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PAGE 6 is a user's magazine and also serves as readers' support or subscription articles and programs. The aim is to explore ATARI computing through the exchange of information and knowledge. We will endeavour to pay for articles and programs where appropriate and we hope that you will gain satisfaction from seeing your work published. It may be hoped that you will learn from articles submitted by other readers. All published material is eligible for awards in the Annual Readers' Poll and may receive additional editorial awards as announced from time to time in the magazine.

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NEW MODELS?

Imagine you go like the Motor Show and see the car of your dreams the Ferrari-Deo G1.S Turbo and a few months later read the Sunday supplements saying 'is your dealer now? You rush down, order a marvellous blue custom painted model, pay your money and bring back the brochures knowing that in a few days time you will be the proud owner of the best car on the block. A few days later, you lose the part of an engine outside and look out to see a sports-motonic blue standard family saloon. 'Where's the turbo?' you cry. 'Ah says the salesman 'it is not quite ready yet, we will fit it later if you bring the car back'. 'What about the quad-sports custom?' you ask. 'well we could give you one later, but it has got a rattle!' says the salesman. And so it goes on. The final straw comes when the salesman says 'Never mind about this one though, sir, why not come down the showroom and see the new super turbo?'

If that story were true you would just tell the salesman what he could do with his car and go to the Lambert dealer next door and get what you want. But suppose it was a computer, you wouldn't be an idiot, would you?

Atari has just announced a 520ST to be shown at Comdex in Las Vegas at the end of November, along with 'several other new ST products' yet at the time of writing you can't even buy the 520ST package in the format promised and advertised. What you get is GEM, TOS and Logo, that's all. No CREAM, no GEM-Paint, no DOS. They will all come but isn't it just a bit galling to be reading about a new bigger memory computer when what you would really like is the sort of software you were promised when you bought your current machine? Admittedly many of the problems are outside Atari's control and they arrive along their best to provide substitute programs but it would have been better for all concerned if they had altered the 520ST to become established before announcing a machine that many people will consider under the 520ST 'on of Atari'.

The reason for such announcements is of course pure hype. Jack Tramiel needs to show the media men and his competitors that Atari is way ahead in all fields of personal computing and today's way is to announce something NEW. These products are not for the files of you and me but for the publicity. Maybe one day they will be available but in the meantime let's hope Atari gets down to establishing the 520ST as the computer of today by getting the software out and selling the machine in sufficient quantities to encourage the software houses to complete and release their packages.

ANOTHER YEAR

This issue marks the start of a new year and we wish all our readers success and prosperity in the coming year. 1986 is going to be one of the most exciting years for Atari so far as many users take the exciting step into 16-bits and many others explore new things on their 8-bit machines. The price of the 1050E and the 1050 disk drive is now lower than ever. Many new users will appear and many more will buy their first disk drive. I hope all of you find that PAGE 6 features something to interest you over the next six issues. Even if you are out of work and can't afford all the latest software you can still get immense fulfilment from your Atari by learning to program or by trying in the programs from PAGE 6 which are practically free.

Even though we may criticise from time to time, we will support Atari 100% in both the 16-bit and 8-bit fields. Believe it or not the success of the ST will determine the ongoing success of the 8088 as software houses recognise that Atari will be the same to support in 1986.

Enjoy PAGE 6 in '86. Enjoy Atari!

Leo Ellinger

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Free yourself from your reference manual!

You know the problem, typing in a listing from any magazine or book. You are suddenly faced with line after line of "Special" characters that are not shown on the keyboard, and that means searching through your reference manual just to type a program in. Well! now you can forget that problem with **Graf-Stix** controlled graphical character feed to the front of each individual key. You can find these "Special" characters instantly. And they are really easy to fit.

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LOWMAG SOFTWARE

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News

NEW ATARI RECORDER

Rumours that Atari are leaving the 8-bit field are "definitely not true" according to Les Player of Atari UK. The company remains fully committed to the the 8-bit machines and to demonstrate that commitment have released a new program recorder for the 800XL/130XE. The new unit is the first peripheral not to require a separate power pack as it draws power from the Serial I/O port of the computer.

Any owners who are looking for a replacement for the 8000 should contact their dealer now for price and availability.

SLOW WORD PROCESSORS PAY MORE!

If you have been deliberating over Superscript (reviewed in issue 17) you may have waited too long! Our review praised the program highly and now the program has been sold to MicroPro who produce the world famous Wordstar. They evidently were impressed by Superscript's capabilities and will now market it in the U.K. under the banner 'from the makers of Wordstar'. Trouble is the price has gone up to £79.95 but it is still a program well worth considering even though equivalent imported American word processors are cheaper.

DIGITAL INTEGRATION SUPPORTS ATARI

The U.K. software support for Atari continues with Digital Integration releasing their first Atari program, Fighter Pilot. Digital Integration was founded by Dave Marshall and Rod Smith who worked with the Royal Aircraft Establishment and transferred their skills to producing flight simulations for micros. They now have four in-house programmers, one of whom is a long time dedicated Atari enthusiast so we can hope to see more programs for the Atari in future.

MID PRICE TITLES FROM ARIOLASOFT

Ariolasoft have just released the first in their mid-price series for the Atari. All titles will retail at £9.95 on disk or £7.95 on cassette. D-Bug is an action strategy game set inside a computer in which you must discover and fix a fault in your computer before continuing with an interrupted game. Aisle Assassin is an arcade game of "kill or be killed" assassins (spiders) with lots of fast action. To follow will be Kaiser which is a simulation in which you control a small German province with the political ambition of becoming Kaiser of Germany.

ELEKTRAGLIDE

English Software are very excited about their new Atari program Elektraglide which they claim has 'features never, repeat never, seen before on a home computer racing game'. Basically a futuristic Pole Position it features junctions where the track splits in two, curved and straight tunnels, high speed 3-D hazards, perspective scrolling landscapes and steering sensitivity options.

Atari versions require 48k and cost £8.95 for cassette or £12.95 on disk.

The screen shots certainly look impressive.



FREE POSTERS AND A NEW ADVENTURE SYSTEM

Level 9 have recently released their latest graphic adventure for the Atari and to celebrate are offering FREE posters to anyone who sends a LARGE stamped addressed envelope to Level 9, 'The Worm In Paradise Poster', P.O.Box 19, Weston Super Mare, Avon, BS24 9J, UK. You don't have to buy the game and the offer is also open to overseas readers who should enclose International Reply Coupons.

The adventure is, of course, The Worm In Paradise, the 3rd part in the Silicon Dream trilogy but the first LEVEL 9 adventure written with their newly developed Adventure system. This will allow Level 9 to improve their adventures - already of a very high standard - even further. Improved text compression techniques allow ordinary English text to be compressed to half its size. Vocabulary is now in excess of 1000 words with an advanced parser which can understand a range of commands and it has multi-tasking. Using separate routines to handle keyboard input, run the game and draw the pictures the program allows players to 'type ahead' whilst the pictures are drawn.

The Worm In Paradise is available now at the usual price of £9.95

ST news

on page 13

SNOWFALL

PROGRAM

by

Fred Key

Look out of the window. It's Christmas and there should be snow. No? Well create a snow scene on your screen with SNOWFALL. Sit back and watch as the snow settles then stop the fall and watch as a thaw sets in!

Type in and run listing 1 and watch the snow fall. If you press 'T' the snow will stop and a slow thaw will set in. If you press 'W' it will start to snow again. Lines 1000-1100 contain the house and bird table scene and can be changed to any other scene you wish.

If you make the changes shown in Listing 2 you can watch the effects of a cross wind on the falling snow. Note that this listing must be added to Listing 1, it will not run on its own.

```

01 1 REM *****
02 2 REM W SNOWFALL - NO FEAR SW
03 3 REM W
04 4 REM W PAGE 5 PROGRAM - SNOWFALL
05 5 REM *****
06 10 REM SCREEN IS DIMENSIONED 2510
07 15 REM SCREEN W,8,15:SCREEN H,8,14:SET
08 16 REM I,11,8:SCREEN O,1,1
09 20 REM SCREEN
10 30 REM SCREEN DIMENSIONED
11 35 REM SCREEN DIM W,8:SCREEN H,8:
12 40 REM DIM I,11:SCREEN O,1
13 45 REM DIM W,8:SCREEN H,8:SCREEN
14 50 REM DIM I,11:SCREEN O,1
15 55 REM DIM W,8:SCREEN H,8:SCREEN
16 60 REM DIM I,11:SCREEN O,1
17 65 REM DIM W,8:SCREEN H,8:SCREEN
18 70 REM DIM I,11:SCREEN O,1
19 75 REM DIM W,8:SCREEN H,8:SCREEN
20 80 REM DIM I,11:SCREEN O,1
21 85 REM DIM W,8:SCREEN H,8:SCREEN
22 90 REM DIM I,11:SCREEN O,1
23 95 REM DIM W,8:SCREEN H,8:SCREEN
24 100 REM DIM I,11:SCREEN O,1
25 105 REM DIM W,8:SCREEN H,8:SCREEN
26 110 REM DIM I,11:SCREEN O,1
27 115 REM DIM W,8:SCREEN H,8:SCREEN
28 120 REM DIM I,11:SCREEN O,1
29 125 REM DIM W,8:SCREEN H,8:SCREEN
30 130 REM DIM I,11:SCREEN O,1
31 135 REM DIM W,8:SCREEN H,8:SCREEN
32 140 REM DIM I,11:SCREEN O,1
33 145 REM DIM W,8:SCREEN H,8:SCREEN
34 150 REM DIM I,11:SCREEN O,1
35 155 REM DIM W,8:SCREEN H,8:SCREEN
36 160 REM DIM I,11:SCREEN O,1
37 165 REM DIM W,8:SCREEN H,8:SCREEN
38 170 REM DIM I,11:SCREEN O,1
39 175 REM DIM W,8:SCREEN H,8:SCREEN
40 180 REM DIM I,11:SCREEN O,1
41 185 REM DIM W,8:SCREEN H,8:SCREEN
42 190 REM DIM I,11:SCREEN O,1
43 195 REM DIM W,8:SCREEN H,8:SCREEN
44 200 REM DIM I,11:SCREEN O,1
45 205 REM DIM W,8:SCREEN H,8:SCREEN
46 210 REM DIM I,11:SCREEN O,1
47 215 REM DIM W,8:SCREEN H,8:SCREEN
48 220 REM DIM I,11:SCREEN O,1
49 225 REM DIM W,8:SCREEN H,8:SCREEN
50 230 REM DIM I,11:SCREEN O,1
51 235 REM DIM W,8:SCREEN H,8:SCREEN
52 240 REM DIM I,11:SCREEN O,1
53 245 REM DIM W,8:SCREEN H,8:SCREEN
54 250 REM DIM I,11:SCREEN O,1
55 255 REM DIM W,8:SCREEN H,8:SCREEN
56 260 REM DIM I,11:SCREEN O,1
57 265 REM DIM W,8:SCREEN H,8:SCREEN
58 270 REM DIM I,11:SCREEN O,1
59 275 REM DIM W,8:SCREEN H,8:SCREEN
60 280 REM DIM I,11:SCREEN O,1
61 285 REM DIM W,8:SCREEN H,8:SCREEN
62 290 REM DIM I,11:SCREEN O,1
63 295 REM DIM W,8:SCREEN H,8:SCREEN
64 300 REM DIM I,11:SCREEN O,1
65 305 REM DIM W,8:SCREEN H,8:SCREEN
66 310 REM DIM I,11:SCREEN O,1
67 315 REM DIM W,8:SCREEN H,8:SCREEN
68 320 REM DIM I,11:SCREEN O,1
69 325 REM DIM W,8:SCREEN H,8:SCREEN
70 330 REM DIM I,11:SCREEN O,1
71 335 REM DIM W,8:SCREEN H,8:SCREEN
72 340 REM DIM I,11:SCREEN O,1
73 345 REM DIM W,8:SCREEN H,8:SCREEN
74 350 REM DIM I,11:SCREEN O,1
75 355 REM DIM W,8:SCREEN H,8:SCREEN
76 360 REM DIM I,11:SCREEN O,1
77 365 REM DIM W,8:SCREEN H,8:SCREEN
78 370 REM DIM I,11:SCREEN O,1
79 375 REM DIM W,8:SCREEN H,8:SCREEN
80 380 REM DIM I,11:SCREEN O,1
81 385 REM DIM W,8:SCREEN H,8:SCREEN
82 390 REM DIM I,11:SCREEN O,1
83 395 REM DIM W,8:SCREEN H,8:SCREEN
84 400 REM DIM I,11:SCREEN O,1
85 405 REM DIM W,8:SCREEN H,8:SCREEN
86 410 REM DIM I,11:SCREEN O,1
87 415 REM DIM W,8:SCREEN H,8:SCREEN
88 420 REM DIM I,11:SCREEN O,1
89 425 REM DIM W,8:SCREEN H,8:SCREEN
90 430 REM DIM I,11:SCREEN O,1
91 435 REM DIM W,8:SCREEN H,8:SCREEN
92 440 REM DIM I,11:SCREEN O,1
93 445 REM DIM W,8:SCREEN H,8:SCREEN
94 450 REM DIM I,11:SCREEN O,1
95 455 REM DIM W,8:SCREEN H,8:SCREEN
96 460 REM DIM I,11:SCREEN O,1
97 465 REM DIM W,8:SCREEN H,8:SCREEN
98 470 REM DIM I,11:SCREEN O,1
99 475 REM DIM W,8:SCREEN H,8:SCREEN
100 480 REM DIM I,11:SCREEN O,1

```

```

44 REM TRAP DIM LOCATE PL,10,80-1,PL,10,10-
45 REM LOCATE PL,10,80,PL,10,10,1,1
46 REM IF NOT AND Y=0 THEN RETURN
47 REM IF NOT THEN J=1:GOTO 448
48 REM IF NOT THEN J=1:GOTO 448
49 REM RETURN
50 REM PL,10,80:PL,10,80:PL,10,80:PL,10,80-
51 REM GOTO 448
52 REM RETURN
53 REM W=1:TRAP REM
54 REM LOCATE PL,10,80,PL,10,80
55 REM IF NOT THEN PL,10,80:PL,10,80:GOTO
56 REM
57 REM IF NOT THEN POP GOTO REM
58 REM PL,10,80:PL,10,80:PL,10,80:PL,10,80:GOTO
59 REM
60 REM POP GOTO REM
61 REM GOTO GOTO PL,10,80:GOTO 74,87
62 REM GOTO GOTO PL,10,80:GOTO 10,10
63 REM GOTO PL,10,80:GOTO 10,10
64 REM GOTO GOTO GOTO GOTO GOTO GOTO GOTO
65 REM GOTO 74,10:PL,10,80:GOTO 1
66 REM GOTO GOTO GOTO GOTO GOTO GOTO 2
67 REM GOTO 1
68 REM RETURN
69 REM POP GOTO 10
70 REM PL,10,80:PL,10,80:PL,10,80:PL,10,80-
71 REM TRAP GOTO
72 REM LOCATE PL,10,80,PL,10,10:PL,10,80
73 REM TRAP
74 REM NEXT I:GOTO REM

```

```

01 1 REM *****
02 2 REM W SNOWFALL 2 WITH CROSS WIND W
03 3 REM W AND LISTED TO LISTING 1
04 4 REM W *****
05 5 REM *****
06 10 REM SCREEN DIMENSIONED 2510
07 15 REM SCREEN W,8,15:SCREEN H,8,14:SET
08 16 REM I,11,8:SCREEN O,1,1
09 20 REM SCREEN
10 30 REM SCREEN DIMENSIONED
11 35 REM SCREEN DIM W,8:SCREEN H,8:
12 40 REM DIM I,11:SCREEN O,1
13 45 REM DIM W,8:SCREEN H,8:SCREEN
14 50 REM DIM I,11:SCREEN O,1
15 55 REM DIM W,8:SCREEN H,8:SCREEN
16 60 REM DIM I,11:SCREEN O,1
17 65 REM DIM W,8:SCREEN H,8:SCREEN
18 70 REM DIM I,11:SCREEN O,1
19 75 REM DIM W,8:SCREEN H,8:SCREEN
20 80 REM DIM I,11:SCREEN O,1
21 85 REM DIM W,8:SCREEN H,8:SCREEN
22 90 REM DIM I,11:SCREEN O,1
23 95 REM DIM W,8:SCREEN H,8:SCREEN
24 100 REM DIM I,11:SCREEN O,1
25 105 REM DIM W,8:SCREEN H,8:SCREEN
26 110 REM DIM I,11:SCREEN O,1
27 115 REM DIM W,8:SCREEN H,8:SCREEN
28 120 REM DIM I,11:SCREEN O,1
29 125 REM DIM W,8:SCREEN H,8:SCREEN
30 130 REM DIM I,11:SCREEN O,1
31 135 REM DIM W,8:SCREEN H,8:SCREEN
32 140 REM DIM I,11:SCREEN O,1
33 145 REM DIM W,8:SCREEN H,8:SCREEN
34 150 REM DIM I,11:SCREEN O,1
35 155 REM DIM W,8:SCREEN H,8:SCREEN
36 160 REM DIM I,11:SCREEN O,1
37 165 REM DIM W,8:SCREEN H,8:SCREEN
38 170 REM DIM I,11:SCREEN O,1
39 175 REM DIM W,8:SCREEN H,8:SCREEN
40 180 REM DIM I,11:SCREEN O,1
41 185 REM DIM W,8:SCREEN H,8:SCREEN
42 190 REM DIM I,11:SCREEN O,1
43 195 REM DIM W,8:SCREEN H,8:SCREEN
44 200 REM DIM I,11:SCREEN O,1
45 205 REM DIM W,8:SCREEN H,8:SCREEN
46 210 REM DIM I,11:SCREEN O,1
47 215 REM DIM W,8:SCREEN H,8:SCREEN
48 220 REM DIM I,11:SCREEN O,1
49 225 REM DIM W,8:SCREEN H,8:SCREEN
50 230 REM DIM I,11:SCREEN O,1
51 235 REM DIM W,8:SCREEN H,8:SCREEN
52 240 REM DIM I,11:SCREEN O,1
53 245 REM DIM W,8:SCREEN H,8:SCREEN
54 250 REM DIM I,11:SCREEN O,1
55 255 REM DIM W,8:SCREEN H,8:SCREEN
56 260 REM DIM I,11:SCREEN O,1
57 265 REM DIM W,8:SCREEN H,8:SCREEN
58 270 REM DIM I,11:SCREEN O,1
59 275 REM DIM W,8:SCREEN H,8:SCREEN
60 280 REM DIM I,11:SCREEN O,1
61 285 REM DIM W,8:SCREEN H,8:SCREEN
62 290 REM DIM I,11:SCREEN O,1
63 295 REM DIM W,8:SCREEN H,8:SCREEN
64 300 REM DIM I,11:SCREEN O,1
65 305 REM DIM W,8:SCREEN H,8:SCREEN
66 310 REM DIM I,11:SCREEN O,1
67 315 REM DIM W,8:SCREEN H,8:SCREEN
68 320 REM DIM I,11:SCREEN O,1
69 325 REM DIM W,8:SCREEN H,8:SCREEN
70 330 REM DIM I,11:SCREEN O,1
71 335 REM DIM W,8:SCREEN H,8:SCREEN
72 340 REM DIM I,11:SCREEN O,1
73 345 REM DIM W,8:SCREEN H,8:SCREEN
74 350 REM DIM I,11:SCREEN O,1
75 355 REM DIM W,8:SCREEN H,8:SCREEN
76 360 REM DIM I,11:SCREEN O,1
77 365 REM DIM W,8:SCREEN H,8:SCREEN
78 370 REM DIM I,11:SCREEN O,1
79 375 REM DIM W,8:SCREEN H,8:SCREEN
80 380 REM DIM I,11:SCREEN O,1
81 385 REM DIM W,8:SCREEN H,8:SCREEN
82 390 REM DIM I,11:SCREEN O,1
83 395 REM DIM W,8:SCREEN H,8:SCREEN
84 400 REM DIM I,11:SCREEN O,1
85 405 REM DIM W,8:SCREEN H,8:SCREEN
86 410 REM DIM I,11:SCREEN O,1
87 415 REM DIM W,8:SCREEN H,8:SCREEN
88 420 REM DIM I,11:SCREEN O,1
89 425 REM DIM W,8:SCREEN H,8:SCREEN
90 430 REM DIM I,11:SCREEN O,1
91 435 REM DIM W,8:SCREEN H,8:SCREEN
92 440 REM DIM I,11:SCREEN O,1
93 445 REM DIM W,8:SCREEN H,8:SCREEN
94 450 REM DIM I,11:SCREEN O,1
95 455 REM DIM W,8:SCREEN H,8:SCREEN
96 460 REM DIM I,11:SCREEN O,1
97 465 REM DIM W,8:SCREEN H,8:SCREEN
98 470 REM DIM I,11:SCREEN O,1
99 475 REM DIM W,8:SCREEN H,8:SCREEN
100 480 REM DIM I,11:SCREEN O,1

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The

CHASE

For those of you who enjoy more subtle or traditional games or who would like a good family game for up to four players, here is THE CHASE.

The game is based on the popular board game of 'Ludo' and each player has four counters of one colour and must retreat them from 'Base' onto the starting square of their own colour. The counters are then moved around the play area to arrive at Home' (Headquarters). The first player to remove all his counters into Headquarters is the winner. As with Ludo, if you land on a square which is already occupied by an opponent, you capture that square and your opponent's counter must be returned to Base. The game differs from Ludo in that only one counter can occupy any square so that if you are unlucky enough to land on a square already occupied by one of your own counters, you will capture your own counter thus returning it to Base.

More detailed instructions are included in the program and prompts are shown on screen throughout the game. No hotkeys are required.



by Nigel Llewellyn

```

00 70 COLOR DISPLAY 12,13,140000 0,0,0,0
01 74 FOR 000 TO 1000000000 0
02 78 FOR 000 000=00,00,00 00,00,0000 77,00
03 7900 700,100
04 80 FOR *****
05 100 0F 00000 AND 00001F0000000004 00
06 0000 0000
07 00 00 00000 AND 00001F00 0000 0000
08 100 0F 0000000000000004 0000 0000 000
09 07 100 POSITION 0,0000 00,00 0000 00 0000
100 0000 00 000000000 000 00 0000 00
11 100 0F 0000 0,0000 00,00 0000 000000
12 100 0F 0000 0,0000 00,00 0000 000000
13 100 0F 0000 0,0000 00,00 0000 000000
14 100 0F 0000 0,0000 00,00 0000 000000
15 100 0F 0000 0,0000 00,00 0000 000000
16 100 0F 0000 0,0000 00,00 0000 000000
17 100 0F 0000 0,0000 00,00 0000 000000
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 226 1226 DATA 650520,650648,650776,650904,651032,651160
 227 1227 DATA 65344

1020 printer

80 COLUMNS WITHOUT FUSS

In issue 13 we published a 1020 hand-to-device for producing listings in 80 columns. The listing would not work on the XL or XL models and several readers have asked for a cassette version. Here then is a simple solution submitted by Jeff Best.

Simply type the following line in direct mode with the program you wish to list in memory.

```
OPEN M.L.S.B."M"IT M.L."64"IPR88 DRI.13  
L3333333333 M
```

If you prefer you can save this with a line number of (say) 32000 and LIST it to disk or cassette. Then simply ENTER it with your program in memory and type GOTO 32000.

UPDATE

As this issue was prepared before issue 18 went out we don't know of any problems with the listings but we are sure there won't be any(!).

One apology though, we wrongly credited LESTER on page 58 to Mary Lynch when in fact it was written by Linda Tindler. Sorry Linda.

£100 REWARD

for information leading to the prosecution of any person or persons responsible for distributing unauthorised copies of 80 COLUMN Pack or other Computer Support products.

Upon prosecution of the person(s) concerned the reward of £100 plus a free original copy of Ultimem will be given to the person providing the information.

All replies treated in the strictest confidence. Your name will not be disclosed.

Please phone John Lawson at Computer Support on 01 361 7038.

ADVENTURE

Due to circumstances beyond our control, as they say, we cannot run the Adventure column by Garry Francis this issue. For the past 18 months disks have been flying back and forth across the world and it is a miracle that things have gone so smoothly. For the first time we did not receive Garry's column by the copy date for this issue and we are unable to give adventure fans their regular fix! Let's hope that Garry will be back soon.

In the meantime why not take this opportunity to drop Garry a line and let him know what you would like to see in future columns. Send your ideas, suggestions or comments to Garry Francis, Atari Computer Enthusiasts (N.S.W.), Adventure S.I.G., G.P.O.Box 4514, Sydney, N.S.W., Australia 2001

DATA BYTE

THE GRAPHICS ART DEPARTMENT

The GAD is the most powerful, most versatile graphics design program available for the Atari Home Computers. Its size flexibility and ease makes it a joy for people of all ages to paint with. It has more than 50 different commands.

An incredible 128 different colours can be used in any one picture. A three stage Zoom feature allows on the ability to do very detailed and intricate work.

Other features include the use of text in your pictures in several different sizes. Velocity draw mode, Ellipse draw, Circle draw, Triangle draw, Kablooiskape draw, Square draw and Ray Line draw are but a few of the drawing features available.

Invert, Rotate, Mirror, Flip and a Move feature make for easy design. The move feature allows one to move any part of the picture to the location of their choice. You can use the 40 point brushes available or create your own and save them to disk. Bold character allows pattern paint. Fill mode and Rainbow special effects make the GAD the best graphics program available for your Atari. If you own a printer you can obtain a printout of your creations. The GAD works with all printer models. You can use pictures created with the GAD in your own programs software etc.

There have been several graphics packages, but none that satisfied all your needs. Now, at last, the GAD has arrived. Don't believe us, see for yourself. You'll be amazed.

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JANUARY 1986

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SOFTWARE UPDATE

Early purchasers of the 528ST should now have a disk-based version of BASIC. The disk and manuals were sent out to distributors in mid-November and may be collected from your dealer free of charge. The disk includes ST WRITER as an alternative (though not a substitute) to GemWrite.

Atari say that Digital Research has promised GemWrite and GemPaint 'during November' but it will still be necessary for Atari to complete the manuals for these products. Atari cannot yet sell the finished products as received but some progress should be evident by the time you read this.

The final decision on the form in which BASIC will be available has not yet been taken but it is likely that Atari will issue a voucher which interested users can take to their local BBS dealer for a free copy of BASIC. It should be stressed that BASIC on its own is worthless so it is only worth obtaining a copy if you intend to purchase BBS based applications.

TDS ON ROM

Although there have been delays, GEM/TDS should now be available on ROM. The upgrade is available from your dealer/distributor by returning the keyboard and which will be upgraded for a 'nominal' fee of £21. Silica Shop will however provide the upgrade free of charge to customers who purchased STs from them. Atari claim that the recent settlement between Apple and DR will not affect TDS/GEM and do not plan to make alterations at the present time. Any future alterations which may become necessary will be cosmetic only and will not affect the performance of any previously released software.

ST WARRANTY

Business in the States that Atari do not provide a warranty are certainly not true in the U.K. Les Pleyer of Atari explained that Atari have passed the warranty to the distributors who were carefully chosen on their ability to effect the necessary repairs or service. In some cases your dealer will provide the warranty but either way the ST comes with a full 1 year warranty. Any problems will be sorted out by your dealer or distributor.

GEM BUG

Wow! Early versions of GEM/TDS have a bug which prevents folders that have an eight letter file name from being opened. Once a file is in, there is no way out! The initial solution is to ensure that you use short file names for folders but if you have got yourself in this predicament the only answer is to use a disk editor to change the filename on disk. Hippo Disk Utilities is available now for this job.

2685T?

'End of this year or beginning of next year'. Apparently there are problems with the modulator.

SOFTWARE AVAILABLE NOW ... All of the Infocore advances, Hippo C, Hippo Disk Utilities, Hippo Spell, Hippo Simple, E-Link, E-Base, files, PC Interconnect, Blank of the Unknown Word Processor, Express Letter Writer, Ultima 2 'New' is the beginning of November so six weeks have passed, check your dealer.

STOP PRESS ... **PARA SYSTEMS INC.** of California have announced the formation of **PARA SYSTEMS LTD** to handle European distribution of all PARA products. Initial products are **PARA Writer**, **PARA Hippo C** and a **Hard Disk Drive**. Your local dealer will be able to stock these products. **PARA Systems Ltd** can be contacted at 18, Greenlands Lane, Pinneroad, Great Missenden, Bucks. Tel. 02986 6817

FREE SOFTWARE

As well as STWRITER, which owners should have, Atari are offering a superb painting program called NextChrome. Drawing with a mouse is so easy and NextChrome, even though it was never intended as a commercial program, is far superior to any paint program on the 8-bit machines. You can get a copy from your dealer for the price of a disk. You will need a colour monitor.

COLOUR MONITOR

Atari's colour monitor has still not been released but in the meantime there are cheaper alternatives. The Philips VideoRGB Monitor CM 8133 costs at around £279 (cable extra) and can double as a monitor for the 1300E or 800XL. Quality is superb. The ST really comes alive in colour!

Winton Computers in Gwent can supply this monitor and a cable for the ST. Phone 0275 214118 for price and details.

OTHER NEWS

Several of the software packages demonstrated at PCW have been taken up by ANTEC magazine for U.S. distribution thus ensuring smaller U.K. developers an outlet in the States.

Silica Shop have over 170 'announced' software packages in their latest ST price list from 61 different companies, most of them British. In addition they list another 88 companies who will be developing software but who are not yet prepared to announce titles. If you can't find the software you want in 1986 you are not looking!

One American company that has really taken the ST to heart is Hippopotamus Software who work among the very first to complete software packages. Many of these were originally written for the Macintosh but have been converted to the ST in super quick time. An amazing variety of finished (and available) products include an Almanac with over 12,000 entries, Jokes and Quizzes, Random and Disk Utilities. In the pipeline are an Express Painter, a full megabyte upgrade, a spelling checker, and Hippo-er which is a collection of hi-res pictures for use with Atari's NextChrome and Backgrounds. Several of these products will be available from Software Express.

THE PRESS RELEASES

TDI SOFTWARE LTD ... announce TDI MODULA-2/ST which allows programmers to write GEM applications for the 528ST in a true 32-bit language. Modula-2 is an advanced language that uses Pascal will learn in a few days. Several business packages and databases are planned under the Modula-2 system. Details from TDI 0272 742 796

TDI SOFTWARE LTD ... UCSD Pascal/P-SYSTEM operating system for the 528ST. A wide range of single and multi-user P-SYSTEM software has already been developed with over 140 packages for business, accounting, CAD and vertical markets. Much of this software will rapidly become available for the ST. UCSD Pascal is available immediately. Details from TDI at 0272 742796

GST COMPUTER SYSTEMS ... GSTC - a C compiler with full GEM window support, standard libraries, simple assembler, editor and linker at £60. GST ASM - a full 68000 macro assembler complete with editor at £40 and GST EDIT, a multi window GEM screen editor at £25. Details from Electric Software Ltd. Tel. 9054 8199

ASSEMBLERS FOR THE ATARI 520ST

A review of the Kuma K-SERA assembler and Metacomex Macro Assembler

By Matthew Jones

As someone who has written several programs using an IBM macro assembler (AMAC), I was interested to see what sort of facilities the macro assemblers for the 1st bit 520ST would give me. The two I have had the opportunity to review so far are obviously meant for two different types of user.

The Kuma K-SERA is actually a complete editor / assembler / linker / debugger program. It provides all you need to write programs in 68000 assembly language. The problem is, so with many programs that 'do everything', it doesn't do some parts very well. The first thing that any programmer uses (on the computer) is the editor. The editor of the K-SERA is a simple line editor, i.e. one line at a time, with facilities to cursor up-and-down. It seemed to me using EDLIN on the IBM PC, which is pretty poor, but its companion I have to say that the K-SERA editor is worse.

The most noticeably missing feature is the ability to list the two ends each side of the line you are working on (the current line), the P command being nowhere near good enough as it shows the current line.

Commands available are: Insert text, Kill current line, Target to line (change current line), Bottom of text, Up a line, Down a line, Print (display) a line, Zap (delete) a line, Locate line, Kill text, Old (undelete) text and Having (no) sex lines. To get the best out of the K-SERA, I would use a dedicated editor for the major typing, and only use this basic editor for small debugging changes.

The assembler itself handles all of the standard (Motorola) instructions (as does the Metacomex Macro Assembler). What is of relevance to the programmer is the extra facilities that the assembler gives, provided by pseudo ops. (A standard line of machine code consists of an optional label, a symbol which identifies particular memory locations), an opcode (the instruction the 68000 understands), an optional operand (the data the instruction acts upon), and an optional comment line. A pseudo-op is an opcode which is not considered to be an instruction for the 68000, but is an instruction to be acted on by the assembler. The table shows a general comparison of most of the available pseudops in AMAC, the Kura Macro Assembler for 8-bit machines, MASM5, the DOS 8-bit macro assembler, and the 68000 processor K-SERA and Metacomex Macro Assembler (referred to hereafter as ASSEM, as it is called on the disk).

One of the most noticeable observations about K-SERA is that it is only suitable for small programs. When I say small, I mean however much you can fit into the obj and code buffers at the same time. K-SERA's most noticeable missing pseudo op is INCLUDE. Without this you cannot assemble very large programs, reading through several files to produce a final big machine loadable (object code) file. Not only that, but the object file cannot be written to disk until after assembly. The advantage of this method of working is that it is very fast, and should allow a very fast edit-assemble-run-debug cycle.

One thing that users of the 1st bit assemblers will find new is that most 68000 programs will need 'linking' (except BASIC and LOGO). Linking is needed because the programs are assembled (or compiled) to an object code file which cannot be loaded and run as is, but must be converted first. This allows programs to be written and assembled in several smaller more manageable parts and put together (linked) later. The K-SERA however does not need this stage (as it cannot generate code in sections), and the code produced can be run straight away. A limited linking facility is provided, but it is of little use as it only produces absolute and relocatable code. DOS, the 520ST disk operating system, generally

uses relocatable code which allows it to have several programs loaded at the same time. Absolute code always loads at the same place in memory, which may cause compatibility problems later.

Kuma does not call the K-SERA a macro assembler, just an assembler, but it does have macro facilities. A macro is a pre-defined piece of code that can be used as though it were a machine opcode. For instance, you may want to have the same bit flag at several places in your program. The assembler code to do this would be:

```
MOVE    #T,(SP)    ;move bit clear to stack
MOVE    #L,(SP)    ;ADDRESS location 2
TRAP    #1          ;call GEMDOS
ADDQ.L  #4,SP      ;restore stack
```

By changing this to:

```
BELL:  MACRO      ;start of macro
MOVE    #T,(SP)    ;move bit clear to stack
MOVE    #L,(SP)    ;GEMDOS location 2
TRAP    #1          ;call GEMDOS
ADDQ.L  #4,SP      ;restore stack
ENDM      ;end of macro-definition
```

the assembler remembers the text when it is read. The programmer can then use it as any time by simply using the command:

```
BELL          ;ring bell
```

The macro assembler will replace this with the previously defined code. This looks similar to subroutines, but the code is copied at each use, a subroutine only exists in one place. Parameters can also be passed to the macro definition, so BELL 4 could ring the bell four times.

ASSEM, the Metacomex assembler, has a very full featured macro facility. In fact, most of the things that it does are done very well. For instance it can use all available program segments (a separate section for the actual code, the data and the associated data), the K-SERA only has the former two. The other files produced must be linked before they can be run, and the Digital Research LINK80 and RELMOD programs are provided for this. LINK80 is too complicated for this review, but comes with GEM libraries and various object files which the serious programmer will need for the best use of the computer. No documentation is provided for these, so it may cost extra.

When it comes to the problems of ASSEM, I have only relatively minor quibbles. K-SERA, and all other assemblers I have known (IBM PC as well) start a comment at the end of a line with a semicolon (;). ASSEM will accept the semicolon start, but it also assumes that any text after the operand, starting with a space character is also a comment. This turns out to be a great mistake. I can imagine accidental spaces occurring during an edit which cause the loss of part of the operand to ASSEM, leaving a syntactically correct line which is actually wrong, which means I would be searching for hours (days) for a problem that most other assemblers would list as an error due to the lack of semicolon. Another quibble is that the EQU pseudo-op cannot be overcharged with the equals (=) character. I so much prefer it.

Metacomex provide all you need to write programs on their disk. Their screen editor, ED, is provided. I have been using the

The Last Kingdom of Zhul West an Adventure Twin Pack from Talent Computer Systems £24.95

One of the temptations of the ST for existing Atari owners will be the availability of new software which will not become available on the 8-bit machines. A vast range of programs currently available for the QL and Macintosh will become available in the months ahead and one of the first conversions from the QL comes from Talent Computer Systems.

Of all the different types of entertainment software, the one form that is likely to be most successful on the ST is the adventure and already Infocom have their entire range available. For an existing Atari adventurer this will not be sufficient to make the commitment but the availability of two brand new adventures on one disk at almost half the price of Infocom games must be tempting. The two adventures are in different styles with WEST as an introductory adventure featuring a great deal of 'real-time' action and The Last Kingdom of Zhul as the 'classic' adventure based more on the dungeons and dragons style with fantasy, fighting, treasures and difficult puzzles and mazes.

WEST is set in 1885 with you on the track of a notorious gang of robbers. They have hidden the proceeds of a bank raid in town and you must recover this loot while concealing - and out-gunning - the robbers and working your way through towns. The adventure follows the familiar format with reasonably lengthy location descriptions and plenty of action. Locations are described in full when you first visit them but are described briefly when you next visit unless you LOOK around. One of the first things you will notice is the warden appearance of mean looking robbers and other protagonists who will kill you if you do not act quickly enough. This does not mean thinking of the right thing to do but literally reacting quickly for the events continue as you think and you are likely to get killed before typing the next command. Unfortunately this aspect can become rather frustrating as it is quite easy to die just after being re-incarnated due to some random events. You have three lives and are re-incarnated each time at the starting location minus any items you were carrying which remain with your 'other body'. As you progress through the game a second time you see the results of all your earlier actions and you come to 'a familiar looking body' here you can pick up all items you previously had before proceeding further. Some rooms seem slightly illogical like your horse who acts like a homestead housing pigeon by wandering off and then always finding you a few miles later wherever you may be, but in general there are plenty of puzzles to solve in time honoured tradition. Talent say that this is the easier adventure but it should prove entertaining all.

The Last Kingdom of Zhul is much more in the classic vein with time to think and solve puzzles, traps for the unwary and every two hundred locations to explore. Set in another time and place you set forth to find the treasures hidden long ago by dwarves in the Doomed City. As usual many have failed before you with the guidance of your friend Eldemar you seek the Lost Kingdom and its treasures. Eldemar does not seem to be of much help as he sits in a bar in the forest acting as a bar for your return treasures in, so you are really on your own. As well as exploring you must look after your health by drinking and eating at the appropriate times and healing yourself following fights. You must find a way to communicate with the various dwarves that appear and magically disappear and avoid the usual perils of death. You have three lives which are given to you with increasing impu-

tenance by some 'foreign being' before being condemned to re-live the game. Points are scored for finding and recovering treasures, visiting difficult locations and for finishing the game. Points are deducted for getting killed, saving the game or using bad language! To become a Grandmaster requires that you complete the game with one life and without saving!

I am unable to comment on complexity as compared with Infocom, as the review versions were specially scaled down demonstration copies but from the first of the initial moves and encounters I am sure expert adventurers will not be disappointed. Novices will find this package very pleasing for it comes with a twenty page introduction which includes many helpful ideas for those and other adventures. Quite welcome too as many people buy adventures on recommendation from more expert players only to find themselves stuck from the start.

Common to both games is a novel game save feature which allows you to compose up to a screen of notes to log your memory later on. Very useful if you have limited time to play or become involved in other adventures between sessions. Both games work on the monochrome or colour monitor using 80 columns on both and the only difference is a title picture which is loaded on the colour monitor but which has no effect on the games. It seems to be there simply as an excuse to use the colour!

Two adventures for £24.95 can't be bad when compared to some prices on the 8-bit systems and these represent one small reason for considering yourself to an ST!

K-RAM Karna £29.95

One of the first things any programmer will require is a set of utilities and the first of these to become available in the U.K. is the Karna Ramdisk. A Ramdisk allows a portion of memory to be set aside and protected for use as a 'disk drive'. All the usual functions of a drive can be used such as saving, copying, deleting files etc. but at phenomenal speed and without ending up with bits of junk on your disks. Chunks of code can be worked on, saved to Ramdisk, talked up and committed to floppy disk only when completed. 8-bit users will not have appreciated the power of a Ramdisk unless they have the I.H.M.E. but there is no denying that the Ramdisk is a very useful utility.

K-RAM allows you to set up any number of Ramdisks. Depending on memory, and to configure them to whatever size you wish. Each ramdisk created will have its own icon on screen which can be used in the same way as existing icons. When first run K-RAM indicates how much memory is available and allocates a default of half of this for the first ramdisk. You may change this to any reasonable figure or do the opposite by telling K-RAM how much memory you require to reserve for your program and it will allocate the rest in the ramdisk. To install multiple ramdisks you merely run the program again.

With TOS on disk only 1024 of memory is available and the use of multiple ramdisks is fairly restricted but once TOS is on ROM K-RAM will allow programmers great flexibility. An additional facility allows you to toggle the write parity to the floppy disk thus allowing writes to disk to occur nearly 50% faster while most advanced users can customise the BIOS parameter block that K-RAM uses to change the size of the directory or arranging more disk space or alternatively allowing more file names to be held in the directory.

Programmers will find that K-RAM fits nicely into their utility library.

PROGRAMS

PROGRAMS?

What do you do with an ST that comes only with Logo, if you don't know anything about Logo? Play around in the menu and you may like to load up Logo and type in these snippets.

First we have BOB which shows a most strange set of characters actually built into the character set of the ST. Anyone you recognise?

```
TO BOB
TYPE CHAR 28 TYPE CHAR 29
TYPE CHAR 30 TYPE CHAR 31
BOB
END
```

Once typed in, you will get the message 'BOB defined'. Open up the dialing window to full screen and type BOB [RETURN].

Now try SQUARES (a much longer programming exercise, wow!)

```
TO SQUARES :SIDE
FD :SIDE RIGHT 90
MAKE "SIDE :SIDE+1
IF :SIDE<>80 [REPEAT 1]
SQUARES :SIDE
END
```

```
TO REV :ADD
MAKE "SIDE :SIDE - 2
BACK :SIDE LEFT 90
IF :SIDE<1 [MAKE "ADD :ADD+1 SQUARES :ADD]
REV :SIDE
END
```

When you have typed it you will get the messages SQUARES defined and REV defined. Type SQUARES 4 [RETURN] and watch. Try changing the line colour and background colour on the Settings. Typing CS will clear the screen and activate your revised colours.

At last it's something to type in, but surely you can do better? Any demos would be welcome.

ST Dust Covers from PAGE 6

52007	4.95
317" 3FD34 Disk Drive	2.95
Stacked 317" Disk Drives (3)	3.95
50324 Mouse/Barcode Reader	4.95

REVIEW

Q. What has over 35,000 facts?

HIPPO ALMANAC Hippopotamus Software £14.95

Imagine a disk containing over 35,000 facts and figures on many different subjects all available at the typing of a sentence or question. Subjects as diverse as geography, history, unit conversions, sports, languages, science, awards and prizes. These and many more are all contained on the Hippo Almanac. A trivia fan's dream come true and a chance to educate yourself and your family? Well, yes, but there are a number of limitations, it is not quite like having an encyclopedia.

As with most databases you must ask questions that the program is capable of understanding and you will find that the type of question you can ask is fairly limited however this is not to say that there are not clever aspects to the Almanac. Initially you enter the time and date of using the program and your situation in the world which are then used as reference points. You can ask 'How many days to December 25?' or 'How far is it to Los Angeles?' or 'What time is it in Tokyo?'. You can ask 'from... to?' type questions or 'What', 'Where' or 'What happened on?' questions and provided you stay within the main format you will get the answer required.

You can ask factual questions about any of the subjects in each main category or call up a help screen which tells you what sub-categories are available. Much of the information, such as telephone codes, is U.S. based and therefore of little use but there are certainly enough facts to keep you occupied for some time. Let's give you a couple of examples of how the Almanac breaks down a category. In Geography you may ask the distance between any two places, where any city or country is or what cities are in a given country. You may ask the population of cities, states and countries, the area of states or countries, what currency is used in a particular country and capitals. In addition there is U.S. specific information such as telephone codes. In the Science category you can find out the size, gravity, length of day and year, distance and density of all planets in the solar system or all the many geometric or mathematical formulas.

Perhaps one of the most useful aspects is the ability to add or delete your own information and recall it by keyword. For instance you can create your own telephone directory by typing 'Remember PAGE 6 - 0785 411 57'. The program will save this to disk and when you type 'PAGE 6' it will recall the number. To delete information, you just type 'forget ...'. With a little bit of thought this could make Hippo Almanac one of the cheapest databases for personal use that you are likely to find. You could list telephone numbers, addresses, birthdays or whatever and search by any keyword. If, for example you wanted to telephone someone you knew in London you need only type 'W1' and you will get a list of London numbers on your directory.

If you accept that there are some limitations and that a certain amount of information is relevant only to the U.S. then you will get a great deal of information from the Almanac. You can use it for educational purposes but most likely you will just use it as a form of trivial pursuit. There is nothing wrong with that, it could spend many more hours digging up trivial facts than I could playing Space Invaders!

Hippo Almanac is available from Software Design.

MAGFILE

Over the last couple of years I have built up a considerable collection of magazines, books and technical data for the ATARI computers and it had become quite difficult to locate a particular piece of information. I badly needed a filing or indexing program and as I could not afford a commercial 'database' type program, I looked around in the magazines for a suitable program. ANALOG had a couple but they did not do what I wanted, so I set about writing MAGFILE. While it is specifically set up for computer information from magazines, there is no reason why the section headings could not be changed to allow the program to function for other record keeping purposes.

HOW IT WORKS

After a brief initialisation and a title screen, a menu of 12 categories is displayed. These have been chosen after a great deal of trial and error but, of course they may be changed if desired. The idea is to choose one from the left column and one from the right, thereby forming an unique 2-word category file reference. There are a maximum of 120 combinations but some will never be used. The choices will be highlighted and any incorrect keypresses are error-trapped. A second menu will now appear giving 7 options and again your choice will be highlighted.

The functions on this menu are as follows:

OPEN NEW FILE - This is the first choice for every new selection. It will create a file on-disk with a filename extension being formed by the letter and number of your chosen two-word category. This file can be updated at any time by using:

APPEND CURRENT FILE - All new records are stored using this function. When selected, you will be asked the following:

- TITLE** Type up to 14 characters and press RETURN.
MEDIA Type the first letter of one of the 7 options shown and press RETURN.
LOCATION Type up to 10 characters and press RETURN.
DETAILS Type up to 10 characters and press RETURN.

Your entries will then be displayed as a record and you can accept it for filing or refuse it if there is a mistake. You can then make more entries or return to the category menu.

ERASE OLD FILE - This is pretty drastic as it will cause the loss of all records in the selected file. Use with caution!

an indexing and record keeping utility by Chris Davis

LIST CONTENTS OF FILE - This will display all the 40 byte records in a file, one after the other, on a filing card. When a card is full, a keypress will display the next one. The top line will show the file no., the filename and the card no.

DELETE RECORD - This allows you to remove any number of records from a file. Records will be displayed one at a time and may be retained or deleted as desired.

If you select the wrong category the ESC key may be used to start over again.

The white line across the middle of the screen is for messages and comments. All likely errors have been trapped and should ensure no loss of records or halting of the program. Keep the volume on your TV or monitor turned up when using this program as the resultant noise can prove helpful.

WILDCARD CATEGORIES

As already mentioned there are 12 categories to choose from. The bottom one in each column is designated as a 'wildcard'. Either one can be used with another category to make up a file. Both can be used together if desired. When selected, your disk-drive will search for the file. If found, the alternative category will replace the word 'WILDCARD' in the menu. If not found, you will be prompted to type your new category. Your typing will print in inverse which is correct. Press RETURN after typing and the new entry will appear in the menu. The program now continues as before.

The only way to stop the program is with the SYSTEM RESET key, however DO NOT PRESS IT DURING DISK I/O as this could result in the complete loss of a file.

I have tested MAGFILE on DOS 1.0 / 1.5 and DOS 3.0 and it seems happy. There are 3 machine language routines included none of which are unusual, so there should be no problems on any machine. The routines are used in lines 130 which is the 'numbers' routine used in the opening title, line 150 which is a VBI used to force inverse video and capitals on or off as necessary and line 170 which is a DLI used to change the colour of the top line of the filing card.

I may consider adding search and sort routines at a later date if there is a need. Any comments or other suggestions for improvements would be welcome via PAGE 6.

THE DISPLAY LIST INTERRUPT

The Display List Interrupt is a highly advanced feature found on few other personal computers even today - not bad for a machine first designed in 1979! The DLI really needs an article all to itself, but hopefully this will provide enough of the basic information to get you started. For an extensive discussion, see 'The Atari', chapter five.

The idea behind the DLI is that when Atari finds a DLI instruction in the DL, the 6502 main processor is forced to stop what ever it is doing and carry out a short machine language routine supplied by the user. Unfortunately, due to timing considerations, there is no way of knowing exactly when on a given mode line the desired effect would actually take place. For example, a colour change could occur part way along a mode line - and exactly where this change occurred might vary each time the DLI was called. There is a solution however. Storing any number into register 34282 (WSTNC; D40A hex) forces the microprocessor to wait until the horizontal blank period before carrying out the required changes. Any changes will therefore appear on the line below that carrying the DLI instruction.

What sort of things can you do? Your routine must be short, and therefore changes are limited, but you can change colour registers, alter other graphics registers such as the character base register, create sound effects and manipulate player-missile graphics. Some examples are given below.

```
00 10 000 0000000000000000
01 20 000 0000000000000000
02 30 000 0000000000000000
03 40 000 0000000000000000
04 50 000 0000000000000000
05 60 000 0000000000000000
06 70 000 0000000000000000
07 80 000 0000000000000000
08 90 000 0000000000000000
09 100 000 0000000000000000
11 20 000 0000000000000000
12 30 000 0000000000000000
13 40 000 0000000000000000
14 50 000 0000000000000000
15 60 000 0000000000000000
16 70 000 0000000000000000
17 80 000 0000000000000000
18 90 000 0000000000000000
19 100 000 0000000000000000
20 110 000 0000000000000000
21 120 000 0000000000000000
22 130 000 0000000000000000
23 140 000 0000000000000000
24 150 000 0000000000000000
25 160 000 0000000000000000
26 170 000 0000000000000000
27 180 000 0000000000000000
28 190 000 0000000000000000
29 200 000 0000000000000000
30 210 000 0000000000000000
31 220 000 0000000000000000
32 230 000 0000000000000000
33 240 000 0000000000000000
34 250 000 0000000000000000
35 260 000 0000000000000000
36 270 000 0000000000000000
37 280 000 0000000000000000
38 290 000 0000000000000000
39 300 000 0000000000000000
40 310 000 0000000000000000
41 320 000 0000000000000000
42 330 000 0000000000000000
43 340 000 0000000000000000
44 350 000 0000000000000000
45 360 000 0000000000000000
46 370 000 0000000000000000
47 380 000 0000000000000000
48 390 000 0000000000000000
49 400 000 0000000000000000
50 410 000 0000000000000000
51 420 000 0000000000000000
52 430 000 0000000000000000
53 440 000 0000000000000000
54 450 000 0000000000000000
55 460 000 0000000000000000
56 470 000 0000000000000000
57 480 000 0000000000000000
58 490 000 0000000000000000
59 500 000 0000000000000000
60 510 000 0000000000000000
61 520 000 0000000000000000
62 530 000 0000000000000000
63 540 000 0000000000000000
64 550 000 0000000000000000
65 560 000 0000000000000000
66 570 000 0000000000000000
67 580 000 0000000000000000
68 590 000 0000000000000000
69 600 000 0000000000000000
70 610 000 0000000000000000
71 620 000 0000000000000000
72 630 000 0000000000000000
73 640 000 0000000000000000
74 650 000 0000000000000000
75 660 000 0000000000000000
76 670 000 0000000000000000
77 680 000 0000000000000000
78 690 000 0000000000000000
79 700 000 0000000000000000
80 710 000 0000000000000000
81 720 000 0000000000000000
82 730 000 0000000000000000
83 740 000 0000000000000000
84 750 000 0000000000000000
85 760 000 0000000000000000
86 770 000 0000000000000000
87 780 000 0000000000000000
88 790 000 0000000000000000
89 800 000 0000000000000000
90 810 000 0000000000000000
91 820 000 0000000000000000
92 830 000 0000000000000000
93 840 000 0000000000000000
94 850 000 0000000000000000
95 860 000 0000000000000000
96 870 000 0000000000000000
97 880 000 0000000000000000
98 890 000 0000000000000000
99 900 000 0000000000000000
100 910 000 0000000000000000
101 920 000 0000000000000000
102 930 000 0000000000000000
103 940 000 0000000000000000
104 950 000 0000000000000000
105 960 000 0000000000000000
106 970 000 0000000000000000
107 980 000 0000000000000000
108 990 000 0000000000000000
109 1000 000 0000000000000000
110 1010 000 0000000000000000
111 1020 000 0000000000000000
112 1030 000 0000000000000000
113 1040 000 0000000000000000
114 1050 000 0000000000000000
115 1060 000 0000000000000000
116 1070 000 0000000000000000
117 1080 000 0000000000000000
118 1090 000 0000000000000000
119 1100 000 0000000000000000
120 1110 000 0000000000000000
121 1120 000 0000000000000000
122 1130 000 0000000000000000
123 1140 000 0000000000000000
124 1150 000 0000000000000000
125 1160 000 0000000000000000
126 1170 000 0000000000000000
127 1180 000 0000000000000000
128 1190 000 0000000000000000
129 1200 000 0000000000000000
130 1210 000 0000000000000000
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instruction from the DL, or more simply by disabling DLs (PARK NIMEN with 64). Do this with a VBI and you turn off the O.S. vertical blank routine as well. The demonstration addresses the sound registers directly; for more information on this, see 'Mapping the Atari' pp. 121-125. The loop in line 140 is necessary because coming to the end of a BASIC program - or the keyword END - turns off the sound. However, pressing Break or the keyword STOP do not (try it and see).

The last example demonstrates the possibilities of using a DL1 to enhance player-on-table graphics. Believe it or not, the effect that is shown is achieved by using just one player and one DL1. The way it works is that the player image data is first read into six different areas in the player-memory map (corresponding to six vertical positions on the screen) and the DL1 code set on six DL mode lines. The DL1 is table driven and each time it is called changes the colour, size, horizontal position and priority registers. A simple VBI routine is used to move the player horizontally (source code in Listing 16). In this third example, there is an inbuilt delay (line 210) to show you the effect before the DL1 is enabled. Because the DL1 is table driven, you can experiment with it and see what effects are produced. The four tables are in lines 310-380 and can all be altered. The position table is not one of absolute positions, but of offsets from the horizontal position stored temporarily in location 204, and then put into the player-0 position register at 51248.

Next issue, in the concluding part of this series, Steve Peeler looks at some advanced uses of the Display List including scrolling.

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SHORT REVIEWS



RESCUE ON FRACTALUS

Activision/Lucasfilm
48k Cassette £9.95
48k Disk £14.95
1 player
Joystick

This game was first conceived by Lucasfilm something like one year ago under the title **BEHIND JAGGI LINES**. For various reasons, it never hit the market except in illegal form, and for many months it looked as if Atari weren't were going to miss out on this remarkable game. Firstly, Epyx were rumoured to be releasing it under license, but sadly that deal fell through. However, you'll be delighted to learn that Activision have come to the rescue, with 'rescue' being the appropriate word. They have taken the old **JAGGI LINES**, and after one or two minor improvements have finally released it under the title **RESCUE ON FRACTALUS**.

FRACTALUS is a three-dimensional space game which successfully combines flight simulation with arcade action. Lucasfilm have taken various elements of several leading games and merged them together to form a totally unique concept which deserves to be a classic in its own right.

You begin the game at the controls of your Valhalla spacefighter as it sits in the take-off bay of the mothership. Your view is through the cockpit window of your spacefighter. Your instrument panel is spread out in front of you, consisting of an impressive array of flashing lights and dials. Press the firebutton and the take-off doors slide open, accompanied by some truly excellent sound effects, whereupon you are rocketed out through the take-off port into space. Once out in space, you automatically drop down into the harsh atmosphere of the planet **FRACTALUS** and then

Jim Short reviews some recent releases

down towards the mountainous surface of the planet itself. The instrument panel suddenly bursts into life as your ship switches over to manual control. Now it's up to you!

The game theme is fairly simple. You are at war with an evil alien race called **Jugga Ra Kachato** - or 'Jaggi' for short. Out in space, the Jaggi were fairly easy pickings for your elite Etherscoops pilots, but now the floods have dug in on **FRACTALUS**, a particularly inhospitable planet with its atmosphere of deadly cyanotic acid. Casualties are high, and it's your job to fly down to the mountainous surface of the planet in a search for stranded Etherscoops pilots who are waiting to be rescued. The Jaggi don't take any prisoners, so they desperately need your help - fast!

A combination of joystick and keyboard controls are required to operate your ship, but thankfully the keyboard options are kept to a minimum and gameplay is surprisingly simple. If only all flight simulators were that easy!

Graphically, the game is a masterpiece. The visual effect of navigating your ship through the mountains is really quite stunning. In fact, it's easy to get carried away and imagine that you actually are sitting at the controls of a Valhalla spacefighter rather than a computer keyboard. I suppose all flight simulators are supposed to convey this effect, but how many of them do? **FRACTALUS** leaves them all standing in the shadow department.



Lucasfilm are sticklers for detail. When you land to rescue a pilot you actually see him - all lit up in spacejet and helmet - walking hurriedly towards your ship, growing progressively larger as he approaches. A knock on the airlock door lets you know that he's reached the ship. If you impudently refuse to open the airlock door, his knocks become increasingly more urgent. I'm told that if you still refuse to open the Airlock his knocks get weaker and weaker until he finally collapses and dies, killed by the acid air eating its way through his suit. That can't get positive proof of this though, as so far I haven't had the heart to kill a pilot off like this. These desperate knocks get to you in the end and you'd have to be a real sadist not to give in and open that airlock!

There are a set number of pilots to be rescued on each level, with bonus points awarded for rescuing 'ace' pilots (ace pilots have purple helmets, ordinary pilots have white ones). When you have completed your task you then boost back to the mothership, where you will be given a scoring bonus before advancing onto the next level of play.

The initial levels are fairly routine in order to let you get the hang of the various controls. The action is stepped up from Level 4 onwards, where you must blast your way through Jaggi gun emplacements situated in the mountains with your **AMB laser cannon**. Suicide maneuvers make life extremely hazardous, and you will also encounter

the infamous Fractalus 'nine minute day' where you will be fixed into some tricky night flying. Life as a rescue pilot certainly isn't easy and the surprises come thick and fast as the levels increase. One particular surprise is guaranteed to make your hair stand on end (literally!), but I won't spoil it by divulging it here. All I'm going to say is watch out for those pilots with green helmets!

As far as I know, there are 99 levels of play, but only thirteen are more selectable at the start. Having seen what the action is like on Level 58, I don't even want to think what Level 99 is like!

If you've seen any of these pathetic little games that frequently grace the top of the software charts for other computers, and, like me, have sniggered under your breath at them, then you'll appreciate that RESCUE ON FRACTALUS has little chance of being a ringing success amongst Commodore and Spectrum owners. It's far too sophisticated for that. Atari owners are used to a higher level of sophistication though, and consequently can recognise a real classy game when they see it. RESCUE ON FRACTALUS is a masterpiece of programming and I cannot recommend it highly enough. The graphics are 'out of this world', with the sound effects almost equally so. I would rate it second only to the legendary STAR RAIDERS. What more can I say, except go out and buy it ... immediately!

BOULDERDASH

Mirrosoft/First Star

48k cassette £9.95

1/2 players

Joystick(s)



This game from First Star Software originally appeared in the States at the back end of 1984 and has been available on import in this country for almost as long. Now it is an official UK release, courtesy of Mirrosoft, and thus to all intents and purposes it can be classed as

a 'new' game, especially as far as recent converts to the Atari are concerned.

BOULDERDASH is a tunnelling game with a difference. You control a cute little character called Rockford, who has an acute fondness for diamonds. You use a joystick to guide him around the screen, digging his way through 16 different levels of play and risking life and limb - not to mention falling boulders, flames, butterflies and amoeba - in his never-ending quest for a hoard of diamonds (sounds like a new spaghetti Western, doesn't it?)

Before each game you have the option of choosing your starting level or one in multiples of four. Rockford begins each screen with a set number of diamonds to collect, but with no visible cue. The cue is revealed once he has gathered up his quota of gems for that level. Some screens are relatively easy, and it's simply a matter of tunnelling your way around, picking up the diamonds while avoiding falling boulders. Others require a certain degree of skill and dexterity and also a significant amount of brain-power. The instructions enclosed with the game give only the briefest outline of what's expected of you, and you basically have to figure out the individual screen for yourself. As you progress you will encounter a series of intricate puzzles which will have to be solved in order to continue, so the challenge is maintained throughout the 16 levels.

The graphics are excellent and surpass all other games of this type. Rockford himself is an amazing little chap. If you refuse to move him he stands there, arms folded, blinking his eyes and tapping his foot repeatedly in a show of impatience. The sound effects deserve special mention, as there are some really neat ones in there, such as the tinkling sound the diamonds make when they fall, and the gurgling noise of the amoeba as it spreads its way across the screen.

BOULDERDASH was a number one hit in the States and in its various conversions for other computers has been highly successful here also. The Atari version was out first (despite what certain commercial 'game press' computer games magazines would have you believe!), and needless to say it's streets ahead of all other versions, with superior graphics, colour, sound and animation. Most Atari owners will already have BOULDERDASH in their collection. If you missed out on it, now's your chance to make amends.

CHOP SUEY

English Software

48k cassette £8.95

48k disk £12.95

1 player

Joystick



Karate games are all the rage nowadays and CHOP SUEY from English Software is one of several such games which have recently hit the market for Atari computers. Following in the tradition of their arcade counterparts, these games offer a head-to-head confrontation against an opponent in true 'blood and guts' style. Unlike Datasoft's BRUCE LEE, which was basically a platform game in disguise, CHOP SUEY is a true sports simulation and it gives you the chance to tackle a human or computer opponent in the combat arena without the risk of losing yourself any physical damage.

The action takes place on a box-type stage, watched by an eager audience sitting in several rows of seats in front of the stage. The intro tune is quite silly and sounds as if it's being played on one of those old music-ball pianos, giving the game a certain theatrical atmosphere. After choosing your game options - computer or human opponent - it's on with the action. Both players are extremely detailed and look the part in their karate suits, with customary black belts (naturally!) All the actions are joystick implemented, and English Software are to be commended for not over-complicating matters with additional keyboard options.

Strength bars at the bottom of the screen indicate the players' current status in the form of a pair of bars. When they change colour from red to orange you are at your lowest ebb, and one good blow from your opponent will drop your player to his knees, gnawing the breath. Animation is superb as the players leap about the stage delivering specific combinations of kicks and punches. One small quibble is that the two players are identical, even down to the colour of their suits, and it's all too easy, in the heat of battle, to lose track of your player. You end up getting him confused with your opponent, which

doesn't do your pain barrier a lot of good when you're desperately trying to avoid a killing blow. Different colour suits would have been a good idea.

Points are awarded for various aspects of play. How well you execute your move and whether it is defensive or offensive determines the number of points you score. In turn, you can only take a certain amount of punishment, and the game is over when your pain barrier reaches 8 units. If you are playing the computer and manage to beat it, you will get an automatic rematch against a much tougher opponent. The price of victory, I suppose.

Just to keep you on your toes, you must also keep a sharp eye out for the ornate scorpions. These handsome ornaments drop out of the air-vents in the roof of the stage at random intervals. You must avoid them when they swirl across the stage as their bite is potentially lethal, depending, of course, on the state of your pain barrier. In any case, a bite from one of these certainly won't do you any good!

English Software are onto a winner here. It will be interesting to see the opposition (INTERNATIONAL KARATE from System 3 and YU AI KUNG-FU from Imagae), but CHOP SLIFY will surely give them a run for their money. Graphics and animation are first-rate and, perhaps more importantly, it's an easy and fun game to play. Well done, English Software!

SUMMER GAMES

Eggs, U.S. Gold
48k Disk £14.95

1/8 players
Joystick

The fact that Britain is a nation of sport lovers is reflected in the overwhelming number of new software releases dedicated to one sport or another. In the comfort of your own home you can now participate in a wide choice of sports ranging from cricket to karate or baseball to boxing. Track and Field type games started the ball rolling and they are still quite popular, so much so that US GOLD have now released SUMMER GAMES in the UK. It was previously available only in import.

The game is based on the Los Angeles Olympics and when you first boot up the disk you are treated to a short animated sequence depicting the opening ceremony of the games where a lone athlete mounts the steps with a torch to light the Olympic Flame and then a flock of white doves (symbolising peace) are released over the stadium.

Up to eight (yes, eight!) players can take part and each has the choice of representing one of seventeen individual countries around the world. The flags of all countries are displayed on screen and when you choose a country you get a brief burst of the appropriate national anthem.

There are eight different events in all - Pole Vault, Platform Diving, 4 x 40m Relay, 100m Dash, Gymnastics, Freestyle Relay, 100m Freestyle and Shot Shooting. Usually these sort of games require you to toggle the joystick back and forth at great speed in order to get your athlete up and running and, consequently, are 'lethal' to joysticks that use bubble contacts. Whilst Activision's DECAATHLON is a great game, a hard session could prove very costly in joystick replacements. Not so with SUMMER GAMES. Only the two running events require this hazardous joystick operation and so you can play the game for prolonged periods with relative safety.

There were no instructions included with the review sample and it took me some time to get the hang of certain events but after a bit of experimentation I just about managed. Let's take a look at the eight events in order beginning

with the Pole Vault. You can adjust certain parameters such as the bar height and pole grip before attempting each vault. The animation is impressive with the pole bending under the weight of the athlete before catapulting him over the bar. Or at least that's the general idea. I'm afraid that all my attempts at clearing the bar proved negative and I definitely need more practice at this event.

Platform Diving was completely beyond me without the benefit of instructions. Pity as it looked the most interesting of them all. Try as I might, my diver always ended up going into an uncontrollable spin and crashing into the water in true 'belly flop' style! Not the way to do it and the judges rewarded me accordingly with a series of zeroes. I enjoyed trying though.

The running events are much of a muchness so I'll skip quickly past them and move onto my favourite event, the Gymnastics. This takes place over the vaulting horse and your athlete undergoes a quick sex-change as you now control a girl athlete for this one event. You can use the joystick to vary the degree of difficulty of the vault and you can even attempt something complex like a triple somersault if you feel like living dangerously. The difficult part is making the athlete land upright on her feet and some of my uncontrolled landings looked painful in the extreme.

The swimming events are next and I've got mixed feelings about these. They are laboriously slow and whilst the 100m Freestyle is only over two lengths of the open-air pool and is short enough not to get too boring, the Freestyle Relay drags over eight lengths and does get rather tiring. On the other hand the sword efforts are great.

After that, the final event - Shot Shooting - comes as a welcome change. It's also the easiest event by far as you are only required to line up the target sights on the black silvers and blast them out of the sky.

The program allows you to compete in all the events, one individual event, or to practice any of the events so there is a good deal of variation. Graphics are colourful and detailed and the animation is super-smooth. The sounds are good too but the game does have it's ups and downs and one really annoying aspect is the way you have to keep flipping the disk over after every event in order to review the results before moving on to the next event.

Next issue



SUMMER GAMES was priced at around £35 on import but the U.S. **GOLD** releases should be around £15 on disk. I am not sure if it will be on cassette, but check with your dealer.

Overall, a worthwhile investment if you enjoy this type of game. I hear that **SUMMER GAMES II** is even better. Can't wait!

FIGHTER PILOT

Digital Integration

48K Disk £12.95

48K Cassette £9.95

1 player

Joystick/keyboard

A couple of days before we completed typesetting on this issue, a copy of **FIGHTER PILOT** arrived and it became obvious immediately that a simulation of this complexity could not be reviewed fully in the time available. A brief description here then and a full review next issue.

I am sure that the program would have been called P-43 Strike Eagle if that title had not been used already, as it features a full simulation based upon the P13 Eagle, the USAF air-superiority jet fighter. The program features a 3-D view from the cockpit, fully aerobic performance, air-to-air combat, crosswinds, turbulence and blind landing with training modes for each option and a pilot skill rating for each level.

The graphics are superb and the simulation very realistic and initial feelings are that anyone interested in flight simulation should check this out. We will ask one of our reviewers to put in several flying hours and give you a full mission report next issue.

JOHN SWEENEY

looks at

a few Adventures

RED MOON

Level 9

32k Cassette £6.95



Level 9 seems to have learnt how to cram an incredible amount into 32K. Red Moon has more than adequate descriptions of over 200 locations, scattered with over 50 items, and inhabited by no less than 19 different beings with whom you can interact.

Its vocabulary is adequate, its ability to understand English not much more than 'VERY NOUN' but once you accept that (and, unfortunately, with few exceptions, that is true for most adventures today), then it is an excellent adventure. Level 9 have enhanced the usual text adventure concept by adding lots of Dungeons and Dragons elements. You start with 50 Hit Points. You lose Hit Points when you are wounded, and it also costs you Hit Points to cast spells. One nice touch is that SAVE is treated as a spell and costs you 1 HP each time you do it!

Magic is an important part of the game. There are ten spells documented in the instructions, each of which requires you to use a certain artifact as a focus. There are a further 12 magical items in the game, most of which are extremely useful (one is actually described as being 'vaguely magical'). Learning your way around the dungeons, and how to use magic effectively, are important aspects of the game. There are also plenty of problems to solve and then there are the fights!

Some decisions attack you, some talk to you, some ignore you. Some of them are more valuable to you alive than dead. Some of them can be killed or

avoided without a fight but if you do get into a fight, then make sure you are well armed and armoured. You can fight with weapons or with spells, or indeed both. Likewise there are both physical and magical ways to defend yourself. The dungeon is littered with weapons, armour, a cloak, a ring, etc., some of them magical - one item, for instance, will improve your Agility.

Beware though of too much mayhem. In this game very few of your files stay dead - they will return to haunt you as ghosts and attack you at the most inconvenient times! You can actually explore about 150 rooms without a fight (although not without a couple of killings!), but just one fight can open over another 40 rooms to you.

The implementation is excellent in that you get colourful graphics which whilst only simple line drawings of the rooms are very pleasant and are drawn VERY quickly at the same time as the text is being output to the screen, and AT THE SAME TIME as it reads your keystrokes. You can, if you wish, turn off the pictures. There is a large keyboard buffer so that you can key your commands ahead as fast as you like without waiting for each response, but beware if you have killed too many demons for their ghosts will get you while you are typing! The people at Level 9 obviously know how to use the inside of the Atari.

Your objective in the game is to rescue the stolen Red Moon Crystal but don't assume that once you have found it you can wave your magic disclaimer and escape to the surface. Once you pick it up it's guardians appear, and they make everything you fought before pale into insignificance. However, since you are allowed to have three lives, you can die gracefully, be reincarnated and finish your quest without finding out how to win that final battle. You will however only achieve 1000 points if you

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rescue the crystal without dying, get all 9 treasures, complete one other minor quest which you must discover for yourself, AND do all this without SAVING, in order to stop you restoring each light until you have a lucky win, you lose 1 scoring point every time you SAVE. If you do all that you will definitely have got your money's worth, but there is one final challenge - it is possible to get 1000 points AND Dend the game with 30 Hit Points - can YOU do it?

EMERALD ISLE

Level 9

32k Cassette £4.95



Level 9 have produced six previous adventures for the Atari's Colonial Adventure / Adventure Quest / Dungeon Adventure Trilogy, the Snowball / Return to Eden / Worm in Paradise - may be out by the time you read this) Trilogy and the Lords of Time. Many of you will therefore be familiar with the value for money you get for these excellent adventures, normally priced at 9.95. They say that 'Emerald Isle' is intended to be slightly easier to solve and is therefore priced at only £4.95.

The game starts with you marooned on an island in the Bermuda Triangle, the only way off appears to be by becoming Radar. How to do this is not immediately obvious - still you're bound to find out eventually, and in the meantime you may as well explore as much as you can, and find as many treasures as possible - they are bound to come in useful! Having explored the first twenty or so locations you come to find yourself faced with a number of problems: how do you start the clock? - why won't the Barber stop and talk to me? - where is the key to the gate? - why is there a letter 'W' on the island in the Hanging Gardens? - how do I read these notices in foreign languages or tiny print? - what is the invisible barrier that is preventing me from going West from the treasure room? - what am I supposed to do with a boat-building manual, a glue-pot, and four assorted coins? - should I risk going into the dark without a lamp? - why don't they provide a disk version for the Atari so that I can SAVE more easily?

Read the instructions again - Ah - 'Don't be too afraid of the dark' it says on the box - maybe that's a clue!

Three of the above questions (apart from the last one!) mainly require patience. One very frustrating aspect to the game is the fact that a couple of times you solve all sorts of dependent problems, one leading to another as they do, and finally reach the end of a trail only to discover... nothing! The Museum and the Office fall into this category - but never fear, carry on with the game as though you don't care that you still don't understand what is happening. With enough patience all will become clear in the end.

Some of the problems seem insoluble, but have faith - there IS a way to climb the two slippery slopes without slipping, it IS possible to see underwater, and it IS possible to read the small inscription (the lens is actually in full view, you have probably walked past it a few times!). Two minor hints: EXAMINE everything - some very ordinary objects are not what they seem; and you never need to type more than two words.

There are unfortunately a couple of minor bugs. The first actually helps you - you can pick up objects in the dark even if you haven't the slightest idea what they are! (No of course I'm not going to tell you how, but it IS possible to solve the game WITHOUT doing this.) To compensate they have put in a bug which can delay you indefinitely: you should eventually find a plaque with a hole. You will probably try inserting items into the hole. If you try INSERT DUBLIONS and it says 'it doesn't fit. Try a coin', DON'T BELIEVE IT! This is a standard response associated with the dubloons, and should have been suppressed in this instance. The item you have to insert is very, VERY much bigger than a coin! I was also rather disappointed by the number of times you had to travel vast distances to very little purpose. There are five main areas which exceed a long way from the central beach, and too much of the game is spent trekking from the far end of one of these areas to the far end of another area, via the beach. The placing of artifacts at the opposite end of the world from where they are required is occasionally interesting, but seemed a little overworked in this game. Further long and unnecessary journeys are necessitated by the fact that there are far too many items to carry. Allow-

ing more to be carried (perhaps by some device or means?) would have removed some of the drudgery from the game.

All that aside it is still a very enjoyable game and excellent value for money, with over 100 locations and about 60 artifacts. Anyone who enjoys playing adventures will find the low price an offer very difficult to refuse. Even if it IS slightly easier than some of Level 9's previous offerings it will still keep you occupied for a considerable time, and the BEK or so-of-text contains plenty of amusing touches! For anyone who has not yet taken the plunge into adventuring, and can't afford to buy an Infocom adventure such as Wishbringer, Emerald Isle offers an excellent introduction to a very enjoyable pastime.

WISHBRINGER

Infocom

48K Diskette £29.95

Wishbringer is the latest text adventure from the acknowledged Number One in the field - Infocom. Anyone with an interest in good adventures must surely be familiar with at least some of their previous 15 adventures, from Zork through to the Hitchhiker's Guide to the Galaxy. Their new game is undoubtedly up to their usual very high standard, and, although it is labelled by Infocom as an 'Introductory Level' adventure, it is bound to please even the most experienced adventurers.

Wishbringer comes with the usual high quality packaging, complete with the actual Wishbringer stone (it glows in the dark!), a Mystravian Envelope (not to be opened until delivered!), a map of the whole village wherein the game takes place, and an excellent manual, complete with legends and sample scripts to help the inexperienced.

The game is introductory in two senses. First, lots of help is provided, once you have found Wishbringer (and the appropriate artifacts to activate it) you can wish for Advice. Some of the problems can also be solved by using a wish (you have seven wishes in total) and the map saves you the problem of mapping most of the game and also includes a clue. It does serve another purpose but you won't discover that till much later! It is also 'introductory' in

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that it is actually Zork II! (Check the product code on the diskette if you don't believe me.) At one point in the game you find yourself 'standing in an open field west of a white house, with a bearded front door. There's a little mailbox here.' Just in case you have been living North of the Arctic Circle for the last ten years - those are the opening words of the legendary ZORK. If you do the right things the mailbox will appear itself and follow you lovingly around for the rest of the game! As you leave this mysterious area you are warned that you have a feeling that you will see this place again.

When you start the game you find yourself a handsome post boy in a small village. You soon discover that your mission in the game is to deliver a letter to an old lady. This all seems innocent enough, and you only have to solve a couple of problems to achieve it. That's when the trouble starts! She gives you another mission - to rescue her cat! What she doesn't tell you is that failure to do this will result in doom for all, and that the village has been transformed in to an evil place full of evil monsters from your worst nightmares.

As usual you have all the benefits of an Infocom game. It actually understands English - with the ability to parse input like 'give the brown letter to the old woman then ask her for a cup of water', and a vocabulary of over 1000 words. There aren't many things that you can type in that it won't understand and if it doesn't understand then it tells you why not. It has vast amounts of text stored on the diskette, so that responses to your actions are sometimes whole screenfuls of data. They have programmed interesting, misleading or humorous responses to just about anything you might try. For instance, it is possible to win the game without ever being caught by the Boat Patrol, but if you do get caught you can escape, not once but twice! If you are foolish enough to let yourself get caught again you get thrown to the sharks - but even now death can be avoided provided that you have made the right friends! Furthermore during the two pages of amusing text that scroll up at this point you will witness the demise of the Boat Patrol, AND you can still complete the quest! None of that is necessary to the main line of the solution - it's just there for

fun - to make the game more enjoyable! With descriptions like Infocom's, who needs graphics? And finally, there is humour. All Infocom games are riddled with jokes, and this one is no exception. For example, in the Game's next (Green) are the nasty things that lurk in the dark) you will find a refrigerator, and since Green like the dark, what could be more natural than the fact that the light inside the fridge goes OUT when you open the door?

One extra nice touch to the game is that when you finally complete the quest and save the world, you will probably find that you have not got all the points. The reason is that some of the points are gained by solving certain problems WITHOUT using winks. So, you can play the game, happily using winks where useful, and you have won once. Then you can play the game again, trying to solve it without winks - two adventures for the price of one!

If you get hooked then you can carry on with Zork, Zork II, Zork III, Enchanter (Zork IV), and Sorcerer (Zork V) and by the time you finish those they may have written the long awaited Zork VI.

Much has been written recently in electronic hobbyists magazines about speech synthesizers, however many of these articles assume the reader is familiar with electronic circuits and components, and that they have the necessary equipment to manufacture their own PCB (Printed Circuit Boards). In this article I have deliberately chosen stripboard to construct the project and I hope that the diagrams given will enable anyone to construct the synthesizer even if it is their first step into electronics.

PARTS LIST

The following order codes and prices are as quoted in the Maplin Electronic Supplies 1985 Catalogue.

Item Description	Quantity	Price	Order Code	Component
Resistors				
1/4W Carbon 10K 5%	1	£0.03p	S30K	R1
1/4W Carbon 10K 5%	1	£0.03p	S10K	R2
10K Pot Linear	1	£0.49p	PW00C	R3
Capacitors				
100nF 20V Electro	2	£0.12p	YY15Q	C1, C6
100nF 20V Electro	1	£0.11p	FF11M	C7
12nF Ceramic	1	£0.07p	HX21B	C5
100nF Ceramic	1	£0.07p	HX35B	C4
12pF Ceramic	2	£0.07p	WX48C	C2, C3
Integrated Circuits				
SP0256 Synthesizer	1	£8.95	QY50E	IC1
LM186 Audio Amp	1	£1.49	T76-1751**	IC2
Miscellaneous				
Veroboard	1	£1.32	FL07H	
Local speaker 8Ω, 0.75W	1	£0.98	WH13P	LS1
28Pin DIL Socket	1	£0.24p	BL21X	
14Pin DIL Socket	1	£0.11p	BL18U	
Ribbon Cable 10Way 1m		£0.75p	SR66G	
D-Socket 9 Pin	2	£0.95p	RR41R	
1.7368MHz Crystal	1	£2.98	FY98T	X1
22awg Tinned Copper 1 mil*		£0.95	BL14Q	
Solder 60Sn/40Pb 1lb**		£0.82p	FR21X	

* Much smaller quantities of these items are actually required for this project, but this is the minimum that may be obtained from Maplin.

** This IC is not available from Maplin the order code shown is a Tandy order code.

TOOLS REQUIRED

- Small soldering iron
- Scoop, Moulding knife or Spot face cutter (Maplin Code FL29C £1.95) to cut veroboard tracks.
- Small sidecutters or wirestrippers

ATARI

Build your own S...

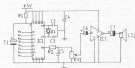
CIRCUIT DESCRIPTION

The schematic circuit shown below is based on the General Instruments SP0256 IC (Integrated Circuit).

Power for the circuit and the controlling signals to generate speech come from joystick ports 1 and 2 (ports 3 and 4 can be used on the 480/800 computers). Six bits from the 1941 port are used to determine which alphabets of the 64 available is generated, the remaining 7 bits are used as 'handshake' lines between the computer and synthesizer. Crystal X1 and capacitors C2 and C3 form a simple clock for the SP0256.

R2 and C3 act as a low pass filter which converts the SP0256 Pulse Width Modulated output to an audio signal. This audio signal is amplified by IC2, an LM186 audio amplifier which, together with a few support components, drives the loudspeaker LS1. Components R1 and C1 provide a Reset pulse to the SP0256 on power-up.

CIRCUIT DIAGRAM



SPEAKS

Speech Synthesiser

by Kevin Griffin

Figure A. Location of components on Stripboard

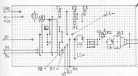
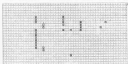


Figure B. Board side B showing cuts in tracks



CONSTRUCTION

Initially the copper tracks on the stripboard should be cut as shown in Figure B. A Spot Face Cutter is best for this purpose although a file can be used if one is taken (always work away from your hands). Next solder the components to the board as shown in Figure A, starting with the link wires followed by the IC sockets. The legs of the remaining components are best left at their full length until after the component has been soldered in position as this will help to conduct heat away during soldering. As an extra precaution against heat damage while soldering a small crocodile clip may be temporarily attached to the component on side A of the board.

Caution must be taken that all electrolytic capacitors are connected the correct way round.

When the board has been completed the two D-Connectors should be connected to the ribbon cable according to the construction chart shown. The opposite end of the cable should then be bared and tinned about 1/4 inch of its length. The tinned ends should then be inserted through the board and soldered in position according to the circuit diagram.

RIBBON CABLE CONNECTIONS

Cable Colour	D-Plug	Lead	Signal	IC3 Connection
White	Port2	Pin 4	B7	8
Grey	Port2	Pin 5	B6	20
Purple	Port1	Pin 1	B0	18
Blue	Port1	Pin 2	B1	17
Green	Port1	Pin 5	B2	16
Yellow	Port1	Pin 4	B3	15
Orange	Port2	pin 1	B4	14
Red	Port1	Pin 7	+5V	7,9,23,25
Brown	Port2	Pin 2	B5	13
Black	Port1	Pin 8	GND	1,10,11,22

Note on D-Sockets

Due to the recessed joystick ports used on all Atari computers the normally available D-sockets cannot be fitted directly. One solution to the problem is to buy joystick extension cables (these have the moulded plastic type sockets as fitted to Atari joysticks) such as those available from Tandy stores, however at prices in excess of £3 this is an expensive solution if they are to be used only for this project.

Another solution is to drill or hack the metal body from the D-Sockets available from electronic suppliers, leaving the plastic core, the two halves of which should then be glued together. The appropriate connections can then be made to the back of the socket. This enables the socket to be connected to the computer but it leaves the wires and connections vulnerable to damage. I have overcome this problem by fixing the plastic covers which are often placed on new ICs to protect their legs. These fit perfectly to the back of the modified sockets and after the circuit has been tested and found to be fully working the cover formed by the IC protectors can be filled with an Epoxylastic adhesive to make a really permanent and strong contact.

continued overleaf

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AUSTRALIA CALLING: Our family enjoy reading PAGE 6 very much and we would like to correspond with other Atari enthusiasts, particularly adventures to we could swap ideas. My son would like a list in Sands of Igeppa could someone tell him what the topography is in the outer chamber area? Dell Johnson, 26 Henderson Street, North Rockhampton, Queensland 4781, Australia

ATARI 800L MEMORY MODULE: For sale in perfect condition. Atari 64K memory module, £40 o.n.o. Contact James Brown on 041 946-0264 most evenings after 4 p.m.

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AMATEUR RADIO: I have been interested in Amateur Radio for about 2 years and have had an Atari 800XL for about the same time. I would be very interested in hearing from anyone who has managed to combine these two hobbies with regard to software and hardware. G.W. Giles, 21 Mountdown Drive, Verwood, Wimborneur, Dorset, BH21 6TN. Tel. Verwood 426763

PRINTER/PLOTTER & FEASIBILITY EXPERIMENT: Atari printer/plotter wanted. Also I need help on the Feasibility Experiment. I have found about 40 locations but I am stuck at the the dragon's lair, nice shaft and the stone bridge. I have completed The Golden Road and n.o.c. is all I require to send the map to you. Please Tony evenings 0673 64997

VERTICAL BLANK PROGRAMMING: Can anyone help explain how to use or program the VBI. I can't find any books or information on vertical blank movement or scrolling. Andrew C. Thompson, 183 Hoadley Way, St. Dicks, Crowland, Grant, NP34 7NF

INTERCHIEFER'S GUIDE TO PRINTING PARALLAX: Can anyone tell me where I can get a good version of Parallax. Can anyone give me some help on Hitchhikers Guide To The Galaxy and does anyone have a cheap printer for sale? Paolo Frappone, 1A, Parson Street, Redmans, Bristol, BS1 5PT. Tel. 0272 664475

1827 POWER ADAPTER: For sale, unused and in. Other accessories also for sale. Contact Hancock, 17, Vicar Street, Mountain Ash, Mid Glam. CF45 1LQ. Tel. 0443 474299

HOLLAND CALLING: A Dutch Atari owner would like to have contact with an English Atari owner for listings etc. I have Dutch and German listings. Please write to H. Raggeman, Kruisveldse 41, 1121 DM Boerburg, Holland

BACK ISSUES: PAGE 4 no. 1 and ANTRC vol 1 no.6 wanted. Will pay £3 for PAGE 4 and £8 for ANTRC to include shipping. Robert De Looze, Wuyepuyrylense, 14, B-9066, Zedelare, Belgium

U.S.A. NEWSLETTER: Are you getting THE POKET PRESS every month? Why Not? Make sure that you get the best Atari newsletter every month. The cost is right (either 12 issues). The price is right, it comes straight to your mailbox. The system is right, you send the most up to date information for your Atari computer. There is only one choice then, **SUBSCRIBE!** Make your money order payable to 'The Atari Computer Club of The Palm Beaches' and send in THE ATARI CLUB OF THE PALM BEACHES, c/o SUBSCRIPTION MANAGER, 630, 10th Avenue North, Lake Worth, FL 33461, U.S.A.

ANY USERS IN CORNWALL? I have just moved to Penzance and would like to meet any other users in the area. Please contact me. M. Rogers, 13, Polmarston, St. Just, Penzance, TR18 7DA

800XL RAM PACK: 64K expansion, hardly used. Also 800XL computer for spare parts only £25 o.n.o. Contact Hancock, 17, Vicar Street, Mountain Ash, Mid Glam. CF45 1LQ. Tel. 0443 474299

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FIRST STEPS

A LOOK BACK

As I mentioned in the last column, this one has to be prepared early so while all of you are busy working on your suggestions for the game outlined in issue 11 I will take this opportunity to go back over a few items I have touched on before.

BOOLEAN ALGEBRA

Back in issue 11 I discussed Boolean algebra and I have been asked if this can be utilized in any other subroutines, so what follows will be additional to issue 11 which you may need to peruse again.

Probably one of the most powerful, and possibly one of the least used, commands is the ON...GOTO/GOSUB statement. If you have never used this before then I shall explain. Instead of using several lines such as

```
10 IF X=1 THEN GOTO 100
20 IF X=2 THEN GOTO 200
```

we can use a single line of ON/GOTO. We must get a value for the variable X, for example by using INPUT X, and then use this in the ON/GOTO statement. In our example X must equal (say) 1 to 4 or else be re-input. When we have a value we can use it to choose a subroutine as follows

```
10? "PRINT CHOICE (1-4)"
20 INPUT X : IF X < 0 OR X > 4 THEN 10
30 ON X GOTO 100, 200, 300, 400
40 REM - Subroutines in lines 100,200,300,400
```

If the limitations did not exist in line 20, then if X fell outside the range 1-4 it would be ignored and the program would continue to line 40. X must be in the range of 1 to (number of choices) for this to work. The subroutine is chosen from the value of X so that if X equals 10 then the tenth routine will be chosen. You must be sure to have enough subroutines to cover the maximum value of X.

What would happen if you used X=PEEK(764) when looking at a keyboard entry? As this means you could have several lines such as

```
10 IF X=250 THEN GOTO 100
```

you would then need 250 choices for the ON/GOTO routine to work. Instead we can use the limitation by Boolean algebra. For example, if we wanted X to equal 10, 20, 30, 40 or 50 only we would have to use five single lines of IF/THEN statements. A Boolean equivalent would be as follows

```
10 Y=(X=10)+2*(X=20)+3*(X=30)+4*(X=40)
+5*(X=50)
20 ON Y GOTO 100, 200, 300, 400, 500
```

To use the subroutine on line 200, X would need to equal

20. If it did then this is the only true statement in line 10. So $(X=20)$ would be the only true statement and the line would evaluate as $Y=(0)+2*(1)+3*(0)+4*(0)+5*(0)$, or 2. So on $Y=2$ the computer will choose the second subroutine at line 200. The values of the subroutines need not be in order, nor need the values of X, just as long as they correspond numerically to the subroutines.

USING LOCATE

I was asked by Stephen Plunkett to explain about the LOCATE statement. This is an excellent way of testing a location on the screen to see what is stored at location X,Y. It can be used in the same way as the PEEK collision routines.

The statement takes the form LOCATE X, Y, Z. You just position the cursor (even if switched off) at position X,Y and the data under the cursor is stored in Z. So if the target is in COLOR 1, you know you have hit it when Z=1. Z will equal 0-3 in four colour modes, 0 or 1 in two colour mode - and 0-255 in the text mode.

Now for the bad news. A PRINT or PUT directly after the LOCATE will move the cursor one point to the right and may modify the character under the cursor. Here is the solution to this little problem. Locations 83 and 84 (cursor horizontal position) are updated by the LOCATE statement by adding 1 to the number stored here, thus repositioning the cursor. You can store the data from 83 and 84 first, use LOCATE, and then restore the data. For example

```
H1=PEEK(83): H2=PEEK(84): LOCATE X,Y,Z: POKE
83,H1: POKE 84,H2
```

Location 93 holds the data found under the cursor, so you would do exactly the same here to stop corruption of the data i.e. PEEK 93 first, use LOCATE and then POKE 93. Another handy set of locations is 94, 95 which holds the current position of the cursor. By the way, location 84 holds the vertical position of the cursor and you may need to use this after rollover when the cursor moves down a line.

The LOCATE statement is just like using

```
POSITION X,Y: GET #62
```

I have included a simple little program to illustrate LOCATE in action. It should be well enough documented not to need an explanation.

DO-IT-YOURSELF REPAIRS

I was impressed by the letters in issue 11. John Dinnar (a regular to PAGE 6) is quite right about paying someone to push in a few chips. If your machine is outside the warranty you could try this yourself but be careful to take anti-static

by Mark Hutchinson

1985

pick their highlights of 1985

What about some votes from a professional programmer? As well as contributing regularly to PAGE 6, MATTHEW JOHNSON has written **DESKTOP SOFTWARE** for Mirabeau technology and is currently working on the 'ultimate' communications desk package for the ST.

Top ten events of significance? Well these were significant to me and to Atari.

1. **MULTI-USER TERM** for the events. Apart from the personal interest I have in it, this marked the end of the age old 'I can do everything except access Personal' problem. **VIEW TERM** is the world's first 'proper' Windows terminal program - and it's British!
2. The **EMST**. Whilst others will probably have mentioned it, I think the most significant release of the ST package was other programs 'wrote after the machine itself, which means we could actually start trying to reuse programs!
3. The **PCW** Show. Not only because of the ST launch, but also because I bought **COURAGEOUSNESS** (Linnamatt) and spent many nights afterwards blowing my mind with it. It's brilliant!
4. Atari 1000 was launched. While I don't think it is a good as **PIRATE 6**, it does increase the Atari's viability in the high price area.
5. I never realised there was so much to **PAGE 6** and it came out on disk. I never quite got round to typing in all those interesting programs (being a professional programmer and writing my own of course...) and even though I was suspicious about the value of a disk subscription, I took the plunge. I am amazed at the quality of the content - and without any typing involved! Well worth it.
6. **SPECIALDISK**. Undoubtedly **THE DISK** for the Atari, especially **SLIMES**. The power of it is incredible, but watch out. I am thinking of buying a **DESK** just to get the full benefits of this disk operating system. 1000 owners can buy the disk, double it and never wait for the disk drive again.
7. **BOOKS** the chairman used for the Atari as a 'point-of-sale' advertiser. Used to promote 'inspiring' salesmen to gather data, the Atari is more than just a game machine so gather data.
8. The Copyright Amendment Act came into power. Perhaps new printers (read there!) will have Atari software available and new printers (but you can't buy software locally) problems will go away.
9. **ANTEC** released **EMCS**, the Bulletin Board Communication Set. I bought one direct and it is incredible. By the time you read this, I should be running a new board. **EMCS** is going to take over the bulletin board world. This may mean going to take over the Bulletin Board Express.
10. I thought that at least one of the ST should be for local news available from Software Express. What could be better than I can't think of support for Atari on the streets. Atari has the level of support for Atari on the streets. Atari users must support their machine. When others talk of computers, don't shy away because you have an Atari, be proud. We know we have the best machines available. It's not everyone!

Our regular software reviewer, **JIM SHORT**, naturally chose an software review.

At the beginning of the year Atari was in a better state of decline and more software was pretty thin on the ground. How times change. Atari is now back at the top, or very nearly, and there is now a wealth of software at reasonable prices/produced in the UK. Thanks to people like **ARND JASPERT**, **ACTIVITY**, **SPON**, **M.S. GARD** and others.

So many good games have been released in the last few months that whittling them down to a 'Top Ten' has been no easy task, however I've sifted through them and come up with what I think are the best games of '85. A couple of them have been available before 1985 on imports but I've included them because they have only just been officially released in this country so it seems Atari-worth they will be regarded as new games. But what it's worth any ten software games of '85 are as follows:

- 1 **RESCUE ON FRIGATALES** Linnamatt/Basilisk
- 2 **EMPOPHONE** Arena Graphics/US Gold
- 3 **BOUNTY BOMB STRIKES BACK** Big 14/US Gold
- 4 **AMCRUSS** Electronic Arts/Basilisk
- 5 **CHUCK'S FOLLIES** US Gold
- 6 **SLIMES** Activision
- 7 **TRADITIONARY** First Star/Mirabeau
- 8 **EMUL** Booktronic
- 9 **F-15 STRIKE EAGLE** Mirabeau/US Gold
- 10 **STEALTH** Booktronic

And finally what about the Editor? Having set others the task, I set down to comparing my own winners. Enjoyed reading my entries and it has been interesting to see how my thoughts compare with other contributors. So...

1. **EMST**. Tyler (best) I was a little dubious about its value to anyone who already had an **ATARI 2** disk system. When I got one, all doubts were cast aside. Some of the software, even in demo form, far outweighs anything you've seen before and nobody really knows the machine well yet! Nobody really knows it even appeared, yet but I believe it is crucial to the survival of many of the software houses who have committed themselves to the ST. £750 is cheap for business, competitive for entertainment and a lower price model will certainly mean more.
2. **PCW 65**. The first show in years to make non-connected users and companies aware of what **ATARI 6** is (and has always been) about.
3. **STAR MARKETING**. They must have done one half of a year's work to make companies in-voice for the ST but, as usual, they didn't tell anybody about it so, yet again, we all got to know it by word of mouth.
4. **ACTIVITY USER**. Significant and a brave gamble. Atari finally realised its **PAGE 6** passed on third birthday that these really are a benefit in having a dedicated magazine.
5. **COURAGEOUSNESS**. Perhaps the first original concept since the first five titles were copied into and put it on disk. Linnamatt will think further ahead and put it on disk.
6. **PAGE 6'S THIRD BIRTHDAY**. Planned, carefully conceived with issue 12. No puns, no cards, but the very first **TENTH** birthday!
7. **PAGE 6'S CONTRIBUTORS**. Without whom you would have nothing to read. Thanks for all the quality work and prizes and thanks for not deserting me. I have worked hard to have make **PAGE 6** a magazine where people can feel proud to have their articles and programs published and others writing from the Atari home writing for a job.
8. **ACTIVITY'S WORLDWIDE USER NETWORK**. A beautiful idea but included in the 'best' event of the year. Virtually all the ST in the States now translates their material every weekend and making the games 'new' from the States means having what reading 4 for the third time.
9. **THE COPYRIGHT AMENDMENT ACT**. I said in the last editorial that I would not have you bother to you all know why.

Bug club call

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STARKIE'S UTILITIES

by Andrew Starkie

Here is a useful routine that you may wish to include in your own programs. No explanation is given as it is intended for users who are already familiar with Basic and who can include these segments as subroutines in their own programs. The routine is called YNKEY and will scan the keyboard for 'Y' or 'N' key presses. All other keys are disabled.

I hope that you find this routine useful to enhance your own programs.

```

10 10 DIM *****
20 20 DIM CALL SUBROUTINE FOR Y/N INPUT
30 30 DIM YNKEY(1000)
40 40 DIM IF YN YES
50 50 DIM IF YN YES NO
60 60 DIM *****
61 70 GOTO 200
62 100 DIM *****
63 110 Y ***** & KEY*
64 120 YNKEY(0) *****
65 130 IF YN YES Y "YES"
66 140 IF YN YES Y "NO"
67 150 IF YN YES Y "NO"
68 160 DIM YN, YNKEY(1000)
69 170 DIM YN, YNKEY(1000)
70 180 DIM YN, YNKEY(1000)
71 190 DIM YN, YNKEY(1000)
72 200 DIM YN, YNKEY(1000)
73 210 DIM YN, YNKEY(1000)
74 220 DIM YN, YNKEY(1000)
75 230 DIM YN, YNKEY(1000)
  
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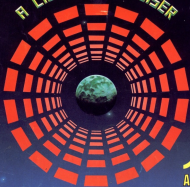
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