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ISSUE TWO

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Editor

Les Ellingham

Editorial Offices

Tel. 0785 41153

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PAGE 6 is a users magazine and relies entirely on readers support in submitting articles and programs. The aim is to explore what computing through the message of information and knowledge and we cannot unfortunately pay for articles published. We hope you will gain satisfaction from seeing your work published and it helps us hope you will learn from articles submitted by other readers.

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Editorial

NEW DIRECTIONS

Well, the response to Issue 1 was very gratifying. Thanks to all those of you who took the time to write in with letters, articles or programs - keep them coming. My apologies if there have been delays in answering your letters. It has been quite hectic. As stated in Issue 1, the magazine was sparked off by the formation of the Birmingham User Group but the response from outside the group - even from abroad - has been so great that it has been decided that the magazine should be run as an independent entity. PAGE 6 will keep close ties with BUC and you will see their page in every issue but in order to reflect the interest shown from all around the U.K., the magazine will now be published by ABACUS - an independent User Group, the Around Britain Atari Computer Users Society. ABACUS will be modelled on the Independent National BBC User Group. LATTERING is that its prime function will be to publish a magazine which will act as a forum for the exchange of ideas and information. It is hoped that PAGE 6 will encourage existing User Groups and individual users all over the U.K. - and abroad - to dig a little more deeply into their Atari computers and share their knowledge so that we may all both learn and teach. There is something new to learn each day in the world of Atari - perhaps with computing you continue to learn forever! I will try to share my enjoyment through the pages of PAGE 6, why don't you do likewise!

WHAT CAN YOU DO?

You can help in many ways even if you are only just beginning. Write in to the magazine with any thoughts - send in articles or program listings. If you can't manage that, then just write to the advertisers asking for details of their products - even buy something! We need their support as well.

One of the most exciting programs I have seen for a long time is TINY-TEXT featured in this issue. It opens up new horizons for 'serious' use of your Atari at minimal cost (nothing!). Get to grips

with it and start sending cassettes to your Atari friends and to PAGE 6.

Some of the people who have phoned or written in have asked whether it is possible for them to be put in touch with other users in their area. If all the Atari User Groups could give me details of their activities and meeting places I will be happy to publish them and hopefully encourage new members. I can't of course give out people's names and addresses without their permission but again I am happy to start up a Contact page if you would like people to get in touch with you. If you can find a like mind there is no better way to learn and perhaps you can then share the fruits of your fertile new partnerships with other readers. This is a Users magazine and can only survive with User support. Let me know what you want to read or, if you have any special talent, write about something you really enjoy and together we can produce a really special magazine.

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News

First news of the Atari 1200 seems to be good news for 800 owners. The only reported improvements so far are that the 1200 has 64K and four programmable function keys. On the other side of the coin, the 1200 has only one cartridge slot and 2 controller ports. This obviously means that Atari have abandoned any plans to bring out software for that second slot, but then there are an awful lot of 800's about and maybe some enterprising independent software house will bring out a cartridge which will run on the 800 and not the 1200. Atari's argument for reducing the number of game controllers seems to be that there is not enough software around that needs to use 4 joysticks. One interesting thought though is that several people are beginning to develop printer interfaces that can be easily (and cheaply) connected to the existing 4 game ports. Could it be that these will not work with only 2 game ports and you will therefore be forced to buy the 830 interface once again! At something like £300 more for the 1200, one wonders why it is being brought out, but then maybe there is more inside, just like there is more in the 400's and 800's than the manuals would have you believe.

On the software front Atari have suddenly become very busy again. After what seemed to be a long while without any new games, Atari are now bringing out the arcade games in force. Salaxion has already been in the shops for 2 weeks and Defender should be available by the time you read this. Also in the pipeline is Qix although that may be a couple of months. On the serious side there should be a Microsoft Basic in ROM quite soon and also File Manager.

Chopdifter, reviewed in the last issue should be available on ROM quite soon, so no need to buy that disk drive after all!

In the removal department....watch out for a 3 inch Micro Drive at the end of the year and four-colour

plotter-printer at only £150!

Atari have now come closer to solving out the problems in repair delays by setting up a network of service centres around the U.K. Your local retailer should have a leaflet but if not, phone Atari on Slough (0753) 24561 for your nearest centre.

There's quite a buzz on the home front now as far as software goes. Apart from the new Adventure International mentioned last issue, watch out for U.K. written software from Liverpool based MicroNet who hope to bring out a new game each month and a new series of Adventure games from Channel 4 Software. These promise to be of interest to those of you who have not upgraded. Being 16K machine code adventures in the Scott Adams style, but written specifically for the Atari and featuring Display List interrupts to add a bit more life to the text display. Expected to retail at £14.95

The new MicroNet arcade, heavily advertised in the computer press is expected to bring out an Atari compatible modem soon but no details yet of what software support can be expected.

Graphics...

```

5 ROM *** SIMPLE G11A DEMO ***
10 GRAPHICS 10:SETCOLOR 4,1,5
15 C=8
20 X=8:Y=8
22 X1=77:Y1=8
25 X2=79:Y2=191
27 X3=8:Y3=191
30 A=1
50 PLOT X,Y:DRAWTO X1,Y1
60 DRAWTO X2,Y2:DRAWTO X3,Y3
70 DRAWTO X,Y
80 COLOR X+C
90 XXX=X:YYY=Y+A:X1=X1+A
100 Y1=Y1+A:X2=X2-A:Y2=Y2-A
110 X3=X3+A:Y3=Y3-A
120 IF X=48 THEN C=C+2:GOTO 28
130 GOTO 50

```

Input

Dear Sirs,

Firstly, congratulations on the magazine and good luck for the future.

I have a question which I hope you can answer. I recently had to break off in the middle of a long program and CHANGED what I had onto two different cassettes. When I attempted to re-water however, both showed an error of the Serial Run type, one immediately and the other after about a minute of normal recording operation. Is there any way I can salvage the section of the program prior to the error or must I re-do the whole thing?

T.C. Meyers
Leicester

"There is no easy way to recover a program which won't load. It should be possible to write a program that can read data as it is received and perhaps one of our readers can come up with one.

A program is recorded on tape in three separate steps. Firstly a 20 second header of mark tone followed by any number of data records and finally an End-of-File record. If the computer does not get to the End-of-File record you will end up with an error. There seem to be easy problems with CHANGING and CLOADING programs so a few ideas may be helpful. Firstly, clean the tape heads REGULARLY with any proprietary tape head cleaner. Before CHANGING any program, type LPRINT followed by RETURN. Ignore the error message and then CHANG. This helps

initialize the cassette handler properly. If you have problems in loading, try starting the tape a little further on or back. Try also moving the tape past the point which will not load by just turning on the cassette motor by POKING J4018,32. Press SYSTEM RESET and try again. If readers know of any other ideas let us know.

Dear Page 6,

I received issue 1 of PAGE 6 and was suitably impressed. I enclose my subscription.

I am a relatively in-experienced computer freak and any short programs like 'line listener' I find a great help. A few thoughts on items I am sure your readers will find useful - a conversion to Atari basic of commands used by other computers to allow programs to be converted - useful parts of memory maps for the same purpose - an explanation of machine code - listings of other machines which use the 6302 processor - a list of User Groups in the U.K. - a list of useful addresses in the U.K.A - a possible breakdown in variables used in programs to help in understanding what's going on - a suggested reading list of books for novices - fault finding in your programs - and a simple adventure game.

I realise I am expecting quite a lot but there are some of things that are not covered in the books I have read and are the sort of things which most people

would like to be able to find easily.

J. Dimmer
Elgin

**Wow! We will start work on some of these but this is a Users Magazine so there are a few ideas for readers to submit articles on. Lets hear from you for the benefit of other readers.

Dear PAGE 6,

Thank you for the first issue of the magazine, its just what we Atari owners need in this country.

If you live somewhere like I do where the availability of software and accessories is virtually non-existent, a magazine such as yours that keeps you up to date with the latest developments is most welcome.

Having to buy programs mail-order without seeing them first can sometimes be quite frustrating! Considering the wealth of software available is it possible for you to square in a few more reviews?...Please!

D. Booth
Hull

**Thanks for your kind remarks. We will try to review all kinds of programs both old and new and if any readers feel they can write reviews of programs that they have and are very familiar with please let us know. It is difficult to give in-depth reviews on programs which you only have a couple of spare hours to look at!

Four in a Row 16K

Mike Aston

Fill your wits against the computer or an opponent in this simple to play but difficult to master game. If you are feeling really lazy, just sit back and watch the computer play itself!

The object is simple, just get Four in a Row, that is four blocks of your colour either vertically, horizontally or diagonally whilst trying to prevent your opponent from doing the same.

Enter each players name when prompted or if you wish to play the computer, enter * as the second player. To watch the computer play itself, enter * for each player's name. Good luck!

```

1 REM *****
2 REM #      FOUR IN A ROW  #
3 REM #      MIKE ASTON    #
4 REM *****
5 DIM NAME(140),NAME2(8),NAME3(8)
6 DIM LINE(7)
7 FOR I=1 TO 7:LINE(I)=NEXT I
8 DIM TAB(7,4)
9 FOR I=1 TO 7:FOR J=1 TO 4:TAB(I,J)=NEXT J:NEXT I
10 FOR I=1 TO 7:LINE(I)=NEXT I
11 GO=1
12 G=GRAPHICS 2
13 POSITION 12,5: #;CHR$(119):FOR I
14 =1 TO 5:NEXT I:POSITION 9,5: #;CHR$(
15 17)
16 FOR I=1 TO 9:NEXT I:POSITION 12,4
17 #;CHR$(119):FOR I=1 TO 9:NEXT I:P
18 OSITION 11,9: #;CHR$(19)
19 FOR I=1 TO 9:NEXT I:POSITION 12,3
20 #;CHR$(114):FOR I=1 TO 9:NEXT I:P
21 OSITION 12,2: #;CHR$(210)
22 FOR I=1 TO 9:NEXT I:POSITION 11,4
23 #;CHR$(180):FOR I=1 TO 9:NEXT I:P
24 OSITION 11,2: #;CHR$(210)
25 FOR I=1 TO 9:NEXT I:POSITION 18,5
26 #;CHR$(185):FOR I=1 TO 9:NEXT I:P
27 OSITION 18,4: #;CHR$(207)
28 POSITION 8,8:PRINT #;"FIRST PLAYE
29 R'S NAME":INPUT NAME1#
30 POSITION 8,9:PRINT #;CHR$(115);CH
31 R$(181);CHR$(99);CHR$(111);CHR$(118)C
32 R$(185)I" * "
33 7 #;CHR$(112);CHR$(185)C;CHR$(97);
34 CHR$(121);CHR$(121);CHR$(114)C;CHR$(115
35 );" * "
36 7 #;CHR$(108);CHR$(97);CHR$(187);
37 CHR$(101)
38 INPUT NAME2#
39 G=GRAPHICS 2
40 POKE 555,8:REM TEMPORARILY DISABLE
41 SCREEN
42 COLOR 3
43 GOSUB 1800#
44 SETCOLOR 4,8,7
45 POKE 555,34:REM RESET SCREEN THEN
46 DRAW INITIAL BOXES
47 PLOT 42,9:DRAWTO 42,78:DRAWTO 157,
48 78:DRAWTO 157,9:DRAWTO 43,9:DRAWTO 43,
49 49
50 PLOT 156,9:DRAWTO 156,78
51 FOR Y=18 TO 48 STEP 18
52 FOR X=44 TO 148 STEP 18
53 PLOT X,Y:DRAWTO X+15,Y:DRAWTO X+15
54 ,Y:DRAWTO X,Y+P:DRAWTO X,Y
55 PLOT X+1,Y+3:DRAWTO X+1,Y+8
56 PLOT X+14,Y+3:DRAWTO X+14,Y+8
57 NEXT X:NEXT Y
58 FOR C=1 TO 2
59 COLOR C:GO=C-1:R14:XP110:Y11
60 FOR Y=9 TO 49 STEP 3
61 PLOT X,Y:DRAWTO XP11,Y
62 PLOT X,Y+1:DRAWTO XP11,Y+1
63 NEXT Y:NEXT C
64 SETCOLOR 3,8,4
65 POKE 57,1
66 FOR I=1 TO 7:POSITION 8+24(I,1): #;
67 CHR$(144+I):NEXT I
68 POKE 57,7
69 IF GO=1 THEN NAME=NAME1#
70 IF GO=2 THEN NAME=NAME2#
71 GOSUB 700
72 IF NAME="*" THEN GOTO 4000
73 PRINT "YOUR GO "NAME#
74 PRINT
75 TRAP 420
76 INPUT COL#0
77 IF COL#1 THEN GOTO 420
78 IF COL#7 THEN GOTO 420
79 IF LINE(COL#)=0 THEN GOTO 420
80 TRAP 4800#
81 GOTO 1800#
82 ? "TRY AGAIN "NAME#
83 GOTO 500
84 Y#+C#3
85 X#(60-1):R14:XP110:Y11
86 FOR W#-1 TO 7 STEP -1
87 COLOR GO:PLOT X,W:DRAWTO XP11,W
88 COLOR 8:PLOT X,W+2:DRAWTO XP11,W+2
89 NEXT W
90 COLOR GO
91 FOR W=1 TO 1 STEP -1
92 PLOT X,W:DRAWTO X+11,W

```

.....over

Joysticks ...

Jeff Woodward

All you 'arcade' game players out there must agree that a more sensitive joystick would be a boon to our game playing enjoyment. I have found that the standard Atari joystick starts to lose its 'reaction' on certain types of game that require FAST and free responses from the stick. I can bring to mind playing Asteroids and pushing the stick forward to fly my spacecraft round the screen only to find that I am totally out of control and whizzing (or should that Hyper-warping!) all over the screen. Alternatives that have been introduced up to now I have found very much the same. I can think of LE STICK which I think would essentially give you Bahk'n's Wrist in five easy movements! I also fied with the standard joystick that it also gives you hand fatigue after extensive play. There are two general positions in which the right handed player can hold the stick. Grasping the stick handle in his right hand, he can either hold the base in his left, or put the base on the table or floor and use his left hand to steady it against a flat surface. In either case, while the left hand is trying to keep the base steady, the right hand is jerking the stick around in order to register the press. The effect of this is that the right hand is always trying to tear the base from the grasp of the left. Since the right hand has the leverage of the stick working for it, the left must work much harder to steady the base, all the while holding it in an awkward position. The fatigue that results is nature's way of telling you to turn the T.V. off! Also note that I have been talking about RIGHT HANDED people only. All you lefties must get to be ambidextrous real quick - Atari never thought of you! I have seen the E-Byte Stick Stand but I personally believe this gadget will soon become known as the 'Stick-Breaker'.

In ANALOG magazine Issue 3, a guy wrote in showing how you can wire up a push button controller just like the original Asteroids controllers on the arcade machines and he said it worked

equally well on Space Invaders. The problem is I do not know where you can buy the input plugs but the rest of the hardware he describes is easily obtainable. Can any reader help?

I have not tried the new 'Trackball' controllers but at over £30 each, there must be a cheaper way to play games. What about someone coming up with a project for a joystick or controller, I am sure we would all be interested!

ORIGINAL ADVENTURE ... A FOOTNOTE

The author Robert A. Howell has recently written to me and has stated that anyone interested in buying this program direct from his house can do so. He will send you a copy off for \$23.95 (about £13.90) including Air Mail postage, if you send him an International Money Order. His address is:-

Robert A. Howell,
10, Richmond Road,
Wadeau, NH 03091,
U. S. A.

This is for the ZX tape version.

CHANGING COLOURS

When you have a long listing to type in, do you get fed up with the 'standard' blue screen and black border with white characters? Well here are two POKE's that will change all that.

Before you start typing in that magic program, type, in the 'Direct Mode', i.e. without using a line number, POKE 710,n where n represents any number from 0 to 255. This will set the main screen colour to whatever you wish and make the characters anything from black to invisible! Experiment until you find a colour that suits you. Then type POKE 713,n where n is the same number as before for a screen all of the same colour or some other number for a contrast. No more strain on the eyes! Choose your own favourite colour!

GTIA Modes

Phil Griffin

When the basic Manuals were written the Atari computers were capable of only 9 graphics modes (Modes 0 to 8) available directly from Basic. With the introduction of the GTIA (George's Television Interface Adaptor) chip to replace the old CTIA chip, the computers now have the added facility of Graphics Modes 9, 10 & 11. This fact is reasonably well publicised but there's not a lot of literature around to tell you how to use these modes. The object of this article is to give a brief explanation of what the 3 extra graphics modes are capable of and how to use them.

All 3 modes have a resolution of 80 horizontal points (0 to 79) by 192 vertical points (0 to 191). They all respond to PLOT, DRAWTO and XIO (fill) instructions. Although modes 9 and 11 are relatively straightforward to use, mode 10 is a little more tricky.

GRAPHICS MODE 9

In this mode you are able to plot points in a single 'line' with up to 16 variations in luminance (brightness) which is ideal for 3-D light and shade drawings. The default colour setting for the background is black and the luminance of the points to be plotted is set with the COLOR command (COLOR 0 to 15) immediately prior to plotting. Plotting in COLOR 0 effectively plots the background colour (black) while COLOR 15 plots in white. Running Program 1 will show the range of luminances available.

Program 2 is a modified version of the 'cylinders' program which appeared in Issue 1 of PAGE 6 and is included as a demonstration of the effects available with mode 9. You will see that the overall colour of the display can be altered by using the SETCOLOR command (SETCOLOR 4, [hue], 0). The 'hue' is selected from the range of 16 colours available and the values to set the 'hue' are shown in Table 1.

```
10 GRAPHICS 9
20 FOR I=0 TO 15:COLOR I:FOR J=1 TO J+
18:PLOT 8,J:DRAWTO 79,J:NEXT J:NEXT I
100 GOTO 100
```

PROGRAM 1

```
0 REM XX CYLINDERS II XX
10 Y=120:Y=50
20 GRAPHICS 9:FOR X=50 TO 8 STEP -10:X
10:Y=10:Y=15:Y=20:Y=25:Y=30:Y=35:Y=40:Y=45:Y=50:Y=55:Y=60:Y=65:Y=70:Y=75:Y=80:Y=85:Y=90:Y=95:Y=100:Y=105:Y=110:Y=115:Y=120:Y=125:Y=130:Y=135:Y=140:Y=145:Y=150:Y=155:Y=160:Y=165:Y=170:Y=175:Y=180:Y=185:Y=190:Y=191:Y=192:Y=193:Y=194:Y=195:Y=196:Y=197:Y=198:Y=199:Y=200:Y=201:Y=202:Y=203:Y=204:Y=205:Y=206:Y=207:Y=208:Y=209:Y=210:Y=211:Y=212:Y=213:Y=214:Y=215:Y=216:Y=217:Y=218:Y=219:Y=220:Y=221:Y=222:Y=223:Y=224:Y=225:Y=226:Y=227:Y=228:Y=229:Y=230:Y=231:Y=232:Y=233:Y=234:Y=235:Y=236:Y=237:Y=238:Y=239:Y=240:Y=241:Y=242:Y=243:Y=244:Y=245:Y=246:Y=247:Y=248:Y=249:Y=250:Y=251:Y=252:Y=253:Y=254:Y=255:Y=256:Y=257:Y=258:Y=259:Y=260:Y=261:Y=262:Y=263:Y=264:Y=265:Y=266:Y=267:Y=268:Y=269:Y=270:Y=271:Y=272:Y=273:Y=274:Y=275:Y=276:Y=277:Y=278:Y=279:Y=280:Y=281:Y=282:Y=283:Y=284:Y=285:Y=286:Y=287:Y=288:Y=289:Y=290:Y=291:Y=292:Y=293:Y=294:Y=295:Y=296:Y=297:Y=298:Y=299:Y=300:Y=301:Y=302:Y=303:Y=304:Y=305:Y=306:Y=307:Y=308:Y=309:Y=310:Y=311:Y=312:Y=313:Y=314:Y=315:Y=316:Y=317:Y=318:Y=319:Y=320:Y=321:Y=322:Y=323:Y=324:Y=325:Y=326:Y=327:Y=328:Y=329:Y=330:Y=331:Y=332:Y=333:Y=334:Y=335:Y=336:Y=337:Y=338:Y=339:Y=340:Y=341:Y=342:Y=343:Y=344:Y=345:Y=346:Y=347:Y=348:Y=349:Y=350:Y=351:Y=352:Y=353:Y=354:Y=355:Y=356:Y=357:Y=358:Y=359:Y=360:Y=361:Y=362:Y=363:Y=364:Y=365:Y=366:Y=367:Y=368:Y=369:Y=370:Y=371:Y=372:Y=373:Y=374:Y=375:Y=376:Y=377:Y=378:Y=379:Y=380:Y=381:Y=382:Y=383:Y=384:Y=385:Y=386:Y=387:Y=388:Y=389:Y=390:Y=391:Y=392:Y=393:Y=394:Y=395:Y=396:Y=397:Y=398:Y=399:Y=400:Y=401:Y=402:Y=403:Y=404:Y=405:Y=406:Y=407:Y=408:Y=409:Y=410:Y=411:Y=412:Y=413:Y=414:Y=415:Y=416:Y=417:Y=418:Y=419:Y=420:Y=421:Y=422:Y=423:Y=424:Y=425:Y=426:Y=427:Y=428:Y=429:Y=430:Y=431:Y=432:Y=433:Y=434:Y=435:Y=436:Y=437:Y=438:Y=439:Y=440:Y=441:Y=442:Y=443:Y=444:Y=445:Y=446:Y=447:Y=448:Y=449:Y=450:Y=451:Y=452:Y=453:Y=454:Y=455:Y=456:Y=457:Y=458:Y=459:Y=460:Y=461:Y=462:Y=463:Y=464:Y=465:Y=466:Y=467:Y=468:Y=469:Y=470:Y=471:Y=472:Y=473:Y=474:Y=475:Y=476:Y=477:Y=478:Y=479:Y=480:Y=481:Y=482:Y=483:Y=484:Y=485:Y=486:Y=487:Y=488:Y=489:Y=490:Y=491:Y=492:Y=493:Y=494:Y=495:Y=496:Y=497:Y=498:Y=499:Y=500:Y=501:Y=502:Y=503:Y=504:Y=505:Y=506:Y=507:Y=508:Y=509:Y=510:Y=511:Y=512:Y=513:Y=514:Y=515:Y=516:Y=517:Y=518:Y=519:Y=520:Y=521:Y=522:Y=523:Y=524:Y=525:Y=526:Y=527:Y=528:Y=529:Y=530:Y=531:Y=532:Y=533:Y=534:Y=535:Y=536:Y=537:Y=538:Y=539:Y=540:Y=541:Y=542:Y=543:Y=544:Y=545:Y=546:Y=547:Y=548:Y=549:Y=550:Y=551:Y=552:Y=553:Y=554:Y=555:Y=556:Y=557:Y=558:Y=559:Y=560:Y=561:Y=562:Y=563:Y=564:Y=565:Y=566:Y=567:Y=568:Y=569:Y=570:Y=571:Y=572:Y=573:Y=574:Y=575:Y=576:Y=577:Y=578:Y=579:Y=580:Y=581:Y=582:Y=583:Y=584:Y=585:Y=586:Y=587:Y=588:Y=589:Y=590:Y=591:Y=592:Y=593:Y=594:Y=595:Y=596:Y=597:Y=598:Y=599:Y=600:Y=601:Y=602:Y=603:Y=604:Y=605:Y=606:Y=607:Y=608:Y=609:Y=610:Y=611:Y=612:Y=613:Y=614:Y=615:Y=616:Y=617:Y=618:Y=619:Y=620:Y=621:Y=622:Y=623:Y=624:Y=625:Y=626:Y=627:Y=628:Y=629:Y=630:Y=631:Y=632:Y=633:Y=634:Y=635:Y=636:Y=637:Y=638:Y=639:Y=640:Y=641:Y=642:Y=643:Y=644:Y=645:Y=646:Y=647:Y=648:Y=649:Y=650:Y=651:Y=652:Y=653:Y=654:Y=655:Y=656:Y=657:Y=658:Y=659:Y=660:Y=661:Y=662:Y=663:Y=664:Y=665:Y=666:Y=667:Y=668:Y=669:Y=670:Y=671:Y=672:Y=673:Y=674:Y=675:Y=676:Y=677:Y=678:Y=679:Y=680:Y=681:Y=682:Y=683:Y=684:Y=685:Y=686:Y=687:Y=688:Y=689:Y=690:Y=691:Y=692:Y=693:Y=694:Y=695:Y=696:Y=697:Y=698:Y=699:Y=700:Y=701:Y=702:Y=703:Y=704:Y=705:Y=706:Y=707:Y=708:Y=709:Y=710:Y=711:Y=712:Y=713:Y=714:Y=715:Y=716:Y=717:Y=718:Y=719:Y=720:Y=721:Y=722:Y=723:Y=724:Y=725:Y=726:Y=727:Y=728:Y=729:Y=730:Y=731:Y=732:Y=733:Y=734:Y=735:Y=736:Y=737:Y=738:Y=739:Y=740:Y=741:Y=742:Y=743:Y=744:Y=745:Y=746:Y=747:Y=748:Y=749:Y=750:Y=751:Y=752:Y=753:Y=754:Y=755:Y=756:Y=757:Y=758:Y=759:Y=760:Y=761:Y=762:Y=763:Y=764:Y=765:Y=766:Y=767:Y=768:Y=769:Y=770:Y=771:Y=772:Y=773:Y=774:Y=775:Y=776:Y=777:Y=778:Y=779:Y=780:Y=781:Y=782:Y=783:Y=784:Y=785:Y=786:Y=787:Y=788:Y=789:Y=790:Y=791:Y=792:Y=793:Y=794:Y=795:Y=796:Y=797:Y=798:Y=799:Y=800:Y=801:Y=802:Y=803:Y=804:Y=805:Y=806:Y=807:Y=808:Y=809:Y=810:Y=811:Y=812:Y=813:Y=814:Y=815:Y=816:Y=817:Y=818:Y=819:Y=820:Y=821:Y=822:Y=823:Y=824:Y=825:Y=826:Y=827:Y=828:Y=829:Y=830:Y=831:Y=832:Y=833:Y=834:Y=835:Y=836:Y=837:Y=838:Y=839:Y=840:Y=841:Y=842:Y=843:Y=844:Y=845:Y=846:Y=847:Y=848:Y=849:Y=850:Y=851:Y=852:Y=853:Y=854:Y=855:Y=856:Y=857:Y=858:Y=859:Y=860:Y=861:Y=862:Y=863:Y=864:Y=865:Y=866:Y=867:Y=868:Y=869:Y=870:Y=871:Y=872:Y=873:Y=874:Y=875:Y=876:Y=877:Y=878:Y=879:Y=880:Y=881:Y=882:Y=883:Y=884:Y=885:Y=886:Y=887:Y=888:Y=889:Y=890:Y=891:Y=892:Y=893:Y=894:Y=895:Y=896:Y=897:Y=898:Y=899:Y=900:Y=901:Y=902:Y=903:Y=904:Y=905:Y=906:Y=907:Y=908:Y=909:Y=910:Y=911:Y=912:Y=913:Y=914:Y=915:Y=916:Y=917:Y=918:Y=919:Y=920:Y=921:Y=922:Y=923:Y=924:Y=925:Y=926:Y=927:Y=928:Y=929:Y=930:Y=931:Y=932:Y=933:Y=934:Y=935:Y=936:Y=937:Y=938:Y=939:Y=940:Y=941:Y=942:Y=943:Y=944:Y=945:Y=946:Y=947:Y=948:Y=949:Y=950:Y=951:Y=952:Y=953:Y=954:Y=955:Y=956:Y=957:Y=958:Y=959:Y=960:Y=961:Y=962:Y=963:Y=964:Y=965:Y=966:Y=967:Y=968:Y=969:Y=970:Y=971:Y=972:Y=973:Y=974:Y=975:Y=976:Y=977:Y=978:Y=979:Y=980:Y=981:Y=982:Y=983:Y=984:Y=985:Y=986:Y=987:Y=988:Y=989:Y=990:Y=991:Y=992:Y=993:Y=994:Y=995:Y=996:Y=997:Y=998:Y=999:Y=1000:Y=1001:Y=1002:Y=1003:Y=1004:Y=1005:Y=1006:Y=1007:Y=1008:Y=1009:Y=1010:Y=1011:Y=1012:Y=1013:Y=1014:Y=1015:Y=1016:Y=1017:Y=1018:Y=1019:Y=1020:Y=1021:Y=1022:Y=1023:Y=1024:Y=1025:Y=1026:Y=1027:Y=1028:Y=1029:Y=1030:Y=1031:Y=1032:Y=1033:Y=1034:Y=1035:Y=1036:Y=1037:Y=1038:Y=1039:Y=1040:Y=1041:Y=1042:Y=1043:Y=1044:Y=1045:Y=1046:Y=1047:Y=1048:Y=1049:Y=1050:Y=1051:Y=1052:Y=1053:Y=1054:Y=1055:Y=1056:Y=1057:Y=1058:Y=1059:Y=1060:Y=1061:Y=1062:Y=1063:Y=1064:Y=1065:Y=1066:Y=1067:Y=1068:Y=1069:Y=1070:Y=1071:Y=1072:Y=1073:Y=1074:Y=1075:Y=1076:Y=1077:Y=1078:Y=1079:Y=1080:Y=1081:Y=1082:Y=1083:Y=1084:Y=1085:Y=1086:Y=1087:Y=1088:Y=1089:Y=1090:Y=1091:Y=1092:Y=1093:Y=1094:Y=1095:Y=1096:Y=1097:Y=1098:Y=1099:Y=1100:Y=1101:Y=1102:Y=1103:Y=1104:Y=1105:Y=1106:Y=1107:Y=1108:Y=1109:Y=1110:Y=1111:Y=1112:Y=1113:Y=1114:Y=1115:Y=1116:Y=1117:Y=1118:Y=1119:Y=1120:Y=1121:Y=1122:Y=1123:Y=1124:Y=1125:Y=1126:Y=1127:Y=1128:Y=1129:Y=1130:Y=1131:Y=1132:Y=1133:Y=1134:Y=1135:Y=1136:Y=1137:Y=1138:Y=1139:Y=1140:Y=1141:Y=1142:Y=1143:Y=1144:Y=1145:Y=1146:Y=1147:Y=1148:Y=1149:Y=1150:Y=1151:Y=1152:Y=1153:Y=1154:Y=1155:Y=1156:Y=1157:Y=1158:Y=1159:Y=1160:Y=1161:Y=1162:Y=1163:Y=1164:Y=1165:Y=1166:Y=1167:Y=1168:Y=1169:Y=1170:Y=1171:Y=1172:Y=1173:Y=1174:Y=1175:Y=1176:Y=1177:Y=1178:Y=1179:Y=1180:Y=1181:Y=1182:Y=1183:Y=1184:Y=1185:Y=1186:Y=1187:Y=1188:Y=1189:Y=1190:Y=1191:Y=1192:Y=1193:Y=1194:Y=1195:Y=1196:Y=1197:Y=1198:Y=1199:Y=1200:Y=1201:Y=1202:Y=1203:Y=1204:Y=1205:Y=1206:Y=1207:Y=1208:Y=1209:Y=1210:Y=1211:Y=1212:Y=1213:Y=1214:Y=1215:Y=1216:Y=1217:Y=1218:Y=1219:Y=1220:Y=1221:Y=1222:Y=1223:Y=1224:Y=1225:Y=1226:Y=1227:Y=1228:Y=1229:Y=1230:Y=1231:Y=1232:Y=1233:Y=1234:Y=1235:Y=1236:Y=1237:Y=1238:Y=1239:Y=1240:Y=1241:Y=1242:Y=1243:Y=1244:Y=1245:Y=1246:Y=1247:Y=1248:Y=1249:Y=1250:Y=1251:Y=1252:Y=1253:Y=1254:Y=1255:Y=1256:Y=1257:Y=1258:Y=1259:Y=1260:Y=1261:Y=1262:Y=1263:Y=1264:Y=1265:Y=1266:Y=1267:Y=1268:Y=1269:Y=1270:Y=1271:Y=1272:Y=1273:Y=1274:Y=1275:Y=1276:Y=1277:Y=1278:Y=1279:Y=1280:Y=1281:Y=1282:Y=1283:Y=1284:Y=1285:Y=1286:Y=1287:Y=1288:Y=1289:Y=1290:Y=1291:Y=1292:Y=1293:Y=1294:Y=1295:Y=1296:Y=1297:Y=1298:Y=1299:Y=1300:Y=1301:Y=1302:Y=1303:Y=1304:Y=1305:Y=1306:Y=1307:Y=1308:Y=1309:Y=1310:Y=1311:Y=1312:Y=1313:Y=1314:Y=1315:Y=1316:Y=1317:Y=1318:Y=1319:Y=1320:Y=1321:Y=1322:Y=1323:Y=1324:Y=1325:Y=1326:Y=1327:Y=1328:Y=1329:Y=1330:Y=1331:Y=1332:Y=1333:Y=1334:Y=1335:Y=1336:Y=1337:Y=1338:Y=1339:Y=1340:Y=1341:Y=1342:Y=1343:Y=1344:Y=1345:Y=1346:Y=1347:Y=1348:Y=1349:Y=1350:Y=1351:Y=1352:Y=1353:Y=1354:Y=1355:Y=1356:Y=1357:Y=1358:Y=1359:Y=1360:Y=1361:Y=1362:Y=1363:Y=1364:Y=1365:Y=1366:Y=1367:Y=1368:Y=1369:Y=1370:Y=1371:Y=1372:Y=1373:Y=1374:Y=1375:Y=1376:Y=1377:Y=1378:Y=1379:Y=1380:Y=1381:Y=1382:Y=1383:Y=1384:Y=1385:Y=1386:Y=1387:Y=1388:Y=1389:Y=1390:Y=1391:Y=1392:Y=1393:Y=1394:Y=1395:Y=1396:Y=1397:Y=1398:Y=1399:Y=1400:Y=1401:Y=1402:Y=1403:Y=1404:Y=1405:Y=1406:Y=1407:Y=1408:Y=1409:Y=1410:Y=1411:Y=1412:Y=1413:Y=1414:Y=1415:Y=1416:Y=1417:Y=1418:Y=1419:Y=1420:Y=1421:Y=1422:Y=1423:Y=1424:Y=1425:Y=1426:Y=1427:Y=1428:Y=1429:Y=1430:Y=1431:Y=1432:Y=1433:Y=1434:Y=1435:Y=1436:Y=1437:Y=1438:Y=1439:Y=1440:Y=1441:Y=1442:Y=1443:Y=1444:Y=1445:Y=1446:Y=1447:Y=1448:Y=1449:Y=1450:Y=1451:Y=1452:Y=1453:Y=1454:Y=1455:Y=1456:Y=1457:Y=1458:Y=1459:Y=1460:Y=1461:Y=1462:Y=1463:Y=1464:Y=1465:Y=1466:Y=1467:Y=1468:Y=1469:Y=1470:Y=1471:Y=1472:Y=1473:Y=1474:Y=1475:Y=1476:Y=1477:Y=1478:Y=1479:Y=1480:Y=1481:Y=1482:Y=1483:Y=1484:Y=1485:Y=1486:Y=1487:Y=1488:Y=1489:Y=1490:Y=1491:Y=1492:Y=1493:Y=1494:Y=1495:Y=1496:Y=1497:Y=1498:Y=1499:Y=1500:Y=1501:Y=1502:Y=1503:Y=1504:Y=1505:Y=1506:Y=1507:Y=1508:Y=1509:Y=1510:Y=1511:Y=1512:Y=1513:Y=1514:Y=1515:Y=1516:Y=1517:Y=1518:Y=1519:Y=1520:Y=1521:Y=1522:Y=1523:Y=1524:Y=1525:Y=1526:Y=1527:Y=1528:Y=1529:Y=1530:Y=1531:Y=1532:Y=1533:Y=1534:Y=1535:Y=1536:Y=1537:Y=1538:Y=1539:Y=1540:Y=1541:Y=1542:Y=1543:Y=1544:Y=1545:Y=1546:Y=1547:Y=1548:Y=1549:Y=1550:Y=1551:Y=1552:Y=1553:Y=1554:Y=1555:Y=1556:Y=1557:Y=1558:Y=1559:Y=1560:Y=1561:Y=1562:Y=1563:Y=1564:Y=1565:Y=1566:Y=1567:Y=1568:Y=1569:Y=1570:Y=1571:Y=1572:Y=1573:Y=1574:Y=1575:Y=1576:Y=1577:Y=1578:Y=1579:Y=1580:Y=1581:Y=1582:Y=1583:Y=1584:Y=1585:Y=1586:Y=1587:Y=1588:Y=1589:Y=1590:Y=1591:Y=1592:Y=1593:Y=1594:Y=1595:Y=1596:Y=1597:Y=1598:Y=1599:Y=1600:Y=1601:Y=1602:Y=1603:Y=1604:Y=1605:Y=1606:Y=1607:Y=1608:Y=1609:Y=1610:Y=1611:Y=1612:Y=1613:Y=1614:Y=1615:Y=1616:Y=1617:Y=1618:Y=1619:Y=1620:Y=1621:Y=1622:Y=1623:Y=1624:Y=1625:Y=1626:Y=1627:Y=1628:Y=1629:Y=1630:Y=1631:Y=1632:Y=1633:Y=1634:Y=1635:Y=1636:Y=1637:Y=1638:Y=1639:Y=1640:Y=1641:Y=1642:Y=1643:Y=1644:Y=1645:Y=1646:Y=1647:Y=1648:Y=1649:Y=1650:Y=1651:Y=1652:Y=1653:Y=1654:Y=1655:Y=1656:Y=1657:Y=1658:Y=1659:Y=1660:Y=1661:Y=1662:Y=1663:Y=1664:Y=1665:Y=1666:Y=1667:Y=1668:Y=1669:Y=1670:Y=1671:Y=1672:Y=1673:Y=1674:Y=1675:Y=1676:Y=1677:Y=1678:Y=1679:Y=1680:Y=1681:Y=1682:Y=1683:Y=1684:Y=1685:Y=1686:Y=1687:Y=1688:Y=1689:Y=1690:Y=1691:Y=1692:Y=1693:Y=1694:Y=1695:Y=1696:Y=1697:Y=1698:Y=1699:Y=1700:Y=1701:Y=1702:Y=1703:Y=1704:Y=1705:Y=1706:Y=1707:Y=1708:Y=1709:Y=1710:Y=1711:Y=1712:Y=1713:Y=1714:Y=1715:Y=1716:Y=1717:Y=1718:Y=1719:Y=1720:Y=1721:Y=1722:Y=1723:Y=1724:Y=1725:Y=1726:Y=1727:Y=1728:Y=1729:Y=1730:Y=1731:Y=1732:Y=1733:Y=1734:Y=1735:Y=1736:Y=1737:Y=1738:Y=1739:Y=1740:Y=1741:Y=1742:Y=1743:Y=1744:Y=1745:Y=1746:Y=1747:Y=1748:Y=1749:Y=1750:Y=1751:Y=1752:Y=1753:Y=1754:Y=1755:Y=1756:Y=1757:Y=1758:Y=1759:Y=1760:Y=1761:Y=1762:Y=1763:Y=1764:Y=1765:Y=1766:Y=1767:Y=1768:Y=1769:Y=1770:Y=1771:Y=1772:Y=1773:Y=1774:Y=1775:Y=1776:Y=1777:Y=1778:Y=1779:Y=1780:Y=1781:Y=1782:Y=1783:Y=1784:Y=1785:Y=1786:Y=1787:Y=1788:Y=1789:Y=1790:Y=1791:Y=1792:Y=1793:Y=1794:Y=1795:Y=1796:Y=1797:Y=1798:Y=1799:Y=1800:Y=1801:Y=1802:Y=1803:Y=1804:Y=1805:Y=1806:Y=1807:Y=1808:Y=1809:Y=1810:Y=1811:Y=1812:Y=1813:Y=1814:Y=1815:Y=1816:Y=1817:Y=1818:Y=1819:Y=1820:Y=1821:Y=1822:Y=1823:Y=1824:Y=1825:Y=1826:Y=1827:Y=1828:Y=1829:Y=1830:Y=1831:Y=1832:Y=1833:Y=1834:Y=1835:Y=1836:Y=1837:Y=1838:Y=1839:Y=1840:Y=1841:Y=1842:Y=1843:Y=1844:Y=1845:Y=1846:Y=1847:Y=1848:Y=1849:Y=1850:Y=1851:Y=1852:Y=1853:Y=1854:Y=1855:Y=1856:Y=1857:Y=1858:Y=1859:Y=1860:Y=1861:Y=1862:Y=1863:Y=1864:Y=1865:Y=1866:Y=1867:Y=1868:Y=1869:Y=1870:Y=1871:Y=1872:Y=1873:Y=1874:Y=1875:Y=1876:Y=1877:Y=1878:Y=1879:Y=1880:Y=1881:Y=1882:Y=1883:Y=1884:Y=1885:Y=1886:Y=1887:Y=1888:Y=1889:Y=1890:Y=1891:Y=1892:Y=1893:Y=1894:Y=1895:Y=1896:Y=1897:Y=1898:Y=1899:Y=1900:Y=1901:Y=1902:Y
```

SETCOLOR commands and in order to use the full colour capabilities, you need to be familiar with how the SETCOLOR command works within a color register.

The SETCOLOR statement contains - specific references to a colour register, a 'hue' and a luminance for that hue. The computer then converts this information into a memory location for the color register and a single value for the hue and luminance selected. This value is then automatically 'poked' into the color register memory location. The basis for calculation of the value to be poked is:

POKE value = ('hue' value * 25) + luminance value.

Table 1 shows the range of values that the "POKE" value can have together with the equivalent hue and luminance figures.

COLOR (HUE)	HUE VALUE (SETCOLOR)	LUMINANCE (HUE) VALUES	POKE (HUE) VALUES
Blackwhite	0	0 - 14	0 - 14
Gold	1	0 - 14	14 - 28
Orange	2	0 - 14	28 - 42
Red	3	0 - 14	42 - 56
Pink	4	0 - 14	56 - 70
Violet	5	0 - 14	70 - 84
Blue-purple	6	0 - 14	84 - 98
Blue	7	0 - 14	112 - 126
Light-blue	8	0 - 14	126 - 140
Blue-green	9	0 - 14	140 - 154
Aqua	10	0 - 14	154 - 174
Green-blue	11	0 - 14	174 - 194
Green	12	0 - 14	192 - 204
Yellow-green	13	0 - 14	208 - 222
Orange-green	14	0 - 14	224 - 238
Orange	15	0 - 14	248 - 254

TABLE 1 - SETCOLOR VALUES AND EQUIVALENT POKE VALUES.

The Atari computer uses 5 color registers (0 to 4) within its operating system and these have default settings as shown in Table 2.

REGISTER NUMBER	SCREEN COLOUR	DEFAULT HUE	VALUES LUM	MEMORY LOC.
0	Orange	2	0	780
1	Aqua	12	14	789
2	Blue	9	4	718
3	Light Red	4	4	711
4	Black	0	0	712

TABLE 2: COLOUR REGISTERS WITH DEFAULT VALUES

Instead of using a SETCOLOR Statement, its possible to by-pass the basic commands and POKE a combined colour value directly into the color register memory location. Some examples of direct 'POKEs' with their SETCOLOR equivalents are shown below.

POKE	SETCOLOR
708,14	SE,0,2,2
710,14	SE,2,8,14
712,0	SE,4,0,4

You should now have a reasonable idea of how to set the colour within a color register by POKEing a value directly into the register memory location.

If you now substitute "GRAPHICS 10" for "GRAPHICS 9" and '8' for '15' in line 20 of program 1 you will find that the screen contains 4 coloured bands. These correspond to COLOR statements 4 to 7 and show their default colours. The program has in fact drawn 9 bands of colour but 5 of them are set to the default colour of black. The position is summarized in Table 3.

You can see from Table 3 that the only way to alter the colours plotted in COLOR statements 0 to 3 is to POKE values directly into the memory locations shown. The other COLOR statements can have their colours changed by using the SETCOLOR command, but its probably better to keep to the POKE instruction throughout. Cont'd

Feature Review

ASTRO CHASE

32K Disk/Cass. 1 Player

Fernando Herrera was the first winner of Atari's annual 'Star Award' for a program he wrote for his little boy called My First Alphabet. Most of you will have heard of the program but many will not have seen it as it is only available on disk due to the fact that it has to access a large number of pictures throughout the program. The idea is very simple - just show the letters of the alphabet accompanied by pictures which represent those letters. Sounds as if anyone can do it, doesn't it! The secret of Mr. Herrera's success though is an exceptional talent for graphic composition and a skillful mind in structuring the program to achieve the desired result.

With his \$25,000 prize in his pocket Fernando promptly set up First Star Software Inc. and took a crash course in machine language. Now, writing an alphabet program out of love for his son is one thing, but to write a successful arcade game to launch a new company is surely something else. Does he succeed? Take a look at ASTRO CHASE and you will find that the answer is an unqualified 'Yes'.

The scenario is that the Megard Empire has surrounded the earth with a force field and placed pulsating Mega Mines which are slowly advancing on the earth. Your mission is to destroy all the mines whilst fighting off the Megard warriors. Sounds familiar? Sounds just like the sort of blurb that poor programmers use to dress up their latest Space Invader variation, but ASTRO CHASE is very different. It begins with an excellent blast-off animation to take you into space from where you see the earth, complete with a map of North and South America, surrounded by various other planets. You can't see the force field but it is there preventing you from straying too far. There are eight types of enemy fighters at the various levels but your real task is to destroy 18 mines which are slowly but surely making their way towards earth. Fernando has invented something he calls 'Single Threat

Propulsion' which means that you can set your craft in motion and it will carry on in that direction whilst you fire in any direction around you! It takes some getting used to but is a great joy once you get it right. Each of your craft will use up energy but there are energy points at the limits of the available universe if you can get to them and 'shield' bases to give you up to 10 seconds of protection from enemy fire. The enemy warriors are not too difficult to destroy but the real problem is keeping into a 'hot star' whilst being pursued. These are tiny pinpoints which don't do you any damage as such but which you can get stuck on and so destroyed by a pursuing enemy craft.

The graphics on this are quite stunning but Fernando has gone much further and crafted a game in which he appears to have thought of everything. There are 24 levels, but if you are good you can start at any level up to 24. So as not to spoil the fun the higher levels can only be obtained by completing level 24. The best feature to my mind however and what sets this apart as an exceptional arcade game is that every 4 levels you come back to earth for a rest and each time can enjoy an animation sequence which adds a little more to the previous one. I get bored with arcade games which just give you points and more points but finding out what the next animation sequence is going to be has got me absolutely hooked! I have only managed it to level 20 and I fear that I will not improve so if somebody gets up to the Master levels let me know what happens.

The game has excellent graphics, scrolls, has music which automatically turns itself down while you are fighting; or which can be turned off and surely marks a big step forward in game design. First Star Software has set itself a big task to follow this but if they can do it they stand a chance of becoming THE Atari Software house to avidly watch in the future.

SILLY CIRCLES

Mike Aston

Explore the Atari Display Lists with this shape changing program. Here's how it works.

LINE 10 - establishes a standard display list for mode 7.
 LINE 20 to 60 - draw a circle.
 LINE 100 - sets the pointer to the display list.
 LINE 150 to 190 - change the display list a line at a time from the standard 4 colour mode with 96 vertical rows to a 4 colour mode with 192 vertical rows on a full screen. This effectively halves the height of the circle producing an elliptical shape.

Try changing LINE 150 to 2=-1, or 2=-2, or 2=-3.

Add more colours to the circle or change the original shape. You could also try starting off in a different

graphics mode but don't forget to make LINE 10 specify the mode with the largest RAM requirement that you are going to use.

```

5 REM ***** SILLY CIRCLES *****
6 REM  ##          by          ##
7 REM ***** MIKE ASTON *****
8 REM
9 GRAPHICS 7+16:COLOR 1
20 DEG :CX=96:CY=48:R=37
30 FOR I=1 TO 360
40 X=COS(I):Y=SIN(I):EL
50 PLOT CX*X,CY*Y
60 NEXT I
100 DLIST=PEEK(560)+PEEK(561)*256+4
150 Z=1
200 FOR I=2 TO 96
310 P=PEEK(DLIST+I)+2
320 POKE DLIST+I,P
330 NEXT I
340 Z=2
350 GOTO 200
360 END
  
```

GTIA ... Cont.

COLOR	SETCOLOR REGISTER	DEFAULT COLOUR	MEMORY LOC.
0	N/A	Black	784
1	N/A	Black	785
2	N/A	Black	786
3	N/A	Black	787
4	8	Orange	788
5	1	Aqua	789
6	2	Blue	710
7	3	Light red	711
8	4	Black	712

Note: Memory location 784 controls the background colour

TABLE 3:COLOR STATEMENTS
 IN GRAPHICS MODE 18

In summary then, graphics displays using mode 18 require the following steps.

- 1) The selection of the colours required.
- 2) The setting (at some stage in the program) of each selected colour to its own COLOR statement by using POKE

instructions.

3) The plotting of points using the relevant COLOR statements

That really concludes this introduction to the world of GTIA. The addition of the new graphics modes gives Atari users even greater flexibility in their approach to graphics displays. In particular, Graphics Mode 18 opens up the possibility of high speed colour animation simply by moving colours through the colour registers. Finally, don't be afraid to experiment with these modes. You can't do any harm to the computer if you make mistakes, but you can learn an awful lot. If you come up with some interesting graphics displays using these modes send them in.

Just to give you a starter in the possibilities of animation try making these changes to program 2 - LINE 30 change 'GRAPHICS 9' to 'GRAPHICS 18', LINE 30 change 'GOTO 10' to 'GOTO 200' and add line 300:-
 200 P=PEEK(708): POKE 708,PEEK(709):
 POKE 709,PEEK(710):POKE 710,PEEK(711):
 POKE 711,PEEK(712):POKE 712,P:GOTO 200

Play Your Cards

Les Ellingham

One of the more simple games to program would seem to be a card game but if you are just starting to learn Acorn Basic the task may not be as simple as it seems. In this article I present you with a pack of cards for you to turn into whatever game takes your fancy.

Graphics 1 would seem to be the ideal choice for a card game using the control characters representing the card suits but unfortunately there is not enough room on the screen to feature sufficient cards. This program uses Graphics 0 and so leaves the option of colour for the 'pips' but does allow up to ten cards on the screen.

Let's go through the listings. The first listing creates the pack of cards and in LINES 50 - 75 goes through the entire pack to allow you to check that everything is alright. You can add Listing 2 later as an example of how to deal the cards.

LINE 10 - Dimensioned strings. A\$ holds the entire pack whilst the CARD strings hold individual cards to be picked by random routines in listing 2.

LINES 20 - 35 fill the strings with the same characters. In the case of A\$ the 'pips' are added in later.

LINE 38 opens the keyboard for direct input later in the game.

LINES 30 - 35 set some colour and put a title up while the program creates the cards in the routine beginning with LINE 400.

LINES 400 - 490 are the 'card-making' routine.

LINE 410 goes through the 52 cards and first reads the CARDNO from the DATA which is the number of 'pips' on each card.

LINES 411 - 434 change the characters from hearts to clubs to diamonds to spades. Refer to Appendix C of the Basic Manual.

LINE 430 reads the position of each 'pip' and places the appropriate character in the correct place in the string.

LINE 440 Restores the DATA for each of

```
18 DIM A$(32767),CARD$(430),CARDNO$(53),
CARDNO$(430),CARDNO$(53),BACK$(430)
```

```
20 A$(1)=" " :A$(32767)=" " :A$(32768)=CHR$
(INVERSE VIDEO SPACES)
```

```
25 BACK$(1)="$" :BACK$(430)="$" :BACK$(430)
=CHR$(8) :INVERSE VIDEO $
```

```
28 OPEN #1:4,8,"R:"
```

```
30 SETCOLOR 2,11,4:SETCOLOR 4,11,4:SET
COLOR 1,11,15:PAGE 752,1
```

```
32 ? CHR$(120):POSITION 12,18:"PLAY
YOUR CARDS"
```

```
40 GOSUB 488:"? CHR$(120)
```

```
50 REM GO THROUGH THE CARDS
```

```
55 FOR CARD=0 TO 51
```

```
60 FOR I=1 TO 10:POSITION 8,1-1:7: A$(CA
RD*43+I*7)=CARD$*I*7:NEXT I
```

```
65 CARD=INT(RND*(RND*850+1)):IF CARD=CAR
```

```
60 OR CARD=CARD1 THEN 65
```

```
70 FOR J=1 TO 99:NEXT 0
```

```
75 NEXT CARD
```

```
390 END
```

```
400 CARDNO=1
```

```
410 FOR I=0 TO 51:READ CARDNO:FOR J=1
TO CARDNO
```

```
411 IF I<13 THEN SUIT=100:GOTO 420
```

```
412 IF I<26 THEN SUIT=140:GOTO 420
```

```
413 IF I<39 THEN SUIT=224:GOTO 420
```

```
414 SUIT=231
```

```
420 READ A:AB$(A)=I*83+A:(I+10)*83+A0
:?
```

```
430 NEXT J
```

```
440 IF I=12 OR I=25 OR I=38 THEN RESTO
RE
```

```
450 NEXT I
```

```
460 FOR I=18 TO 49 STEP 13
```

```
461 FOR K=0 TO 2
```

```
462 FOR J=1 TO 2
```

```
470 READ A,B:AB$(I+K*83+A,(J+10)*83+A0)
=CHR$(B)
```

```
475 NEXT J
```

```
475 NEXT K:RESTORE 340
```

```
480 NEXT I
```

```
490 RETURN
```

```
500 DATA 1,22,2,11,53,3,11,32,59,4,9,3
3,31,55,5,9,13,32,51,33
```

```
510 DATA 6,9,13,38,34,51,50,7,9,13,38,
34,52,51,55,8,9,13,18,38,34,48,51,55
```

```
520 DATA 9,9,19,23,27,32,37,41,51,55,1
8,9,13,18,23,27,37,41,46,51,55
```

```
530 DATA 2,9,55,2,9,55,2,9,55
```

```
540 DATA 18,282,34,282,58,289,54,289,1
8,282,54,282
```

the four suits.

LINES 460 - 480 step through the 11th, 12th and 13th cards of each suit to add the letters representing the court cards.

The program then goes back to line 50 to run through the pack.

There's your pack of cards. Now add listing 2 to see how these can be dealt out. The program picks 4 random numbers to represent four cards and makes sure that you don't have two cards the same. Each card is made up of 83 characters and these are picked out of A\$ at the appropriate point and put into the CARD strings. These are then printed out line by line at set positions on the screen to give you your 'deal'.

```

50 REM * DEMONSTRATION BLACKJACK DEAL
5
55 CARD1=INT(RND*(83/52)+1)
58 CARD2=INT(RND*(83/52)+1):IF CARD2=CARD1 THEN 48
65 CARD3=INT(RND*(83/52)+1):IF CARD3=CARD2 OR CARD3=CARD1 THEN 45
78 CARD4=INT(RND*(83/52)+1):IF CARD4=CARD3 OR CARD4=CARD2 OR CARD4=CARD1 THEN 78
75 CARD1=CHR$(CARD1*63-62)+CARD1*63
88 CARD2=CHR$(CARD2*63-62)+CARD2*63
95 CARD3=CHR$(CARD3*63-62)+CARD3*63
98 CARD4=CHR$(CARD4*63-62)+CARD4*63
100 FOR I=1 TO 9:POSITION 8,1-I: CARD 1*(17-6,17):NEXT I
110 FOR I=1 TO 9:POSITION 8,1-I: BACK 6*(17-6,17):NEXT I
120 FOR I=1 TO 9:POSITION 8,1+9: CARD 2*(17-6,17):NEXT I
130 FOR I=1 TO 9:POSITION 8,1+9: CARD 4*(17-6,17):NEXT I
140 POSITION 2,31: *PRESS ANY KEY FOR DEALER'S CARD*:GET #1,K
150 FOR I=1 TO 9:POSITION 8,1-I: CARD 2*(17-6,17):NEXT I
160 POSITION 2,31: *PRESS ANY KEY FOR NEXT DEAL. *:GET #1,K
170 ? CHR$(129):GOTO 50

```

What you do now is up to you - blackjack, poker, snap (!) or whatever. Add scoring, a money pot, anything you wish. If you can make up a good game send it in for a future article.

CAN YOU....

write an article?

send a program?

COPY DATE 25th MARCH

GTIA Text Window

Colin Boswell

One slight disadvantage of the GTIA modes 9, 10 & 11 is that you can't easily mix text with your graphics displays.

With this short program you can now add a standard text window to these modes. Most of what is happening is shown in the REM statements and you should be able to quite easily build up your own program incorporating these routines.

```

5 REM LET'S SET UP FOR A TEXT AND GTI
A GRAPHICS MODE
10 FOR M=9 TO 11:GOSUB 1000
15 REM PUT SOMETHING ON THE SCREEN
20 FOR Y=0 TO 15:COLOR Y:PLT 8,Y
30 DRAWO 20,Y:18:NEXT Y
35 REM NOW LET'S SHOW OFF OUR NEW TEXT
WINDOW
40 ? *THIS IS GRAPHICS *Y,M
50 FOR T=1 TO 100:NEXT T
60 NEXT M
990 END
995 REM M CONTAINS THE GRAPHICS MODE
1000 IF PK2 OR PK1: THEN 1000
1010 REM READ IN THE DISPLAY LIST ROUT
THE
1020 RESTORE I:FOR J=1234 TO 1234:READ
A:POKE X,A:NEXT X
1030 REM SET UP DISPLAY LIST FOR GR.9
AND FIND THE BEGINNING OF THE DISPLAY
LIST
1040 GRAPHICS 0:DL=PEEK(5640)+PEEK(561)
8204
1050 REM FIND THE LINE THAT LIES BEFORE
TEXT AREA AND INSERT DISPLAY LIST IN
TERRIPT
1060 DL=DL+164:POKE DL,143
1070 REM ENABLE INTERRUPT STARTING AT
PAGE 4,SET BITS 6 + 7 FOR GTIA OPERATI
ON AND TELL D.S. WHAT MODE TO WORK IN
1080 POKE 513,8:POKE 513,6:POKE 54204,
192:POKE 423,16-8:44:POKE 87,16
1090 REM DIFFERENT VALUES FOR DIFFERENT
T MODES ?
1095 SETCOLOR 4,8,8:IF M=1: THEN SETCO
LOR 4,8,4
1075 RETURN
1000 IF PK24 AND PK28 THEN M=1-16:GRAW
KECS M:RETURN
1005 REM DATA FOR D.L.I. ROUTINE
1090 DATA 72,173,27,289,41,63,143,18,2
12,141,27,289,147,8,141,26,289,184,64

```

Product Reviews

VICTAGRAPH PLOT WINDOW

Whilst the Atari is capable of excellent graphics displays in modes 7 or 8 there is no denying that it is a laborious task indeed to get a picture from paper to screen. The traditional way would be to trace the original drawing and then transfer to graph paper, finally either numbering the squares on the graph paper or counting along to find the plot position. Anything that can make this task easier must be worth looking at. The best answer of course is to use a digitizer. The only one generally available at the moment is Verne Writer but at £109 you need to do an awful lot of drawing to make it worth while. The Victagraph which retails at £7.00 won't take away the chore of finding all those Flat and Drawie points but it does make the job much easier. The Victagraph is described as a Plot Window and comes as four sheets of plastic measuring 17 inches by 12 inches. One is a white base sheet, two are see-through sheets with scales of 120 horizontally by 100 vertically and the final sheet is a clear mask with eight at each corner which enable you to plot and read off points. You may not think that that is a lot for £7 but there has been no attempt to use cheap materials, the plastic is of a very heavy gauge and the printed scales very clear and professionally done. It comes in a protective cardboard sleeve which even the most heavy handed postman could not damage! There are two pages of instructions which are written in a friendly way although they do seem to make the use of the device seem more complicated than it really is. To use, you merely place a drawing on the base sheet, overlay a plot window and then use one of the sights on the window mask to go round your drawing and read the horizontal and vertical co-ordinates for each point. Once you get used to it, reading off points is very easy and very fast. You would probably be persuaded to try some fairly complex designs in Graphics 8 to which the scales are ideally suited. It can cope with the

other Graphics modes with either a smaller drawing or by scaling down.

The Victagraph certainly makes picture drawing easier. Don't be mislead, you still have to figure out the Flat and Drawie points but it definitely beats tracing and counting up graph squares.

COMPUTER GAMING WORLD MAGAZINE

COMPUTER GAMING WORLD is a 48 page glossy American magazine which has just celebrated its first year but has only just become available over here. It is distributed in the U.K. by Games Workshop.

Games Workshop are heavily into Dungeons and Dragons and Wargaming and it might be expected therefore that Computing Gaming World will reflect similar interests. It does. Its content consists almost entirely of reviews - all written by readers - but these are not the normal half page game descriptions you find in most magazines, but full length, in depth, discussions of game design, strategy and tactics. Would you believe a three and one third page review of Chris Crawford's new game, Legionsaire? Most of the strategy type games currently available are written for the Apple but Computer Gaming World has a surprising amount of interest in the Atari owner. Reviews are broken down into three categories. Mini reviews which merely give you a brief description of what you can expect to see in the near future, Micro Reviews which are more like the normal magazine reviews and Feature reviews which really go to town like the review of Legionsaire. The current issue (Dec/Jan) has 29 mini reviews of which 8 are Atari but then most of the Apple ones will soon be available on Atari, four Micro Reviews of Atari games, the review of Legionsaire and a full article on how you can change Eastern Front if you don't like the way it plays! In addition to all that, the next issues will feature a regular Atari column.

DISK DIRECTORY

Colin Frison

One of the most common uses for DOS on your disks is to obtain a directory of the contents. Now many of us can remember all the file names we make up! DOS on every disk will take up 81 sectors but here is a program that will give you a directory on screen or on the printer at a cost of only 8 sectors per disk.

I usually file as "DIR" so that it can be accessed simply by `DIR "D:\DIR"`. The program opens an IOCH to the disk drive directory and runs between lines 40 and 60 getting all directory entries. At the end of file the program traps to line 90 and gives an optional printout. A trap to line 100 is included to cover the printer being out of commission. The program is a fast way to recall and record what is on each disk without having to go into DOS.

Next issue I will show you a Master Directory which will give you a catalog of all your disk entries.

```

1  ROM #####
2  ROM 0   DISK DIRECTORY 0
3  ROM 0   by  X
4  ROM 0   COLIN FRISON 0
5  ROM #####
6  ROM
70  ROM 44(20),84(20) TRAP 70:OPEN #1,4
   ,8,"D:\X"
20  GRAPHICS 0:POKE 752,1:POKE 712,1761
   POKE 710,1761? *   DISK NUMBER DIR
   ECTORY*
30  ? *   #####*RE
   N CONTROL N TO UNDERLINE
40  INPUT #1:00
50  P=P+1:IF P=21 THEN POKE 82,20:POSIT
   ION 20,3
60  ? :GOTO 40
70  CLOSE #1:POKE 82,2:OPEN #2,4,0,"R:"
   POSITION 0,20: ?   HIT Y P0
   R PRINTOUT *SET #2,0:IF NOT00 T
   HDN 170
70  TRAP 100:LPRINT #GOTO 110
90  POSITION 7,20: ? PRINTER DOES NOT
   RESPOND :? :FOR T=1 TO 999:NEXT T:GOT
   O 80
100  TRAP 100:OPEN #1,6,0,"D:\X"
120  LPRINT "LPRINT " 00
   NUMBER "0"
130  LPRINT " 00 DISK DIRECTO
   RY 0" LPRINT
140  #0=" " :00" :INPUT #1:00,00:LPRIN
   T #0:" " :00
150  GOTO 140
160  LPRINT #0:" " :00
170  CLOSE #1:CLOSE #2:GRAPHICS 0

```

COMPUTER GAMING WORLD ... Cont.

If your gaming interests lie in the strategy field or you prefer to exercise your 'thinking' ability rather than your reflexes then Computer Gaming World is well worth £1.95 every two months. Quite apart from being an interesting read, you will get more out of your existing games and will have a much better idea of what to buy as your next piece of software. No other computer magazine that I can think of will give you reviews of such depth. Games Workshop have branches in various parts of the country but if you can't find a branch nearby give the Birmingham shop a ring on 021-632 4804 for more information.

FOUR IN A ROW ... Cont.

```

4300  GO=5100
4400  COLNO=INT(ROW/10)+1
4410  IF LINE(COLNO)=0 THEN GOTO 4400
4500  GOTO 1000
5000  END
10000  ROM SET UP DISPLAY LIST
10004  ROM STD. LIST 15:00 LINES 00:MOE
   E 7 + 4 LINES 00:MOE 0
10006  ROM CHANGE TO 1 LINE 00:MOE 1 +
   72 LINES 00:MOE 7 + 4 LINES 00:MOE
   0
10010  OLIST=PEEK(500)+PEEK(563)+256+4
10020  POKE OLIST-1,70+POKE OLIST+2,6
10030  I=0
10040  DLH=PEEK(OLIST+1)+0
10045  RETURN
10050  POKE OLIST+1,PEEK(OLIST+1)+0
10060  IF DLH=PEEK(561) THEN RETURN
10070  I=I+1
10080  IF I>999 THEN STOP
10090  GOTO 10040

```

TINY TEXT

Stan Ockers and Jim Carr

Fancy using your 400 or 800 as a mini word-processor? Even if you don't have a printer? TINY-TEXT will allow you to do just that. It is a very clever cassette (or disk) based text editor which will allow you to compose letters or articles and send the cassette through the post to be read or printed straight out by the receiver. It was developed by Stan Ockers for the Eugene ACE Newsletter to enable readers to send in 'ready' copy and I hope readers will start using it to send in articles to PAGE 6 as well as writing to each other.

USING THE PROGRAM

The OPTION key is used to select one of five options: LOAD, EDIT, PRINT, SAVE and DISPLAY. The following paragraphs describe the use of each of these functions.

LOAD OPTION

The LOAD option is used to re-load text which has been saved on cassette or disk. When the LOAD option is selected you will be asked to give a file name of the text you wish to load.. If the text is on cassette simply type C (no quotation marks). The computer will 'beep' once in the normal way to remind you to set up the recorder. Then press RETURN and the text will load. If you are using disk, type the complete file name of the text file. For example B:TEXT1.TXT.

EDIT OPTION

The EDIT option lets you enter text or make changes to text already entered. ENTERING TEXT: When the Edit mode is requested, a blank area (text window) appears in the centre of the screen. Up to three lines of text can be typed in this window. Pressing RETURN causes the text in the window to be added to the text already entered. You can use all the standard screen editing functions to edit any text in this window. NOTE however that all trailing blanks in the window will be deleted so

each line should be ended with a complete word and a blank used to start the next line.

Functions such as tabbing and indentation are controlled by special formatting symbols. These symbols always cause the current line to be ended before the requested formatting function is executed. The following formatting symbols may be used:
 CTRL-E End current line and start a new line with no indentation.
 CTRL-I Indent the next line.
 CTRL-S Space before starting the next line.
 CTRL-T Tab over a set number of spaces before starting the next line.
 CTRL-C Centre the next line.
 CTRL-P Advance the printer forms to the top of the next page before printing the next line.

EDITING TEXT: When you are in the Edit mode, pressing the SELECT key will cause the line of text below the window to be moved up into the window. The normal screen editing functions can then be used to change the text in the window. Use the joystick to scroll the desired line to the position below the text window and from side to side if needed. Pressing SELECT twice without making any changes, simply moves the text line into the window and back again. To delete a line of text move it to below the text window and press RETURN. Pressing the joystick trigger will cause you to jump to the end of the present text.

PRINT OPTION

This option prints the formatted text on your printer. Before the printing begins you have a chance to alter the default setting for line length, tab stop etc. Use the screen edit functions to make the desired changes, then press RETURN. The items which may be changed are:
 LINE - Line length (max. characters per line)
 INDENT - The no. of spaces to be indented (left margin)

TAB STOP - The number of spaces for the tab

PAPER SIZE - The total number of lines which can be printed on a fully covered page.

FORMS FEED - The no. of lines to skip to separate the bottom of one page from the top of the next. For example, if you require 3 blank lines top and bottom, then set forms feed to 6.

SAVE OPTION

This option lets you save your text on either cassette or disk. When the Save option is chosen you will be asked to enter a file name. If you are using cassette simply type C and then set up the recorder when you hear two 'beeps'. Press RETURN. If you are using disk enter a complete legal filename.

DISPLAY OPTION

This option displays text in formatted form on the screen. It uses the same format change function as the Print option excepting Paper Size and Forms Feed.

Get used to the above control functions and you will have a very easy to use and versatile text editor. If you wish to make any changes to the program you should first change line 14 which automatically expands the main data storage array T\$ to the memory size of your computer. Try changing "SIZ=FREE(0)-50" to "SIZ=FREE(0)-500". When you have finished making any changes restore line 14 to its original form.

Any system errors are trapped and printed out by the program. You are then prompted to press RETURN. If you make any mistakes such as selecting LOAD or SAVE when you did not want to, enter an illegal file name and you can easily recover by pressing return.

There you have it! A brilliant little program that I have been using to get all the copy ready for this magazine. If you can make any improvements let me

know and I will let ACE know. Above all start using this to write a few magazine articles - even with 16K and no printer, you now have the opportunity to widely expand the use of your Atari.

```

1 REM *****
2 REM % TINYTEXT by STAV DAKERS %
3 REM % and JIM GARR - FIRST %
4 REM % PUBLISHED IN ACE %
5 REM % NEWSLETTER %
6 REM % 3662, VINE HAPLE DRIVE %
7 REM % EUGENE, OREGON 97405, U.S.A %
8 REM *****
12 DIM SPP(48):FOR I=1 TO 48:SPP(I,1)=
  "NEXT I
14 DIM S$(45),L(128),M(128):SIZ=FREE(
  0)-50:DIM T$(SIZ):FOR I=1 TO 45:READ A
  :S$(I)=CHR$(A):NEXT I
20 DATA 164,164,133,264,164,133,263,16
  4,133,263,164,133,263,164,164,168,162,
  6,161,263,143,263,198,263,163
30 DATA 263,261,233,268,2,198,264,165,
  263,177,263,260,236,165,264,177,266,26
  5,236,96
40 FOR I=1533 TO 1643:READ A:POKE I,A:
  NEXT I
50 DATA 164,164,133,264,164,133,263,16
  4,133,263,164,133,263,162,6,167,248,32
  ,53,6,167,46,32,71,6
60 DATA 165,267,266,6,167,168,32,71,6,
  24,144,16,167,46,32,53,6,167,128,32,71
  ,6,167,248,32,53,6,96
70 DATA 133,265,161,263,261,74,176,11,
  291,32,176,5,26,193,64,269,2,233,32,12
  9,265,236,263,266,2
80 DATA 236,264,236,265,264,2,236,266,
  176,266,260,221,76,133,266,167,6,127,2
  93,236,265,266,2
90 DATA 236,264,176,266,266,244,76
110 P=241:POKE 267,6:POKE 62,6:OPEN #2
  ,4,6,"E:";"T$(I)":";T$(466)":";"T$(I)=
  T$
120 SIZ=PEEK(88)+256:PEEK(87)+128:LL=7
  :UL=5:IND=5:RAD=47:PS=66:PF=6:GOTS=56
  #
290 ? "INSERT TEXT OR ... PRESS SELEC
  T TO EDIT"
295 POKE 263,6:REM Square lower case i
  next
300 POSITION 6,6:? SIZ-LEN(T$):" FREE
  ";&STICK(8):IF S=15 THEN 330
305 IF S=14 AND PLEN(T$)>320 THEN P=P
  +48
310 IF S=13 AND P<128 THEN P=P-48
315 IF S=11 AND PLEN(T$)>288 THEN P=P
  +1
  .....
```

```

328 IF S=7 AND P=341 THEN P=P-1
329 A=JSR(1534,ADR(TB)+P-241,SCR)
330 K=0
340 POKE 53277,S+P*P*P*53277:IF P=
5 THEN GOSUB 988
350 IF P=3 THEN 560
360 IF PEEK(744)<255 THEN 400
365 R=4:IF R<10 THEN 380
370 IF STRIG(R)=R THEN P=LEN(TB)-240:P
ONE 287,0
380 GOTO 388
400 POSITION 0,10:INPUT #2:0:P=P*PEEK(
287):IF P=0 THEN 440**
405 L=L+DLEN(10)+L*LEN(TB):IF L=0 THEN
420
427 IF L<L*2512 THEN POSITION 0,1:7 *
OUT OF SPACE *+6070 388
430 IF P=1 THEN A=TB*(P,P*9):IF TB*(
+9,P*9)=* * THEN D=LI+3:=" *L,D,LI+
1
435 L=LEN(A)+A*W*DR(TB):IF L<LA THE
N A=USR(ADR(580),ADR(L)-1,A*P*2,LI-LA)
438 TB*(P,LI-D)=A
440 IF LA<1 THEN TB*(P,LI)=TB*(P,LA)
450 P=P+LI:TB*(LI+LI-LA)=* *POKE 287,
0:GOTO 388
460 IF PEEK(287)=1 THEN 470
465 IF P=LEN(TB)=279 THEN TB*(P)=TB*(P+
0)
470 POKE 764,255:GOTO 388
500 TB*(P)=P*P*P*540+P*P*540+P*P*540+25
0+P*P*540:ST=1,79:POKE ST+3,79:POKE ST+3
+112:POKE ST+4,0:POKE ST+5,0
505 POKE ST+24,0
510 POKE ST+25,P*P*540:POKE ST+26,P*
P*540
515 DP=OP+1:IF OP=0 THEN OP=1
520 ? CHR$(123)+POSITION 20,0:IF OP=1
THEN ? "LOAD "
525 IF OP=2 THEN ? "EDIT"
530 IF OP=3 THEN ? "PRINT"
535 IF OP=4 THEN ? "SAVE"
540 IF OP=5 THEN ? "DISPLAY"
545 POSITION 0,1:7 ? "PRESS START TO RES
IN"
550 FOR D=1 TO 20:NEXT D
555 POKE 53277,S+P:IF PEEK(53277)=3 THEN
570
577 IF PEEK(53277)<16 THEN 585
580 POKE 764,255:POSITION 20,1:7 CHR$(
123)+POSITION 0,1:ON OP GOTO 2000,290,
590,1500,570
585 REM 10 =ESC 340,ARROW IN LINES 0
90 AND 595 = LINE0 394 AND 395 IN INVE
RSE
590 FOR D=1 TO 6:IF "*" :NEXT 1:7 :FOR
1=1 TO 6:7 * :NEXT 1:7 * *
594 POSITION 0,1:7 ? "SET FORMAT CONTROL
0":POSITION 0,0:7 ? "LINE LEFT IN=
TAB PAGE FORM":
595 ? "SIZE H800 DENT STOP 0
120 FEED" :? " *LL:," :LN:," :*IND
0," :*TAB:," :*PS:," :*OFF:POSITION 0,0
600 INPUT LL,LN,IND,SA0,PS,FF:P=240
710 LINE=0:GRAPHICS=0:POSITION 0,0:FL=
0
715 RL=LL:TP=P:R=ASC(TB*(TP,TP))
720 RL=LL-2*IND*(0=?)=TAB*(0=20)
725 IF D=17 AND OP=3 AND LINE<=PS-FF)
THEN LPRINT " *LINE<LINE+1"
730 IF D=19 AND OP=3 THEN ?
737 IF D=10 AND OP=3 THEN FOR D=1 TO P
0:LINE=LPRINT " *LINE<LINE+0
739 IF D=10 AND OP=5 THEN ? :7 :7 :LN
D=0
740 C=0:K=0
740 R=0:1:TP=TP+1:IF R=RL+0 THEN 765
745 IF TP=LEN(TB)-241 THEN FL=1:GOTO 0
10
750 A=ASC(TB*(TP,TP)):IF A<32 THEN C=R+
0:GOTO 760
755 IF A=32 THEN C=0:1
760 GOTO 740
765 IF C=0 THEN A=TB*(P+1,TP-D):TP=TP-
1:GOTO 810
767 IF TB*(TP,TP)=* * THEN A=TB*(P+1,TP
-D):GOTO 810
769 IF TB*(TP-1,TP-D)=* * THEN C=0:1
770 K=1
775 TP=TP-1:IF TB*(TP,TP)<* * THEN K=K
+1:GOTO 770
780 IF TB*(P) THEN P=TP:GOTO 715
785 A="":L=P+1
790 A=LEN(A)+1+TB*(L,0):IF TB*(L,0)<
* * THEN 805
795 IF C=1 THEN A=INT((C+R*0.8)):IF A
<0 THEN FOR D=1 TO A*LEN(CHR$(0)+0)=* *
:NEXT D:K=K+0
800 C=C-1
805 IF C=0 AND K=0 THEN FOR D=1 TO R+0
4:LEN(A)+1)=* * :NEXT D
810 D=1:IF L<TP THEN 790
815 IF FL THEN A=TB*(P+1,TP-D)
820 IF OP=3 THEN LINE=LINE+1:IF LINE<
PS-FF) THEN LINE=1:FOR D=1 TO PP:LPRIN
T " * :NEXT 1
825 SP=LN+(0=P)+IND+(0=20)*TA0-(0=0):L
L-LEN(A)*2:IF SP<0 THEN SP=0
830 IF OP=3 THEN LPRINT SP+1,SP+0
840 IF OP=3 THEN ? SP+1,SP+0
845 POKE 53277,0
850 IF FL THEN ? :7 :7 * END OF PREGON
T TEXT, PRESS START"
855 IF FL THEN IF PEEK(53277)<16 THEN
860
865 IF FL THEN 590
868 P=TP:GOTO 715
880 P=P*P*P*287:IF P=1 THEN POKE 287
,0:GOTO 930
910 IF P=0 AND P=LEN(TB)-279 THEN FOR
E 287,1

```

TINY TEXT ... Cont.

```

928 #USER(1500,ADR:TR@P-241,SCR) :FOR
  0=1 TO 50:NEXT D:RETURN
958 ? "ERROR ":PDEE(150):" AT ":254#PE
  EK(187)+PEEK(260):? "PRESS RETURN TO C
  ONTINUE":INPUT D:GOTO 588
1008 ? " ENTER FILE NAME":INPUT D:OPE
  N #D,0,0,0,0:#HINT(LEN(TR)/120):PRINT #
  3,#:IF #=0 THEN ST#0:GOTO 1028
1018 FOR D=1 TO N:ST#1:288#0:PRINT #D:TR
  (ST-127,ST):NEXT D
1028 PRINT #D:TR(ST-1,LEN(TR)):CLOSE #
  3:GOTO 588
2008 ? " ENTER FILE NAME":INPUT D:OPE
  N #D,4,0,1#INPUT #D:#:IF #=0 THEN GOTO
  #-127:GOTO 2028
2018 GRAPHICS #:FOR D=1 TO N:BCD#(128#D
  -127):INPUT #D,#:? #D:TR(BCD#):#0#NEXT
  D
2028 INPUT #D,#:TR(BCD#-120)+#0#CLOSE
  #D:FOR D=1,2,4:GOTO 588

```

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User Groups

PAGE 6 will try and promote User Groups in the U.K. If Club Secretaries will send in details. If you are new to Atari competing then the best way to learn is to meet other folks who have the same interests. Whether you are an expert or complete novice, any of the Groups below will welcome you at their next meeting.

MERseyside ATARI COMPUTER CLUB.

Meetings every other Tuesday (next one 4th March) at:

THE BRADFORD HOTEL,
TITHEBAEN STREET,
LIVERPOOL.

The Club have been going for some while now and have a software library, run tutorials, arrange discounts etc. Meetings start at 7.00 p.m. and you can go along to the first one free. For more details contact Ray Gibson on 051 608 9953

PRESTON ATARI COMPUTER ENTHUSIASTS,

Meetings on the 3rd Thursday of every month at 7.30 p.m. Meet at:

KNIGHTS OF ST. COLEMBIA,
OFF BLACKPOOL ROAD,
BRIGHAM CROFT,
ASTON, NR. PRESTON.

Despite their name, all makes of computer are represented. Contact Rowland Taylor on 0253 738192 for details.

EDINBURGH AND LOTHIAN ATARI USER GROUP

Meetings are held on the 1st and 3rd Thursday each month, commencing 7.30 p.m. at:

ASTON HOTEL,
ASTON CRESCENT,
EDINBURGH

Contact Silicon Centre 031 557 4346 for more details.

Software

STRATOS

ADVENTURE INTERNATIONAL 16K CASS.

1/2 PLAYERS 32K DISK

Stratos makes no pretensions, it is definitely an arcade game - it even starts with a request for you to "Insert Coin or Press Start"! Perhaps you put the coins in that mysterious right hand slot on the 800!

Stratos is played on a single screen where you have a city which is defended by a force field beamed overhead from towers at each side of the screen. At the base of each tower are land based guns which can be aimed at attacking enemy craft with a "floating" sight. Many Starjammers in groups of three are out to destroy directly the force field and then the city. The two guns fire together and the resulting 'energy' collides at the point of your aim and spills out to destroy your enemy. This effect diminishes however as the enemy begin to destroy the power towers inside the City. The game plays well and is not too difficult - at least at the Novice level-and has a few nice touches such as the ability to change the background and City colours to any colours of your choice, from pastel to glaring! There is a continuous sound of the force field being generated but if this begins to fray your nerves you can change the pitch to a more peaceful level.

There are one or two player options and a high score feature as well as two skill levels. There is also a repair manor with the ability to patch up the force field during 'pauses in play' although when these occur I am not sure! When the enemy stops attacking, you are faced with a meteor shower!

For an arcade game which runs on 16K cassette Stratos is pretty good although the more advanced gamer may find it a bit too easy - unless there is something

more lurking at the higher score levels. There are no levels as such - the scoring is along the lines of the popular arcade games in that you score bonus points at the end of each 'wave' and get a bonus award at 20,000 points. Another good quality arcade game but with a slight difference and well worth a try.

PREPPIE

ADVENTURE INTERNATIONAL 16K CASS.

1/2 PLAYERS 32K DISK

PREPPIE is probably quite well known by now but deserves a mention as it has some of the best graphics and sound of all the Atari games developed so far. Make that all the COMPUTER games developed so far, because no other home computer has done near achieving the capabilities of the Atari and this game proves it.

PREPPIE is like Frogger in that you have to get your 'Preppie' (American for schoolboy) across the golf course with assorted mowers, tractors and golf buggies and then across a river with boats, logs and alligators. In this game however you must retrieve golf balls and make it back again. The game is not too difficult to play (I scored over 12000 the first try!) and is probably ideally suited to children even if they just watch you play. The graphics and the music will keep them enthralled and there will be howls of laughter when the Preppie falls in the river or gets squashed by a golf cart!

The game obviously gets more difficult as you go through the levels but is probably one which you could actually master. Even level 10 is not that difficult, but then I have discovered a way of jumping straight to level 10 and starting with five men instead of three! (Any offers?)

If you have a young family, this game is ideal. The instructions include a five page story introduction and even if the young ones can't get very far in playing, they will love watching.

SEA DRAGON

ADVENTURE INTERNATIONAL 16K/CASS.

1/2 PLAYERS 32K DISK

What about an arcade style game that is nice and relaxing, instead of having you jumping out of your seat? At first sight SEA DRAGON appears to be just the thing.

Your submarine glides slowly along and you can dive or surface at realistically slow speeds all the while accompanied by the specific deep 'bleep' of the radar. All you need to do in the game is to shoot mines which are either tethered or on the seabed and then negotiate some underground passages. Great, I thought, no more ending up a nervous wreck after fighting off the first board of aliens. Wrong! There are no aliens, but SEA DRAGON turns out to be just as nerve wracking to play as all the best arcade games. The problem is, believe it or not, the very slowness of the game. The mines on the seabed break loose at random and float upwards. Unless you have anticipated them and have time to fall back, you are stuck trying to slowly back away whilst knowing you are not going to make it! Negotiating the underground passages is difficult as there is very little room and rising vertically takes some control as the screen is scrolling at a constant rate. You have to both go up and backwards at the same time to avoid deadly contact with the walls. Further on into the game the passages get narrower, the mines more frequent and ships above drop depth charges. Oh, and by the way, there are 'Supershooters' protecting some of the passages and forcefields protecting the Master Mine. And you can run out of air if you don't

surface regularly.

I started off thinking this a very easy game, got fed up with it when I found out how hard it is but now that I have managed to negotiate some of the passages, have become quite addicted. One minor criticism is that the High Score feature is set at 3000 before you start the game and it takes a long while to have your scores registered!

SHAMUS

SYNAPSE 16K/CASS.

1 PLAYER 32K DISK

I sat back, covered in perspiration, nails bitten to the quick and a feeling in the pit of my stomach that is indescribable. My name is SHAMUS and I have just returned from the latest attempt to trap that evil creature, the Shadow, in his lair. He lives four levels down inside an underground hideaway. Each level can only be reached by obtaining coloured keys to fit the matching locks. As I ventured along passageways and through rooms, the guardians of the shadow attempt to kill me. They come in many guises and are deadly. The first level contains 37 rooms and passages, each one different from the next. The walls are electrified and contact means certain death. Right, I feel better now, see more try.

SHAMUS is one of the best programs to come from Synapse, using all the best in sound and graphics your Atari can offer.

Mike Reynolds-Jones.

SUBSCRIBE

to PAGE 6

see page three for details

GETTING STARTED

Les Ellingham

It is quite often the small things that can make an ordinary program a little bit more special. If you take care in the presentation of your program including such things as titles and instructions, you will end up with a program which will impress people from the start.

Here are a couple of simple routines to add life to the beginning of your programs. Listing 1 for Graphics 0 simply PEEKs the Character Base Register at location 755 with a 1 which makes all Inverse characters disappear. Try changing the loop in line 60 to any combination between 0 and 4 for different results. Alter the value of the step to change the speed of the flashing.

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```
10 GRAPHICS 0:POKE 755,1
50 ? CHR$(125):POSITION 10,21:? "PRESS
  START TO BEGIN":REM START IN INVERSE
60 FOR I=1 TO 2 STEP 0.01
70 POKE 755,1
80 IF PEEK(53277)=0 THEN 100
90 NEXT I:GOTO 60
100 ? CHR$(125):? "PROGRAM HAS STARTED"
```

Listing 2 works in Graphics 1 or 2 and simply cycles the Inverse characters through the colors available. Location 755 controls the color value of Inverse upper case letters in these modes.

```
10 GRAPHICS 1+16
20 ? 0:"PRESS START TO BEGIN":REM STA
RT IN INVERSE
30 FOR I=0 TO 255
40 POKE 755,I
50 IF PEEK(53277)=0 THEN 100
60 NEXT I:GOTO 30
100 ? 0:"PROGRAM HAS STARTED"
110 GOTO 110
```

Listing 3 runs through a string and makes each character 'inverse' which in Graphics 1 & 2 simply changes the color of the characters. Try adding some sound to this routine.

```
5 DIM ABC(26)
6 ABC="PRESS start TO BEGIN"
10 GRAPHICS 1+16
20 POSITION 8,1:? ABC#0
30 FOR I=1 TO LEN(ABC)
40 ABC(I)=CHR$(ASC(ABC(I))+128)
50 POSITION 8,1:? ABC#0
60 IF PEEK(53277)=0 THEN 100
60 NEXT I
70 GOTO 30
100 ? ABC:"PROGRAM HAS STARTED"
110 GOTO 110
```


First Steps

First steps this month will concentrate on a problem which I know is common to many of our readers. How to get VULTURES III running!

Whilst much of what we will say will be specific to Vultures many of the principles will apply to all listings which are typed in from magazines. The first hard lesson to learn - like it or not - is that **NEE** (or so) of the time the reason that a program won't run is because YOU have made typing mistakes! Don't get upset, I make typing errors so does everyone I have come across - we all have to learn the hard way. Although the listing of Vultures was not very clear (blame the Atari 800 printer which has now died completely) the program does run as listed.

Lesson number one is, when any program has machine language in it, **SAVE IT BEFORE YOU RUN IT**. Any mistakes in entering data can back up your machine making the only means of recovery to switch off and start again. Machine language is usually included in a Basic program as a series of DATA statements as when you see blocks of DATA - beware! It is probably a good idea to get into the habit of saving ALL Programs before you run them and you don't have to wait until you have completed a listing, you can save it at any time making it possible to put in a long listing over several evenings. The biggest headache is to try and find out where you are likely to have made your mistake - not easy! Common errors in typing DATA statements include typing an 0 (letter) instead of a 0 (figure), using a full stop instead of a comma or missing out commas thus ending up with numbers greater than 255. Most of the problems in Vultures stemmed from these type of errors in the big block of DATA between lines 2000 and 2080. If you have still not got it running try making the following changes which will check the DATA.

```
LINE 2000 DELETE :NEXT I
ADD LINE 2005 TOT=TOT+AC:G.I:IF
TOT<>19259 THEN ? "ERROR IN
```

```
DATA":TOT=0:STOP
```

If you get the error message, there is no getting away from it - you must check every one of these DATA statements!

If you get **ERROR 8** messages when reading in DATA then you have characters or punctuation in the statements. If you are using a FOR...NEXT loop to read in the data then you can pinpoint the area of the error by asking the computer to print the value of the FOR...NEXT variable and the value of the last statement read. For example if you get an **ERROR 8** message in line 2000 of Vultures, the loop variable is I and the variable for the DATA is A. Ask the computer to PRINT I,A. The two figures you get are first the number of times the loop has executed before coming to the error and secondly the value of the last **OSCREEN** data statement read. You should be able to count through the DATA statements to the I'th number which should be wrong. The number before should be your last correctly read item of data.

This idea of checking variables is very useful for tracing bugs. You can always stop a program at any time by using the **BREAK** key and then ask the computer to PRINT the value of a variable or the content of strings. If you can figure out whether a variable is behaving correctly you should be able to narrow down the likely area of error.

If you still can't get Vultures going and you feel it is because you may have read the bad (awful!) printing wrongly, send me a stamped addressed envelope and I will send you off a full original listing.

Would anyone like to write this column for a future issue? It would be interesting to get alternative views - perhaps a humorous story, incorporating a few hints and tips of how you survived that nerve-wracking first few months with your new Atari computer! Let me know.....

B.U.G. Club call

Well BUG at last appears to be settling down and making some real progress. Many of the members who came to the Constitution meeting at the end of November seem to have stayed away from subsequent meetings but they have missed some good meetings since. Agreed the constitution evening was a bore, but it was vitally necessary for the survival and well being of the Club.

Our 'Christmas Special' meeting on the 7th December, although perhaps a bit early to be really festive, went very well with plenty going on. The local retailers generously supported the evening with the donation of prizes for the various competitions and in fact there were so many prizes available that we found it hard to give them all away! The main event of our meeting of 13th January was a talk by Lawrence Miller of Games Workshop on strategy and adventure type games, an area which is not too well represented in the present 'arcade' era. If you missed either of these meetings you missed something good.

Mike Aston has begun a series of beginners classes for basic which represents a good opportunity to discuss any problems you may have if you are just starting, whilst Gaila Rowell is trying to get together a discussion group on Assembler. Other courses and classes are possible but the success of those already arranged and future events depends on you. You must let the committee know what you want and more importantly be prepared to join in and support any activity.

There have been some changes recently on the Committee and the Officers of the Club are now:

Chairman - Mike Reynolds-Jones
 Vice-Chairman - Keith Mason
 Secretary - Mike Aston
 Treasurer - Steve Gould

Get to know these people and the rest of the committee and let them know what you want the club to arrange and how you are willing to help.

Steve Gould now has a software library running where you can off-load your unwanted software and borrow other games, books and magazines. The scheme is growing fast so make sure you don't miss out, ask Steve for details at the next meeting.

Lots of other ideas are in the melting pot and we are making contact with other User Groups. Come along to future meetings to find out more, but don't just sit there, bring along some ideas or your programs. Even if you just grab one of the committee members and say 'Would it be possible to', you will have done your bit to help BUG grow into the best User Group in the U.K. Match our America!

One area we should be looking into is building a library of software written by members of the Group. If you bring along programs you have written you can discuss these with other members and when they are ready they can build into a 'user written' library. Once built up, the possibilities for exchange with other groups arise, particularly with User Groups in America where exchange of libraries is one of the best means of contact and learning. Some of the bigger Groups in America have libraries of over 1000 programs.

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VICTAGRAPH - PLOT WINDOW

The above photographs show VICTAGRAPH PLOT WINDOW and demonstrations RUN on ATARI 400, 800. Have you got PLOT, DRAWTO or similar to an absolute coordinate?

Could you draw the above screen display?
Without using graph-paper?

Place your drawing in the VICTAGRAPH and you are ready to plot all the points, using the movable window mask and easy to read scale. Plot 0.0 in each corner and a fully adjustable window to 320,250... working area 12" x 6" total size 17" x 12" approx.

Total Price £7.90. Cheque/PO to: VICTA CERAMICS

U.K. ONLY

VICTA CERAMICS (imp)
64, BOW STREET, RUGELEY, STAFFS, WS16 2BT

U.K. ONLY

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Software reported to be available in the following quantities:

ADVENTURE (10)	100	ADVENTURE (10)	100
ADVENTURE (20)	200	ADVENTURE (20)	200
ADVENTURE (30)	300	ADVENTURE (30)	300
ADVENTURE (40)	400	ADVENTURE (40)	400
ADVENTURE (50)	500	ADVENTURE (50)	500
ADVENTURE (60)	600	ADVENTURE (60)	600
ADVENTURE (70)	700	ADVENTURE (70)	700
ADVENTURE (80)	800	ADVENTURE (80)	800
ADVENTURE (90)	900	ADVENTURE (90)	900
ADVENTURE (100)	1000	ADVENTURE (100)	1000
ADVENTURE (110)	1100	ADVENTURE (110)	1100
ADVENTURE (120)	1200	ADVENTURE (120)	1200
ADVENTURE (130)	1300	ADVENTURE (130)	1300
ADVENTURE (140)	1400	ADVENTURE (140)	1400
ADVENTURE (150)	1500	ADVENTURE (150)	1500
ADVENTURE (160)	1600	ADVENTURE (160)	1600
ADVENTURE (170)	1700	ADVENTURE (170)	1700
ADVENTURE (180)	1800	ADVENTURE (180)	1800
ADVENTURE (190)	1900	ADVENTURE (190)	1900
ADVENTURE (200)	2000	ADVENTURE (200)	2000
ADVENTURE (210)	2100	ADVENTURE (210)	2100
ADVENTURE (220)	2200	ADVENTURE (220)	2200
ADVENTURE (230)	2300	ADVENTURE (230)	2300
ADVENTURE (240)	2400	ADVENTURE (240)	2400
ADVENTURE (250)	2500	ADVENTURE (250)	2500
ADVENTURE (260)	2600	ADVENTURE (260)	2600
ADVENTURE (270)	2700	ADVENTURE (270)	2700
ADVENTURE (280)	2800	ADVENTURE (280)	2800
ADVENTURE (290)	2900	ADVENTURE (290)	2900
ADVENTURE (300)	3000	ADVENTURE (300)	3000
ADVENTURE (310)	3100	ADVENTURE (310)	3100
ADVENTURE (320)	3200	ADVENTURE (320)	3200
ADVENTURE (330)	3300	ADVENTURE (330)	3300
ADVENTURE (340)	3400	ADVENTURE (340)	3400
ADVENTURE (350)	3500	ADVENTURE (350)	3500
ADVENTURE (360)	3600	ADVENTURE (360)	3600
ADVENTURE (370)	3700	ADVENTURE (370)	3700
ADVENTURE (380)	3800	ADVENTURE (380)	3800
ADVENTURE (390)	3900	ADVENTURE (390)	3900
ADVENTURE (400)	4000	ADVENTURE (400)	4000
ADVENTURE (410)	4100	ADVENTURE (410)	4100
ADVENTURE (420)	4200	ADVENTURE (420)	4200
ADVENTURE (430)	4300	ADVENTURE (430)	4300
ADVENTURE (440)	4400	ADVENTURE (440)	4400
ADVENTURE (450)	4500	ADVENTURE (450)	4500
ADVENTURE (460)	4600	ADVENTURE (460)	4600
ADVENTURE (470)	4700	ADVENTURE (470)	4700
ADVENTURE (480)	4800	ADVENTURE (480)	4800
ADVENTURE (490)	4900	ADVENTURE (490)	4900
ADVENTURE (500)	5000	ADVENTURE (500)	5000
ADVENTURE (510)	5100	ADVENTURE (510)	5100
ADVENTURE (520)	5200	ADVENTURE (520)	5200
ADVENTURE (530)	5300	ADVENTURE (530)	5300
ADVENTURE (540)	5400	ADVENTURE (540)	5400
ADVENTURE (550)	5500	ADVENTURE (550)	5500
ADVENTURE (560)	5600	ADVENTURE (560)	5600
ADVENTURE (570)	5700	ADVENTURE (570)	5700
ADVENTURE (580)	5800	ADVENTURE (580)	5800
ADVENTURE (590)	5900	ADVENTURE (590)	5900
ADVENTURE (600)	6000	ADVENTURE (600)	6000
ADVENTURE (610)	6100	ADVENTURE (610)	6100
ADVENTURE (620)	6200	ADVENTURE (620)	6200
ADVENTURE (630)	6300	ADVENTURE (630)	6300
ADVENTURE (640)	6400	ADVENTURE (640)	6400
ADVENTURE (650)	6500	ADVENTURE (650)	6500
ADVENTURE (660)	6600	ADVENTURE (660)	6600
ADVENTURE (670)	6700	ADVENTURE (670)	6700
ADVENTURE (680)	6800	ADVENTURE (680)	6800
ADVENTURE (690)	6900	ADVENTURE (690)	6900
ADVENTURE (700)	7000	ADVENTURE (700)	7000
ADVENTURE (710)	7100	ADVENTURE (710)	7100
ADVENTURE (720)	7200	ADVENTURE (720)	7200
ADVENTURE (730)	7300	ADVENTURE (730)	7300
ADVENTURE (740)	7400	ADVENTURE (740)	7400
ADVENTURE (750)	7500	ADVENTURE (750)	7500
ADVENTURE (760)	7600	ADVENTURE (760)	7600
ADVENTURE (770)	7700	ADVENTURE (770)	7700
ADVENTURE (780)	7800	ADVENTURE (780)	7800
ADVENTURE (790)	7900	ADVENTURE (790)	7900
ADVENTURE (800)	8000	ADVENTURE (800)	8000
ADVENTURE (810)	8100	ADVENTURE (810)	8100
ADVENTURE (820)	8200	ADVENTURE (820)	8200
ADVENTURE (830)	8300	ADVENTURE (830)	8300
ADVENTURE (840)	8400	ADVENTURE (840)	8400
ADVENTURE (850)	8500	ADVENTURE (850)	8500
ADVENTURE (860)	8600	ADVENTURE (860)	8600
ADVENTURE (870)	8700	ADVENTURE (870)	8700
ADVENTURE (880)	8800	ADVENTURE (880)	8800
ADVENTURE (890)	8900	ADVENTURE (890)	8900
ADVENTURE (900)	9000	ADVENTURE (900)	9000
ADVENTURE (910)	9100	ADVENTURE (910)	9100
ADVENTURE (920)	9200	ADVENTURE (920)	9200
ADVENTURE (930)	9300	ADVENTURE (930)	9300
ADVENTURE (940)	9400	ADVENTURE (940)	9400
ADVENTURE (950)	9500	ADVENTURE (950)	9500
ADVENTURE (960)	9600	ADVENTURE (960)	9600
ADVENTURE (970)	9700	ADVENTURE (970)	9700
ADVENTURE (980)	9800	ADVENTURE (980)	9800
ADVENTURE (990)	9900	ADVENTURE (990)	9900
ADVENTURE (1000)	10000	ADVENTURE (1000)	10000

SPECIAL OFFER: FREE BLANK DISKETTE WITH ANY TWO OR MORE GAMES ORDERED (OFFER ENDS MARCH 31)

VICTA PLOT WINDOW	£7.90	MOORE PLOT WINDOW	£7.90
ADVENTURE (10)	£2.95	ADVENTURE (10)	£2.95
ADVENTURE (20)	£5.90	ADVENTURE (20)	£5.90
ADVENTURE (30)	£8.85	ADVENTURE (30)	£8.85
ADVENTURE (40)	£11.80	ADVENTURE (40)	£11.80
ADVENTURE (50)	£14.75	ADVENTURE (50)	£14.75
ADVENTURE (60)	£17.70	ADVENTURE (60)	£17.70
ADVENTURE (70)	£20.65	ADVENTURE (70)	£20.65
ADVENTURE (80)	£23.60	ADVENTURE (80)	£23.60
ADVENTURE (90)	£26.55	ADVENTURE (90)	£26.55
ADVENTURE (100)	£29.50	ADVENTURE (100)	£29.50
ADVENTURE (110)	£32.45	ADVENTURE (110)	£32.45
ADVENTURE (120)	£35.40	ADVENTURE (120)	£35.40
ADVENTURE (130)	£38.35	ADVENTURE (130)	£38.35
ADVENTURE (140)	£41.30	ADVENTURE (140)	£41.30
ADVENTURE (150)	£44.25	ADVENTURE (150)	£44.25
ADVENTURE (160)	£47.20	ADVENTURE (160)	£47.20
ADVENTURE (170)	£50.15	ADVENTURE (170)	£50.15
ADVENTURE (180)	£53.10	ADVENTURE (180)	£53.10
ADVENTURE (190)	£56.05	ADVENTURE (190)	£56.05
ADVENTURE (200)	£59.00	ADVENTURE (200)	£59.00
ADVENTURE (210)	£61.95	ADVENTURE (210)	£61.95
ADVENTURE (220)	£64.90	ADVENTURE (220)	£64.90
ADVENTURE (230)	£67.85	ADVENTURE (230)	£67.85
ADVENTURE (240)	£70.80	ADVENTURE (240)	£70.80
ADVENTURE (250)	£73.75	ADVENTURE (250)	£73.75
ADVENTURE (260)	£76.70	ADVENTURE (260)	£76.70
ADVENTURE (270)	£79.65	ADVENTURE (270)	£79.65
ADVENTURE (280)	£82.60	ADVENTURE (280)	£82.60
ADVENTURE (290)	£85.55	ADVENTURE (290)	£85.55
ADVENTURE (300)	£88.50	ADVENTURE (300)	£88.50
ADVENTURE (310)	£91.45	ADVENTURE (310)	£91.45
ADVENTURE (320)	£94.40	ADVENTURE (320)	£94.40
ADVENTURE (330)	£97.35	ADVENTURE (330)	£97.35
ADVENTURE (340)	£100.30	ADVENTURE (340)	£100.30
ADVENTURE (350)	£103.25	ADVENTURE (350)	£103.25
ADVENTURE (360)	£106.20	ADVENTURE (360)	£106.20
ADVENTURE (370)	£109.15	ADVENTURE (370)	£109.15
ADVENTURE (380)	£112.10	ADVENTURE (380)	£112.10
ADVENTURE (390)	£115.05	ADVENTURE (390)	£115.05
ADVENTURE (400)	£118.00	ADVENTURE (400)	£118.00
ADVENTURE (410)	£120.95	ADVENTURE (410)	£120.95
ADVENTURE (420)	£123.90	ADVENTURE (420)	£123.90
ADVENTURE (430)	£126.85	ADVENTURE (430)	£126.85
ADVENTURE (440)	£129.80	ADVENTURE (440)	£129.80
ADVENTURE (450)	£132.75	ADVENTURE (450)	£132.75
ADVENTURE (460)	£135.70	ADVENTURE (460)	£135.70
ADVENTURE (470)	£138.65	ADVENTURE (470)	£138.65
ADVENTURE (480)	£141.60	ADVENTURE (480)	£141.60
ADVENTURE (490)	£144.55	ADVENTURE (490)	£144.55
ADVENTURE (500)	£147.50	ADVENTURE (500)	£147.50
ADVENTURE (510)	£150.45	ADVENTURE (510)	£150.45
ADVENTURE (520)	£153.40	ADVENTURE (520)	£153.40
ADVENTURE (530)	£156.35	ADVENTURE (530)	£156.35
ADVENTURE (540)	£159.30	ADVENTURE (540)	£159.30
ADVENTURE (550)	£162.25	ADVENTURE (550)	£162.25
ADVENTURE (560)	£165.20	ADVENTURE (560)	£165.20
ADVENTURE (570)	£168.15	ADVENTURE (570)	£168.15
ADVENTURE (580)	£171.10	ADVENTURE (580)	£171.10
ADVENTURE (590)	£174.05	ADVENTURE (590)	£174.05
ADVENTURE (600)	£177.00	ADVENTURE (600)	£177.00
ADVENTURE (610)	£180.95	ADVENTURE (610)	£180.95
ADVENTURE (620)	£183.90	ADVENTURE (620)	£183.90
ADVENTURE (630)	£186.85	ADVENTURE (630)	£186.85
ADVENTURE (640)	£189.80	ADVENTURE (640)	£189.80
ADVENTURE (650)	£192.75	ADVENTURE (650)	£192.75
ADVENTURE (660)	£195.70	ADVENTURE (660)	£195.70
ADVENTURE (670)	£198.65	ADVENTURE (670)	£198.65
ADVENTURE (680)	£201.60	ADVENTURE (680)	£201.60
ADVENTURE (690)	£204.55	ADVENTURE (690)	£204.55
ADVENTURE (700)	£207.50	ADVENTURE (700)	£207.50
ADVENTURE (710)	£210.45	ADVENTURE (710)	£210.45
ADVENTURE (720)	£213.40	ADVENTURE (720)	£213.40
ADVENTURE (730)	£216.35	ADVENTURE (730)	£216.35
ADVENTURE (740)	£219.30	ADVENTURE (740)	£219.30
ADVENTURE (750)	£222.25	ADVENTURE (750)	£222.25
ADVENTURE (760)	£225.20	ADVENTURE (760)	£225.20
ADVENTURE (770)	£228.15	ADVENTURE (770)	£228.15
ADVENTURE (780)	£231.10	ADVENTURE (780)	£231.10
ADVENTURE (790)	£234.05	ADVENTURE (790)	£234.05
ADVENTURE (800)	£237.00	ADVENTURE (800)	£237.00
ADVENTURE (810)	£240.95	ADVENTURE (810)	£240.95
ADVENTURE (820)	£243.90	ADVENTURE (820)	£243.90
ADVENTURE (830)	£246.85	ADVENTURE (8	



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Tee off on this crazy green. Cross the alligator filled river to recover wayward golf balls. In this game danger lurks everywhere. With 30 star courses and super graphics, this game will delight and test the gamster.

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BUG OFF

Your garden has fallen into a Florida sink hole where weird forces have released a frenzy of bizarre bugs. You must destroy them with precise sharp graphics and colour and "your weapon DOT" — will you love him?

Cassette 121.99 Disc 121.99



TUTTI FRUTTI

Escape a fruit feast. With your finished fruit functioning "burger" like a banana, grabble a piece or pollen off a caterpillar that looks out for the lady bugs that would spoil the fun. In this colorful jungle feast you may even get a taste of the everlasting "Tutti Fruity"!

Cassette 117.99 Disc 117.99

ELIMINATOR

Fans of this game — now it's available for the Atari 400 and 800. Plot your Eliminator Craft over alien terrain and light the fuses of menacing enemy ships. Superior graphics and realistic sounds make this arcade style game exciting to the end.

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SEA DRAGON

Prepare to dive in your nuclear armed sub. Guide your submarine through a labyrinth of obstacles and past underwater monsters. Try to avoid mines of explosive energy that rise from the sea bottom. With more shopping ships alive, deadly lasers and missiles, try to reach your goal — destruction of the nuclear reactor. Will you succeed in this creative game?

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STRATOS

This is a breathtaking explosion of awesome graphics and other-worldly sounds beyond all arcade style games. About futuristic Megacrafts (among a score of alien and relaxing awesome weaponry — the terrifying matter manipulator) with your joystick control of the Armageddon have can you destroy them in time?

Cassette 155.49 Disc 155.49



ZAXXON

This sensational arcade game of 1982 is now available for use on your home computer system. Fly through a three dimensional landscape to attack the fortress and its deadly automated turrets. Survive this battle and earn the ultimate challenge!

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ASTRO CHASE

Here is the ultimate challenge. Defend the Earth from an awesome attack by aliens. There is no escape from their force field set around our planet! They launch their attack vessels and the chase begins — avoid deadly lasers, destroy space mines — save the Earth from inevitable doom.

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