a non numeric value for a numeric variable.

Check your data statements between lines 1040 and 1510. You will probably find that your mistake is somewhere there.

It may well be that you have a letter instead of a number, a comma at the end of a line, full stop instead of a comma or an extra comma where there shouldn't be one.

Cruel to edge connections

FOR a while now I have been programming using OSS's Mac/65 cartridge to write routines that can be called from Basic.

In order to test them I have to remove my Mac cartridge and reboot the system with Basic. All this removing and replacing isn't exactly beneficial to the cartridge edge connector.

Do you or any of your readers know of an edge connector extension that could be fitted to save wear and tear?

Or better still a device that could be fitted between the cartridge port and the cartridge that would allow me to switch the cartridge out without having to remove it? – **A Crawford Laceby, North Grimsby.**

● If you own a 130XE the supra hard disc interface would give you a vertical slot for your cartridge. This will reduce wear and tear on the port on the computer.

Pokes for games

IS it possible for you print some pokes for Atari games like those I've seen for other computers? Or is there something unusual about games on the Atari that makes this impossible? – **Sean Canningh, London.**

● With a lot of computers the games are loaded using a Basic loader routine. This can often be modified or pokes can be entered first and remain active as the program runs. But on the Atari machine code games are loaded using a procedure called Boot.

This is done by a combination of the Start, Option and Select keys being held down as the computer is switched on. This causes the game(s) to be loaded directly into memory so there is no way you can enter a poke. Also most games software on the market today require you to switch Basic off which makes it very difficult to give you any pokes on the Hints and Tips page.

Helpful review

I OWN a Panasonic KPX 1081 printer and was very interested in the review you published on this model in the October 1987 issue of Atari User.

After reading it I proceeded to experiment with my printer and discovered a lot of interesting features. Thank you for a superb review keep them coming. – **Mike Barstow, Birchwood, Cheshire.**

Amateur radio

THERE must be thousands of amateur radio operators worldwide who like me are also Atari computer fans.

But could you tell me if there is a program or interface that will enable me to receive teleprinter signals on my radio and pass them to my 800XL so I can view them on the screen and finally print them out? – **Sid Thompson, Leyland Lancs.**

● We don't know of any programs or add on that will do what you want but the Radio Society of Great Britain may be able to tell you of a product to solve your problem. Their address is: Radio Society of Great Britain, Lambda House, Potters Bar, Herts.

Adding on to the 800XL

A LOT of computers these days seem to have the expansion capabilities necessary for adding a second processor the most common of which is the Z 80. Is there such an add on for my 800XL? – **Steve Ward, Newcastle Upon Tyne.**

● Quite a while ago Atari did mention that it was about to bring out a second processor for the 8 bit computers. The package was called the Atari CP/M Module and was an external microprocessor upgrade that would allow CP/M software to be used on all 8-bit Atari computers.

This add on plugs into the serial port and offers the following features:

- Z 80 microprocessor
- 4 0 MHz processing speed
- 64k ram
- CP/M 2 2 operating system
- 40/80 column video output (switchable)
- Serial input/output port
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Unfo[illegible] released th[illegible] Britain, w[illegible] because it w[illegible] popular on a [illegible] always crying [illegible]

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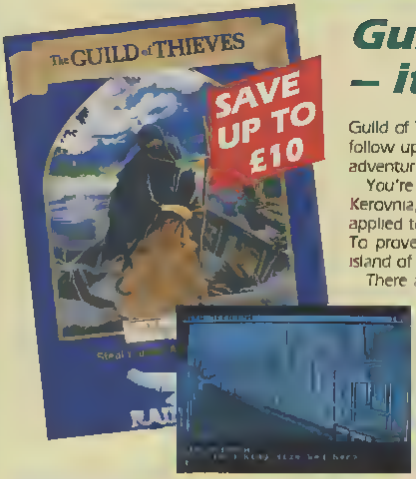


This fascinating adventure features the most sophisticated parser around. You can type complex sentences and interact with the many characters, including some very intelligent animals.

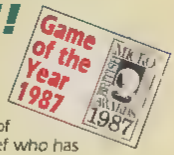
This superb package includes a 44-page novel and a cryptic help section.

> The program took three man years of programming time to produce – and it shows. The Pawn is the stuff from which cults are made
>
> *– Anthony Ginn, Atari User, May 1986*





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> This is an absorbing, funny and tantalising adventure and guaranteed to be another sure-fire winner for Rainbird
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> *– Bob Chappell, Atari User, October 1987*

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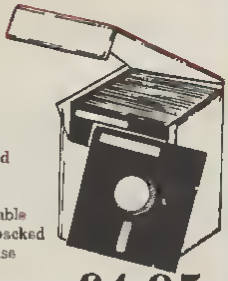
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Or you could do what more and more Atari users are doing – use your micro to double as a Telex machine. And still use your ordinary telephone.

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How to join
See Page 18

SOFTWARE Solutions

Your programming problems solved by ANDRÉ WILLEY

I'VE had a tremendously varied set of questions from you this month, starting with a problem from Timothy Herrington from Portsmouth who's having trouble with his memory

I have been a regular reader of Atari User since 1985 and now have quite a library of your games on disc, together with a menu selection program which runs them. I have slightly modified each program so that when I have finished playing the game I can press an exit key to re-run the menu program where any of the games can be selected and run.

Generally this works efficiently but if the previous game has used Player/Missile Graphics or machine code routines – which many do – vertical lines of squares are left flickering across the screen. These can only be cleared by pressing the System Reset key. Sometimes the following game will not run at all, or the screen display is corrupted, and often the only way to cure this is to power off and restart from scratch.

Obviously data is being left behind in the memory by the preceding program and this is interfering with the next one. For example, if I run Cubes in Space after Chopper Rescue I usually find that once I have completed the first screen of Cubes nothing happens, or only the bottom of the screen moves to the left. Is there a routine – it will probably have to be written in machine code to be fast enough – to clear out any left behind data? It is awfully inconvenient to have to re-power every time.

Well Timothy there are actually a number of problems to be considered to allow you to freely move between Basic game programs. Firstly as you have noticed Player/Missile Graphics don't clear themselves properly when you have finished with them.

Secondly you might find that some Vertical Blank or Display List interrupt routines are still running. Finally the program might have adjusted some of the OS or Basic work variables – such as the Display List pointer or the top of memory indicator.

To clear the PMG data is slightly more complex than just POKEing the enable register to off with the command POKE 559,34. This will stop the ANTIC graphics chip from getting bytes of player data from memory but will leave GTIA – the display generator – free running with random data giving the flickering vertical stripe you have noticed.

You can tell GTIA to stop reading new data by using POKE 53277,0 and the stripe becomes solid which is at least some form of improvement. GTIA in fact contains a number of temporary registers which hold the incoming PMG data until it can be processed, and since these haven't been specifically zeroed they will still contain the last byte of data received from ANTIC – hence the solid stripe based on that data.

The four player registers are located at 53261-53264 ($D00D-$D010), and the single missile register is at 53265 ($D011). These must all be set to zero, and while we're doing that we might as well reset the PMG position and size registers at 53248-53260 ($D000-$D00C) and the PRIOR and VDELAY bytes at 53275 ($D01B) and 53276 ($D01C).

Now that we've dealt with the PMGs let's turn off any user defined interrupts which may be running. The DLI vector is at 512,513 ($200,$201) and the Immediate and Deferred mode Vertical Blank interrupts (VBI's) are at 546,547 ($222,$223) and 548,549 ($224,$225) respectively.

The normal contents of these registers will depend on the age of your machine and the type of OS it contains. The easiest way to find out what number to POKE into them is to use PEEK to find the original value of each location **before** you run any programs at all, and change lines 1120 to 1140 accordingly. I've used the standard 130XE values but make sure they are set correctly for your machine or it could be *goodbye program* time.

One point to note here is that you can't just POKE the new values straight in since the OS may want to use any of the vectors at any time, even after you've changed one byte but not the other. Thus you should make sure to turn off all interrupts with POKE 54286,0, then POKE the new values into place and only then turn the VBI system back on with POKE 54286,64.

Next you should re-set the RAMTOP high memory pointer in case the previous program has tried to reserve space at the top of memory by adjusting it. This can be achieved by using POKE 106,160 for a machine with more that 40k of memory. Again, you can find out the normal contents by turning the computer off and on again and then using the command PRINT PEEK(106).

Finally just to be sure you should do a GRAPHICS command to set the Display List back to its normal location. I'm not saying that these measures will cure every possible problem.

```
10 REM CLEAR MEMORY AFTER PROGRAM.
20 REM ADD THESE LINES AT END OF
30 REM OFFENDING PROGRAM
40 REM MAY BE RE-NUMBERED
50 REM ADJUST LINES 1120, 1130,
60 REM 1140 & 1210 ACCORDING TO
70 REM YOUR COMPUTER'S NORMAL
80 REM VALUES FOR THE LOCATIONS
90 REM 1000 REM CLEAR UP PMG REGISTERS
1010 POKE 559,34
1020 FOR BYTE=53275 TO 53277
1030 POKE BYTE,0 1040 NEXT BYTE
1050 FOR BYTE=53248 TO 53265
1060 POKE BYTE,0
1070 NEXT BYTE
1100 REM RESET INTERRUPT VECTORS
1110 POKE 54286,0
1120 POKE 512,200 POKE 513,192
1130 POKE 546,226 POKE 547,192
1140 POKE 548,138 POKE 549,194
1150 POKE 54286,64
1200 REM RESET RAMTOP/DLIST
1210 POKE 106,160
1220 GRAPHICS 0
```

Listing 1. Memory clearing routine

Turn to Page 54 ▶

◀ *From Page 63*

you might encounter – games programmers are a perverse bunch at the best of times However Listing I *should* cure most of the common faults and at least give Basic and the OS a fighting chance to do their job correctly

Merging Basic programs

Now let s move on to another problem Mr K R **Henwood** from Pembroke Dock Dyfed writes

"I am writing a program in Basic for an 800XL and 1050 disc drive in which I want to interchange different blocks of DATA statements from within the main program – using the ENTER command For example

```
100 ON I GOSUB 500,600,700
110 REM REST OF THE PROGRAM
500 ENTER "D:DATA1.LST" RETURN
600 ENTER "D:DATA2-LST" RETURN
700 ENTER "D:DATA3-LST" RETURN
```

This works fine, but when the new segment has been loaded into the computer execution of the program stops and the READY prompt appears Can the 800XL be re programmed to continue execution of the main program automatically after the extra lines heve been ENTERed from the disc? At the moment I have to restart the program every time with a direct GOTO command in order not to wipe out other data which is stored in arrays"

There is en answer to your problem and one which may prove useful in solving many other programming difficulties too

As you have correctly stated the ENTER command was designed to work in direct mode rather than as a program statement So it returns control to the editor rather than to the currently resident program What is needed is a way to control the editor s operation from within a program

Impossible? No not really You need to use a trick often known as 'Return Key Mode' in which you are able to print whatever commands you like onto the screen and have the Basic interpreter execute them just as if you heve pressed Return at the end of each line – hence the name

Listing II is a small program to illustrate the technique but you could expand it to do much greater things – including allow a program to modify itself directly Here s how it works

Lines 10 to 110 set up a string which contains the main portion of the filename Assuming you use a single number to indicate each separate file then all you need to do is alter that byte within the string – in this case character number 7 Thus line 110 replaces the lowercase X in the string with the number contained in NUMB

Next comes a GRAPHICS 0 command to avoid corruption from any old lines of text which may still be on the screen The POKE 559 0 simply turns off the display while the clever stuff goes on – omit it if you want to watch the system in action

Next lines 130 and 140 print the two instructions which we want to execute in immediate mode The two blank PRINTs between each line are to allow for Basic s READY message which will be printed after each immediate mode task is finished

Since we want to print a quotes symbol and this can't be done from within a string I have used it s Ascii value – CHR$(34) – instead Thus line 130 will print

ENTER "D DATAx LST

Once the two lines have been printed the cursor is placed just above the first command to be executed and Return-Key mode is enabled using POKE 842 13 Immediately after this the STOP command temporarily halts the program with the message STOPPED AT LINE 140

Since Return Key Mode has been set the screen editor won t wait for you to type a command and hit Return – it will instead go straight on to execute the first line it comes to which will in this case ENTER the new lines for you Then it will carry on and find the CONT command which will re start your program

The line immediately after CONT should always be POKE 842 12 to disable Return Key Mode before you continue with the rest of your program I've also added a GRAPHICS 0 to turn the screen back on

This method can be used to do almost anything you want, but it s always best to experiment until you get it just right – some commands such as LIST and the graphics oriented instructions would not be suitable

```
10 DIM FILES$(20)
20 REM NUMB WILL BE 1,2,3 or 4
30 REM TO INDICATE FILE NUMBER
100 FILES$="D:DATAX.LST"
110 FILES$(7,7) CHR$(NUMB)
120 GRAPHICS(0) POKE 559,0
130 ? ? "ENTER ",CHR$(34),FILES
140 ? ? "CONT
150 POSITION 0,0
160 POKE 842,13
170 STOP
180 POKE 842,12
190 GRAPHICS 0
200 REM NEW LINES ARE NOW LOADED
```

Listing II Return-Key Mode demonstration

Before I disappear for another month there's just time to mention a letter I've received from **Chris Simon** from Mold in Clwyd who has just typed in Get It Right III from the November issue of *Atari User* Not resisting that we'd be printing the full source listing this month he went ahead and disassembled it for himself, and found various messages within the code, such as

```
SELECTION MENU FOR D2
2) INIT DRIVE
3) CHANGE DRIVE #
4) SET NEW OFF
```

He wondered if this is an extra utility provided for more experienced users, and if so how it might work

Well, sorry to disappoint you Chris, but it's not an extra utility If you look at the machine code program on Page 57 you will see that there is a 256 byte buffer defined near the end of the listing As with most other assemblers my own MAC/65 cartridge creates this space by simply skipping the relevant number of bytes, leaving any existing memory contents intact

In order to configure my 1050 to work correctly with my hard disc and SparteDos I have set up an AUTORUN file which re programs the system to my requirements at boot time and it is a port-on of this code that inadvertently slipped into the GIR II object file These bytes could just as easily be zeros of course as all they do is pad the boot file out to the required length

Next time we print the Basic version I II modify it to skip that area completely and thus save you about 10 lines – although it won t effect the size of the machine code version Anyway, well spotted Chris I hope that the listing in this issue will be of interest to you

Ah well that s about it for another month All that remains is for me to wish you all the very best for a great Christmas – and wait for the deluge of mail which will come in from all those new Atari XE games console owners early in the New Year

Merry Christmas all

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 56 Chester Road, Hazel Grove, Stockport SK7 5NY

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

MicroLink
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NEWSLETTER

Email is good business

BOOKSELLERS Graeme Roberts and Tony Swann who first got in touch through MicroLink's bulletin board are finding electronic mail makes for good business

Graeme made a 12 900 per cent profit on a battered copy of Sower by's Exotic Mineralogy he sold to Tony a director of natural history specialists Wheldon & Wesley

"I bought the book for £1 from a local junk shop after seeing Wheldon & Wesley's advertisement on the MicroLink BB" said Graeme "I thought it was probably worth more than I paid but had no idea I would get as much as £130"

Tony Swann was equally delighted with the deal "After a couple of hours hard work with a soft rubber I was able to remove the accumulated dust and grime of 175 years and turn it into a quite reasonable copy which I sold on the phone to a collector in America for £240 the same day" he said "The three of us are very happy and it's all thanks to MicroLink"

The aged scientific tome was a change of theme for Graeme who specialises in out-of-print science fiction fantasy and horror and is currently expanding into supplying dealers and collectors in the US His main reason for joining MicroLink is its enormous potential for speeding communications with his clients

Tony also considers MicroLink an extremely useful business tool "It isn't just because of increasing sales and purchases" he says "I travel a lot around Britain and Europe and find the Official Airlines Guide saves me much time at the travel agency Telex and the British Rail timetables come in handy too

Overall I'm delighted with the system and it's certainly beginning to pay for itself

Cut the cost of fashion

PEOPLE can now dress themselves from head to toe in the latest fashions with the help of MicroLink

London company Twillfine is using the system to advertise High Street chain store fashion wear at a fraction of normal retail prices

The garments aren't seconds – they're warehouse stock which has to be cleared to make room for new lines

Twillfine's prices are as low as £4 for blouses usually priced £14 99 and £1 50 for shirts which normally retail at more than £13

YOUR chance to join MicroLink – Page 18

New board for chess

MICROLINK subscriber Keith O'Connell has challenged the world to a giant electronic game of chess

Playing on the MicroLink bulletin board he says he is willing to take on anyone of average standard

"I don't mind how many games I play at once" he said "Anyone who wants to take part can just mail box me with their moves in response to my game on the bulletin board"

"All I ask is that my opponents play for themselves and don't just use a computer chess program to decide their moves I want to play people not a computer – I can do that on my own at home"

Micro muscles

MICROLINK subscriber Theo van der Meer has launched a search for software authors with experience of writing for peripherals

He wants them to help him develop a device which allows people with severe muscular problems to use computers

Theo's company, Preston Communicatrons, is UK distributor for a Dutch product that links a muscle or several muscles to a joystick allowing people with all kinds of muscular diseases to control a micro

The device which takes over the five joystick functions, has just completed clinical trials in Holland and is now being tested here

Our problem is that all the programs to control the device are currently written for the Commodore and we need to have them re written for other machines such as the BBC Micro IBM PC and compatibles Atari, Apricot Apple and Macintosh" said Theo "We will of course gladly pay for this work"

Tower triumph

TWO years after finding himself out of a job at the age of 56 Yorkshireman Philip Gibbs is boss of his own company and poised for success

With the help of his computer and MicroLink he has launched Sheffield Skyhook to manufacture self erecting towers for closed circuit TV systems

Now his project is nearing completion he is also receiving financial support from British Steel British Coal and the Department of Industry prior to going into full production

Philip has been using MicroLink to improve his communications with the various agencies he deals with and has also found the Kompass Online directory of UK companies invaluable as a source of potential customers

"At the moment we are using MicroLink mainly for telex" said Philip "But when we finally get going full swing we'll be making use of Email as well"

LAST month's Basic program is quite sufficient to generate all the checksums you will ever need, but we are now going to look at the machine code version

This will allow experienced programmers to tailor it to their own needs, but you should note that you don't need to understand the inner workings of either version in order to use Get it Right III to check your listings

The program is written in pure machine code, with a simple Basic routine to make to boot tape or disc. So, unlike the original Get It Right!, there's no easy way for you to see what's going on when you use it.

Get It Right III is a fully re-locating piece of machine code – which means that it can place itself anywhere in memory adjusting automatically to take account of its new position. Even its work space is internal so it won't interfere with anything else you may have loaded including page 6 space.

If you want to write your own code to interface with ours then you will require a non-relocating version and that's what we've printed here.

You can specify a new origin address simply enough by changing the *=$0700 definition on line 140, but once you've assembled it for a given address it must always be loaded there.

Listing I is the assembly code for the cassette version and contains all the necessary information to make a boot tape.

If you want to make a disc version first type in the listing using an assembler/editor and then enter the extra lines given in Listing II. These will overwrite any cassette specific



ANDRÉ WILLEY gives a detailed breakdown of our checksum program

PROGRAM BREAKOOWN

180 – 210 Only applicable to the cassette version and contain the six boot header bytes

230 The first line of code to be run – simply jumps to the setup code starting at line 3490

250 – 320 The handler vector table for CIO use – refer to the recent series on I/O Channels for more information

360 – 450 Define the ten internal work bytes used for data storage and condition flags

470 – 690 Perform the CIO Open command. Firstly the buffer pointer and cumulative checksum digit are cleared then the zero page IOCB is accessed to find the address of the filespec buffer. This should contain either 'G:', 'S:' or 'G:P:' and the OUTVEC flag is set accordingly – or if neither is found an error 139 is generated. As with all CIO commands the routine is normally exited by setting the Y register to a value of one and performing an RTS instruction (lines 770 and 780)

710, 730 and 750 Perform the CIO Status, Special and Close functions – all of which simply return with the Y register set to one

800 and 810 Used to return an error 137 if the line length is over 255 characters (the maximum buffer length). Using Basic this should never happen but it's always best to check for all possibilities

830 and 840 Return an error 146 should the user mistakenly try to GET bytes from the 'G:' handler

880 – 930 Contain the 'Put-byte' routine. This dumps the byte into a buffer area, increments the buffer pointer and returns. If the byte is 155 – the End Of Line marker – then the routine jumps to the CALC section of the program which is where the actual checksum is created

950 – 1110 Output a single Ascii character to the screen or printer depending on the value of OUTVEC. The address of the relevant 'Put-byte' routine within the Operating System is retrieved from the appropriate CIO vector table and this is then pushed onto the stack. The byte to be printed is stored in the A register and the routine is called by executing an RTS.

This method works because a JSR instruction places the return address on to the stack in the same way we placed the 'Put-byte' address. When an RTS is found the address to return to is always pulled back off the stack – and so in this case it jumps to our 'Put-byte' routine.

This is a cheating way to generate an indirect JSR instruction which is not included in the standard 6502 instruction set.

1150 – 1340 Use this character output routine to print out the checksum line. Firstly the line number is printed – stopping at the first space found – then lines 1430 to 1490 get and print the first digit, lines

lines with the appropriate disc instructions

Once the disc version is assembled it can be used as an AUTORUN SYS file, or just a straightforward binary-load if required

The program breakdown shows how it all works But remember, the listing printed in last month's *Atari User* is functionally identical to this assembler version, but obviously has some practical differences due to its ability to locate itself anywhere in memory

This is achieved partly by increased use of relative branch instructions but mainly from the use of a relocation table near the end of the load space This ensures that any position dependent instructions are modified as they are moved from the load address of $3000 to their new location just above the original LOMEM

So now you have Get It Right III in two versions – a user vers on and one that you can modify to suit your own requirements We'd be very interested to hear your comments on the new system, and of any modifications or additions which you dedicated programmers might come up with

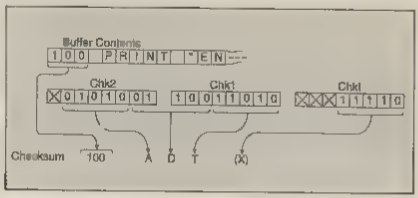


Figure I Calculating the checksum digits

Listing I Get it Right cassette version

```
10 ,GET IT RIGHT V/2 B
20 ,
30 ,WRITTEN BY ANDRE WILLEY, 1987
40 ,
50 ,N B  NON-RELOCATING CASS VERSION
60 ,
70 HATABS =  $031A
80 ZIOCB =  $20
90 EDVEC =  $E400
100 PRVEC = $E430
110 EOL =  $9B
120 SPACE = 32
130 ,
140     *=  $0700
150 ,
160 ,CASSETTE HEADER BLOCK
170 ,
180 START  BYTE 0
190       BYTE EFLN-START+1273/128
200       WORD START
210       WORD INIT
220 ,
230 RUN JMP SETUP
240 ,
250 VECTAB ,        HANDLER VECTORS
260       WORD OPEN-1
270       WORD CLOSE-1
280       .WORD GET 1
290       WORD PUT-1
300       WORD STATUS-1
310       .WORD SPECIAL 1
320       JMP EXIT
```

Turn to Page 59 ▶

1500 to 1660 print the second and lines 1670 to 1710 the third

Five bits of data are used for each digit, giving a number between 0 and 31 (see Figure I) This number is then used as an index nto the table of valid letters and numbers (lines 3060 and 3070) Note that letters such as I, O and Z are missing to avoid any confusion with the numbers 1, 0 and 2

Finally lines 1740 to 1840 print the cumulative digit surrounded by brackets, and then a Carriage Return The buffer is then cleared ready for the next line and CIO is exited via an RTS instruction

1960 – 2990 The part that actually calculates the checksum itself When a Carriage Return is detected the buffer is scanned, character by character adding up the coded values for each byte When the line is completed or when a rem is encountered, the print out routine starting at line 1150 is called The process used is quite complicated and is best understood in flow chart form – as shown in Figure II

3010 and 3020 Contain the text strings for rem and data to allow for testing and setting flags accordingly

3060 and 3070 Contain the list of valid characters which may be used for the checksum printouts

3090 – 3420 Provide the initialise code required for correct system reset handling This includes looking for a blank entry in the OS's handler address table (HATABS) and inserting the address for our own 'G' driver then setting MEMLO LOMEM and APPMHI to tell the system where our code ends After zeroing the temporary work space the INIT code returns control to the OS which in turn starts Basic

3440 Defines the 255 byte text buffer used for storing program lines until their checksum has been printed

3470 – 3700 Executed from the boot loader to set the CASINI (or DOSINI) vector to point to our initialise routine For disc users they also set up an extra JSR within the INIT code to execute the original DOSINI vector in order to maintain DOS's own pointers

This setup routine does two other things – it prints the 'Loaded OK' message and it sets Basic's Load in Progress flag (location 202) to a value of one This has the effect of making Basic do a cold start which will reset its pointers with the new LOMEM values to leave space for our code

Since this portion of machine code will only be needed at boot time it is placed outside the LOMEM protected area which means that it will be erased after it has done its job

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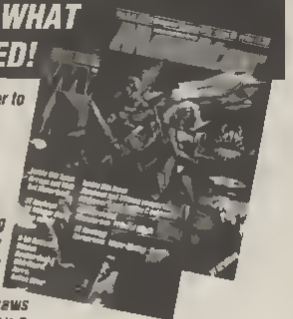
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```
0330 ;
0340 ;WORK DATA AREA
0350 ;
0360 CHK1 .BYTE 0    ;CUMULATIVE BYTE
0370 CHK1 .BYTE 0    ;CHECKSUM BYTE 1
0380 CHK2 .BYTE 0    ;CHECKSUM BYTE 2
0390 BUFPTR .BYTE 0  ;BUFFER POSITION
0400 DATA .BYTE 0    ;"=DATA MODE
0410 STRING .BYTE 0  ;1=IN STRING
0420 SNIET .BYTE 0   ; OF SNIETS
0430 OUTVEC .BYTE 0  ;P  ON S
0440 TEMP1 .BYTE 0
0450 TEMP2 .BYTE 0
0460 ;
0470 OPEN LDA #0
0480      STA CHK1
0490      STA BUFPTR
0500      LDY #2     ;TEST P  OR S
0510      LDA (ZIOCB+4),Y
0520      CMP #
0530      BNE OP1
0540      INY
0550      LDA (ZIOCB+4),Y
0560 OP1 CMP #EOL
0570      BEQ SET S
0580      CMP #S
0590      BEQ SET S
0600      CMP #E
0610      BEQ SET.S
0620      CMP #P     ;SET MODE= P
0630      BNE OPERR
0640      STA OUTVEC
0650      BEQ EXIT
0660 OPERR LDY #139  ;SET DEVICE NAK
0670      RTS
0680 SET S LDA #S    ;SET MODE S
0690      STA OUTVEC
0700 ;
0710 STATUS
0720 ;
0730 SPECIAL
0740 ;
0750 CLOSE
0760 ;
0770 EXIT LDY #1     ;RETURN (I/O OK)
0780      RTS
0790 ;
0800 OVERRUN LDY #137 ;TRUNCATED REC
0810      RTS
0820 ;
0830 GET LDY #146    ;NO GET FUNCTION
0840      RTS
0850 ;
0860 PUT LDY BUFPTR  ;TRANSFER BYTE
0870      CPY #255   ;OF DATA TO
0880      BEQ OVERRUN ;BUFFER AREA
0890      STA BUFFER,Y
0900      CMP #EOL    END-OF-LINE"
0910      BEQ DO SUM  ;YES - CALCULATE
0920      INC BUFPTR  ;NO   RETURN
0930      BNE EXIT
0940 ;
0950 CHOUT TAY       ;OUTPUT BYTE
0960      LDX #0
0970      LDA OUTVEC
0980      CMP #'P
0990      BEQ PRTR
1000 SCRN LDA EDVEC+7 ;GET E  DRIVER
1010      PHA        ;PUTBYTE ADDRESS
1020      LDA EDVEC+6 ;AND EXECUTE IT
1030      PHA
1040      TYA
1050      RTS
1060 PRTR LDA PRVEC+7 ;GET P  DRIVER
1070      PHA        ;PUTBYTE ADDRESS
1080      LDA PRVEC+6 ;AND EXECUTE IT
1090      PHA
1100      TYA
```

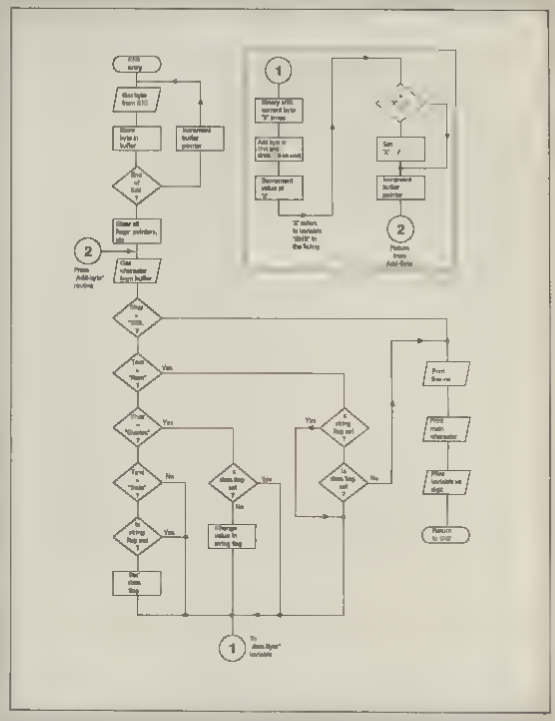


Figure II Flow chart showing the process used for adding a byte to the checksum

```
1110      RTS
1120 ;
1130 DO SUM JMP CALC
1140 ;
1150 PRINT LDY #255   ;PRINT LINE No.
1160 SP  INY
1170      LDA BUFFER,Y
1180      CMP #EOL
1190      BEQ SP1
1200      CMP #SPACE
1210      BNE SP
1220 SP1 CPY #5
1230      BCS P1
1240      STY TEMP1
1250      LDA #SPACE
1260      JSR CHOUT
1270      LDY TEMP1
1280      INY
1290      BNE SP1
1300 P1  LDY #0
1310 P2  STY TEMP1
1320      LDA BUFFER,Y
1330      CMP #SPACE
1340      BEQ P3
1350      CMP #EOL
1360      BEQ P3
1370      JSR CHOUT
1380      LDY TEMP1
1390      INY
1400      BNE P2
1410 P3  LDA #SPACE  ;PRINT SPACE
1420      JSR CHOUT
1430      LDA CHK2   ;GET DIGIT 1
1440      AND #124
1450      LSR A
1460      LSR A
1470      TAY
1480      LDA ASCII,Y
1490      JSR CHOUT   ; AND PRINT
1500      LDA CHK2   ;GET DIGIT 2
1510      AND #3
1520      ASL A
1530      ASL A
1540      ASL A
1550      STA TEMP1
1560      LDA CHK1
1570      AND #224
1580      LSR A
1590      LSR A
1600      LSR A
1610      LSR A
1620      LSR A
```

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```
1630     ORA TEMP1
1640     TAY
1650     LDA ASCII,Y
1660     JSR CHOUT    ,   AND PRINT
1670     LDA CHK1     GET DIGIT 3
1680     AND #31
1690     TAY
1700     LDA ASCII,Y
1710     JSR CHOUT    ,   AND PRINT
1720     LDA #SPACE
1730     JSR CHOUT
1740     LDA # (
1750     JSR CHOUT
1760     LDA CHK1     ,GET CUMULATIVE
1770     AND #31      ,DIGIT
1780     TAY
1790     LDA ASCII,Y
1800     JSR CHOUT    ,   AND PRINT
1810     LDA # )
1820     JSR CHOUT
1830     LDA #EOL     ,CARRIAGE RETURN
1840     JSR CHOUT
1850     TYA
1860     PHA
1870     LDA #0       ,CLEAR BUFFER
1880     TAY          ,READY FOR NEXT
1890 WIPE STA BUFFER,Y ,LINE OF DATA
1900     INY
1910     BNE WIPE
1920     PLA
1930     TAY
1940     RTS          ,RETURN TO CIO
1950 ,
1960 CALC LDY #0      ,CLEAR WORK DATA
1970     STY BUFPTR
1980     STY CHK1
1990     STY CHK2
2000     STY SHIFT
2010     STY DATA
2020     STY STRING
2030 ,
2040 MORE LDA BUFFER,Y ,GET CHARACTER
2050     CMP #EOL     END-OF-LINE?
2060     BNE TEST1
2070     JMP POUT
2080 ,
2090 TEST1 TYA        ,IS TEXT ITEM ?
2100     PHA
2110     DEY
2120     DEY
2130     DEY
2140     LDA BUFFER,Y
2150     CMP # '
2160     BEQ T1
2170     CMP #SPACE
2180     BNE TEST2
2190 T1  LDX #3
2200 T1A INY
2210     LDA BUFFER,Y
2220     CMP TEXTB-1,X
2230     BNE TEST2
2240     DEX
2250     BNE T1A
2260     PLA
2270     TAY
2280     LDA STRING
2290     BNE ADD
2300     LDA DATA
2310     BNE ADD      ,NO   ADD VALUE
2320     JMP POUT     ,YES - PRINTOUT
2330 ,
2340 TEST2 PLA        ,INSIDE QUOTES?
2350     TAY
2360     LDA BUFFER,Y
2370     CMP #
2380     BNE TEST3
2390     LDA DATA
2400     BNE ADD
2410     LDA STRING   ,SET STRING FLAG
2420     EOR #1
2430     AND #1
2440     STA STRING
2450     BNE ADD
2460 ,
2470 TEST3 TYA        ,IS TEXT DATA?
2480     PHA
2490     DEY
2500     DEY
2510     DEY
2520     LDA BUFFER,Y
2530     CMP #
2540     BEQ T3
2550     CMP #SPACE
2560     BNE ADD1
2570 T3  LDX #4
2580 T3A INY
2590     LDA BUFFER,Y
2600     CMP TEXTB-1,X
2610     BNE ADD1
2620     DEX
2630     BNE T3A
2640     LDA STRING
2650     BNE ADD1
2660     LDA #1       ,SET DATA FLAG
2670     STA DATA
2680 ,
2690 ADD1 PLA         ,ADD BYTE TO
2700     TAY          ,CHECKSUM
2710 ADD LDA #0
2720     STA TEMP2
2730     LDA BUFFER,Y ,GET BYTE
2740     STA TEMP1
2750     LDX SHIFT    ,SHIFT 1-8 BITS
2760     BEQ A3
2770 A1  ASL TEMP1
2780     ROL TEMP2
2790 A2  DEX
2800     BNE A1
2810 A3  LDA CHK1
2820     EOR TEMP2
2830     EOR TEMP1
2840     STA CHK1
2850     LDA CHK1
2860     CLC
2870     ADC TEMP1
2880     STA CHK1
2890     LDA CHK2
2900     ADC TEMP2
2910     STA CHK2
2920 ,
2930 NEXT INY
2940     DEC SHIFT
2950     BPL MORE1
2960     LDA #7
2970     STA SHIFT
2980 MORE1 JMP MORE
2990 ,
3000 TEXTB  BYTE MEM ,REM
3010 TEXTB  BYTE ATAD ,DATA
3020 ,
3030 ,PRINT DIGITS FOR CODES 0-31
3040 ,
3050 ASCII  BYTE 01234567890ACDEF
3060       BYTE "HNJKLRNPQRSTUVWXY
3070 ,
3080 INIT LDY #0      ADD 6  TO TABLE
3090 LOOK LDA HATABS,Y
3100     CMP #'G      FOUND
3110     BEQ FOUND
3120     CMP #'G
3130     BEQ SET_MEM ,ALREADY EXISTS
3140     INY
3150     INY
3160     INY
3170     CPY #35
3180     BNE LOOK
3190     JMP SET_MEM ,NO SPACE LEFT
3200 ,
3210 FOUND LDA #VECTAB#255 ,ADD ENTRY
3220     STA HATABS+1,Y
3230     LDA #VECTAB/256
3240     STA HATABS+2,Y
3250     LDA #'G
3260     STA HATABS,Y
3270 ,
3280 SET_MEM LDA #NEW_LOMEM#255
3290     STA $82E7    ,SET NEW LOMEM
3300     STA $0E
3310     STA 128
3320     LDA #NEW_LOMEM/256
3330     STA $82E8
3340     STA $0F
3350     STA 129
3360 ,
3370     LDX #9       ,ZERO WORK SPACE
3380     LDA #0
3390 IN3 STA CHKT,X
3400     DEX
3410     BPL IN3
3420     RTS
3430 ,
3440 BUFFER  DS 256  ,BUFFER SPACE
3450 NEW_LOMEM ,     END OF DRIVER
3460 ,
3470 MESS  BYTE $9b,'Set-IT RIGHT-IT -
Loaded OK',EOL,EOL,0
3480 ,
3490 SETUP LDA #$3C  ,STOP CASSETTE
3500     STA $0300
3510     LDY #0      ,PRINT LOADED
3520 R1  TYA
3530     PHA
3540     LDA MESS,Y
3550     BEQ R2
3560     JSR CHOUT
3570     PLA
3580     TAY
3590     INY
3600     BNE R1
3610 R2  PLA
3620 ,
3630     LDA #INIT&255 ,SET CASINI
3640     STA $02
3650     LDA #INIT/256
3660     STA $03
3670     INC 202      ,COLDSTART BASIC
3680 ,
3690     CLC          ,NO INIT
3700 FIN RTS
3710      END
```

Listing II Disc modifications for Listing I

```
50 ,N B  NON-RELOCATING DISC VERSION
0140     *= $2200    ,AFTER DOS RAM
0150 ,
0160 ,AUTORUN SYS FILE, SO NO NEED
0200 ,FOR BOOT SECTOR INFO
0210 ,
3005 INIT
3006 OLD_DOSINI JSR 0 ,(DUMMY VALUE)
3050 IN1 LDY #0       ADD 6  TO TABLE
3490 SETUP
3500 ,
3621     LDA $0C      ,STORE ORIGINAL
3622     STA OLD_DOSINI+1 ,VALUE FOR
3623     LDA $0D      ,DOSINI INTO OUR
3624     STA OLD_DOSINI+2 ,INIT CODE
3625 ,
3630     LDA #INIT&255 ,SET DOSINI
3640     STA $0C
3660     STA $00
3680     JMP INI
3690 FIN *- $0280
3700     .WORD RUN
```

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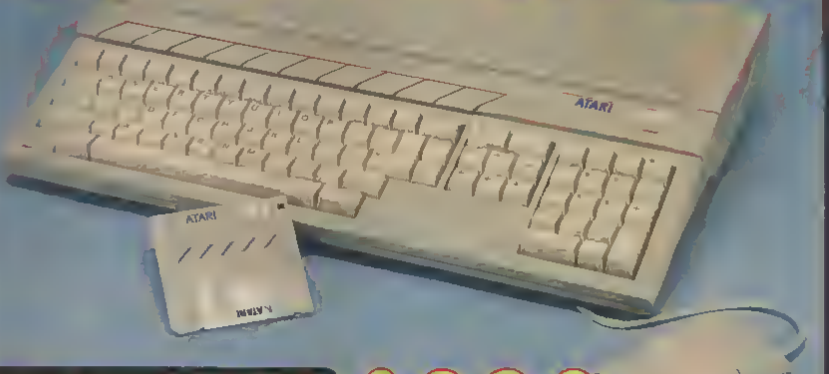
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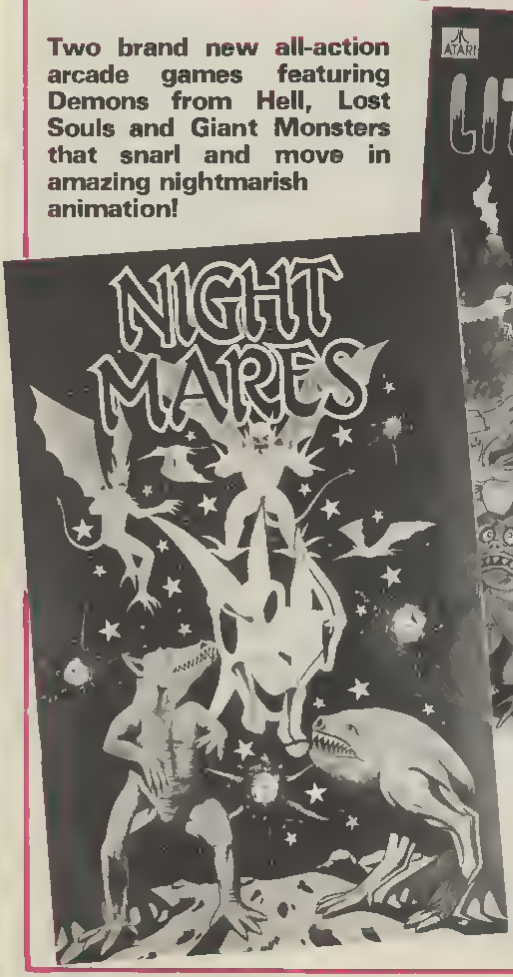
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