ISSUE 2

EIGHT BIT

The

TIPS 'n' TRICKS

Special

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PROGRAMMING

SPRITES

IN THE FIRST OF A NEW SERIES JOHN KAVANAGH HAVE A LOOK AT PROGRAMMING HARDWARE SPRITES ON THE COMMODORE 64 AND THE AMSTRAD 464 / 6128 PLUS RANGE.

The **TIPS 'n' TRICKS** *Special*

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WE GO IN SEARCH OF TIPS AND TRICKS TO MAKE YOUR RETRO LIFE A LITTLE MORE COMPLETE!

01: REPLACE A SCRATCHED UP FACEPLATE ON A 16K / 48K SINCLAIR SPECTRUM

EDITORIAL

Welcome to the second issue of Eight Bit Magazine. The support we received over the past two issues is nothing short of spectacular. In fact, it's as spectacular as the 8-bit retro scene has been in the past few weeks. With so many new games and hardware projects, it beginning to feel like the good old days again. The Amstrad CPC scene in particular is pumping right now with high quality games popping up one after the other.

Finally, I would like to thank those of you who made suggestions on improving the magazine. We have listened and have implemented many of your recommendations. We aim to grow and improve over the coming months.

Enjoy the magazine,

The Eight Bit Team

THE MAGAZINE FOR COLLECTORS AND USERS OF EIGHT BIT COMPUTERS

ISSUE 3

EIGHT BIT

THE COLLECTORS GUIDE TO THE

AMSTRAD CPC

PLUS: PROGRAMMING SPRITES PART 2, THE HISTORY OF CP/M AND MORE!
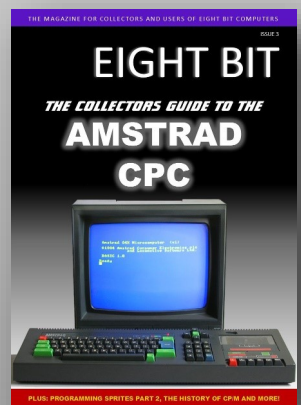
Issue 3 Coming Soon…

THE COLLECTORS GUIDE TO THE:

sinclair

ZX81

The 35 year old British micro that introduced affordable computing to the high street

Before the ZX Spectrum there was the Sinclair ZX81, the first low cost computer to be sold in a high street store. Here is your collectors guide to the Sinclair ZX81.

While the ZX81 never will be as popular as the later released ZX Spectrum, it does enjoy a passionate, some would say cult-like following. There are numerous websites dedicated to the little wonder, as well as the occasional game or hardware release. The reason for this becomes clear as you read on.

The Sinclair ZX81 was the successor to the ZX80, which was released a year earlier. As well as being a superior computer, it was also much cheaper. It was released in the UK on the 5th of March 1981 at a price of UK £ 49.95 Sterling in kit form and UK £ 69.95 assembled.

It was also the first cheap mass-market home computer that could be bought from a high street store such as W.H. Smith.

Having never owned a Sinclair product, I recently went a bit crazy and purchased two computers sporting the well-loved Sinclair badge. One being the Sinclair ZX81, the other, a Spectrum +2 which is a beautiful machine visually. Although some would say not as beautiful as earlier Spectrums, its sleek black colour and Amstrad styling is nevertheless pleasing to the eye. Opening the package which contained the ZX81 was somewhat shocking, I expected the computer to be small but not that small. The whole unit measured a little under 16.6 cm (6.5 inches) wide, 17.5 cm wide (6.9 inches), 4 cm (1.58 inches) high at the back and 2 cm high at the front. A little bigger than a portable DVD player. The weight

felt non-existent but I was told it was 350 grams (12 oz). The power supply was heavy as one might expect and produces 9 Volts DC. It has a power jack looking similar to a 3.5 audio jack! Thoughts of accidentally plugging it into a nearby mic or ear jack and destroying the unit flashed through my mind. However the manual offered reassurance that no damage to be done if this should happen. Still, I wasn't going to attempt such a pointless exercise.

The unit can handled between 7 and 11 Volts DC and requires only 700 mA. I imagine changing the jack on any suitable 9 volt adapter would work as a replacement power source if needed. However, I would recommend going for at least 1.2 Amps as was supplied on later versions.

There's no ON/OFF switch or even a reset switch. An inverted 'K' appears on the bottom left of the grey screen when the computer is turned on. There was difficulty getting a crisp image on the test TV which was a portable 14 inch TV from the 1990's. A bit of fine tuning improved the situation, although not as much as I would have liked.

The ZX81 uses a pressure sensitive membrane keyboard and is a bit of hit and miss when pressing a key. Touch-typing is definitely not an option on such a keyboard. While there are only 40 keys, each one can have up to five functions. For example, pressing the F key would print the BASIC "FOR" command to the screen, pressing it again would produce the letter "F" separated by a space. Pressing "SHIFT + F" would produce the "FAST" command. The F key can also produce a graphical symbol and the SGN function. Pressing "P" would display the "PRINT" command, pressing any of the character keys after that produces that character and so on.

Weirdly, when entering BASIC commands one cannot simple type "TO" in a "FOR" statement for example, instead you had to press "SHIFT + 4" in order for the "TO" to appear. Otherwise the computer would report an

THE ZX81 IN COMPARISION TO A MODERN KEYBOARD AND A 24 INCH SCREEN

error when entering the line despite it looking identical. You got the same situation with "AND" and "OR" operations which are accessed by pressing "SHIFT + 2" and "SHIFT + W" respectively.

The 8K built-in BASIC was based on the version supplied to the ZX81's predecessor, the ZX80, but upgraded with the much needed floating-point arithmetic. It isn't as forgiving as other versions of BASIC, in that you had to use the "LET" command to define a variable, and the difficult of entering data as mentioned above. It did have most of the expected commands such as INPUT, PRINT, GOTO, GOSUB etc.

THE HARDWARE

The 32 x 24 character monochrome screen is drawn with the CPU, a Zilog Z80A CPU running at 3.25 MHz. This puts tremendous pressure on the CPU having to process data, while maintaining the screen. Because of this the computer does not perform as one expects from a Z80 CPU. The problem can be solved

THE ZX81 OFFERED A WORKABLE (ALMOST) LOW-COST MEMBRANE KEYBOARD OVER MORE EXPENSIVE OPTIONS.
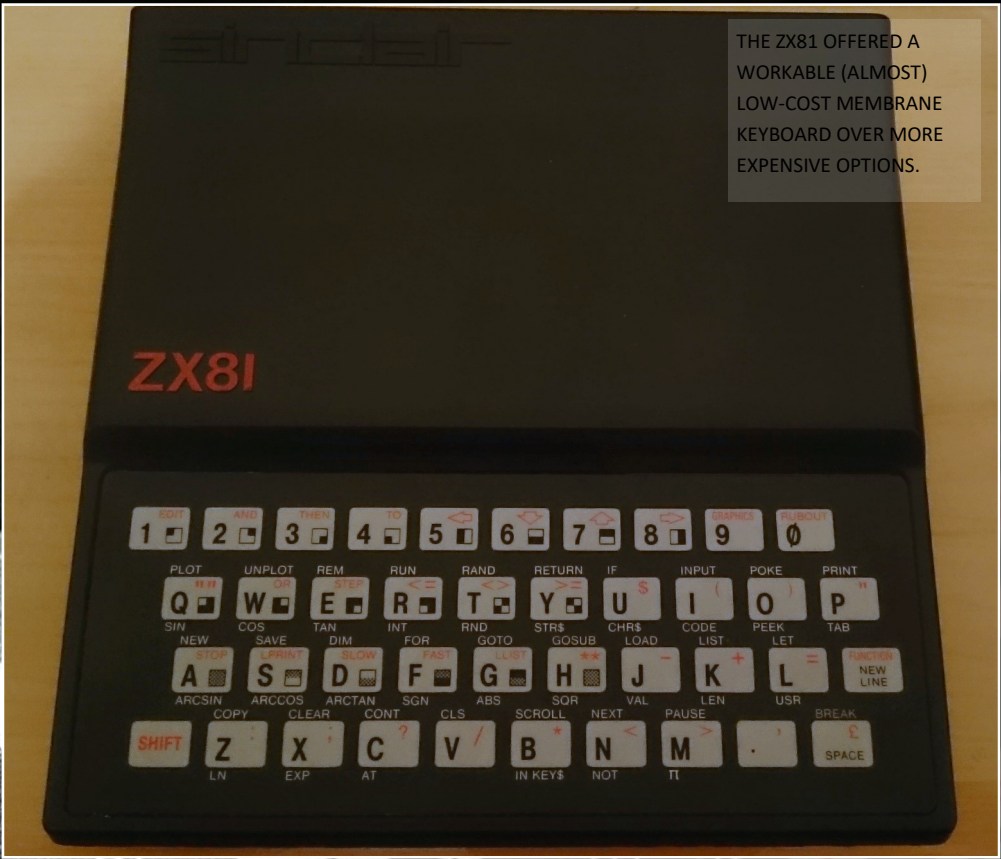
FROM LEFT TO RIGHT, TV JACK, EAR AND MIC FOR LOADING FROM AND RECORDING TO TAPE AND THE 9 VOLTS DC JACK.

by using the FAST command. On powering up the computer it is set to what is known as a "compute and display" mode. This means that the computer refreshes the information on screen while it processes data. The computer struggles with updating the screen and processing data at the same time. The following short program demonstrates this:

```
10 FOR A=1 TO 100
20 PRINT A;
30 NEXT A
```

The above took 36.7 seconds to reach the end of the program, where as a Sinclair ZX Spectrum running at 3.5 MHz would complete it in under 2 seconds. Using the US version only makes the situation worse, as NTSC requires the screen to be updated 60 times a second instead of 50. It would takes a whole minute on a NTSC system.

The "FAST" command fixes this, it forces the computer to only update the screen when it isn't processing data. Typing the FAST command causes a irritating flash on screen each time a key is pressed and when a program is running only displays a blank screen. It will however display the screen for INPUT statements and the PAUSE command. Using FAST mode the above program will count out 1 to a 100 in a little over 10

seconds. It's still not as fast as a ZX Spectrum but it is a much needed boost when processing data.

Officially the computer displays a graphic resolution of 64 x 48 using graphical symbols. However, a resolution of 256 x 192 is possible using a 16K RAM pack and some clever programming.

While there's no audio hardware, people have produced sound out of the computer by two methods. By rapidly cycling between the FAST
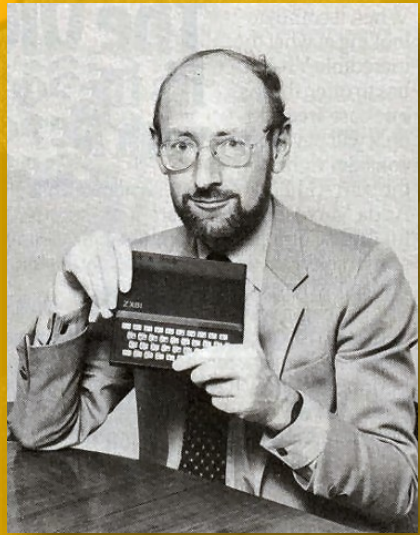
CLIVE SINCLAIR INTRODUCING THE ZX81
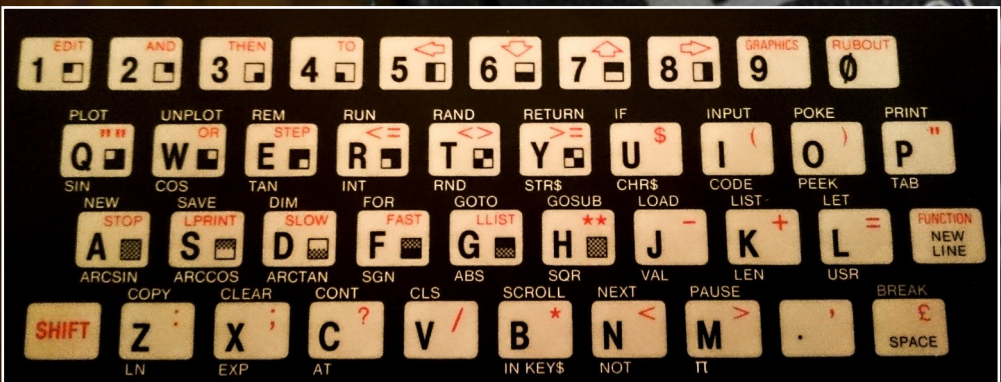
THE MEMBRANE KEYBOARD OF THE SINCLAIR ZX81

and SLOW modes and using the cassette port as audio output. As expected the results are primitive but can be entertaining.

There are only four integrated circuits in the computer, the CPU, ROM, RAM and the ULA. The ROM is 8K in size and the RAM is just 1K but can be upgraded to 64K with 56K being useable. The ULA is a little more mysterious.

Called the "dogsbody" in the supplied manual, the ULA was responsible for many functions. It synchronises the screen display, reads input from the keyboard and generates the timing for the CPU among other things.

Loading and saving data is done by a standard cassette recorder with an input socket for a microphone and a output socket to headphones. Reliability is hit and mess as volume levels can't be too high or low. However, by monitoring the zigzag lines that appear during loading, one can track these levels. The zigzag lines that appear are due to the ULA being unable to maintain the display while saving or loading data. Data was saved and loaded at modest rate of 50 baud. Considering the small size of the programs, this wasn't a problem.

SOFTWARE

The vast majority of available software was made up of games and education programs. There was even a word processor program but as mentioned above, you could not do any real work with the ZX81's keyboard. You'd be better off using your smart phone to write a novel! The games especially, have a charm to them and you can check out the best of them on pages 14 and 15.

RELIABILITY

Reliability was poor, with about one third of ZX81 returned within the first year. Sinclair claimed that the majority of the returns came

from the kit version where people inserted the ICs the wrong way around. Many ZX81s were also returned due to a square-root bug where when finding the square-root of 0.25, the incorrect result of 1.3591409 was given.

The weakest component in buying a used Zx81 today is the ULA, which can run very hot and is often the failing component on a broken ZX81. Replacements, either originals or a modern version programmed in to a CPLD, can be found online with a bit of searching.

FINAL CONCLUSION

I've read in a recent article that when it was launched the ZX81 was a useless computer, comparable to a expensive notepad. The writer of that article didn't grasp the potential of such a little machine. This was the first cheap computer that brought computing in to people homes and gave them the opportunity to experiment. Typing in commands and making things happen on a TV screen back in the early 1980's was truly amazing for anyone with even a bit of interest in technology. It opened up the world of computers to the average person leading them to wanting more.
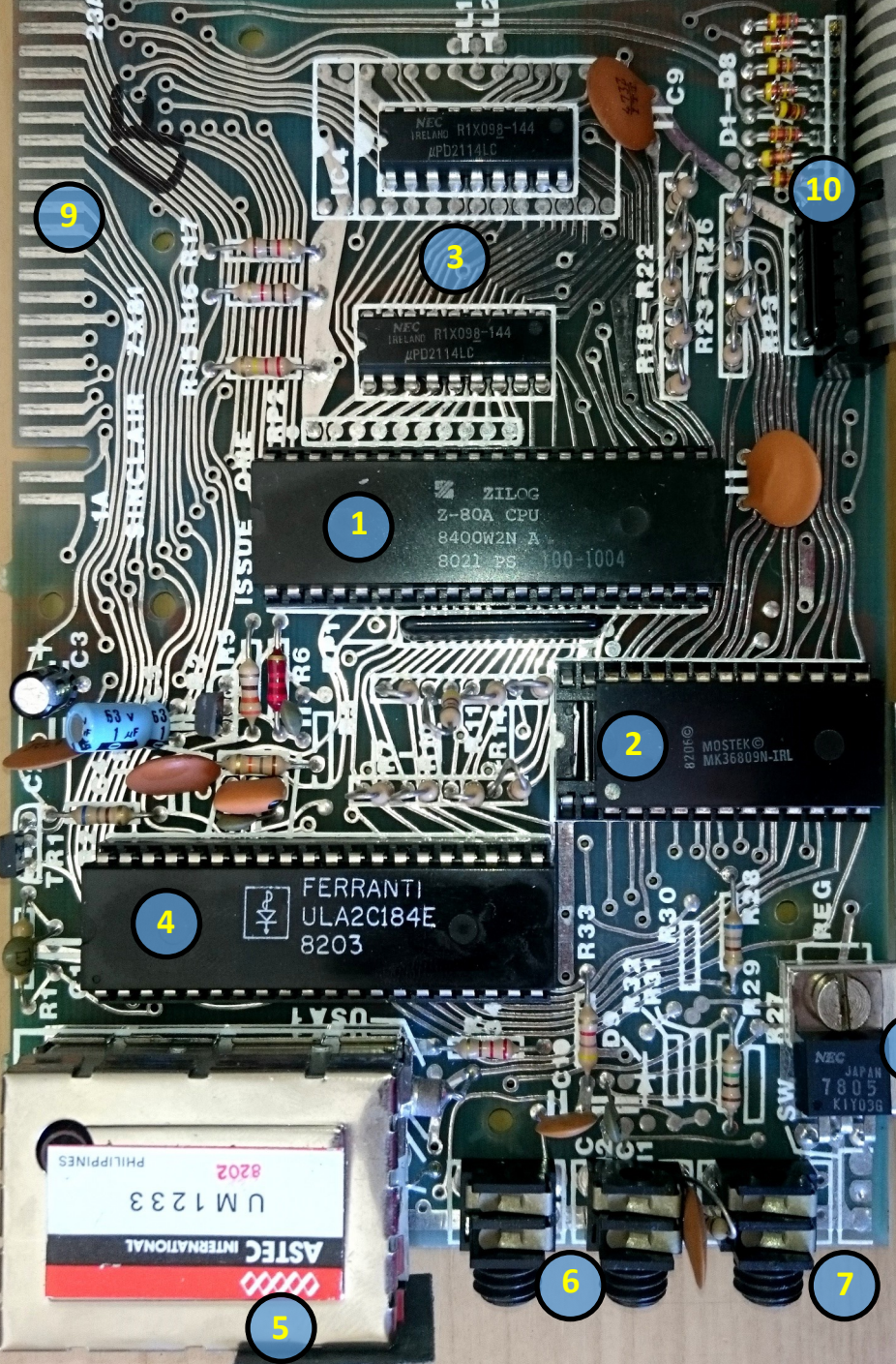
Today the computer is only an interest to collectors and those who had one in the past. You wouldn't buy such a computer for games for example as you would for a Commodore 64 or Sinclair Spectrum, as most games are extremely limited. Especially those games that only use 1K of memory. Having said that, I did enjoy seeing the little machine been pushed to its limits and I loved finally been able to play some classics such as 3D Monster Maze.

Having sold more than 1.5 million units over two years makes this a computer that was easily available at an affordable price. Well worth checking out if you have any interest in early home computers.

BACK

FRONT

① ZILOG Z-80A CPU 8400W2N A 8021 PS 100-1004

② MOSTEK MK36809N-IRL

③ NEC IRELAND R1X098-144 µPD2114LC

④ FERRANTI ULA2C184E 8203

⑤ ASTEC INTERNATIONAL UM1233 8202 PHILIPPINES

⑧ NEC JAPAN 7805 K1Y03G

⑨

⑩

INSIDE THE SINCLAIR ZX81

1. The CPU used in this example is the Zilog Z80A operating at 3.25 MHz. A NEC branded CPU is more common in the ZX81.

2. 8K ROM chip providing Sinclair BASIC.

3. RAM was provided by either two 512 bit chips or one 1024 bit chip.

4. ULA stands for Uncommitted Logic Array and was a method of reducing chip count by packing many functions in to a single custom integrated circuit. THE ULA on the ZX81 was responsible for generating the clock for the CPU and detecting keystrokes from the keyboard as well as processing the audio single to and from cassette. It was also responsible for producing the screen display.

The earlier Ferranti ULA2C158E and ULA2C184E ULAs were designed to work on black and white TVs and don't work well on colour screens due to the lack of a "back porch". This causes the picture to be very dark and lacking in contrast. The later ULA2C210E fixes this problem and should work fine with colour screens.

In this example on the left, the number 8203 refers to the week the chip was made, in this case the 3rd week of 1982.

5. RF modulator for connecting to a old style analogue TV.

6. The EAR and MIC jacks are used for output and input of data using two 3.5 mm jacks to a standard cassette recorder.

7. Power socket for 9 Volts DC.

8. The NEC 7805 voltage regulator smooths out any small variation on voltage input. It is screwed to a simple heatsink. This along with the ULA are the two hottest components.

9. Expansion port. Primary use is to connect a RAM pack.

10. Keyboard connector for the membrane keyboard.
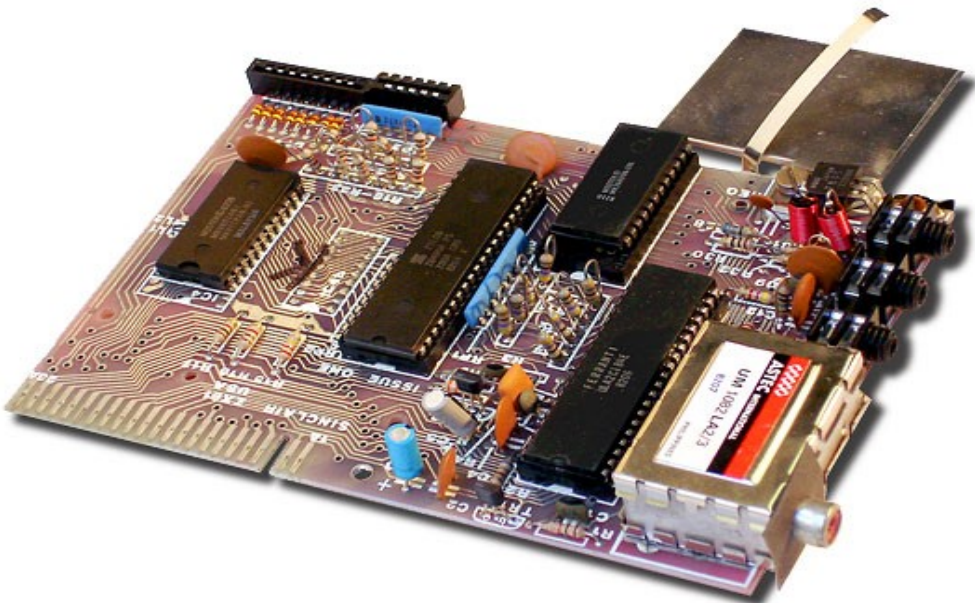
RECOMMENDED EXTRAS
GOING OLD SKOOL

A RAM is important to get the full experience of the ZX81 as the units 1K of RAM runs out quickly. 16K should be more than enough.

If you really want to experience the ZX81 the way it meant to be then a black and white TV is what you need.

A cassette player with mic and headphone jacks is required if you wish to load original tapes. Remember to get two 3.5 mono audio cables as well.

The printer that was available for the ZX81 is known as a spark printer. It required aluminium coated paper in which the surface is burnt away to reveal a dark underlay. Terrible but fun to play with.
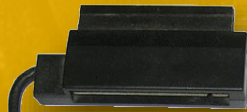
The Sinclair ZX81 manual written by Steve Vickers, gives the reader everything they need to known to get going.
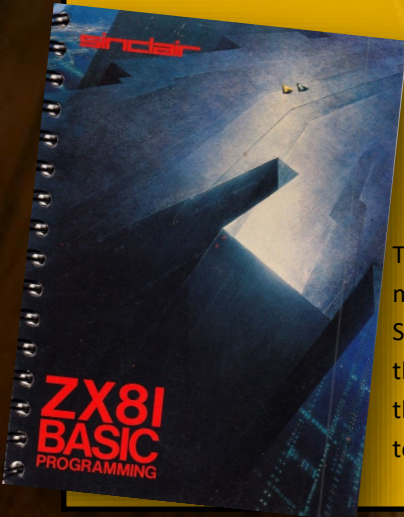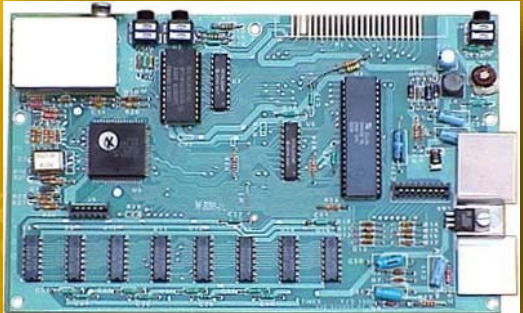
TIMEX TS1000 & TS1500

The Timex Sinclair 1000 (TS1000) is the North American version of the Sinclair ZX81 and was released in the United States in 1982. It had 2K of memory instead of 1K with slight differences in design. The keyboard "Rubout" key was changed to "Delete" although technically it was a backspace. "New Line" changed to "Enter". The unit also had better shielding probably to deal with more stricter electromagnetic interference regulations.

TIMEX SINCLAIR 1000 WITH RAM EXPANSION

The RF modulator was changed from PAL to NTSC as would be expected. Due to NTSC taking up more processor time on the CPU the computer was noticeable slower than the PAL based ZX81. The screen was made up of 32 x 22 characters (instead of 32x24) allowing 64 x 44 pixels on screen.

The eye pleasing Timex Sinclair 1500 was a upgraded TS1000 with a much better, ZX Spectrum type keyboard and 16K of RAM. It wasn't as successful commercially as the TS1000 due to stiff competition from Apple, Atari and Commodore.


TIMEX SINCLAIR 1500 MOTHERBOARD

MODERN COMFORTS

Over the years there have been many add-ons for the ZX81 that gives extra features and the ZXpand is one of the best. It plugs in to the back of the ZX81 offering the ability to load software from a SD card. It also expands the system memory to 32K of RAM which is fully configurable to support various graphics modes. The ZXpand-AY sound module is a optional extra that plugs into the ZXpand to give the computer the ability to play audio. It also has a Atari type joystick interface.

Both devices have currently sold out but will be available in the near future from sellmyretro.com
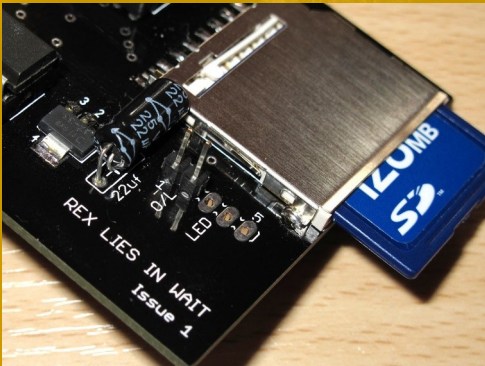
THE ZXPAND
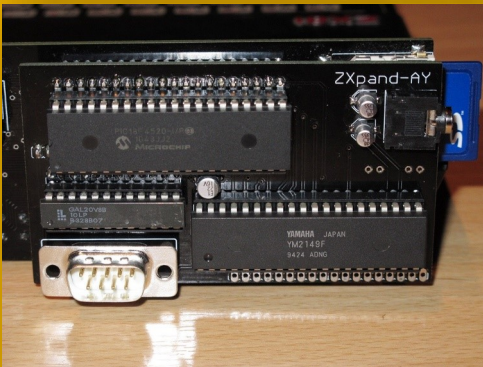
THE ZXPAND-AY OPTIONAL SOUND MODULE
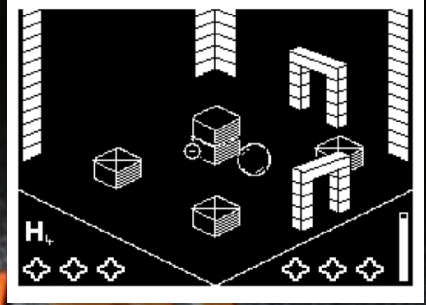
AGAINST THE ELEMENTS (2016)

THE GAUNTLET (1982)

FROGGER (1981)

NIGHT GUNNER (1982)

3D MONSTER MAZE (1982)

MANIC MINER ZX81 (2003)

MAZOGS (1982)

SPACE INVADERS (DK) (1982)

ANT ATTACK (2013)

FLIGHT SIMULATION (1982)

3D DEFENDER (1981)

1K CHESS (1982)
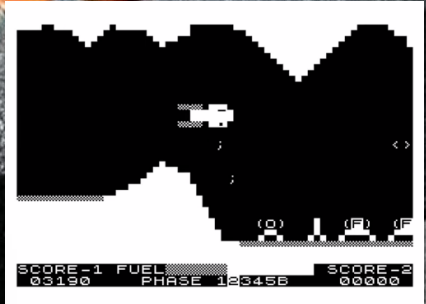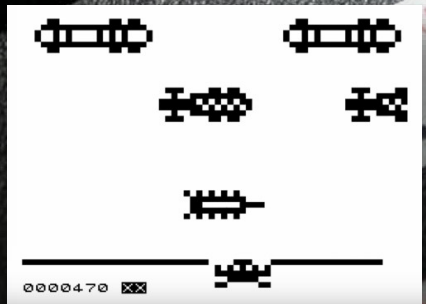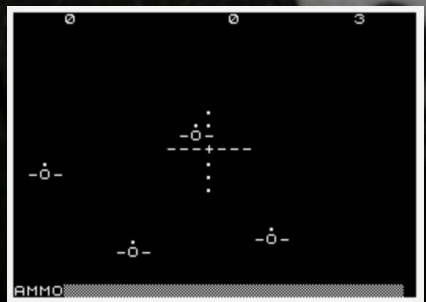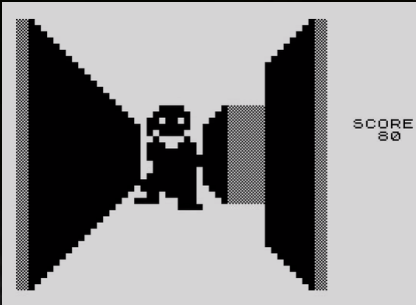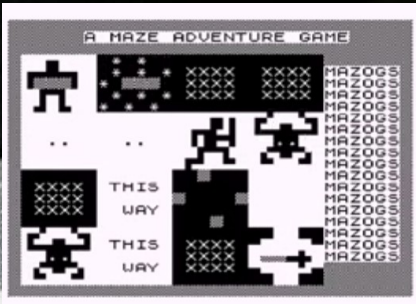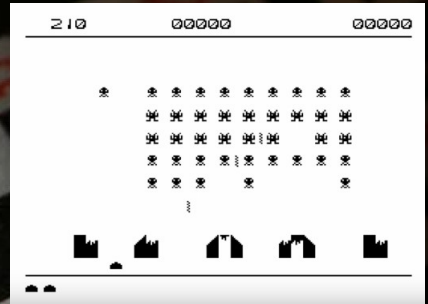
THE

Code Masters

CD GAMES PACK

By George Bachaelor

26 years ago, budget priced, computer games software house, Codemasters of the United Kingdom, launched a hardware item that was going to revolutionize 8bit computer gaming on the Amstrad CPC, Spectrum and C64 computers forever….

26 years ago, budget priced, computer games software house, Codemasters of the United Kingdom, launched a hardware item that was going to revolutionize 8bit computer gaming on the Amstrad CPC, Spectrum and C64 computers forever….

It was called the 30 games on one CD pack. This new technology of playing 8bit computer games on CD was BIG BIG BIG news at the time.

Amstrad CPC gaming magazine, Amstrad Action#52, January 1990, made sure that the Amstrad readers knew all they needed to know on this incredible new innovation, that was destined to be the "Dawn of a new age, as computing leaps into the 1990s with CD breakthrough".

It appeared on the front cover of the magazine with artwork as the main news story of the month. It had a 3 page in depth article with Codemasters Director, David Darling, a one page tech article from Adam Waring and Codemasters placed a double page ad in the magazine.

The technology was so simple, just a lead connecting your Amstrad CPC, Spectrum or C64 computer to any ordinary CD player.

At the time it was a mind blowing development in 8bit computer gaming. Due to the extra storage and speed advantages a CD had over existing tape and disk games, all sorts of amazing statements where being made about the possibilities of where 8bit computer games were heading.

Claims such as full screen graphics, huge animated sprites, extra levels, digitized music and movie styled video were going to be the norm. So what happened? To find out, turn the page for a in depth interview with Philip Oliver who worked on the project with Codemasters.

NEED SOME ACTION?

January 1990, Issue 52 of Amstrad Action covered the Codemasters CD Games Pack in depth. Check out pages 7, 20, 21 and 35 to 38. You can view the full issue here: http://www.eightbitmagazine.com/cpcoxygen/aa_depot/052JS.html

February 1990, Issue 73 of Crash magazine also covered the device for the Sinclair Spectrum. https://archive.org/details/crash-magazine-73

AMSTRAD ACTION

DAWN OF A NEW AGE

Computing leaps into the '90s with CD breakthrough

How to load – p18

THE UNTOUCHABLES
Fully playable demo!

"Hey Mr. Newsagent, I want my coverdisc. And I mean now."

PLUS

● Sun crossword – wicked, warped, word-weaving
● Gunslinger – rootin' tootin' two-player fun
● Word processor – write that best-seller now!
● Hypertrier – get those type-ins right
● Tape-to-disk transfer
● Easy start menu

ISSN 0954~8068

"THE CD GAMES PACK"
30 GAMES ON CD – EVERYTHING INCLUDED
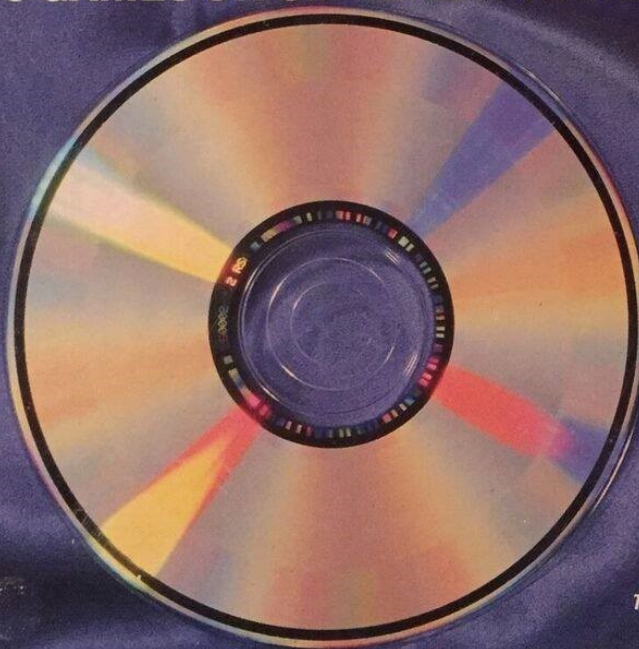
■ This Pack contains 30 award winning computer games on one CD with a cable to connect to *any* standard Compact Disc Player.

■ It's as simple as that! All you need is a computer, any CD player and this Pack!

■ Digitally recorded to make load errors a thing of the past, each game takes only *seconds* rather than minutes to load!

Code Masters
CD GAMES

THE · ACTION · STARTS · HERE

Philip Oliver informs me that of the Oliver Twins, it was just him working on the 30 Games CD project as Andrew Oliver was busy on starting Fantastic Dizzy on NES. Philip Oliver informed me that he spent about 4 weeks work. Nov./Dec '89 on the project (but It was only supposed to be 2 weeks work).

Q1. When was the 30 games on one CD idea first developed and by who?

Philip Oliver: Richard Darling and Ted Carron I think. But it was much earlier in the year and we weren't around when it started. We were still working from our house in Trowbridge.

The first version was on Commodore 64. I think either Jon Menzies or Andrew Graham did the code on that version.

Q2. What was the actual product?

Philip Oliver: A box containing a Cable audio jacks one end and an adaptor Jack, a signal converter chip and a joystick port adaptor the other. It also included a CD ROM containing the Games and an instruction booklet.

Q3. How did the product work?

Philip Oliver: We saved the games using a very high baud rate, 20 times the speed of the regular signal to a high quality audio DAT tape. You couldn't write to a blank CD in those days – that technology hadn't been invented then played it back to the computer.

The "Saver" and Loader" had to be written with extreme accuracy and error checking build in. It had to allow for

slight variations in signal "high's"(1's) and "low's" (0 's). Once you had the tech working you loaded the game – saved it to the DAT at ~20 times speed. Sent the DAT to a company to cut a test CD. Tested it – and if it passed QA you did the production run. The joystick port input acted like a cleaner digital input port, but still very similar to the Audio in used when loading tapes. Initially the plan was to use the Stereo output from the CD player to have 1 channel work as the timer channel and the other to act as the stream of faster data. Wait for the Timer channel to switch (0 to 1 or 1 to 0) and read the other channel for the data. Sadly we discovered through buying a load of CD players that some of the cheaper makes mixed the stereo to a mono output to save money. We clearly had to be compatible with all CD players and reverted to a software solution relying on only 1 input signal – very similar to have a regular tape loaded.

Sounds simple? It was so hard to get it reliable.

Q4. Could 30 games really fit onto the one CD at the time ?

Philip Oliver: Yes – actually more. a CD is 74 mins. The game typically loaded between 20-30 seconds depending on exact size. So you could get about 150 on !

There were 30 games on the Amstrad [34 on Spectrum] that we felt were high enough quality. So we simply saved all twice – in case

someone scratched a disc – there were 2 tracks for each game. There was still a tonne on capacity left on the CD.

Q5. You mentioned to me on FB that it was quite an experience and not much fun – what was your involvement with the project ?

Philip Oliver: What I thought was a simple task turned out to be extremely tricky. Different CD players at the time were of varying quality. At first it was assumed that all were stereo. Certainly they all said they were. But actually some of the cheaper, mass volume CD players cheated and were mono. This made writing code that deal with all the variance very tricky. Time was against us – this was supposed to be the ideal present for Christmas. But we only started in November – so we were really against the clock. Every hour and every day counted. Andrew and I moved from our nice new house in Trowbridge to be on site to help. On-site meant working and practically living in a portacabin. Being November was nasty weather! It was cold and windy outside, but being a portacabin meant it was noisy and rocked and not in a good way! We practically lived in our coats. Peter Williamson, one of the other game developers offered that we could sleep on his floor, in sleeping bags, at his flat. The problem was with Christmas fast approaching and technical problems I ended up working 20 hours days in that portacabin and living on pot noodles, crisps, chocolate and coke. The electronics' guy leading the project was Ted Carron who was a chain smoker – we're talking 50+ a day! I don't smoke, I never have and hate cigarette smoke. He'd sit next to me most of the time, smoking (days before people went outside to smoke), and to make matters worse, he thought it was funny to drop his butts in my can drinks when I wasn't looking.

Q6. In the AA#52 interview, David Darling said that tests were done to make Amstrad CPC specific games. Did you or anyone else at Codemasters actually put together any specific games to take advantage of the extra storage and speed capabilities of the CD?

PHILIP OLIVER: TOP PHOTO: IS ANDREW'S DESK. IN THE BOTTOM PHOTO THE DOG IS JIM DARLINGS POINTER CALLED ZAK. THE OTHER GUY WITH US IS PETER WILLIAMSON.

Philip Oliver: Sorry to burst that bubble, but the plan was to put existing games on the CD. Nothing new and no extended titles.

Q7. David Darling said in the AA#52 interview that Codemasters spent quite a bit of money on the project, it wasn't just for the Amstrad CPC but also the Spectrum and C64 machines. Did it ever hit the shelves ? If so what were sales like?

Philip Oliver: The C64 was first out, in November I recollect, the Spectrum version also got released but not the Amstrad CPC version. The main reason for this was that unfortunately due to poor sales of the C64 and Spectrum versions the decision was made not to release an Amstrad CPC version. The inventory did probably cost quite a lot and I'm sure Codemasters lost money on the venture.

Codemasters co-founder Richard Darling, was interviewed in 2015 on website http://www.gamesthatwerent.com/2015/05/codemasters-cd-games-pack-amstrad-cpc-version/ and stated "I think we originally intended to launch it simultaneously on the 3 formats but had some difficulties with the Amstrad version, so we launched with C64 and Spectrum intending to follow-on with Amstrad. However, when we launched it for Spectrum and Commodore 64 the sales levels were very low, so we decided not to roll-out the idea to the Amstrad."

Q8. In AA#52, Adam Waring stated that anyone who owns a CD player and a CPC is going to find this irresistible. Why do you think the project failed so badly ?

Philip Oliver: It was a cool idea and good tech, but timing was all wrong. When developing it I remember saying anyone that plays games and has the money to buy a CD player would buy an Atari ST or an Amiga, both released 4 years prior, before attempting to hook up their 8 bit computer to their CD player. In addition most of the CD players were sold as part of a stack system and were non-portable – in many cases this was unlikely to be near the players 8 bit computer – that had to be tethered to a bulky static TV. Both the Atari ST and Amiga had Disk Drives and were 16 bit computers with far better graphics.

Q9. The sky seemed the limit with this project. It was touted that gaming on 8bit machines such as the Amstrad CPC, Spectrums and C64 would be changed forever. Claims such as full screen graphics, huge animated sprites, extra levels, digitized music and movie styled video were going to be the norm. It sounded a little far fetched, would we have seen this if the project have been a success ?

Philip Oliver: I still believe that the limiting factor would have been the 8 bit computers. People wanted 16 bit computers, these had disk drives that were already a significant

improvement on Cassettes. Some CD-ROM Drives were made for 16 bit computers and they did quite well – they obviously used the disks as proper digital data discs – which was obviously far better than the crude method we used. Codemasters were quick to produce a CD-ROM for one of these – the Amiga CD32. It was called the Big 6 Dizzy Pack. Then came a console with an integrated CD Rom drive – that was amazingly successful – that was the original PlayStation!

Q10. Looking back now with hindsight do you think people just didn't understand it and maybe it would have been more successful if Codemasters had developed an actual CD ROM hard drive for the CD instead ?

Philip Oliver: I think Codemasters were very innovative, they came up with a clever solution and saw it through, but I don't think the market was there. People with enough money to a have a CD player – had enough money to buy an Atari ST or Amiga. That was the fundamental problem. However, when you are an innovator and pioneer, you expect some failures. Some of their other innovations, like the Game Genie were spectacularly successful.

It's is better to try and have some successes, rather than be terrified of failure and try nothing.

I would like to thank Philip Oliver for his time and fantastic in depth answers on the Codemasters, 30 Games on 1 CD project of 1989 / 1990.

COMMODORE 64 – QUICK REFERENCE GUIDE

TRACK	CONTENTS
1	(VOLUME TEST TRACK)
2	BMX SIMULATOR
3	PRO SKATEBOARD SIMULATOR
4	SUPER ROBIN HOOD
5	GRAND PRIX SIMULATOR
6	VAMPIRE
7	POLTERGEIST
8	REDMAX
9	FRUIT MACHINE SIMULATOR
10	NINJA MASSACRE
11	MAGNUM FORCE
12	RUGBY SIMULATOR (RESTORE FUNCTION INACTIVE)
13	SUPER STUNTMAN
14	LAZER FORCE
15	BMX FREESTYLE
16	SUPER G-MAN
17	DIZZY
18	GHOST HUNTERS
19	ADVANCED PINBALL SIMULATOR
20	PRO SNOOKER SIMULATOR
21	THUNDERBOLT
22	COSMONUT
23	ARCADE FLIGHT
24	MOTO X SIMULATOR
25	SAS COMBAT SIMULATOR
26	ATV SIMULATOR
27	PRO SKI SIMULATOR
28	SUPER HERO
29	TREASURE ISLAND DIZZY
30	BMX 2 – DIRT RIDING – STANDARD
31	BMX 2 – QUARRY RACING – EXPERT
32	STREET SOCCER
33	INDOOR SOCCER
34	11 A-SIDE SOCCER

While a game is loading the screen will flash many different colours. When it has finished the screen will go black for approximately two to three seconds before the game starts. You should press STOP on your CD Player during this time to prevent the CD sending false Joystick controls to the game.
Each game is recorded twice on each track, in case of scratches. If the first one fails to load the computer will automatically wait for the second.

Während des Ladens eines Spieles leuchtet der Bildschirm in vielen verschiedenen Farben. Ist der Vorgang beendet, wird der Bildschirm ungefähr zwei bis drei Sekunden lang schwarz, bevor das Spiel beginnt. Während dieser Zeit solltest Du auf Deinem CD-Spieler STOP drücken, um die CD davon abzuhalten, falsche Joystick-Steuerimpulse an das Spiel abzugeben.

Jedes Spiel ist für den Fall von Kratzern zweimal auf jeder Spur aufgenommen. Kann das erste nicht laden, wartet der Computer automatisch auf das zweite.

SPECTRUM QUICK REFERENCE GUIDE

TRACK	CONTENTS
1	(VOLUME TEST TRACK)
2	BMX 2 – DIRT BIKING – STANDARD
3	TREASURE ISLAND DIZZY
4	SNOOKER
5	FAST FOOD
6	RUGBY SIMULATOR
7	JETSKI SIMULATOR (PART A)
8	DIZZY
9	3D STARFIGHTER
10	BMX 2 – QUARRY RACING – EXPERT
11	PINBALL SIMULATOR
12	11 A-SIDE SOCCER
13	PRO SKI SIMULATOR
14	GHOST HUNTERS
15	JETSKI SIMULATOR (PART B)
16	GRAND PRIX SIMULATOR 2
17	SUPER STUNTMAN
18	FRUIT MACHINE SIMULATOR
19	BMX FREESTYLE
20	ATV SIMULATOR (ALL TERRAIN VEHICLE)
21	STREET SOCCER
22	MOTO X SIMULATOR
23	TWIN TURBO V8
24	DEATH STALKER
25	INDOOR SOCCER
26	BIGFOOT
27	ARCADE FLIGHT
28	SKATEBOARD SIMULATOR
29	SOCCER SKILLS
30	STREET GANG FOOTBALL
31	SUPER ROBIN HOOD
32	VAMPIRE
33	NINJA MASSACRE
34	DEMONSTRATION TRACK – SLIDESHOW
35-66	THE SAME AS TRACKS 2-33

Each game is recorded twice on the CD, in case of scratches. To load the second copy of a game simply add 33 to the games track number, eg. Dizzy is on tracks 8 and 41.

Track 34 is a special demonstration and contains over 40 game pictures. Hold down Q,U,I & T to load another Track.

PROGRAMMING

SPRITES

IN THE FIRST OF A NEW SERIES JOHN KAVANAGH HAVE A LOOK AT PROGRAMMING HARDWARE SPRITES ON THE COMMODORE 64 AND THE AMSTRAD 464 / 6128 PLUS RANGE.

WHAT IS A SPRITE

Sprites are an important element in most games on older computers and consoles. If you are interested in making a fast paced action game, they are required knowledge. Even if you're not intent on making a full blown game, sprites are fun to play with, especially hardware sprites.

A sprite is a two-dimensional graphical object that can be positioned anywhere on screen. For example, the Dizzy character from the Oliver Twins games of the same name.

DIZZY (SPRITE) FACES AN ARMOROG IN DIZZY III

A sprite can be made up of a certain size, depending on the requirements of the game or a fixed sized defined by hardware for computers that had it. Larger sprites can also be made up of multiple of smaller sprites.

In the Commodore 64 manual it briefly touches on how you can create single colour sprites. In the coming issues we will be digging a little deeper, dealing with multicolour sprites as well as animation. In this issue however, we will focus on hardware sprites on the C64 as well as the Amstrad PLUS range.

HARDWARE VS SOFTWARE

Hardware sprites have a massive advantage over software programmed sprites in that they don't take up any CPU time. This allows the hardware to do all the work without taxing the CPU. In some systems a hardware sprite can have more colours than is typically allowed on screen e.g. Amstrad PLUS. The disadvantage

C64 TERMINATOR SPRITE

is that hardware sprites are fixed in sizesand are limited in numbers. On the Amstrad PLUS the sprite size is 16 by 16 pixels, 24 x 21 single colour on the C64 and 12 x 21 pixels in multicolour mode. The Commodore can display 8 sprites at a time and the Amstrad, 16. On the other hand, software sprites can be any size the programmer wishes and you can have as many on screen as you want the larger they are and the more that are on screen, the harder the stress on the CPU.

COMMODORE 64 SPRITES VS AMSTRAD PLUS SPRITES

The original Amstrad CPC didn't have hardware sprites and was often at a disadvantage to the Commodore 64 for certain type of games. Especially when you consider that the CPC didn't had horizontal scrolling, meaning clever programming was required for smooth scrolling and displaying multiple sprites on screen at the same time.

In 1990, Amstrad released the PLUS range of computers, compatible with the original CPC

THE COMMODORE 64 HAD EXCEPTIONAL HARDWARE SPRITE CAPABILITIES ALLOWING FOR AMAZING GAMES

but with added capabilities, vertical and horizontal hardware scrolling, sprites, enhanced colour palette and DMA audio. However those extra enhancements were to be only available for GX4000 cartridge based games. Tape and disk games were never meant to have access to those extra features. Yet, despite Amstrad efforts, programmers figured out ways to use them.

The Commodore 64 always had hardware sprites which, along with its SID audio chip made it the world's best selling computer. While it didn't have the 4096 colour palette of the younger Amstrad PLUS, they can still be used to great effect.

It was fairly easy to access the sprites functions from BASIC on the Commodore 64 by POKEing certain areas of memory. Although it would had been easier if there were specific sprite commands built into

BASIC. While sprites could be magnified 2x the original size, the Amstrad has the advantage of independent scaling of 2x and 4x. It also has the advantage of having 15 independent colours despite whatever 16 colours were used for the screen.

PROGRAMMING SPRITES ON THE COMMODORE 64

Before we get to move sprites around the screen, we first got to create one. The example graphic below is made up of 24 pixels wide by 21 pixels high, a total of 504 pixels. This makes up one of the eight available sprites.

The graphic data can be entered into the computer using BASIC INPUT statements. In the example below you can see that the grid
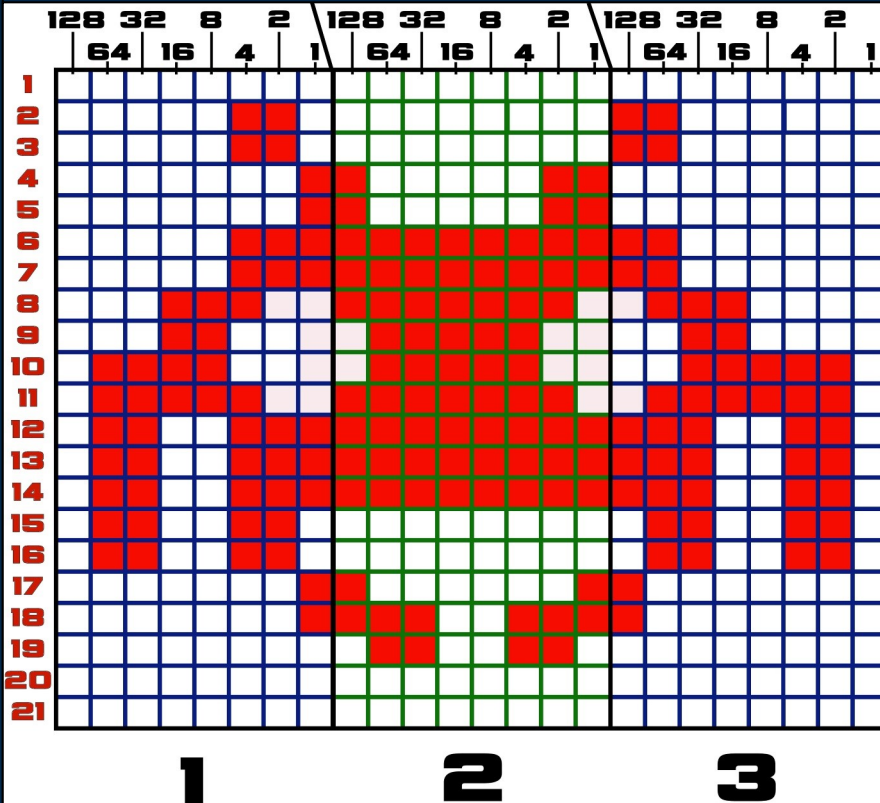

```
0, 0, 0 = 0
(4+2),(0),(
(4+2),(0),(
(1),(128+2+
(1),(128+2+
(4,2,1),(128
(4,2,1),(128
(16,8,4),(12
(16+8),(64+
(64+32+16
(64+32+16
(64+32+4+
(64+32+4+
(64+32+4+
(64+32+4+
(64+32+4+
1, (128+1), 1
1, (128+64
0, (64+32
0, 0, 0 = 0
0, 0, 0 = 0
```

is divided into three sections as you enter three bytes per column line. Looking at the example sprite below, the first 8 pixels of row one hasn't any pixels filled in, it's the same with the second and third column of 8 pixels. So the DATA statement would read:

DATA 0,0,0

The second line of column 1 (the first 8 pixels) has the grid coloured in at 4 and 2, which equals 6. The second set of 8 pixels hasn't any coloured in pixels so the value is 0, the third column of eight pixels has 128 and 64 coloured in, equalling 192. So a DATA statement for row 2 would read:

DATA 6,0,192

And so on for each row, always adding up the number of shaded cells in each section to get the value fort that section.

Once we have all out numbers, -we have the first part of a simple sprite program:

30 FOR D=0 TO 62 : READ A : POKE 832+D, A; NEXT D

100 DATA 0,0,0
110 DATA 6,0,192
120 DATA 6,0,192
130 DATA 1,131,0
140 DATA 1,131,0
150 DATA 7,255,192
160 DATA 7,255,192
170 DATA 28,254,112
180 DATA 24,124,48
190 DATA 112,124,62

```
, 0, 0
128+64) = 6, 0, 192
128+64) = 6, 0, 192
-1),0 = 1, 131,0
-1),0 = 1, 131,0
3+64+32+16+8+4+2+1),(128+64) = 7, 255, 192
3+64+32+16+8+4+2+1),(128+64) = 7, 255, 192
28+64,32,16,8,4,2),(64+32+16) = 28, 254, 112
+32+16+8+4),(32+16) = 24, 124, 48
),(64+32_16+8_4),(32+16+8+4+2) = 112, 124, 62
+8+4),(128+64+32+16+8+4+2), (64+32+16+8+4+2) = 124, 254, 126
+2+1),(128+64+32+16+8+4+2+1),(128+64+32+4+2) = 103, 255, 230
+2+1),(128+64+32+16+8+4+2+1),(128+64+32+4+2) = 103, 255, 230
+2+1),(128+64+32+16+8+4+2+1),(128+64+32+4+2) = 103, 255, 230
+2), 0, (64+32+4+2) = 102, 0, 102
+2), 0, (64+32+4+2) = 102, 0, 102
128 = 1, 129, 128
+32+4+2+1), 128 = 1, 231, 128
2+4+2), 0 = 0, 102, 0
, 0, 0
, 0, 0
```

```
200 DATA 124,254,126
210 DATA 103,255,230
220 DATA 103,255,230
230 DATA 103,255,230
240 DATA 102,0,102
250 DATA 102,0,102
260 DATA 1.129.128
270 DATA 1,231,128
280 DATA 0,102,0
290 DATA 0,0,0
300 DATA 0,0,0
```

The above program, it would appear to does nothing. You still need to add a few extra pieces in order to see it. What the above program does is to enter the sprite example into the Commodore's memory.

Sprites take up 63 bytes of memory (3 columns by 21 rows), although they are spaced 64 bytes apart. The first part of line 30 is a FOR NEXT statement which counts from 0 to 62 (for a total of 63 bytes). **READ A**, reads the DATA lines from 100 to 300 which loads the values into memory. If you make a error with the DATA values, the program will still run as long as a number between 0 and 255 is used. However your sprite wouldn't look right. POKE 832+D,A puts a value from the DATA statement into memory location 832 + D. The variable A is used because of the **READ A** statement. Once the program enters all the DATA lines it finishes.

POKES

Instead of having to remember a load of forgetful memory locations, we instead define the area of memory where the VIC II chip handles sprites. Add this line to your code:

10 VIC=53248

SPRITE POINTERS

The reason we used memory location 832 instead of a nice round number is because of the way sprite data is saved.

Memory location 2040 tells the computer where Sprite 0 is located, memory location 2041 for Sprite 1, all the way up to 2047 for the 8th sprite.

As each memory location can only store a number between 0 and 255, values entered are multiplied by 64. So entering:

20 POKE 2040, 13

would define the location of Sprite 0 data to be located at 13 which is memory address 832 (13 x 64).

SETTING THE COLOUR

You can set the colour of the sprite can be set by typing:

40 POKE VIC+39, 5

This sets the sprite to colour 5, which is green.

TURNING THE SPRITE ON

To display a sprite we much first instruct the VIC II chip to 'turn on' the sprite by typing:

50 POKE VIC+21,1

This sets sprite 0 to on.

POSITIONING THE SPRITE ON SCREEN

Type the following:

60 POKE VIC+0, 50
70 POKE VIC+1, 100
80 POKE VIC+16,0

Line 60 and 70 sets the horizontal coordinates, in this case, 50 pixels from the left of the screen and 100 from the top. Line 80 allows the sprite to move further than 255 pixels from the left of the screen. By POKEing VIC+16 to 1 you will add 255 pixels to the horizontal coordinates. For example, setting VIC+16 to 1 and VIC+0 to 45 will set the horizontal coordinates to 300. In this example it is not required, so it is set to 0. Now type

```
270 DATA 1,231,128
280 DATA 0,102,0
290 DATA 0,0,0
300 DATA 0,0,0
READY.
```
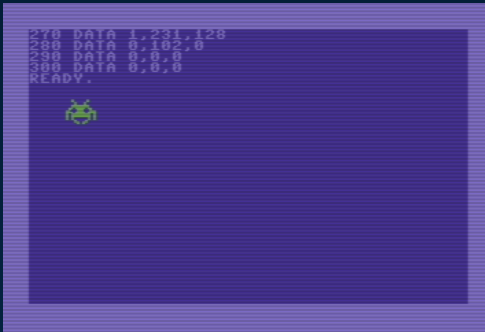
RUN and press RETURN to see the results.

As you can see from the screenshot there's a green alien sprite on your screen. It remains as you type over it and scroll the screen. In the next issue we will be looking at multicolour sprites and collision detection.

TIPS 'N' TRICKS

Since this is a tips n tricks issue, here are a few things to try:

Without resetting your computer, type:

POKE VIC+23,1

Now type: **POKE VIC+29,1**

As you can see these expand the sprite size horizontally and vertically by two. Just poke the value 0 instead of 1 to return to normal.

You can position the sprite at a different location without having

to edit or re-run the program, e.g. **POKE VIC+0,120**

Just for fun you can change the pointer location of a sprite to see what you get.

POKE 2040,0

You'll get garbled sprite. What you actually seeing is program code trying to be displayed as a sprite. To get the original sprite back type:

POKE 2040,13

Now over to the Amstrad.

PROGRAMMING SPRITES ON THE AMSTRAD PLUS

As mentioned, when Amstrad created the PLUS range they didn't want people to be able to access the enhanced features. The reason for this was to make sure that any future tape and disk games created would still be backward compatible with the original Amstrad CPC. It was also another reason for people to pay extra for a cartridge based game. However, Amstrad didn't try hard enough and with a bit of help the 4096 colours palette and hardware sprites could be accessed from the computer, giving us the chance to program with those enhanced features.

B-ASIC is a utility program, originally a part of a tutorial series from the French magazine, Amstrad Cent Pour Cent. Programmed by *Logon System*, it can be downloaded from: *eightbitmagazine.com/downloads/*

COMPARING SPECS

	COMMODORE 64	AMSTRAD 464 / 6128 PLUS
RELEASED	September 1982	September 1990
COUNTRY OF ORIGIN	United States	United Kingdom
CPU	MOS 6510, 1 MHz	Zilog Z80A, 4 MHz
GRAPHIC RESOLUTIONS	320 X 200 with any 2 colours out of 16 per 8x8 block	640 x 200 with 2 colours
		320 x 200 with 4 colours
	160 x 200 with any 4 colours out of 16 per 4x8 block	160 x 200 with 16 colours
BITMAP SCREEN SIZE	8 Kilobytes	16 Kilobytes
MAX COLOURS ON SCREEN	16	31 (16 + 15 for sprites)
COLOUR PALETTE	16	4096
NUMBER OF SPRITES	8	16
SPRITE SIZE	24 X 21 pixels (12 X 21 in multicolour mode)	16 x 16 pixels
SPRITE COLOURS	1 or 3 depending on graphic mode	15
TRANSPARENCY	Colour Key	Colour Key
SPRITE MAGNIFICATION	1x, 2x width and height	Width and height magnification of 1x, 2x and 4x
COLLISION DETECTION	Yes	No
HARDWARE SCROLLING	Vertical and Horizontal	Vertical and Horizontal

B-ASIC requires 128K (which came as standard on the 6128 PLUS) so 464 PLUS owners will need to use the older version, B-ASIC 1.4 or upgrade their computer to 128K.

I suggest downloading version 3.4 if you can, which is the most complete version. It also comes with documentation. B-ASIC gives you the ability to be able to access hardware sprites and other functions on the ASIC chip, directly from BASIC using RSX instructions.

RSX stands for Resident System eXtensions and are used to add extra commands to Locomotive Basic. All RSX commands has to start with a pipe symbol | (by pressing SHIFT + the key directly right of the P key).

To get those commands you need the B-ASIC.BIN file, which is on the disk image.

To load the file, type the following:

IF PEEK(&BC0E)<>&CD THEN OUT &7F00,&C1:LOAD "BASIC.BIN",&C000:CALL &C000

THE GAME FLUFF MADE GOOD USE OF THE AMSTRAD PLUS FEATURES. THE GAME PLAYS AT 50 FRAMES PER SECOND AND HAS UP TO 60 COLOURS ON SCREEN.

This loads the file BASIC.BIN into memory at location &C000 and runs it.

You should now have access to almost forty extra commands which we will cover in greater detail in a future issue. For now, this short program will get you started:

```
10 |SPRON,0
20 |SPRZOOM,0,3,3
30 |INKCOPY
40 FOR A=0 TO 15
50 FRAME
60 |SPRFILL,0,A
70 |SPRXY,0,RND(1)*640, RND(1)*200
80 FOR W=1 TO 100 : NEXT W
90 NEXT A
100 GOTO 40
```

Line 10, the first RSX command using the pipe symbol turns the sprite 0 on. Notice how if a value is required, there's a comma after the command. All RSX commands work this way. You can see the same in line 20, which sets the zoom level for sprite 0. Line 30 is to copy the current screen palette to the sprite palette.

Line 40 starts a FOR NEXT loops which positions the sprite to random locations on the screen. Line 50 contains the FRAME command, which makes the computer wait for frame flyback before updating the screen, this is to avoid the a tearing effect when the sprite moves or changes colour during screen update.

Line 60 fills the sprite with a certain colour, in this case the, whatever the value of variable A is. The sprite is displayed with |SPRXY in line 70. The 0 is for sprite 0 and then the X position and Y position. Line 80 is another FOR NEXT loop that does nothing but slows down the sprite as it pops up at different locations around the screen. Next issue we look at creating a proper looking sprite, super-sprites, plus saving and loading sprites into memory. We might even program a sprite designer so you can start creating beautiful multicolour sprites as easy as possible.

The TIPS 'n' TRICKS Special

WE GO IN SEARCH OF TIPS AND TRICKS TO MAKE YOUR RETRO LIFE A LITTLE MORE COMPLETE!

REPLACE A SCRATCHED UP FACEPLATE ON A 16K / 48K SINCLAIR SPECTRUM

The original rubber keyed Sinclair Spectrum is a favourite among many Spectrum owners. Sadly, most faceplates tend to be covered in scuffs and marks which is not surprising for a computer over 34 years old.

ZX Renew (www.zxrenew.co.uk) offers a solution with replica faceplates for the low cost of £ 9.99 Sterling. Made from soft aluminium alloy, they come in original black as well as funky styles such as silver, copper, white, yellow, red, blue, orange and green. Currently they only sell a glossy version but matt will be available in the future.

Fitting is easy and it can make a tired looking Spectrum looks fresh in minutes. ZX Renew also sells keyboard membranes and mats.

WATCH THE BEN HECK SHOW

For those of you who are not familiar with the Ben Heck show, it's a show where cool projects and mods come to life. Occasionally there are retro computer projects. In one of these, a three part episode, Ben builds a Apple 1 from scratch using off the shelf components.

There are two Sinclair Spectrum projects. The first Sinclair Spectrum project by Ben Heck is split in to 3 episodes and shows you how to turn a original Sinclair ZX Spectrum into a portable device. The second ZX Spectrum project is about building one from scratch.

While the Ben Heck show rely on tools not readily available to the average person, it is still fun to follow along and attempt to recreate his work at some level. **https://www.youtube.com/channel/UChturLXwYxwTOf_5krs0qvA**
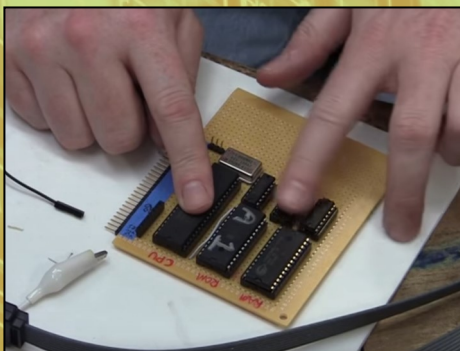
COMPOSITE VIDEO MOD FOR THE ACORN ELECTRON

Usually the first thing I do when adding a new computer to my 8-bit collection is get a RGB SCART (if available) or a composite video cable. I dislike grainy RF outputs, especially on larger screens. Luckily, the Acorn Election can use a standard RCA cable. The only problem is that the output is in black and white. The reason for this was, Acorn wanted to have the highest video clarity possible for composite video. For the very best video it was expected that the RGB port was used.

Luckily there's an easy fix. Just make a solder bridge across two points marked as LK4 on the mainboard. You can also use a jumper wire if you want a neater job done.

LK4
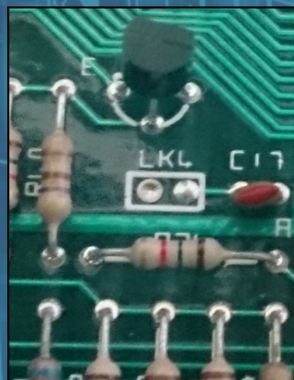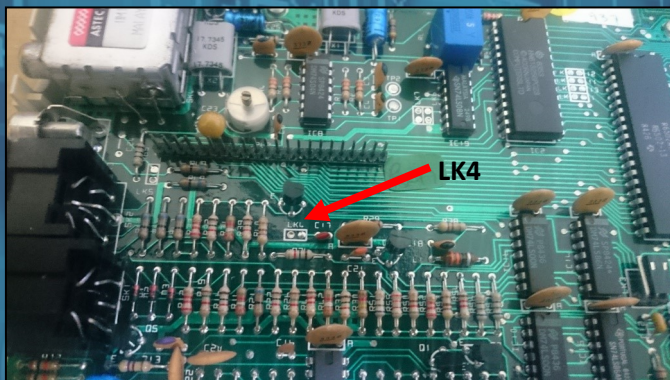
TURNING YELLOW AND/OR BROWN COMPUTERS BACK TO SHINING WHITE

One of the worst things about owning retro computers is that sometimes they can turn yellow which makes them rather ugly looking.

Many of you may have heard of Retr0bright. and other various techniques to turn a case back to white. Retr0bright is a combination of chemicals that when applied to a yellowed computer and left in sunlight or under a UV light for a few hours, will hopefully your computer turn back to a beautiful white colour.

The process is fairly simple and the ingredients are fairly easy to find. Firstly, Hydrogen peroxide, with either a 6% or 12% solution is required. Try your local pharmacy as mine tend to have the 6% solution which works wonders for me. A 1/4 teaspoon per gallon of Tetraacetylethylenediamine is added. Don't worry, you'll find it in oxygen based cleaners in your local supermarket. Look for names with the work "Oxy" in the name. I just use a teaspoon of it.

A thickener such as xanthan gum or arrowroot is suggested to thicken the mixture. Just add enough to make the texture thicker. Once everything is combined, apply the mixture to the case of the computer. Make sure the computer is stripped down first and that all electronics inside the case are carefully removed. Apply the paste and leave in sunlight or under a UV light for a few hours. I always use the a UV light as there's not much sunlight in Ireland.

After a few hours, you should notice that the case has lightened considerably. You might have to apply another coat to whiten it completely. I've tried this method a few times and it has always gave me good results. However we will be trying different methods, such as submerging a complete Commodore 64 case into a pan of Hydrogen peroxide and using a UV light instead of sunlight. We will report the results in a future issue.

There are some pitfalls to using Retr0bright. The first which I have experienced but isn't too serious, is the yellow returning. This happened to me with an Amiga 1200. However it didn't return as strongly as it had been and could easily be fixed with another session of Retr0bright. More serious pitfalls were reported by people online such as weakening of plastic and blooming where certain parts are whiter than others. However, plastics weakens and become brittle anyways. Surely anything is better than a yellowed computer?
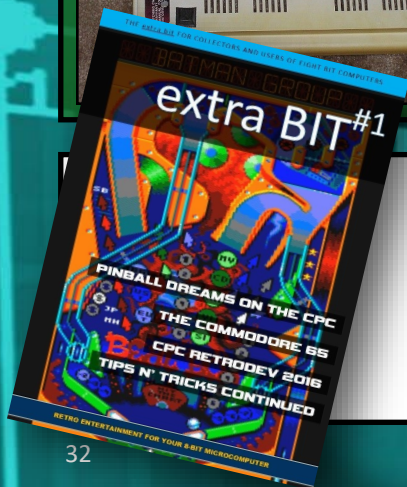
EXTRA BIT #1 COMING SOON

Continue reading the rest of Tip N' Tricks by downloading Extra Bit #1 from **eightbitmagazine.com**. The download will be free to everyone and expands on topics covered in the magazine as well as new articles. In the first Extra Bit, the Commodore 65, Pinball Dreams on the CPC as well as all the games of CPC RetroDev 2016 played and reviewed.

FIX AUDIO DISTORTION ON THE SPECTRUM +3

You may not realise it but if you have a Sinclair Spectrum +3 there's a good chance that your computer suffers from audio distortion . Some 2A models also suffer from this. You can compare audio with the following YouTube video: **https://www.youtube.com/watch?v=nI_mg9hpoEw**

There are various articles online on how to fix this but a video is best. The video link above, as well as showing you the audio difference, will also guide you quickly through the repair. If you can solder three resisters to a motherboard then you can perform this fix.

BELT REPLACEMENT FOR A 3 INCH DISK DRIVE FOR AMSTRAD CPC, PLUS, PCW AND SINCLAIR SPECTRUM +3

IF you are having trouble loading software on your 3 inch disk drive, it's more than likely that the disk drive belt needs replacing. Sourcing a drive belt is easy enough and fitting is also easy. The biggest issue is not to lose the 'read pin' which has a habit of falling out. Lose this and your computer will constantly think the disk is write protected. If it does fall out and you're lucky enough to find it but don't know where to place it. Just look at the area where the write protect tab would be located if the disk was inserted and you'll figure out where it fits. There's a video tutorial from Xyphoe on YouTube: **https://www.youtube.com/watch?v=tKZCbHqEX_k**

```
Ready
cat
Drive A: disc missing
Retry, Ignore or Cancel? ■
```

TAPE AND FLOPPY EMULATION

Using a original tape or disk drive is fantastic in keeping that retro feel but it's always nice to have all your software collection readily available on a SD card or a USB flash drive.

For the Sinclair Spectrum there's the DivMMC which can load tape images from an SD card at super fast speeds (in comparison to tapes). It also has a built in Kempston joystick interface. Currently available from **http://www.sellmyretro.com**

Emulators for the Amstrad CPC and various Commodores were covered in this issue and the previous issue of Eight Bit.

For the Atari 8-bit range you can find a few

options here: **http://lotharek.pl/**

The same website also contains solutions for other disk based machines like the MSX.

For the Apple 2 check out the BMOW (Big Mess O' Wires) floppy emulator at **http://www.bigmessowires.com/floppy-emu/**

As a added bonus, it also works with the Apple Lisa and Macintosh.

WORKING WITH DIFFERENT VERSIONS OF BASIC (NOTE THE SUBTLE CHANGES B

	ATARI BASIC ATARI 8-BIT RANGE	APPLESOFT BASIC APPLE II RANGE	BB ACORN ELECT
CLEAR THE SCREEN	PRINT CHR$(125)	HOME	C
INPUT COMMAND (EXAMPLE)	PRINT "NAME?" : INPUT A$	INPUT "NAME?";A$	INPUT "
MOVE CURSOR UP	PRINT CHR$(28)	CALL - 998	PRINT
MOVE CURSOR DOWN	PRINT CHR$(29)	PRINT CHR$(10)	PRINT
MOVE CURSOR LEFT	PRINT CHR$(30)	PRINT CHR$(8)	PRINT
MOVE CURSOR RIGHT	PRINT CHR$(31)	PRINT CHR$(21)	PRINT
MOVE CURSOR TO POSITION 10 ACROSS BY 5 DOWN	POSITION 10,5	HTAB 10 : VTAB 5	VDU
SELECT RANDOM NUMBER BETWEEN 0 AND 0.99999999	PRINT RND(1)	PRINT RND(1)	PRINT
SELECT RANDOM NUMBER BETWEEN 1 AND X	PRINT RND(1) * X + 1	PRINT RND(1) * X + 1	PRINT
SELECT RANDOM LETTER BETWEEN A AND Z	PRINT CHR$(RND(1)*26+65)	PRINT CHR$(INT(RND(1)*26+65))	P CHR$(RI
CHECK KEYBOARD TO SEE IF A KEY IS BEING PRESSED	OPEN #1,4,0,"K" : DIM K$(1) GET #1,K: K$=CHR$(K)	X$ = " " : IF PEEK(- 16384) > 127 THEN GET X$	INK
CONVERT CHARACTER IN TO A INTEGER, ASCII VALUE	ASC("X")	ASC("X")	ASC
PRINT THE FIRST CHARACTER OF A STRING	DIM X$(LEN(A$)) X$=A$(1,1) : PRINT X$	PRINT LEFT$(A$,1)	PRINT L
PRINT THE LAST CHARACTER OFA STRING	DIM X$(LEN(A$)) X$=A$(LEN(A$), LEN(A$)): PRINT X$	PRINT RIGHT$(A$,1)	PRINT RI
PRINT THE MIDDLE CHARACTERS OF A STRING	DIM X$(LEN(A$)) X$=A$(N,N2); PRINT X$	PRINT MID$(A$,N1,N2)	PRINT MID
CHANGE TO A HI-RES GRAPHICS	GRAPHICS 8	GR (low res), HGR and HGR2	MO
CHANGE BORDER COLOUR TO COLOUR 1	SETCOLOR 4,1,0	N/A	VDU 19,
CHANGE TEXT / GRAPHIC COLOUR TO 2	SETCOLOR 1,0,2	COLOR=2 or HCOLOR=2 in hi-res mode	COL
CHANGE BACKGROUND COLOUR TO COLOUR 1	SETCOLOR 2,1,0	N/A	COLO

SECOND P

C BASIC RON, BBC MICRO	COMMODORE BASIC VIC-20 / COMMODORE 64	LOCOMOTIVE BASIC AMSTRAD CPC / PLUS	SINCLAIR BASIC SINCLAIR ZX SPECTRUM
CLS	PRINT CHR$(147)	CLS	CLS
NAME?",A$	PRINT "NAME?" : INPUT A$	INPUT "NAME?",A$	INPUT "NAME?",A$
CHR$(11)	PRINT CHR$(145)	PRINT CHR$(11);	PRINT CHR$(11)
CHR$(10)	PRINT CHR$(17)	PRINT CHR$(10);	PRINT CHR$(10)
T CHR$(8)	PRINT CHR$(157)	PRINT CHR$(8);	PRINT CHR$(8)
T CHR$(9)	PRINT CHR$(29)	PRINT CHR$(9);	PRINT CHR$(9)
31,10,5	POKE 211,10 : POKE 214,5	LOCATE 10,5	PRINT AT 10,5
T RND(1)	PRINT RND(1)	PRINT RND	PRINT RND
T RND(X)	PRINT RND(1) * X + 1	PRINT RND(1) * X + 1	PRINT RND * X + 1
RINT ND(26)+64)	PRINT CHR$(INT(RND(1)*26+65))	PRINT CHR$(RND*26+65)	PRINT CHR$(INT(RND*26+65))
EY$(X)	GET X$	INKEY$	INKEY$
C("X")	ASC("X")	ASC("X")	CODE("X")
EFT$(A$,1)	PRINT LEFT$(A$,1)	PRINT LEFT$(A$,1)	PRINT A$(1 TO 1)
GHT$(A$,1)	PRINT RIGHT$(AS,1)	PRINT LEFT$(A$,1)	PRINT A$(LEN(A$) TO)
D$(A$,N1,N2)	PRINT MID$(A$,N1,N2)	PRINT MID$(A$,N1,N2)	PRINT A$(N1 TO N2)
ODE 0	POKE 53265, PEEK(53265) OR 32	MODE 2	N/A
-1, 1, 0, 0, 0	POKE 53280,1	BORDER 1	BORDER 1
LOUR 2	POKE 646,2	PEN 2	INK 2
UR 129	POKE 53281, 1	PAPER 1	PAPER 1

The Very First

By Martin Grundy

Like many kids that grew up in the 1980s my first contact with a computer was at school. At Highfield Primary School in Bolton, like thousands across the country, computers were being introduced to classrooms as part of the government's 'Micros in Schools' scheme. With traditional British industries in a state of steep decline, hopes were pinned on the fledgling computer industry to help Britain find its feet again as an economic force in the world.

Our headmaster, Mr. Williamson, opted for the BBC Model B computer. This was a wise choice for two reasons: 1. The BBC Model B was a powerful computer for its time and 2. The BBC (the broadcaster not the computer) had recently launched the Computer Literacy Project in an attempt to 'provide the opportunity for viewers to learn how to program and use a microcomputer.' At the heart of the BBC's project as a weekly TV show called 'The Computer Programme' which was 'designed to be useful to viewers in schools and colleges' and was based around the BBC model B.

Unfortunately, in the recession hit early 80s British schools were rather cash-strapped and Mr. Williamson could only afford one computer. This meant that opportunities for kids to use it were very limited. It lived in the library on a specially made trolley and was only wheeled out now and again for the most trusted of students. I have a few vague memories of typing in simple BASIC programs and playing Granny's Garden – a game so

terrifying it's a wonder that it didn't frighten a generation of kids off computers for ever- but that's about it. Using the school's BBC was good fun but the chances of getting your nine-year-old sticky fingers on it frequently were slim. I quickly realised that the only way to get regular access to a computer was to have one at home. This meant persuading my parents to buy me one so that's exactly what I decide to do.

In the early-80s, computers were thought of as not only expensive but also rather exotic so it wasn't going to be easy to talk Mum and Dad round. Fortunately, Government education secretary Kenneth Baker made it somewhat easier by announcing that computer literacy was essential for the future prospects of British children and after months of mithering, Mum and Dad finally gave in.

After some deliberation between the Oric 1, Mattel's Aquarius and the Commodore VIC-20, Dad chose the Commodore computer. Compared to some of the other budget machines the VIC was pretty high spec. It had colour graphics (unlike the ZX80 and ZX81), decent sound, a 3.5K memory and a proper keyboard. A proper keyboard was important to Dad for two reasons. Firstly, he had some notion of giving the computer thing a whirl himself - and his big fingers would've struggled with the keyboards of the other computers - and secondly because the majority of programs for the computer would need to be typed in as this was a much cheaper way of obtaining software than

buying it.

In 1983 the average price of a computer game was £6.50, which was quite expensive, and I'd have to save up my pocket money for weeks before I could afford to buy one. The cheaper option was to buy one of the many magazines which offered type in listings. Mags such as Commodore Horizons, C&VG and Commodore User could be bought for as little as 75p and contained a wide range of programs which included games, simple spreadsheets and home accounting packages.

I can remember vividly the day Dad brought the VIC-20 home. It must've been a birthday present as it was a windy autumnal day when Dad proudly strode through the front door with it under his arm.

It came in a long white oblong polystyrene box which had a cardboard sleeve that slid over it. We carefully unsheathed it and opened the polystyrene box. Inside was the computer itself – encased in cream coloured plastic with dark brown keys and four fat orange function keys. The box also housed a heavy fudge coloured wedge shaped thing, a small silver tin box, a couple of black cables and a spiral bound manual. We laid out all these pieces on the coffee table in the front room and gazed upon them in wonder as if they were the parts of a space ship that had crash landed in the back yard.

After a quick consultation of the manual, we attached the computer to the fudge coloured wedge – the PSU - then plugged in the silver tin box (the modulator) but then hit a problem. The computer came with a regular UK three pin plug but back in the early 80s our house was in desperate need of a rewire and we still had the old circular plugs with the three round pins that went in a horizontal line. Fortunately, Dad had an adapter. It was currently employed to connect the radiogram (I know it was the 80s but our house was still stuck in the 60s) to the house power supply. Dad

disappeared behind the armchair for a moment then returned triumphantly with the adapter. The next task was easy – plug the other wire (the one which connected the modulator to the TV) into the telly's aerial socket. I took that duty upon myself and pulled out the Ferguson TV from the corner of the front room (this was quite easy as it was on casters), removed the TV aerial and pushed the computer cable into the telly's aerial socket. Done.

This was it. The big moment. Mum was called in from the kitchen and Our Susan was summoned from her bedroom to witness the momentous occasion.

"Ruth! Ruth!" Shouted Dad to Mum.

"Susan! Susan! We're switching the computer on!" I yelled upstairs.

Soon the family was gathered around the computer and the excitement was building. I could hardly contain myself.

"Well, go on Martin, switch it on," said Dad.

After a quick check that all the cables were secure, I flicked the switch on the side of the VIC and a red LED light blinked into life. There was a sudden increase in tension in the room. I clambered around the coffee table, careful not to trip over the 2-meter-long wire that connected the computer and the PSU to the power socket, and switched on the TV.

This is it! I thought. It was like lighting a firework. I had lit the fuse and now it was time to stand back and watch the splendour and magic unfold before our eyes.

Unfortunately, like so many fireworks, we were rather disappointed when nothing happened.

"What's wrong with it?" asked Mum.

"I don't know." said Dad.

"Let me have a look," I said.

I checked all the cables but everything looked fine.

"I'll be upstairs if you need me," said Our Susan rolling her teenage eyes and disappeared back to her bedroom and Duran Duran.

I picked up the manual again, had another read through the first few pages and spotted the error of our ways. The TV had to be tuned to the computer's signal. The manual recommended using Channel 6 or above as channels 1, 2, 3 and 4 were engaged with television stations. I pressed the 6 button and flipped open the little secret door on the front of the telly that hid the tiny wheels that you used to tune the stations in. The manual recommended leaving the computer on so that you could find the signal easily and after a bit of wheeling - first all the way down and then quite a long way back up - a ghostly image eventually slid into view and as I slowly tweaked the wheel to get as sharp a picture as possible this appeared on the screen:
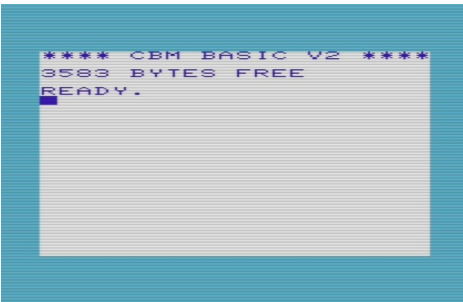
Mum and Susan were summoned once again and this time both were suitably impressed. Everyone had a go at typing their name in and we all wondered in disbelief at how we could make our own name appear on TV.

After a shaky start, the VIC was a hit and a few minutes later we stared at it with further astonishment when Dad learned this impressive piece of early BASIC programing from the manual:

10 PRINT "HELLO"

20 GOTO 10

RUN
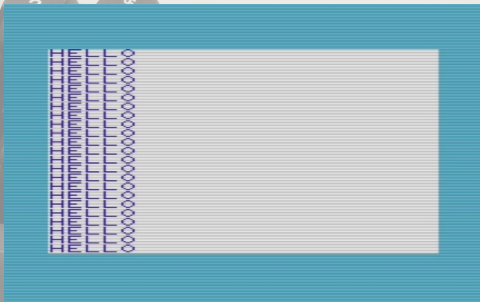
Now that blew our minds.*

If all of the above seems a bit unlikely, you have to remember that this was 32 years ago. Before computers existed you could only watch the television – you had no way of affecting what was on your TV screen, you just switched it on or off and watched whatever was being broadcast at the time. You were passive. But this was different. Now you could make whatever you wanted appear on your TV screen. You were active. Empowered. It was a revelation. A revolution.

Unlike consoles such as the Atari VCS, which played cartridges that were plugged into them, the 8-bit computer was an open invitation to get involved, it handed control over to the user. Yes, you could buy ready-made software on cartridge, disk or tape but you could also create your own. With a bit of time, patience and brain work you could even

produce a video game and make money. It was the beginning of a revolution that was to sweep across the world over the next 30 years and give birth to what grew into the biggest entertainment industry in the world.

I loved my VIC-20 and had lots of fun with it. At the time my best mate Collin had a ZX81 and next to that the VIC looked awesome. Over time I built up a collection of decent games which included Avenger, Blitz, Amok, Chariot Race, Mickey the Brickey, The Perils of Willy. Menagerie, Skram-20, Hunchback, Shadowfax, King Tut, Shamus, Gridrunner, Metagalactic Llamas Battle at the Edge of Time and the legendary Jet Pac. All these games and many more I hungrily devoured as my new found love of computer games blossomed.

Yet although I adored playing games on my VIC -20 I'm not sure that Mum and Dad were quite as enamoured. The machine was supposed to help me develop my computer literacy skills, yet all I really did was play games on it. In fact, rather than helping me with my schoolwork the computer seemed to get in the way of it as I'd spend more time on Jetpac than I did on my homework. I did put in a few frustrating hours trying to learn some BASIC programming, but my heart wasn't in it. At the age of ten I was far more interested in playing games than learning how to create them.

Over time Mum and Dad abandoned any hope that the computer was going to be of any educational value and accepted that I was going to use it as a games machine. In a similar way Dad never took up computer coding either. After typing in a few Commodore Horizons listings that never worked he gave up and went back to his lifelong love of growing vegetables on his allotment.

Back at school the BBC computer continued to wheeled out once in a blue moon as a rare treat for the good kids. However, the fun was cut short one night in 1984 when the school was burgled and the precious computer was pinched. It was a sad day when a visibly upset Mr. Williamson announced in assembly that the school computer had been stolen. A sense of mourning hung over the school hall as my friends and I realised that we'd never venture into Granny's Garden again.

Yet although the school's computer was gone it certainly wasn't forgotten. It left a lasting impression on myself and many of my school friends and kindled an interest in computers that lasted for the rest of my life. The school BBC was a brilliant introduction to computers and it's therefore a machine that holds a special place in my heart. Thanks Mr. Williamson.

THE TECH ZONE

Paul Monopoli investigates the Multiface two for the Amstrad CPC while John Kavanagh has a look at the SD2IEC floppy drive emulator for the Commodore 64.

Touted as the 'must have' device for the Amstrad CPC, the Multiface 2 was released by Romantic Robot in 1987. The '2' was added to the title as the first version of the Multiface had already been released on the ZX Spectrum.

A hacker's dream, the Multiface 2 had the ability to edit the code of any program that was stored in the Amstrad's memory. This was used extensively for cheat codes that featured in Amstrad Action and Amstrad Computer User magazines. It also featured the ability to dump the system memory onto a disc, allowing you to pick up where you left off at a later time. The piracy implications are obvious, though Romantic Robot didn't try to hide this fact. Quite the opposite, they brazenly promoted the Multiface's ability to backup tape programs to disc in their magazine advertisements.

Software developers took steps to prevent games from being loaded if the presence of a Multiface was detected, some hiding nasty messages to would be hackers and pirates. The device was able to get around this by using a 'hide' mode, only becoming active when required. Software that was backed up could not be reloaded without a Multiface being present, though Amstrad Action incorrectly claimed that a backed up game could not be reloaded without the same Multiface, as they were coded with a serial number. However, a backup was useless for multi-load titles anyway, as when you complete a level the game would still ask you to press play to continue.

To further complicate matters, a freeware program called Anti Multiface was released. This was a program that would allow a backup to be restored without the Multiface being present. This meant that you could purchase the latest Dizzy game and back it up for all of your mates. Potential legal action was always looming for Romantic Robot, who had a 'buy it before it's banned' sale that lasted a couple of years.

History has proven that any successful product will be cloned, and the Multiface 2 was no exception. Devices and utilities that copied all or some of the Multiface's features were released, including HackIt and Transtape. When reviewed by Amstrad Action, each of these devices were compared to the Multiface 2, nearly always with the suggestion that you

just buy Romantic Robot's wonder-ipheral instead.

Though I frequently read about the device in the pages of Amstrad magazines during my childhood, I would have to wait until adulthood before I was in the position to buy one. In 2005, at the prime age of 26, I found a boxed Multiface 2 on Ebay for the reasonable sum of $80AU. I had a play with it at the time, then I put it away for a rainy day. It's currently winter in Australia, so now is the perfect time to see whether the Multiface 2 really lives up to the hype.

For authenticity purposes I have taken screen shots directly from the Amstrad CRT monitor. I apologise for the quality of these images.

The first thing I tried was to backup a tape game on to a disc. I removed a freshly formatted disc from its plastic case and placed it into the disc drive. I typed CAT to check that the disc was definitely blank before starting. I can be forgetful, and I often put things in the wrong place. The title I selected to back up was the Codemasters Dizzy clone, Seymour Goes To Hollywood. After waiting seven and a half minutes the tape had loaded. Transferring to disc should shorten this to a few seconds.

The instructions called for me to push a red STOP button. What wasn't mentioned in the instructions was the switch on the bottom of the device that turned it on or off, and that the button on my Multiface is black, not red. I enabled the device by flicking the switch, then

pressed the black button. It is worth noting that there were several hardware revisions for the Multiface, and that most of them do have red buttons, with some omitting the on/off switch.

I was presented with a menu that gave me five options. The manual states that if the game you want to back up is 64k then to press C to clear the extra 64k of RAM before saving. As Seymour is a game designed to work on a 464, and I was using a 6128, I assumed this would be applicable. I pressed C, then went back into the game just to see if anything had changed. The game immediately crashed. Seven and a half minutes of tape loading later and I was back at this point. This time I decided to simply save the game by pressing S. From here you can opt to store the game on another tape or a disc. You even have the option of taking a screen grab and saving it. I selected D for disc, typed in a file name and waited for it to save.

Another handy feature of the Multiface is the reset button, something I used to return to BASIC once the backup was complete. Upon checking the catalogue of my previously blank
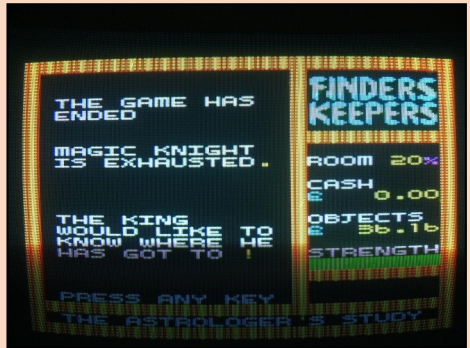
disc, I was presented with seven files. I ran the first one, and within seconds the game had loaded at the point that it was saved. I tested the game by playing it for about 10 minutes and all was fine. The backup was a success! I repeated the process with Wild West Seymour, and this also copied successfully. I now have both Seymour games on the one disc! Prior to testing I conducted some research on Multiface cheat codes. I extracted several for games that I own from the pages of Amstrad Action, and the archived website, CPC Zone. The first one I tried was for my recently backed up version of Seymour Goes to Hollywood. The code 61C8,00 is supposed to provide infinite lives. I decided to forgo using the instruction manual for this one, and instead used the simplified cheating instructions that were printed in the pages of Amstrad Action.

I re-loaded my copy of Seymour, then pressed the black button while still on the title screen. I'm not sure if 'when' you enter a code is important, but I thought I would mention it. This time I pressed T for tool, then followed the instructions from Amstrad Action. I pressed *, then H for hexadecimal, then SPACE to enter in a code. I typed in 61C8, then the 00. I pressed RETURN, then ESC, then R to return to the game. From the first screen I went left to the traffic. The life meter did not go down, even after dying five times. The test was a success!

Earlier in this article I mentioned that I had 'played' with the Multiface when I first bought it. At that time I tried some cheat codes, but had no success getting them working. I decided to put the device through its paces, so I tried some more games. Here are the results:

Into the Eagles Nest: 1AE3,00 is supposed to give you infinite keys. I tested this with the 6 Pak Volume 2 version of the game, and the standalone release. Neither version yielded the desired results, but the standalone release glitched a soldier into the wall of the castle.

Finders Keepers: 20CE,00 is supposed to provide infinite lives. What it ended up doing was altering the collision detection and energy drain rate. When I was on top of an enemy my energy drained slowly. When I was next to an enemy it drained quickly. Also, no infinite lives!

Fernandez Must Die: I tried 2 codes with this one, 538C,00 for infinite energy and 6236,00 for infinite lives. Both codes worked a treat, but the game glitched a second wall. This was purely a cosmetic fault, and this second wall could be walked through with no problems. The soldiers also glitched slightly, but it didn't affect the gameplay.

Dizzy - Prince Of The Yolk Folk: 185F,00 is supposed to provide you with infinite lives. This code didn't work, and no glitches occurred with it.

In the pages of Amstrad Action, many of the

Sword Slayer	(t)	14A8	3C}	Lives player 1
		14B6	FF	lives player 2
Skweek	(t)	9974	FF	Inf. lives
		9982	00	Inf. time
Shinobi	(t)	0F62	00	Reset timer
		3758	00}	
Captain Blood	(-)	43A3	00}	
		43A4	00}	
		43A5		
Power up Compilation				
Altered Beast	(t)	09B9	00	Inf. credits
Star Wars	(t)	4515	00	Inf. Shields
Empire strikes back	(t)	0746	00	Inf. Shields

Using the Multiface...

The (t)s and (d)s before the address indicate whether the poke was written for a tape or disk game (they might work on both, its worth a try). Just in case you don't already how to put in these BLACK BOX POKES, here are the steps to success.

a) Load the game as normal.
b) Press the RED button on the MULTIFACE.
c) Press "T" for tool.

d) Press "*" to make sure you select the code.
e) Press "H" for HEXADECIMAL input.
f) Press "SPACE" for input.
g) Type in the ADDRESS (4 characters ie. 3A7C)
h) Type in the POKE (2 characters ie. A7)
i) Press "RETURN"
j) If there is more than one poke goto (f)
k) Press "ESC" back to the menu.
l) Press "R" return to the game.

December 1991

INSTRUCTIONS FROM AMSTRAD ACTION (DEC 1991) ON USING THE MULTIFACE

codes mention that they only work on certain versions of games, either budget, compilation or stand alone. Many, however, do not. This makes it difficult to know whether a code will work for the version of the game that you own, and the process can be hit or miss.

The Multiface 2 was the must have device in the 80s and 90s, though in 2016 I would suggest that it isn't an essential buy. Add ons such as the X-MEM (512k RAM and ROM), X-MASS (128MB Flash drive) and HxC/Gotek drive emulators are what I would class as "essential", however that is purely my opinion. If you want the ability to cheat in games, many of the dsk files available online are already cracked. Most of the tape-only games are already on the Internet in disc format, so there is no need to back them up. With that said, if you are a serious enthusiast who will only use original 80s hardware then you will definitely want to add this to your collection.

SD2IEC FLOPPY EMULATOR FOR THE COMMODORE VIC 20, C16, C64, C128.

Still enjoying the USB floppy emulator for the Amstrad CPC 6128 last issue I then decided to check out the SD2IEC floppy drive emulator from **thefuturewas8bit.com**. Unlike the Amstrad device, this uses SD cards instead of a USB flash drive. There are also a number of different versions with different styles, colours and different power connector options. Most of the devices look like miniature 1541 drives. The options for the power connector are cassette port, user port or USB powered. There

are different cassette and user port options for various Commodore machines with prices varying slightly. Some versions are made from recycled Commodores!

I decided on a tape powered version and a style to match my Commodore 64C. On received the device I was impressed by the built quality and styling. It really does look like a tiny 1541 disk drive, well close enough. It came with one sheet printed on both sides. The instructions are detailed but there's a quick start section to get you going quickly.

Basically all you need to do is format a SD card, download the SD2IEC-collection.exe from **https://www. thefuturewas8bit.com/ index.php/sd2iec-info** and unpack directly to your SD card , copy a few disk images over and you're ready to go.

Connecting the device is easy. It's just a matter of plugging the device into the serial port and then the power cable into the cassette port or user port, depending on which version that was purchased. The cassette port version has a pin bent upwards to stop it from being inserted the wrong way around, although this might break if pushed too hard. It best to remember that the power line is always closer to the serial port.

Starting the file browser is as easy as typing: **LOAD "FB",8** and then typing **RUN** and pressing Return. You can have files in directories and it can load the popular disk formats such as D64,
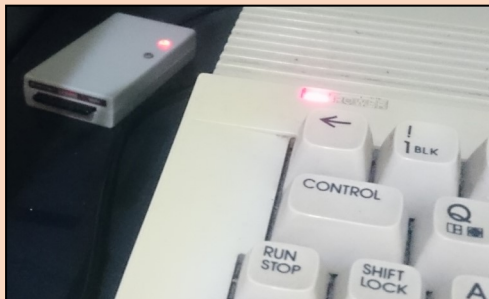
D81 and PRG. Controls are either by the cursor keys or via joystick plugged into joystick port 2. Selecting files is easy although entering folders that contain a lot of files do take a while to appear on screen. Loading speeds are about the same as a real 1541 drive, slow. Luckily it is compatible with most fast load cartridges. The device flashes red when starting up and green while loading. There are two buttons, for resetting the device and to "disk swap". The instructions goes into detail about writing a AUTOSWAP text file for software on multiple disks but this can be avoided when using the larger D81 or PRG disk images.

Version 4 of the SD2IEC has recently been released and it has three buttons instead of two. The third button is used to auto generate autoswap files.

There are some disk images that won't work on the device as it does not fully emulate the mechanical functions of the 1541 drive. However the vast majority of disk images will load perfectly.

As expected the device can't load cassette images in the T64 format. However there is a workaround to this which we'll cover in the next issue as there are a lot of fantastic tape only games out there. The SD2IEC floppy emulator is well built, works well and is certainly recommended to all Commodore users. I would recommend getting the suggested Epyx Fastload cartridge to help with loading times. Prices start at £ 39.99 Sterling and £ 16.99 for the Epyx Fastload cart.

PROGRAMMING THE 8-BITS

In this issue we get to grips with some programming concepts by creating a prime number generator! Then just for fun we'll compare a few computers to see which runs the program the fastest.

I have always enjoyed the fact that on most 8-bits you can just switch on the computer and it would not only be ready to use but ready to be programmed as well. Instead of just loading up the newest game in your collection it encouraged experimentation with programming. What I always found interesting was doing the things that was either impossible or impractical to do n a calculator, one such thing was, prime numbers.

PRIME NUMBERS

A prime number is a number greater than 1 that has no positive divisors other than 1 and itself. In other words it can only be divided by two natural numbers, itself and the number 1. A natural number is a whole number that is positive.

For example, 5 can only be divided by itself, 5 and the number 1. There are no other divisors for this number. This makes 5 a prime number.

Prime numbers are never even numbers and always end in 1, 3, 7 or 9.

So why are prime numbers important? Without getting into too much detail, prime numbers are important for example, in the study of cryptography, working with harmonics, solving complex mathematical problems and when generating pseudo-random numbers in computers. On first impressions prime numbers cam seem random but further study reveal elegant and mysterious patterns. Prime numbers have even been found hidden within nature! Even music has been generated from primes. At the time of writing the largest known prime number is $2^{74,207,281} - 1$, a number with 22,338,618 decimal digits. Don't, however expect your 8-bit computer to be able to calculate such large numbers!

PRIME NUMBER CHECKER

The program on the right prompts for a number greater than 1 and then checks if it is a prime number or not. Starting at the beginning you will see that line 10 is a REM statement which is short for "Remark". Anything wrote after this does not affect the code. It is a safe space to place comments within programs. Comments are handy for understanding how a program works and is a good habit to develop when writing larger programs. Line 20 clears the screen. The usual command is CLS but it can vary in different versions of BASIC. For example, on the Apple][it's HOME and character codes must be used on the Commodore 64 and Atari BASIC. Line 30 is the PRINT command. It is used to display text on the screen as well as variables which we explained in issue 1.

Line 40 is the INPUT command, by using this it causes the computer to pause, waiting for the user to enter information via the keyboard.

```
*** PRIME NUMBER CHECKER ***
ENTER A NUMBER GREATER THAN 1:
16777217
CALCULATING... DIVIDING  16777217  BY:
16777217  IS NOT A PRIME NUMBER,
AS IT CAN BE DIVIDED BY  97
FINISHED!

READY.
```

```
10 REM PROGRAM 1. PRIME NUMBER CHECKER
20 CLS
30 PRINT "*** PRIME NUMBER CHECKER ***"
40 INPUT "Enter a number greater than 1:",n
50 LET d=2
60 PRINT "Calculating... Dividing "n" by:"
70 LOCATE 1,4: PRINT d
80 IF (n/d) = INT(n/d) THEN GOTO 140
90 LET d=d+1
100 IF d=n THEN GOTO 120
110 GOTO 70
120 PRINT n "is a prime number."
130 GOTO 160
140 PRINT n "is not a prime number,"
150 PRINT "as it can be divided by "d
160 PRINT "Finished!"
```

MICRO ADJUSTMENTS

LINE 20
APPLESOFT BASIC: **20 HOME**
ATARI BASIC: **20 PRINT CHR$(125)**
COMMODORE 64: **20 PRINT CHR$(147)**
LINE 40
APPLESOFT BASIC: **Use a semicolon (;) instead of a comma.**
COMMODORE 64: **40 PRINT "ENTER A NUMBER GREATER THAN 1:":INPUT N**
LINE 70
APPLESOFT BASIC: **70 HTAB 1:VTAB 4:PRINT d**
ATARI BASIC: **70 POSITION 1,4:PRINT d**
BBC MICRO (ACORN): **70 VDU,31,1,4:PRINT d**
COMMODORE 64: **70 POKE 211,1:POKE 214,4:PRINT d**
SINCLAIR ZX SPECTRUM: **70 PRINT AT 3,0:PRINT d**

Once data has been entered it moves on to the next command. In this example the data entered will be stored in the variable: n. If text was expected then n$ would be used to indicate that. Notice that the syntax for this command is different on the Commodore 64. Line 50 creates a new variable called d and sets it to 2. This variable is the value the inputted number is going to be divided by. We start at 2 as there's no point in dividing the number entered by 1. Line 60 uses the PRINT command again, this time to display to the user what is happening on screen. Depending on the number given it can take some time to work out if a number is prime or not. Using the PRINT command massively slows the process down but also makes it much more interesting to watch. The purpose of line 70 is to let show what divisor is currently been used. In this example the LOCATE command is used. This command also varies between different versions of BASIC.

Line 80 is the clever bit. It compares the number you entered and divided by the divisor with the calculation but requiring a integer (whole number) value in return, i.e. no decimal places. Take for example, that the number 7 is divided by 3 giving a result of 2.3333 recurring but the second part of the calculation uses an INT which forces the result to be a whole number, in this case 2. The program then checks if both answers are the same and since (7/3) is not equal to INT(7/3) the program will not go to line 140. If they are the same it jumps to line 140. Line 90 increases the divisor by 1. Line 100 checks if the divisor is equal to the number entered by the user. If it is, then we have found a prime number, as all the divisors that we cycled through couldn't be divided equally into the number we were checking. If the divisor is still lower than the number entered, line 110 beings it back to line 70 where the divisor is updated by 1 and the calculations are done again at line 80. Line 120 displays on screen that the number the user entered is a prime.

If (n/d) matches the INTeger of (n/d) at line 80 the program will jump down to line 140 where it explains from 140 to 160 that the number entered is not a prime. As one can guess line 130 jumps to 160 to stop lines 140 to 150 being displayed in the situation where a prime is found.

PRIME NUMBER CHECKER

The second program works a little different. It searches for prime numbers between a certain range of values. In this example, from 3 to 200. Line 40 is a FOR loop as explained in issue 1. What is new is the part at the end, STEP 2. This tells the computer to count in steps of 2, e.g. 3, 5, 7, 9, 11 and so on. As no even numbers are primes there is no need to check these. While 2 is a prime number we need to start the checking for primes at 3. This is because in this program if we start at 1 it would incorrectly display 1 as a prime. We would also need to change line 80 to:

80 IF d=>n THEN GOTO 90

For simplicity in this tutorial we start at 3. As we are keeping things basic (pun intended) the program is not optimised for speed so getting to 200 even in steps of 2 takes a while. You can increase the range to practically any number you like but the starting number must be an odd number for the program to work. While simple, one can have a bit of fun benchmarking various computer models.

BENCHMARKING

Before anyone gets hot under the collar when they see that their favourite 8-bit is underperforming just remember that there's a number of factors at play here. The results can be quite different with other BASIC programs where one computer outperforms another. Atari BASIC is well known to be a poor interrupter and despite the computer's fast CPU, a MOS 6502 clocked at 1.79 MHz it failed to impress. You get the same story with the MSX with Zilog Z80 running at 3.58 MHz. The Sinclair ZX Spectrum did a little better with it's 3.54 MHz Z80. As expected the Sinclair ZX81 did badly having the extra stress of updating the screen while processing data. However it did surprisingly well in FAST mode when the screen output was switch off during

BENCHMARK RESULTS

Sinclair ZX81 (SLOW mode): 4 Minutes, 30.8 Seconds
MSX (NTSC): 2 Minutes, 0.5 Seconds
Atari 8-bit (NTSC): 1 Minute, 37.9 Seconds
Sinclair ZX Spectrum: 1 Minute, 30.8 Seconds
Commodore 64 (PAL): 1 Minute, 18.7 Seconds
Sinclair ZX81 (FAST mode): 1 Minute, 17.1 Seconds
Commodore 64 (NTSC): 1 Minute, 16.3 Seconds
Acorn Electron: 51.5 Seconds
Amstrad CPC: 48.6 Seconds
Commodore 128 (NTSC, FAST mode): 47.3 Seconds
BBC Micro: 37.2 Seconds

processing. The Commodore 64 did well considering the slow CPU and the Commodore 128 performed much better in FAST mode but it has to be changed to a 80 column mode to work this way. The BASIC built into the Amstrad CPC was considered good and it shows. Along with it 4MHz Z80 CPU it managed 48.6 seconds. The Acorn Electron big advantage is the excellent BBC Basic and it comes in at a respectable 51.5 seconds but the crown so far has gone to the BBC Micro which comes in at 37.2 seconds. Feel free to send in the results you got on your system and we'll print them in the next issue. Until next time, have fun!

```
10 REM PROGRAM 2. PRIME NUMBERS GENERATOR
20 CLS
30 PRINT "*** PRIME NUMBER GENERATOR ***"
40 FOR n=3 TO 200 STEP 2
50 LET d=2
60 IF (n/d) = INT (n/d) THEN GOTO 110
70 LET d=d+1
80 IF d=n THEN GOTO 100
90 GOTO 60
100 PRINT n;
110 NEXT n
```

MICRO ADJUSTMENTS

LINE 20
ATARI BASIC: **20 PRINT CHR$(125)**
APPLESOFT BASIC: **20 HOME**
COMMODORE 64/128: **20 PRINT CHR$(147)**

Named backers of Eight Bit Magazine Issue 2

Craig Harrison
The CPC was my first machine. I have now added Atari 130xe and a speccy to my CPC machines. Loving 8-bit.

Jonathan Garcia
October 4th 2016. Seattle WA. After my 8bit journey, I got the amazing Amiga 500. My grand-parents drove me to Nancy in France to purchase it. I played a lot with my brother Nicolas Garcia. Minitel was our Internet, we used it to trade games.

Kenneth Chadman
Big fan of Retro-computers, especially the 8-bit type.

Magnus Färje

Markus WERNER
Ich grüße alle 8-bit Fans der Commodore 64 und NEC PC-Engine Systeme. Greeting's to all the 8-bit fans of Commodore 64 and NEC PC Engine Systems. Feel free to contact me: 8bit@mxcon.net

Michael Towns
Issue two is here!
All of that retro goodness
About computers

Once again, it's print.
Paper and some staples too.
Gift from the mailman.

Some good stuff to suss
Paul's things in this here issue.
Good dude at writing.

But now I must leave.
Need to read this mag again.
You should do the same.

Mike Mee
For my retro-in-training, real ale drinking fiancée, Eleanor :-)

Paul Craddy
Happy 10th wedding anniversary to my amazing wife Joelle - thanks for being my player two! I love you!

Phil Reichert
My C64 was all 8 bits of heaven wrapped in 20 min of loading tape. Bubble Bobble, Barbarian, Spy Hunter… PRESS PLAY ON TAPE forever.

Seppo Seppälä
Karpow of Scoopex salutes everybody in C64 and Amiga demo and crack scene. Keep the power switch on and Commodore spirit alive! And support Commodore related projects worth to support what ever they are! And always remember... Scoopex - Generations Ahead!

Steven Warren Merrill
The American Way LLC says hello to all Commodore kids, Appleheads, etc. With the ICCAN turnover anyone want a dial up BBS?

Stuart Polkamp
The Eight Bit era was a unique time. Each computer had its own individual character and functionality, which included design, peripherals and most of all, different graphics and sound. Unlike today, where most people use computers and play games, whether on a computer, console or phone, most people just didn't 'get it' back then. It usually took someone with a curious and analytical mind, to appreciate and enjoy learning commands, getting software to run and be able to become immersed in the many enthralling games that were on offer. Meeting someone who was into these computers as you were, was great, as there was an instant level of understanding you didn't have to explain, as you knew they 'got it'. This would build rapport and often turn into a friendship, that in a lot of cases still continues today.

Tim Blanks
In a happy turn of events I recently found my original Apple //e for sale on eBay and managed to get it back. When I was a kid I got in a lot of trouble for damaging the case but without that damage it would have been impossible to identify the machine from a photo all these years later!

Tobo Bobo
@tobobobo - ZX Spectrum and doodles. Non swearer.

HEROES RESCUE

Reviewed by Paul Monopoli

Amstrad CPC

Heroes Rescue? Shouldn't the heroes be rescuing us instead? Lazy gits…

Heroes Rescue is a traditional, single screen platform game that appears to be inspired by the likes of Manic Miner. Your heroic protagonist bears more than a passing resemblance to Fry; the titular character from Futurama. Fry begins his adventure in the lower left corner of the screen, while the heroes who require rescuing are held in the top right.

The sprites are a decent size, and the levels, while small, are challenging and require some thought to get through them. The game is presented in the Amstrad's Mode 0, allowing the maximum amount of colours on the screen. A lot of attention has been put into the game, with small details like background stars being visually pleasing.

The game offers no keyboard controls, which was something that I wasn't too happy about. I prefer to play most of my Amstrad games on the solid and robust CPC keyboard, and I have

done so ever since I was a kid. For this game I decided to compromise and use one of my GX4000/Plus controllers.

Fry moves around quite smoothly, and I was pleased that you had the ability to move in mid air. This meant that if I mistimed a jump or an enemy was going to end up on my planned landing position that I could try to move out of the way. Many games don't allow you to do this, including the aforementioned Manic Miner. The one issue I did have was with unintentionally double jumping. If you hold down the fire button for even a split second too long then Fry will jump again as soon as he has landed. On more than one occasion this caused me to hit an enemy or mistime the next jump.

There is no music, but there are sound effects. Nothing much to mention here, other than it sometimes feels like the sound effects play when nothing has happened.

According to the coder, the game comprises of 5 Teenage Mutant Ninja Turtle levels, 5 Marvel Super Hero levels, 5 The Simpsons levels and 5 Futurama levels. The game is quite difficult, and whilst playing it for this for review I was unable to get past the TMNT levels. Certain frustrations with the game, such as only being given 3 lives and the aforementioned jump

mechanic, prevent it from being great, though it is still quite good. The collision detection also caused me to pull out some of what remains of my hair. On more than one occasion I thought that I had cleared an enemy and could see space between them and Fry, yet it registered a hit.

I admit, before writing this review I had turned off the Amstrad, having given up on the game. While writing it I found myself turning the computer back on and giving it another go. Despite the faults the game has a high grab

factor, though it took a while for me to get into it.

It's a good effort, though the frustration factor might put a lot of people off.

Graphics 7 - Nice background effects

Audio 1 - Competent sound effects that seem to play at odd times.

Playability 5 - The level of frustration may be a real turn off to begin with...

Lastability 7 - … but stick with it & you'll find a worthwhile game.

Overall 7 - It's a difficult game, but a fun game. Those dodgy jumping controls really stop me wanting to give this game a higher score.

Heroes Rescue can be downloaded free from the Defecto Digital website at:

http://defectodigital. wixsite.com/software/ heroes-rescue

DOOMS DAY
LOST ECHOES

Reviewed by John Kavanagh   **Amstrad CPC (Requires 128K, HD Disk Drive)**

A dark room, the only illumination coming from the monitor, the only noise is the barely audible high pitched buzz that a Amstrad tends to make in a silent room. Totally engrossed, I pressed on the keyboard, GO NORTH, EXAMINE ITEM and so on, as night brightened into morning. Many happy hours were spent solving puzzles and exploring numerous text based adventure games. So when I was sent a release candidate of Dooms Day: Lost Echoes I couldn't resist rushing to my Amstrad and loading the game up straightaway.

While I had been told that the release candidate would closely resemble the finished product, I had my doubts. What I received in my email was mind-blowingly polished and that was even before I started the game. I am, of course talking about the manual. Graphically exciting, 24 pages of pure joy to read, the type of manual that gets a person itching to turn on

INSTRUCTION MANUAL

DOOMS DAY
LOST ECHOES

AMSTRAD CPC & PLUS 128 KB

their computer and play. The only thing thatsurpasses it is the game itself.

You play the character of Mike, a deserter of the evil Sinotec army and now a gun for hire. At the start of the game you received a communication about a lost worker from the Regus, an abandoned space station. The worker, Arnold Croft disappeared over 30 years ago and was last seen at this station. Your job is to find out what happened to him, It was requested that I don't give any spoilers so that is all I will say on the story, except to add that it is truly enjoyable.

The game is a graphics adventure and there's a graphical screen for each and every room you come across. There are those that would say that having graphics in a text adventure takes away from the imagination but I found it only added to it. With over 600KB of graphics, each screen is well drawn and atmospheric. Certain screens can be clues to progressing through the game so it pays to have a good look, and to find every secret one must study these graphics carefully.

The game can be saved at any time by simply typing SAVE and entering a filename. You There is also a quick save into the RAM, which can be accessed by typing RAMSAVE and then using RAMLOAD to load back. I quickly discovered that it's best to do this often to avoid having to repeat steps when Mike gets himself killed or more accurately, when I get him killed.

A good or bad text parser can make or break a game and I'm pleased to say that this game has a good one. It can understand more than 550 words and can handle complex statements such as "FILL THE GLASS WITH WATER", "POUR WATER IN THE GLASS", "PUT WATER INSIDE THE GLASS", "USE GLASS WITH WATER" and so on. Having such a good parser means that frustrations are kept low and the puzzles to be complex but rewarding.

Early on in the game I got stuck, not because I came across a difficult puzzle but more down to my rustiness playing adventure games. Once I was away from the computer I found myself mulling over the puzzle. I was assured that all the puzzles were logical which increased my desire to get back to the game even more. I haven't felt that way about a game in some time. There's a strong desire to progress through the game.

Completing the game doesn't mean it's the end. You can do the bare minimum and get to the end or complete three additional missions that will add a substantial amount of lore and are essential in getting the most out of the game. One side mission, in particular, will give a much more satisfying ending if you completed it. In fact ,there are multiple different endings depending on your actions within the game.

Unlocking all the secrets will takes a fair amount of time, especially the Easter Egg, but it's an enjoyable journey. While there's no

Things had been quiet for a while. The
money from the last mission was almost
over and I was considering to start a
scavenging expedition on my own when I
received the most interesting mail:
"Find out what happened to Arnold Croft,
a worker last seen in the now derelict
Regus station 30 years ago, and we will
make you rich. Here is a little advance
and the coordinates. Beware, the Regus
still belongs to Heliotech."■

I am aboard my ship, the Doomsday. The
ship is resting on a derelict landing
pad. Through the cockpit windscreen I
can see the enormous station dock
illuminated by Pollux.
>ex Pollux
Pollux is a massive giant star that
exhausted the hydrogen at its core.
>ex cockpit
Crowded with indicators and displays.
>

DOOMSDAY LOST ECHOES

A. RIERA D. CASTAÑO T.PAPASSILEKAS
"[[G]-E]]" "EL NOÑO" "GRYZOR"
DOOMS DAY PROD. 2016

AMSDOS LOADER: A. del Campo -Rhino-
FONT SELECTOR: M. Garcia
-FloppySoftware-
SUPPORT: M.A. Silva -MiguelSky-
TEXT CORRECTION: C. Mykura,
S. Haywood -dthrone-

TESTING: C. Moreno -Celemor-, D. Busto
-Ennegativo-, D. Rodriguez -Kerrick
Sword-, J.M. Velo -Dubliner-, M.A.
Silva -MiguelSky-, S.W. Stumpferl
-TFM-, S. Haywood -dthrone-█
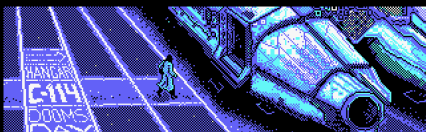
So here I am, ready to pack some things
inside the Doomsday and leave my hideout
in the Pit. The coordinates indicate
that the Regus is somewhere around
Pollux b, not even too far. However, it
is still an interstellar jump and
nowadays real distances do not matter,
only the combination of available
wormholes. Since Pollux system is not so
visited anymore, it can take a great
deal of time to go there.█

The name is Mike. I am a renegade, a
deserter, a bounty hunter, a scavenger,
a mercenary, a hitman...almost
everything you can get paid for. A few
years ago I escaped from Kepler 452 b
aboard my ship, the Doomsday, and fled
from Cygnus to the constellation of
Cancer. There I found The Pit, an old
station orbiting 55 Cancri e. It is a
hole of thieves, goons and whores, but I
like to call it home.█
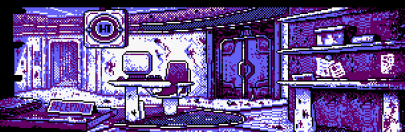
The Regus reception is soulless. I see a
counter with a computer on top, a chair
behind it and some shelves with
pamphlets. The walls are splattered with
blood and peppered with bullet holes. A
large, shimmering Heliotech logo hangs
from the ceiling. There is a pair of
blast doors to the north and a corridor
to the west. The doors are closed.
>█

audio in the game, you don't miss it. I found myself so engulfed in the game that the lack of sound only adds to the eeriness of the station.

The games runs on CP/M and requires a CPC with 128 KB of RAM and two disk drives with one been a high a high density floppy disk, usually a 3.5 inch external drive on the CPC. The game plays fine on a floppy emulator and this is probably the best choice to use.

I would highly recommend this game even if you don't normally play on a Amstrad. If you love adventure games you won't be disappointed.

A BIG THANKS TO DOOMSDAY PRODUCTIONS FOR SUPPLYING US WITH A COPY OF THE GAME. THE GAME SHOULD BE AVAILABLE TO DOWNLOAD NOW AT https://doomsdayproductions.org/

Graphics 10 - Well drawn graphics

Audio 0 - There's no audio although the manual does recommend some tunes.

Playability 9 - Easy to get in to and familiar to adventure lovers.

Lastability 9.5 - If you love adventure games then this is one that you'll be coming back to time and time again.

Overall 9.5 - A excellent adventure game. Well polished and very enjoyable.

AGAINST THE ELEMENTS

Reviewed by John Kavanagh

Sinclair ZX81 (Requires 16K)

A high resolution isometric game on a Sinclair ZX81 shouldn't be possible but here it is. Thirty five years after the release of the humble Sinclair ZX81 comes a game that pushes it to it's limits. Programmed and designed by Paul Farrow, Against the Elements comes from an idea that has existing in his head since the 1980's. It was released in February 2016, to much excitement in the ZX81 community.

You play the element Hydrogen and your mission is to save the atomic world as it plunges into crisis. An epidemic is sweeping through the atomic world and is altering the nature of elements. Only you and the six Noble gases remain unaffected. It is up to you to find these gasses, Helium, Argon, Neon, Radon, Xeon and Krypton and collect the antidote from them. As Hydrogen you have the ability to pick an additional electron and this ability will be needed to progress in the game. You must keep in mind that picking up an extra electron will give you negative charge and this has an effect within the game.

As the game starts you are presented with your instructions and from there launched right into the game. As I mentioned above the game is a isometric game similar in style to Knight Lore or Head over Heels.

The cursor keys are on 5, 6, 7 and 8. This makes the controls feels a bit cramped on the ZX81. It's easy to make a mistake in moving in isometric games but this layout makes it worse. I would have much preferred to use something along the lines of Q, A and O,P for moving. Having said that, using the top row isn't a game breaker.

From the very first room you can head in to four different directions and you may feel you need a map. There's only a slight pause going from screen to screen which is very impressive. The game does slow down with a lot of objects on screen, but never to a critical level. You quickly encounter enemies, touching them means losing a life. There's no way to fight then, the only option is avoidance.
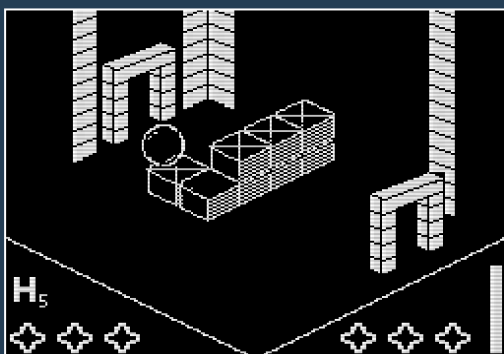
AN EPIDEMIC HAS SWEPT THROUGH THE ATOMIC WORLD, TURNING THE ELEMENTS HOSTILE. FEW REMAIN SAFE AND TIME IS RUNNING OUT.

THE NOBLE GASES, UNINFECTED SO FAR, HAVE MANAGED TO CREATE AN ANTIDOTE BUT HAVE BEEN TRAPPED IN DIFFERENT LOCATIONS AND SO CANNOT COMBINE AND RELEASE IT.

YOU ARE HYDROGEN AND ARE ALSO UNINFECTED. YOU MUST FIND ALL SIX NOBLE GASES, COLLECT EACH ANTIDOTE PART, AND RETURN THEM COMBINED FOR RELEASE.

CURSOR KEYS=MOVE, 9=GRAB/DROP, 0=JUMP, SPACE=PAUSE/CONTINUE.

PRESS ANY KEY TO START

PLAYING AGAINST THE ELEMENTS

ENTRANCE / EXIT

NUMBER OF LIFES

ANTIDOTES FOUND
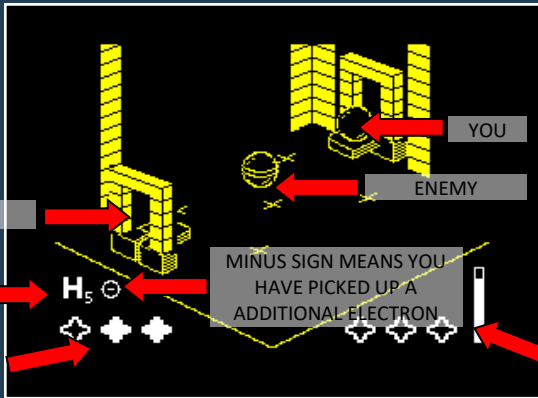
YOU

ENEMY

MINUS SIGN MEANS YOU HAVE PICKED UP A ADDITIONAL ELECTRON

In order to enter some rooms you need to jump up to a platform, which sometimes can be too high. To combat this you will need to move around some obstacles.

Traps are spread out throughout the game and if you are not careful it is easy to lose your six lives fairly fast. Like the instructions on the download site says, you need to use your dexterity and ingenuity in order to succeed.

The game requires 16K of RAM and works with the Chroma SCART to give a pseudo type colour effect (see screenshot above). The high resolution graphics not only looks great but the animation is smooth, which brings that bit of extra enjoyment to the game. Against The Elements is not only a good game, it's arguably the best game out there for the ZX81 and will unlikely be bettered in the future.

DOWNLOAD FREE FROM www.fruitcake.plus.com/ Sinclair/ZX81/Software/ AgainstTheElements.htm

Graphics 10 - For a ZX81 they are the best possible. Good use of colour too when used with the Chroma SCART interface.

Audio N/A - You're kidding, right?

Playability 7 - The game slows when too much is on screen and sometimes it's difficult to know if a object is on the ground or floating in the air. Can be frustrating at times. Controls can be awkward for big hands.

Lastability 9 - There's enough to keep you going and it keeps you interested in wanting to complete it. Even then you'll go back to it again even just to marvel at such an achievement.

Overall 9.5 - If you like isometric games you'll going to enjoy this. Plenty of puzzles to solve and exciting to play on the humble ZX81. Surely the best game possible for this micro? Control issues stopped it from reaching full marks.

CAREN AND THE TANGLED TENTACLES

Reviewed by Joseph McMahon

Commodore 64
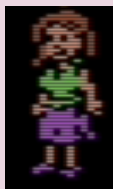
I love the 8-bits but also enjoy playing point and click adventure games like The Secret of Monkey Island and Beneath a Steel Sky on the Amiga. While there are point and click games on the C64 they are few and far between. So when I came across Caren and the Tangled Tentacles I was excited to check it out.

The game plays on both NTSC and PAL systems and on starting the game you also have two language options, English or German. From there you are led to the optional instructions before the main game starts.

You play as Caren, starting your work day as usual, except today you get a phone call letting you know that hardly anyone showed up for work this morning. From there your adventure begins. I won't spoil it for you but expect to be engrossed as you solve puzzles to progress further into the story. There is quite a bit of comedy and wittiness similar to the style of LucasArt games.

Controls are done by moving a cursor around the screen with a joystick and pressing the fire button. This will make Caren walk to wherever the cursor is. Double pressing fire on a object gives a description of that object and when you double press on a character you can talk to them. To use a item in your inventory on a object you just hold down the fire button and press right to select a item.

Graphics are good and the animation smooth. Music is atmospheric and the sound effects perfect. A very enjoyable game to play, but the game completes all too soon leaving you wanting more.

The phone is ringing. I should get it.

DOWNLOAD FREE FROM
http://csdb.dk/release/?id=141659

Graphics 10 - Very nice graphics and smooth animation. Good use of colour.

Audio 9 - Atmospheric music and good sound effects, especially the mumblings of characters.

Playability 9 - Controls are good and the game plays at a good speed. Although there is an annoying pause going from screen to screen.

Lastability 7 - Once completed you are unlikely to go back to it but if you love point and click adventures you'll stay until it's completed. Although it is a bit short.

Overall 9 - A bit too short but perfect in every other way. Download now.

HARBINGER
CONVERGENCE

Reviewed by John Kavanagh

Sinclair ZX Spectrum (128K only)

The fate of thousands of worlds and millions of lives around the Galaxy depends on you in this new ZX Spectrum game from Apsis Games.

Harbinger Convergence is a platform shooter for the Sinclair Spectrum. It comes as a download with two tape images, maps and nicely made, graphical instructions.

Your missing in on the planet Thanatos where an advanced base of the Archon Empire is situated. Your mission is to infiltrate an alien facility and blow it up, but first you must collect various important objects.

The game has two stages. In the first stage you have to find a safe entry from the swamp to the facility. You got to shoot lizard like aliens and flying objects, none of which shoots back at you. However your game character will die on contact with them.

In stage two, inside the outpost facility, you have to collect ten discs with the convergence data project. One specimen of the experiment for DNA Analysis. One molecular bomb that will explode when leaving the installation. One TALI module with biogenetic information. In this stage the enemies shoots back at you, and not just horizontally but shots can be fired at a angle. This stage is harder to play and it's easy to get yourself lost as you got to use a teleport to get to different sections.

In both stages a mistake can get you killed quickly and you will have to restart the game from the start of that stage.

Graphically the game looks fantastic. It makes good use of colour and the drawings for the scenery, main character and enemies are done very well.

Animation of the lizard creatures looks a little off. Their legs move while they are standing still and when going backwards they look like bipedal lizards doing the moonwalk. The

THE GAME IS MASSIVE AND THIS IS JUST ONE OF THE TWO MAPS

same problem applies to other enemies as well. There is no screen scrolling but each screen appears fast and works well with the game.

Interestingly, you can start stage two without completing stage one as they are both supplied in separate tape images.

Controls are nice and tight and while collision detection is slightly off it doesn't take from the game. Controls are Joystick (Kempston / Sinclair) or keyboard which are Q to Jump, A for Down, O and P for left and right. Pressing Space fires your gun and M is pressed to use a object. H pauses game and Y ends the game. Unfortunately, you may find yourself ending the game often when your character gets stuck in scenery which as you can imagine, adds a bit of frustration to the game.

The game map is big, around 160 screens, which adds to the game as the graphics are
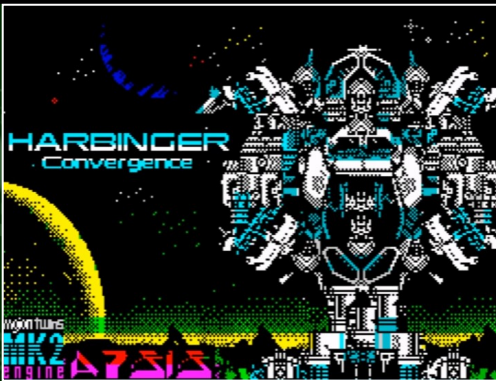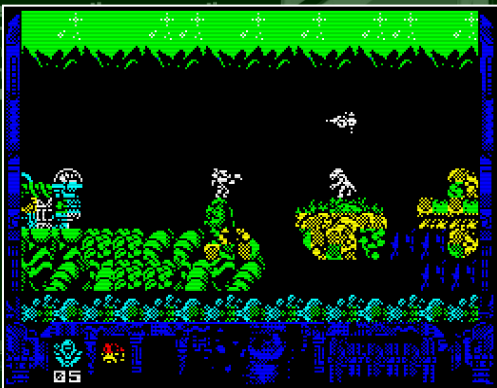
very well done at portraying a large alien world.

Audio is ok with the expected sound effects. It does the job nicely. Overall a enjoyable game in the true heritage of a good platform shooter.

DOWNLOAD FREE FROM
https://cthoniangodkiller
.wordpress.com/2016/10/05/
harbinger-convergence/

Graphics 9 - Very nice graphics gives the feeling of being on a alien planet. There's enough variety between screens to keep you interested.

Audio 8 - The usual sound effects does the job but nothing to get overly excited about.

Playability 8 - Enjoyable to play. Controls are good and responsive. Going from screen to screen is fast and doesn't get in the way of the game.

Lastability 9 - A hard game to complete when you get to stage 2. Enjoyable enough to keep you coming back.

Overall 8.5 - Enjoyable game, let down by a few issues.

JAWS

Reviewed by Philip Boyce of Recovering From a Scratch blog

http://recoveringfromascratch.blogspot.co.uk

Commodore 64

From the moment I saw Jaws on TV in my teens it's been my favourite movie, so you can imagine my thrill when 15-year-old me stumbled upon this game in January 1993, immediately parting with my Christmas money and rushing home. I loved every incredibly difficult moment of it. These days I'm 38, purchased a C64C last Christmas, a friend bought me the game and I'm hooked again. But this particular version remains pretty much unknown so I'm here to help correct that.

There's a well known earlier game from Box Office with basic resource management, crude graphics and, for me personally, little playability. The Screen 7 version couldn't be more different. Produced by Intelligent Design it's more arcade-like, with you taking control of a one-man submersible to search the depths off Amity Island for parts of a weapon lost at sea after a storm destroyed its ship. Chief Brody, Hooper and Quint take three volunteers and yes, it's nothing like the film and yes, that's just an excuse to give you six lives but the game is a joy.

The first thing that hits you is the main sound effect! While the game looks gorgeous, it's the sound of the sub's air system which stuns upon loading, transporting you instantly into this world. As you leave the surface to explore the many caverns of the game's huge ocean, the colourful graphics and this sound come together to create something utterly magical.

Such a shame the rest of the sound is so basic. The sub has great inertia and learning how to pilot it is the biggest challenge when you begin, as it constantly moves. Well, you're underwater and can't exactly use breaks. Instead there's grades of speed from full pelt to mollusk-like slow available through deft joystick use. But once you master this don't be thinking the game will be a pleasure cruise.

Clear blue water gives way to intricately drawn caverns, gorgeous backgrounds and a multitude of unique sea creatures firing constantly at you! Some are also impervious to your pellets, bouncing them right back at you and if this sounds ridiculous that's because it's a game first and foremost but you'll soon lose yourself in it. Learning how each creature moves and attacks/ defends itself is key to progressing, some reacting suddenly to being fired upon or when approached. There's lots of when approached. There's lots of variety

with them, but the game's maze too is brilliantly designed to be as interesting and challenging to navigate as possible. It makes for extremely fun exploration; one moment it could be a huge open cave, the next a maze of dangerous tunnels. You really don't know what's next and the size of it makes mapping essential.

Creatures can leave things behind, most importantly (and rarely) weapon parts, others could drop bullets for it (you'll need these for facing Jaws) and power-ups. But accidentally shoot them and they'll flash and disappear, adding another element; you can't blast through carelessly, each creature must be dispatched with the right amount of bullets, as any extra shots will destroy what they've dropped. There's also power-downs! If that's a phrase. You'll find extra air, mines and fast bullets, but also energy drainers, faulty mines which explode if you don't leave the screen in time, others make the walls deadly to the touch (insane since you can't stop) and, my personal favourite to curse at: invisibility. With this you can only see a little line of air bubbles which is a neat graphical trick, but the creatures can see you fine, thus hiking the difficulty.
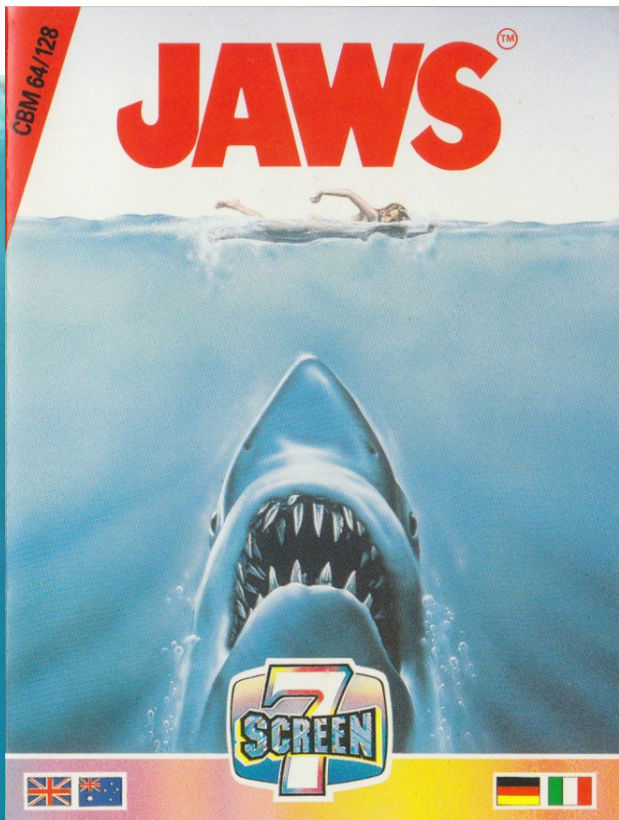
Add in the huge scale of the game and this is one tough challenge, but losing your six lives in the caverns or via Jaws on the surface aren't the only ways the game can end. You've finite air which constantly needs topped up by collecting bubbles floating about, usually behind a sea creature. Run out and lose a life. This affects the way you explore and plan because you can't just scoot through avoiding

enemies, you have to constantly defeat them just to be able to breathe! Not only this, but on your sub's panel is a little display of a swimmer joyfully kicking their way through the water. If you hear the infamous theme music look down and you'll see that person being eaten! If five people are ingested the Mayor can no longer hide it from the press and the game's over, no matter how many lives you've left.

Collect all the weapon pieces and bullets (which you'll need to use on some of the sea creatures just to find the weapon pieces, so use them sparingly) and you're placed into open water with Jaws, one life, eighty seconds of air and four bullets. It takes three direct hits to win the game. What's the ending like when you've successfully completed this? I'll let you know when I know!

Playing it now as an adult I definitely have more patience for this game. I love carefully exploring the caverns, working out each enemy's pattern of attack, lining up difficult shots and each time coming back to the game able to uncover just that little bit more. For fans of Jaws there's some lovely touches in here to always make you aware it's a game based on that fantastic movie, but for any fans of shoot-'em-ups and exploration, of games that require thought behind your blasting and who want a good challenge with plenty of charm thrown in for good measure, hunt out this game on eBay for your 8-bit and discover a lost gem.
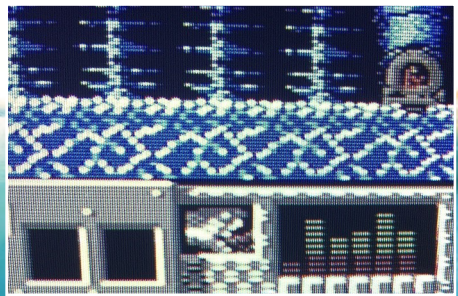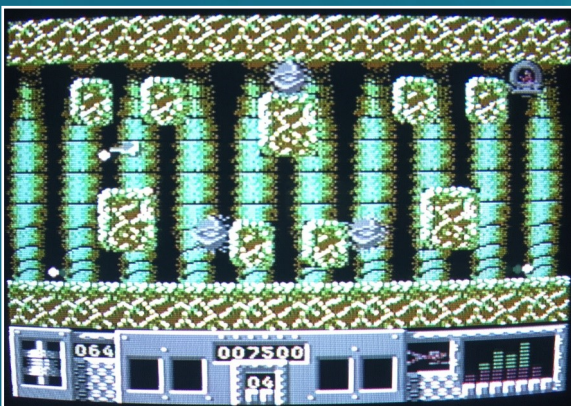
Graphics 9 - Beautiful backdrops, strange sea creatures and colourful scenery make this game a joy to explore, with a lovely animated shark thrown in for good measure.

Audio 5 - That air sound is superbly atmospheric, but the rest is just spot effects and a rather bland rendition of the theme music. I have the soundtrack CD on when I play!

Playability 9 - Once you get into the groove of careful exploration and experimentation with each creature it's hugely absorbing and brilliant fun.

Lastability 10 - This is one tough game, but never to the point of frustration. You'll return time-after-time to see more of the ocean and get that bit closer to the showdown.

Overall 9 - It's a Corker! My favourite film licence game creates something which focusses on the fun, with added touches for fans. Channel your inner Quint and hunt this down!

The Last Bit

The latest retro news and rumours from around the world.

GARY KILDALL'S MEMOIRS

Gary Kilidall, best known as the creator of the CP/M operating system, along with many other achievements, had his unpublished memoirs released by The Computer History Museum in Mountain View, California.

Draft copies of the memoirs, "Computer Connections: People, Places and Events in the Evolution of the Personal Computer Industry" were written in 1993 but weren't finished due to his death a year later.

The 78 pages released is just a portion of his work and there are plans to release more. You can read the memoirs here: **www.computerhistory.org/atchm/in-his-own-words-gary-kildall/**
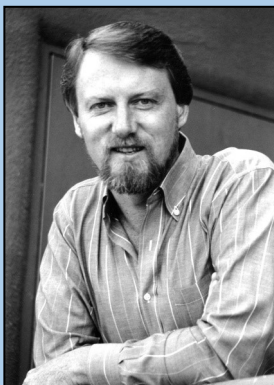
BBC MICRO ADVENTURE

The Darkness of Ravenwood is a new adventure game coming soon for the BBC Micro. It is being programmed by John Blyth. No other information is available at the moment but it's hoped to be finished in time for Christmas. We'll keep you posted.
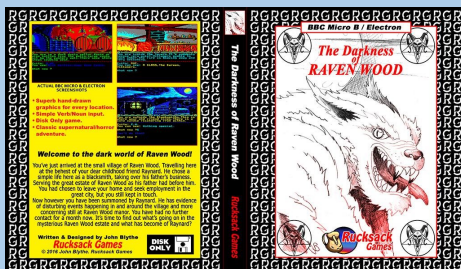
ANCIENT LEGENDS

Ancient Legends is a new fantasy role playing adventure for the Apple IIc/e. Created by 8 Bit Weapon and friends, it features 3D raycasting graphics and has over 80 foes to defeat. You can find out more here: **https://8bitweapon.com/2016/07/21/our-rpg-ancient-legends-released/**

NEXT GENERATION

Last issue we managed to fit in a short piece about the Spectrum Next computer. This issue we have two more projects worth mentioning.

The ZX Vega Plus is a handheld version of the original ZX Spectrum. Instead of being like the countless devices that can emulate the Spectrum, the Vega's aim is to be as closer to the real thing. Firstly the screen will be a 4:3 ratio with approximately 0.2565 mm dot pitch to accurately reproduce the Spectrum's 256x192 resolution with minimal screen border. Secondly the styling is being influenced by Rick Dickinson, the man behind the design of the ZX80, ZX81 and the non-Amstrad ZX Spectrums. It's also the only games console to come with a thousand licensed games included. Additional games can be loaded from a micro SD card.

 It can be connected to a PAL or NTSC TV if desired and comes with a connection for a external keyboard.

The crowd funding for the Vega Plus has ended but you can still purchases it from Indiegogo at: **https://www.indiegogo.com/projects/the-sinclair-zx-spectrum-vega-plus-console-games#/** for UK £100 Sterling. Expect a full review in a future issue.

For Commodore 64 fans there's The 64. While reaching only 67% of it's US$ 150,000 flexible goal the project is still going ahead and can be pre-ordered at **http://the64.computer/**. Two versions are being offered, the 64 and the 64 SX. The 64 is a desktop version, with similar styling to the original Commodore 64 and is priced at US$ 150 plus postage. The SX is a handheld version priced at US$ 170 plus postage.

However, I would hold off on pre-ordering just yet as there's a possibility that the project has stalled. At the time of writing there were no updates for over two months now. Such projects always comes with these risks but fingers crossed this one won't.
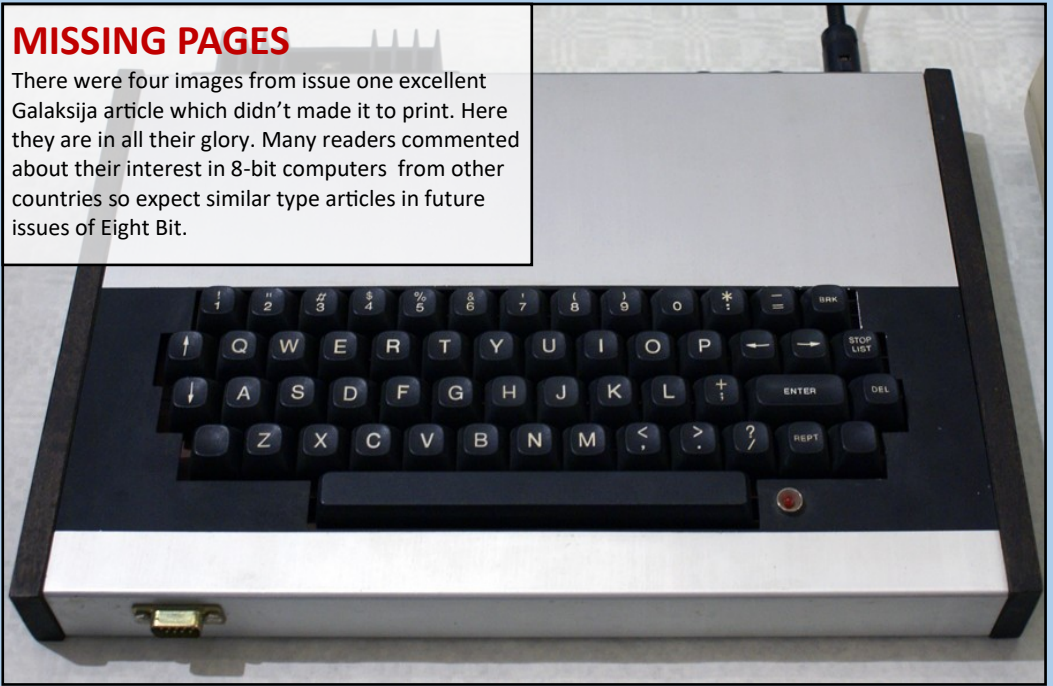
COMMODORE 64 CHIPMUSIC

8-bit Weapon has produced a new chipmusic album. Created entirely on the Commodore 64's SID chip. Check it out at: **https:// 8bitweapon.andcamp.com/ album/disassembly-language-ambient-music-for-deprogramming-vol-1**
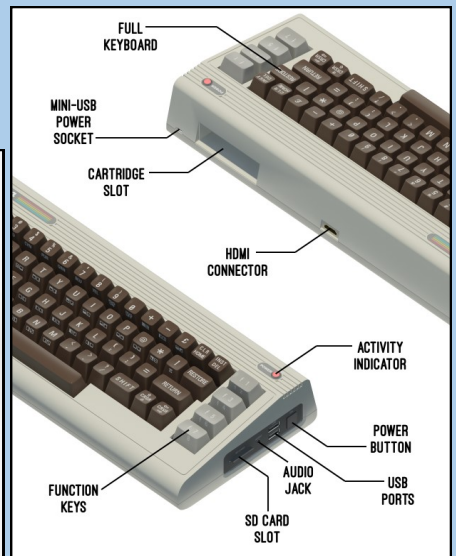
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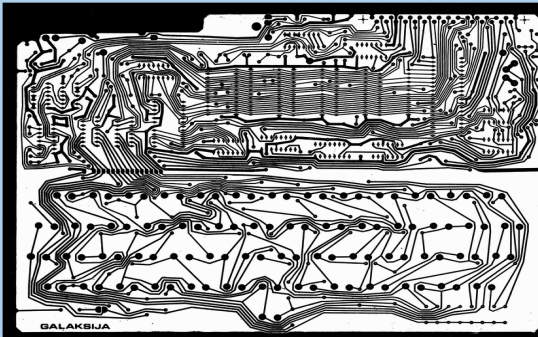
School model of the Galaksija
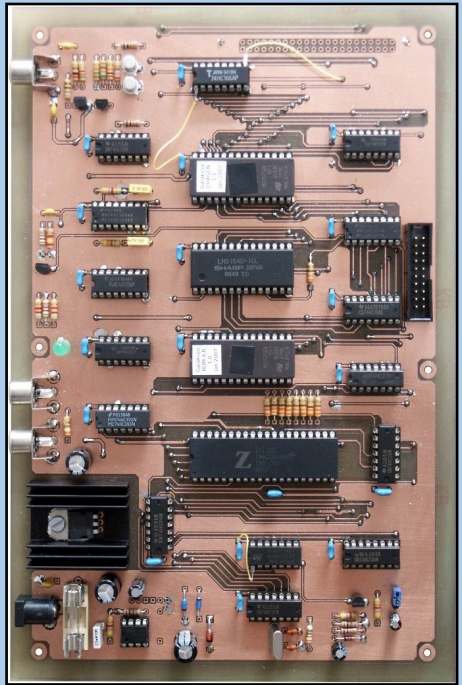
CMOS Galaksija Motherboard

IN OUTER SPACE

BEING ALONE IS NOT ALWAYS BAD

DOOMSDAY LOST ECHOES
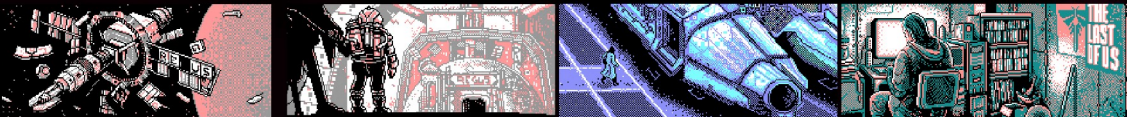
A GRAPHICAL TEXT ADVENTURE FOR THE AMSTRAD CPC AND PLUS. DOWNLOAD IT AT

WWW.DOOMSDAYPRODUCTIONS.ORG