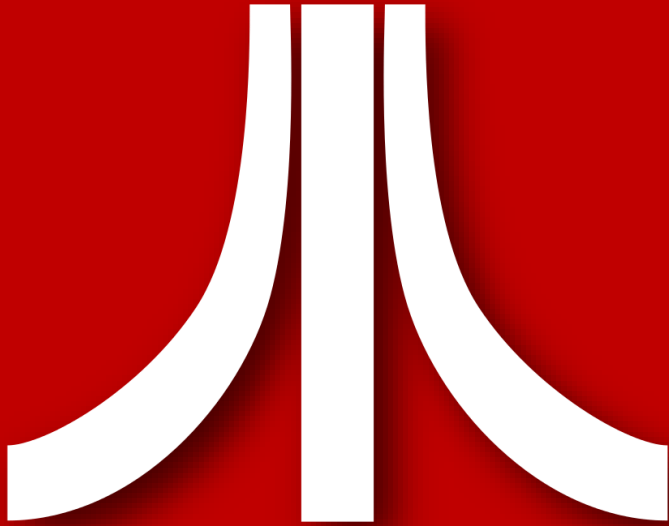


# EIGHT BIT



# ATARI



# IN THIS ISSUE!

**THE COLLECTORS GUIDE TO THE:**  
**ATARI 8-BIT RANGE**



Introduced in 1979, the Atari 8-bit range was the first home computers designed with custom co-processors giving it an edge over the competition in graphics and audio. We will have a look at arguably, one of the most desirable models. Here's your collectors guide to the Atari 800XL.

**PAGE 4**  
**THE FIRST HOME COMPUTER WITH PROPER GRAPHICS AND AUDIO, WE HAVE A LOOK AT THE ATARI 8-BIT RANGE**

**PAGE 28**  
**THE CROWDFUNDING PROJECT THAT HAS TAKEN THE ZX SPECTRUM COMMUNITY BY STORM**

**NOT READY**



**RETROPIE**  
**EMULATING THE 8 BITS**

John Kavanagh checks out RetroPie in an attempt to emulate 8-bit computers on the tiny Raspberry Pi computer.

When purchasing or just playing a well game that requires a joystick, I almost always do it on my PC. Playing on a modern computer just doesn't seem the same.

However, what if I want to play a game for the Atari 8-bit? While I have a spare Atari 8-bit computer, it's not really my thing. I don't have the time or space to store a collection of them. Emulation is a necessary evil if you can't afford the original hardware.

It can't be said that the Raspberry Pi is a modern computer, or worse, a tablet PC. It's a computer in its own right, but it's not a modern computer. It's a computer that's designed to be used in a very specific way. It's a computer that's designed to be used in a very specific way. It's a computer that's designed to be used in a very specific way.

The Raspberry Pi comes with all the software required for perfect emulation on your system.

**PAGE 32**  
**WE INVESTIGATE USING A RASPBERRY PI FOR EMULATING RETRO COMPUTERS**

**SPECTRUM NEXT**



...new ZX Spectrum is coming your way, using real hardware and 21st century enhancements. We investigate the Spectrum Next...

...the crowdfunding for the new ZX Spectrum has reached with 5,133 backers pledging £723,980. It's certainly been seen as a success but why did this new piece of hardware get the Spectrum community so excited?

...we briefly covered the Spectrum Next in issue 1 of the magazine, where we reported that it will have advanced graphics modes and 512 KB of RAM. However, thanks to a successful crowdfunding campaign, it has increased to 1024 plus a few extra enhancements. There were three main reasons why the Spectrum Next was so successful. Firstly, it is based on the hardware already used in the Spectrum, but it has a new CPU designed by Rick Dickinson. This is a work of art designed by Rick Dickinson. It's the same as the original Spectrum, but it's a work of art. It's the same as the original Spectrum, but it's a work of art. It's the same as the original Spectrum, but it's a work of art.

...WHAT IS FPGA  
 FPGA stands for Field Programmable Gate Array. It's a type of integrated circuit that can be programmed to create a wide range of logic functions. It's a type of integrated circuit that can be programmed to create a wide range of logic functions. It's a type of integrated circuit that can be programmed to create a wide range of logic functions.

...E.BANK SPARTAN

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# EDITORIAL

*Welcome to Issue 4 of Eight Bit.*

*This issue we have a look at the Atari 8-bit range, specifically the Atari 800XL. While not as popular as the Apple II and Commodore 64 in the North American market, it has a loyal following today in the US and parts of Europe.*

*I have not experienced the joys of this wondrous machine until recently, but what an experience. The Atari range wasn't popular in my part of the world, Ireland, and I knew of nobody that had one. In contrast, the Atari 2600 game console was very popular here and that what I kept comparing it to. It has all the magic and feel of the 2600 but with much better graphics and sound, plus all the enjoyment that only a computer could bring.*

*We also investigate the new crowdfunded ZX Spectrum computer, the NEXT and also emulation on the Raspberry Pi, plus all our usual columns.*

*Enjoy the magazine,  
The Eight Bit Team*

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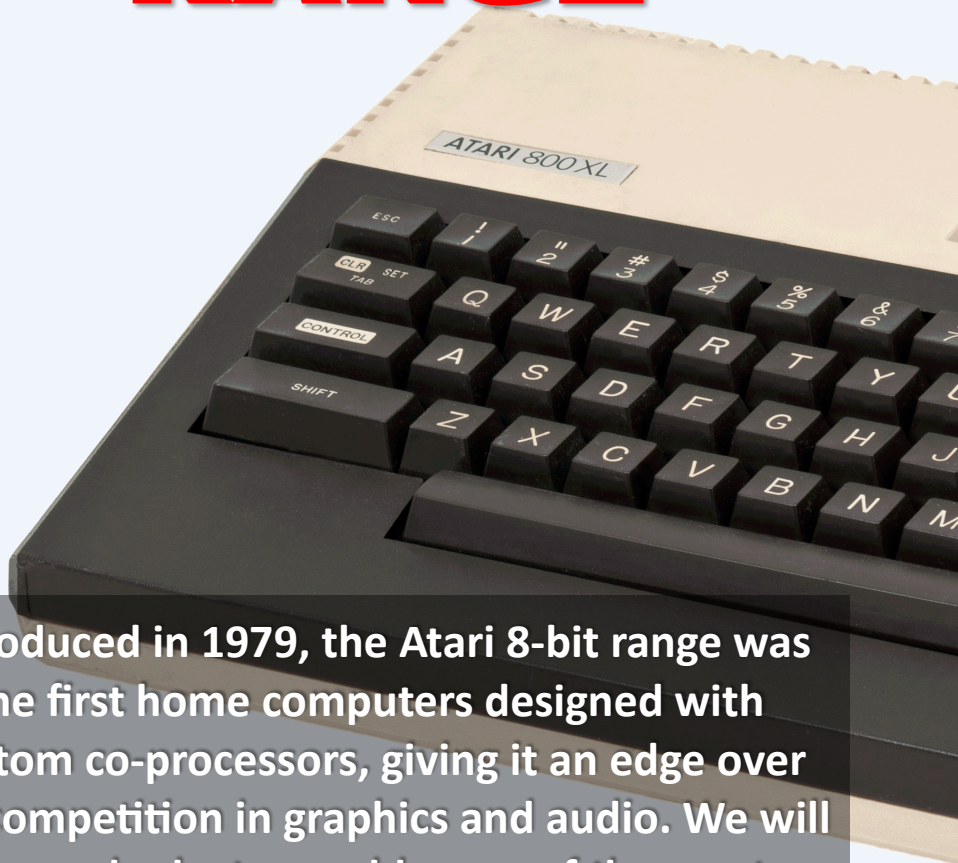
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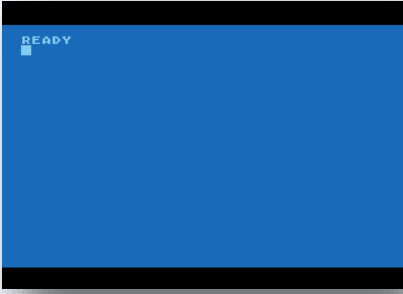
Issue 5 Coming Soon...

***THE COLLECTORS GUIDE TO THE:***

# **ATARI 8-BIT RANGE**



Introduced in 1979, the Atari 8-bit range was the first home computers designed with custom co-processors, giving it an edge over the competition in graphics and audio. We will have a look at arguably, one of the most desirable models. Here's your collectors guide to the Atari 800XL.



# ATARI



## THE COLLECTORS GUIDE TO THE: ATARI 800XL

Having a three year head start over the Commodore 64, the Atari 8-bit range was the first home computer to have dedicated co-processors and hardware sprites. Although only managing to sell a little over 2.5 million computers worldwide, the range had a long lifespan into the early 90's and an active support base that's still going strong today.

The original 400 and 800 models, was released in 1979 . Both came in cheaper than the Apple II but more expensive than the Commodore VIC-20, the 400 model was \$200 dearer and the 800 a whopping \$700. Although superior to the Apple II and VIC-20 it didn't capture the sales Atari was hoping for. One of the main reasons was due to production costs. To meet FCC (Federal Communications Commission) regulations the computers were completely enclosed in strong cast aluminium to avoid signal leakage. This drove up production costs significantly. Apple and Commodore avoided this by not having an RF modulator installed in the computer and therefore no television circuitry for the FCC to worry about. The Atari been built like a tank, the two cartridge slots and a modular design also added to the cost.

By the time the cheaper XL range came along in 1983, the impressive and cheaper Commodore 64 was already released and was starting to develop a strong foothold in the market. Like the earlier 400 and 800, the Atari XL remained an underdog, but just like the 400 and 800m a much loved one. The underdog



THE ORIGINAL ATARI 800 HAD USER-ACCESSIBLE EXPANSION SLOTS FOR RAM AND ROM CARDS AS WELL AS LEFT AND RIGHT CARTRIDGE PORTS.



ATARI BUILT IN SELF TEST.

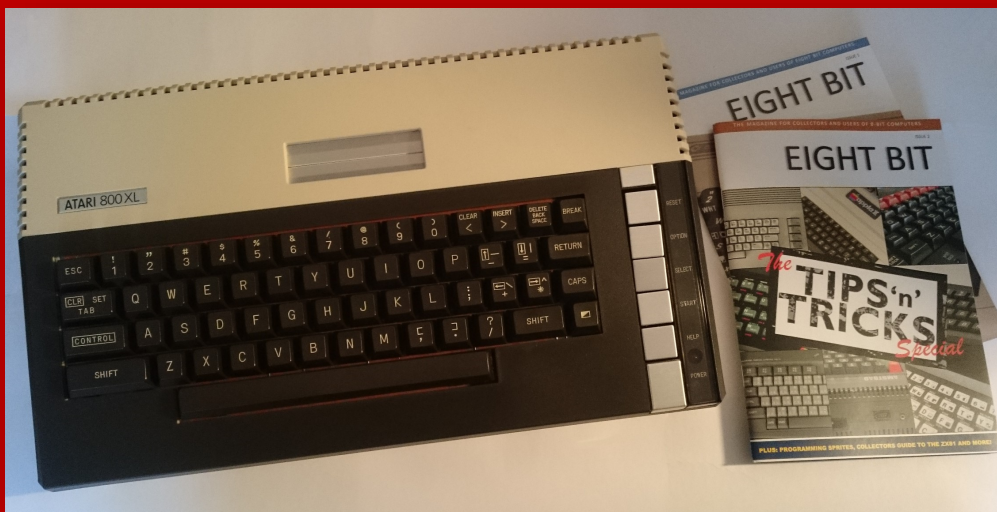
theme continued with the even cheaper XE range in 1985 until its demise in 1992. Of those much loved underdogs, the most popular was the 800XL which is the one we'll look at today.

### INTRODUCING THE 800XL

Advertised on a local website with the statement that the condition was unknown, I took a chance and paid up. What I received a few days later was a well kept, mint condition Atari 800XL in it's original packaging but with an Atari 2600 PSU! Thanks to eBay, but another few days of waiting I was ready to play.

First impressions were quite good. The computer was well put together and aesthetically pleasing. The cream and brown colours are very retro but in contrast to earlier models, it looks sleek and is much more interesting than later XE design, which has similar styling to the Atari ST. The silver buttons at the right side never seem to line up correctly. Even in any photo I've seen online or in magazines. Apart from that, the computer is a work of art.

Cleverly, the top button, RESET, has a harder press than the other buttons. The other four buttons are OPTION, SELECT, START and HELP. Most of these buttons are required for use in games. SELECT to select level difficult or number of players, START to, as expected, to start the game. OPTION is pressed on starting the computer to load a disk game without



THE ATARI 800XL

## Jay Miner

The reason the Atari 8-bit was ahead of its time was due to its graphical and audio co-processors. All of which took stress off of the CPU. The man who leads the team to design these chips was Jay Miner.

Receiving a Bachelor of Science in Electrical Engineering and Computer Sciences at the University of California, Berkeley, he went on to work at Atari in the late 1970s. He designed the TIA (Television Interface Adaptor) for the Atari VCS 2600 which was a success for Atari, selling over 30 million units worldwide. He then went on to direct the architecture of the Atari 400 and 800 computers as well as its custom graphics chips, the ANTIC and CTIA / GTIA.

To compete with Apple, Miner wanted to go on and create an advanced Motorola 68000 based computer but Atari decided that they didn't need another computer. When they decided not to pay him and his engineers their bonuses, he quit.

He then went on to create the first microprocessor-based cardiac pacemaker for Zimast before getting involved in the Amiga computer, designing its custom graphic chips which earned him the title "The father of the Amiga". Although, a Commodore product, the Amiga was seen by many as the spiritual successor to the Atari 8-bit range due to the way it was designed. Like the Atari, Miner, took as much load as possible off of the main CPU, in this case, the Motorola 68000 resulting in spectacular performance over other computers of the time.



## THE COLLECTORS GUIDE TO THE: ATARI 800XL

having BASIC present in memory. Failure to press this button would stop many games from loading. Holding down OPTION with no disk in the drive or by typing BYE into BASIC will start the built-in self test program. This program allows you to test memory, keyboard, audio and video. A handy function, especially considering the age of the hardware, where anything to help diagnose a problem is much welcomed.

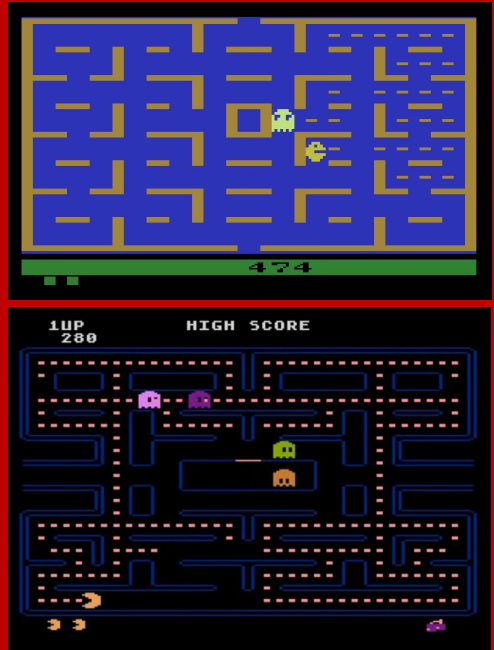
Looking at the computer as a whole, shows quality, from the weight, to the plastics and that glorious keyboard. Measuring just over 37 cm by 21 cm, the front is just 3.5 cm high making it easy to use the desk for palm rests. It's 6cm high at the rear which is a perfect slant for the keyboard. Above the keyboard is the cartridge slot, hidden under a silver coloured flaps. The switch for turning the computer on is at the rear but easily accessible. Turning on the computer reveals a lighter blue on blue READY prompt, nothing else.

The keyboard itself, feels solid and is nice to type on. It gives the feel of quality. However I was told that there were different versions of keyboards fitted to the 800XL, some not so good. I can report that the one I'm using feels excellent, maybe just slightly stiff by today standards but nonetheless, a joy to type on.

### BASIC

Originally supplied as a cartridge on the early models, BASIC was built into the system on the XL and XE range.

Before the launch of the 400 and 800, Atari originally intended to use Microsoft BASIC. To add better support for hardware features they wanted to expand the language. However, fitting it all into 8K of ROM storage proved too difficult. Atari created their own version of BASIC instead. Overall there was three versions, the best been Rev V. This is what is found on my 800xl but it s not on all, some have the buggy Rev B. Sadly, despite the



COMPARING PAC-MAN ON THE ATARI 2600 (TOP SCREEN) TO THE ATARI 800XL (BOTTOM SCREEN) TRULY HIGHLIGHT THE DIFFERENCE IN GRAPHIC ABILITY BETWEEN THE TWO SYSTEMS.

increased CPU performance over most other 8-bits at the time, for example, the Commodore 64 and Apple II, Atari BASIC was extremely slow. This was highlighted back in Issue 2 with our Prime Number Generator, where the Atari underperformed compared to other systems. There were two reasons for this, the first is that all numbers were stored as floating point numbers and the second is that when a GOTO command is used Atari BASIC has to search through the program code to look for that specific line number. Another limitation is that commands can only be typed in upper case.

However, unlike the BASIC built into the Commodore 64, the Atari had graphics and sound commands. It also has a neat feature where the colours cycle from one hue to another when the computer was not used for a while, which functioned like a old style screensaver.



There are of course better versions of BASIC available, such as TURBO BASIC XL which is said to be up to 4 times faster. When we ran our Prime Number Generator program from Issue 2 on TURBO BASIC XL we got a result of 44.5 seconds compared to 1 minute and 37.9 seconds using Atari BASIC. Considering that the 1MHz Commodore 64 does it in 1 and 16.3 seconds and a 2 MHz BBC Micro in 37.2 seconds, it can be said that TURBO BASIC XL is as efficient as the BASIC on these systems. There is also a compiler version but that turns a BASIC program into machine code. We will investigate these in a future issue.

### **GRAPHICAL ABILITIES**

There are many graphics modes available, from 40 x 24 pixels in 4 colours up to 320 x 192 pixels in 1 colour with 2 luminances. Most modes are quite blocky and are limited in colour. The best graphic modes is either 16 colours at 80 x 192 or 4 colours at 160 x 192. Text modes goes up to 40 characters wide by 24.

While the screen modes mentioned above does compare favourable against other home computers of the late 70's, they look a little underpowered compared to those released in the 1980's. However, the Atari has three tricks up its sleeves. Firstly, it has the ability to display multiple graphic modes on screen at the same time without taxing the CPU, and secondly, it has a colour palette of 256 colours. Lastly, it has Player / Missiles.

### **PLAYER / MISSILES**

The Atari also has hardware sprites, although for the Atari 8-bit range they're called Player / Missile Graphics (PMG). There are 4 players and each has 1 missile associated with it. Each player can be one colour, different from each other and independent of the other colours in the playfield. You can make each player double or quadruple width and double height if



THE BOX THE ATARI WAS PACKAGED IN SPORTS THE COLOUR SPECTRUM THAT WAS ASSOCIATED WITH ATARI PRODUCTS FROM THE EARLY 1980'S.

required. You can also set the player behind or in front of the playing field. The missiles, themselves, are two bits wide and can be moved independently of the player but they must be the same colour.

While each player must be 8 pixels wide, it can be any height, up to 128 pixels high in double-line resolution (where each byte occupies two scan lines on the screen) or 256 pixels in single-line resolution. Since the maximum vertical resolution is 192 pixels, the player (sprite) can be taller than what can appear on screen. Assisted with hardware scrolling and collision detection resulted in many fast paced, smooth scrolling games.

### **AUDIO**

When you think of sound on an Atari, you probably think of the Atari VCS2600 with its alluring but basic arcade type sound effects. While not as advanced as the SID chip in the Commodore 64, the Atari's POKEY sound chip is more of the same but better. It boasted a four square wave sound channels, with or without controlled distortion. It had only an octave range of only three and a half, but what it did have, suited arcade type games perfectly.

**THE COLLECTORS GUIDE TO THE:  
ATARI 800XL**

**GRAPHICS IN BASIC**

There are 16 graphics modes available in Atari BASIC, numbered 0 to 15. Some are text only modes while the majority are bitmap modes. You can change to different graphic modes by using the GRAPHICS command, for example:

**GRAPHICS 5**

You can see a list of graphics modes at the bottom of the next page. Some graphic modes have only 1 colour but with 2 luminances. For example, blue and a lighter blue. Refer to the colour palette chart on the next page. To get rid of the text window at the bottom of the screen that appear in some modes, add 16 to the graphics mode, for example **GRAPHICS 5+16**

**SETCOLOR no, hue, lum**

No is the colour number, from 0 to 4. Use colour 1 to change the text, 2 for the background and 4 for the border colour. Hue and luminance can

be from 0 to 15.

**COLOR no**

Used to select which colour to use with the PLOT and DRAWTO commands.

**PLOT x,y**

In bitmap mode it plots a dot at the x and y coordinates, starting at the top left of the screen. In text mode it plot characters to the screen instead of dots. To plot the character 'A' to screen, you would use **COLOR 65:PLOT 10,5**. Use **COLOR 66** for 'B' and so on.

**DRAWTO x,y**

This command draws lines on the screen from one point to another. E.g. **PLOT 5,5:DRAWTO 20,5** draws a horizontal line from bitmap location 5,5 to 20,5. To draw a vertical line from 20,5 to 20,0 type **DRAWTO 20,0**

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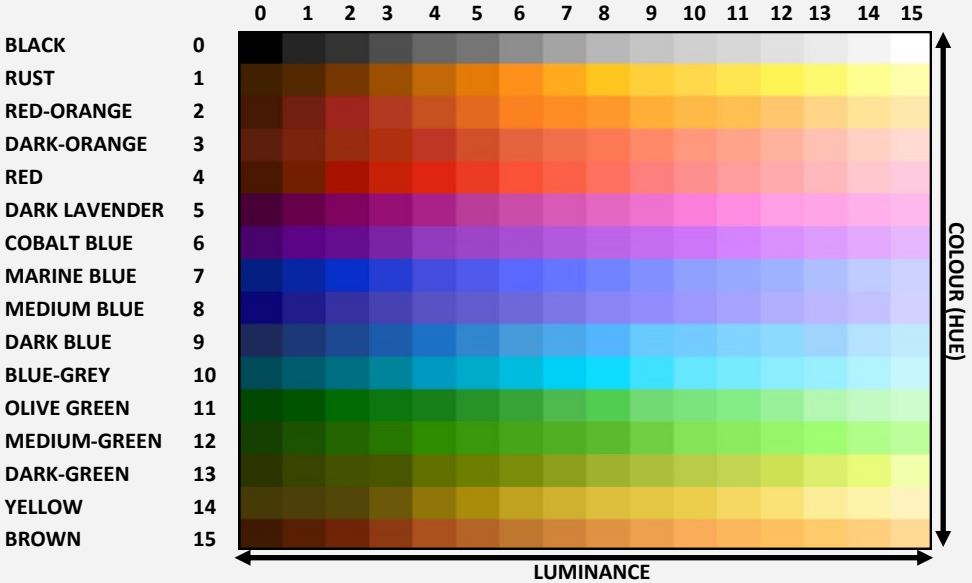
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in Canada!**



**COLOUR PALETTE OF THE ATARI 800XL**



**ATARI 800XL GRAPHIC MODES**

MODE	TYPE	RESOLUTION	COLOURS	MEMORY USED	NOTE
0	Text	40 x 24	2	992 Bytes	(1 Colour, 2 Luminances)
1	Text	20 x 24	5	672 Bytes	
2	Text	20 x 12	5	420 Bytes	
3	Bitmap	40 x 24	4	432 Bytes	
4	Bitmap	80 x 48	2	696 Bytes	
5	Bitmap	80 x 48	4	1176 Bytes	
6	Bitmap	160 x 96	2	2184 Bytes	
7	Bitmap	160 x 96	4	8138 Bytes	
8	Bitmap	320 x 192	2	8138 Bytes	(1 Colour, 2 Luminances)
9	Bitmap GTIA	80 x 192	16	8138 Bytes	(1 Colour, 16 Luminances)
10	Bitmap GTIA	80 x 192	9	8138 Bytes	Modes 9 to 11 were not
11	Bitmap GTIA	80 x 192	16	8138 Bytes	available on CTIA graphics.
12	Text	40 x 24	5	1152 Bytes	Modes 12 to 15 were not
13	Text	40 x 12	5	660 Bytes	accessible within BASIC on
14	Bitmap	160x192	2	4296 Bytes	older 400 and 800 models,
15	Bitmap	160x192	4	8138 Bytes	even with a GTIA upgrade.



**ATARI 400**  
**YEAR: 1979**      **ORIGINAL PRICE: US\$ 549.95**

The 400 has a splash-proof pressure sensitive membrane keyboard. It booted up in to a notepad program. To use BASIC, a cartridge had to be inserted. Early models used a CTIA chip for graphics instead of the better GTIA chip which meant that it had fewer graphics modes and a colour palette of 128 colours. Originally supplied with 8K of RAM, later models had 16K.



**ATARI 800**  
**YEAR: 1979**      **ORIGINAL PRICE: US\$ 999**

THE 800 has 4 joystick ports like the 400 but with a much better keyboard and two cartridge slots instead of one. The right slot was intended to supplement those that were plugged into the left slot. However, this wasn't popular and all later models would use only one slot. Originally sold with 8K of RAM with a 32 KB RAM cart, later models used 48K. It also had RGB output.

# THE ATARI 8-



**ATARI 1200XL**  
**YEAR: 1982**      **ORIGINAL PRICE: US\$ 899**

The first of the XL, the 1200XL was released only in the US and lasted a few months. The problem, being backwards incompatible with earlier models due to a upgraded ROM chip.

It came with the GTIA video chip as standard which meant a 256 colour palette and 3 extra graphics modes. It shipped with 48K of RAM.



**ATARI 600XL**  
**YEAR: 1983**      **ORIGINAL PRICE: US\$ 199**

The following two XL computers solved the compatibility problem of the 1200XL with only a handful of software failing to work on old models. The 600XL came with 16K of RAM and an improved 24K ROM chip. It lacks a composite video port unlike it's bigger brother, the 800XL. All the XL and XE range has two joystick ports instead of the four as found on the original Atari 400 and 800.



**ATARI 800XL**

**YEAR: 1983**

**ORIGINAL PRICE: US\$ 299**

The 800XL is slightly bigger than the 600XL and came with 64K of RAM and composite video output. It also has an expansion slot unlike earlier models. The 800XL is a very popular choice for collectors as it works with the majority of software and has a very nice design. The keyboard of the XL range is also the best of the lot. BASIC is built in and is available on start up.



**ATARI 65XE / 800XE**

**YEAR: 1985**

**ORIGINAL PRICE: US\$ 199.95**

Atari's new boss, Jack Tramiel cancelled the XL range to make the XE range which were cheaper to produce. The 65XE has 64K of RAM. It was marketed as the 800XE in Germany and other Eastern European countries. All 800XE models contained the ECI port (Enhanced Cartridge Interface) which replaced the PBI (Parallel Bus Interface). Only later models of the 65XE had a ECI port with earlier models having neither.

# BIT RANGE



**ATARI 130XE**

**YEAR: 1985**

**ORIGINAL PRICE: US\$ 299.95**

The 130XE has 128K of RAM and both XE models as well as the XEGS had the FREDDIE management chip which allowed for the CPU and ANTIC chip to independently access RAM. All 130XE models have the Enhanced Cartridge Interface. The video output of the XE ranges isn't considered as good as the XL range, the same can be said about the keyboard which feels cheap in comparison to the XL.



**ATARI XEGS**

**YEAR: 1987**

**ORIGINAL PRICE: US\$ 199**

Marketed as a games console but can be used as complete computer. It came with 64K of RAM as standard with the BASIC interpreter built in to the ROM chip as well as a game of Missile Command. It was fully compatible with the XE range. Packaged with a light gun and two games. The XEGS is highly desirable among collectors.

## THE COLLECTORS GUIDE TO THE: ATARI 800XL

In fact, the sound chip was used in multiple arcade machines of the time period, such as Centipede and Missile Command.

There are four 8-bit channels, this can be combined into 1 16-bit and 2 8-bits channels, or just two 16 bit channels. There was also a noise channel.

### THE CPU

The original models used an MOS 6502B running at 1.79 MHz while later models used a custom version with an extra HALT line. Along with Player / Missiles and other co-processors, games tend to be, in true Atari fashion, quite nippy. The majority of games responded fast and effortlessly which enhances the enjoyment of those games.

### COMPATIBILITY

Regarding compatibility, all NTSC games will run on PAL systems with varying degree of colour change but not the other way around. Some will work, some won't.

For the most part, all the Atari 8-bit range are compatible with each other except for the poor compatibility of the 1200XL. Most software for the original 400 and 800 will work fine on the later XL and XE range, apart from a few business software and games. Also, as mentioned, sometimes the OPTION key needs to be held down to disable BASIC, especially for older games and other software.

There's also the issue that the older 400 and 800 computers had four joystick ports instead of two, making four player games impossible to play without modifications.

### LOADING SOFTWARE

There were two options for loading software into the Atari XE. The most popular method was to use a disk drive. The Atari 1050 was the



WHILE IT USED SIMILAR HARDWARE, THE ATARI 5200 GAME CONSOLE WAS NOT COMPATIBLE WITH THE ATARI 8-BIT COMPUTERS. HOWEVER THE GAMES LOOKED AND PLAYED ALMOST IDENTICALLY.

replacement for the Atari 810 disk drive, which was dual-density 5.25 inch drives allowing 127K to be stored on the disk. This was an improvement over the older 810 drive which could only store 88K on a 5.25-inch disk. Up to four disk drives could be daisy-chained together using the Atari's custom SIO bus.

The Atari 1010 cassette program recorder was more popular in Europe. Uniquely, it has a dual track system where data could be loading while playing an audio track at the same time. This was used in educational software to give user instructions while a program loads.

As expected, collecting game cartridges for the system is a hobby of some owners. Many cartridges are extremely rare, making the find that much more enjoyable.

However, if you just want to load software, the most popular way is to use a SD2SIO device, which works similar to the devices mentioned for other computers in previous issues on Eight Bit magazine, where data is loaded from a SD card.



SD2SIO DEVICE

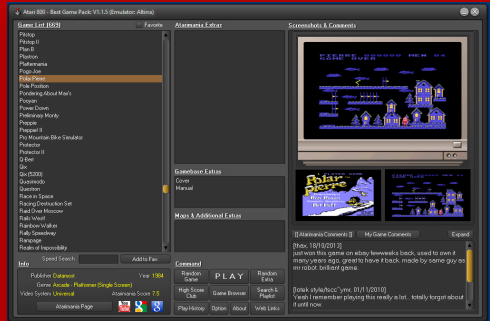
## OVERALL

The Atari 800XL is an enjoyable computer to have in your collection. Well built and certainly eye-catching. The majority of games tend to look more like arcade games of the late 70's / early 80's but that's no bad thing. Just don't expect to see many games from the late 80's / early 90's on the system. Those later games tended to appear on the 16-bit Atari ST instead.

As previously mentioned, the games tend to be fast-paced arcade games for the most part, apart from the obvious games like the Ultima series. For those who are more familiar with the Atari 2600 game console, it has that feel, visually and auditory but much, much better. To get an understanding of the games for the system, check out the Atari Best Game Pack: <http://atari800.tistory.com/category/Download>



<http://atari800.tistory.com/category/Download>



### THE ATARI BEST GAME PACK

While the 400 / 800 are desirable collectors items, you'll have more fun with the later XL and XE range due to the extra memory. Since receiving the 800XL I have been bitten by the Atari bug. The desire to collect games and peripherals are high and gaming on the system hasn't stopped as many of its games are still enjoyable today.

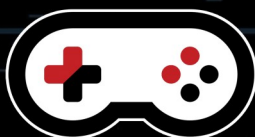


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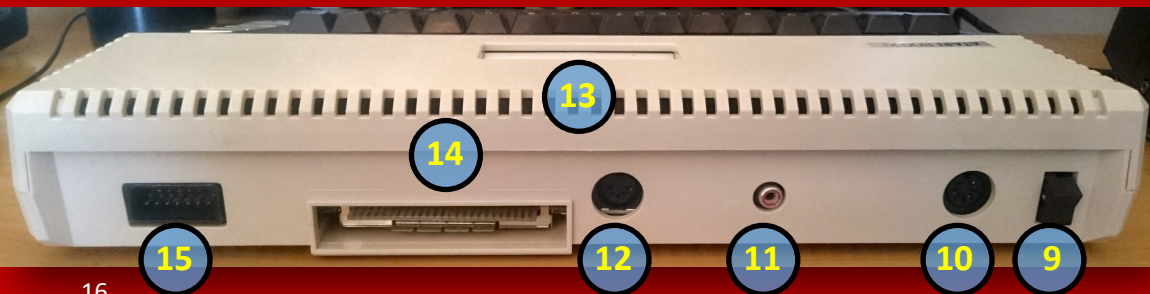
It will definitely cause you Max Payne if you miss out.



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## INSIDE THE ATARI 800XL

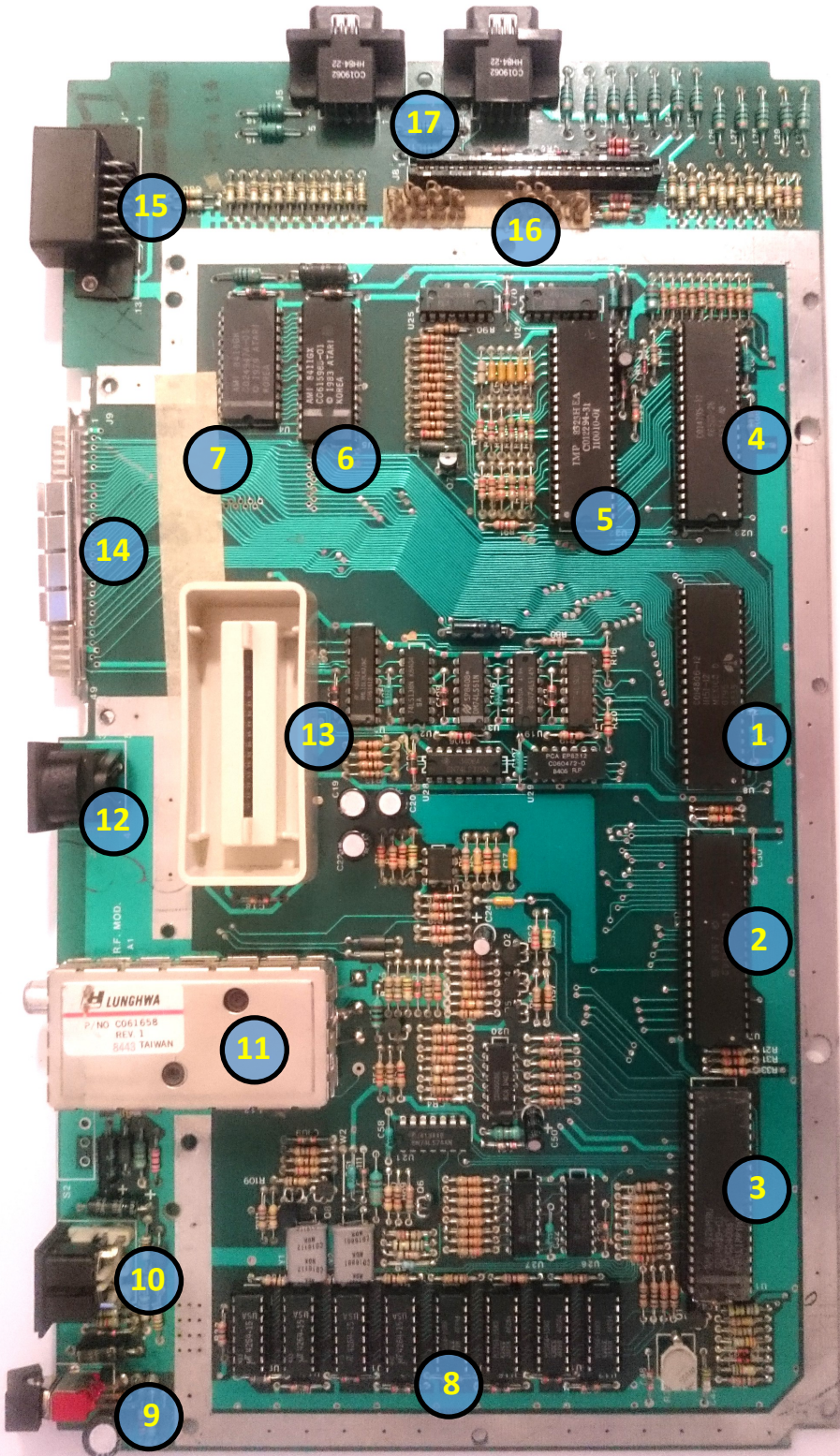
1. MOS Technologies 6502C CPU @ 1.79MHz NTSC and 1.77MHz PAL. The 6502C was a MOS 6502B with an extra HALT line.
2. ANTIC (Alphanumeric Television Interface Controller) Co-Processor, in this case the PAL version, is dedicated to generating the playfield computer graphics which is then passed on to the GTIA chip.
3. The GTIA (Graphics Television Interface Adaptor) takes the playfield graphics from the ANTIC chip and adds colour as well as Player / Missile graphics.
4. The PIA (Peripheral Interface Adapter) is used for the joystick controls.
5. The POKEY is a 4 channel sound chip capable of producing square waves on 4 channels including noise and distortion effects. It has an octave range of 2.5.
6. 16K Atari Operation System ROM. The older Atari 400 and 800 had a 10K ROM. The newer ROM fixed several problems and added support for on-board BASIC and PBI (Parallel Bus Interface).
7. 8K BASIC ROM chip, this is a REV C version, unusual as most REV C models also have the FREDDIE chip, unlike the model shown here. The FREDDIE chip is a RAM address multiplexer. It was created to cut down costs and to enhance CPI and ANTIC memory access. If it were present, it would be located just above the ANTIC IC.
8. The RAM (Random Access Memory) is made up of eight 8K RAM chips, making 64K of RAM available.
9. Power switch
10. Power input is with a 7 pin DIN socket PSU. Input is multiple 5 volts on pins 1, 4 and 6. The power supply is rated at 7.5 Amps.
11. RF video output for use with a TV. Some versions had a switch to select the output channel.
12. Monitor output via 5 pin DIN socket. Can be used with a television by using custom composite video cable. S-Video is also possible if you are handy with a soldering iron.
13. Cartridge slot for cartridge based games. Originally games came on 8K and 16K carts, but later carts were 64K and 128K in size.
14. The Parallel Bus Interface provides direct access to the CPU. It's a 50 pin edge connector. The earlier 400 and 800 didn't have this, instead relying on internal expansion.
15. SIO (Serial Input/Output) is a proprietary peripheral bus that allows multiple devices to be connected to the computer such as printers, floppy drives, tape drives, modems etc. Unlike RS-232, multiple devices could be daisy-chained for dozens of devices to be connected at the same time.
16. Keyboard connector.
17. Two DB9 Atari Joystick ports.





BACK

FRONT



**THE COLLECTORS GUIDE TO THE:  
ATARI 800XL**



POLE POSITION (1983)



MULE (1983)



STAR RAIDERS (1979)



RAINBOW WALKER (1983)



RESCUE ON FRACTALUS (1985)



KARATEKA (1985)



THE EIDOLON (1985)



THE SEVEN CITIES OF GOLD (1984)



ULTIMA III (1983)



SPACE HARRIER (1985)



PITFALL II (1984)



DROPZONE (1988)



DEFENDER (1982)



GALAXIAN (1982)



INTERNATIONAL KARATE (1986)



KORONIS RIFT (1985)



**The awesome Amstrad CPC GAMES CD has recently been updated with just about every Amstrad CPC game ever released, ready to play at the click of a button, we talk to it's creator Miguel Sky.**

**EIGHT BIT:** Just so people / readers out there know who you are and what your about could you please introduce yourself, who is Miguel Sky ?

**MIGUEL:** I'm 46. I work as a mechanic and I have two children. I'm a CPC user (well, player better said :) since 1985. As I hadn't any PC until 1998, I continued working with my CPC after its commercial life (after 1992). But this situation changed a lot in a good way when I finally discovered internet: one of the first things I did was to search for help in those games I haven't finished yet and this way I found other Spanish CPC users and with them we created new forum and started that what now its known as GUA (Grupo de Usuarios Amstrad) that englobes most of CPC users in Spain. I'm a member of ESPsoft since it's beginnings.

**EIGHT BIT:** What was the first 8bit computer you owned or started coding with?

**MIGUEL:** My Amstrad CPC 472 with English keyboard, a weird model with some incompatibilities due its BASIC 1.1 ROM. I enjoyed some Sinclair Spectrum's and Sega Megadrive console in 90s.

**EIGHT BIT:** Have you ever released or worked on any games before ?

**MIGUEL:** Yes, of course. Due the fact I love Text Adventures games, I started to learn about different parsers. My friend Litos of AmstradESP gave me the script of a game he made in early 90s and I adapted it to work in CPC through PAWs. It was Nheredia. I've adapted other Text Adventures for use with CPC, like Mansión Kali, El Prisionero, Arquimedes XXI, Tower of Despair... I've translated or worked as translator to Spanish some games: Orion Prime, Maraudeur... And even converted other kind of games too, like Dead by Dawn, an Freescape 3D adventure.

# ***THE INTERVIEWS***

***GEORGE BACHAELOR  
INTERVIEWS MIGUEL SKY  
AND DAMIAN CAYNES  
INTERVIEWS MARTIN PIPER***



MIGUEL SKY, PICTURED 5TH FROM THE RIGHT, STANDING, WEARING A BLACK T-SHIRT  
WITH GRUPO DE USUARIOS AMSTRAD (GUA) TEAM AT RETRO MADRID 2013

## THE INTERVIEW

I've too beta tested several games and even I did Junior! a BASIC game for CPC RetroDev15.

**EIGHT BIT:** What is this CPC GAMES CD that you have created and just how does it all work ?

**MIGUEL:** CPCGamesCD is a Mame32 like a CPC games collection in a CD handled through an interface (CPCLoader). There you can see all data about every game and even you can sort them by Company, Year, etc. Data includes some maps, link to game comments and the part that takes the most of my time, screenshots of every game.

**EIGHT BIT:** Who came up with idea for the CPC GAMES CD ? How and when did this project of yours the CPC GAMES CD all begin?

**MIGUEL:** TroelsK had the idea. But it was in 2004 when I contacted TroelsK about an amazing program named CPC Loader (the interface of CPCGamesCD) he wrote. I thought that it could be a great idea to put a loading screen and a in game screenshot of each game together to be used with the program. He liked the idea and he transferred to me the work of making these screenshots and keep the game collection updated. The name of the CD he used to release changed to CPCGamesCD and this lasted until nowadays.

**EIGHT BIT:** Is there a team behind the project or are you doing it all alone ?

**MIGUEL:** Well, we are not a sort of work team but several people are involved in CPCGamesCD. Think that the games collection is made from NVG ftp site that it's maintained by Nicholas Campbell.

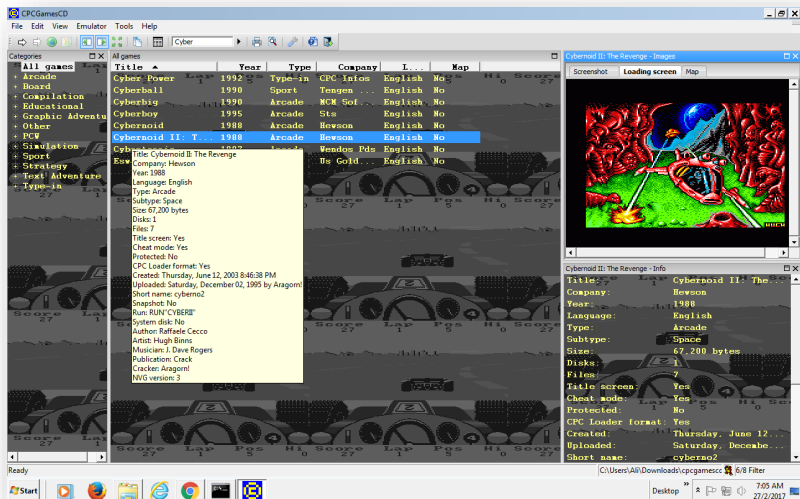
He does a amazing work by putting every new game released there. I'm in charge of update the collection and screenshots and put the CD images online. TroelsK continues updating CPCLoader with new features and translators keep translations updated too.

**EIGHT BIT:** You have recently released the December 2016 version of the CPC GAMES CD, just how many versions of the CPC GAMES CD have been released over the years?

**MIGUEL:** A good bunch of them! I don't remember how many, but every new one is only an enhanced version of the last one. Updates were more frequent in the past, when screenshot collection was not complete yet, but now they take longer from any release to the next as all of we are very busy with our "real" lives.

**EIGHT BIT:** How does this December 2016 release differ from the previous releases of the CPC GAMES CD ? What will users notice or be amazed by this release in comparison to the previous releases of the CPC GAMES CD?

**MIGUEL:** Of course it includes a lot of new games released/discovered since 2013 and the interface has got some interesting new features like Favorites, for example. Ah! And PCW games collection has grown a lot. The CPC



now includes an Applications collection. There also a number of new cool looking game Skins as well as a Snap Pack of 4458 images.

**EIGHT BIT:** What fun / silly facts can you share with us about the CPCGAMECD for instance: How many Amstrad CPC games in the database?

**MIGUEL:** 4127

**EIGHT BIT:** Number of Amstrad CPC emulators you can use?

**MIGUEL:** 8 (plus 2 internal ones)

**EIGHT BIT:** How many game maps are included?

**MIGUEL:** 138 maps (144 games)

**EIGHT BIT:** How many games have cheat modes in them?

**MIGUEL:** Most of them, as Nicholas Campbell likes trainers.

**EIGHT BIT:** How many search functions you can use like by year, title, etc etc?

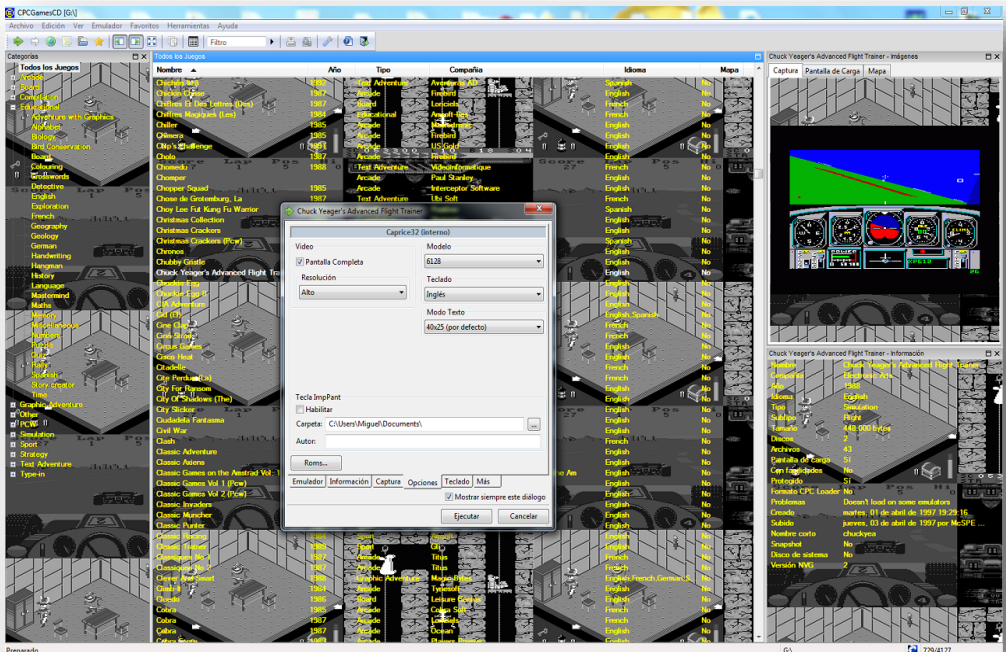
**MIGUEL:** Search is applied only to Name of game filed , but you can filter them by Category / Subcategory and sort by every field of the information sheet as you can add / remove more fields to the Explored window by right clicking the fields bar.

**What's next for Miguel Sky?**

**MIGUEL:** Nothing new really. I'm going to continue translating to Spanish adventure games, beta testing and giving advice to everyone who ask, keeping CPCGamesCD fresh, and playing a lot but not so much as when I was younger :(

Thank you, many thanks for your time much appreciated :)

You can download the new 2016 version of CPCGAMECD here: [www.amstrad.es/cpcgamescd/](http://www.amstrad.es/cpcgamescd/)



## THE 2HS INTERVIEW

### Damian Caynes Interviews Martin Piper of the SEUCK Redux Project.

As you may know from personal experience SEUCK (The Shoot-em-up Construction Kit) is an awesome tool for game construction. In fact, some people use it's graphic and sfx editors for other game projects. But unfortunately it can be quite limiting and many games for the platform can suffer from being quite similar.

Enter SEUCK Redux, written by Martin Piper in 2008; an entirely new SEUCK engine, written from scratch, with full source code, and allowing you to use a remastered version of the SEUCK engine with new scroll code and sprite multiplexor, or alternatively the new Sideways SEUCK engine. Several games have already been released with enhanced features of SEUCK Redux, including Super Tau Zeta 2 Redux, The Adventures of Alain, Another Day, Another Zombie, Final and the technically brilliant Nuclear Strike Force all with new title screens and enhancements such as power-ups.

The engine can also be used to create other forms of c64 games; as it has a multi-directionally scrolling engine, a powerful new sprite multiplexor, as well as the SEUCK routines for attack waves and sound effects.

I chatted with Martin recently about the SEUCK Redux project, and about his C64 coding career, read the interview below.

**DAMIEN:** When did you first use a c64? What is your first memory?

**MARTIN:** I think my first C64 was around 1987 (so 14 years old) when I upgraded from a VIC20. I think the first game I bought with the computer was Wizball. I remember the John Lewis store in Bath (UK) selling a bundle at the time.

**DAMIEN:** So what games inspired you to get into design and development?

**MARTIN:** Coin-op arcade games were a great inspiration, like After Burner, because their hardware was way beyond anything a mere home computer had. They gave me something

to try to emulate on the trusty old C64 and other previous machines. These ambitious targets kept on making me strive to improve my coding.

**DAMIEN:** Which coders inspired you to become a coder?

**MARTIN:** I suppose the coders that inspired me back in the early 1980's were those who wrote type-in listings printed in magazines and the numerous series of short books with listings of simple BASIC games. But when I got the C64 the world of great games using machine code was just beginning to open up before me. Andrew Braybrook's diary of a game for Morpheus really started me off with wanting to learn much more about machine code. Then Martin Walker's Citadel diary really helped with honing my knowledge about design and attention to detail.

**DAMIEN:** When did you start programming and on what platform?

**MARTIN:** I actually started coding back in 1981 (8 years old) when my dad bought a ZX81 and quickly gave up trying to use it. So it quickly ended up in my bedroom where I could use my childhood perseverance and focus to learn BASIC. I learnt a little bit about machine code back then, but not enough to be that useful. Then came the VIC20, which I think had a busted VIC chip (or memory timing) as the graphics were very glitchy. Then the C64.

**DAMIEN:** What was your first piece of code on the c64?

**MARTIN:** Some BASIC demos, where I used compiled BASIC to try to get some speed. Also some BASIC text adventures.

My first real program which is when I had that real eureka moment was when I got a 6502 assembly reference guide and using pen and paper wrote my first bit assembly. I used the opcode lookup table in the book to convert to hex, which I then entered as BASIC pokes and started it with a SYS statement. The code was something like:



```
l3
*=$C000
sei
inc $d020
inc $d021
jmp $c000
```

I wanted to see how much faster this machine code was compared to doing something similar in BASIC. I nearly fell off my chair with surprise when I saw how tiny the narrow strips of colour were compared to BASIC. I then twigged that using this style of code I could use the raster register much more quickly than ever before. My next bit of assembly code was like this:

```
sei
ldx #0
l1
lda #100
l2
cmp $d012
bne l2
inx
txa
and #7
sta $d016
lda #150
cmp $d012
bne l3
lda #0
sta $d016
jmp l1
```

All the opcodes and branch offsets were calculated by hand and laboriously poked into memory. But in the end I had a split screen scroll with the other part of the screen static.

Ideas kind of very quickly exploded from there as I wrote my own assembler in BASIC at that point and really started on writing larger assembly projects. The game Tusari happened shortly afterwards and was my first real finished 100% assembly game.

**DAMIEN:** Have you ever coded an intro or a demo?

**MARTIN:** Yes several, that are not very good. :) Somewhere in the archive of all my old work

disks ( [www.gamethatwerent.com/2015/02/martin-piper-assets/](http://www.gamethatwerent.com/2015/02/martin-piper-assets/) ) there are various unfinished demo ideas for wireframe 3D plotters, or scrollers etc. There is even somewhere in there a graphical demo creator application that allows graphics, music and colours bars to be setup with customised text and screen positioning.

**DAMIEN:** Who are your favourite demo scene coders?

**MARTIN:** Back in the day I have to say Triangle inspired me mostly because they did bigger demos with great design.

These days Booze Design and Censor Design have to be right up there at the top of my list. These are groups, not just coders, because code needs the whole package or music/graphics/design to bereally great.

OK, OK, if you really twist my arm to choose a specific coder then it would be *The Human Code Machine*, he seems like a nice chap and I respect his work.

**DAMIEN:** SEUCK Redux is a revelation, did you plan to integrate SEUCK into your engine from the beginning?

**MARTIN:** It wasn't planned as such. I was working on resurrecting my old work disk projects and enjoying tidying them up and exploring the old code. But it struck me how decades of knowledge in the console games dev industry that followed the C64 times kept on making me see massive improvements in my old teenage code. It was at this point I saw the enthusiasm that some people, Richard Bayliss mostly, had for SEUCK games. Back in the day I liked SEUCK but I saw that it had rather glitchy code. So I started poking around looking for the graphics file format, reverse engineering it by tweaking things in the editor and finding the changed bytes in memory. I thought to myself that maybe it would be useful to try writing some code to play these SEUCK files but using entirely new code with modern algorithms and ideas instead. Which

## THE 2ND INTERVIEW

lead to this post on CSDB: [csdb.dk/forums/?roomid=11&topicid=60233&showallposts=1](https://csdb.dk/forums/?roomid=11&topicid=60233&showallposts=1)



At this point I had just found the graphics, blocks and map data for the levels in memory and got the scroller working.

**DAMIEN:** The c64 scene wasn't initially receptive to your project, did you find that discouraging?

**MARTIN:** After writing that first post and before replying to the thread again I think I had already managed to figure out most of the animation code and enemy attack wave triggering and had it tied into the multiplexor and scroller code. So the few naysayers really didn't dissuade me, actually on the contrary their lack of vision encouraged me because it highlighted how the C64 scene really needed a good quality entirely open source game engine available for others to learn from. I think now the large number of redux games with really good extra bespoke code that expand the game way beyond what SEUCK could do is a great vindication of the idea of sharing and reusing code when possible. It shows a generic open source game engine for the C64 is really feasible.

**DAMIEN:** What is your favourite SEUCK Redux game?

**MARTIN:** Richard Bayliss and Alf Yngve are prodigious when it comes to producing games. It's great that Richard really took onboard the idea of reusing the redux code.

I think for me the favourite has to be "Legion of the Damned" because it contains the special spell effects that make it obvious that it's obviously a lot more than just a horizontal scrolling SEUCK game. Closely followed by "Nuclear Strike Force" because it really pushes the multiplexor quite hard, something the original SEUCK could not do.

**DAMIEN:** Your engine can also be used to make multidirectional scrolling games, how hard would it be to create such a game with your engine?

**MARTIN:** The game engine is quite generic. So enabling the 8-way scrolling code (using `Scroller_MultiDirection = 1 inScrollEntry.a`)

shows how to scroll the screen with 4x4 map blocks, full colour scroll and multiplexed sprites moving with the background. This code can be expanded to include animations from SEUCK or other sources.

**DAMIEN:** Have you considered creating a level editor for the Redux multi-directional scrolling engine?

**MARTIN:** I tend to use CharPad and SpritePad these days and just import the data. I used to make map editors out of a mixture of assembly and BASIC that were bespoke for each game idea.

**DAMIEN:** Tell me about the other game projects you have planned for the future?

**MARTIN:** Look through my old work disks and you'll probably see repeating themes and attempts at certain types of game. For example racing games ([www.gamesthatwerent.com/gtw64/racinggame/](http://www.gamesthatwerent.com/gtw64/racinggame/)) and paradroid/citadel style games ([www.gamesthatwerent.com/gtw64/citadel-2/](http://www.gamesthatwerent.com/gtw64/citadel-2/)).

I've spent most of my time recently honing various things to do with animation ([csdb.dk/release/?id=117482&show=notes#notes](https://csdb.dk/release/?id=117482&show=notes#notes)), *data compression, music/sfx players, tape/disk loaders, Behaviour Driven Development (Cucumber driven testing for 6502* <https://github.com/martinpiper/BDD6502>), *source level remote debugging* (<https://github.com/martinpiper/ACME/tree/master/VICEPDBMonitor>) and some AI algorithms for the C64. These side projects are basically working towards something to do with the repeated themes in my old work disks. I feel this itch has not yet been scratched.





LEGION OF THE DAMNED

But I've learned now never to promise anything specific until it is practically done, so I'm staying quiet. Whatever happens, I know the code will eventually be made open source for everyone to enjoy. Just like the Berzerk redux port was open sourced.

**DAMIEN:** Thanks for taking the time to talk to us, and thanks for your coding efforts with SEUCK Redux, we look forward to your future

releases!

**MARTIN:** You're welcome, and thank you for the interview invitation. I've enjoyed the trip down memory lane.



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# SPECTRUM NEXT WEB

**A New ZX Spectrum is coming your way, using real hardware and 21st century enhancements. We investigate the Spectrum Next...**

**The crowdfunding for the new ZX Spectrum has finished with 3,113 backers pledging £ 723,390 Sterling.** It can certainly be seen as a success but why has this new piece of hardware got the Spectrum community so excited?

We briefly covered the Spectrum Next in Issue 1 of Eight Bit, where we reported that it will have enhanced graphics modes and 512 KB of RAM. However, thanks to such a successful crowdfunding campaign this has increased to 1MB plus a few extra enhancements. There were three main reasons why the crowdfunding was so successful, firstly, the hardware already exists and secondly, it is based on FPGA technology and not emulation. Lastly, the design is a work of art. Designed by Rick Dickinson, the same guy who designed the Spectrums before Amstrad's takeover in 1986. It was the combination of trust, style and hardware that made this the most successful Kickstarter so far for a retro computer.





## WHAT IS FPGA

FPGA stands for Field-Programmable Gate Array. It's an integrated circuit that is based on a matrix of logic blocks that can be configured. In other words, the chip's logic can be programmed to create a circuit such as the CPU, video, audio and so on. It is similar to ASIC (Application Specific Integrated Circuit) as used on the Amstrad PLUS range but unlike ASIC, FPGA can be re-programmed.

FPGA is not emulation, real logic circuits are being used which means that you are getting a proper Spectrum computer and not just another box that emulates the original hardware.



## HARDWARE SPECS

The specs have increased from the last time we looked at the computer, thanks for further developments and Kickstarter stretch goals.

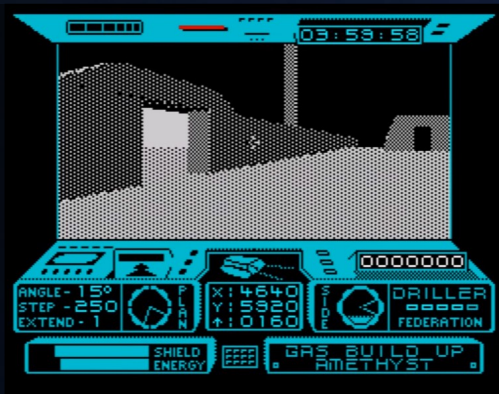
Instead of having the CPU operate at 3.5 MHz and a 'turbo' 7 MHz mode, there will also be a 14 MHz and dizzily a fast 28 MHz mode. Currently, there are some glitches in the 28MHz mode but that may be ironed out before it's released. Of course, the majority of games are unplayable at this speed, others like the *Freescape* game, *Driller* play amazingly well with smooth, fast movement that improves the game's enjoyability.

As expected the Next will have the original Speecy's screen mode but also a 256 colour option at the same screen resolution as the original Spectrum, 256 x 192. New for the Spectrum is hardware sprites. The Next will be able to handle 12 sprites per scanline with a total of 64 sprites. Sprites will have a size of 16 x 16 pixels in 256 colours with collision detection. Memory is now 1 MB instead of the planned 512 KB and will be expandable to 2 MB.

Audio will be provided by three AY-3-8912 audio chips compared to just one in the original Spectrum 128, with stereo output and FM sound. Controversially the Next will also have a SID audio chip added, as found on the Commodore 64. While everyone agrees that the SID sounds better than the AY-3-8912, many felt that it shouldn't be included as it's a Commodore chip and would take away from the feel of the Spectrum. It'll certainly be interesting hearing a Spectrum play SID tunes, that's for sure.

Software can be loaded into the Spectrum using an SD card slot that has a compatible DivMMC protocol. For those who don't know, the DivMMC is a device that connects to original Spectrums to allow loading from SD cards. The Next can also load software from cassette using the supplied mic and ear ports.

Interestingly, the expansion port is fully compatible with the original Spectrum allowing



DRILLER ON THE ZX SPECTRUM NEXT PLAYS AMAZINGLY WELL AT HIGHER PROCESSOR SPEEDS.

for retro peripherals to be added. It will also have two DB9 joystick ports which will be compatible with Cursor, Kempston and Interface 2 protocols. These will be added to the front of the machine, a change from the original Kickstarter. There will also be the ability to add an external keyboard and mouse via a PS/2 port.

Multiface functionality will be included with the Next allowing for direct memory access for game cheats etc. Video output will be RGB, VGA and HDMI.

## SPECTRUM NEXT WEBSITE



Visit the ZX Spectrum Next website at [www.specnext.com](http://www.specnext.com) for the latest information, forum and online store.



## KICKSTARTER VERSIONS OF THE NEXT

The board only option will be available soon. It will fit into an original Spectrum with a bit of work.

A fully built ZX Spectrum Next will be released in January 2018. It has all the functionality mentioned plus the ability to add a Real Time Clock (RTC) and WiFi as well as a Raspberry Pi accelerator.

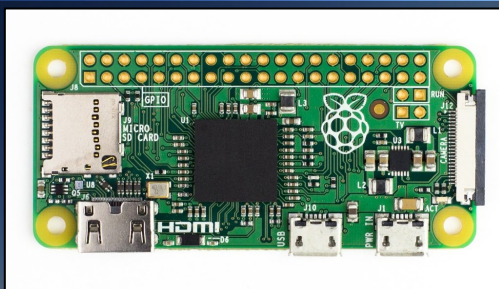
The Spectrum Next Plus has the RTC and WiFi added as standard. The ZX Next Accelerated will have an RTC, WiFi and a Raspberry Pi Zero.

## RASPBERRY PI ZERO

The Raspberry Pi Zero is a small computer board with a Broadcom BCM2835 CPU running at 1 GHz and 512 MB of RAM. It can be used for processor intensive tasks. For example, it could be used to process intensive 3D environments, letting the Spectrum Next get on with other stuff. There's a lot of discussion on what else the Pi Zero could add to the Next, such as modern USB joystick input or making use of the Pi Zero's memory.

## THE GAMES

There are already a number of games in development for the NEXT. First up are the games which were promised for reaching certain stretch goals. *Rex Next*, a remake of the 1988 platform shooter *Rex*. As expected it's going to be a showcase the Next's graphics capabilities. There's also a new *Dizzy* game, *Wonderful Dizzy*. It is directed by the Oliver Twins, the original creators of the *Dizzy* series and will be programmed by the team who remade *Crystal Kingdom Dizzy* recently for the Spectrum. The game, *No Fate* is being made by the same team who made *Castlevania: Spectral Interlude* which will be giving the Spectrum version away free and the enhanced Next version at a 50% discount for those who supported the Next's Kickstarter.



THE £5 RASPBERRY PI ZERO CAN BE USED AS AN ACCELERATOR BOARD FOR CPU INTENSIVE TASKS.

The recently release *Dreamworld Pogie* for the Nintendo Entertainment System will also be getting a Spectrum Next version. *Nodes of Yesod*, another remake for the Next, will also be released as part of a stretch goal. The original game was released in 1985 as a platform game where you controlled a guy in a spacesuit with a mole that chews through walls. Then there's *Nextipede* by Jonathan Caldwell which is a Centipede clone that uses the Timex 8 x 1 video mode to create interesting colour effects. We will be covering these games and more in future issues.

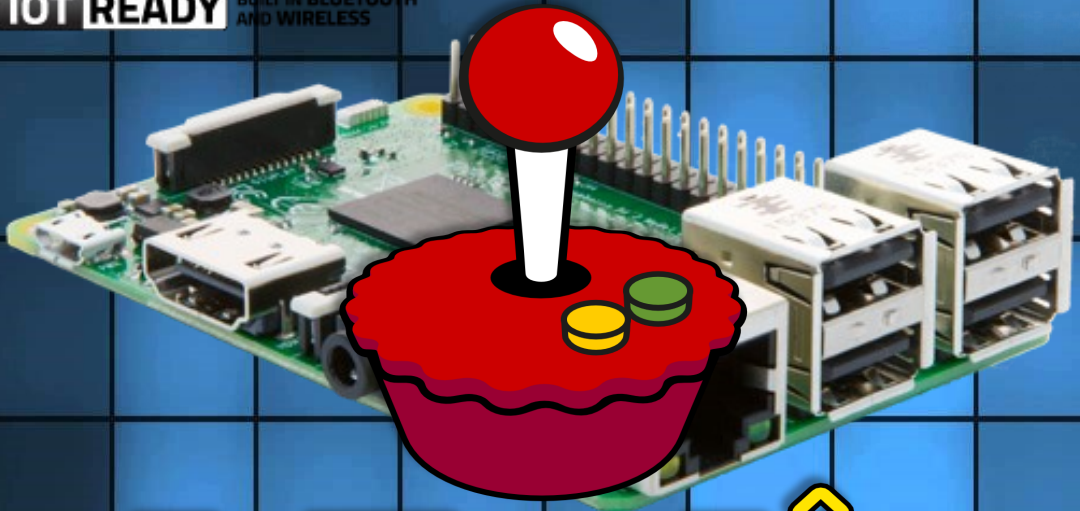
## BUYING A ZX SPECTRUM NEXT

If you missed out on the Kickstarter you can still buy a Spectrum Next from their website at a slightly increased price. The board version costs UK £119 + VAT and will ship in Autumn 2017, after the Kickstarter pledges are honoured first. The ZX Spectrum Next costs UK £210 + VAT, ships in February 2018 and the ZX Spectrum Next Accelerated with all the bells and whistles will be UK £275 + VAT. See the Spectrum Next website for more information. All the cased versions of the Next will come in a beautifully designed box with a proper manual, just like the original Spectrum.

We will be reviewing a Kickstarter version in January 2018. Until then we will be sitting back, getting involved in the forums and building our excitement. After all, it isn't everyday that a new Spectrum comes along.

**IOT READY**

BUILT IN BLUETOOTH  
AND WIRELESS



# RETROPIE

## EMULATING THE 8 BITS

John Kavanagh checks out RetroPie in an attempt to emulate 8-bit computers on the tiny Raspberry Pi computer.

When reviewing or just playing an old game from a retro computer, I almost, always do it on real hardware with a display suitable for that time period. Playing on a modern computer just isn't the same thing.

However, what if I wanted to play a game for the MGT Sam Coupe or just play around with an Apple II? While I have a room full retro computers and consoles but I don't have those two. Many people only have space for one or two computers, if that. Emulation is a necessary evil but what if we can improve the experience

compared to playing on a modern computer, or worse, a table or smartphone. For something better, we are going to be using the Raspberry Pi. Why is it better? Here are some reasons:

- It can connect to a TV, and more importantly, it can connect to a old type CRT TV with component input, thus allowing you to play the games they way they were meant to be played.
- The Raspberry Pi is compact and has all the CPU performance needed for good emulation.



- It's cheap and can be purchased for as little as £5 Sterling. However, we do recommend the more expensive models.

- RetroPie is available for the Pi, which can emulate over 50 different computers and consoles.

### WHAT IS A RASPBERRY PI?

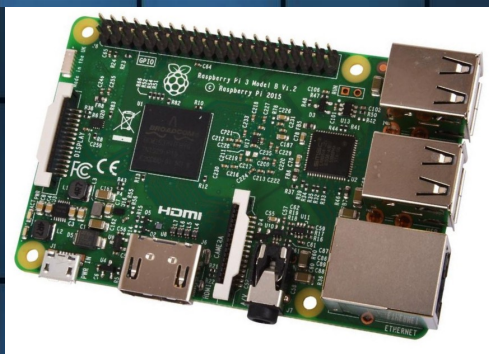
For those of you who don't know, the Raspberry Pi is a powerful credit-card sized single board computer that can be used for many applications such as running as a Linux based computer, a living room media player and even as the brains for quadcopters and robots.

There are a few versions of the Raspberry Pi to choose from. Firstly, there's no point in buying the original model 1 or even the model 2 as the latest, the Raspberry 3, is about the same price and is much more powerful, especially compared to the model 1. The Raspberry Pi Zero is a lower cost, smaller size option. While less powerful than the Raspberry 3, it's £25 cheaper and at under £5 there's no reason not to have a bunch of them. You will also need a charger, one from an old phone which uses micro USB for charging will do as long as it can handle up to 2.5 Amps (2 Amps for the Model 2B). A HDMI cable, a Micro SD card and a joystick are required to play. A USB keyboard will also be needed as well a USB memory stick. We'll be experimenting with using a composite cable later to enhance the retro feel, but for now, the goal is to get everything set up and running. To purchase a Raspberry Pi, check out [www.raspberrypi.org](http://www.raspberrypi.org) for links.



### RETRO PIE

RetroPie is a complete package which emulate multiple computers and consoles. The version we will be using is built upon the Linux Raspbian Operating System. To download, head over to: [retropie.org.uk](http://retropie.org.uk) and click on the 'Download' link



THE RASPBERRY PI 3

and then the button for whichever version of the Raspberry Pi you got. The download is over 600 MB and is compressed to the img.gz file format. To decompress you can download and install 7-Zip at: [www.7-zip.org](http://www.7-zip.org)



Once you decompressed the file, you should be left with an image file (.img). You can't just copy this image file to the Micro SD card, you need to write the image to the card. For this, I would suggest Win 32 Disk Imager: [sourceforge.net/projects/win32diskimager/](http://sourceforge.net/projects/win32diskimager/)



To burn the image on a PC / MAC to a Micro SD requires a computer that has an SD card slot or, either internal or external and a Micro SD to SD card adapter.

We recommend at least a card that is 4GB in size but you can go up as far as 32GB without problems which is plenty for your needs.



MICRO SD TO SD ADAPTER

I had problems with the built in card reader on my computer so instead opt for a high quality external unit.

## STARTING UP

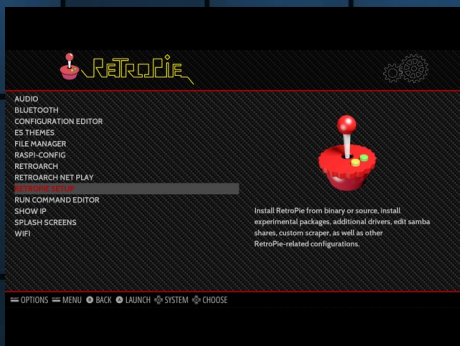
Plugging in the keyboard, game controller, the HDMI cable from the TV and a phone charger from an old Android phone, the Raspberry Pi started up. In typical Linux fashion, a massive amount of text scrolled the screen. Too fast to read but within a few seconds the RetroPie logo appeared.

It detected the joystick right away and asked if I wanted to configure it. Then it asked to press button for A, B, X, Y etc. Since I was using a replica SNES control it didn't have any analogue buttons to press but to bypass those was easy as holding down one of the keys on the controller for longer than usual.

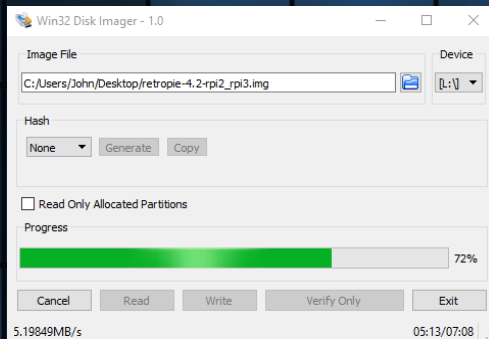
Then I was asked to select audio output, I selected to output to HDMI. Amazingly I can do all of this from my joystick, but it did take me a second to realise I had to press X for the OK button. After a few seconds the RetroPie menu appears but no options for selecting computers or consoles to emulate. This is because we need to set up a few things first.

## UPDATING PACKAGES

For RetroPie to function at its best, it must be up to date. Press the A button on your controller with RetroPie selected, from the



THE RETROPIE MAIN MENU



WIN32 DISK IMAGER IS RECOMMENDED FOR BURNING THE RETROPIE IMAGE TO DISK

menu that comes up, select "RetroPie Setup". From the DOS-like screen, select "Update All Installed Packages". Select Yes to confirm. Text will start scrolling at high speed, but it will take a while. Make sure your Raspberry Pi is connected to the internet either via WiFi or an ethernet cable for this update to be successful.

Return to the RetroPie setup menu again, this time selecting "Update RetroPie-Setup Script".

## INSTALLING OPTIONAL PACKAGES

Some packages are not installed as standard, such as the Commodore 64 and Atari 8-bit emulators, as RetroPie seems to be more targeted towards consoles than computers. To install these, and other emulators, again select RetroPie Setup from the RetroPie menu. This time, select "Manage Packages", then "Manage Optional Packages". You can install each package you require in turn but it's easier to install all optional packages by selecting "Install / Update all optional packages from binary".

## ADDING DISK IMAGES AND ROMS

To add games (and other software) to RetroPie will require a USB flash drive, formatted to FAT32. Insert the flash drive into the Pi and wait a few seconds for it to copy over its folder structure. A flash drive with a LED light makes it

easier to know when it's finished. Once finished, insert the flash drive into your computer and you will see a folder named "retroPie". Clicking into that folder will display a ROMS folder, and within that, a folder for each computer and console system. There you can copy your disk images and ROMS. Handily, RetroPie can deal with compressed zip files too.

Putting the flash drive back into the Pi, and it will automatically copy the ROMS to the SD Card. Depending on the number of files, this again, may take a while. Not to worry, the fun part is about to begin.

### COMMODORE CONTROLS

Depending on which disk images and ROMs you copied over, on the main RetroPie screen you will see a number of computers and consoles you can play. If you copied over Commodore 64 disk images, naturally you will see the Commodore 64 as an option. On selecting it you can choose the game you want to play.

Sadly, joystick control is not set up as standard so to do this, press F12 on your keyboard. Select "Machine Settings", then "Joystick Settings".

Set "Joystick Device 2" to Joystick. Then select Joystick 2 mapping. Select each option, up, down, left, right and fire with the keyboard and pressing enter, then the key on the joypad that you want to correspond to that control.

You may want to emulate faster loading, to do this, select "Speed Settings" from the emulator main menu and pressing Enter over "Warp mode" to activate it.

To save your settings select "Settings management", then "Save current settings". Also select "save joystick map", and you're done.

### ATARI 8-BIT PROBLEMS

The Atari 8-bit is a little more complex to setup as you must set up the BIOS also or otherwise, you'll get a message about needing a real Atari



RETROPIE MAIN SCREEN. THE COMPUTERS AND CONSOLES OPTIONS THAT APPEAR DEPENDS ON THE DISK IMAGES AND ROMS IN THEIR REPECTED FOLDERS.

to play. The BIOS ROMS you need are listed on the next page. You will need to copy those ROMS to your USB flash drive to the retroPie/BIOS folder.

Once done, you need to tell the Atari emulator where the ROMS are located. You do this by pressing F1 to open the main menu and



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SCENEWORLD.ORG

# 8-BIT COMPUTERS CONFIGURATION ON RETROPIE

SYSTEM	ROM EXTENSIONS	EMULATOR	ROM FOLDER
<b>Amstrad CPC (1984)</b>	.DSK .CPC	Caprice32, CapriceRPI	amstradcpc
<b>Apple II (1977)</b>	.DSK	Linapple	apple2
<b>Atari 8-bit (1979)</b>	.a52 .BAS .BIN .XEX .ATR .XFD .DCM .ATR.GZ	Atari800	atari800
<b>Commodore 64 (1982)</b> (plus PET and VIC-20)	.CRT .D64 .G64 .T64 .TAP .X64	VICE	c64
<b>Dragon 32 (1982)</b>	.CAS .WAV .BAS .ASC .DMK .JVC .OS9 .DSK .VDK .ROM .CCC .SNA	XRoar	coco
<b>MSX (1983)</b>	.ROM .MX1 .MX2 .COL .DSK	OpenMSX, Lr-bluemsx, Lr.fmsx	msx
<b>Oric (1983)</b> (plus Atmos, Stratos, Telestrat)	.DSK	Oricutron	oric
<b>SAM Coupé (1989)</b>	.DESK .MGT .SBT .SAD	SimCoupe	samcoupe
<b>Tandy Color Computer (1980)</b>	.CAS .WAV .BAS .ASC .DMK .JVC .OS9 .DSK .VDK .ROM .CCC .SNA	XRoar	coco
<b>TRS-80 (1977)</b>	.DSK	Sdltrs	trs-80
<b>Sinclair ZX Spectrum (1982)</b>	.SNA .SZX .Z80 .TAP .TZX .GZ .UDI .MGT .IMG .TRD .SCL .DSK	Lr-fuse, FBZX, Fuse	zxspectrum

BIOS REQUIRED	PACKAGE INCLUDED
	Yes
	Download
ATARIXL.ROM, ATARIBAS.ROM ATARIOS.A.ROM, ATARIOSB.ROM 5200.ROM	Download  Download
d32.rom	Download
Depends on setup, check: <a href="https://github.com/retroPie/retroPie-setup/wiki/MSX">github.com/retroPie/retroPie-setup/wiki/MSX</a>	Download  Download
bas13.rom	Download  Download
level2.rom	Download  Yes

navigate down to “Emulator Configuration”, then “System ROM settings”. Select “Find ROM images”. You can find them in “/home/pi/RetroPie/BIOS”. Although for me, they weren’t there. For now I just selected them from the USB flash drive at “/media/usb0/retroPie/BIOS”. However you will need your flash drive to be inserted to be able to play the games with the BIOS files still on the flash drive. Don’t forget to save your configuration file.

### SMOOTH GRAPHICS

RetroPie displays games far more jagged than one would care to remember. The reason for this is due to the way older CRT TVs display images. The TV’s scanlines are visible to the naked eye helping to hide the low resolution of the game. There was also signal distortion where pixels would blur together, creating an anti-aliasing effect, further hiding any pixelation.

To fix this, you can apply a shader to re-create the effects of a CRT TV. However, there are two problems with this, firstly, not all the emulators supplied with RetroPie can do this and secondly, it increases load on the CPU immensely. It might not be much of a problem when emulating 8-bit systems, but it can be problematic when emulating higher powered computers and consoles.

A better solution might be to use a real CRT TV, preferably one with a 4:3 ratio and a curved, fishbowl look. When I tried this using a composite cable from the Raspberry Pi to a TV from the 1990’s, the results were spectacularly retro. As good as I remembered all those years ago.

### CONCLUSION

The strong point of RetroPie on the Raspberry Pi is the ability to connect it to an older CRT TV for that true retro feel. It can also handle a big variety of controllers. With the right controller and an old TV, you can easily forget you are just playing with an emulator. Setting up can be tricky, and we only touched the surface, but it’s a rewarding experience. Much more than the effort it takes in setting it up. It’s well worth checking out.



## By Stuart Williams

Whether you are an adventurer bold, or you simply haven't a clue, and are you looking for one, welcome to the first edition of my new regular column – *Eight Bit Adventurer!*

This column focuses on adventure games past and present, as well as current adventure news, for users of those eight-bit home computers which were the first affordable home of 'interactive fiction' – software programs better known by many as text adventures, or stories in which the computer user could actually intervene and play a critical role in defeating evil, solving a mystery, exploring – or just grabbing as much treasure as possible!



TITLE SCREEN FROM 'ADVENTURE'  
FOR THE APPLE II, 1980

To quote Graham Cunningham's first November 1983 Editorial in the much-missed *Micro Adventurer* magazine, which inspired this column in part:

*"For those of you who have never ventured into the realm of computer adventures before, they consist of a series of intricate puzzles. The puzzles themselves are set in worlds of myth and imagination, ranging from J R R Tolkien's *The Hobbit* through any number of elves, dwarves and trolls, to deserted castles and vast alien space ships. Most adventures have some central aim, either a princess to be rescued or some treasure to be collected, but much of the fun lies in exploring the world created by the programmer."*

And that, indeed, is the purpose of *Eight Bit Adventurer* – to explore, and to help others explore, the many worlds of the multiverse which were created in past computer adventures, and also those 'worlds within' of the new games which have been created, and are still being created, in more recent years when the use of home computers long considered obsolete by the mundane and the mainstream has become one of the most fascinating hobbies for computer historians, collectors and retro gamers alike.

### WHY EIGHT BIT?



STUART WILLIAMS' APPLE IIe RUNNING  
'THE HOBBIT' FROM FLOPPY DISK

This focus on eight bit computers offers an ideal opportunity to take a closer look back at this most historic form of computer gaming, which has its origins in the time when there were either no or very limited computer graphics available to programmers and gamers. And so, the most important aid to any adventure gamer was, and remains today, their imagination. The fact that *Eight Bit* magazine concentrates on such computers makes it the perfect home for this column.

### SHAPE OF THINGS TO COME

I will be looking at both text-only and graphical adventure games with text input which were, and still are, popular with users of such computers as the Apple II, Tandy TRS-80, Amstrad, Acorn, Atari, Sinclair, Commodore and more. And apart from adventure gaming on historic hardware, I will also be checking out the use of emulation for those who, for reasons of convenience or affordability, play their games using emulators on the vastly more powerful machines available to us today.

As time permits, you can expect to see the following in future instalments of *Eight Bit Adventurer*, space permitting:

- Adventure game reviews, past and present
- Maps and solutions to the trickier puzzles – where available
- Interviews with the creators of adventure games
- Reviews of adventure creation tools, past and present
- Reviews of books about adventure games
- Listings of software and where to find it
- A look at the use of historic hardware and emulation
- Selected articles reproduced from the pages of *Micro Adventurer*
- Guest articles from other writers and adventurers

- Last, but not least, your very own readers' comments!

So, if you are a book or software publisher producing adventure games or books about them, please do get in touch if you would like your work to be reviewed here!

### OFF THE WEB AND ONTO PAPER



WHO DOESN'T HATE COMING ACROSS BIG CREEPY SPIDERS IN THE DARK. THESE ARE FROM *THE HOBBIT*

This column had its very first incarnation on my, now closed, website *Retro Computing News*. Unfortunately, for personal and family reasons that site has now been mothballed and will not be updated, although it will be left online. The good news is, *Eight Bit Adventurer* had already been accepted for regular publication in *Eight Bit* magazine by the editor, John Kavanagh, for which I was very grateful as it meant there would be another audience, and indeed a permanent record, of my spidery web-scribbblings on paper. What could be more retro than that? Now, the column begins again on these pages, and also follows up my Apple II-specific feature *The Apple Adventurer*, which appeared in issue 3.

### ADVENTURE NEWS

#### What's Next on the Sinclair Spectrum?

The Kickstarter campaign to raise funds for a new 'Next Generation' Sinclair ZX Spectrum eight-bit home computer, which was very successfully funded earlier this year, has



RICK DICKINSON-DESIGNED ZX SPECTRUM NEXT  
CONCEPT-RENDERING

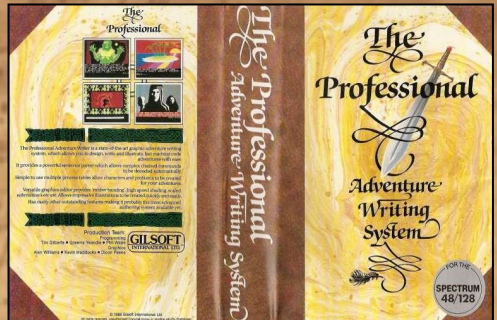
certainly stirred up a massive amount of interest in the retro computing community. Subsequently, a number of past and present developers for the original 1980s British home computer range, affectionately dubbed the 'Speccy' by fans, have been surfacing, interested in the potential of the more powerful and sophisticated, but still compatible, 'ZX Spectrum Next', which is aimed to be released in August in board-only form, and in fully cased and boxed form with manual in January 2018.



CASSETTE-BASED ORIGINAL VERSION OF THE PAW

Following on from this, great news for Spectrum-loving fans of adventure games in particular is that now Tim Gilberts, founder of legendary 1980s Welsh software developers and publishers Gilsoft International Ltd, has firmly thrown his hat in the ring, having previously expressed strong interest, subject to discussion with the former Gilsoft team, in adapting the now-defunct company's adventure game generation software the *Professional Adventure Writer* (aka *The PAW* or *The Professional*

*Adventure Writing System*) to the Spectrum Next, with its modern SD card storage system and other updated facilities.



COVER FOR THE ORIGINAL SPECTRUM  
VERSION OF THE PAW

Gilsoft were best known for *The Quill* and the *PAW*, both of which were popular development systems in their day, enabling the simplified creation and coding of text and graphical adventures on a number of eight-bit home computers. The *Quill* in particular was used by a number of independent developers to create and publish text adventure games, as did Gilsoft itself.



THE QUILL MAIN MENU

*The Professional Adventure Writer* was created by Tim Gilberts, Graeme Yeandle, and Phil Wade of Gilsoft, and was first published in 1986. It followed the company's 1983 publication of predecessor *The Quill* by Graeme Yeandle, who had originally created that program to make his own adventure game writing simpler.



Tim Gilberts, who has enthusiastically joined the ranks of more than 3000 Spectrum Next backers, has been greatly impressed by the potential of the new system, and although it seems unlikely that there will be a reboot of Gilsoft itself, he is keen, working as an individual, to get to grips with the Next, and is already working on recovering past data and creating a reboot of *The PAW* using TBBlue emulation, with advice from the Next team. He hopes to get his hands on one of the production Next boards, based on a modern FPGA system, soon.

I am in regular contact with Tim Gilberts, and when there's more to hear about developments with *The Professional Adventure Writer* for the ZX Spectrum Next, you'll hear it here in the Eight Bit Adventurer column.

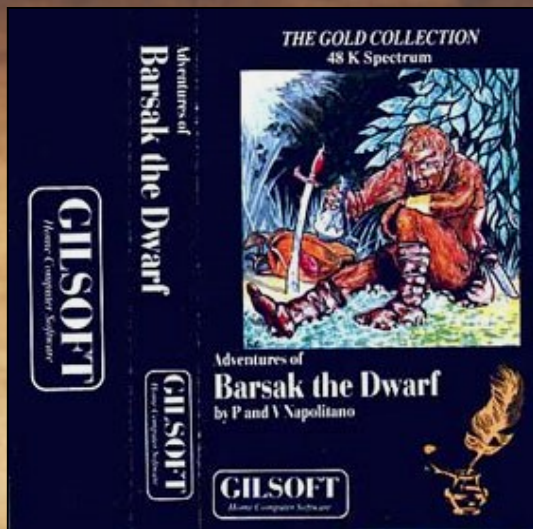
For more information about past and modern implementations based on the *PAW* in the post home computer era, see:

<https://gilsoftpawreservoir.wordpress.com>

### CRASH MAGAZINE REBOOT INCLUDES ADVENTURE TRAIL

Another sparkling speck of Specky news which ties in to this column is that Chris Wilkins, publisher of the highly popular *Fusion Retro* range of books, has joined forces with former *CRASH* magazine Newsfield publishers, editor Roger Kean and artist Oliver Frey, to reboot the Spectrum games mag more than twenty years after its demise, in the form of a brand, spanking new annual! *CRASH* was a legend in its own lifetime, and is still hugely popular with retro-minded 'Spec-chums', as they were known back in the day.

The connection between the new incarnation of *CRASH* and this column is that I have the honour to have been invited to write the *Adventure Trail* column for *Crash Annual 2018 - The next chapter*, succeeding the original columnist and noted game developer, Derek Brewster. The new column has already been submitted, so I am waiting with bated breath to see the



COVER OF GILSOFT'S ADVENTURES OF BARSAK THE DWARF

finished result in this new board-backed publication, which will be packed from cover to cover with Specky goodness from columnists old and new, as well as great art and editing from Messrs Frey and Kean. Hopefully more news on all that in my next column!

### FURTHER ADVENTURES

That's all for the moment, friends and fellow adventurers! Once this first column has gone into print, I aim to write an *Eight Bit Adventurer* feature for every issue of *Eight Bit* magazine from now on, so whether you are already a fan of adventure games, or want to find out about them for the first time, I hope that, apart from all the other excellent content of this publication, you will also see this as an incentive to subscribe to future issues, so you can get the latest features as soon as they are published.

Please do write in via the magazine or direct to [a.stuart.williams@gmail.com](mailto:a.stuart.williams@gmail.com) if you have any comments or questions, and I'll do my best to answer them, or point you in the right direction.

What an adventure!

Stuart Williams

Love him or loath him, Paul Gascoine, aka "GAZZA", a big time footballer of the 1980s and 1990s era, proved a very marketable commodity, in particular in the selling of football / soccer computer and video games.

Video and computer game software company, Empire Interactive, saw the opportunity to cash in and license Paul Gascoine's name to some footy games across various systems, one such game that is proving to be surrounded in mystery is the 1991, Amstrad CPC Plus, cartridge release of GAZZA 2.

Gazza's instantly recognizable picture appeared in many computer magazines of the time it received a great deal of hype and fanfare. As such as his popularity, his face pawned over the many magazine cover pages and game adverts. French magazine, Amstrad Cent Pour Cent, had a review of the GAZZA 2 cart game, scoring it an overall rating of 60%. Major multi-format video game magazine, CV+G in 1991, gave Gazza 2 an overall rating of 74%, while the Amstrad CPC specific magazine, Amstrad Action (AA) #65 gave it a 2-page spread, calling it a "STUNNER", giving it an overall rating of 88%.

So what's the mystery? A game with a great deal of hype, a well-known worldwide marketable personality, some pretty decent ratings in the magazines, so what's the issue? The problem with GAZZA 2, Amstrad CPC cartridge, is it doesn't seem to exist. No one has ever seen the cartridge.

Claims abound on social media to this day (2017) that it has been seen, but where is it? While the actual Amstrad CPC cartridge game was reviewed back in 1991 by various magazines, an actual, physical cartridge has never been seen. Reviews of the game in the magazines depict some difference of the game's screenshots, leaving some to wonder was GAZZA 2, Amstrad CPC cartridge even reviewed? The question has to be asked, were screenshots of other platforms such as the Atari St or Amiga computers used in the Amstrad CPC cartridge reviews? It is possible. Maybe, maybe not, as coders of GAZZA 2, Amstrad CPC cartridge, the Pickford Brothers website <http://www.zee-3.com/pickfordbros/softography/index.php?game=44> states, that the Amstrad CPC cartridge was actually completed and had over 10,000 units sold, but as the disclaimer on their website states, it is only an educated guess relating to sales figures.

The Mysterious, Disappearing

GAZZA

Gazza 2, did come out on disk for the Amstrad CPC in 1990 and showed some interesting coding techniques for the time. According to website [CPCPOWER.com](http://CPCPOWER.com), GAZZA 2 on disk, uses the Multi-Mode technology which allows mixing of graphics modes. The playing area is in MODE 1 (4 colour, 320 x 200) and the area with the title of the game is MODE 0 (16 colour, 160 x 200). The colour palette is changed by the use of rasters between the playing area and the area of the scores.

Was there much difference between the disk and cartridge versions? Until a physical cartridge is found we will never know.

From magazines screenshots I viewed, there does appear to be major differences in sprites and minor differences in colour or palette between the two versions.

Does Gazza 2 cartridge exist? The short and unfortunate answer is NO.

I searched online website, CPC POWER (<http://www.cpc-power.com/>) there is a question mark and "unreleased" next to the GAZZA 2 info page.

I looked for a download of GAZZA 2 on The Amstrad Computer Games Resource or TACGR website (<http://tacgr.emuunlim.org/downloads/downloads.php>), while Gazza 2 is listed, when you click on it error 404 not found is returned.

Some people in the Amstrad CPC community even believe they have seen a copy of Gazza 2 Amstrad Plus / GX Cartridge, but it becomes a

bit like the old stories of seeing BIGFOOT, a lot of people have said they have seen BIGFOOT but there is no evidence to prove it.

If you believe you have a copy of Gazza 2, Amstrad CPC cartridge, or you know someone who does, then let people know at AMSTRAD CPC CLASSIC GAMING & Demos FB page <https://www.facebook.com/groups/1066160190075999/>



AMSTRAD ACTION'S REVIEW OF THE ILLUSIVE OR INDEED, NON EXISTENT GAME



DISC VERSION ABOVE AND POSSIBLE ENHANCED CART VERSION BELOW



# GUNFRIGHT

Reviewed by Bill Lange (@BillLange1968)

ATARI XL / XE (64K RAM, PAL AND NTSC)

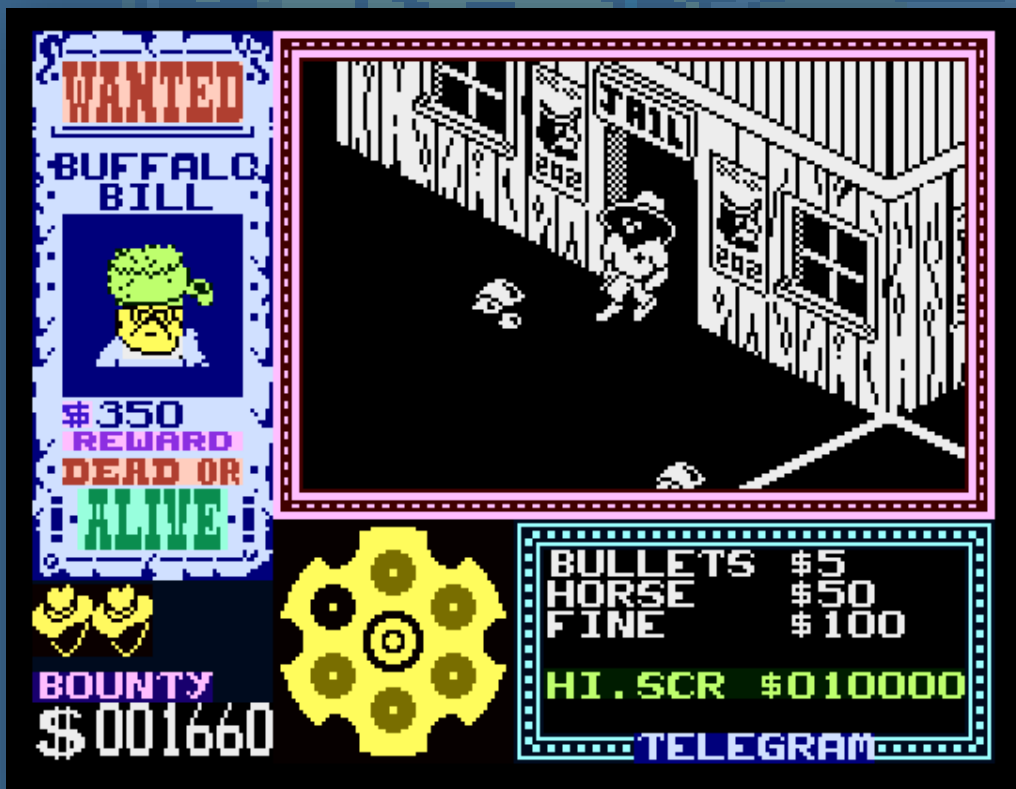
PRICE: FREE

Gunfright for the Atari 8-bit family of home computers is a new 2017 release based on the 1985 game of the same name for the ZX Spectrum, the Amstrad CPC and the MSX.

The Atari 8-bit version was created by AtariAge member Mariusz, with music by Saul Cross and graphics by Jose Pereira.

Acting as a sheriff in the Old West, the player must search the town and its buildings for various outlaws as indicated by an on-screen Wanted Poster. As you move the sheriff about the town, the buildings are replaced by an outline, if it blocks your line of sight. The building will reappear once it is out of your

view.



line of sight. Random town's people will help you out by pointing in the general direction that you need to go. If you collide with the townsfolk, you will lose one of your three lives. Once you find the outlaw, there will be a shootout mini-game to determine the outcome.

As the levels increase, so does the speed of the game. Tumbleweed starts to blow through the town's streets and the outlaw may be on a horse, *Monty Python and the Holy Grail* style, requiring you to find a horse as well.

As the game uses an isometric view, you may find controlling the sheriff is a bit easier if you hold the joystick with the fire button pointed up as you might in Q\*Bert.

Gunfright is a one or two player game which requires 64KB RAM Atari 8-bit. It works on both NTSC and PAL systems. The player can select either joystick or keyboard input control.

An .ATR disk image file, a .XEX executable and the full source code were released, for free, in April 2017. You can find them in the Atari 8-bit forum on AtariAge.

#### DOWNLOAD LINK

<http://atariage.com/forums/topic/264005-new-game-released-gunfright/>



## EIGHT BIT SCORE

### GRAPHICS

Gunfright's graphics are highly detailed and colorful, though the main playfield area is black and white. The animation is good.



### AUDIO

The sound effects are ok, but the synthesized Old-West themed music is outstanding.



### PLAYABILITY

On the Options screen, the response time to user input seems to be slow. During gameplay, the isometric view requires the player to move on the diagonals.



### LASTABILITY

While the town seems to stay the same, the location of the outlaws changes from level to level and from game to game. Gunfright throws new challenges at you as you move up in levels.



### OVERALL

Once you get the hang of it: the isometric view, using the controller and following the townsfolk hints, Gunfright is a fun and enjoyable game with good use of the Atari 8-bits graphics and sound capabilities.



# ATARI NET

Reviewed by Bill Lange (@BillLange1968)

ATARI 400, /800 / XL / XE (48K RAM, PAL AND NTSC)

PRICE: FREE DOWNLOAD

AtariNet is a modern homebrew by SlorSoft for the Atari 8-bit family of home computers. AtariNet is a port of the fun and addictive NetWalk puzzle game for the Palm OS by Beilks as well as other games with similar gameplay for both classic and modern platforms.

AtariNet was announced in August 2015 as a limited run of 50 AtariNet game cartridges. The cartridge release uses a 16K ROM and a custom label with the classic brown Atari

<<<LEFT CARTRIDGE cartridge case of the early Warner Communications Company years that we all know and love. If you were lucky enough to get one of the first ten cartridges released, a serial number was embedded by the developer and displayed in the game. The price for one of the 50 officially released cartridges was \$20 plus shipping, a great price for a small cartridge run!

AtariNet is a fairly simple game to understand, no instructions are needed. The player rotates



various network connections and nodes, using either a joystick, an Atari ST mouse or the keyboard, attempting to complete a random circuit in as few moves as possible. To win, every connection and node must be connected, there are no loops or orphans allowed. AtariNet has four levels of gameplay: Beginner - using a 5x5 grid, Easy - using a 10x5 grid, Normal - using a 10x10 grid and Hard - using a 20x10 grid. As the level of difficulty increases, it gets insanely hard to complete the circuit in a reasonable number of moves.

While the graphics and sound are simplistic, they work well with this game. The shortcomings are few. It would have been more user-friendly if you could restart a completed game from the joystick or mouse button, for example. Otherwise, this fun, challenging and highly addicting casual puzzle game should be a great addition to anyone's Atari 8-bit software library.

A few months after the cartridge release was sold out, SlorSoft graciously made the binary file of the game available as a free download. It can be used with an Atari 8-bit emulator or it can be loaded onto a physical Atari 8-bit home computer, the way it was meant to be played! You can find the binary file for download in the Atari 8-Bit Computer forum on AtariAge.com.

AtariNet requires an Atari 8-bit (NTSC or PAL) with at least 48K RAM with optional joystick controller or Atari ST compatible mouse.



#### DOWNLOAD LINK

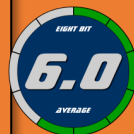
<http://www.slors.net/a8/atarnet10.zip>



## EIGHT BIT SCORE

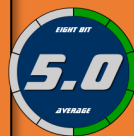
### GRAPHICS

AtariNet does not take full use of the legendary graphics capabilities of the Atari 8-bit. It uses mostly simple line-drawing type characters and a few colors.



### AUDIO

AtariNet takes advantage of even fewer of the superb sound capabilities of the platform, using a simple sound while rotating pieces and a short randomly generated sound effect when the puzzle is successfully completed.



### PLAYABILITY

The gameplay is fast and responsive. Puzzle pieces rotate quickly. Even at the hardest level, it takes less than 10 seconds to generate a 200 cell puzzle. The choice of input devices is a nice feature.



### LASTABILITY

Like Solitaire, this casual puzzle game has enough combinations and difficult levels to keep you coming back to beat your high score, without a substantial investment of time.



### OVERALL

The randomly generated playfield allows for numerous puzzle combinations. Four levels of difficulty allow for the player to start with a puzzle at their skill level. The graphics and sound, while simple, works well for this type of game. Having a new physical cartridge is nostalgic. You can't beat the price.



# PROJECT ZX

Reviewed by John Kavanagh • PC • PRICE: Free download but donations accepted

It's 1982. Clive Sinclair is unveiling his new home computer, the ZX Spectrum. The computer is to help with education but the kids that received the beloved ZX Spectrum are thinking differently, they are using it to play games!

Clive is furious at the misuse of his invention. He turns red with rage and returns to the Sinclair lab to make a few adjustments to his creation. Before long, every single sprite from every single Spectrum game you've ever played come spilling out of the computer to wreak havoc on the uneducated world. Fortunately, you are equipped with a jet fighter that is capable of shrinking in size, flying inside the modified computer and blasting away all those evil sprites.

As you can see, the game backstory is totally bonkers. Project ZX, created by Richard Langford, is a homage to the Spectrum, and in the true style of 1980's gaming, a crazy background story is a part of that homage. You play the game piloting a fighter ship, blasting your way through multiple levels, R-Type style but this time you must avoid Spectrums, cassette tapes, microdrives and issues of Crash magazine!

After defeating the first stage boss, which is Clive Sinclair in a Sinclair C5, your fighter is pixelated and shrunk down to size, giving it more of a ZX Spectrum type of graphics. Then the game starts proper, the 'Ultimate Play The Game' level. This level feels and looks more

## DOWNLOAD LINK

[www.langfordproductions.com/projectzx.html](http://www.langfordproductions.com/projectzx.html)



retro and enemies and graphics morph from one Ultimate game to the next, such as Jet Pac, Knight Lore and Underworld. However, the gameplay remains similar, but this time you're blasting away sprites from well known games.

As the game progresses there are references to many other software houses such as Bug-Byte, Ocean and Gremlin. At the end of each level is







a boss character from a retro game to fight. Then it's on to the next level. There's even a cool ZX81 bit. No audio, and in black and white like a real ZX81.

There are over 100 classic games to blast your way through until the end where you encounter Clive Sinclair for the final battle. The controls are the cursor keys for movement, the CTRL key for firing. Holding down the CTRL key builds up a firing blast. The controls are redefinable. You start with six ships and while the game is difficult, the game doesn't require you to go back too far on restart. There are also power-ups and extra lives to collect on the way.

As you progress through the game you will have access to a virtual bookshelf where you can check out the game covers and listen to the music of the levels you completed.

Project ZX is a nostalgic trip through the most enjoyable games for the ZX Spectrum that will keep you coming back for more. The only downside is that it can be frustrating at times but the rewards are worth it. It's a free to download but consider making a donation as it is a fun, enjoyable and well polished game.

## ***EIGHT BIT SCORE***

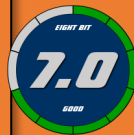
### ***GRAPHICS***

Retro style graphics at its best. Really catches the style of the games it's paying homage to. The story graphics at the beginning are polished and well presented.



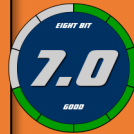
### ***AUDIO***

Music is enjoyable and the sound effects, while nothing specular, are spot-on.



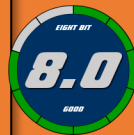
### ***PLAYABILITY***

It's frustrating but practice does improve gameplay. The controls are straightforward and responsive and collection-detection is spot on.



### ***LASTABILITY***

Once completed I don't think there's much to come back for, but you will feel the need to keep coming back until it's completed, just to see what's next.



### ***OVERALL***

A fantastic homage to the Sinclair Spectrum even if it is frustrating to play at times.



# CHIBI AKUMAS

## Episode 1: Invasion!

Reviewed by George Bachaelor • Amstrad CPC • PRICE: FREE DOWNLOAD

Bullet hell shooters, if you're an avid gamer you probably have seen and played your fair share over the years but when it comes to the Amstrad CPC though, they are rare, so rare in fact that since 1984 when the CPC 464 was first released, there have only been two bullet hell shooting games ever made and they were both released last year, in 2016.

The first was released at the 2016 #CPCRETRODEV game creation competition called Dragon Attack, coded by Bitplane Technomantes and the second ever Amstrad CPC bullet hell game is called Chibi Akuma Episode 1: Invasion, coded by Keith Sear, an expat Brit, living and working in Japan, who describes the game as a "Spoof Gothic Horror shoot em up."

What or who is Chibi Akuma Episode 1: Invasion, I hear you ask? I was asking myself the same question when I first saw it. A quick look on google shows that the word 'Chibi' is Japanese, meaning a child-like character with exaggerated features, particularly in anime. 'Akuma', is Japanese for "Devil" or "Demon". So in English, it could mean something like 'little devil'.

That's exactly the type of character you play in Chibi Akuma Episode 1: Invasion. A young but very naughty girl known as Chibiko remains an undead child vampire, killed by divine intervention of God and banished from the underworld for her unforgivable misdeeds. You

might think Chibiko would be happy not being sent to Hell, but as life would have it a hoard of noisy, ugly, cliché, and badly drawn monsters are invading her land, and causing a ruckus in her castle (i know how Chibiko feels as it sounds just like my real life battle with all the roadworks outside my front door going on Since January this year and I just can't get any sleep!).

Chibiko is having none of it, she rises from her grave, taking flight in a left to right sideways scroller to use unholy magic and unleash hell in a bid to annihilate all the monsters at the source.

For a vampire, Chibiko looks rather cutesy, don't let that fool you as you quickly discover Chibiko is a vampire far from cute - throwing insults aplenty, using foul-mouthed language, going crazy with non-stop shooting, using smart bombs to blow up all sorts of evil creatures invading her castle. I would think that if this game had been released commercially back in the day it would have found it being censored



like Renegade from Ocean / Imagine was in 1987, do you remember they were forced to replace the red blood with blue?

Chibiko is attacked ferociously bullets are sprayed from her enemies at will, their firepower so intense it covers the whole screen. If you make to the end of a level there is some stupendously awesome-looking end of level bosses – sound like your kind of game? Well, it is my kind of game, one that is truly unique on the Amstrad CPC. Even more impressive is that it's hard to believe that coder Keith Sear only learnt Z80 programming last year and put the game together in 5 months during his spare time.

It's all sounding good so far but just how does it play you ask? There are a few things I don't like in this 4 level bullet hell shooting spree is the normal square shaped bullets they look naff as bullets, however I asked coder Keith Sear why are the bullets this way he replied "because there are so many bullets, I have to draw them fast by making them a 2x2 pixel square, I can draw 1 bullet by changing only 2 bytes, and only doing one 'next line' command, if they were a 4x4 pixel 'circle' I would have to use change 4 bytes and 3 next line commands, so the 'cost' of plotting the bullets would go up a lot, just to make it clear, the bullets are not 'sprites' - there is no bitmap data that is used to draw them - the bullet code knows how the screen works, and alters the bytes of the screen to save time. The other dislike about the bullets is that they are the same colour for both you and your enemy, meaning it can get confusing often.

The power-up curse cubes are a different colour so that sort of makes up for it. On the plus side, I found it to be a most enjoyable game, the only time damage hurts Chibiko is when enemy bullets hit



**ZX SPECTRUM AND MSX**  
Spectrum and MSX versions coming soon, keep an eye on [chibiakumas.com](http://chibiakumas.com) for updates.

her heart which is shown by a small red dot. The specific hit area means you can weave and dodge enemy fire quite easily and blast away almost to your heart's content. The speed of the game is quite fast without too much slowdown at all, which I was kind of expecting with so much happening on the screen. It's just so much fun shooting and blasting away at everything.

Graphically it's no Rembrandt, but in certain parts it does make your jaw drop. In particular, I loved the Spider Skull boss, know as 'Skulder, it's just so freakin' cool.

The cut scenes are fantastic, with lots of fun bits of humour. A fantastic tune plays throughout, which is really addictive. I am really looking forward to Chibi Akuma's Episode 2: Confrontation when it comes out around October this year as it is boasting even more features and even more humour.

Chibi Akuma Episode 1: Invasion, is much different than the average Amstrad CPC shoot em up. What sets it apart is that the game is jam-packed with features, in particular arcade gaming type features.

- Furious firepower saturated action with up to 256 enemy bullets onscreen at all times!
- Twin Movement speeds hold a fire button for slow precise movement to weave around the enemy fire.
- Don't take it in the back - Two fire buttons for Dual direction shooting action!
- Send More Firepower! Collect "Curse Cubes" to Max your your evil magic!
- If it moves, you can kill it: Use Smart-Bomb-Scrolls to Blast everything away - 3 per continue.
- Insane Coin munching arcade action: 99 continues so you can die, be resurrected and die again!
- 'Superior' technical capabilities! "High Res" 320x200 4 color mode 1 graphics.
- Raster palette switching, for 8 colors in 4 colour mode!
- Full screen scrolling gameplay - Edge to edge action with parallax (sort of!) - no 256px wide gaming here - eat that speccy users!
- CPC plus enhancements - 16 color sprites for the player character, and UI elements.
- Multiple graphics systems - Uses fast Pset sprites, "byte-key" transparency, double-height interlacing, and supersized compiled and compressed sprites!
- Works, and takes advantage of all CPC systems 464, 664 or 6128 with better animation and cartoon loading screens. Plus sprites work on 464 plus and 6128 plus!
- Unique 'features' - Cartoon Loading screens and Cut sequences.
- Over a dozen 96x96 mini screens in the introduction alone!
- An advanced Insult Simulator!

- 'Chibiko Scoring System (TM)' will review your gameplay - and tell you how badly you sucked!
- Lousy Humor! Bad Jokes in poor taste!
- Stupid and weird enemies! Rude and insulting language! A pathologically insane 'heroine'!
- And a zombified parody of a popular cartoon character! what more could you want?

**FREE DOWNLOAD**

[www.chibiakumas.com](http://www.chibiakumas.com)



## ***EIGHT BIT SCORE***

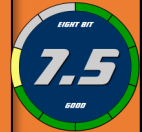
### ***GRAPHICS***

No Rembrandt but it has its own unique coolness, sprites and animation clear and it all looks rather nice in mode 1 at a screen resolution of 320x200.



### ***AUDIO***

Catchy possibly addictive. Some cool in-game firing and hit sounds.



### ***PLAYABILITY***

Smooth scrolling, heaps going on screen maybe too much? Pick up and play with ease, a little tricky getting to remember to switch and fire both ways.



### ***LASTABILITY***

4 levels to complete and a lot of lives and you'll need them too.



### ***OVERALL***

Just good shooting fun.



# 7 new C64 games by **POND SOFTWARE**



I Am the Flashing C64 Cursor  
Bonkey Kong - Winky Blinky  
Dog - Goblin - Super Ski  
C64ColQuiz

<http://pondsoft.uk/>



# THE BEAR ESSENTIALS

Reviewed by John Kavanagh • Commodore 64 • PRICE: £15 Disk, £10 Tape, Free Download

We featured Pond software in Issue 3 where we interviewed Vanja Utne and the rest of the team. It's about time we review one of their excellent games, this time it's *The Bear Essentials* by Graham Axten.

You probably know the story by now. Winter is coming and bear has been lazy. He didn't collect enough apples to survive winter and Mrs. Bear is furious. As Bear, you must collect 326 apples for you and your family to survive winter.

The game is a non-scrolling platformer, in that once you reached an exit, the next screens appears. Each screen has apples and creatures positioned at different areas. Touching any of the other creatures is an instant loss of one of your five lives. There are frogs, snails, bees and birds to deal with plus many more. All which are all animated beautifully.

The apples are positioned at different areas of

## DOWNLOAD OR PURCHASE

<http://pondsoft.uk/bear.html>

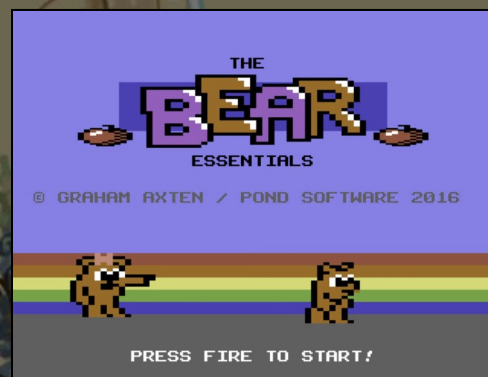


Downloading is free but a extended boxed 5.25 disk version is well worth it. It comes in an A5 jewel case with a 12 page colour manual for £15 with free worldwide postage. The tape version will be available soon for £10.

difficulty. Usually an exit to the next screen is a hole in a tree. Sometimes there are multiple exits so it can be easy to forget to return to a screen to collect the apples. If you manage to lose all of your lives, and you will, you can jump to later stages by entering the three digit code that is giving to you at the beginning of each stage. However, you also have a certain amount of continues and you can continue from the last check point room you visited.

Each of the six stages has 60 screens and vastly different graphics and music style throughout to keep things interesting. The stages are Home, Forest, Cloudy, Rocky, Jungle and Mine. You can play the different areas in any order you like but you must complete the other five before attempting the mine stage.

While there are 60 creatures in the game, their AI is non-existent and they just follow a predetermined path. However, the game is still enjoyable and the lack of AI doesn't take away from it. I do enjoy the relaxed pace of the



game, there are no timers to worry about. Bear won't die either if he drops from an extreme height. This is not to say that the game is easy, but completion feels possible even for an average player. You can lose lives fast if you rush in but you soon realise it's best to take things easy. The real difficulty is trying to get certain apples. Sometimes you have to drop down from another screen to grab them, so memory and timing are key, but persistence usually pays off.

Graphics are fantastic, spot on, especially the animation. Music is okay, nothing special but nice. Sound effects are functional and suitable for the game. You have the option of turning the music on and off too, although my preference would be to leave it on.

The paid version do have a few extra screens and some extras. It's also presented in a nice case with a manual and a few extra goodies. I personally haven't purchased a copy yet, terrible I know but from what I've seen online, it's well worth getting a physical copy.

The Bear Essentials is perfectly implemented, and importantly, enjoyable to play. The controls are tight and the option to allow the player to change direction in mid-air is a good decision. This is one of the better games released for the C64 games in the past year.



## EIGHT BIT SCORE

### GRAPHICS

Cute graphics, well animated. Stages are different enough to keep the game interesting.



### AUDIO

Enjoyable music with suitable sound effects.



### PLAYABILITY

Good controls, easy to get into. What more can be said?



### LASTABILITY

I can see one coming back to the game from time to time due to the cuteness and relaxing gameplay. The continues and level passcodes encourages completion.



### OVERALL

You won't be disappointed. One of the best games for the C64 in the past year.



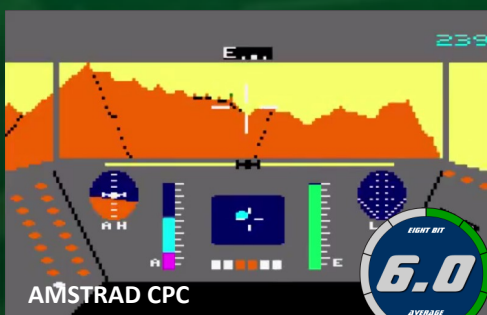
# RESCUE ON FRACTALUS!

Reviewed by John Kavanagh • Atari 8-bit • Released 1985

A number of downed pilots must be rescued before they succumb to the toxic atmosphere and hostile environment of the planet Fractalus.

To rescue each pilot you must land your space ship close to their ship while avoiding enemy fire and jaggy mountains. Once landed, you must turn off your shields and engines as the pilot to be rescued run towards your ship. As you hear banging on your ship by the pilot you must open the airlock to let him in. Be careful, as there

aliens pretending to be downed pilots, if they get into your ship it's game over. Occasionally you see them pop up in front of you, trying to smash your ship to pieces. While it's certainly a jump out of your seat moment, a quick turn on of the systems will fry the alien. Once enough pilots are rescued you can return to your mothership and start the next level. While the first few levels are easy enough when you get used to the controls, the difficulty level does increase as the game goes on.







THE TOXIC ATMOSPHERE OF FRACTALUS



A JAGGI (ALIEN) PRETENDING TO BE A DOWNED PILOT

The game uses fractal technology to create the mountains to good effect. The mountains move along at a fair pace, slightly sluggish but still impressive for an 8-bit computer. The game really takes advantage of the Atari's hardware, making good use of its fast processor and custom chips.

The game is full of atmosphere which really brings you into the game. The sound effects, while simple, are put to good use and the graphics, while blocky, are good. The pilots running towards the craft are done to good effect. The only let down is the simply drawn

cockpit of your Valkyrie spacecraft. It's also the only view in the game. A fun game, even if it is a bit basic. It's just a shame that the other versions for different computers weren't as fun.

## OTHER VERSIONS

Other versions didn't fare as well as the Atari original. The ZX Spectrum version is extremely ugly, while the Commodore 64 version is slow in comparison to the Atari. The Amstrad CPC version has sluggish controls and a small viewing screen. The Apple version is not bad but still nowhere near as enjoyable as the Atari version. The CoCo version is better looking than the Atari but much too slow.



## EIGHT BIT SCORE

### GRAPHICS

Impressive use fractal technology. The same technology that was used to create the Genesis effect on Star Trek II: The Wrath of Khan.



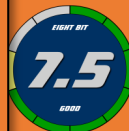
### AUDIO

No music but a good use of sound effects to create tension and to absorb you into the game.



### PLAYABILITY

Once the controls are mastered, the game plays well. Movement is impressively fast considering the strain on the CPU to produce fractals.



### LASTABILITY

16 levels that keep you coming back for more.



### OVERALL

A fun, atmospheric game that makes full use of the Atari's hardware.



# THE TECH ZONE

## John Kavanagh takes an in-depth look at the M4 board, a mass storage device that is also a ROM board and WiFi adapter for the Amstrad CPC.

The M4 board has so many possibilities that it's hard to know where to start. Firstly, it's a proper mass storage device in that files and folders can be created on it directly from BASIC and disc images can be accessed with ease. This compares favorably against the Zaxon floppy emulator that was reviewed in Issue 1 as that could only open disk images from a floppy emulator manager thus limiting user control. Secondly, the M4 also acts like a virtual ROM board and lastly, it offers WiFi access to your CPC in which software can be downloaded directly from the internet. This even allows the CPC to have a real-time clock of sorts.

When I received the board there were no instructions, just the device in an anti-static bag. Luckily, being a regular to the CPC Wiki forums I knew there were instructions available from Spinpoint: [www.spinpoint.org/cpc/m4info.txt](http://www.spinpoint.org/cpc/m4info.txt)



Getting started I formatted a microSD card to FAT 32, copied a few dozen disk images over and inserted the SD card into the M4. When plugging in the device and turning on the computer I was presented with the standard start-up screen along with an extra line of text showing that the M4 was working.

### WiFi FOR THE CPC

The first thing I wanted to do was to get the WiFi working. With a quick look at the online instructions I typed:

```
|NETSET,"name=CPC464, ssid=vodafone-EDC2, pw=xxxxxxxxxxxx, dhcp=1, dns1=8.8.8.8, dns2=8.8.4.4"
```

and of course, eagle-eyed CPC users will know it won't work as I was working on a 464. The 464 uses Locomotive Basic 1.0 which doesn't allow parameters to be directly inputted into RSX commands.

For those who don't know, RSX commands are those which are preceded by RSX bar (the button right of P when pressed with the SHIFT key). RSX stands for Resident System eXtension and allows for extra commands to be added to BASIC. To enter the above with a CPC 464 one must type:

```
A$="name=CPC464, ssid=vodafone-EDC2, pw=xxxxxxxxxxxx, dhcp=1, dns1=8.8.8.8, dns2=8.8.4.4"
```

```
|NETSET,@A$
```

It does get annoying as it has to be done with all commands where parameters are passed but it isn't the fault of the device but limitations of Locomotive BASIC 1.0. Understanding the |NETSET command is easy, NAME can be anything you want, in this case I choose, CPC464. SSID is the name of your access point, usually listed on your router. If you don't know what it is, just have a look at the back of your WiFi router or you can use your smartphone, tablet or laptop. It'll be the network you're connected to, in my case,

Vodafone-EDC2. PW is your WiFi password. All other settings can be left the same. Provided everything is entered correctly, the |NETSET command won't need to be typed again as a config file is automatically saved to the M4's SD card. The next time you turn on the CPC the WiFi should be ready almost instantaneously.

Once a connection is made, typing |NETSTAT will give you the IP address that's assigned to the CPC. In my case, it's **192.168.1.10**. I could either type that or **http://CPC464** into my Windows PC browser to access the web interface. There I can upload files directly to the CPC, make directories, add or change ROMS and change the network settings.

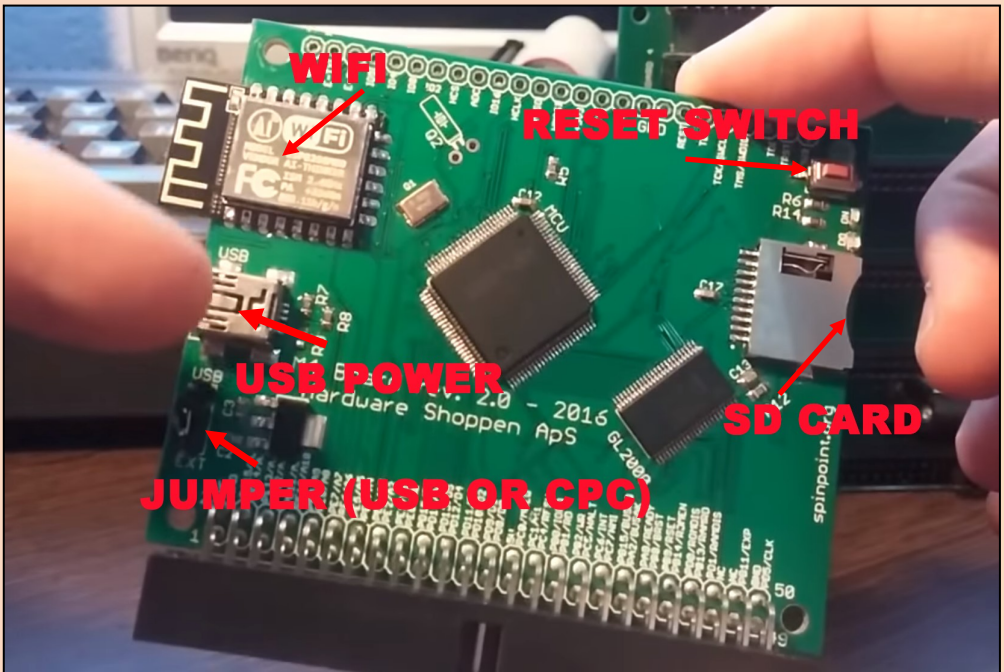
The first thing I did was transfer an Amstrad CPC disk image from my PC to the M4 using the web interface. Once transferred, typing CAT on



THE START UP SCREEN WITH THE M4 BOARD INSTALLED AS WELL AS VIRTUAL MAXAM AND PROTEXT ROMS

the CPC displayed the .DSK disk image. To access the disk image I typed the following on my CPC:

```
A$="3D_STUNT.DSK"  
|CD,@A$  
RUN "3DSTUNT"
```



EVERYTHING IS SELF EXPLANATORY EXCEPT FOR THE JUMPER. THIS IS USED TO SET THE UNIT TO BE POWERED FROM A USB PORT OR DIRECTLY FROM THE CPC. WE HAD NO ISSUES USING THE CPC AS THE POWER SOURCE.

The game loaded right way, faster than a disc drive. Truly impressive, especially on a 464 which doesn't EVEN have a FLOPPY DISC CONTROLLER. Not only did I transferred the disk image from a Windows PC, I could open the .DSK disk image directly with the **|CD** command on my Amstrad and list the directory, although I could not alter the contents of the DSK file.

I tried loading Chase HQ but the game hung. If the M4 could load all disk images it would be amazing but sadly not all disk images would load. The M4 does not emulate the floppy disc controller so copy protected games or games with custom loaders will not work. Luckily, many games online are cracked versions and will work fine. However, many games, even cracked ones, insist on displaying the message "Press Play on Tape" and then crashes. This has happened to both Batman The Movie and Afterburner for example. On disc based systems the games tried to continue loading from the 3-inch disk drive instead of the M4 device.

I then changed the M4 to slot 7 on the virtual ROM board instead of slot 6. I did this from the web interface and Chase HQ worked perfectly. Unfortunately, the other two games still had problems.

So what else can be done when your CPC connected to the internet? Well, you can see the time by typing **|TIME** but I'm not sure how useful that is as many people don't use their CPC for serious applications anymore. If you want something more interesting how about downloading a game directly from the internet? There are two commands for this, **|HTTPMEM** and **|HTTPGET**. The first downloads a file to RAM, while the second, downloads directly to the mass storage device. For example:

```
A$="spinpoint.org/battro.dsk"
|HTTPGET,@A$
```

downloads the file to mass storage, in this



SOFTWARE CAN BE LOADED FROM THE WEB INTERFACE

case, 190KB in a relatively fast 13 seconds. The possibilities available now that the CPC is connected to the net is endless. Another option is connecting to IRC which we will cover in a later issue.

### MASS STORAGE

As a mass storage device, the M4 works amazingly well with the CPC. Typing CAT into BASIC will catalogue the SD card. Locomotive Basic has no problem in reporting back the amount of free space on the SD card. In my case, it was 1,526,640 KB which is 1.45 GB. A ridiculous amount of space considering the small file sizes on the CPC. Windows 10 also reports 1.45 GB free on the 2 GB SD card.

The CAT command does have limitations in that it can only display filenames in the 8.3 format, using ~1, ~2 etc, to show that the filename is longer than being reported. Luckily the M4 fixes this with the **|LS** command which lists the filenames in their full length. To save you from typing long filenames the CPC's twin cursor and copy key comes to the rescue.

There's also the added **|DIR** command which can use wildcards, unlike the CAT command. For example, to find all files that start with 'C'

one would type:

```
A$="C*.dsk"  
|DIR,@a$
```

This will list all the disc images within a folder that start with the letter 'C'.

You can load software from tape by using the **ITAPE** command, just like on the CPC 664 and 6128 disc basic CPCs. Typing **|SD** or **|DISC** on the 464 will allow access to the M4 storage. On disc based Amstrads the **|DISC** command would access the floppy drive, and **|SD** to access the M4 device. There's also an option to load software from the web interface which can be faster, especially compared to the RSX limitations of the 464.

## VIRTUAL ROM BOARD

When the CPC was young, the more serious users had ROM boards connected to the back of their computers. Here they could plug in extra ROM chips such as the Protext word processor, and Maxam assembler, so that they can load their program in a split second with an RSX command. Some people would go as far as to purchase an EPROM programmer to program software on to 16K EPROMs (Erasable Programmable Read Only Memory) themselves.

ROM boards were often self-made from following articles in magazines such as Amstrad Computer User or Everyday Practical Electronics. Each board contained a number of ROM slots. With the M4 you won't need an extra board on the back of your CPC nor go searching for ROM chips and EPROM programmers as the M4 has a virtual board built in. It's actually where the M4 stores its commands, on a virtual ROM chip. To my delight, adding virtual ROMs was a piece of cake. It could be done from the web interface



NETWORK SETTINGS CAN BE CHANGED DIRECTLY FROM A MODERN COMPUTER, TABLET OR PHONE

or from the CPC with the **|ROMUP** command. ROMs can be downloaded from the CPC Wiki at [www.cpcwiki.eu/index.php/ROM\\_List](http://www.cpcwiki.eu/index.php/ROM_List)



After I added the Protext ROM, rebooted and typed **|PROTEXT**, a flash of the screen and Protext appeared on the screen, ready to be used. Typing **|HELP** on the CPC gives a full list of ROMs installed, typing **|HELP,n** where 'n' is the ROM number gives a list of RSX commands that can be used with that ROM.

## UPGRADING FROM BASIC 1.0 TO 1.1

As mentioned above, entering RSX commands on a 464 is a pain. Luckily with the virtual ROM board, we can upgrade the 464's BASIC to version 1.1, the same as on the CPC 6128.

To do this we need to download two ROMs, the BASIC 1.1 ROM and the CPC 6128 ROM. Then it's just a matter of uploading the OS ROM to slot 31 via the web interface and ticking "Enable Lower-Rom". Upload the BASIC 1.1 ROM to slot 0 and restart the computer. You now have a 464 that thinks it's a CPC 6128.

## USEFUL FEATURES

Another useful feature of the M4 is that you can save a BASIC program as AUTOEXEC.BAS in the root directory and that program will load on restart. The only issue is that the escape key doesn't work when the program runs. I found that a bit strange but the program can be removed via the web interface, avoiding a possible never-ending loop.

Upgrading the firmware is easy, just type **|UPGRADE**, wait a few seconds, restart, wait another few seconds and you're done. The maker of the board is constantly adding new features so it's worth upgrading once new firmware is available.

## OVERALL

We thought it would be interesting to test to M4 working alongside the Zaxon Floppy Emulator and I'm pleased to say that they both work perfectly together. The advantage of the

Zaxon Floppy Emulator is that it emulates the floppy drive precisely so every game we tried, worked flawlessly. The downside to this was that the Zaxon performed at roughly the speed of a real 3-inch floppy drive. The M4 is lightning fast in comparison but as mentioned previously, doesn't emulate a disc image precisely so some games won't work. Both are very different devices and now that I have both I can't see myself being satisfied with just one device.

The M4 is an amazing device that we haven't yet seen at its full potential. The mass storage aspect of it is worth the purchase alone and with WiFi and the ability to load ROMs, it's a must-have for those who do more than play games on their CPC. The M4 board (edge connector version) is € 43.50 plus € 3.50 shipping and is available from Duke on the CPC Wiki forums ([www.cpcwiki.eu/forum](http://www.cpcwiki.eu/forum)). Send him a friendly PM for availability.



THE M4 BOARD AND THE ZAXON USB FLOPPY EMULATOR WORKING TOGETHER

# F U L L Q U I E T

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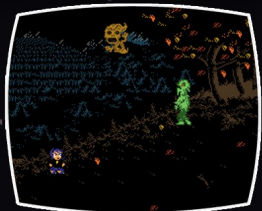
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# The Last Bit

The latest retro news and rumours from around the world.

## DOOMSDAY PHYSICAL EDITION

Reviewed in Issue 2 of Eight-Bit, the excellent Domsday: Lost Echoes will now be available to purchase in a physical copy by the time you read this. There are two versions available, a 3-inch plus a 3.5-inch disk version for 25 Euro, or 2 x 3.5-inch disk version 20 Euro. You will also get a micro SD card containing the disk image as wallpapers, icons, concept art and more. It will be included a 24-page manual, stickers and

an A3 poster. All shrink-wrapped in a beautifully designed box. You can purchase it at: <https://www.polyplay.xyz/navi.php?qs=dooms>



## C64 RELOADED MARK 2

Individual Computers are taking pre-orders for the C64 Reloaded MK2 motherboards. For those of you who don't know, the C64 Reloaded is a brand new motherboard to fit inside a C64's case. You then have to add the chips such as the CPU, audio and graphics chip. Unlike the previous version of the motherboard, the MK2 will automatically identify chips without having to set jumpers. It will automatically adjust voltages and if the screen output is NTSC or PAL. Fitting the chips is a doodle with the use of ZIF (Zero Insertion Force) sockets, so you can have fun trying different combinations. For example, the early version of the SID chip has better audio and some versions of the VIC II outputs a clearer image than others. Interestingly you also have the option of having two SID chips fitted at the same time. You also only need 5 chips in total, as RAM and the PLA is supplied on the board.

The new motherboard also has S-Video and 3.5 mm stereo outputs. There's also a USB Interface for a serial link to configure the board with a terminal program. Best of all, you won't need your unreliable C64 power brick and the whole board can be powered with a single 12-volt power supply.

You can pre-order the motherboard up to the end of 2017 for 185 Euro at:

<https://icomp.de/shop-icomp/en/produkt-details/product/c64-reloaded-mk2.html>



## ULTIMATE 64

The Ultimate 64 is a FPGA implementation of the Commodore 64 AND Like the C64 Reloaded MK2, it is also designed to fit into a Commodore 64 case. Unlike the Reloaded MK2, no extra microchips are required.







However, there is an option to add a real SD chip if you wanted. It will have a 1541 Ultimate II+ built into it which means you will be able to load disk images with 100% hardware accuracy. It will have connections for cartridge/expansion as well as for a tape player. Video output will be provided by HDMI.



The product expects to sell for under \$200, depending on numbers. For more information and to express your interest, visit: [http://1541ultimate.net/content/index.php?](http://1541ultimate.net/content/index.php?option=com_content&view=article&id=74&catid=9)

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## AMSTRAD CPC RETRODEV 2017

The popular game programming competition for the CPC is in its fifth year running This year there are over €1,100 Euro in prizes. Last year's

competition resulted in 34 new games for the CPC, some were really enjoyable to play, such as Outlaws. Check out this year's competition at: <http://cpcretrodev.bytereadms.com/contest/cpcretrodev-2017/>



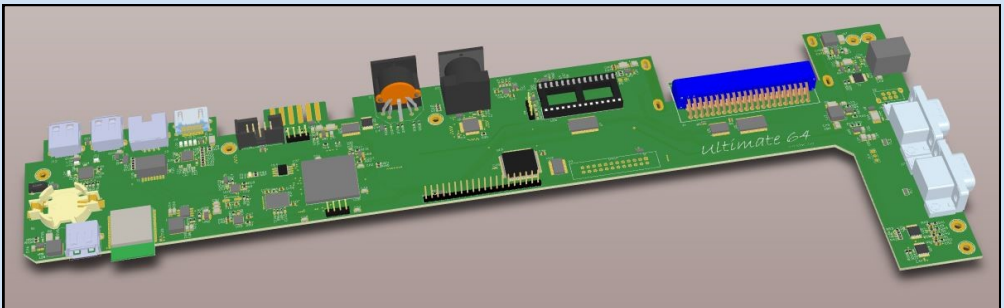
## BACKERS

Messages from our supporters:

**Phil Reichert:** Still waiting for the imminent release of the Commodore 65. Fingers crossed. Bubble Bobble will look great in 256 colours.

**@Tobobobo:** woz ere!

**L.J.L:** a=h Olssv hnhpu Slah. Dlss kvul mvy mpukpun aopz zljvuk opkklu tlzzhnl. Hz h yldhyk, hzr Thaaold mvy h wylzlua huk ol dpss npcl pa av fvb. Fvb hyl h clyf zthya npys ilpun hisl av iyhr aopz jvkl. Rllw svvrpun mvy jvkl huk mpukpun zljylaz! P svcl fvb, myvt Thaaold.



## SCENE WORLD AND C64.TV



Scene World #27 is out. Packed with interviews, tutorials and more. Download it now for your Commodore 64 (or emulator) at: <https://sceneworld.org/>

The people behind Scene World also recently launched a new website dedicated to the Commodore 64. Check it out at: <http://c64.tv>



## LUNIK 15 FOR THE AMSTRAD CPC



Previously known by its codename Project Goat, Lunik 15 is a pseudo rocket simulator and a point and click adventure in one. The aim of the game is to return to Earth after crash landing on the moon. It is being programmed by DefectoDigital, the same people who brought you the excellent Heroes Rescue.

## RESCUING ORC FOR C64

How far would you go to help a friend? That's the question asked in the new platform game for the Commodore 64. Your friend has gone missing and it's your job to find him. The game is spread over five different areas from perilous Rocky Mountains to the dark corridors of Bluestone Keep.

There will be a review of the game in Issue 5. For those of you who can't wait, the disk version is now available from: [www.polyplay.xyz/navi.php?qs=rescuing+orc](http://www.polyplay.xyz/navi.php?qs=rescuing+orc)



with tape and cartridge versions are available on pre-order.



## CRASH 2018 ANNUAL

Many Sinclair Spectrum users have fond memories of Crash magazine which was published between 1984 and 1992. Thanks to a very successful Kickstarter by Chris Wilkins, the magazine is back as a once-off annual. The editor of the magazine will be Roger Kean who was one of the editors of the original magazine. The artwork will be done by Oliver Frey, who of course, did the amazing artwork for the original magazine. So this is more than a homage to the original magazine, it's a continuation of it. The Kickstarter is over but you can pre-order it at: [fusionretrobooks.com](http://fusionretrobooks.com) for £15 Sterling or for £25 if you want the perks to go with it.



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