

KILOBYTE

MAGAZINE

2018 / 3

UNIVERSAL 65XX REPLACEMENT · EMULATION ON 8BIT · SORDPLAY · JARLAC (CPC) · OPERATION ALEXANDRA (CPC) · SHADOW SWITCHER (C64) · SILVER VALLEY (SMS) · AND MORE



8BIT
ONLY

**INTRODUCING:**

The **KILOBYTE MAGAZINE GEM AWARD** for games with exceptionally clever concepts, great playability and/or impressive technical features.

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Photo: Boris Kretzinger

There are nice covers in your diskbox as well – we're sure of it! Please send your scans or photos to: kilobytemag@gmail.com

PRECISION MAGNETIC DATA

If you were looking for reliable magnetic data storage back in the 70s and early 80s, you were looking in Dysan's direction. And they were really big, even manufacturing OEM products for several other disket-

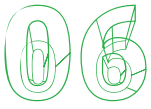
te brands. They became a fortune 500 company by 1983, then merged with Xidex one year later, another name you may recognize from your diskboxes. They were a strong brand in the US, but less-known in Europe amongst consumers. (bk)

THIS IS CRAZY

When you think of the brand JVC, you think of stereos, speakers and generally hifi equipment. You don't remember them for their storage media. But they were quite popular back in the day, and the quality was alright, too. And of course, following the well-known flood-the-market-move, they were rather cheap. In 1986, you could buy ten DD disks from Dysan for 24 USD. Or you

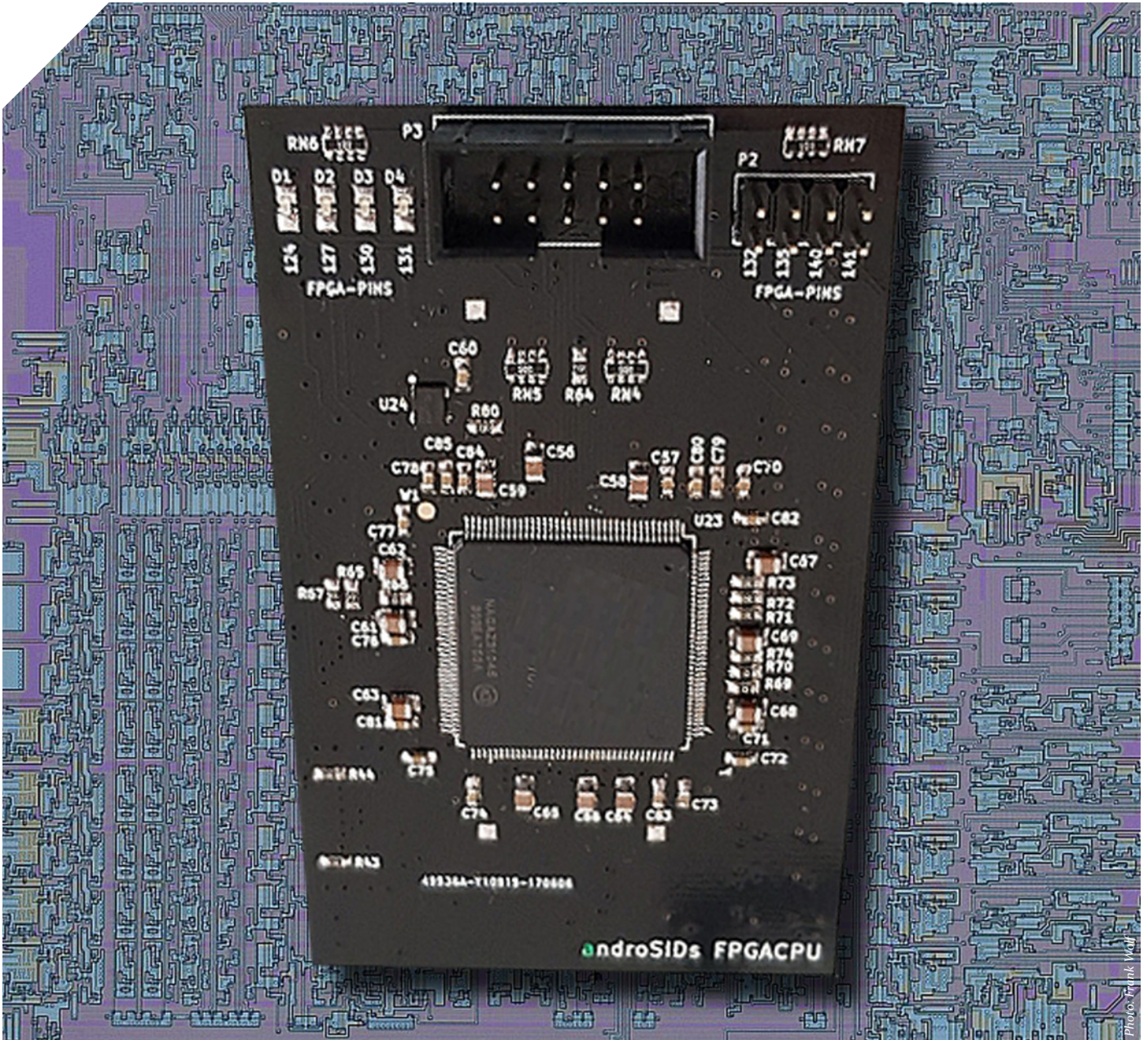
could buy 100 JVC DD diskettes for just about 60 USD. But they were facing declining sales with their 5.25" disks towards the end of the 80s and early 90s, like many other manufacturers. So they dressed them up a bit by giving them a colored coat, put them in a rad sleeve with a punk on it and called them crazy. It did not turn their diskette business around, but it certainly looks great! (bk)





MICROCHIP STRIP

ONE FPGA TO RULE ALL 65XX PROCESSORS



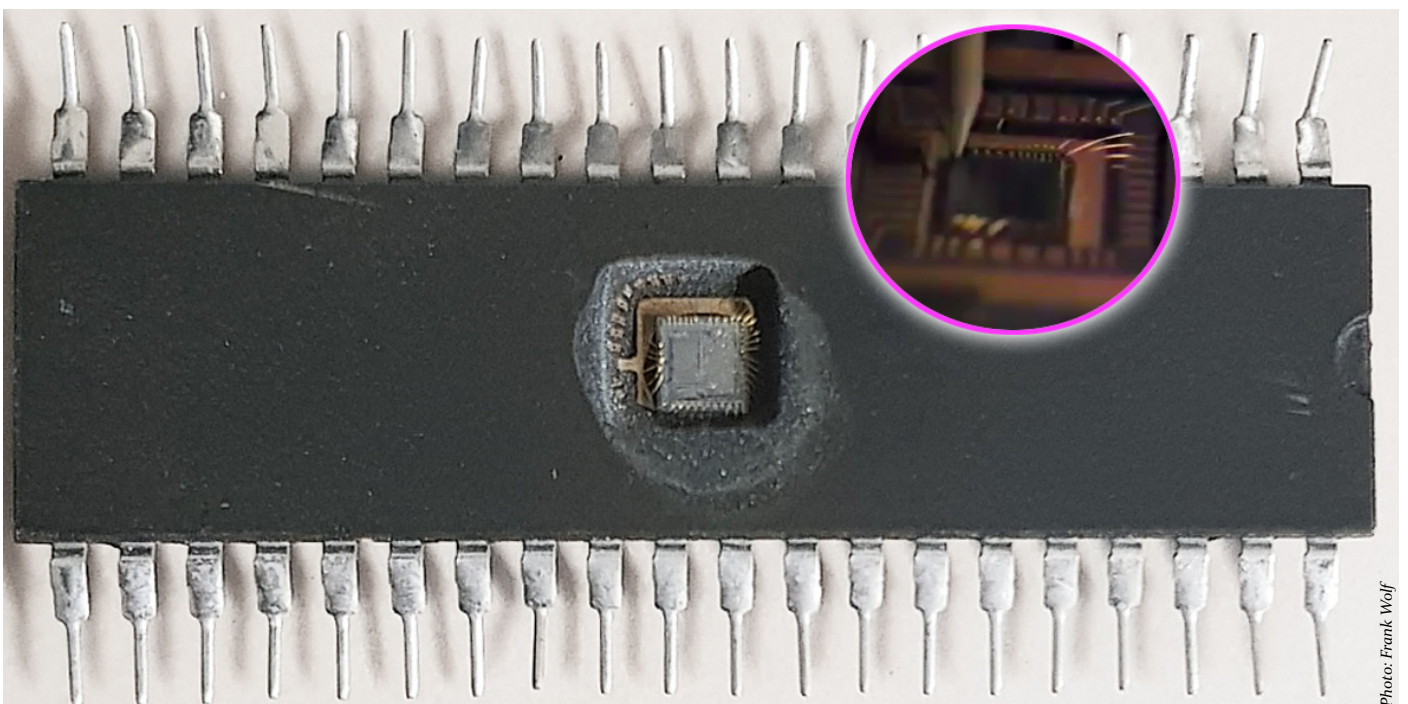
When your Commodore Plus/4 stops working and just shows a black screen, it's very likely that your 8501 CPU died. Good luck finding a replacement for a reasonable price that will work. Sure, there are adaptors to fit in a much more common 6502 instead. But what if these will get harder to find, too? Many old MOS Technology CPUs are

reaching the end of their lifespan. Actually, they are altogether well over it already. And although there is still some new old stock supply available here and there, it is already getting harder to find working chips. Especially if you are looking for the ones that were already rare back in the day, like the 6509 used in the CBM-II line of Commodore

computers like the 500s, 600s and 700s. Or the 6508 which was used in Commodore's C900 prototype of which only a few exist today. So Frank Wolf from Germany started his work on a FPGA board that will replace many CPU designs, from the 6502 to all the aforementioned ones, plus the 8502 used in the C128 and the 6510T used in the 1551 floppy disk drive. And he's already getting much input on what processors to implement next. So his work is not done yet. Together with a team of like-minded guys, he puts a lot of effort into making this FPGA board the best possible replacement you can get for your Commodore. "We are aiming for a phase-level-exact replication of 6502 behaviour, a one hundred percent support of all op-codes, including illegals, a simulation of the pass-gates between

internal buses and porting of all latches/pass-gates to D-flip-flops (full static design) as well as one hundred percent identical function blocks and modules as in the 6502", he says. So in other words: You will be able to throw any software at this device and it will behave just like the real deal. However, in this case, size matters. As the original processors are rather flat and tiny compared to the current FPGA board they are experimenting with, it won't be easy to put this device in everything. The team is aware of the issue and currently working on this, as Frank explains: "We will shrink the PCB to a reasonable size before we prepare mass production." And as requested by some users from the German speaking C64 user forum Forum64.de, more processors will be implemented. "As soon as the final hard-

*Off with their heads!
Here lies a decapitated
8501 R4, showing all of
his innards. You can see
the metal layer that will
be etched off in the next
step. And next to that
you can see a photo of
the bonding process
at Commodore's own
production line.*



ware design of the Mock-A-65xx will be ready, I'll try to implement the 6500/1 that is used in the Commodore 1520 plotter and also in Amiga keyboards as 6570-036." He cannot say anything about the price of the product yet, but looking at the steep price curve original 8501 CPUs alone

are selling for – currently at least for 40 Euros – and considering that 6509s are quite more expensive, it is safe to say that this will be worth buying as replacement. Moreover, it's likely that prices of replacement chips like this will drop over the years as production is readily available and the hardware design might get optimized at one point or another. So far, so good. But how is this magic even possible and how do you start making a clone of an old CPU? Well, here is an answer that you might have expected: by destroying them.

STRIPPING THE CHIPS

This sounds quite brutal, doesn't it? But in order to get to the silicon, you have to carve the protective plastic or ceramic casing away. And that's only the beginning. The naked "chip" itself consists of different layers with different functions. If you look at it just from the top, you will not see the layers beneath. Just the stripped chip, holding on with very thin golden wires to the so-called bond pad. To get under its "skin", Frank and his team carefully remove the passivation. Then they begin photographing layer after layer of the chip, starting with the metal layer, then the polysilicon layer. "From sacrificing those rare chips we gain very clear photos of every layer, which are almost good enough to virtualize them right away. They need some minor clean-ups here and there and we're done.

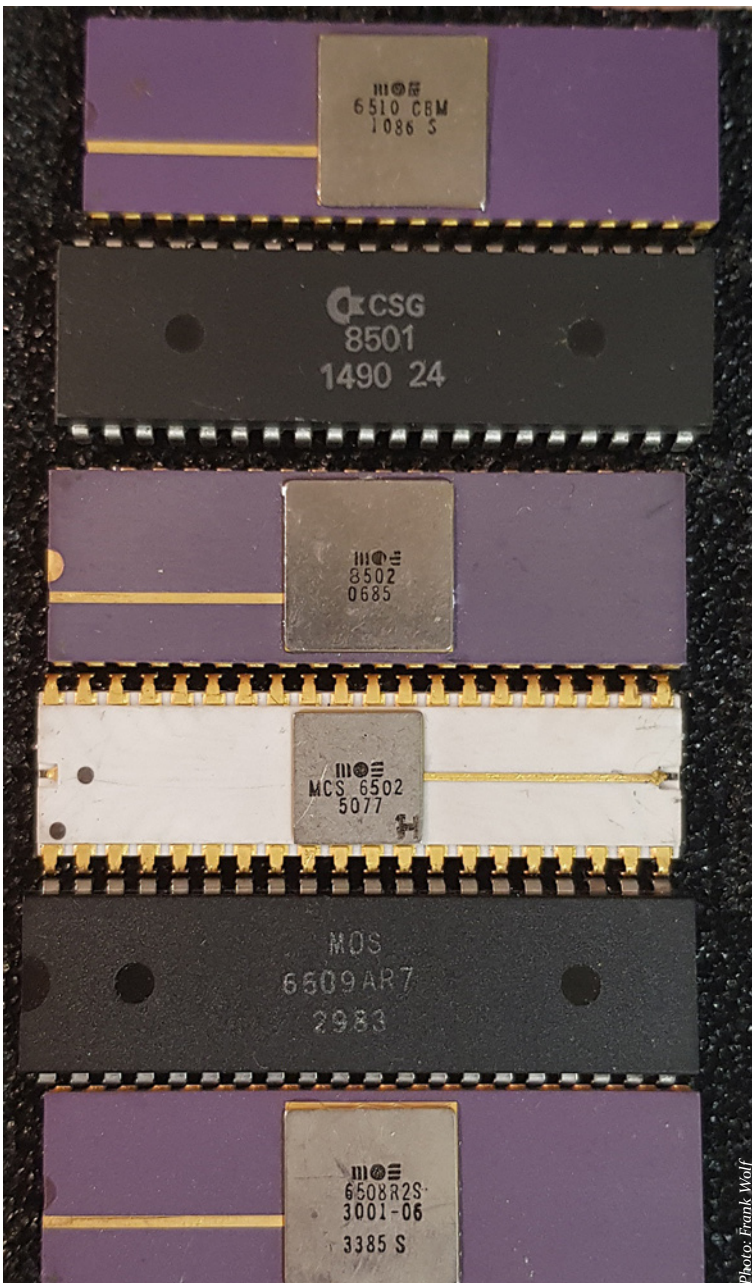


Photo: Frank Wolf

Far better than most of what you see over at SiliconPron”, says Frank, referring to a website that presents photos of many different integrated circuits. To reach down even further, they need to etch the metal layer off. It consists of aluminium and its function can be compared to the conducting paths of a printed circuit board. Then, they come down to the polysilicon layer. Together with the diffusion layer beneath it they make the magic happen: Wherever the polysilicon crosses the diffusion layer, a field-effect transistor is formed. These conduct the current when the polysilicon piece above is positively charged. Well, at least in enhancement mode. Frank explains: “There are a few exceptions which conduct the current when the gate

(i.e. the polysilicon) is not charged and block it as soon as it is negative to the source connector. These are mostly used to create a kind of pull-up resistor.”

HOW FAR IS THE PROJECT

So how far is the project already and what needs to be done? While the 6502 is very well documented and is implemented fine, the more rare chips are keeping the team busy. Also, they are still working on shrinking the whole circuit board down to a size that will allow for universal usage in any device. “We are aiming for one hundred percent compatibility, including the exact mode of operation of the I/O ports”, says Frank. Only then they will release this work of art. (bk, fw)

Test drive: Here is a MockA65xx running in a Commodore 1551 disk drive. And it works!

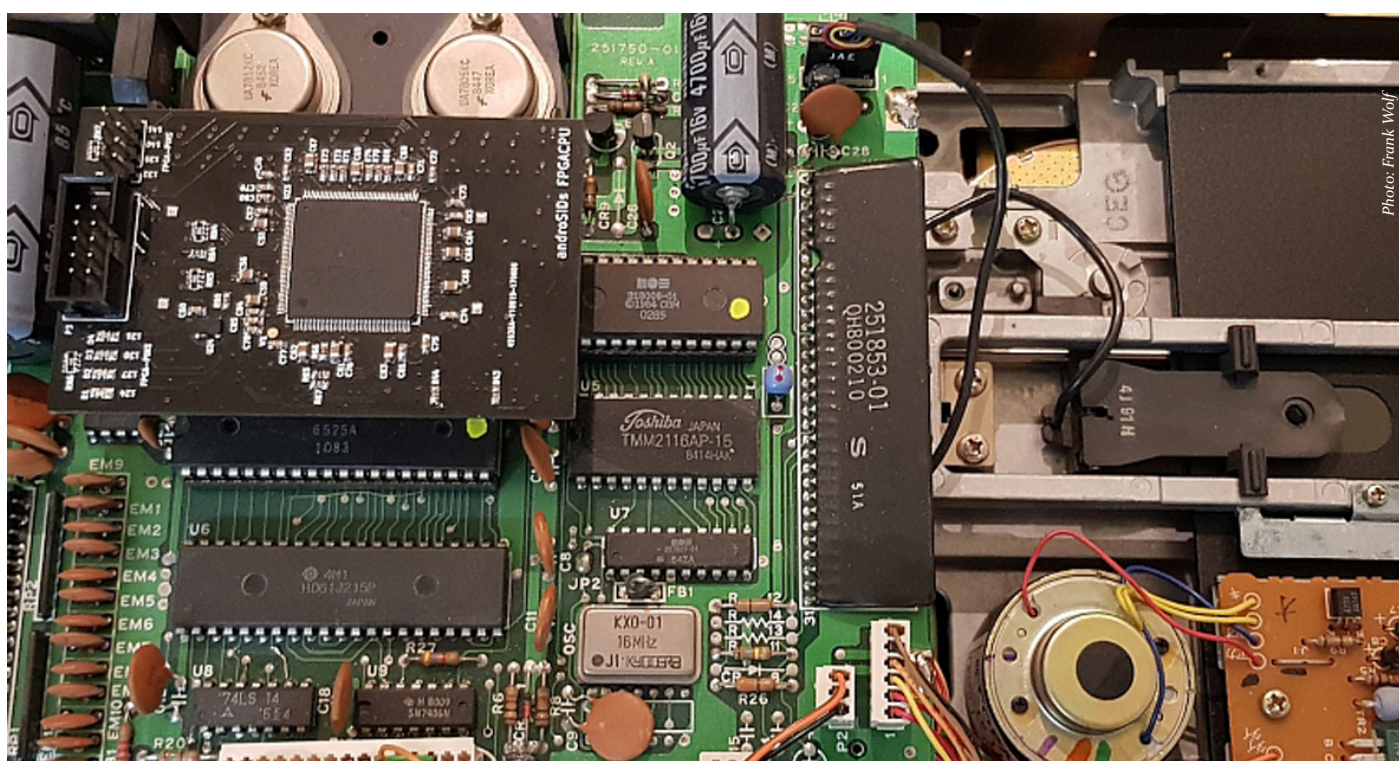


Photo: Frank Wolf

10

JUST PRETENDING

EMULATION ON 8BIT COMPUTERS



They are called Stella, Hoxs, Wzonka-Lad or Nestopia and you run them on your PC: emulators. Packing the complex system architecture of an entire 8bit computer or console in some Megabytes of data, they allow us to play or program while we are on the go, maybe even between two business meetings – or during one, if it is exceptionally boring. There are so many of them out there for any system you'd want to emulate that it's hard to keep track of them all. And, naturally, emulation is something you automatically associate with using your PC or laptop. But the idea of one platform emulating another is quite old. In fact, there are even emulators available that run on 8bit machines. Which makes sense, as long as the system that is emulated is weaker than the one the emulation runs on. So in theory, you should be able to emulate an Atari VCS on your Commodore 64, as it is far more powerful. But this is where it gets complicated. Tom Wilson is currently working on an 65816 simulator that he is building in conjunction with the C256 Phoenix project. He has implemented a virtual CPU that executes all of the 65816 opcodes, and he plans to refactor the code to make the CPU cycle-accurate – so he knows a thing or two about emulation. The first two things one has to differentiate between are virtualization and paravirtualization. “Virtualization means that the virtual CPU is entire-

ly software. Each machine language instruction, or opcode, executes several instructions on the host computer, and the CPU's internal parts – the registers, pins, busses, and so forth – are all just variables in the emulator program”, explains Tom. This means that a rather simple assembly language instruction like LDA #\$15 executes a bunch of software steps, like reading the signature byte from the memory location immediately after the opcode, then copy the signature byte value

How much computing power does it take to emulate an Atari VCS – and can the C64 handle it?



Photo: bk

into a variable that represents the CPU's accumulator. Then check if the value is zero, set the CPU's Zero flag. Otherwise, clear the Zero flag. If the value is negative (the top bit is set), set the Negative flag. Otherwise, clear the Negative flag. "If the emulator is coded in C, this process will add up to a few dozen or maybe even a few hundred bytes, depending on how the CPU and variables are implemented and accessed. So true virtualization has a lot of overhead, both in terms of memory and CPU time", Tom illustrates. This is where paravirtualization steps in. "Instead of software pretending to be a CPU, an emulator that uses paravirtualization will run the machine code instructions directly on the CPU. This obviously only works when the CPU on the host system is binary compatible to the CPU used by the guest operating software." So coming back to the C64 emulating the VCS: Although they share basically the same CPU, they have different chips for video, sound and I/O. "A emulator using paravirtualization would need to handle that in some manner. One way is to actually modify the running program before the CPU executes it. For example, if the guest program tries to write to the Atari's video screen, it will write a byte to the memory block used by the Atari's video chip. An emulator might re-write those instructions to write to the VIC-II video memory, instead", says Tom. And in theory, this could be handled by the C64.

But because its CPU is on par with that of the VCS, and because this would mean the processor would not only have to calculate what the CPU of the Atari would calculate, but in addition to that it would have to handle all the other information that the dedicated chips in the VCS take care of. The result would be an unplayable game that would barely move, as all the things the C64 would have to handle would slow it down immensely.

ARCADE EMULATION

It's far easier to program an emulator for an arcade machine even on an 8bit computer like the C64 or Atari 800 as they have exactly one piece of software running on them. Like Asteroid, for example. "You can write your emulator to handle exactly what that software does. It helps that the Asteroids CPU is a 6502, so it's really just a matter of figuring out how to handle the screen. Asteroids uses a vector screen, so the emulator needs to draw the lines onto the VIC's bitmap memory. If I was building the emulator, I'd probably trap the code that draws the vectors and replace that with my own line-drawing routines", explains Tom.

LEVEL 40

Coming back to 8bit machines emulating other computers, how much faster does a host system need to be to emulate the target machine with a satisfying output?

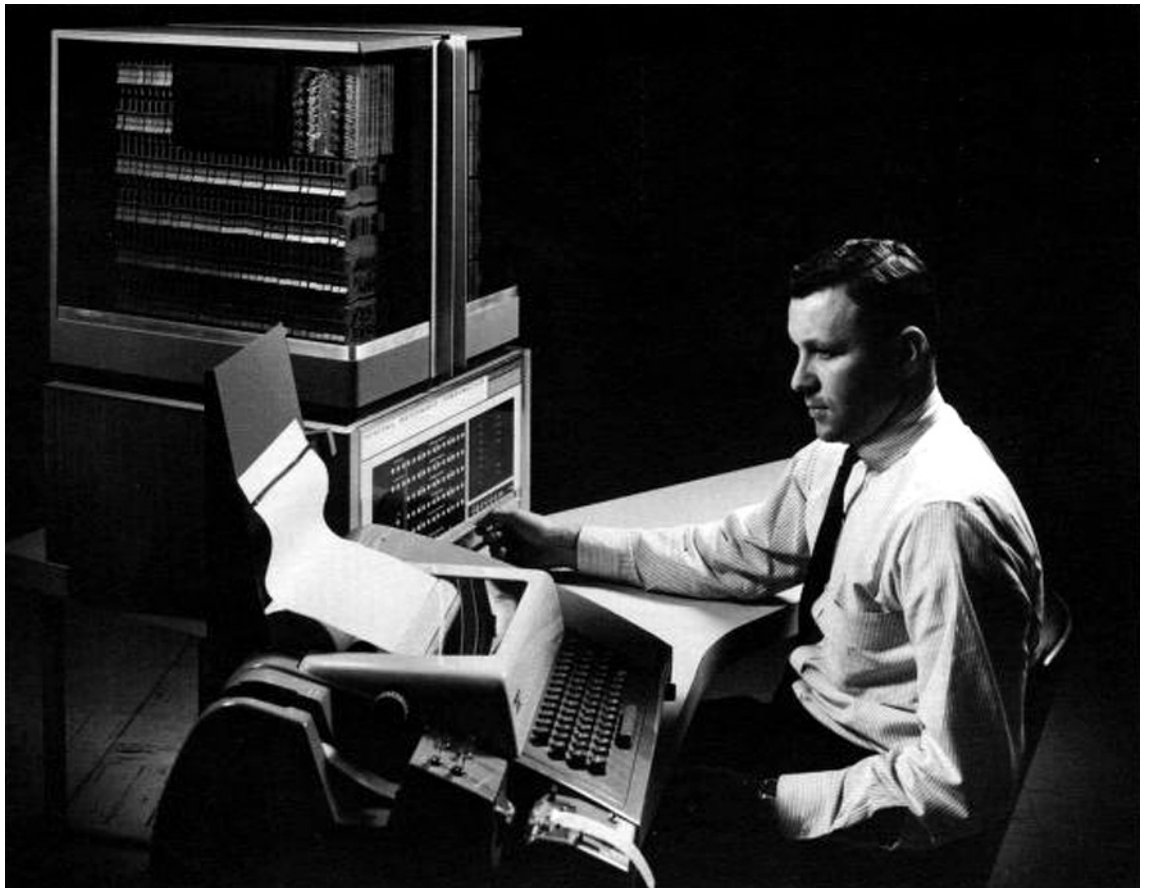
From his own experience with the emulation of an Altair 8800 on an Arduino, Tom Wilson suggests the following: “The Altairduino emulator runs a virtual Altair 8800 on an 84MHz RISC CPU. The 8080 on the Altair is clocked at 2 MHz, and with CPU throttling turned off, the Altairduino manages just over two million clock ticks per second.” This suggests at least an 40:1 ratio. Tom elaborates: “If you look at the steps needed to execute a single machine code operation in software, the 40:1 ratio makes sense. Up above I gave some psuedocode for a simple Load Immediate instruction. Imagine that each of those psuedocode steps takes ten CPU instructions, and

you’ll see why cycle-accurate CPU-level emulation is very demanding. The Altairduino code is actually pretty tight. Another emulator, the Altair Clone, actually runs on a PIC microcontroller running at 32MHz. Mike Douglas had to implement his emulator in assembly language, so he gets more like 16:1 out of his system. That’s a testament to the power of assembly language, but there are definitely tradeoffs, advantages, and disadvantages to writing in C, rather than assembly.”

So the question rises: Can there ever be such a thing as “true” emulation on the C64? And what systems could be done, theoretically speaking, to which degree? “While

Photo: archive.org,
Digital Equipment Corporation, PDP-8 brochure

The PDP-8 was introduced in 1965, so you’d think that the C64 can easily emulate this antique machine. The answer is: Yes, within some limitations.



There is more to emulating a calculator than you would think. Norbert Kehrer did it with some HP ones on the C64.

I'm tempted to say, 'no, it's silly to think someone would write a virtual computer on the C64', people never cease to surprise me. So I'm sure there's something out there like a KENBAK-1 or ENIAC emulator that someone wrote just to see if they could." And there is indeed some-

one who accepted this challenge. At least to a certain degree. Enter Norbert Kehrer.

MAINFRAME EMULATION

Norbert programmed an emulator of the arcade game *Asteroids* on the C64 in 2013. It comes pretty close to Atari's 1979 original, but he was not as much interested in the arcade conversion itself as into the emulation side of things. Next, he went for emulators of pocket calculators by Hewlett Packard: the HP-35, -45, -55 and HP-80. "They all have their proprietary CPU that I emulate on the C64 and the Atari", Norbert says. At the heart of these calculator is a register and arithmetic chip, a control and timing chip and three ROMs on which the actual calculating software of the machines is stored. To emulate them exactly, Norbert firstly emulated the processor and then the ROMs. "This means that the calculations of the emulation on the home computers matches the original exactly. You can test this by calculating $\arcsin(\arccos(\arctan(\tan(\cos(\sin(9))))))$. Every machine or calculator will display a slightly different result, which is close to 9 in most cases. With my emulators, you get the same exact result as with the HP calculators, right down to the very last decimal place." Why he did it? Because he can. But not only that. "The internal computational accuracy of the HP calculators is higher than that the BASICs Commodore and Atari



gave their machines”, he says. And after he did this, there was one more machine on his mind that needed to be emulated: a PDP-8 by Digital Equipment Corporation. This mainframe computer was introduced in 1965 and sold well over 50.000 units until it was discontinued in 1979. It featured a relatively simple instruction set and came with a very small central memory – both good starting points for a decent emulation on the 8bit homecomputers. Norbert explains: “I implemented every command for the PDP-8 in 6502 assembler and as soon as this was done, I tested it for quite a long time and looked for bugs – which is always necessary in almost all emulator projects, unfortunately. My first PDP programs running on the Atari were the interpreter for the LISP programming language and the interpreter for DEC’s Focal. Focal is similar to BASIC and came, I think, with most PDP-8 machines. These languages actually run pretty fast on the Atari and C64. This might be due to the fact that waiting times are less noticeable because of the constant need of user input. The third PDP-8 program that I ran on the emulator was the chess program *Checkmo*. And there you can see pretty clearly that the home computer needs a very, very long time to calculate a move, because every PDP command is emulated by a series of 6502 machine commands.” So there you have it. Norbert knew that this emulation would have

limitations, but he was just curious what could be done with the 6502/6510. So to conclude the story: Can you emulate a VCS on your C64? Yes, but you won’t want to play on it.

There are other emulators, like for example for the Sinclair ZX81 and even the Spectrum. But as they used a Z80 processor with a whole different set of instructions, this calls for a “translation” that the CPU has to do on top of everything else. It works, but it’s slower than the original. David Tindale did the programming on the Spectrum Emulator for the C64 for Whitby Computers Ltd. back in 1985. He remembers: “There was a complete annotated disassembly of the Spectrum ROMs available as a book, and I re-coded it all pretty much byte for byte from Z80 to 6502. This meant even a couple of the Spectrum bugs. The code was bigger in 6502 due to a less powerful instruction set, and often it was hard to find enough machine registers to make the code, since again the Z80 had more of those. Of course, we couldn’t run Z80 machine code games on the 6502, but BASIC ran pretty well.” A nice feature they managed to put into their emulator: the ability to read and write tapes recorded in Spectrum format, even through the C64’s tape hardware. “Big smile when that started working”, David remembers. And after all, that’s what all this emulation on 8bit machines is about, isn’t it? The fun. (*tw, nk, bk*)

THE ONE THAT GOT AWAY: SORD M5



Photo: Roger Keitel

With regard to home computers, 1982 was a great year. The Commodore 64 was released in the USA, which went on to dominate the market for several years in the West. In Europe, the Sinclair ZX Spectrum was also released that same year, selling millions of units as well. And then there were many other computer manufacturers that had no chance competing with the big ones, like Dragon Data for example. And over in the land of the Rising Sun, there was one of those companies that launched what they hoped would become the next big thing in the home computer market. Their Sord M5 had a rubber keyboard just like Sinclair, a Z80 CPU, 32 hardware sprites – which was quite impressive considering the C64 had eight –, three sound channels and 16K RAM. It was reasonably priced in Japan, but due to import taxes, the

computer has rather expensive in Europe. As one PCW journalist put it in issue 141 of the magazine: “If Sord would only knock 50 quid or so off the retail price, the M5 could well be a winner. As it stands at the moment, it is an attractive machine with much to recommend it – but unless the price comes down I don’t envisage Sir Clive suffering too many sleepless nights.”

In Japan, however, the little machine did quite well before the launch of the MSX computers. With 32 hardware sprites, it was capable of delivering some solid arcade action at home. So Konami, Namco and Irem supported it with some decent conversions: *Dig Dug*, *Bosconian*, *Galax* (which is basically *Galaga*), *Moon Patrol* or *Power Pac* are good games and very playable. And then there are also many games that play rather dull and slow. It came with a version

of BASIC, but after most of the RAM is used up by the machine to handle the display, users were stuck with around 3K for their programs. They could add 4K to that if they bought a BASIC-G cartridge, but this was still an amount to toy around, not do complex games. You needed assembler for that, but then the machine did not come with very good documentation at the time.

At least the design is sleek, compared to the bulgy look of the VIC20, for example. The rubber keys may seem cheap, but at least they don't feel all too bad when you type of the keyboard. Actually, they have a nice, responsive feel to them. And whether Sord was making some cutting edge joke on the keys is not recorded, but there was small edge missing on the lower right (or left in some cases) corner of every key. The case feels sturdy and well manufac-

ured. And above the keyboard was a hinged lid that lifts off and gives access to the cartridge port. The lid also contained some short instructions for the operation of the computer, making it clear that this one was aimed at beginners.

The joysticks or even the joypads – featuring a disc-like pad similar to the Intellivision – that came with this computer are very rare today. It's really hard to find ones in working and nice condition. Let alone a boxed machine. There were European releases, like the CGL version for the UK, but as they didn't sell well back in the day, you will need patience to find one that you like for under 200 bucks. So you might want to look over at Japanese auction sites for this little machine. But it's just something for hardcore collectors. There seems to be next to no active scene around it. (rk, bk)

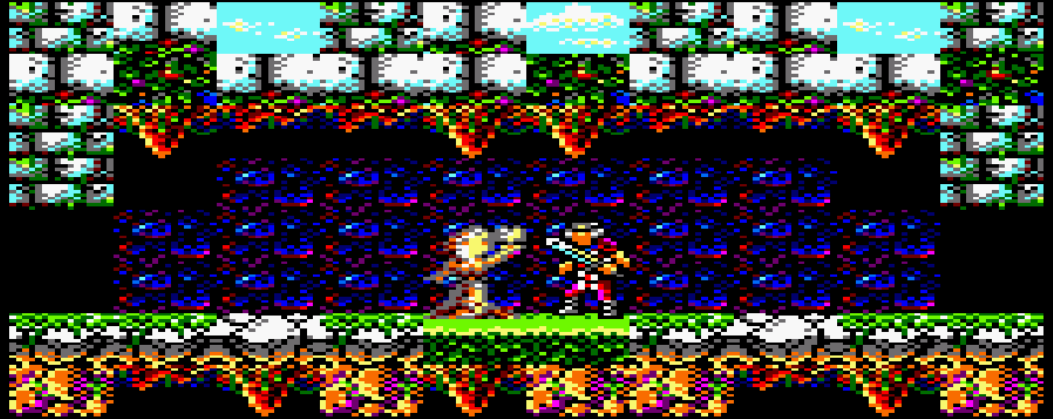


Photo: Roger Keidel

It takes some time getting used to the joypads, but the play quite well. Make sure you'll purchase a computer that comes with two or good luck finding a spare one for sale anywhere.



Nice and detailed graphics are one of the strong points of Jarlac. Also, with this logo, it would be a great name for a rock band.



The big stories are all about love. And so is this one: Arlett and Jarlac lived in the lost kingdom of Tyramat and had a happy life, until dark sorcerer Ott fell in Love with the beautiful Arlett. But she denies him, so he turns her into a stone statue. As soon as the news reaches Jarlac, he goes in search of his beloved. He finds her petrified, but in her hand she shows the solution to his spell: a heart of stone. This is where the player starts. Jarlac is a powerful hero who knows how to wield his sword. And when he falls from great height, the ground shakes. This is the kind of guy you don't want to mess around with, so it's clear from the beginning that Ott is in for some trouble. But first, Jarlac has to find 13 fragments of a heart. They are spread throughout the levels and you can only revive

and collect them when you have enough magic power to cast a powerful spell that kills all enemies on the screen and frees the hearts. You gain magic power by killing enemies, and there is no shortage of those! It's incredibly fun to run and jump through the levels, slashing around. There is no scrolling, so you have to go screen for screen, but this works very well. Keep in mind that enemies will reappear when you come back to a screen you just left. An annoyance in most games, you can use this to your advantage here, starting in the second screen: After you leave your beloved stone figure, you'll encounter a spider and you can see a heart in to top right half of the screen. Kill it, go back to the first screen and return until you have collected enough power to revive the heart, then go on. This way of col-

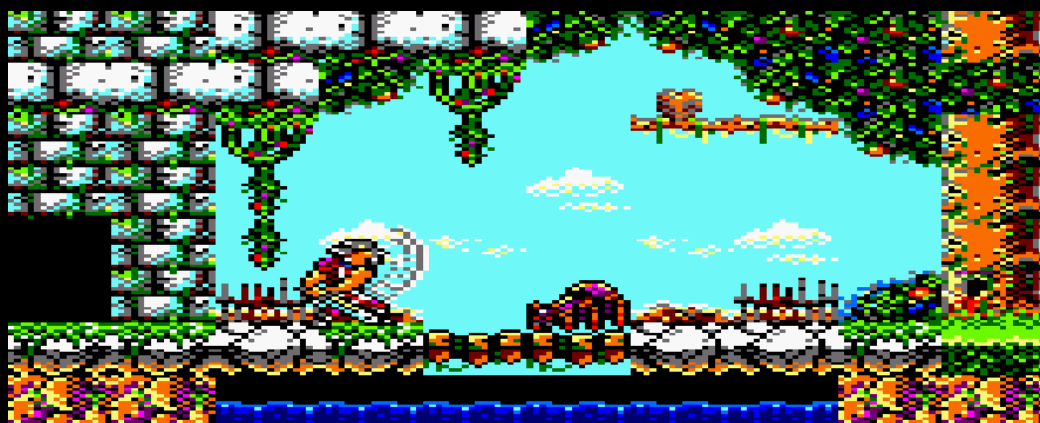
IT'S A GEM!



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lecting magic power is not mandatory, but it will help you on your quest. It's also helpful to know that water won't kill you, but heal your wounds. So jump in every (blue) well you see to regain your energy. Toni Ramírez did a great job here, as the main sprite feels vivid and strong, making the story all the more believable. He breaths, his sword leaves a swish when he swings it – everything here is very nicely animated. The graphics by Alejandro Layunta are also very charming and detailed. This is another game that looks awesome on a CRT monitor, where the colors run beautifully, creating a more smooth picture. If you like the blocky sharpness of an LCD, this game will also give you enough to look at. And finally Jose A. Martín is responsible for the music and sound FX, which are also awesome.

You control your character with the keyboard the QA + OP keys instead of WASD, which makes sense as you only need to press A if your magic bar is full, Q for jumping and O and P for left and right. There is currently no port for the GX4000 available, but that might change hopefully soon. It would be possible as the game fits 60 screens in 64K RAM. Originally the team wanted to implement a night-and-day change and also another music track, but could not fit all that into the memory of the CPC. This is also the reason that there was no room for an extended final cut scene, and fighting Ott at the very end is not that challenging if you face him with at least half of your energy, but it doesn't damage the overall awesomeness of this pretty little game. It's free, go grab it at Retrobytes Productions. (bk)



A heart of stone – there you have it! Slay enough enemies to revive and collect it to finally rescue your loved one.



LEGEND OF STEEL (CPC)



Legend of Steel is an action and dungeon exploration game where the player has to fight with countless enemies, find keys to open doors, obtain gold and find the hidden chamber where the secret of the immortality of the Delorians is hidden. Yes, the Delorians. This is the name for a breed of terrible demons that are terrorizing the landscape in this game. Thought you would never read something with a bad ring to this iconic name? There you go. The player controls Darkin, son of Dred. He wields the only sword that is capable of killing the otherwise immortal Delorians. The enemies you encounter on your journey are Orcs, Skeletons, Knights, Wizards and Slimers. Those green blobs are one hell of a pain in the back, so don't ever let them get you, as they will take control over you, wobble to the next best enemy and deminish your

energy. They are also the most enervating ones of all, because if you slay them, they split up into four smaller green blobs.

You can only leave a screen when you found a key to open the door to the next screen. It is located in the same room as you in the first levels, but later on you'll have to find it in one of the other adjacent rooms. Slashing the enemies is only fun if you face them sideways. If you have to beat them above or below you on the screen, the sword-swinging feels to slow at times, so they will reach you before you can hurt them. So it's very important to get your timing right on spot. And be patient, as it might not work right from the beginning – which is maybe the biggest weakness of this otherwise great dungeon crawler. As you progress and collect gold your dead enemies leave, it's a bit like playing a very



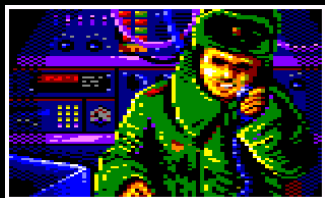
Look at the beautifully pixelated stone walls and columns!

basic version of *Diablo*. The music is great, but you'll only hear it during the intro. During the game, you'll only be accompanied by sound effects that would have been great for *Rodland* and I found myself turning the volume down because of it. The

graphics and level design is great and you feel like you have accomplished something once you get the hang of it. TOD Studios did a solid job here and there is already a port to the GX4000 available, which is great. Get the game here. (bk)



The armored guards of the Delorians take quite a beating! You'll do best if you force them against a wall and then hit them as fast as you can.



Life in the Soviet Army is hard for Mikhail. He is out patrolling the the snowy cold when he receives a radio message from his base. It seems HQ has picked up some strange signals only a few kilometers away from his position, so he walks off to take a look. Mikhail hoped to warm up to some hot coffee soon, but what he discovered was more than a strange signal. Turns out there is a Nazi outpost in the middle of the Soviet Union in the 70s. With no time left to inform his superiors, Mikhail decides to clear the situation himself and eliminate whatever threat awaits the world here. And that's a tough quest, because whatever the Nazis had been working on here before leaving this base, it seems to have come to life. The player controls Mikhail on his way deep down into this base, armed with an AK47, shooting the

hell out of everything that moves down here. Operation Alexandra crams a lot into the 64K of the CPC, as they take their time to explain the story with a cut-scene at the very beginning between the protagonist and his base. There is a lot of text that needed to be compressed here, which is impressive. Javier García Navarro, responsible for the code and the game engine, certainly had a hard time fitting all that together with a whole game that runs at a stable 25fps into the RAM of the CPC. The decision for no scrolling was the right one, instead you walk through the screens, shoot blobs, sentry drones and other small evil things in your way. The controls are tight, Mikhail is very well animated, and nice effects like the lights going out, diming the whole complex unless you refuel the generator are impressive to watch. The soundtrack

by John McKlain is also great, giving the whole setting a bleak mood. The in-game tune is not very long, but it just doesn't get dull listening to it. The only questionmark the game leaves, even after finishing it, is what all this had to do with Nazis in the first place? It their old base, but it is unclear whether an experiment they had been working on here went terribly wrong or if some aliens landed here and just took over the base. For the team of 4MHz, who released this game, this is a fiction take on real events: In 2016 a Russian expedition discovered hundreds of Nazi artefacts on a small island called Alexandra Land in the Arctic – this is the inspiration 4MHz took for calling their game *Operation Alexandra* and letting the events take place there. And also altering the story a bit. Gamewise, this title offers a bit more than just pure platform action. There

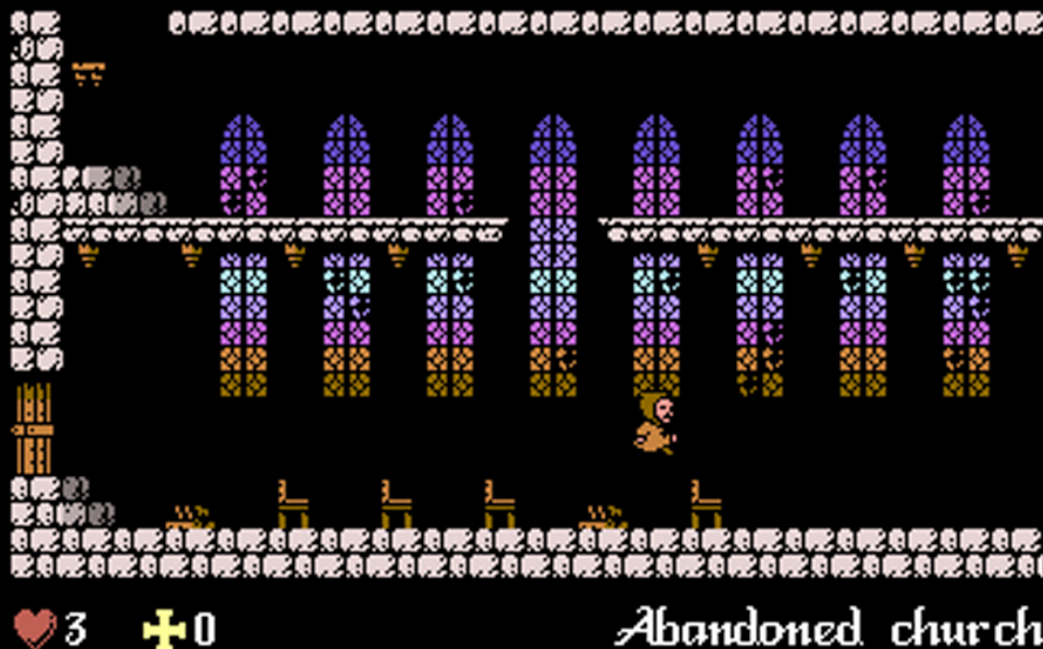
are also some minor puzzles to solve, like using the aforementioned gasoline tank to power-up the generator again. But remember: You can only hold one item at a time. The team put also a lot of effort into designing every screen in a way that allows the player to get through without taking a hit. To manage that, it is often better to wait and see how the enemies move before you run in with guns blazing. There is no timer, so there is no need to hurry up. *Operation Alexandra* is a enjoyable game, even if it's not that easy. But you can nevertheless complete it within 20-30 minutes. It offers great playability and features a nice soundtrack. And it won the Amstrad CPC RetroDev Game Creation Contest 2018 before *Jarlac* and *Legend of Steel*. 4MHz delivered a very solid game here that is definitely worth spending some time with. (bk)



Mikhail is nicely animated, and so are all the enemies – especially these sentry drones which spin up before shooting, then going slower and spinning up again – making it easier to determine when they are going to shoot and thus time your jumps.

L'ABBAYE DES MORTS (C64)

A church can be a safe haven. Or many other things, in this case. L'Abbaye des morts is a great platform game for the C64.



Languedoc, late at night sometime in the 13th century. Jean Raymond is running for his life. Behind him, screaming and rattling with their swords, were six crusader knights who sought to burn him alive, as Raymond is a Cathar. He runs through the woods as fast as he can and soon sees an abandoned church in front of him. What better shelter to seek, he thought to himself, running inside and barricading the entrance. The crusaders give their best to break the door open, but they don't seem to be able to. Jean knows that they will break in eventually, but after his pulse has calmed down a little, he notices that he is in a strange place. He finds a few short notes and very strange creatures that make him curious, and he decides to get to the bottom of this. And so, a new journey begins for Jean. One that will lead him, at the very end,

to Satan himself. But to get there, he needs to collect twelve crosses which are spread throughout the maze-like church. He looks one last time out of the window of the bell tower before descending into the catacombs that await him.

You control Jean on his quest, armed with only his beliefs and not a single weapon. Which means you can only dodge enemies and their magic spells, not kill them. And why would you want to, after all, you're bound to the ten commandments, right? So you jump and dodge your way through this nice Hi-Res platformer. The graphics and music were done by Saul Cross, and they create a great atmosphere, especially if you're playing on a CRT monitor or television where the colors merge far better than on any LCD. If you touch an enemy, you will instantly light up in flames. And after you lost all your

three lives, it's game over. No continues, just back to the beginning. It would not have hurt to include at least one or two continues, but then again, this is how it was played in the old days, so learn to live with it. At least there are checkpoints every so often, so you will be able to start from there after you lost a life.

While you explore the catacombs beneath the church, you really have to appreciate the level design and love for detail that went into it. The clever use of colorized Hi-Res conceals all signs of color clashing – nice! The controls feel precise, you can even change directions while jumping, which is useful a lot of times. To amass additional lives, you have to collect the heats you will find here and there. You will need them!

The game consists of 20 different screens, all named individually, that

you will have to master in order to get to the end. And the end reminds me in a way to that old short story by Ambrose Bierce, “An Occurrence at Owl Creek Bridge”. It's something special for sure. Antonio Savona (*Po Snake, Planet Golf*) coded this port of a PC indie game with a ZX Spectrum aesthetic (which is why is got ported to the Spectrum and why this version comes with Hi-Res graphics) that was released in 2010. And this one here is indeed the one to go for, even if you played the original back in the day.

Published by Double Sided Games in a very limited quantity on cartridge and diskette, it will be available early in 2019 and can already be preordered on their website. If you choose the cartridge version, you'll also get Jean Raymond's Ring, which is a really nice gimmick. Wear it while you play – maybe it helps! (bk)



There it is, the ring of Jean Raymond. Relic or talisman? You'll have to find out for yourself ...



♥ 4 ✚ 3

Pestilent Beast

What a cute little dragon, trying to kill you with his breath of fire. Maybe all he needs is a cuddle.



Think you had a hard day? Think again. Imagine being Noah after the rain had come, sailing around in a giant boat full of animals that are either in need of food or leaving the result of their digestive process for you to clean. Day in, day out, Noah had nothing else to do. He was kind of the very first zoo keeper – only without any spectators. His tough day inspired the programmers of Enter-Tech back in 1982 to make a game about it for the Atari VCS. Starring Noah, no one could be offended by it. Parents would love to buy this one for their kids. But while a game based on a bible character might remind you of some Video Game Nerd who played all the bible games there were, this one is actual-

ly good. And just this one had never been released before: Arkyology. Programmer Paul Walters recently published the ROM for free via AtariAge, so you can grab this game and give it a go. And it's very much worth your time.

First of all, it looks and plays like an Activision title: Awesome graphics for the VCS, smooth gameplay and precise controls. It is astounding what they crammed into the few Kilobytes (8K) they had to work with. You play as Noah and have two objectives per day: First, you open all the gates to the animals. Second, when the animals appear, you feed them. You have to do that on all three decks of the ark while being harassed by birds, alligators

DAY
1
OPEN
THE
DOORS

and porcupines. Who knows why they don't want you to feed the other animals, maybe they are just evil. So you have to evade them while doing your job. And after those two duties are done, you can finally sleep well. The programmers felt the need to include a little cutscene showing Noah in his bed sleeping while the moon passes by. It plays great and gets challenging pretty quickly, but it will keep you motivated for some time while you get better. And it certainly shows that the team, consisting of Paul Walters, Rick Harris, and Barbara Ultis, got their inspiration from the best VCS games around at the time. "We were all avid gamers and played every game out there. We would always try deconstructing the 'how' for both coin-op and console. It was fun talking through how the software must be organized to do what it did, how it used the available resources, and especially on coin-op how the hardware must be designed whether multi-layer,

sprites, character or pixel, and how the audio was generated", remembers Paul Walters. "So we played and talked through most Activision games because they were very good at getting the most out of the 2600's limited hardware. Pitfall and Keystone Kapers were high on our list of 'best' design to make the most of the resources", he adds.

The game was never released, a missed opportunity for the company. When the programmers left one after another, Enter-Tech went down and the Video Game Crash made it too difficult and risky to release new software for the VCS when Commodore was soon pushing their C64 home computer and Nintendo revitalizing the video game market in 1985 and the following years again. "I didn't realize at the time what a special era we were in, and how enduring the legacy would be", he recalls. But thankfully he kept the ROM anyway and released it to the public. Grab it here! (bk)



DAY

1

FEED

THE

ANIMALS



Photo: pixanuffentig / pixabay

Paul Walters created Arkyology in 1984. KILOBYTE MAGAZINE asked him about how it was working as a programmer back then and why the game was never released until now.

How did you get to Enter-Tech in 1982, what was your job position back then and what made video games interesting for you?

In the early 80's we were going through a recession in the US. This hit the job market in the Phoenix area hard, as the largest part of the

economy was based on growth. I had been working as a professional 'programmer' since I was 17 years old and worked on FORTRAN, COBOL, some BASIC, but my true love was assembly language. I worked for MicroAge's corporate headquarters, which were less than a mile from Tuni/Enter-Tech, until they released nearly all employees in December of 1981. After that, I did a little work here and there as available to help them with their IT issues, but it wasn't much. I still remember seeing Alan Hald jump on the hood

of a Volkswagen in the parking lot as their financiers on-site auditor loaded up his car with all the financial records and started driving away – with Alan on the hood! The next day we were all released. Going back to the recession, it was very difficult to find work. It didn't help that I was 20 years old. I looked for work for several months. I was married with our first child on the way, so I seriously needed to get a job. While I was job hunting, I was also developing games on my Atari 800 computer. I regularly checked with several job placement firms and finally got a 'hit' on a game development job in Tempe. This was Tuni Electro Services. When I went to Tuni, my interview was with Tom Opfer. Tom was the head of R&D for the company, and we developers all reported to him. The interview went very well. We talked about the games that I was writing at home, but Tom was a little worried about my age and experience. As he would have to pay the recruiter, he was hesitant to hire me, he was worried I wouldn't work out and he would still have to pay the recruiter. I was a little desperate so I offered to let him take the recruiter's share directly from my paycheck and if he decided to keep me, then he would reimburse me. When the first two week paycheck came around, Tom had decided to keep me – so my gamble paid off. I started with Tuni Electro Services, which later became Enter-Tech, LTD, in April 1982. My job position

was 'programmer'. We didn't have all the fancy names they do now, we were all 'programmers'. When I was hired, Rick Harris was already there. He worked on the CVS games. I at first worked on the 'El Grande 5 card Draw' arcade gray market card game. Tom wanted to hire a third programmer. I recommended George Hefner. George and I had worked together in 1979 – 1980 at 'Contemporary Computers and' remained friends. George was hired and was the third and last 'programmer' at Tuni. The three of us, George, Rick and I, all worked on the Atari games as well as the various arcade games including the Moppet Video games.

Can you describe what the work environment was like there?

What was a typical day in the office like? And on what machines did you program for the VCS?

Tuni's building was large with full manufacturing facilities for both electronics, and full arcade game assembly. We programmers had an office that was perhaps 30 feet by 15 feet. Our office was in the building where final arcade game assembly took place. Fortunately we had a door that closed so we could keep out the manufacturing noise. The three of us got along quite well most of the time. We worked closely and we all were thrilled with challenges. The bigger the challenge, the happier we were. We used to regularly

➤➤ ***We worked closely and we all were thrilled with challenges. The bigger the challenge, the happier we were.***

Paul Walters

go out to lunch where there were arcade games we liked. And we played every game made. We were very well versed in hardware design as well as software, so while playing the arcade games, we would break down how it had to have been put together. How the sprites interacted, how many levels of video were being overlaid, what likely chip sets were being used, how the software had to be designed to accomplish the game play, and what chips were used for the audio production. The development machines we had for VCS, as well as the Moppet Video line of arcade games, were the GenRad/FutureData machines. These were full Incircuit-simulator (ICE) devices. We took the 2600, cut it open, removed the CPU and placed a socket that converted the 28pin package to a standard 6502 40 pin header. The GenRad's ICE prob then was plugged directly into the 40 pin 6502 socket. For it's time it was a very advanced tool. Having an ICE that supported multiple hardware breakpoints, was very useful. This way we could time how long it took to run blocks of code and rapid build and test cycles. The units had two 8" floppy drives, and internally it had a RAM file system. In the morning we would load up the RFS with the code, compiler, editor etc. Then we could get very fast (for the time) compilation cycles. We used these dev systems for all of our 6502 work on the Atari, the Moppet video arcade games, and the gambling card

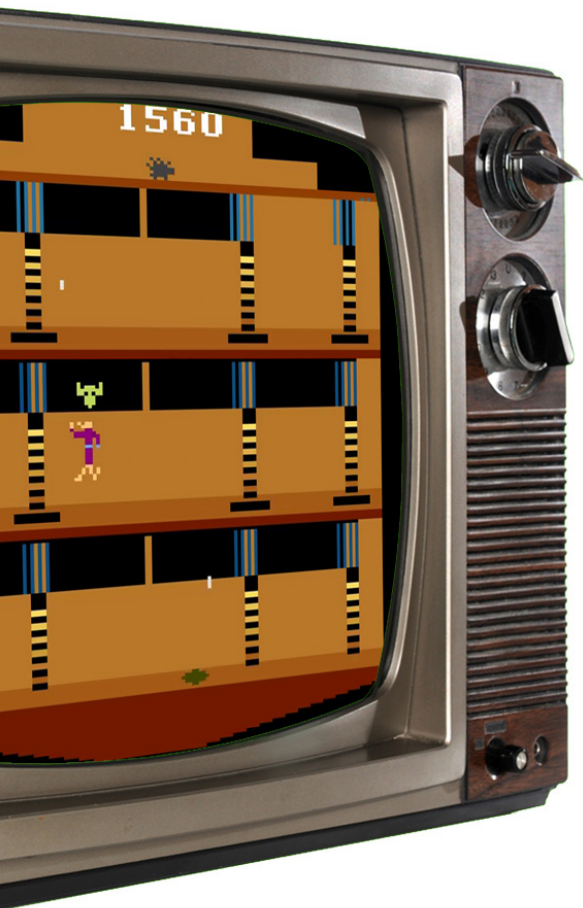


Photo: overjupiter / pixabay

game products. These development systems were pretty expensive. In 1982 they were 25,000 USD each. That works out to over 60,000 USD in today's dollars.

What games inspired you most while working on Arkyology? And what were your favorite games back then?

We all were inspired mostly by Activision games. We talked through most Activision games because they were very good at getting the most out of the 2600's limited hardware. Pitfall and Key-



stone Kapers were high on our list of 'best' design to make the most of the resources. It was a very important thing to design your game in a way that took the best advantage of the limited hardware resources. We spent a lot of work on the gameplay. At one point I was having a problem with getting the game to be able to display 'Noah' climbing the ladders without throwing off the timing the video loop. Driving home from work late one evening I had a "eureka!" moment and came up with an indirect pointer to an encoded table method that halved the machine cycles for handling the climbing ani-

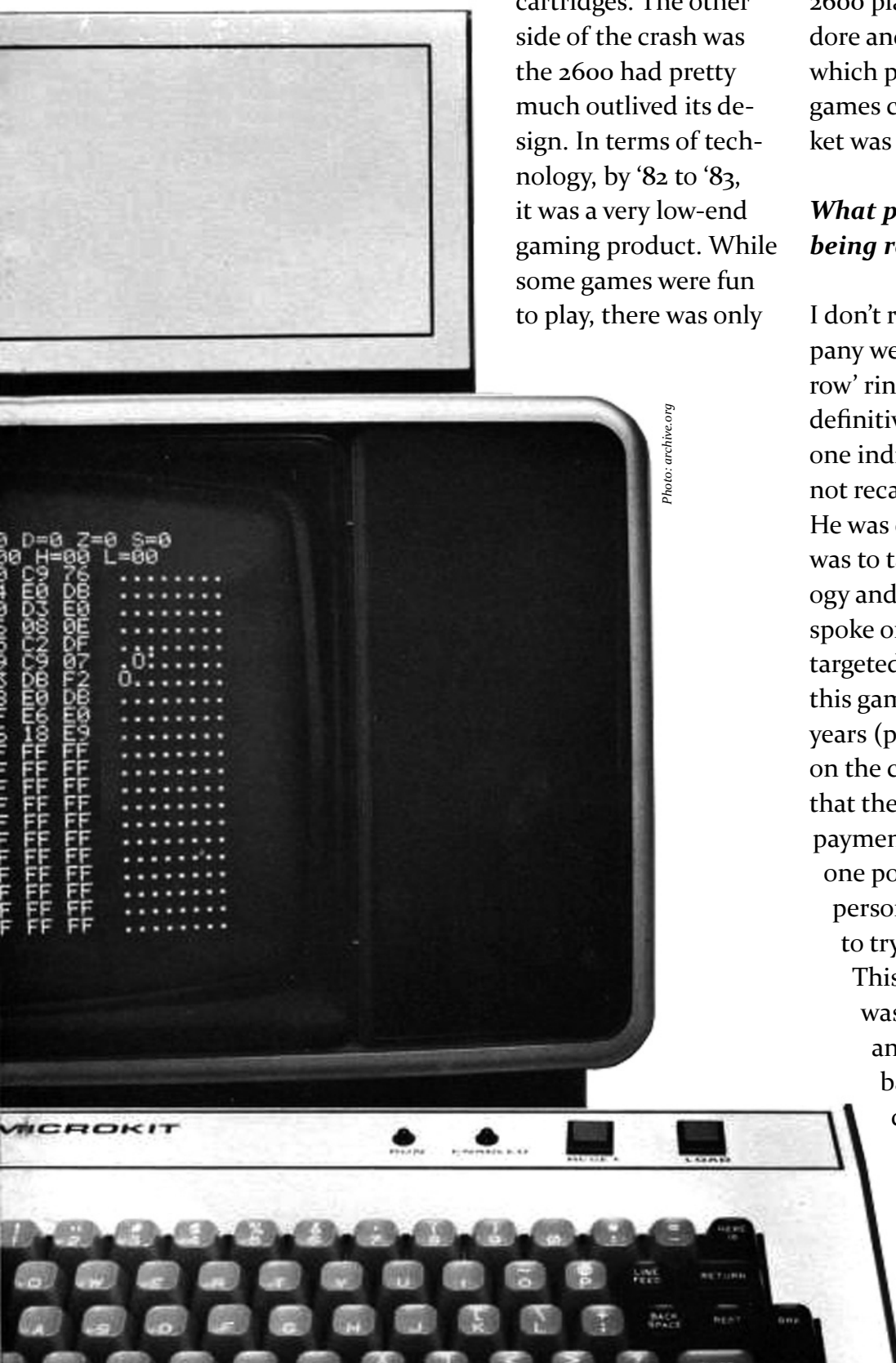
mations and made them possible. Those were the moments that really made the work fun. Barbara Utlis was our graphics designer and she was great. She is a generation older than we were and brought a lot of stability to the table when we were working together. I wrote a program on the Atari 800 computer that simulated the 2600's graphics and let her create the backgrounds and sprite/missile/ball images that would be recreated the same on the 2600. She used that tool to make the graphics for these games.

Looking back now, we talk about the video game crash of that era like it was something you could predict. But what was it like for you, how did you experience this period? Has there been a special moment when you thought: "This is it", if at all?

I thought in the early 80's that a crash in the consumer market was imminent. The reason was there were a LOT of really poorly built games being released. The glut of games being introduced weren't terribly high quality. My thinking at the time was that was putting off the consumer market. It was a market where the parents generally had to do the buying. With lack luster games, the kids would only play for a short while and stop – which made the parents reluctant to buy more games. I knew quite a few parents who felt this way, and they simply

» *We played every game made. We were very well versed in hardware design as well as software, so while playing the arcade games, we would break down how it had to have been put together.*

Paul Walters



refused to buy more cartridges. The other side of the crash was the 2600 had pretty much outlived its design. In terms of technology, by '82 to '83, it was a very low-end gaming product. While some games were fun to play, there was only

so much that could be done on the 2600 platform. With the Commodore and Atari home computers, which played much higher quality games competing, the console market was no longer dominant.

What prevented Arkyology from being released back then?

I don't recall the name of the company we were developing for. 'Sparrow' rings a bell, but I just can't be definitive as I don't recall. There was one individual – whose name I cannot recall – who was the 'customer'. He was driving the project and he was to take delivery of both Arkyology and David and Goliath. He spoke of his 'ministry' and who the targeted demographic was to be for this game – which was mid-teenage years (part of why the gameplay is on the challenging side). I do recall that there were problems with payment from our customer. At one point, he told me that he had personally mortgaged his house to try to pay for the projects.

This was part of why Arkyology was not released and David and Goliath wasn't finished back then – and also why the copyright stayed with Enter-Tech, and eventually to me when I purchased it at their bankruptcy auction. It wasn't until after Enter-Tech was gone, that the original customer started up trying to

make the ROM again, and contacted me in 1986. The customer ended up not having the funds to move forward with the mask, as it was quite expensive at 40,000 USD at a minimum. The game was designed for a specific manufacturer's F8 masked ROM – not today's laissez-fair home brewed circuit boards. As such there were specific functionalities that we counted on. Such as guaranteed startup in bank 0, guaranteed timing on bank switching. One other thing that gave it faster timing was inside the ROM, the -CE was always on and -OE was what was toggled on a memory fetch cycle. This is an old trick on the 6502 and later 65816 to get 20ns or so faster response from the ROM. They were playing it with a hand-built F8 board. Propagation delays were non-standard, startup was not guaranteed in bank 0, and their board was a little heat sensitive, meaning when it was cold the game could get a bit flaky. The problems they saw in their hand-built board disappeared with a short blast from a heat gun – which indicated they had a marginally too tight timing in their circuit. I reviewed their hardware, and looked into the issues. At the end of the day there was really nothing I could do except propose that their F8 board needed a redesign. Their hardware guy wasn't interested in going that route, and was certain there was a software problem causing it to not run – which wasn't the case. After that I didn't do anything with the game

until about 1998. Because the 2600 simulator Stella was out, I transferred the ROM binary to my PC to let my children play Arkyology. The next time I did anything with it was in 2015 when I googled the game to see if there were any references out there about it. That's when I found the 2009 AtariAge post about Arkyology and David and Goliath.

How would you describe the work atmosphere with your colleagues George Hefner, Rick Harris and Barbara Ultis? Are you still in touch?

George, Rick and I got along very well. I had worked with George at a company named Contemporary Computers for about a year and a half in 1979 – 1980. We all three regularly went to lunch together, and worked very closely on the development projects. George and I still had a relationship for a few years after I left Enter-Tech. He ended up going to university to get his EE degree. We talked on the phone a few times a year. I also kept in touch with Rick for a few years. I did some consulting work for a company Rick worked for in the early 90's. I emailed with George a few years ago, I found him on LinkedIn's web site. I've not had contact with Barb much. Only once in 1990 did I talk with her. She ended up moving back to Cedar Rapids Iowa. I've been in contact the last year or so on Facebook with her.

The picture to the left shows what the machine used for development at Enter-Tech looked like.

Did they stay with the company when you left in 1984?

Barb left Enter-Tech about a year before I did. George and Rick stayed on for about another year after I left. The company was no longer doing development work when they left.

What was the toughest challenge you were confronted with designing Arkyology?

I'd have to say the real challenge was being able to get the most out of the 2600. It is a very limited platform.

What features would you like to implement in the game if you were to design it all over again?

Well, I'd love to have a 32k cartridge so I would have room to add to it. First, I'd put back in the cut scenes that we had to remove to make room for gameplay. I would give 'Noah' power-ups that would add a life, make him invincible for a few seconds, and a power-up to double his speed. I'd put more different animals in as well, and have them able to escape the pen and chase Noah.

Did you program games - and if so, for which systems - after you left in 1984?

After I left,, I went to work in Data Processing for a large school district. I was a 'Senior Programmer' writing COBOL and FORTRAN on a Hon-

eywell Level 66 mainframe. I had two children then and needed the stability. Later though, I got back into making games. Since I had the EnterTech development system and all the games source code, I was working with some of EnterTech's old clients to make updates for existing games, and developing new games. After a few years of doing this work on the side, I quit my job and started a company named "Red Mountain Software". I did a lot of game development for the card gaming world including some lottery machines that were licensed in Montana and South Dakota. I also developed and sold a complete development system for the Nintendo Super NES. In the mid 90's I developed a software for a BBS server that would let players log in and play multiplayer games through dial-up on a BBS. I sold the host software to BBS operators around the world. At its peak there were a little more than 200 servers around the world running my software. It was called 'MADM'. It supported most 'twitch' games, DOOM/DOOM 2, Duke Nukem, Blood, Quake, as well as most popular games such as Starcraft, Warcraft II, Total Annihilation, etc. It supported over 50 games. The toughest part of that was taking the data stream the game designed for a LAN, and being able to compress it to the point you could get the same quality game play over a 28k modem connection.

This is what the mentioned Honeywell mainframes looked like. The were in production for nearly 20 years until 1989.



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AVIATOR ARCADE II (C64)

Looks nice, doesn't it? Wait until you see it on your CRT. They did an awesome job with the graphics here.



Aviator Arcade II lets you take control of a combat chopper. And with this, you start what seems to be a simple mission at first, fighting enemy tanks and light armored vehicles in a suburb. An unknown mercenary force, it seems. Which is already a sensation in the world you're playing, because John Lennon's dream has come true there: The world is at peace, nothing to kill or die for. As part of the Rapid Response Unit of the Earth Defense Force, you can be deployed to any combat scenario with very short notice. Being an elite pilot, you don't think that this mission will keep you busy for ten levels of some very fine vertical scrolling Shmup action you've come across in a long while on the C64. The beginning is fairly easy: Shoot the vehicles on the road and some gun turrets on the surrounding houses and that's it. You'll love the precise controls and smooth

scrolling. Also, you'll notice some powerups on the ground that you can pick up by shooting at them. Like repair kits that restore the life bar of your copter (yes, thankfully this is not one of those one-hit-and-you're-dead-games). And this tough beast can take a beating. But this is also much needed in later levels, but we'll come to that later. While you progress, the resistance of this so-called mercenary force gets tougher and tougher, which is not at all what you were expecting. And while destroying the bad guy's base, your final encounter with them would suggest an alien presence. Now we're talking! Step aside, Independence Day, this guy will take out the space invaders with his helicopter. Well, at least as long as he's on earth. But soon, you'll take over a spaceship, find a hyperspace launchpad and enter alien space to teach those bastards! And boy, does



This cute little alien is not as friendly as his button eyes might let you to believe. Don't trust him, shoot him!

this get tough! But thanks to some great powerups like dual missiles that will find their target automatically and even split up to maximize your damage potential (sweet!) and a laser blast that plows even through the thickest of meteor storms, you will get deeper and deeper in alien space. Mark Hindsbo did the game

concept and coding, and he did a great job here. He had help from the fabulous Saul Cross with some amazing graphics that look even better on CRTs and from Thomas Petersen who produced a great SID soundtrack for the game. This is a wonderful piece of software, distributed by legendary RGCD. Get it! (bk)



Helicopter or spaceship – what's the difference? If it flies, you can pilot it. And if there ever was a time for negotiation, it's all over now.

Finally, a new game with a level editor! This is an awesome feature that should be mandatory for every logic game.



Remember the feeling when you loaded an Epyx game back in the day? The crude soundtrack? The graphics? The whole atmosphere that the game created? With the logic platform game *Shadow Switcher*, Christian Gleisner managed to catch this very essence, distilled it and poured it into a d64. From the moment the first SID notes play till you see the blocky levels and the clumsy enemies. *Shadow Switcher* takes you back to your past instantly. And as if the author tips his hat to the 80s, you notice that the first few notes of the soundtrack sound somehow familiar. It sounds very much like *Trans-X's* "Living on Video", but then takes another turn and becomes a unique song. But enough about the good old times, let's talk about the game itself.

SWITCHING SHADOWS _____

At first glance, the game looks a bit

like *Lode Runner*, but the similarities end soon enough, as Christian created a very unique game here. The moment you move your sprite, he leaves a dark shadow behind. You start collecting golden rings, evading the evil Frankenstein monsters wandering around. If the get too close to you, you can switch places with your shadow. Now you can go on from his position, until you switch back. The sprite you control is always vulnerable to the enemies, your shadow isn't. You can try to play the game without using your shadow, but it will be impossible in later stages when you are being surrounded. So make good use of the switcharoo, make sure to always leave enough space between you and your shadow, so that you can be sure that you can switch back to him without dying the instant you take control over him, as he then can be killed by enemies. To

IT'S A GEM!

progress to the next level you have to collect all rings plus a key. Then the exit will open up and you will have to reach it. At least there is no time limit, as some levels are quite tough. Also helpful: There are some safe spots where you can stand with your shadow without him being in danger of any enemy reaching him as soon as you switch back. These isolated positions are quite handy! The game includes 40 levels which will entertain you for at least one hour, which is amazing considering how small the game is. And it comes with a level editor that will keep you entertained a couple of hours more, if you like to experiment. The controls are nice and firm, you always feel in charge of the player sprite. A necessity in many situations where you have to react fast to shake of those pesky Frankenstein guys. What are they doing here



anyway? Well, to sum it up, this is an intelligent game that may look like it was done in 1984, but shows quite well that gameplay counts! It is a must-have for every C64 gamer, it is difficult here and there, but never unfair. And it always gives you enough motivation to keep trying until you got it right. This is a real gem. And it's free! (bk)



Ladders, fragile platforms, Frankenstein monsters, lightning, rings and keys – Shadow Switcher looks like a mixture of Lode Runner, Solomon's Key and Madness. But it is a unique and fun game of its own.

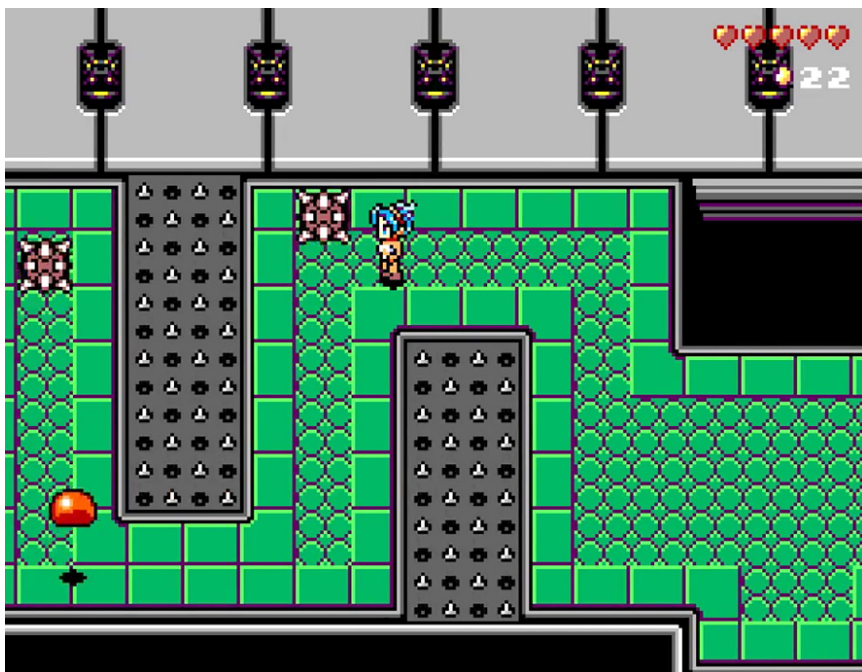
GALACTIC REVENGE (MASTER SYSTEM)

Mike Ruiz, Master System magician. *Galactic Revenge* is his second great game after *Silver Valley*.



Imagine someone breaking into your home, eating all the food in your fridge, killing your boyfriend and then, on his way out, stealing your Master System console. We can certainly agree that this one bad, bad day. And it is exactly what happened to Olivia Gun, main character of *Galactic Revenge*, a light-hearted platform shooter for your Master System. It is also another game done by Mike Ruiz, who delivered an absolute masterpiece with *Silver Valley* (you'll read about it in this issue as well). As the title can't conceal, the game is about Olivia getting her revenge and at the very end also her beloved games console back. Graphically, this game is just pure eye candy. We have seen many homebrews on the Master System – well, actually not that many, to be honest – but this could have been a full-price game back in the day, and

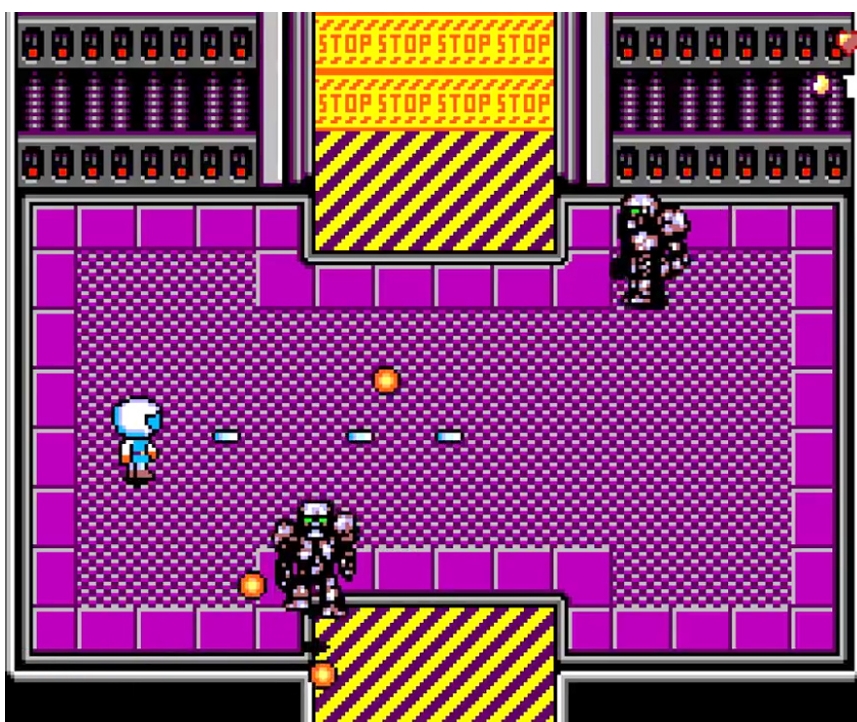
nobody would have hesitated to pay fifty bucks for it. You control Olivia on her way deep down into the alien vessel, shooting at robotic enemies, collecting their remains and jumping on moving platforms. It is just pure pleasure to play: the graphics are sweet, the music has a nice upbeat ring to it and the design of the levels is clever. And the humor, have we mentioned the humor? It starts with Olivia chasing the alien vessel down, complaining about what had happened to her, which is quite hilarious. But once on the alien ship, the fun does not stop. Olivia will have to change her clothes from time to time, as the space suit is too heavy to jump with it in areas with gravity on. Conveniently, there are changing booths spread around the levels where you need to change. Far less convenient for Olivia: If she can't wear her space suit, she'll



Hearts and parts: Thankfully, the game gives you enough energy to suffer a few hits without that pesky Game Over screen appearing.

walk around in her underwear. The stage bosses add to the fun, as they have to say some wiseass lines to our heroine. And the more you play it, the less you will feel like playing a Master System game. Actually, this would have made a decent 16bit title – not that you’d want one, because who needs more than 8bit? But it is simply astonishing what Mike Ruiz did on this console. And he kind of left a trademark in this game that you will have noticed in his other release, *Silver Valley*, as well: There is an arcade machine called “Balout” with a 1K version of *Pong* that you can play here. It won’t do anything good for you and you’ll soon quit the cabinet with frustration, but it’s a funny idea nonetheless. The enemy sprites are drawn with great attention to detail and look really impressive, though most of the normal ones are not very challenging. But

as soon as they come up in hordes, it gets harder. And some jumping passages can strain your nerves, too. But it’s worth playing this gem to the end. We sure hope to see a physical copy some day. (bk)



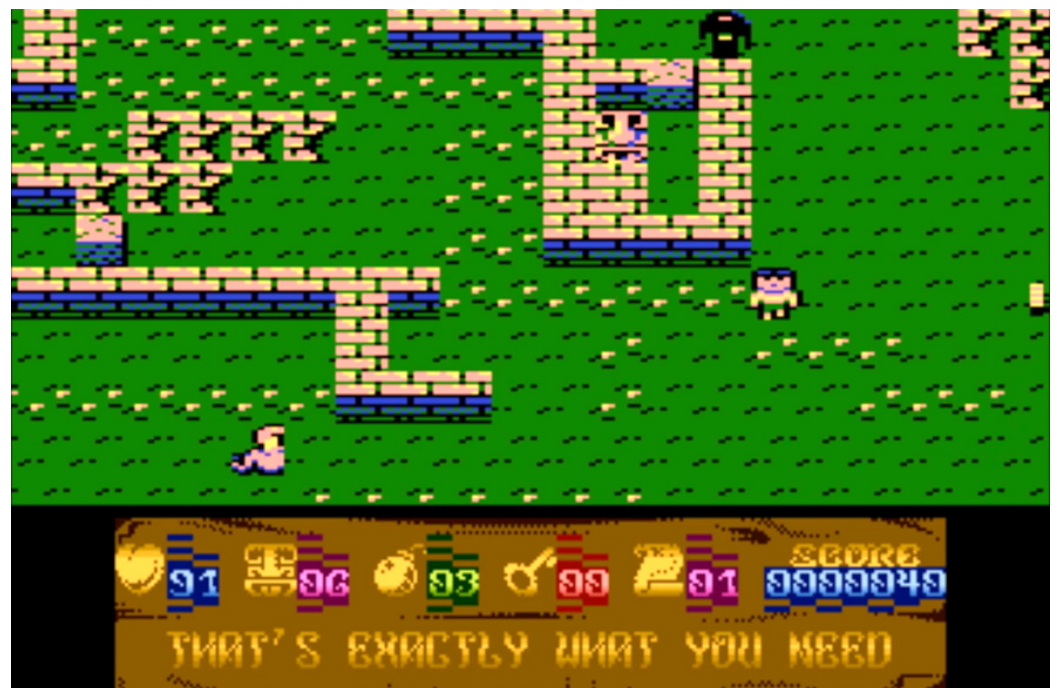
THE NEW ADVENTURES OF LAURA (ATARI XL/XE)

The presentation is superb, graphics and sound are very enjoyable, but the difficulty on this one makes you wish for cheat codes.



She could be the child of Lara Croft and Henry Walton Jones Junior by the looks of it, and Laura is indeed on an adventure to find some ancient treasures. But she is neither carrying guns nor cracking the whip. She has to use her wits and think very carefully before she makes her moves. This nice little puzzle game

was programmed by Pawel Kuczmański, German Gonzales, Arkadiusz Lubaszka and a man who is only known by his mysterious handle “CCWRC”. The game is for Atari 8bit computers with at least 128K of RAM and it contains 16 different and challenging levels. Retronics released a limited collector’s edition



on tape that sold out pretty quickly – only 20 copies were made – but the cassette image can be downloaded for free to play on the original hardware or on any emulator of your choice here. Helping Laura through the mazes is not as easy as the cute graphics might make you think. You have to lay bombs and push big walls aside to get to the treasures she is seeking. But be careful: If you make the wrong move, you might end up blocking a way you'll need to take later on. And if you are not fast enough, a part of the landscape will get swamped and you won't be able to reach the entry to a treasury. Oh, and there are enemies and mines, too. So all in all, this is a tough ride and you will need to be a frustration-resistant nature. But the game is worthwhile, as the team put a lot of effort in the presentation: The graphics look amazing, the scrolling is smooth but slow, so



that at times you can indeed outrun the screen, which is not very desirable. Who knows where you might end up? While playing, you'll only hear sound effects, the music will play only at the title screen and the end, be it game over or not. And that game over screen is nice, but you will see it far too often, as the authors might have gone a tad too far with the difficulty here. A pity, as otherwise this game is very well made. (bk)

Want a tape? Can't have it. There was only a very limited run. Fortunately, you can download and play the game for free as well.





Kneel before your Empress: Lady Carmilla Bane. Can you give her what she wants to defeat the resistance?



The Commodore VIC20 can only handle arcade style games with its very limited graphic capabilities – or so they say. Well, whoever thinks so certainly never played a role playing game of the Realms of Quest saga by Ghislain de Blois. He is currently working on the fifth part of the saga and we were lucky enough to take a sneak peek. The first thing that you will notice is that he put a lot of effort into the graphics part. The water of rivers on the map is animated, the multicolor graphics look very nice overall and there are so many different races and portraits to discover: Humans aside, there are also Elfs, Dwarfs, Halfelings, Dayanorians, Eldars, Gnolls, Gnomes, Gobilns, Kobolds, Lizard-Men, Ogres, Orcs, Spites, Vurdulaks and Zzy-Zzyx. And each species has at least one female and one male character portrait, which were digitized and then polished by hand, pixel by pixel, to look even

better. This is not something you see everyday on your VIC20, that's for sure. Sixteen races all in all and sixteen classes to choose from. This will keep you entertained for a while just trying out what kind of party you can come up with.

LET'S PLAY

As you can tell by the looks of it, Ghislain was influenced by one game in particular with his title: “*Ultima IV* is the gold standard as far as world exploration goes, along with great graphics and music”, he told us. But that was not everything, as he continues: “*Phantasie* also had a great influence on me for not being afraid to provide a great variety of races and classes. *Telengard* strips down the computer roleplaying game to its most basic elements, and *Wizardry* for its game mechanics – while the *Ultima* series may have been prettier and had richer content, the early *Wizardry* games

IT'S A GEM!



were great for their game mechanics which are a virtual simulation of the Dungeons & Dragons rule-book.” Aside from games, Ghislain drew some inspiration from movies as well, but this game is far more than a mash-up of other ideas, he explains: “Obviously the *Lord of the Rings* movies are a huge influence, but I do inject my own quirks and ideas into my RPG game world. I have a race of interdimensional beings that can be played as characters in the game, for example. There’s a few nods to old horror movies with Christopher Lee and Vincent Price that can be spotted in the game. I’m influenced a little bit by current events and the things that I see and read as well.” All this melts together in a huge world that is very much worth exploring and wandering around in. And by huge, we mean really huge, even compared to C64 standards: it contains 350 portrait

images, a 128x128 tile world map with 20 cities that are 42x42 tiles in size, 20 dungeons that are 25x25 tiles in size, 60 magic spells and more than 150 items to be found. This is a massive world to dive into. But does it play well? Yes, it really does. If you ever played *Ultima IV* or *Wizardry*, you will feel at home right from the start. And if not, you won’t have much trouble figuring out what to do, even without a handbook that will come with the final version of the game. “I do my best to make the interface as good as possible. The game mechanics resemble the early *Wizardry* games. There is a great game engine with a cohesive ecosystem that is consistent throughout. I don’t just keep track of hit points and magic points here – player characters can be poisoned, turned to stone (by a Medusa’s gaze) and die of old age. There’s even a combat feature where the Courtesan class



The portrait images in Realms of Quest V are really awesome and nice to look at. But not only the graphics are great, the gameplay is as well.

350 portrait images, a 128x128 tile world map with 20 cities that are 42x42 tiles in size and 20 dungeons that are 25x25 tiles – *Realms of Quest V* has a lot to show and you can sink some time into it.



can use her charisma to ‘seduce’ an enemy humanoid monster to join her. A Lord can subdue a dragon to join him as well. I try to put all the things that were thought to be cool back in the 1980s into my game.” And it really shows. While the author of these pages here has little passion for the VIC20, this game really opened my eyes on what is possible on the system nowadays. And I would go as far as to say that if you never played a VIC20 game or never possessed the real hardware, it will be well worth your time as soon as this game is released. It is a modern system seller for a computer that stood far too long in the shadow of its successor. But back to the game itself.

AND SO THE JOURNEY BEGINS _____

You start at Castle Rivaria, a legendary stronghold and seat of power in the Great Empire. It is ruled by Empress Lady Carmilla Bane. She

united the Lands after a long and brutal Civil War, just to face another evil. “A new enemy has risen to attack the recently united nation. In the depths of this grave danger, the people are desperately looking for hope. Yet they remain divided over their differences. Those who have courage will join together and defeat the true enemy whose power comes from hate. They inspire the people that in unity there is beauty and there is strength”, says the introduction, which already shows some very nice portraits in between. At Castle Rivaria, you will first of all have to create your party with up to ten members. Keep in mind that your 1.000 gold pieces must be enough to equip your whole party, independent of its size. You’ll find a temple of healing where wounded party members can regain their strength, and a market where you can buy weapons, shields, staffs and armor. For test purposes, we went with a

Concept scetch for
the cover art, done by
Darkatx



Lizard-Man we called Lizardo, an Elf named Elfira and a Human whose name is Claus. A team that is neutral towards the law in these lands. A decision that will influence how you experience the game. But first of all, we equip the team with some stuff from the market and leave the castle, heading North-East to Bigby Woods, which is ruled by Baroness Jakayla. You can freely roam the cities, discover entries to buildings and talk to people. But it is not always clear that a step further here and there exits a city. It won't happen that often, but it would be great to get a short notification if one is indeed willing to exit the city. But this might change as the development progresses. You will meet some people who are willing to join your party here and there, but it depends on the path you have chosen at the very beginning. For example, if you want to stay neutral towards your journey, people who

are seeking lawful adventurers will not join your cause. You will meet a guy named Jochen in Bigby Woods to whom this applies. And you will meet some children that might have valuable information for you if you have something for them in return. Other villagers will tell you about what treasures to find where, if you are kind to them. You'll gather portions of the tablet of Uthar this way, for example. Later in the game, you will learn what they are good for. Just return them to the Empress who awaits you next to the Castle Rivaria. So many characters to meet, so much dialogue, yet so compact – it was hard work for Ghislain, as he explains: “Programming and doing the graphics were easy for me. The most challenging part has been to create maps for the world map and cities and the dialogue when you interact with the people who reside in the cities. I found writing dialogue to be excruciating at times and I need a

Some NPCs in this game will join your cause if you ask them to – but only if you are likely minded. Lawful people will not join a chaotic party.





Enemy of the people: This beast looks rather intimidating. No wonder that the Empire wants to get rid of them.

bit of time away from my game after even writing just a few lines. Thankfully as of this writing, I'm working on the final city (20 of 20) and I just have a superfluous amount of dialogue and story to write after that. The world map took me about three weeks of work and I was mentally exhausted afterwards." Which leaves only one final question open: Why is Ghislain so attached to the VIC20 and when did his programming career on the little breadbin start? Having won his VIC20 in a contest by Pepsi and Commodore in 1982 in Ontario, he stayed with his first computer for the following years and even after he got a C64. "During that time, I had tried to make many of my own games in BASIC, not being content with just playing those that came on cartridge", he recalls. "We formed a VIC20 group called System III where they would tell me game ideas to program as I

was the most competent programmer among them. Fortunately, some of these creations from the mid-1980s had survived and I was able to improve on the original programming for a collection of games I put out in 2015, entitled *System III Catalog 1986-1990*." And in the early 90s, having played some RPGs, he created his first entry of the Realms of Quest series: "It started in 1991 and I've upheld that tradition since then. Retrocomputing involves a lot of nostalgia, but also familiarity. And I really like the aesthetics of the VIC20 graphics and sound chip." His latest creation will be published by Double Sided Games – hopefully soon.

Come to think about it, in a way it's funny that Ghislain de Blois created a whole universe of his own on the one machine that saw only one Ultima spin-off-game: *Ultima – Escape from Mt. Drash*. (bk)

SILVER VALLEY



Illustration designed by iconichbestiary / freepik

“Sit down, my friend. You have come to the right place” said the man in the brown coat while he took off his hood. “I will gladly tell you more about the legend of the cursed dragon that has terrorized this peaceful landscape of Silver Valley many ages ago.” It was impossible to say how old he was exactly, as a large white beard concealed a large part of his face that might have shown some wrinkles, and his frost-blue eyes danced vividly as he spoke. “I hear there was also a game made in honor of this legend”, I said. He responded with a nod and as a gentle smile. „Yes, indeed. But let me tell you the story first.“ He took a sip out of his tin cup filled with the delicious brown ale Silver City is known for. „There was a time when our land was

much more peaceful than it is now. It was the time of the Wise King, as we call him. But near the end of his reign, suddenly a Dragon appeared in Silver Castle, a dark and abandoned ancient one deep in Silver Valley’s outback. So the king sent an army of his best men to defeat the dragon, who rampaged more and more villages and cities of our country. Knights in heavy armor marched towards Silver Castle, and at first it seemed that they could beat the beast: The closer they came to the castle, the fewer attacks the dragon flew on the villages. But it was a trap. The men felt like their pure presence would daunt the dragon, but the beast was just waiting for the right moment. And when they assembled in the Ravine of Screams, as we call

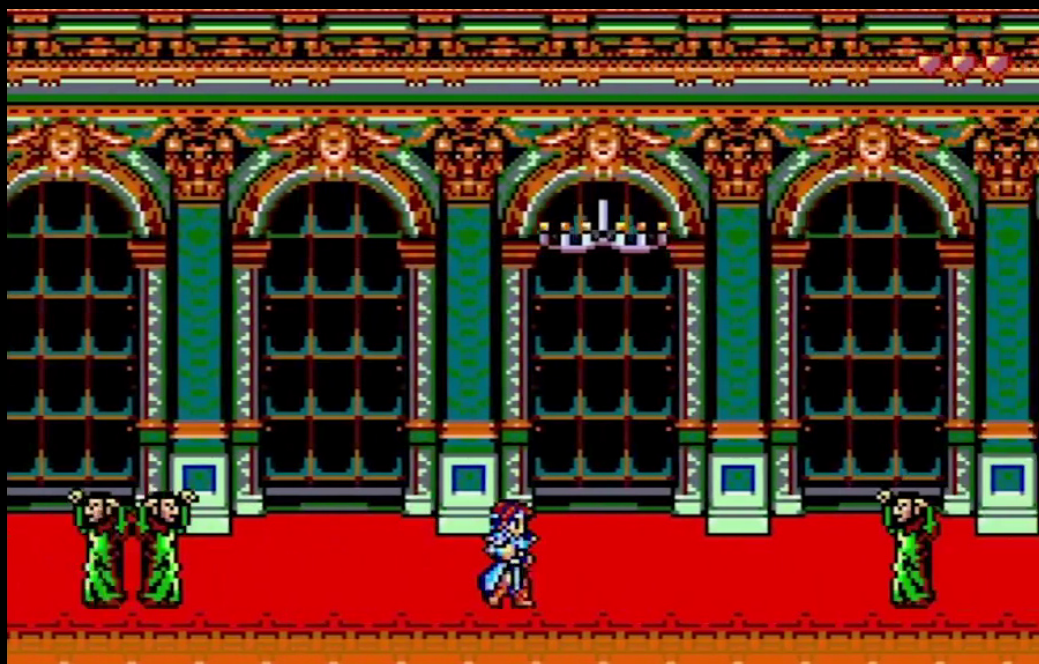
IT'S A GEM!

it now, the dragon attacked and killed all of them. Only one squire survived to tell the story. Maybe the dragon even spared him on purpose, so that he could tell the King about the terrible fate of his knights. Maybe the dragon thought that this way, our ruler would not dare to send another party. And the dragon was right in a way.” He paused for a moment to fondle his beard, seemingly hanging on to some thought he was not willing to share. Then he continued: “The King then sent his best warrior who just returned from a long journey to slay the dragon. It was a tough thing to ask from one man after a whole army had just failed, but our hero agreed with a stoical expression on his face, they say. There was no desire in his eyes to kill, nor to distinguish himself with this deed. And so he went on his quest, freeing one village after

the other until he finally faced the dragon himself. And somehow, he defeated the beast and Silver Valley was once again a safe place to live. Some say he was only able to succeed because of the power of six jewels he collected throughout his journey that gave him extraordinary strength.”

So much for the legend, I thought. But I also came here to get to know more about this game they made to honor this story. “Thank you for your insights on the legend. Now about that game...”

“Yes, yes”, he interrupted me. “About that game. Indeed there is a game made by Mike Ruiz, which was released for free at our 400th celebration of the legend in 2017. And it was released for the most popular console in Silver Valley, the Sega Master System. Even I have one”, he added with a chuckle. “If you like



For rent: Estate with large, high-ceilinged rooms and sophisticated decor. Included: Some weird creeps running around all the time. Oh, and chandeliers. Don't forget the chandeliers.

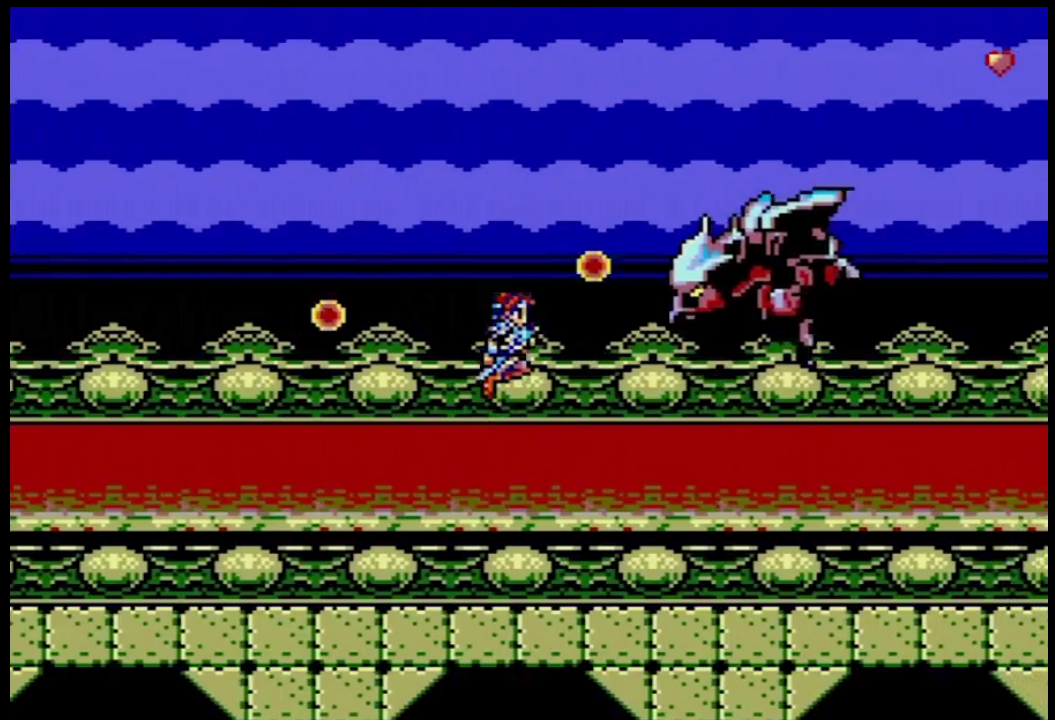
Castlevania or Holy Diver, you will love this game as well. Our hero is equipped with a sword that has a short attack range, and right at the beginning you will face some zombies that might look familiar if you played any of the aforementioned games. Another feature that you'll recognize: Your character has three hearts. Everytime you get hit by an enemy, you lose one – lose all and you're dead. But fear not: There are several continues waiting for you so you have a real fighting chance on your journey. You step inside a castle that is lavishly furnished, with many details to be discovered in the beautifully drawn background. It is the first of 60 sections, and it sets the mood of this game just right. It really looks amazing and stands up well to any commercial release on the platform." He pauses to take

another sip of beer. "Heck, I would have paid to be able to place this one in a nice physical box next to the other games of my collection. But let's get on with the gameplay. There are some sprites borrowed from Castlevania which you will recognize, I am sure. But Mike Ruiz manages to create his very own atmosphere that is an homage in parts, stands on its own right. Also interesting: You will see the final boss of this game after the first few screens. He looks really sweet, nothing like the old drawings we have in our museum. But of course, you won't beat him just yet. The game has so much more to throw at you, he just makes shall we say, a small introduction."

"Sounds kind of funny", I said.

"Yes, the game has some funny elements, like for example an arcade cabinet that the villagers received

There be dragons: Not too far into the first stage, you will meet the final boss. But it's not the time to kill him just yet. Have a little patience, man!





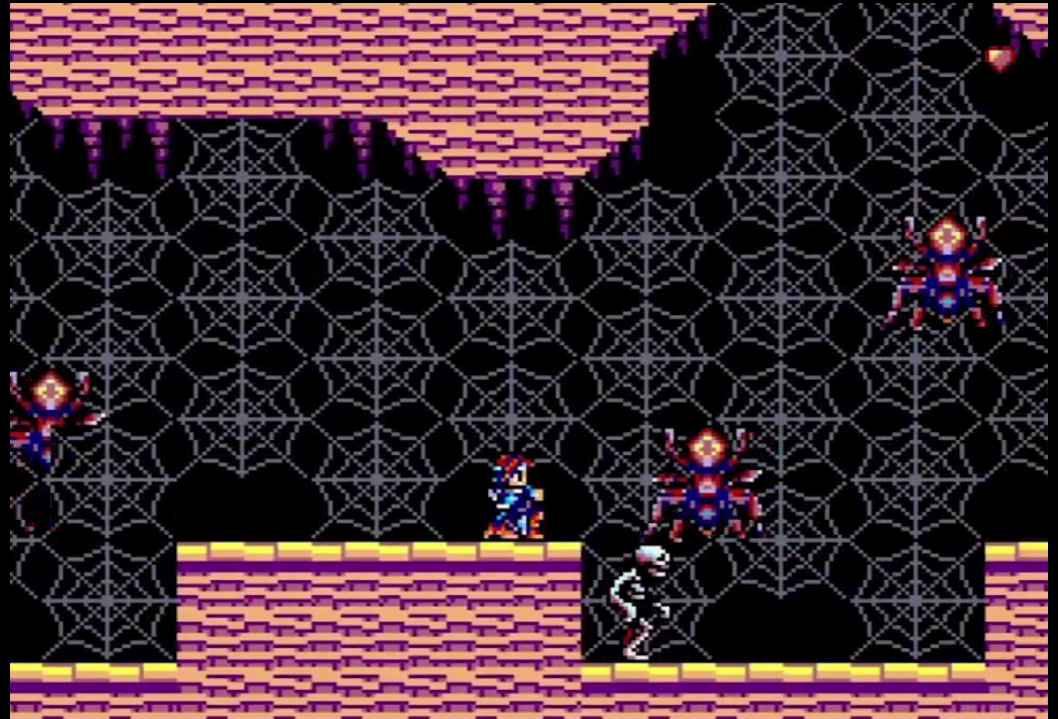
Crap Man, the trailer-trash-cousin of Pac-Man. It's a 1K game within the game, so it's awesome!

from a higher power. It is called *Crap Man* and you can even play it! As you might have guessed by the name, it is a 1K version of Pac Man. The developer did a great job of pushing the Master System to its limits, not by adding this Pac Man clone, but in general. You know the sprite flickering that one can experience in games like *Mega Man* on the NES? Well, there are some levels in this game that will do that, too. It is simply amazing what Mike Ruiz created here. And let me tell you about the music: The soundtrack is catchy, but never feels repetitive. Very nice!" He seemed even younger now as he kept telling me about this game. There was a sparkle of joy in his eyes like you see on children who can fully immerse themselves into a game, get lost in it and tell their best friends all about their journey

next day in school. Maybe this game brought back some memories of his youth – although I was not sure what he played back then. It could not be game consoles as they might not have been invented when he was a child. But still I can't tell when that would have been exactly.

"Only having a sword makes the later levels pretty challenging", he went on. "There are so many enemies coming at you with different attacks that it would be great to have a weapon to throw like your axe or holy water in *Castlevania*. But you are stuck with your blade. I will admit that in the legends of our hero, there was also no mentioning of any other weapon than his sword, so I guess you could call that part historically accurate. Thankfully, the controls are precise and feel great. You can perform pixel-perfect jumps

The skeletons look a bit familiar, right? Right. The spiders not so much. Later levels get more and more challenging.



– and in some cases, you will need this. It's tough enough for young players, let alone someone of my age. But I managed to get pretty far in the game anyhow. And some day, I will finish it. I am sure of that. It just needs constant practice. And after all, it's a game about our best-known national legend, so I see it as a kind of patriotic duty", he smiled, lifting his tin cup to empty it with one last gulp.

"So you'd consider it worth playing, even if I would not consider the Master System a console I spend much time with?"

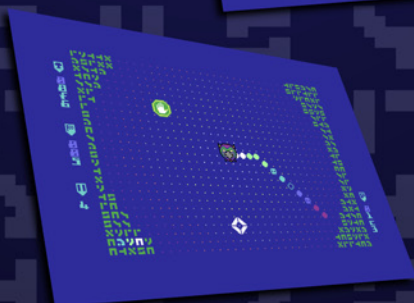
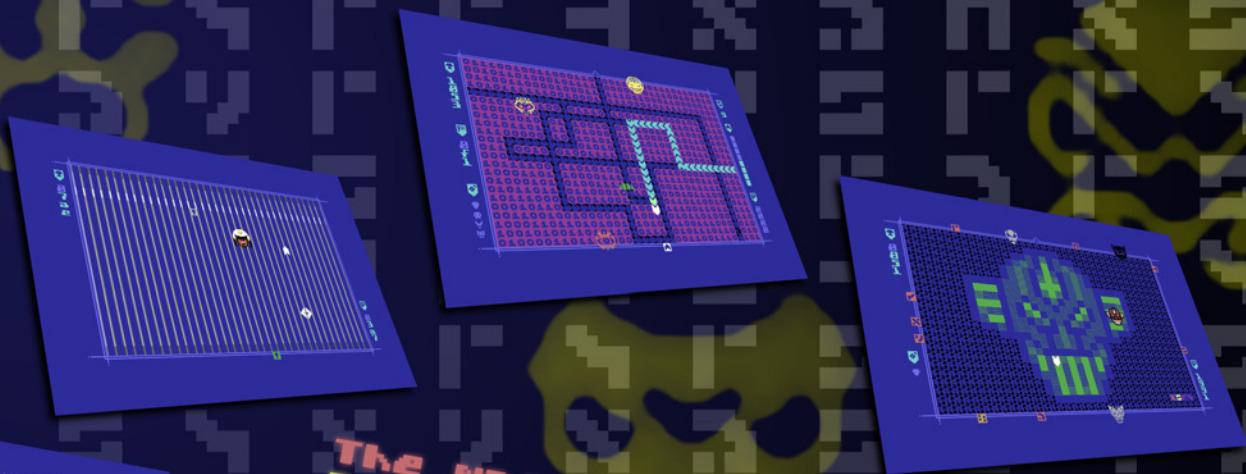
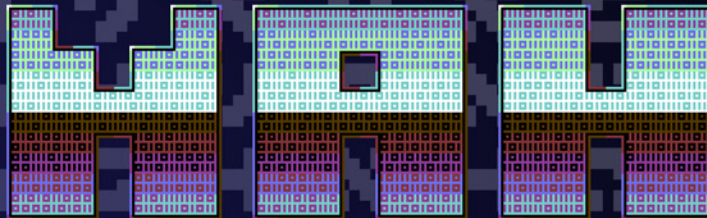
"Yes, absolutely. This is not your typical game for the system, and I dare say it's even better looking than *Wonder Boy in Dragon's Trap*. But that is just my opinion. It has a charming way of borrowing elements from Castlevania, combining

it with the sweet looks of a JRPG, resulting in what I would have considered a system-seller back in the golden age of the Master System. It could have lured gamers from the NES to Sega. And even today, if you love 8bit games, this is definitely a game that you have to try out. After all, it's free, so what's holding you back? Plus you learn a tiny but important bit of Silver Valley's history." "Good, thank you for your time and explanations. But I have one last question for you, if I may. But it's a personal one. How old are you exactly?"

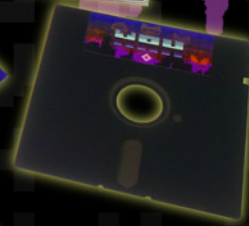
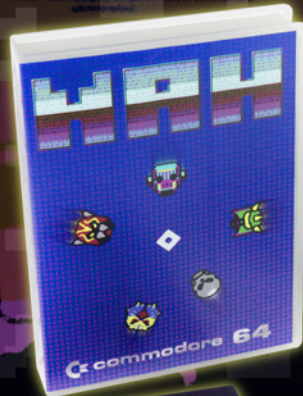
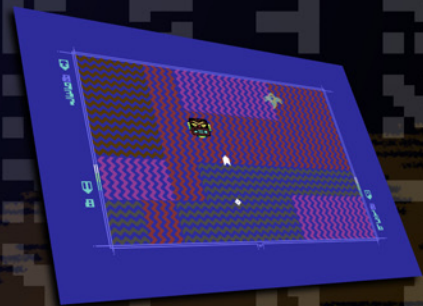
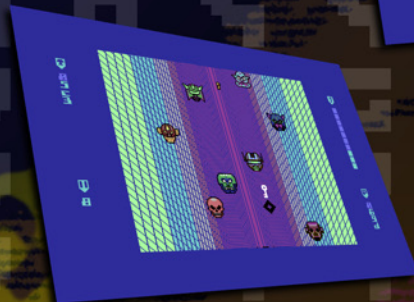
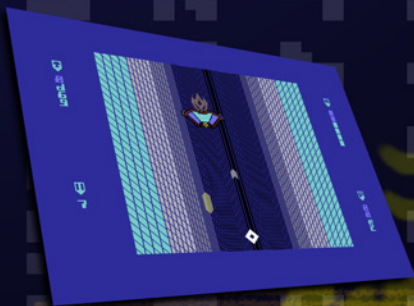
He gazed at me for a while that felt like an eternity, then put his hood back on, hiding his face under a dark shadow so I could only see the lower half of his white beard.

"Let's just say I know this legend very well."

(bk)



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PROTOVISION



There it is: the Aperture Science Handheld Portal Device that can create inter-spatial portals between two flat planes. If you wonder how that can be done, you might want to ask Neil deGrasse Tyson.

It does not happen very often that a game company publishes a title that defines a genre and has a big impact on a whole generation of gamers. And it's even rarer that a game company produces two such titles. Valve did it: First with *Half Life*, then with *Portal*. Now, eleven years after the first appearance of *Portal* on the PC, the game gets a demake on the C64. And it does the impossible: It captures the charm, the wit, the sarcasm and the fun of the 3D original and breaths new life into it on an 8bit computer in 2D. Jamie Fuller made it happen. He packed as much of the original into 20 levels that fit the C64's memory as he could. It even comes with the "Still Alive" ending, including the SID tune. While we're talking about the ending, the game may leave you longing for an 80 column display that fits more text onto the screen,

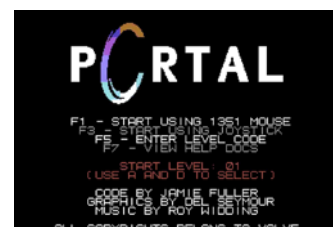
especially with the ASCII art that comes with the karaoke-styled look of the endscreen. If you ever played the *Pirates!* crack by C64 group Nostalgia, you'll see exactly that in their intro. With this, the ending would have been perfect. But it is still good the way it is. Enough about the ending though, what about the game itself?

THIS IS A TRIUMPH

If you are a PC gamer, you will feel instantly at home here, as you control the female protagonist Chell using WASD keys and a mouse to point to where you shoot your portals. With its minimalistic graphics, this is really a joy! If you don't happen to have a mouse at hand, fear not: You can also use a joystick instead, although you won't get the best gaming experience out of that. So Chell has to conduct a couple of

tests in the laboratory and is guided through by a very sarcastic artificial intelligence, GLaDOS. Instead of the iconic voice of the PC original, you'll get all the bad vibes you need from reading the texts that are presented between levels. Other things that made it into this demake are cubes you can carry around and use as a shield, and of course the turret guns you need to evade. Thankfully, time is not critical at all in this game. While the first few levels start quite easy to make you familiar with the controls and the gameplay, the later ones get tougher, naturally. What Jamie Fuller did not include in here is the bossfight at the end of the game. The final level (level 20) is just another one to complete, nothing to fancy, and then the game is over – which feels a tad unfinished, to be honest. It might have been due to lack of RAM, but it would have been nice to actually defeat GLaDOS

at the end. What's great is that the game gives you level codes so you can pick up where you left without having to endure the first ones all over again after you switched your Commodore off. Also, it's nice that you can skip the text between levels at any time. It is fun and a bit challenging, but once you've completed the game, you may not feel any real motivation to try it again. If there will be a level editor some day, it would make it much more appealing to give it another go. As it is, the game is a very nice addition to the C64 library and you can see that much attention to detail was put into this. By the way, this was not the first Portal-demake on the C64: that honor belongs to *Shotgate* by Simon Quernhorst in 2008; however this one here plays and looks a lot better. Try it out if you have not already. Final verdict: "I'm making a note here, huge success!" (bk)



The SID music by Joy Widding is a great rendition of the original score with a minimalistic charm.



Have you been stuck somewhere after level ten? Here is a screenshot from level 15 – including the level code. You are welcome. But from now on, you're on your own.

poly.play

NEW GAMES FOR
CLASSIC COMPUTERS AND CONSOLES



HIBERNATED 1 THIS PLACE IS DEATH

What would you do, waking up too early from hypersleep? Stranded and with an Artificial Intelligence being your only friend? Close to Vega, Olivia Lund is on the trail of mankind's greatest secrets and a thousand-year-old mystery.

HIBERNATED 1 is the critically acclaimed text adventure debut from Stefan Vogt (Pond Software). The interactive novella inspired by Isaac Asimov and Perry Rhodan is considered a modern reboot of the whole genre for which **INFOCOM** and **LEVEL 9** were famous for.

For this, the first part of the saga won the legendary **CRASH SMASH** award. The Addon **EIGHT FEET UNDER** is included.

DEVELOPER: Pond Software

Systems: Amstrad CPC, Commodore 64, Sinclair ZX Spectrum, Amiga, Atari ST and IBM PC

Box content: Diskette or cassette in a cardboard box that also contains a 128 MB SD card (includes disk images, MP3 soundtrack and extras), manual, poster, stickers, Hibernated 1 addon »Eight Feet Under« download code and the exclusive **mission patch**

ZAPA!
64
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A
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Smash

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