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An ATARI™ Users Magazine

50p

ISSUE THREE



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PAGE 6 is a users magazine and carries articles on readers' requests or submitting articles and programs. The aim is to ensure Atari computing through the exchange 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 sure we hope you will learn from articles submitted by other readers.

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Editorial

WHERE ARE THE PROGRAMMERS?

You all know that the UK glossy magazines feature very little about the Atari and one of the reasons put forward is that nobody sends them any material. Well, I am beginning to wonder whether that is true. Whilst much appreciation goes to those readers who have submitted articles and programs, the initial response seems to have dried up and we need more articles and programs for future issues.

If it is true that most people do not submit Atari programs to magazines, I wonder why? There could be two reasons. The first is that nobody writes any programs and the majority of owners spend all of their time playing games. If that is what you are doing, then put down your joystick read the articles and programs in this magazine and start writing some programs. It is not that difficult and you really don't know what you are missing. The

real joy in owning a computer is in creating something of your own. Simple or complex, it doesn't really matter. When you finish your first program you will experience great satisfaction. The second reason could be that you look at some of the truly remarkable commercial software and think Wipe! I could NEVER write anything like that! OK, so maybe you can't . . . yet! So be content with what you can write. Pick up some ideas from magazines, improve them or write something similar. Pay attention to the little details of presentation and you can write a program, long or short, that you can be proud of. Sit down now and start to write something. When you have finished, send it in to show other readers that we Atari owners can after all write programs. The magazine is totally dependent on your contributions.

Let's hear from you. It's your magazine.

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Crewe, Cheshire, CW2 6JJ

Input

WHERE ARE THE PROBLEMS?

Dear Sir,

In issue 2 you published *Four in A Row*. The more astute of your readers may have noticed the 'deliberate' mistake of the spurious line 100MS RETURN. This prevents the text window being re-positioned on the screen and may cause it not to be displayed on some TVs but otherwise it should work OK.

I have been hearing a lot of comments about the quality of 48K upgrade boards for the Atari 400. I have had a MAPLIN board fitted at their Birmingham branch and this is working fine in spite of the use it gets at Club meetings. There appears to be a propaganda war being waged by suppliers of these boards. Perhaps your magazine could publish an unbiased review of these, but what you could say apart from 'it works' or 'it doesn't work' may be of interest only to electronics experts and not the normal user.

Mike Aston,
Wednesbury

"The question of what upgrade is the best quality and value is certainly one which most 400 owners will be interested in. As you say, some suppliers do tend to put down boards put out by competitors on the grounds that the chips used are likely to cause overheating. To get an expert review we would probably have to ask one of the manufacturers and the views

are unlikely to be unbiased. Perhaps more to the point would be to ask owners who have had upgrades what their experiences have been. If you have had your 400 upgraded to 48K write in and let us know. Who did you go to and why? Were you given any guarantees and if so what happened? Did you get a repair or replacement without bother? We would also be pleased to hear from suppliers and retailers — what makes your board reliable?

Dear Page 6,

Great magazine. At last one just for Atari users. I have a couple of questions to ask.

In the basic manual there is a description of RND. The variable or expression in parentheses following RND is said to be a dummy with no effect on the numbers returned.

If this is the case, what effect will a 0 or 1 in the parentheses have on the outcome of a random number as several programs seem to use these. An example from an actual program is $70 R=INT(I0)+1: S=INT(RND(I)*10$.

Also, I have just had a 48K memory put in my 400 which seems to work OK, no patterning problems. Is there something I can type in to check that I have actually got a 48K memory in there working to its full extent? What would I expect to see printed on the

screen with a 16K, 32K or 48K memory, assuming no program as such has been typed in?

Mrs. E. E. Matthews,
Watton-on-Thames

"I have heard it said that a 0 used as the variable produces a totally random number whilst a 1 prints the next number in a series of random numbers, though what truth there is in this I don't know. It may just be based on another machine's method of choosing random numbers. Does anyone know whether this is true? You can check your memory by typing $PRN(I0)$ after you power up (don't boot DOS if you have a disk drive). With 16K you should get 13000, with 32K 29710, and with 48K 37902. The seeming discrepancy with 48K is not due to your being done out of some memory but is because the Basic Cartridge overlays the memory between 40K and 48K. With 10 or 32K this makes no difference but with 48K you do lose 8K to Basic. Take out the cartridge and you have an extra 8K although you can't then write programs in Basic. If you buy a 48K game however which boots without the Basic cartridge you are probably getting the full 48K use.

Keep sending in your letters. Not only do they let us know what you want, they also spark off ideas for articles and programs.


```

5158 SOUND 8,8,8,8:FOR D=1 TO 38:GOSUB
160:FOR J=1 TO 16:NEXT J:NEXT Z
5159 RESTORE %OTO 5118
5160 REM ** OPTIMUM ROUTINE **
5161 %MATHICS 17:DL=PEEK(348)+25%PEEK
(541):FOR D=9 TO 4:POKE DL+11:2,7:NEXT
2
5162 REM NEXT THREE LINES IN INVERSE C
ACCEPT "optima" AND "start"
5163 POSITION 2,8:?" optima" option:?"
opt":POSITION 2,11:?" opt:difficulty" have
1"
5164 POSITION 3,6:?" %d:?" % "BASIC":POSIT
ION 3,8:?" %d:?" % "MODEM%":POSITION
3,18:?" %d:?" % "HARD"
5165 POSITION 4,8:?" %d:?" % "press start" %
% "opt"
5166 TL=PEEK(66)+25%PEEK(69):POKE TL+
216,8:POKE TL+136,74:P=111:R=2:P2=11:
%Q=2:P=2:P2=2
5167 FOR D=1 TO 38:NEXT D:POKE 33279,
8
5168 IF PEEK(33279) < 3 THEN GOSUB 8816
OTO 5118
5169 POKE TL+136,8:POKE TL+176,74:P=1
7:P2=8:P=8:R=3:FOR D=1 TO 38:NEXT
D:POKE 33279,8
5170 IF PEEK(33279) < 3 THEN GOSUB 8816
OTO 5128
5171 POKE TL+176,8:POKE TL+216,74:P=7
7:P2=11:P2=4%R=3:FOR D=1 TO 16:NE
XT D:POKE 33279,8

```

```

5158 IF PEEK(33279) < 3 THEN GOSUB 8816
OTO 5158
5159 GOTO 5166
7888 REM ** MUSIC ROUTINE **
7818 RESTORE 774+188
7828 FOR D=1 TO 7:READ A,B,C,D:GOSOUND B
A,14,4:GOSOUND 1,B,14,4:GOSOUND 2,C,14,4:
GOSOUND 3,D,14,4:GOSUB 78:NEXT D
7838 FOR D=1 TO 4:READ A:GOSOUND 3,A,14,
4:GOSUB 78:NEXT D:GOSUB 88:GOSUB 88
7848 FOR D=1 TO 8 STEP -2:GOSOUND 8,66,1
4,1:GOSOUND 1,6,14,1:GOSOUND 2,47,14,1:G
OSUB 3,243,14,1:NEXT D
7858 FOR D=1 TO 28:NEXT D:RETURN
7868 REM ** LOST ? ROUTINE **
8888 FOR D=1 TO 28:GOSOUND 8,25,2,8:NEXT
D:GOSUB 8,8,8,8
8818 ? CHR$(125):?" " "SOMEHOW YOU'VE LOS
T THE INPUT PROMPT:?" ? " -PLEASE INPUT
YOUR ANSWER AGAIN!"
8828 FOR D=1 TO 750:NEXT D:?" "?:GOTO
4888
8868 REM ** HEARD ANSWER SOUND **
9668 FOR D=1 TO 5:GOSOUND 8,208,12,P:PO
R 1=1 TO 4:NEXT D:GOSUB 8,8,8,8:FOR I
=1 TO 25:NEXT I:NEXT D:RETURN
9698 REM ** TRAP ROUTINE **
9888 FOR D=1 TO 38:GOSOUND 8,25,2,8:NE
XT D:GOSUB 8,8,8,8
1888 ? CHR$(125):?" " "PLEASE INPUT
ONE NUMBER:?" ? " IN YOUR ##
342 ??:FOR D=1 TO 45:NEXT D:TRAP 188
3818 ? CHR$(125):GOTO 4888

```

User Groups/Contact

If you run a User Group or would like to get in touch with other Atari owners, let us know and we will happily publish details.

See Issue 2 for User Groups in MERSEYSIDE, EDINBURGH and PRESTON. Meanwhile, here are a few more contacts.

NORTH WALES.—G.P. Video Systems of Wrexham have just started up a User Group. No details yet of meeting place or time. Get in touch with

G.P. VIDEO SYSTEMS,
38, HENBLOS STREET,
WREXHAM
Tel. 0578 254631

NORWICH.—Ken and Sherry Ward are trying to get some people together to form a local User Group. If you live in or near Norwich, get in touch.

KEN & SHERRY WARD,
45, COLEBURN ROAD,
LAKENHAM,
NORWICH
Tel. 0603 661148

HULL.—Harvey Kong Tin would like to meet anyone locally to sort out some problems and learn some more. Write or phone.

HARVEY KONG TIN,
548, HOLLERNESS ROAD,
HULL, HU9 3ES
Tel. HULL 791084

ARCADE ACTION

Three more of the classic arcade games are now available for your Atari 400/800. They are reviewed here for us by reader HARVEY KOMQ TIN who appears to be an avid arcade gamer.

DEFENDER

16K ROM

ATARI 1/2 PLAYERS

The Arcade game is at least available for the Atari 400/800 and plays very much like the arcade — fast action and furious enemies.

Like *Airstrike* the game is best played with your computer on the floor, so that your foot controls the very important space bar which in this case controls your life-saving smart bombs. With this arrangement, a very responsive joystick (the *Woo Command Control* is excellent) and persevered endurance, your scores will climb. For those unfamiliar with this highly-rated game — your spacecraft moves in four directions with unlimited fire power, your aim is to protect the humanoids on a planetoid landscape. There are five types of enemy craft to become familiar with, which you will need to do to climb to 100,000 points. A radar screen prepares you for any oncoming hazards as you pass over the scrolling landscape. Smart bombs obliterate any enemy on the screen except for their fire. You start off with three and earn an extra one for each 50,000 points.

The sound didn't sound like the arcade version at first, but after a while it grows on you and starts sounding familiar. While the graphics are not sharply defined (but equal to the worst quality arcade machine) the action and pace is there for anyone hardy enough to enjoy it.

This cartridge is for fans who enjoy defender who are willing to forgive Atari for being a bit rushed with it.

Reviews

GORF

16K ROM/DISK

ROKLAN 1/2 PLAYERS

A quality arcade game from Roklan. This game gives you four different missions to go through.

The first, *Astro Battles*, is a mini version of *Space Invaders*. Even if you were lousy with *Space Invaders*, you can easily learn to survive this mission and continue with the others. The second, *Laser Attack*, reminds me of *Galaxian* in a kamikaze sort of way — two ships fire lasers and the rest ram you!

The third mission, *Space Warp*, requires you to shoot Gorf and Fighters as they emerge from a vortex. The fourth and final mission of each round is *Flag Ship*, where you must first blast through a force field arc to shoot at the big ship. Just like *Star Wars*, you are aiming for a sensitive internal reactor vent. However, defensive fireballs are coming at you and rebounds of your own shots can hit you. With any ships remaining you can go through all the hazards again — faster and faster.

The graphics and sound are very well programmed and the game should suit those fond of arcade games. The four separate missions add variety and makes Gorf somewhat more challenging than the one screen games.

GALAXIAN

16K ROM

ATARI 1/2 PLAYERS

Another direct translation of a popular arcade game. All of the elements of *Galaxian* are there. An overhead fleet of enemy spacecrafts in formation which peel off to attack your ship below and, if they survive your fire, return to formation.

Character Redefinition

Michael Jackson

The Atari computer is truly an electronic marvel which offers fabulous graphics and sounds. It is for these qualities the Atari Home Computers are best known. There is, however, another feature that the Atari possesses which, when used to best effect, can be just as stunning — if not more so — than all those very impressive graphics modes.

How would you like Roman-style numerals instead of the normal numbers? Or perhaps some artistic script writing (like the writing you see in *Scott Adams Adventures*)? What about some trees or perhaps grass? Some mountains might be nice! How can all this be done? It's called character redefinition.

Probably the best place to start understanding the principles of character redefinition is to examine what makes up a single character in the first place. Each character can be mapped on an 8 x 8 grid which represents 8 bytes of memory inside the computer. A character is best thought of as being composed of 8 layers — see figure 1 — with each layer representing a consecutive address in memory.

As you can see from figure 1, the shape of the character is decided by which 'bits' are filled in (on) and which are not (off) in each layer.



This image is stored in memory and the value stored at each memory address (representing each layer) is determined by the placement of the 'on' bits. Let's suppose that layer 1 starts at address 30000. To create the shape in figure 1

you would POKE 30000,0;30001,24;30002,60 and so on. Address 30000 would represent the first layer of another character.

Now you know the basic principle of creating a character, let's get down to practicalities.

WHERE TO STORE YOUR CHARACTER DATA

The memory of your Atari is grouped together in lots of 256 address locations. Each group or lot of memory is referred to as a 'page'.

You must decide which memory page to start storing your character set data. Care must be taken to avoid occupying memory which may be taken by your Basic program. The bigger your Basic program (which needs your custom character set), the higher up in memory you must go to store your character data, i.e. the page number must be bigger. I have found that page 120 (on a 32K machine) works well enough for me. With a page number of 120, this means that the starting address for your custom set is 120x256 which equals 30720. Try poking 758,120. If the screen goes blank, this means that there is nothing in that area of memory and that you can store your character data there. It is wise to do this while you have the program which is going to use your character set already in memory. If the screen is full of weird characters then you must try a higher page.

SELECTING CERTAIN CHARACTERS ONLY

Up till now I have assumed that you want to redefine every keyboard character or will only use those characters that you have redefined. Sometimes, however, you may want to change only one or two characters and keep the rest the same as the Atari set. For example, if you have a business program, you will probably want a 'C' sign rather than the '\$' sign! Perhaps a proper division sign instead of '/'.

If this is the case, then two things must be done. First, the whole Atari character set must be copied over into the spare memory pages you have selected and then selective areas that

relate to the character/keystroke you want to change must be POKED with new values. In case you're thinking of giving up, I should add that the CHARACTER GENERATION UTILITY program does everything for you, but I will explain it here so you can understand the mechanics better.

The following short program would deal with the first task:

```
10 FOR I=0 TO 1023: POKE
130*256+(I/256)*256+I: NEXT I
```

Page number 224, by the way, is the page which the computer uses to store its permanent character set. This page cannot be changed which is why you need to copy the character set to another location. As you will see, this program simply pokes what is in page 224 and then copies it into page 120. If you want to actually see the copying process taking place, then switch off the computer and re-enter the program but with Line 5 POKE 766,120. Run it. Weird, isn't it?

The second task, picking out that group of 8 memory addresses for your particular character, requires consultation of your Atari Basic Reference Manual at page 55. Here you will find a table which details the relative positions of characters. Let us suppose you want to poke data that creates a "C" sign into the area of memory that currently holds the 8 sign. Consider the following program, which does this.

```
10 FOR I=0 TO 7: READ A
20 POKE 120*256+4*8+I,A
30 NEXT I
40 DATA 28,32,32,32,120,32,98,126
```

Let's see now. Line 10 reads each of your data values. There are 8 values — one for each layer of your character. In this case it is a pound sign. Line 20 identifies the starting point of your character set ($120*256$), then it calculates the first of the 8 addresses you want ($+4*8$) — where 4 is the internal number representing the 8 sign (see page 55 of your manual) and 8

since there are 8 memory addresses involved to make up each character. Line 30 repeats the process 8 times and Line 40 holds your data.

The utility program actually writes these programs for each key you choose for each custom character you create!

Once you have stored the values of your new character set into memory, you will want to see the fruits of your labour on the screen. POKE 766 with the page number you are using, in this case it is 120, and voila!

NOTE: Entering a new Graphics command returns you to the Atari standard character set. You must POKE 766,120 (or whatever page you are using) straight after a new Graphics command. A GOSUB may help you here.

See next page for program

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Character Generation Utility

Michael Jackson

This program runs on an Atari 400/800 computer with a minimum of 32K RAM.

The Utility allows the user 3 functions.

1) **MANUAL** — This status allows the user to create his own character by filling in any box on the grid.

2) **DATA INPUT** — Allows the user to input Data values and see what they represent in character form. This is particularly useful when analysing other people's character data.

3) **CHARACTER INPUT** — This status examines an existing character in the set.

The program always returns to **MANUAL** after any status and therefore allows you to improve upon or otherwise amend a character. For example, if the character you wish to create looks a bit like a 'T' then you can use the **CHARACTER INPUT** status to get the 'T' on the grid and then use **MANUAL** to change it slightly.

Your new character **ON THE GRID** will only be registered in the program's memory if you press 'G' for **GENERATE**. Please see the command list.

COMMAND LIST

CH — Allows you to enter a character on the grid. At the prompt, press the appropriate key and **RETURN**.

CL — Clears the grid.

D — Allows you to enter **DATA** and see the character representation. At the prompt, enter 8 values, hitting **RETURN** after each.

E — Puts the program in **ERASE** mode. Use to erase points on the grid.

F — **FILL** mode. Use to plot points on the grid.

G — Commits whatever is on the grid to memory. (Even a blank grid.)

L1 — Allows key choice for each character created. Follow the prompts. This key must always be used before you can save any characters to tape.

Lx — Where x is the layer number of the grid. To fill points on layer 2 of the grid enter **L3** and then press a key 1-8 to fill or erase a point in that layer.

The program writes its own code for each custom character using a special feature called screen editing. It is for this reason that you can create only a maximum of four characters at any one time. You may return to the program to redefine more after ever four characters have been generated by the 'G' command. If you try to generate a fifth character, the program reminds you to use the **L1** command. You do not have to wait for the reminder, especially if you only want to redefine one character!

LOADING A SAVED CHARACTER SET

To load a character set that you have saved using the **CHARACTER GENERATION UTILITY**, use the following program:

```
10 OPEN #4,0,"C":FOR I=0 TO 1023:
GET #4,P:POKE 30720+I,P:NEXT I:
CLOSE #4
```

30720 by the way is simply the page number multiplied by 256. If the program that will use your custom set is a small one, you may want to use another page lower in memory. It's up to you.

A final reminder. Don't forget to **POKE 756,120** (or whatever page you are using) and that this must be done every time a new Graphics command is used.

SUBSCRIBE

to PAGE 6

see page three for details


```

7100 27.61+ "FILL" :GOTO 2258
3588 IF A#="0" OR A#="9" THEN POSITION
27.7:7 "GENERATE" :GOTO 4038
3558 IF A#="CL" OR A#="C" THEN POSITIO
DN 27.7:7 "CLEAR" :GOSUB 4188:GOTO
2768
3528 IF VAL(A#-1) OR VAL(A#+1) THEN GO
TO 3788
3458 X=8
3429 REM #IDENTIFY LEVEL-POSITION
3788 FOR I#1 TO 8
3758 IF VAL(A#)=I# THEN A#="I#X2
3688 NEXT I#
3658 B#=" " :REM INVERSE SPACE
3628 IF A#2 THEN B#=" :REM INVERSE OF
ACE
3598 IF A#1 THEN B#=" "
4688 POSITION X,Y:7 B# :GOSUB 9158:GOT
O 2288
4658 REM #GENERATION ROUTINE
4188 IF GCOUNT#7 THEN POSITION 22.28:7
" LIST NON " :POKE 784,255:GOTO 2288:R
EM LIST NON IN INVERSE
4158 GCOUNT=GCOUNT+1
4288 FOR L#1 TO 8
4258 FOR C#1 TO 8
4228 GOSUB 5288
4258 GOSUB 5458
4288 REM SPACES IN NEXT LINE IN INVER
S
4688 LOCATE 3:COR2,TT,Y:IF B##X:Y#="
" THEN P(L#)=P(L#)+B:POSITION 3+COR2,
TT:PUT #,A#C: " :GOTO 4588
4458 POSITION 3+COR2,TT:PUT #,A#C: "
"
4588 NEXT C#
4558 NEXT L#
4428 POSITION 2,22:7 "
4448 REM #CREATION OF WORKING CHARAC
TER AND DATA WRITE-UP
4428 POSITION 1,22:7 "DATA "
4788 FOR I#1 TO 8
4758 POKE 128+256+3288+(I-1)*8
4888 POKE 128+256+3288+(I-1)*8:P(I)
4858 IF A#="0" OR A#="9" THEN DAT(LI)=
P(I):LI=LI+1
4888 IF I=8 THEN P(I):GOTO 5488
4858 P(I): " "
5088 P(I)=8
5058 NEXT I
5388 P#8
5158 GOTO 3258
5128 REM #CALCULATION OF DATA VALUES
#40 POSITIONS
5288 IF L#1 THEN S=128:TT=3
5258 IF L#2 THEN S=64:TT=5
5228 IF L#3 THEN S=32:TT=7
5258 IF L#4 THEN S=16:TT=9
5488 IF L#5 THEN S=8:TT=11
5458 IF L#6 THEN S=4:TT=13
5588 IF L#7 THEN S=2:TT=25
5558 IF L#8 THEN S=1:TT=57
5688 RETURN
5428 IF C#1 THEN S=128
5398 IF C#2 THEN S=64
5368 IF C#3 THEN S=32
5338 IF C#4 THEN S=16
5308 IF C#5 THEN S=8
5278 IF C#6 THEN S=4
5248 IF C#7 THEN S=2
5218 IF C#8 THEN S=1
4658 RETURN
4188 FOR L#1 TO 8
4158 FOR A#1 TO 8
4288 GOSUB 5288
4258 POSITION 3+P#A2,TT:7 " "
4288 NEXT A#
4258 NEXT L#
4488 RETURN
4428 POSITION 22.28:7 "YOUR INPUT " :P
OSITION 22.21:7 "CHARACTER" :REM CHARAC
TER IN INVERSE
4588 INPUT C#:POSITION 31,21:7 " "
4558 POSITION 1,22:7 "
4488 POSITION 1,22:7 "DATA "
4458 IF A#="0" OR A#="9" THEN FOR C#1
TO 8:INPUT D#
4788 IF A#="0" OR A#="9" THEN POSITION
4,22:7 " :C/D=C#D:POSITION 4,22:4#
E#T :GOTO 2858
4748 REM #CALCULATION OF CHOSEN CHAR
ACTER POSITION IN MEMORY
4728 IF ASC(C#)-31 THEN C#B=ASC(C#)+8
4:GOTO 4788
4698 IF ASC(C#)=94 THEN C#B=ASC(C#)-10
370 4788
4668 C#B=ASC(C#)-32
4638 FOR D#0 TO 7
4758 C#C(I)=PEEK(128+256+C#B+D#C)
7888 NEXT C
7858 GOSUB 4188
7188 FOR P#1 TO 8
7158 P(I)=C(I)
7288 NEXT P
7258 FOR L#1 TO 8
7228 GOSUB 5288
7258 FOR P#1 TO 8
7488 GOSUB 7788
7458 IF C(L#)/555=1 THEN C(L#)=C(L#)-8
5:POSITION 3+FIX2,TT:7 " :GOSUB 8158
7588 NEXT P:REM SPACE IN INVERSE
7558 NEXT L#
7688 POSITION 22,21:7 "
7658 GOTO 4488
7628 REM #CALCULATES A CHOSEN CHARAC
TERS MAKE-UP
7788 IF P#1 THEN S#=328
7758 IF P#2 THEN S#=44
7888 IF P#3 THEN S#=32
7858 IF P#4 THEN S#=14

```


KEYBOARD TECHNIQUES

Les Ellingham

There are two commonly used methods of obtaining input from the keyboard during a program. The first is the INPUT statement which can be used to input either a numeric variable or a string and the second is the GET statement which accepts only one keystroke in the form of an ATASCII number. Appendix C of the Basic Reference Manual gives a full list of the ATASCII character set and corresponding decimal codes.

One thing both these statements have in common is that they stop the program until such time as a key is pressed and in the case of the INPUT statement, until RETURN is pressed. In certain cases this can be a distinct disadvantage. You may, for instance, wish to set a time limit in which to enter an answer to a question or may wish to have a "real-time" battle scene giving you only seconds in which to attack or defend. For both these situations neither INPUT or GET are of any use. Fortunately there is an answer and that is to take a PEEK at the keyboard. Memory location 764 holds a value which corresponds to the last key pressed or contains the value 255 if no key is pressed. So all you have to do is PEEK location 764, read the ATASCII code and convert that to see which key you pressed. Right? No, wrong! Unfortunately, the value stored in location 764 has no relation whatever to the ATASCII code and is an internal code recognised only by your Atari.

You can easily program around this limitation by combining a PEEK to location 764 with a GET statement, but in many cases there is no need to print out the character of the key pressed and it would be helpful to be able to include the keyboard code in your program for immediate recognition. The Basic Reference Manual does not include a list of the keyboard codes and I have not seen them printed elsewhere, so the accompanying chart lists the internal code of all the keys.

Fine, another chart to refer to, but what practical use can this be put to? I mentioned earlier a "real-time" battle scene where you had to input information quickly to attack or defend.

When attacking, you may, for instance, wish to hit 'H' for an attack to your opponent's head, 'B' for an attack to the body or 'L' for an attack to the legs. The following subroutine can be used.

```

500 POKE 764,255:FOR I=1 TO 20
110 IF PEEK(764)=H7 THEN GOTO 500
120 IF PEEK(764)=L1 THEN GOTO 600
130 IF PEEK(764)=R1 THEN GOTO 700
140 NEXT I:?"OUT OF TIME"

```

Line 500 would determine the outcome of a blow to your opponent's head, line 600 to his/ (his?) body and line 700 to the legs. The length of the loop should be altered to suit how quickly you wish to react, if you failed to hit any of the correct keys, the program would return from the subroutine to allow your opponent to continue his attack. If this type of subroutine is used for a "surprise" attack, preceded only by a quick warning, it is surprising how nimble you have to be to hit the right key!

If you wish to use location 764 to obtain an answer within a time limit, then again PEEK at the keyboard from within a loop. Suppose, for example, you have a program which poses a question and gives a choice of four answers—A, B, C or D. The following can be used as a subroutine (assume C is the right answer).

```

500 POKE 764,255:FOR I=1 TO 200
110 IF PEEK(764)=18 THEN ? "RIGHT" :SET
URN
120 IF PEEK(764)=C255 AND PEEK(764)=C1
8 THEN ? "WRONG" :RETURN
130 NEXT I:?"TIME UP" :RETURN

```

There must be many other ways to use the internal keyboard code and also routines which involve PEEKing location 764. Certainly you can fool your Atari into thinking you have pressed RETURN by a POKE 764,12. When you next load a program by typing POKE 764,12:LOAD (make sure that the tape is ready first).

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The secret of learning to program is to experiment. Try expanding the simple routines given and making up some of your own. The

suggestions are only a couple of many uses for a PEEK at the keyboard. What other interesting applications can you find?

INTERNAL KEYBOARD CODES

KEY	CODE	KEY	CODE	KEY	CODE	KEY	CODE
1	33	F	54	U	11	*	10
2	36	D	41	V	14	+	7
3	26	H	57	W	46	CAPS/LOCK	48
4	24	J	13	X	22	,	32
5	29	F	1	Y	43	.	34
6	27	K	9	Z	29	/	38
7	31	L	8	ESC	28	SPACE	39
8	30	M	37	~	54		
9	48	N	35	BACK	53		
A	43	P	18	TAB	44		
B	21	O	47	~	14		
C	18	R	68	~	15		
D	38	S	62	RETURN	12		
E	42	T	49	~	2		

PRESSING SHIFT AT THE SAME TIME ADDS 04. PRESSING CTRL AT THE SAME TIME ADDS 100.

PRESSING SHIFT AND CTRL AT THE SAME TIME AS A KEY ADDS 104. BUT ONLY IF THE KEY VALUE IS 04 OR OVER.

Character Designer

Paul Stevens

Editor's note: This program does not offer all the facilities of the CHARACTER GENERATION UTILITY but is superb graphically and very easy to use. It only uses 1880.

This program lets you design your own characters using the joystick on an 8 x 8 grid. It then works out and displays the DATA for you to incorporate in your own program.

A flashing marker will show your position on the grid. To fill in a square simply press the fire button. To erase the square press the button again.

```

1 REM *****
2 REM a CHARACTER DESIGNER a
3 REM b By PAUL STEVENS a
4 REM c 2/13/83 a
5 REM *****
6 REM
7 REM GRAPHICS 20:POKE 259,0:POKE 760,154
8 REM 767,252:POKE 718,0:POKE 710,180
9 REM 762,1
10 REM
11 REM ALTER DISPLAY LIST
12 REM
13 REM POKE 500:POKE 501:POKE 502:POKE 503
14 REM A=1:78:POKE 642,0:POKE 643,0
15 REM 644,0:POKE 645,0:POKE 646,0
16 REM 647,1:POSITION 1,0:PRINT "Character Designer"
17 REM 0:PRINT "VIDEO"
18 REM 647,0:POSITION 2,0:PRINT "A,B,C,
19 REM 0,0,0,0,0"
20 REM POKE 647,0:SCREEN 0
21 REM POKE 647,0:POKE 648,0:POKE 649,0
22 REM 650,0:POKE 651,0:POKE 652,0
23 REM 653,0:POKE 654,0:POKE 655,0:POKE 656,0
24 REM 657,0:POKE 658,0:POKE 659,0:POKE 660,0
25 REM 661,0:POKE 662,0:POKE 663,0:POKE 664,0
26 REM 665,0:POKE 666,0:POKE 667,0:POKE 668,0
27 REM 669,0:POKE 670,0:POKE 671,0:POKE 672,0
28 REM 673,0:POKE 674,0:POKE 675,0:POKE 676,0
29 REM 677,0:POKE 678,0:POKE 679,0:POKE 680,0
30 REM 681,0:POKE 682,0:POKE 683,0:POKE 684,0
31 REM 685,0:POKE 686,0:POKE 687,0:POKE 688,0
32 REM 689,0:POKE 690,0:POKE 691,0:POKE 692,0
33 REM 693,0:POKE 694,0:POKE 695,0:POKE 696,0
34 REM 697,0:POKE 698,0:POKE 699,0:POKE 700,0
35 REM 701,0:POKE 702,0:POKE 703,0:POKE 704,0
36 REM 705,0:POKE 706,0:POKE 707,0:POKE 708,0
37 REM 709,0:POKE 710,0:POKE 711,0:POKE 712,0
38 REM 713,0:POKE 714,0:POKE 715,0:POKE 716,0
39 REM 717,0:POKE 718,0:POKE 719,0:POKE 720,0
40 REM 721,0:POKE 722,0:POKE 723,0:POKE 724,0
41 REM 725,0:POKE 726,0:POKE 727,0:POKE 728,0
42 REM 729,0:POKE 730,0:POKE 731,0:POKE 732,0
43 REM 733,0:POKE 734,0:POKE 735,0:POKE 736,0
44 REM 737,0:POKE 738,0:POKE 739,0:POKE 740,0
45 REM 741,0:POKE 742,0:POKE 743,0:POKE 744,0
46 REM 745,0:POKE 746,0:POKE 747,0:POKE 748,0
47 REM 749,0:POKE 750,0:POKE 751,0:POKE 752,0
48 REM 753,0:POKE 754,0:POKE 755,0:POKE 756,0
49 REM 757,0:POKE 758,0:POKE 759,0:POKE 760,0
50 REM 761,0:POKE 762,0:POKE 763,0:POKE 764,0
51 REM 765,0:POKE 766,0:POKE 767,0:POKE 768,0
52 REM 769,0:POKE 770,0:POKE 771,0:POKE 772,0
53 REM 773,0:POKE 774,0:POKE 775,0:POKE 776,0
54 REM 777,0:POKE 778,0:POKE 779,0:POKE 780,0
55 REM 781,0:POKE 782,0:POKE 783,0:POKE 784,0
56 REM 785,0:POKE 786,0:POKE 787,0:POKE 788,0
57 REM 789,0:POKE 790,0:POKE 791,0:POKE 792,0
58 REM 793,0:POKE 794,0:POKE 795,0:POKE 796,0
59 REM 797,0:POKE 798,0:POKE 799,0:POKE 800,0
60 REM 801,0:POKE 802,0:POKE 803,0:POKE 804,0
61 REM 805,0:POKE 806,0:POKE 807,0:POKE 808,0
62 REM 809,0:POKE 810,0:POKE 811,0:POKE 812,0
63 REM 813,0:POKE 814,0:POKE 815,0:POKE 816,0
64 REM 817,0:POKE 818,0:POKE 819,0:POKE 820,0
65 REM 821,0:POKE 822,0:POKE 823,0:POKE 824,0
66 REM 825,0:POKE 826,0:POKE 827,0:POKE 828,0
67 REM 829,0:POKE 830,0:POKE 831,0:POKE 832,0
68 REM 833,0:POKE 834,0:POKE 835,0:POKE 836,0
69 REM 837,0:POKE 838,0:POKE 839,0:POKE 840,0
70 REM 841,0:POKE 842,0:POKE 843,0:POKE 844,0
71 REM 845,0:POKE 846,0:POKE 847,0:POKE 848,0
72 REM 849,0:POKE 850,0:POKE 851,0:POKE 852,0
73 REM 853,0:POKE 854,0:POKE 855,0:POKE 856,0
74 REM 857,0:POKE 858,0:POKE 859,0:POKE 860,0
75 REM 861,0:POKE 862,0:POKE 863,0:POKE 864,0
76 REM 865,0:POKE 866,0:POKE 867,0:POKE 868,0
77 REM 869,0:POKE 870,0:POKE 871,0:POKE 872,0
78 REM 873,0:POKE 874,0:POKE 875,0:POKE 876,0
79 REM 877,0:POKE 878,0:POKE 879,0:POKE 880,0
80 REM 881,0:POKE 882,0:POKE 883,0:POKE 884,0
81 REM 885,0:POKE 886,0:POKE 887,0:POKE 888,0
82 REM 889,0:POKE 890,0:POKE 891,0:POKE 892,0
83 REM 893,0:POKE 894,0:POKE 895,0:POKE 896,0
84 REM 897,0:POKE 898,0:POKE 899,0:POKE 900,0
85 REM 901,0:POKE 902,0:POKE 903,0:POKE 904,0
86 REM 905,0:POKE 906,0:POKE 907,0:POKE 908,0
87 REM 909,0:POKE 910,0:POKE 911,0:POKE 912,0
88 REM 913,0:POKE 914,0:POKE 915,0:POKE 916,0
89 REM 917,0:POKE 918,0:POKE 919,0:POKE 920,0
90 REM 921,0:POKE 922,0:POKE 923,0:POKE 924,0
91 REM 925,0:POKE 926,0:POKE 927,0:POKE 928,0
92 REM 929,0:POKE 930,0:POKE 931,0:POKE 932,0
93 REM 933,0:POKE 934,0:POKE 935,0:POKE 936,0
94 REM 937,0:POKE 938,0:POKE 939,0:POKE 940,0
95 REM 941,0:POKE 942,0:POKE 943,0:POKE 944,0
96 REM 945,0:POKE 946,0:POKE 947,0:POKE 948,0
97 REM 949,0:POKE 950,0:POKE 951,0:POKE 952,0
98 REM 953,0:POKE 954,0:POKE 955,0:POKE 956,0
99 REM 957,0:POKE 958,0:POKE 959,0:POKE 960,0
100 REM 961,0:POKE 962,0:POKE 963,0:POKE 964,0
101 REM 965,0:POKE 966,0:POKE 967,0:POKE 968,0
102 REM 969,0:POKE 970,0:POKE 971,0:POKE 972,0
103 REM 973,0:POKE 974,0:POKE 975,0:POKE 976,0
104 REM 977,0:POKE 978,0:POKE 979,0:POKE 980,0
105 REM 981,0:POKE 982,0:POKE 983,0:POKE 984,0
106 REM 985,0:POKE 986,0:POKE 987,0:POKE 988,0
107 REM 989,0:POKE 990,0:POKE 991,0:POKE 992,0
108 REM 993,0:POKE 994,0:POKE 995,0:POKE 996,0
109 REM 997,0:POKE 998,0:POKE 999,0:POKE 1000,0
110 REM 1001,0:POKE 1002,0:POKE 1003,0:POKE 1004,0
111 REM 1005,0:POKE 1006,0:POKE 1007,0:POKE 1008,0
112 REM 1009,0:POKE 1010,0:POKE 1011,0:POKE 1012,0
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114 REM 1017,0:POKE 1018,0:POKE 1019,0:POKE 1020,0
115 REM 1021,0:POKE 1022,0:POKE 1023,0:POKE 1024,0
116 REM 1025,0:POKE 1026,0:POKE 1027,0:POKE 1028,0
117 REM 1029,0:POKE 1030,0:POKE 1031,0:POKE 1032,0
118 REM 1033,0:POKE 1034,0:POKE 1035,0:POKE 1036,0
119 REM 1037,0:POKE 1038,0:POKE 1039,0:POKE 1040,0
120 REM 1041,0:POKE 1042,0:POKE 1043,0:POKE 1044,0
121 REM 1045,0:POKE 1046,0:POKE 1047,0:POKE 1048,0
122 REM 1049,0:POKE 1050,0:POKE 1051,0:POKE 1052,0
123 REM 1053,0:POKE 1054,0:POKE 1055,0:POKE 1056,0
124 REM 1057,0:POKE 1058,0:POKE 1059,0:POKE 1060,0
125 REM 1061,0:POKE 1062,0:POKE 1063,0:POKE 1064,0
126 REM 1065,0:POKE 1066,0:POKE 1067,0:POKE 1068,0
127 REM 1069,0:POKE 1070,0:POKE 1071,0:POKE 1072,0
128 REM 1073,0:POKE 1074,0:POKE 1075,0:POKE 1076,0
129 REM 1077,0:POKE 1078,0:POKE 1079,0:POKE 1080,0
130 REM 1081,0:POKE 1082,0:POKE 1083,0:POKE 1084,0
131 REM 1085,0:POKE 1086,0:POKE 1087,0:POKE 1088,0
132 REM 1089,0:POKE 1090,0:POKE 1091,0:POKE 1092,0
133 REM 1093,0:POKE 1094,0:POKE 1095,0:POKE 1096,0
134 REM 1097,0:POKE 1098,0:POKE 1099,0:POKE 1100,0
135 REM 1101,0:POKE 1102,0:POKE 1103,0:POKE 1104,0
136 REM 1105,0:POKE 1106,0:POKE 1107,0:POKE 1108,0
137 REM 1109,0:POKE 1110,0:POKE 1111,0:POKE 1112,0
138 REM 1113,0:POKE 1114,0:POKE 1115,0:POKE 1116,0
139 REM 1117,0:POKE 1118,0:POKE 1119,0:POKE 1120,0
140 REM 1121,0:POKE 1122,0:POKE 1123,0:POKE 1124,0
141 REM 1125,0:POKE 1126,0:POKE 1127,0:POKE 1128,0
142 REM 1129,0:POKE 1130,0:POKE 1131,0:POKE 1132,0
143 REM 1133,0:POKE 1134,0:POKE 1135,0:POKE 1136,0
144 REM 1137,0:POKE 1138,0:POKE 1139,0:POKE 1140,0
145 REM 1141,0:POKE 1142,0:POKE 1143,0:POKE 1144,0
146 REM 1145,0:POKE 1146,0:POKE 1147,0:POKE 1148,0
147 REM 1149,0:POKE 1150,0:POKE 1151,0:POKE 1152,0
148 REM 1153,0:POKE 1154,0:POKE 1155,0:POKE 1156,0
149 REM 1157,0:POKE 1158,0:POKE 1159,0:POKE 1160,0
150 REM 1161,0:POKE 1162,0:POKE 1163,0:POKE 1164,0
151 REM 1165,0:POKE 1166,0:POKE 1167,0:POKE 1168,0
152 REM 1169,0:POKE 1170,0:POKE 1171,0:POKE 1172,0
153 REM 1173,0:POKE 1174,0:POKE 1175,0:POKE 1176,0
154 REM 1177,0:POKE 1178,0:POKE 1179,0:POKE 1180,0
155 REM 1181,0:POKE 1182,0:POKE 1183,0:POKE 1184,0
156 REM 1185,0:POKE 1186,0:POKE 1187,0:POKE 1188,0
157 REM 1189,0:POKE 1190,0:POKE 1191,0:POKE 1192,0
158 REM 1193,0:POKE 1194,0:POKE 1195,0:POKE 1196,0
159 REM 1197,0:POKE 1198,0:POKE 1199,0:POKE 1200,0
160 REM 1201,0:POKE 1202,0:POKE 1203,0:POKE 1204,0
161 REM 1205,0:POKE 1206,0:POKE 1207,0:POKE 1208,0
162 REM 1209,0:POKE 1210,0:POKE 1211,0:POKE 1212,0
163 REM 1213,0:POKE 1214,0:POKE 1215,0:POKE 1216,0
164 REM 1217,0:POKE 1218,0:POKE 1219,0:POKE 1220,0
165 REM 1221,0:POKE 1222,0:POKE 1223,0:POKE 1224,0
166 REM 1225,0:POKE 1226,0:POKE 1227,0:POKE 1228,0
167 REM 1229,0:POKE 1230,0:POKE 1231,0:POKE 1232,0
168 REM 1233,0:POKE 1234,0:POKE 1235,0:POKE 1236,0
169 REM 1237,0:POKE 1238,0:POKE 1239,0:POKE 1240,0
170 REM 1241,0:POKE 1242,0:POKE 1243,0:POKE 1244,0
171 REM 1245,0:POKE 1246,0:POKE 1247,0:POKE 1248,0
172 REM 1249,0:POKE 1250,0:POKE 1251,0:POKE 1252,0
173 REM 1253,0:POKE 1254,0:POKE 1255,0:POKE 1256,0
174 REM 1257,0:POKE 1258,0:POKE 1259,0:POKE 1260,0
175 REM 1261,0:POKE 1262,0:POKE 1263,0:POKE 1264,0
176 REM 1265,0:POKE 1266,0:POKE 1267,0:POKE 1268,0
177 REM 1269,0:POKE 1270,0:POKE 1271,0:POKE 1272,0
178 REM 1273,0:POKE 1274,0:POKE 1275,0:POKE 1276,0
179 REM 1277,0:POKE 1278,0:POKE 1279,0:POKE 1280,0
180 REM 1281,0:POKE 1282,0:POKE 1283,0:POKE 1284,0
181 REM 1285,0:POKE 1286,0:POKE 1287,0:POKE 1288,0
182 REM 1289,0:POKE 1290,0:POKE 1291,0:POKE 1292,0
183 REM 1293,0:POKE 1294,0:POKE 1295,0:POKE 1296,0
184 REM 1297,0:POKE 1298,0:POKE 1299,0:POKE 1300,0
185 REM 1301,0:POKE 1302,0:POKE 1303,0:POKE 1304,0
186 REM 1305,0:POKE 1306,0:POKE 1307,0:POKE 1308,0
187 REM 1309,0:POKE 1310,0:POKE 1311,0:POKE 1312,0
188 REM 1313,0:POKE 1314,0:POKE 1315,0:POKE 1316,0
189 REM 1317,0:POKE 1318,0:POKE 1319,0:POKE 1320,0
190 REM 1321,0:POKE 1322,0:POKE 1323,0:POKE 1324,0
191 REM 1325,0:POKE 1326,0:POKE 1327,0:POKE 1328,0
192 REM 1329,0:POKE 1330,0:POKE 1331,0:POKE 1332,0
193 REM 1333,0:POKE 1334,0:POKE 1335,0:POKE 1336,0
194 REM 1337,0:POKE 1338,0:POKE 1339,0:POKE 1340,0
195 REM 1341,0:POKE 1342,0:POKE 1343,0:POKE 1344,0
196 REM 1345,0:POKE 1346,0:POKE 1347,0:POKE 1348,0
197 REM 1349,0:POKE 1350,0:POKE 1351,0:POKE 1352,0
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309 REM 1797,0:POKE 1
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Software Reviews

FLOYD OF THE JUNGLE

MICROPROSE 32K CASS.

1/4 PLAYERS 32K DISK

Silly title! Still I suppose that Tarzan is copyrighted, so Floyd is as good as any. In this game you, as Floyd, have to rescue the lovely Janice by thrashing your way through the jungle which is set out like a combination of Apple Panic and Frogger. Instead of ladders you have vines to climb and instead of the assorted perils of Frogger, you have snakes, alligators, tigers, pygmies, monkeys and elephants all wandering along ready to eat or squash you. You still have the river with boats to jump on to get across. On the way to saving Janice, you can score points by capturing birds and 'punching pygmies'. Trouble is, it is hard to tell the difference between the birds, pygmies and monkeys, and the monkeys are deadly.

The biggest plus of the game is that it allows up to four players (all Floyds?) at the same time to race against each other in a bid to become the first to rescue the damsel. The screen is very colourful with snakes hissing back and forth, alligators opening and closing their mouths, monkeys swaying to and fro, etc., and Floyd actually runs with arms and legs going full pelt. Point him in the right direction with the joystick and press the fire button to watch him bound along or jump over the animals. Watch out for those poison pygmy darts on the way! Once you get the timing right for your jumps, the game is not too difficult and as you have unlimited Floyds, it doesn't matter too much if you are eaten—you only return to the beginning. Screen two is harder, obviously, and screen three has the river to cross and plenty of elephants. Playing solo, I quickly got up to screen three and once I had mastered riding the elephants, managed to rescue Janice. I eagerly looked forward to the super challenges of screen four only to find that the game ended. You have to start at a higher level to get to screens four and five.

To master this game is fairly easy, but then it is not really a one player game. All the fun comes in racing against the other Floyds and picking up bonus birds and pygmies whilst watching your opponents being eaten by alligators! At times, the game can get quite hilarious and you won't know whether to concentrate on your own Floyd or watch the others in peril.

If you are a dedicated gamer and welcome the big challenge, don't bother with Floyd of the Jungle, but if you want some FUN, particularly if you know someone with two more joysticks, this could be just the game. I imagine that the kids will love it.

CHOPPER RESCUE

MICROPROSE 32K CASS.

1/4 PLAYERS 32K DISK

Not really what I imagined it to be, I had expected this to be another version of Choplifter but it is an underground labyrinth type game where you have to fly your chopper and rescue people from ledges and various nooks and crannies. Of course there are plenty of things to stop you — these games are never THAT easy.

I was quite taken with Chopper Rescue, it is PLAYABLE yet still has quite a lot of challenge. Not being the world's best arcade player, I get fed up with games that kill me off every 5 seconds but I found in Chopper Rescue that you at least had a chance when danger lurked. There are plenty of obstacles to your rescue mission. Laser guns are stationed on the walls, bomb pots shoot spinning explosive upwards, whilst force fields bar your way. All of these can be destroyed with either your missiles or bombs. There are also several pulsating pods that either supply energy to the enemy lasers or act as hatching plants for the 'mutants' that come for you every so often. Didn't I mention them? Oh well, you can kill them off. Best idea

Character Designer

RAIDUS

is to destroy everything in sight, that way you are safer and get more points. After rescuing ten hostages, you go on to a more difficult labyrinth with more obstacles and pods. Some of these are very difficult to get to, but you can release your bombs with forward momentum and sort of "throw" them into the narrow channels.

A word about the confusion over the 'energy pods'. The problem is that with these MicroProse games, the documentation is pretty basic to say the least. In fact, considering the price (normal Atari Prices), it is downright poor. I know that it is the game that counts, and this one is very good, but if we have to continue paying these high prices, then would it not be asking too much to have some extensive and well presented literature for our money? **PRO**

RAIDUS

MICROPROSE

PYRAMID SOFTWARE

16K CASS.

1 PLAYER

32K DISK

The latest space action game Raidus has you in an attack fighter within the Mother Ship high above one of the planets of the Cronian Empire. Miles below on the planet surface is one of the Evil Overlords — mechanical devices that act as security posts for the Cronians. You must leave the Mother Ship, fly down to the planet surface whilst avoiding the enemy patrols and space boulders, find and destroy the Evil Overlord and return to the Mother Ship to continue your mission on another planet.

The action is spread over dozens of screens, but the game does not scroll, rather it flips from screen to screen but does give the impression of continuous movement. The graphics of the Mother Ship and the cities on the planet surface are very good but out in space are just hundreds of stars, too many to make it look realistic. What's it like to play? **HARD!** In fact I found it so hard that I lost the majority of my craft just getting out of the Mother Ship! Control is by the joystick, but once you move in

Software Reviews

one direction you carry on moving and can go careering from screen to screen until you inevitably crash into something. The only way to slow down is by applying thrust in the opposite direction but it is not easy. The effect is rather like trying to drive a car on an ice rink. What it is like at the more difficult levels, I dread to think. During the time I had this game to review, I didn't even get down to the planet's surface and there are 216 levels in all. Yes, 216! What's more, each level can only be accessed by a password gained by completing the previous level.

If you want a real challenge, then this game appears ideal. It easily lives up to its claim of being 'a game you will not easily master' and with 216 levels of play you will have to spend many hours (weeks?) developing your skills before you can claim to have completed your mission.

HELLGAT ACE

MICROPROSE

32K CASS.

1/2 PLAYERS

48K DISK

Go and get the seat belt from the car and strap yourself into the chair. You'll need it for this World War II flying simulation! The screen gives you the view from the cockpit of your aircraft as you battle against the Japanese in 14 different scenarios based on actual events in the battles of the Pacific in World War II. The graphics are simple but the overall effect is quite stunning as you bank, dive, climb or loop the loop to get the enemy in your gunights. There are even instructions on how to do Immelmann turns and Split S's! The sun lies just above the horizon and as you turn away the sky darkens to give you an idea of your heading. You can do all of the manoeuvres expected and if you get into trouble you can try to ditch or bail out. For the more experienced there are night missions.

This is a great simulation giving a real feel of action but I have never flown a light aircraft and

First Steps

DO NOT KNOW HOW accurate it is. Any RAP flying officers out there who are into computer games? Is this as realistic as it seems? I thought it was great.

LEGIONNAIRE

AWALON HILL

128K/CASS.

1 PLAYER

Legionnaire is the latest offering from Chris Crawford, the man who designed Eastern Front which was a major step forward in micro-computer gaming. Legionnaire is better than Eastern Front. Much better. It has all of the challenge (unless you are a very experienced War-gamer), better looking graphics, multiple choices of scenario and above all, the battles happen in real time. Still no game save feature but with all the options available you can choose a fairly short campaign.

For those not familiar with the style of Eastern Front, the structure of Legionnaire is of a large map of the terrain on which your battles will take place. The map scrolls in any direction and is perhaps 12 times larger than your television screen so that battles are taking place outside your immediate vision. You command Caesar and up to 9 other Legions in battles against barbarian tribes that outnumber you two to one. By giving your troops orders of movement you can use the terrain to best advantage to attack, outflank or surround your enemy. Everything is programmed in — slower movement uphill, fatigue and morale of the troops, strength, fighting ability, losses in combat — all are taken care of by the computer and the current state of any unit can be seen by positioning the cursor over a unit and pressing the fire button. There is a 30 page manual which gives you historical background, details of the various legions of your command and details of the barbarian tribes. You need to get some idea of the capabilities of your units beforehand because as soon as you press the

Start button the barbarians start advancing. Remember this is in real time and requires some quick thinking.

Legionnaire is an excellent demonstration of the capabilities of your Atari, its presentation will make owners of other computers wonder why they didn't buy the best. Atari themselves did not want this in their catalogue which shows exactly why they are not making the headway they should be with the best computer on the market. All credit to Avalon Hill, although they were not taking much of a gamble, for Legionnaire is a sure fire success. Only one criticism and that is the lack of credit to Chris Crawford in the packaging. His name appears only in small type as Game Designer and Avalon Hill ought to realise that in the Atari world the name of Chris Crawford is now synonymous with that of Scott Adams.

Software for review kindly supplied by Calisto Computers of Birmingham and Avalon Hill Games of London.

THE PAGE 6 AWARDS

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Master Directory

Colin Friston

As an extension to the Disk Directory in Issue 2, I now present a Master Directory which will give you a print-out of all programs on your disks in alphabetical order.

The program will request the insertion of all your disks, one after another and store the contents in two strings, L1\$ and L2\$. These are then sorted into alphabetical order and printed out. The program can accept up to 300 entries and has the facility in lines 1000 on to exclude often recurring items such as DOS, DUP SYS etc.

```

1 REM *****
2 REM # MASTER DIRECTORY #
3 REM # BY #
4 REM # COLIN FRISTON #
5 REM *****
6 REM
7 DIM L1$(5000),L2$(5000),T$(20),A$(20)
8 DISK$(10),DATE$(40),SPACES$(20)
9 GRAPHICS 8:POKE 712,40:POKE 718,40:
10 "MASTER DIRECTORY":? :L1=L2=L$
11
12 ? "INPUT DATE ":INPUT DATE$
13 FOR T=1 TO (40-LEN(DATE$))/2:SPACES
(T,T)= "NEXT T
14 ? " "
15 ? " "
16 ? " "
17 ? " "
18 ? " "
19 ? " "
20 L2=L2$+D$
21 OPEN #1,"A,B,"D,X,X"
22 INPUT #1,A$:DOSUB 1000:IF A$=" N"
THEN 33
23 L1=L1$+A$,L2=L1,L1=L1$+A$,L2=L1+2$
L1+2$)
24 L2=L2$+D$
25 L2=L2$+L2$+L2,L2=L2$+L2$+L2$+L2$+L2$+L2$
L2+2$)
26 TRAP #0: ? " "
27 "INSERT DISK WHEN B
USY LIGHT GOES OUT. TYPE (STO
F) TO STOP."
28 CLOSE #1: ? "DISK NUMBER ":INPUT
DISK$:IF DISK$="STOP" THEN 30
29 H$=L1/20:H$=L2/20:TRAP #0
30 LPRINT #LPRINT " MASTER
DIRECTORY "
31 ? " "
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418 H$=L1:FOR LOOP1=1 TO L1-20 STEP 2
#
419 FOR J2=1 TO H$-20 STEP 20
420 IF L2$(J1,J1+20) < L2$(J2+20,J2+20)
THEN T=L2$(J1+20,J1+20):L2$(J1+20,J1+20)=
L2$(J2+20,J2+20):L2$(J2+20,J2+20)=T
421 NEXT J2:POSITION 15,7: ? " ":INT(L
OOP1+40/20) " DONE" : H$=H$+20:NEXT
LOOP1
422 H$=L2:FOR LOOP2=1 TO L2-20 STEP 2
#
423 FOR J2=1 TO H$-20 STEP 20
424 IF L2$(J2,J2+20) < L2$(J2+20,J2+20)
THEN T=L2$(J2+20,J2+20):L2$(J2+20,J2+20)=
L2$(J2+20,J2+20):L2$(J2+20,J2+20)=T
425 NEXT J2:POSITION 15,7: ? " ":INT(L
OOP2+40/20) " DONE" : H$=H$+20
#NEXT LOOP2
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```

WHOOPI!... ERROR 17

Like all the quality magazines, we need a blunders corner sometimes which will call ERROR 17 (look it up in your Manual).

Issue 2 contained the following which should be amended.

Four in A Row — line 1000 should be deleted.

In the article GTIA modes, the word 'line' in the third paragraph should read 'true'.

First Steps

Many beginners do not understand REM statements and believe they are responsible for program errors. They are in a way — if you don't bother to read them! A REM statement actually has no effect at all on the running of a program, it is there to help you understand what is going on or to give you help in typing in the listing. If you wish you can leave out all REM statements thus saving a lot of typing, but be careful. Sometimes a program branches to a line containing a REM statement and if you did not type that line you will get ERROR 53. The solution is to change the line number of the GOTO or GOSUB so that it refers to the line immediately following the line that you didn't type. Leaving out REMs will save you some typing but it is very important that you read all REMs before you type in a program. Quite often they give you clues on how to type in the following lines and if you don't work it out you will end up with all sorts of problems. Take TINY TEXT in Issue 2 for example. Line 580 gives you clues for typing the next few lines. The funny little symbol that you can't find in your Manual is a peculiarity of the printer. It cannot reproduce the right pointed arrow which you get by pressing ESC,TAB and so line 580 gives you a clue by saying that the symbol represents ESC,TAB. Try pressing ESC followed by TAB to see the 'arrow' referred to. Remember, REM statements are there to help you, not the program (they actually slow the program down). Make sure you read them before typing any lines referred to.

Did you know that you can stop a listing from scrolling up the screen by pressing CTRL and 1 at the same time? Pressing them again will start the listing up again. Even the experts took a long time to find that out!

The Atari has superb editing facilities but few people seem to use them properly. Sit down awhile and look through Chapter 3 of the Reference Manual and play around with the screen. If you use editing properly you will save a lot of time. Suppose for example you have to type the following lines

VICTAGRAPH - PLOT WINDOW

The above photographs show VICTAGRAPH PLOT WINDOW and demonstrates PLOT on ATARI 400, 800 & 1000. 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 6.3 in each corner and a fully adjustable window to 325,350... working area 17" x 12" total size 17" x 12" approx.

Total Price: £12.00. Cheaper Price: VICTA CERAMICS

VICTA CERAMICS (pvt)
64 BOW STREET, RADELEY, STAFFS, MK10 2BT

U.K. ONLY

```
10 IF A=6 THEN GOTO 100
20 IF A=7 THEN GOTO 200
```

Instead of typing both lines, type in line 10 and then use the CTRL/UP ARROW keys to put the cursor over the 1 of 10 and type 2. Move the cursor right with the CTRL/RIGHT ARROW keys until it is over the 6 and type 7. Move the cursor right again to the 1 of 100 and type 2. Now press RETURN. All you will see is line 20, but now list the program. Presto! Two lines for the price of one (almost). Use the editing facilities whenever you see lines that are similar to lines you have already typed and you will save a lot of time. Don't forget that you can insert or delete characters in a line by using CTRL/INSERT or CTRL/DELETE.

Just for fun, try the following program. Put the word 'PRESS' in inverse. More about PEEKs and POKEs in future issues.

```
10 ? CHR$(126);? "PRESS SOME KEYS"
20 POKE 755,PEEK(764):GOTO 20
```


