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Hardwarecore: The Rise of the Garage Solderer

Over the last decade, bedroom coders have risen up: indie became a fundamental creative force as game makers gained access to the means of production, in middleware and free engines, and the market, in open platforms. Yet during this time, an indie hardware revolution has also gathered pace. Sometimes labelled as the 'maker movement', fellow hardware designers have begun getting access to the sort of tools and markets our software peers had enjoyed for years.

3D printers and computer-controlled milling machines, once costing tens of thousands, now cost less than a laptop. PCBs, the complex component-connecting boards of all electronics, can be designed with free open-source software and ordered in small batches for under £10, shipped. Communities have formed, allowing tinkers, makers, and small startups to share knowledge on everything from obsolete components to navigating deals with Chinese manufacturing plants.

And one of the biggest benefactors of this kind of hardware cottage industry so far has been the retro game scene. It's something Wireframe has written about in the past: as consoles age, their disk drives fail and their connections become obsolete. But many individuals and small companies have started producing drive emulators and video upscalers to plug that gap.

For example, with the combination of GDEMU and the OSSC, players can upgrade their flaky Dreamcast to play games from quick-loading, reliable SD cards while upscaling analogue video and feed it laglessly into a modern HDMI TV.

Meanwhile, PC gamers long frustrated with the handful of mushy commercial keyboards can now choose from a plethora of different switches and layouts. Designers build small batch circuit boards which are preordered by enthusiasts, while wood and metalworkers produce custom cases. Others create keycaps, build USB cables, and hand-modify switches.



WILL LUTON

*Will Luton is a veteran game designer and product manager who runs Department of Play, the games industry's first management consultancy. He is the author of *Free-to-Play: Make Money From Games You Give Away* and has worked with Sega, Rovio, and Jagex. He is also an avid retro games and pinball player.*

Today, the range and quality of keyboards available is mind-blowing; the best craftsmen are being drafted in to create £800+ boards for esports and Twitch stars. This is something that only a decade ago would have seemed impossible. And similar progress is happening in the arcade stick and custom controller scene.

These aren't the most remarkable stories of this indie hardware revolution: we've had a thousand bargain bins of microconsoles (remember OUYA?) and the Pebble smartwatch (fact: I designed the Pebble's most successful game, which reached millions and made me £0). Raspberry Pi was born from these dropping barriers – without it, you wouldn't be holding this magazine.

But the biggest success so far is Oculus VR: Kickstarted hardware, ostensibly created by a barefooted boy genius in his parent's garage, later snapped up by Facebook for £1.7 billion. While Oculus has failed to realise the potential many had hoped for, it's indicative of what is possible for independent hardware developers: to build what people and big corporations don't yet know what they want. Hardware is once again as disruptive as software.

So while we celebrate the indie software pioneers of the last decade, it's worth us all looking forward to what is possible in the next ten years in silicon. What's most exciting is not what's already announced, but the possibility of what comes later. That's to say: the promise of independent hardware as the capital overheads close in to software. Much as indie games have us playing games we never envisioned, could indie hardware have us playing in ways we never dreamed of?

As our next keyboard is less and less likely to be from Dell or IBM, could our next console *not* be from Nintendo, Sony, or Microsoft? Perhaps it'll be an indie console. Perhaps it'll be open source and supported by the world's bedroom coders. Perhaps it'll look and feel like nothing we've ever considered before. Perhaps it's being developed right now, on your street, by some young kid in a garage, whether barefoot or not. 🐣

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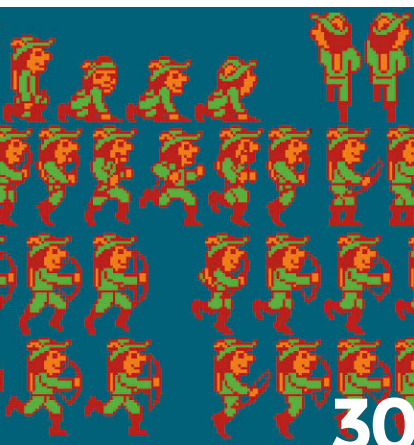
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WELCOME

Conversations can often veer off on strange tangents here at Wireframe towers. Case in point: the thinking behind *Ninja Gaiden's* title. In Japan, developer Tecmo originally called it *Ninja Ryūkenden* ('*Legend of the Ninja Dragon Sword*'). When the game went over to America, it was mystifyingly redubbed *Ninja Gaiden*. As many of you will know, Gaiden translates to 'side story' in English, which implies that it's some kind of spin-off. Obviously, it isn't. We've had all kinds of *Ninja Gaiden* games since 1988, which means over 30 years of side stories starring the series' laconic hero, Ryū Hayabusa.

"So what happened to the ninja's main story?" I wondered aloud one rainy morning. "We need answers."

"Well, if he's a regular ninja," our Ian replied, "his main story's farming. Farming and living a quiet life in the daytime. No calltrops, just tending crops."

"In that case," I said, "I want that game. I want my ninja farming simulator. *Ninja Farmden*."

"I'd be surprised if there hasn't been one already," Ian said. A quick search revealed a 2012 free-to-play smartphone title named *Ninja Farm*, but from what we could tell, it contained an awful lot of combat and not a lot of farming.

"Surely it could be a *Harvest Moon*-like?" Ian suggested. "A reason for your questing and battling: you're a ninja fighting for the poor downtrodden village folks... Wait, have we just invented a game?"

I think we have. Billionaire status surely beckons.

Ryan Lambie
Editor





Rektjavik

Ambition and freedom in a sci-fi MMO strategy title, made by an Icelandic team – but not the one you're thinking of. This is *Starborne*

When you're leaving one of the most complex and ambitious video game projects ever seen to strike out on your own, it's fair to assume many would be tempted to tone it down a smidge; to take it a bit easier on whatever comes next and unwind. Solid Clouds, a team formed by *EVE Online*/CCP Games alumni, has not opted for that approach, instead attempting to add new layers of complexity and depth on top of a genre already riddled with both of these things. *Starborne: Sovereign Space* is seven years into its development journey and has been picking up fans all that time – people who like... well, complexity and depth, really.

There's plenty familiar about *Starborne* – it tackles the 4X genre staples (eXplore, eXpand, eXploit, eXterminate) seen in titles for the past few decades, so you're going to be setting up your home regions and building out from them, finding your resources, engaging with your opponents

how you see fit – and not always with a war-ish tint to proceedings – the usual kinds of things. But it's that MMO aspect that aims to lift the game into Genuinely New territory.

Negotiating with a basic AI opponent is one thing (unless it's Gandhi in *Civilization*, of course), but negotiating with another real player is something altogether different. Their motives can be as complex as your own, their subterfuge as refined as anyone else's, their cloaks the most enveloping and their daggers the sharpest. *Starborne* isn't a game built specifically for players to screw each other over in the pursuit of an empire, but it understands people, and people are bastards.

Intrigued by the concept of stabbing dozens (or hundreds) of people in the back, Wireframe had a chat with Stefán Gunnarsson, lead designer (and Solid Clouds CEO), and Haukur Steinn Logason, marketing chief at the studio.

things that truly set it apart. Among those features is its gargantuan scale and the fact it is deeply political. You cannot win a game of *Starborne* by yourself. You need to join an alliance, and you need to work together. Don't expect it to be easy; the galaxy has over 5000 players who are also vying for ultimate control. All of this is happening on an incredibly detailed and beautiful

seamless single-layer map. It

is huge. The current version has over 800,000 hexes and navigating is smooth; there

are no loading bars, city views, or lag of any sort, meaning that you can go look up any empire within the game and go there instantly and back if you so desire. This fidelity is unheard of and makes strategising and watching your plans come to fruition a pure joy.

How are you tackling the bane of any MMO: long-established games that are hard to break into?

Each server only runs up to eight weeks, meaning that all players start colonising the galaxy at nearly the same time – this means that players who have been playing for years do not have an inherent advantage by being incumbents as in other MMO titles.

How many lasers are we talking? Lots of lasers? A reasonable amount of lasers?

SG: An unfathomable amount of lasers!

Is *Starborne* suited to those of us who don't play MMOs?

HSL: 'Traditional' MMOs like *World of Warcraft*, *Runescape*, or *The Elder Scrolls Online* do not have much in common with *Starborne*. We have often heard the comparison that *Starborne* is a lot like a real-time *Civilization* in space with thousands of players. It is deeply political, and each server will end and have clear winners. ➔

Where did the idea for *Starborne* come from?

SG: The original idea for *Starborne* was born out of frustration. I've been playing strategy games my entire life, and about ten years ago, I felt strongly that the development of the then old, yet brilliant strategy browser games had grown stagnant – I was not impressed by the direction of the new mobile strategy games. The in-game maps of those games were, unfortunately, becoming less and less critical for the overall experience of the players. However, I was seeing all these fantastic PC single-player grand strategy games like *Civilization*, *Hearts of Iron*, and *Europa Universalis* where the players play on truly immersive maps, and then you had these massively multiplayer strategy games where the world map had little real relevance.

Out of this frustration, Solid Clouds was founded in late 2013 to create something that had not been done before; a massively multiplayer strategy game named *Starborne* where players would play on a seamless single map layer in the classic 4X style, rather than spending most of their time in narrow city views.

What is it about *Starborne* that you think makes it stand out? Why should people care?

HSL: While at its core *Starborne* is a player-driven empire builder, there are many





If that is something that remotely piques your interest – then *Starborne* is for you.

How challenging is it to marry the concept of grand strategy (typically the reserve of offline single-player) with an MMO framework?

HSL: It is a match made in heaven. What is more grand than the collective scheming, plotting, and strategising of thousands of real-life players?

How does the MMO framework modify the standard strategy game approach? What special tucks and tweaks are you having to make?

SG: Most real-time strategy matches are over in less than an hour, and a lot of turn-based variants you might finish a playthrough in 10–20 hours. Of those that are multiplayer, you might only be competing against a handful of opponents. For *Starborne*, we are talking eight-week games competing against thousands of players. So, as a designer of an MMO strategy game, you need to be able to forecast how players will be doing, feeling, and what they will be excited by weeks into the future.

It is therefore not as simple as 'jumping in a match' yourself to try out an idea, as you might be designing a feature that will come into play in week four, and one that might be mostly focused on alliance warfare. So that's why we started running huge alpha tests so early on, both to build up our community but also just to simply validate our game design.

^ A player-driven universe should make moments like this all the more impactful.

Has anything major come to light from the numerous alphas?

HSL: One of the biggest things to come to light last year was that our initial assumption on having just one victory condition was barring *Starborne* from being as political as we wanted it to be. We are condensing all of

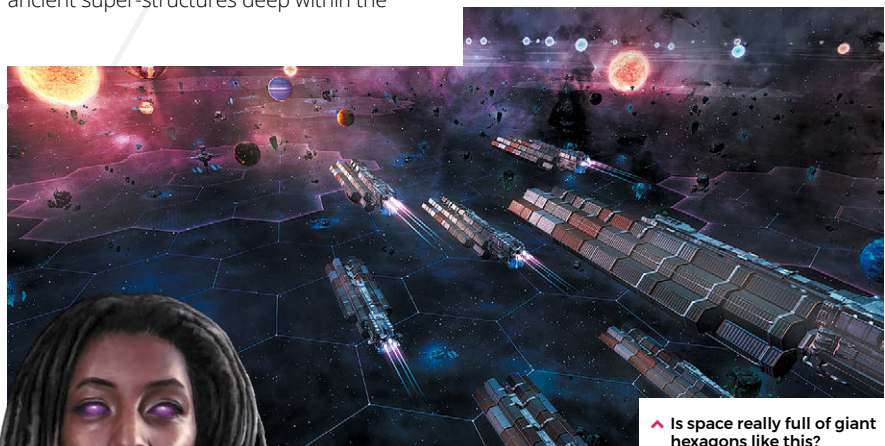
those 'lessons learned' into our new open-beta map, [which will] feature three distinct victory conditions. All of them are very unique and reflected in the world. It is going to be

nearly impossible for an alliance to go for more than one, so it will encourage a lot of backroom agreements, political partnerships, and betrayals. An alliance trying to hold on to and fully construct a Dyson sphere, the ancient super-structures deep within the

galaxy, will try to work with an alliance that is going for Grand Terrestrial planets located in the most war-torn areas of the map. They will start sharing intelligence and military power to overpower their enemies. The enemy of my enemy is my friend.

Is there anything from *EVE* specifically that you've tried to bring across? The sense of community, maybe?

SG: A lot of the influence and similarities have become clear now, in hindsight. Both games are player-driven, deeply political, and set in space. In 2014, our founding team and the *EVE* veterans that would join the team agreed that the political intrigue and the strong community were the most successful



^ Is space really full of giant hexagons like this?





elements that could inspire *Starborne*. Those were pillars we wanted to emulate. That is why our fifth hire into Solid Clouds would become a community manager, and during *Starborne*'s alpha stage development, we have hosted three *Starborne* fanfests in Iceland. We knew the development of the game was going to be a bit of a slow burner, so that investment we feel has paid itself back multiple times and continues to do so.

Both studios are also based in Reykjavík, which has a population of around 240,000. Naturally, a lot of knowledge sharing takes place because of that intimate proximity. After many moons of development, with harsh weather conditions and a brutal lack of sunshine in the winter months, we are super-proud to present the results to the world! During that time, our studio headcount has tripled. *Starborne* and Solid Clouds as a studio has developed its own unique character and identity and has started inspiring the next generation of game makers in Reykjavík.

What engine/toolset are you using to bring *Starborne* to life?

HSL: We develop in Unity and use the Azure cloud to host our server. Last year we switched to ASP.NET for our backend which has made our lives so much easier in respect to development speed, cost, and raw server performance. Unity gives us a lot for free, but with *Starborne* being such a unique game, we've been developing our own framework, named PROSPER, on top of it to facilitate the development of *Starborne*, and to be able to create a series of MMORTS games.

And what about your team – how many are working on the game?

HSL: We are 18 full-time, on-site in our Reykjavík office. We have a nice mixture of development disciplines, and we outsource for some things, like sound design. Around 15–20 is a magical number in our eyes. Everyone can sit together while eating lunch, so we avoid a lot of unnecessary communication overhead. We are still big enough to generate enough power for some really heavy punches, as we've proven. We just have to be [mindful] to select our shots carefully.

^ It may not show up in-game, but there's a real sense of humour behind *Starborne*.

There's a sense of humour behind your early promotional material, though the game itself seems quite straight-faced. Is that fair to say? Or are we looking at a secret comedy game?

HSL: Yes, that is indeed super-fair to say. *Starborne* is set in a serious world, grounded in a rich science fiction aesthetic, where players assume the roles of commanders conquering a newly discovered final frontier. Apart from this setting, the world of *Starborne* is entirely player-driven, and what energy the players bring to the world echoes within each server. Most just focus on empire-building and conquering the galaxy, but we've had an alliance role-play

“We've had an alliance role-play as a descendant of the Spanish Inquisition”

as a descendant of the original Spanish Inquisition, instigating wars and eradicating players they deem to have remnants of an entirely imaginary space flu.

In general, Icelanders don't take themselves too seriously. We want the material we release as a studio, where we talk about the game, to echo this. We think a lot of players who have joined us so far have really resonated with the sincerity in Solid Clouds' marketing materials. All the in-game trailers for *Starborne* however, and everything that is set within the game world, is very much grounded and straight-faced.

What are your plans for *Starborne* over the next few weeks/months/years?

SG: One of our biggest ambitions, post-open-beta release, will be to connect each

game server to form a metanarrative where victors are prominently featured on a perpetual galaxy map, and their spoils affect an ongoing competition between in-game factions.

On that galaxy map, you will also start seeing different types of game modes. We have worked for a long time to really nail the core one, but players will start seeing games that will be slower or faster, featuring different victory conditions, and be on a bigger or smaller map. We will be constantly changing up the formula to keep giving players fresh puzzles to solve.

In the long term, we want to make the game more accessible, and therefore we've started looking into different platforms like browser and mobile.

Finally: will I actually be able to get my tiny mind around what's happening (unlike in *EVE*)?

SG: I'm sure you will! It can be a bit daunting at first glance, but the best way to get into *Starborne* is with friends. Like with *EVE*, we have an amazing community that is really willing to help new players with their first steps. Our Discord channel is always buzzing, and we recently launched forums, so we have a lot of avenues for players to group up and take hold of the frontier. 🌌

***Starborne* arrives in open-beta on 2 April, on PC.**



Sailing the high Cs

Bad Dream Games' Thomas Wilson wants to cure your fear of singing with *One Hand Clapping*

Info

GENRE
Puzzle platformer

FORMAT
PC

DEVELOPER
Bad Dream Games

PUBLISHER
HandyGames

RELEASE
2021

Singing isn't for everyone, and even if you fancy yourself as quite the warbler, doing so in public takes courage. Singing, or simply making noise with the abandon we did as children, presents a hurdle to many of us as adults. Bad Dream Games' *One Hand Clapping* looks to change that. In this platformer, your voice can't move mountains, but create them – you sing or hum into a microphone in order to build platforms for your character to walk on or overcome obstacles with. Over the course of their character's journey, players get to know their own voice and also learn to better appreciate musical theory.

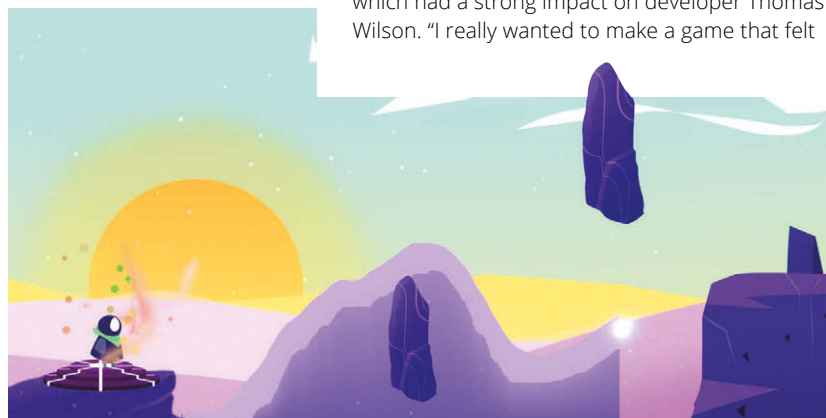
One Hand Clapping began life as a student project at the University of Southern California – a short game made freely available on itch.io. The initial idea was inspired by Jonathan Blow's puzzle games *The Witness* and *Braid*, which had a strong impact on developer Thomas Wilson. "I really wanted to make a game that felt

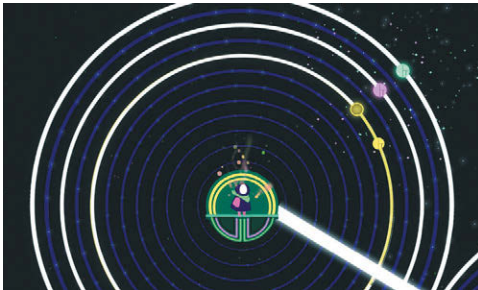
visceral, so that whatever you were doing in the game was actually something you were doing in real life. Maybe the skills you used in-game could somehow be transitioned back into reality," he says. After a prototype that involved steering a rowboat didn't pan out, Wilson turned to his own life for inspiration. As a music lover and former member of his high school's choir, he wanted to find a way to keep his love of singing alive, as he had stopped attending choirs once in college. "It was a bit like my youthful curiosity had been replaced with the reality of having to find a job and become an adult," he says, "but I enjoy singing a lot, and my research shows that humanity at large does, too. Humans have always bonded over making music, but recently we've become reluctant to do so. I knew there was something in there worth looking into."

What followed were various prototypes for games you could control with your voice, including one where your pitch changed colours on screen. This would eventually culminate in the first version of *One Hand Clapping*, a short game Wilson made with a sound design student. That iteration, which you can find on YouTube, had you use your voice to overcome the kinds of challenges you'd expect to find in a platformer, including opening doors, lowering platforms, and avoiding enemies.

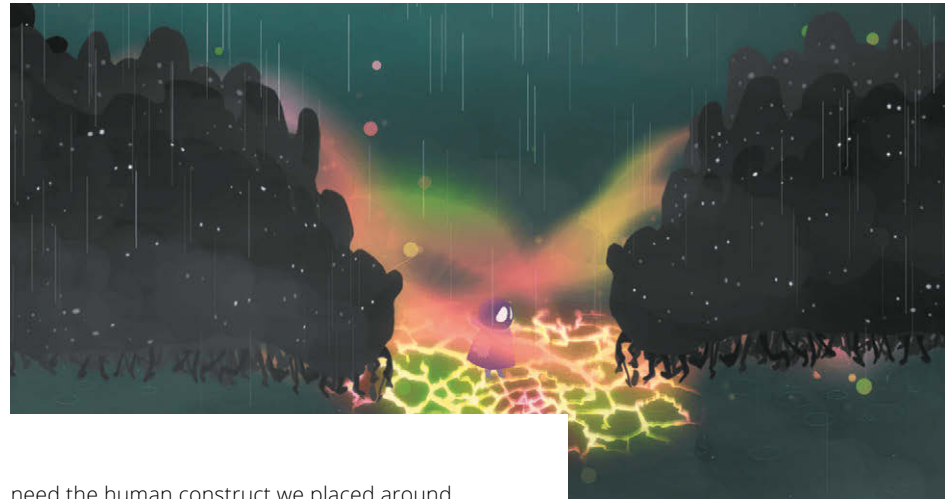
The version on itch.io is the game's second iteration, made from scratch by Wilson and 20 fellow students with various degrees of involvement over the course of a year. When asked why he put it online, Wilson cheerfully admits everyone involved just wanted

▼ Here, your singing creates soundwaves that let you walk from platform to platform.





▲ Challenges will take a variety of forms - here, you'll need to time your notes precisely to light up the rings.



▲ Social isolation and shame are both themes in *One Hand Clapping's* non-verbal narrative.

to show off the work they were so proud of. "We didn't really think it would go anywhere, but then big YouTubers like PewDiePie started playing it. At first, I didn't know what that meant, or how to make the best of it, but we decided to pitch the game to publishers," he says. Not long after, HandyGames, a subsidiary of THQ Nordic, picked up *One Hand Clapping's* publishing rights.

Throughout the interview, Wilson acknowledges several times that players may have to overcome their own embarrassment when singing, and that he hopes *One Hand Clapping* will help with that. But if it means the game could have a potentially smaller audience – well, he's OK with that, too. That isn't to say the team isn't hard at work making the game accessible: "In the demo right now we allow you to just make noise for a bit at the beginning in order to get used to the idea of creating sound and influencing the world around you that way. Throughout the game, you'll also have a guide. We're still working on calibration options and making it clearer how you can use your voice and what pitch represents. Also, once you know how it works, you'll continue to get better, and with that comes confidence."

In addition to confidence, Wilson also hopes to give players a musical education. "In the finished game, information will pop up sometimes; for example, what note you're singing, and what note you're asked to sing. Maybe we'll show a staff with notes to help with sight-reading. I also want players to learn something about rhythm. The game doesn't

need the human construct we placed around music to make it legible, but it could help people who are interested in that."

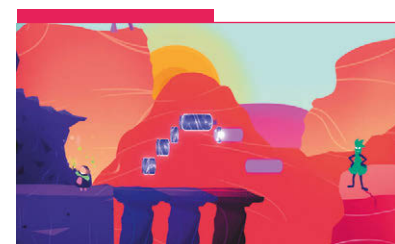
Watching streamers play the demo, you usually see people goof around quite a bit. They're obviously playing things up for an audience, but it makes me ask if *One Hand Clapping* could be one of those games in which you overcome your fear of singing by having someone there with you. Wilson gives a long pause before he settles on this. "I mean, you can do that?" he wonders.

"People like to play together. When *Braid* came out, there was a video of Soulja Boy playing it with his friends

"We want *One Hand Clapping* to be cerebral and intimate"

and just rewinding over and over. It's absolutely not how the game is supposed to be played, but they had fun. I think you can share games pretty much no matter what the game is, and that just harkens back to people going over to their friends' houses to watch them play as a kid. But we want *One Hand Clapping* to be cerebral and intimate. We want to create a calming experience with a narrative that makes you think. That's what will make you feel good about singing, and more besides." 🗨

▼ *One Hand Clapping* is intended as a calming experience, and the imagery certainly underlines this.



LEARNING BY DOING

The demo of *One Hand Clapping* includes two kinds of puzzles that are already musical education in disguise. In one, a character appears and asks you to repeat a sequence of notes they're singing. It's a test of your musical memory, and an official part of examinations by The Associated Board of the Royal Schools of Music in the UK. Another puzzle shows you what notes chord sequences are made of and how they work, simply by singing them yourself.



OBEY, CONSUME

Elite alien sports and pleasing sponsors in Drink More Glurp

Info

GENRE
Glurp drinking sim

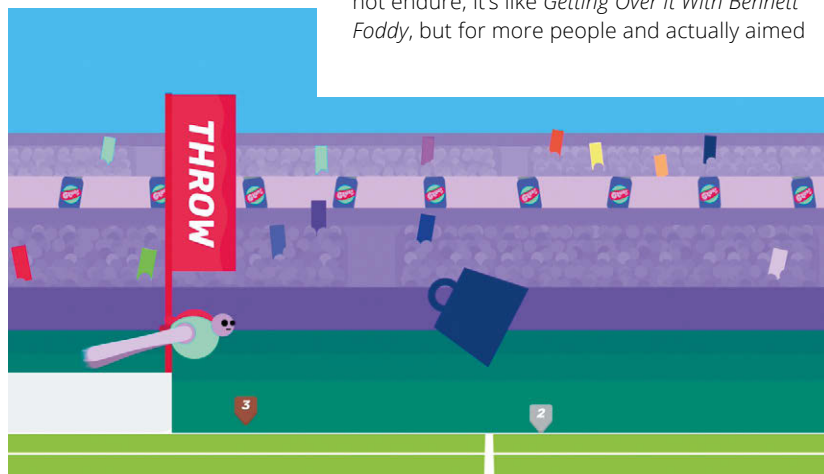
FORMAT
PC

DEVELOPER
CATASTROPHIC_ OVERLOAD

PUBLISHER
The Yogscast

RELEASE
2020

▼ Even without friends, you can still compete across leaderboards. It is primarily a party game, though.



It's a physics game – but don't run away screaming, please: *Drink More Glurp*, from CATASTROPHIC_OVERLOAD, is specifically designed to be something of an outlier in this weird world where 'physics' denotes a genre. How? By aiming to actually be fun to play, and not setting out to frustrate the player, all the time, forever, until you never want to play *Surgeon Simulator* ever again. Ahem.

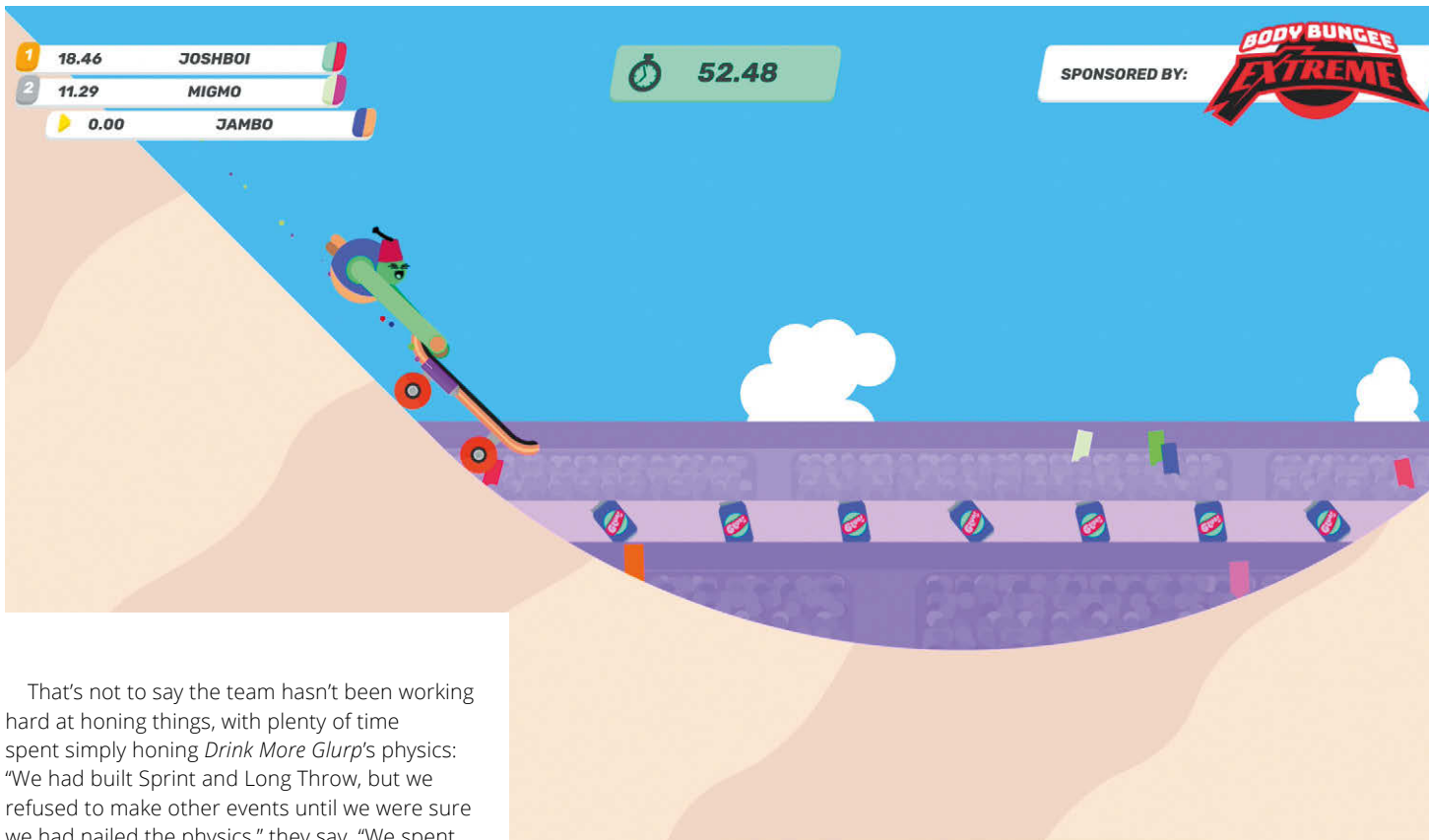
Aliens have recreated a selection of Earth's sports, see, and have got them a bit wrong. From there, we have the jumping-off point – throw in a number of sponsors, all of which has way too much influence over proceedings, and add in a huge focus on multiplayer (both actually playing and spectating), and you've pretty much got the idea behind *Drink More Glurp*. It's like if *I Am Bread* was designed as something to play, not endure; it's like *Getting Over it With Bennett Foddy*, but for more people and actually aimed

more towards 'fun' than 'punishing'. Actually, the developers looked more towards traditional multiplayer stalwarts – the *Overcookeds*, the *Worms*, the *Gang Beasts* of the world, and it shows.

With James Letherby (artist) and Joshua Burr (programmer) ready to chat, we threw a few questions about *Glurp* their way; responses were provided as a dual hive mind. "We were very keen to make a silly physics game but were very aware that we needed to make it accessible enough so that players will actually have fun playing," they tell Wireframe. "Especially in a party setting where you don't have time to practice."

"We wanted it to be fun to watch and fun to pick up and play, but we also wanted a high skill ceiling where you can become super-graceful and accurate with your techniques. Some physics games will always fight you on that because they're built to be intentionally difficult – sometimes frustratingly difficult. We don't want people to be frustrated; we want players to go from having a sense of novelty, to discovering, improving, and showing off new techniques over time."

Moving from early split-screen prototypes to a single-screen, hot seat style of play proved the eureka moment for *Glurp's* development: "Suddenly the pressure was off to do super-well because the sense of holding up the game goes away," the duo explain. "And suddenly, watching each other became a part of the game. The crowd laughs along and cheers and will even give hints and tips to players. It's heartwarming to see."



That's not to say the team hasn't been working hard at honing things, with plenty of time spent simply honing *Drink More Glurp's* physics: "We had built Sprint and Long Throw, but we refused to make other events until we were sure we had nailed the physics," they say. "We spent a lot of time working out the traction on the 'hands' to make sure that players could run over obstacles without skidding. We did our best to make it as close to 'pure' physics as possible, which carried through to the minimalist visual styling of the game.

"But the process of making a game goes beyond just making something fun. We've had to learn things like setting up a business, pitching to publishers, sorting out funds, dealing with platform holders and getting devkits, all while trying to do anything social while also trying to make a game.

"We've been going to conventions, working on marketing, dealing with music and audio... The production side has been a new challenge for us, but it's all very important."

Sponsors are more important to *Glurp* than just a funny-sounding name and an army of puns: event sponsorship essentially indicates a modifier for the event in question – maybe low gravity, say, or super-strength throughout. It's another way in which things are being aimed more down the path of fun for the sake of it, rather than frustration for the lulz.

Drink More Glurp is a party game first and foremost, but there is some level of support

baked in for those without a party with which to play. A challenge mode provides curated events to take part in with scores to beat, and you can unlock – of course – hats through playing this mode. Thrown in with challenge mode is an online leader board and full replays, so you can see what those atop the mountain

actually *do* in order to be the best. Beyond drinking more of the titular soft drink (or whatever it is).

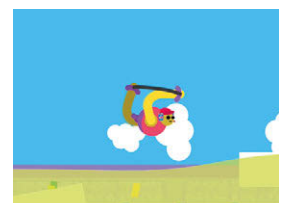
But we had to save the most important question

for last: what's in a name? "It took us *forever* to come up with a name," the devs reply. "But we were super-keen to carry the sponsorship theme through to the title, so we created *Glurp* and had it take over every aspect of the game, as well as have the sponsorships completely dominate the events, too."

This ultimately led to the actual name of the game being an ad for the fictional drink, but it still leaves the question: what is *Glurp*? "Who knows," they respond. "We had sheets full of words. Drink more this... Drink more that... The exact origins have been forgotten... but I think *Glurp* was an amalgamation of 'Gurgle' and 'Burp.'" And now we know. 🗨️

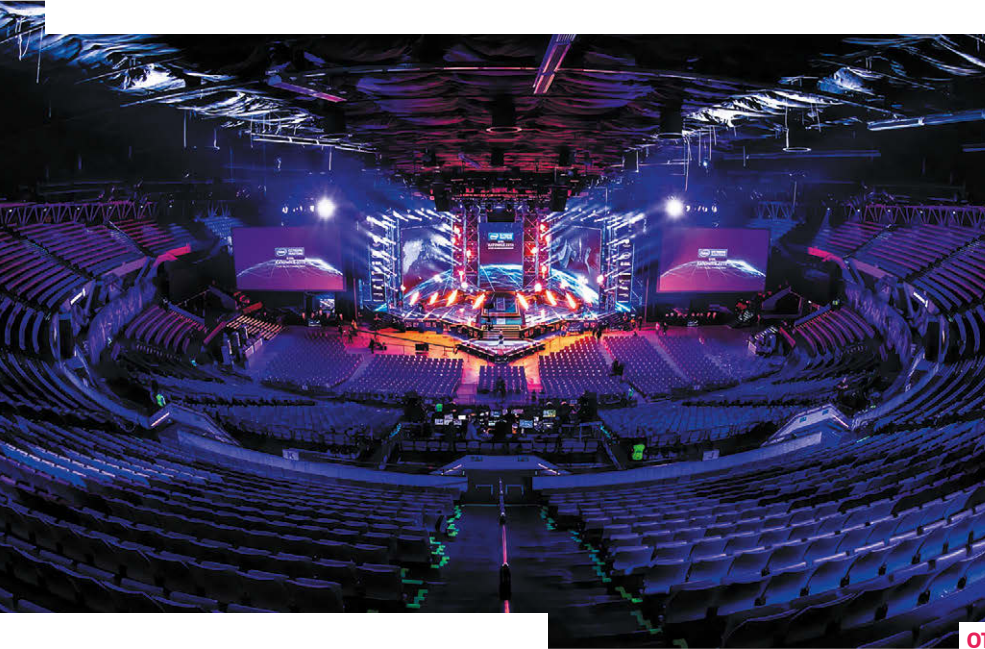
^ Hot seat competition means players are able to study each others' techniques, levelling the playing field a bit.

✓ When you're sponsored by handcuffs, you're not going to see a prime competitive advantage.



Headlines

from the virtual front



02
03



01. Corona cancellations

Numerous publishers, studios, and other gaming companies have been pulling out of events over the past few weeks, owing to the ongoing issues surrounding the Covid-19 coronavirus outbreak. While Sony, CD Projekt, and others missed out on PAX East, Kojima Productions, EA, Unity, Microsoft, and Epic all made it known they would not be attending GDC, and the ultimate result has been the event's cancellation, with no new dates announced at the time of writing. Additionally, IEM Katowice – the esports tournament – held its *Counter-Strike* playoff tournament in front of a crowd of zero, after permission for a mass event licence was revoked by the Polish State Sanitary Department.

02. Next-gen X-gen

The slow rumble of promises about the next generation of consoles is continuing to build, with the Xbox Series X firing the first shots in the Teraflop Wars. Microsoft is claiming its high-spec console (that looks suspiciously like a desktop PC) is aiming for 12 teraflops of GPU performance, doubling what the Xbox One X kicks out. Well, we don't know what to say. Really, because this teraflops stuff is – aside from being a very rough measure of what sort of power a machine is capable of – little more than marketing gumph. Variable rate shading, ray tracing, SSD storage, 120fps support, attempts to minimise latency – it all sounds good, don't misunderstand. But we just want to see the games.

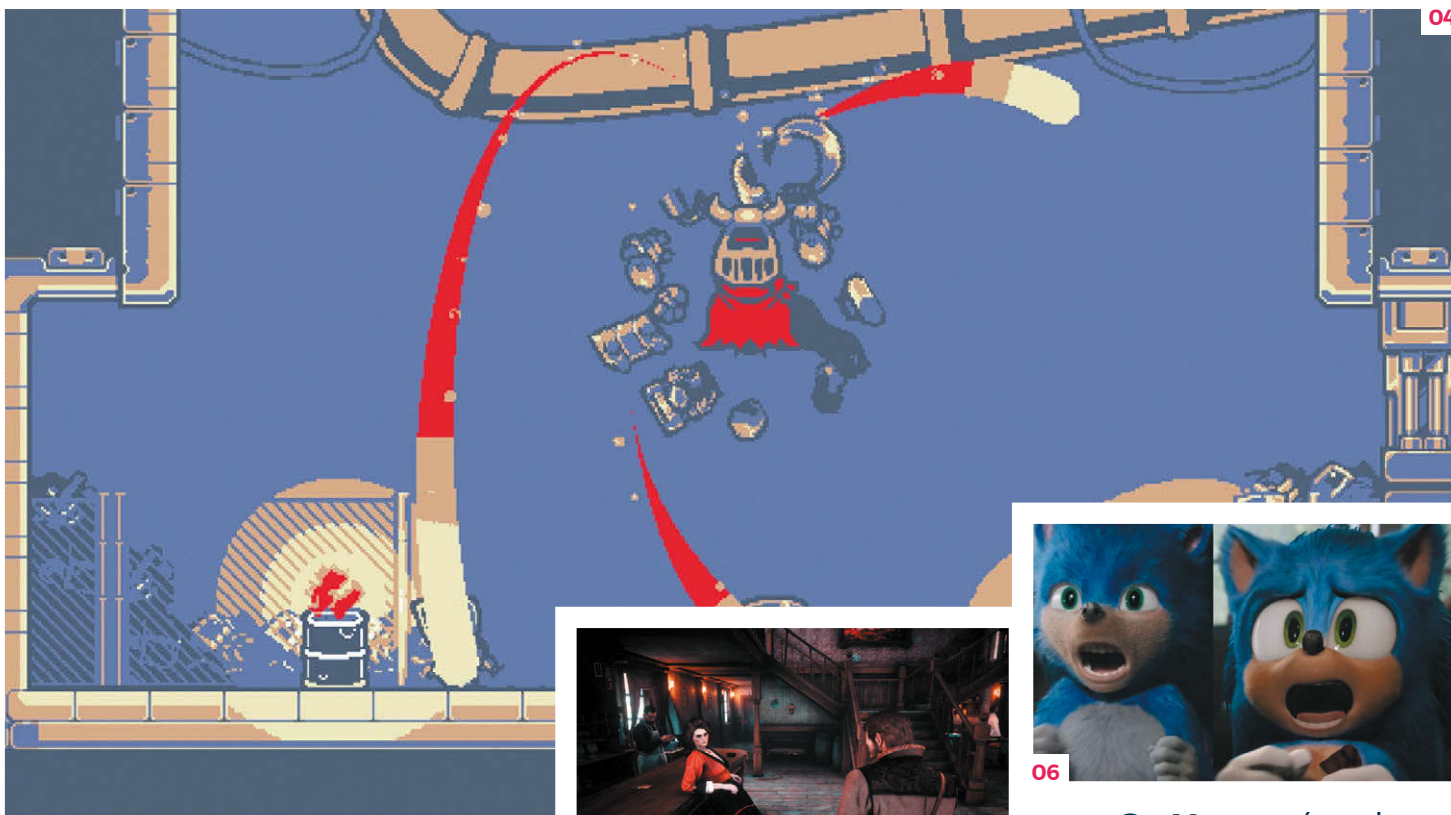
03. Take a breath

Let's stick with that next-gen chatter for this one – is it huge, earth-shattering news? No. But it's nice, and we like nice here. Following the Xbox news (seen slightly to the right of these words), CD Projekt Red made an announcement of its own about the upcoming *Cyberpunk 2077*. Namely: you buy it on Xbox, you get it on all the Xboxes: "Gamers should never be forced to purchase the same game twice or pay for upgrades," the game's account tweeted. "Owners of #Cyberpunk2077 for Xbox One will receive the Xbox Series X upgrade for free when available." D'aww.



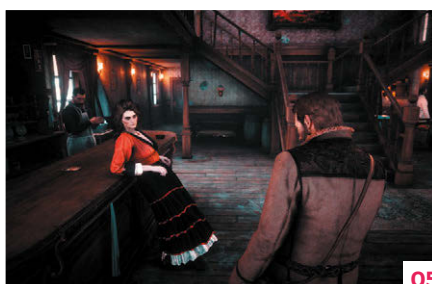
Tony Hawk's Pro Skater documentary released, sadly not on 16 May

Eli Roth set to direct *Borderlands* movie



04. Play Kunai-ce

The spectre of review bombing reared its big daft face recently, with an apparently angry *Pokémon* fan taking his frustrations about something I won't even pretend to understand out on poor *KUNAI*, the little Metroidvania that could. The point here is that a person (semi-)randomly decided to try and destroy the reputation of a well-received indie game by sabotaging its user rating on Metacritic, taking it from an organic 8.1 to a less-deserved 1.7, simply by abusing the system's lack of IP checks and using hundreds of free email sign-ups. The person behind all this is irrelevant; the real issue highlighted here is how Metacritic – once famously tied to developer bonus payouts and still with a decent amount of clout – can still be successfully, easily gamed in certain ways.



05. Not coffee

After making your own version of *GTA San Andreas*'s infamous Hot Coffee sexytime mod, this time for *Red Dead Redemption 2*, you might sit back and chuckle. First, because it's a pretty rubbish effort of a lowbrow idea, introducing hacked-together sex scenes to the western opus. Second, because it's clearly something done 'for the lulz' or whatever the internet says these days. Rockstar, however, did not see the funny side when this very mod did pop up online, raining down legal fury like the hammer (or gavel) of Thor, resulting in the awkward sex-based silliness to be removed from its mod-hosting home. Sex doesn't sell (free mods), folks.



06. Gotta go (to the cinema) fast

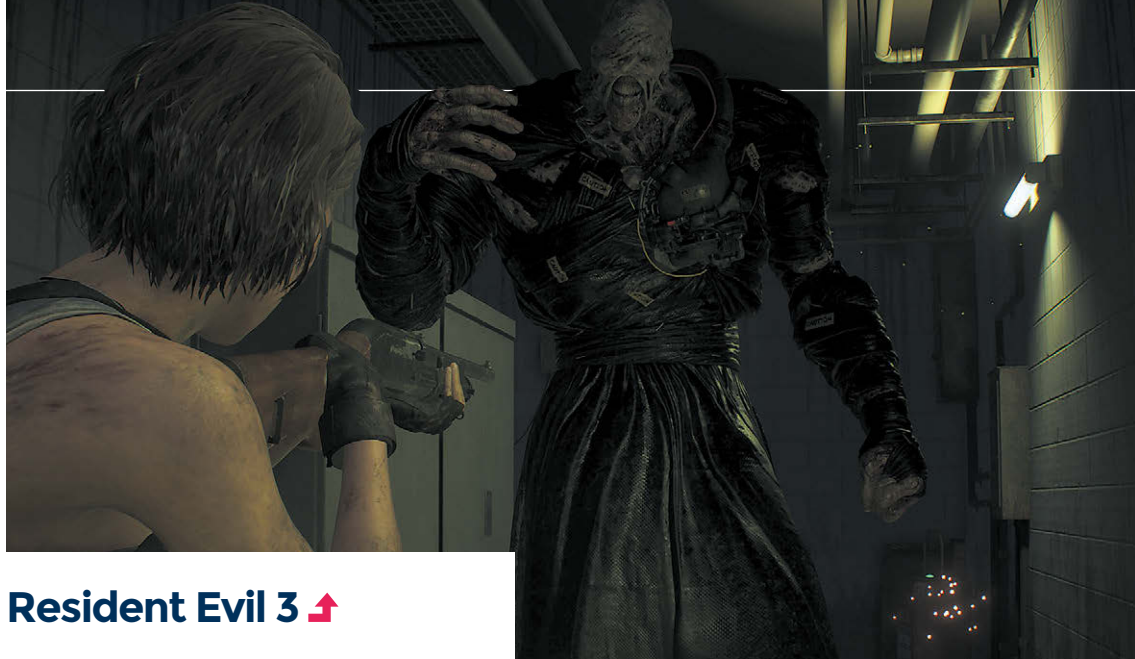
After the horror of *that face*, hopes were somewhat middling for Sonic the Hedgehog's cinematic debut. But here we are, in the year 2020, with a blue alien hedgehog that can run quick and doesn't have a face that haunts your very soul (also: human teeth), and a movie that brought in the most for any video game tie-in across its US opening weekend (£45m, fact fans). *Sonic*'s wider performance at the time of writing had it as the 13th highest-grossing video game movie ever released, with a £208m worldwide take – though of course, that figure will have risen by the time you're reading this. Will the blue one be able to tackle 2019's *Pokémon Detective Pikachu*? No, because the Ryan Reynolds vehicle bagged £334m worldwide. Sorry, oh speedy one.

Ex-BioWare dev: "92% of *Mass Effect* players were Paragon," for some reason



2003's *Need For Speed: Underground* gets ray tracing via mod

Attract Mode



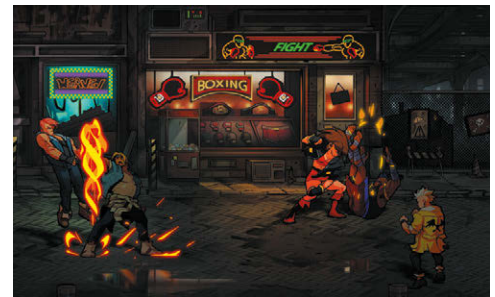
Resident Evil 3 ↗

It's fair to say *Resident Evil 3* was originally a bit of a sideshow project to the *Resi 2* main event – and history seems to be repeating itself with Capcom's 2020 remake of the 1999 original. Considering *Resident Evil 2*'s remake was one of the best games of last year, though, this isn't in any way a criticism – more of that fine mix of gorgeousness, terror, and an absolute git endlessly chasing you around is a welcome thing, definitely. Given *Resident Evil 3*'s core concept centres on said pursuit – the genetic experiment gone wrong (or right, actually), Nemesis, who pursues Jill Valentine from the game's start to its finish – we're already onto a winner.

So what is this remake doing beyond the prettification? Well, the Nemesis is more dogged than *Resi 2*'s Mr X, with plenty more abilities and ways to make you soil yourself unexpectedly, and there's a multiplayer game bolted on in the shape of *Resident Evil: Resistance*. Beyond that? Not much. History is repeating itself, and *Resident Evil 3* is once again a sideshow attraction. But just like in 1999, it's looking like the 2020 version will be a great game in its own right anyway.

Streets of Rage 4 ↘

Age attack: *Streets of Rage 3* came out 26 years ago. Ah, let that settle in. Anyway, *Streets of Rage 4* will be out at some point in 2020, and besides the nostalgia blast, there are reasons to be excited: it looks stunning, it's being made with the due care and attention you'd hope for by a triumvirate of devs (Lizardcube, Guard Crush Games, and Dotemu), and it's introducing things never before seen in the series, like four-player co-op and a couple of new characters – Cherry and Floyd – joining series stalwarts Axel, Blaze, and Adam. No, we haven't heard anything about Skate or Roo yet. We'll have more on *Streets of Rage 4* in due course, because how on earth could we possibly resist?



← Bright Bird

A leisurely paced side-scrolling puzzle game, *Bright Bird* sees players controlling Yao or Xuan as they try to 'find the bright bird to solve the smog crisis'. A straightforward affair, the game is backed up by some lovely visuals and a general cultural flair that gives it a real sense of heritage. We don't know a huge amount beyond that, but we're keeping half an eye on this one.



Soldat ↗

Originally released back in 2002, *Soldat* has been doing the rounds in the competitive gaming community ever since. Mixing the best elements of *Worms*, *Scorched Earth*, and *Counter-Strike*, *Soldat* sees players controlling a wee soldier with rocket boots as they

pootle around maps in a violent ballet reminiscent of *My Friend Pedro*. The devs decided to bring the free game the way of Steam a few years ago, and right now we're on course for a 1 April release, with the game to be open-sourced following the official launch.



Evergate ↗

When you get an *Ori* vibe from a game, you tend to stop and pay attention for a bit. *Evergate* has that look about it, but mixes things up a bit to be its own thing – this is a puzzle platformer utilising your 'Soulflame' to reach exits on levels. What that means is carefully aiming a beam of light – while leaping about – to break crystals and activate useful powers to help you overcome challenges. It looks lovely, and hopefully, it'll be as nicely designed as it is drawn.



King's Bounty II ↗

If you know *King's Bounty*, you're excited about this. Not the original 1980s release – the 2008 (and on) turn-based strategy game of epic, colourful battles and a *big pile of fun*. This 'grittier' sequel looks like it's doing away with some of the whimsy of the last round of releases under the banner, which is a shame, but hopefully that same fine blend of satisfying strategic play can carry through.

Population Zero ↘

Think of a world where *Rust* met *ARK*, then *No Man's Sky* turned up for a natter too. You've pretty much got *Population Zero* nailed down, at least from a cursory glance. Survival, combat, building, hunting, a weird alien world, and a title that could end up prophetic if the whole thing goes bottom over boob.





NEUTRONIZED

The one-man indie studio at ten

As Neutronized celebrates its first decade, we find out what it takes to be an indie on mobile – and the challenges ahead

WRITTEN BY
CRAIG GRANNELL

If you're an aficionado of retro-infused mobile gaming, you're likely aware of Neutronized. If not, you should be. This tiny one-man studio, founded by Gionathan Pesaresi, is a regular supplier of arcade joy, from *Drop Wizard's* frenetic single-screen larks to epic side-scrolling platformer, *Super Cat Tales 2*. A decade in, we decided to find out what makes Neutronized tick.

Unsurprisingly, given the retro stylings of Neutronized output, old-school gaming is in Pesaresi's blood. Many of his early memories involve classic DOS titles like *Prince of Persia* and Lucasfilm graphic adventures – "I loved the humour, and trying to solve a difficult puzzle right before I had to catch the bus to school!" – but also coin-op classics. "I was mesmerised by sprites in games like *Street Fighter II*," he says, "and had already started to wonder how to create such animated images."

GAME ON

Additional early gaming experiences further informed the young Pesaresi's subsequent path. With *Duke Nukem*, he used the Build engine to fashion new level maps. Then a mix of emulation and handhelds opened up a world of Japanese video games. RPGs taught Pesaresi the value of developing a bond with a title's stories and characters. "But *Kirby's Dream Land 3* had the biggest impact," he remembers. "It matches what I most love about video games – peaceful environments and relaxing gameplay – and influenced me the most as a creator. It's the one game I'll take if I'm to be stranded on a desert island."

As Pesaresi reminisces about his school days, you feel he was always somehow destined to



▲ It turns out you don't need to be a major corporation to issue figurines. This one of Alex from *Super Cat Tales* is just about purr-fect.



work on games. "During elementary school, I'd sketch imaginary level maps that my teacher savagely ripped apart because they apparently weren't part of the lesson," he jokes. "And I started writing letters to computer magazines, asking how to make games. I quickly got the hint programming was fundamental to that, but I'd no clear concept [of] what programming was! Eventually, I found tools like 'Klik and Play', which allowed me to start experimenting with sprites and logic."

Actual games then followed, Pesaresi sharing them with like-minded classmates who'd constantly challenge each other to do even better. Later, he studied programming, making simple games like *Food Maniacs* in C++ and SDL. These helped Pesaresi secure a role at Impressionware during his early twenties. "My job was to code J2ME games, and I even got the chance to work on a Nintendo DS devkit," he recalls, adding that he rapidly learned from experienced programmers that "programming on the battlefield was way better than studying it in books."

GOING SOLO

After some years, the itch to work on his own games returned. Flash was popular at the time, and so Pesaresi made *Ghosts Stole My Puppy*. This gentle side-scrolling platformer had you take on the role of a low-rent ghostbuster, leaping about a massive house, using a vacuum cleaner to suck up pet-stealing spooks. Released in 2010, under the Neutronized banner, its pixel art and carefully considered, platform-specific control method (mouse to aim/suck; keys to move) hinted at what was to come.

More importantly, it got Neutronized noticed, with a licence sold to gaming portal, Ninja Kiwi. "After this first success, I became self-employed, determined to make a living from my games, and be competitive – in terms of quality and output – with what the likes of Nitrome was doing," says Pesaresi. Two years later, though, a major change found Neutronized's attention abruptly shift to mobile. "That happened because I was contacted by publisher FDG Entertainment, who wanted to convert my browser game *Roar Rampage* to mobile." It was a timely development: Pesaresi had started



▲ Mini-Pesaresii on his home PC, where he developed a thirst for games. Pretty soon, he was making his own.



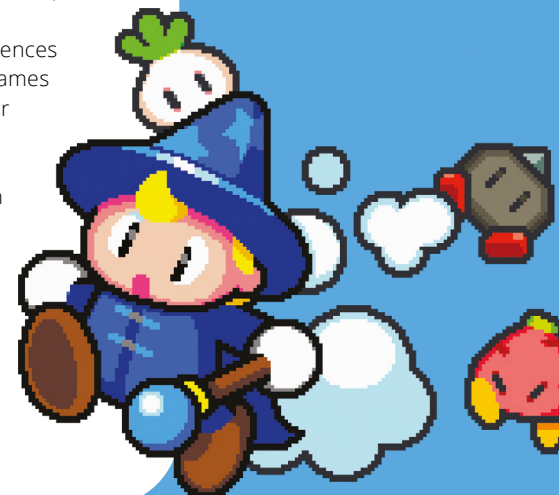
▲ Neutronized founder Jonathan Pesaresi in 2020.

"I'd sketch imaginary level maps that my teacher savagely ripped apart"

to notice the decline in Flash games, and FDG provided insight into how mobile gaming worked. "I learned about App Store reviews, the need to create promotional art in case Apple wanted to feature a game, and key information about ratings and rankings," he explains.

The move to mobile also aligned with a desire to ramp up the quality level of Neutronized games: Pesaresi decided they must have "more story, more levels, and more secrets." This dovetailed with his childhood love for arcade and console hits. The ultimate aim was to "come up with a game that could pass for one on classic consoles", harking back to a creative era primarily driven by "new, original games, rather than sequels and remakes."

From a visual standpoint, such influences are clear, given that all Neutronized games use pixel art. "Most games I remember playing when younger used pixel art," says Pesaresi. "It delivers a unique level of precision I love – the way I can control all the pixels on the screen." But there was never any interest in cloning an existing property – any 'tributes' had to build on gaming's history. "Keeping old classics as reference is a good way to pay respect and ensure their spirit lives on," he adds. But innovation is ➔



Interface

Neutronized: the one-man indie studio at ten

RISKY BUSINESS

Pesaresi has released games solo and worked with publishers. "There are pros and cons to each approach," he says. "With publishers, I learned a lot about the industry in a very short space of time. But I also had to cope with compromises, and adjust my games according to their feedback. Don't get me wrong: some of their ideas were good. But as my experience increased, I felt I had enough skills to stand on my own."

something we should all strive for, taking into account new technology and trends, and the platforms we're working on."

CONTROL YOURSELF

Nowhere is such innovation more obvious than in Neutronized game controls. Although Pesaresi sometimes uses bog-standard virtual on-screen buttons, many titles show imagination and a determination to wrestle with the perceived limitations of touchscreen devices. In *Drop Wizard*, single-screen platforming akin to *Bubble Bobble* and *Snow Bros.* is upended with an auto-running protagonist who only blasts magic when landing. The *Super Cat Tales* titles rethink horizontally scrolling platformers by reducing your input to two thumbs, and yet afford plenty of nuance and control. Muscle memory and assumptions are obliterated, and mastery requires you learn each game's mechanics afresh – an echo of classic arcade gaming, before inputs became almost codified.

For Pesaresi, such experimentation is bitter-sweet. "When I stepped into mobile gaming, I had high hopes, and wanted to tailor my work

around a smart touch interface. I thought too many developers were approaching mobile wrong, imitating games originally designed for joypads," he recalls. "With *Drop Wizard*, the idea was to create a legitimate arcade game for mobile – one that could stand on its own from coin-op counterparts. I then pushed this further with *Super Cat Tales* – a proper platform game without auto-run/auto-jump 'hacks', but that played naturally on mobile."

The response from players to these controls was mostly positive, but some griped about the lack of traditional options, oblivious to how the level choreography in these games was designed around non-standard input. Also, Pesaresi laments how mobile games en masse didn't grasp opportunities in the way he did, instead preferring "virtual buttons or hyper-casual designs that focus more on player retention than quality." He adds: "Back then, I thought mobile would develop its own identity, based on original games born on mobile, for mobile players. But players still don't consider mobile as a platform to be taken seriously."

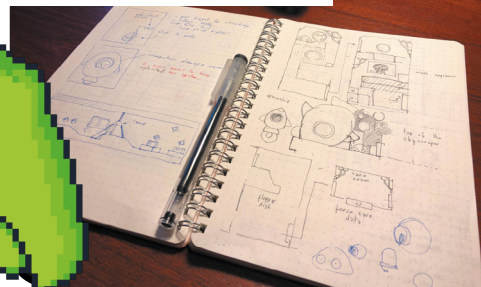
BE THE BUSINESS

Such issues present challenges, not least when Neutronized hasn't (yet) got an Apple Arcade call-up. Fortunately, though, Pesaresi notes the App Store editors "still care about quality indie games," thereby enabling discoverability. Yet he sadly adds that things are today much harder for small developers than they were even a few years ago.

Such changes in the mobile gaming landscape have altered Pesaresi's approach, from game content through to how the games are marketed. This has been particularly apparent during the development of *Super Cat Tales II*, which with its wealth of content, feels almost ludicrously ambitious and generous for a 'freemium' mobile title.

As Pesaresi outlines his thinking, you suspect those early childhood RPG experiences had more impact than was immediately apparent. "When designing *Super Cat Tales*, I wanted to come up with a quality platform game. But with *Super Cat Tales II*, I especially focused on the story, adding cutscenes and more detailed dialogue within the game," he says. "I thought coming up with all this in-game content was fundamental to let players bond with the characters, and become fans of the game."

▼ Neutronized game concepts often start out as sketches – but only about ten percent go beyond paper.



TRUST THE PROCESS

Neutronized games typically start out as anything – "a doodle, a random thought, or even a sound," according to Pesaresi. Often, they begin as sketches, but he notes the "main mechanic must be easy to learn – and convincing enough for me to turn into a real game." Much of the time, jotted-down ideas don't pan out, but those that do come into being via a mix of Cocos2d-x and Starling. Pesaresi is currently checking out Unity. Pixel art is worked on in GraphicsGale and Photoshop. GoldWave and Movie Studio, respectively, are wheeled out for audio work and game trailer edits.



▲ An arcade game on mobile, *Drop Wizard* mixes up single-screen platforming and auto-running.

According to Pesaresi, mobile players are so used to playing games for free that “only a tiny percentage” of those who installed *Super Cat Tales II* have purchased the premium IAP, which mostly exists to remove in-game advertising. Even so, the game has a dedicated core following. A *Super Cat Tales* Discord channel thrives, as does the Neutronized YouTube channel, which is – naturally – hosted by an animated pixel-art Pesaresi. Demand at one point was such that a batch of *Super Cat Tales II* figurines was released. The game remains an ongoing concern, and has expanded greatly since its debut, with a range of new levels, environments, and characters.

GETTING THE WORD OUT

For Pesaresi, this growing ecosystem is a vital part of his work, but he says it grew organically rather than being meticulously planned: “As I was working on *Super Cat Tales II*, I noticed more and more people were asking me for details about it. I eventually decided to publish some devlogs on YouTube, where I could update players about the development of my game.” To his surprise, views rapidly ramped up, in part simply from people searching for the game on YouTube.

The channel was subsequently updated weekly, in the hope of keeping new subscribers on board, and snaring yet more people who might be interested in *Super Cat Tales II* and Neutronized’s wider body of work. At the time of writing, the channel has over 30,000 subscribers – not bad for a solo indie developer.

“*Super Cat Tales II* has been going on for two years”

Pesaresi recommends doing something similar, if you have the means: “It’s a nice way to connect with players, keep them engaged, and get useful feedback.”

As for the future – the next ten years of Neutronized – Pesaresi remains cautious but keen. He notes the market is saturated, making it tough for even those with passion and skills to survive. For newcomers eager to make their mark, he recommends coming up with “sustainable game projects that won’t absorb too much time before they’re completed,” along with using other indies as reference points regarding game quality and business approaches.

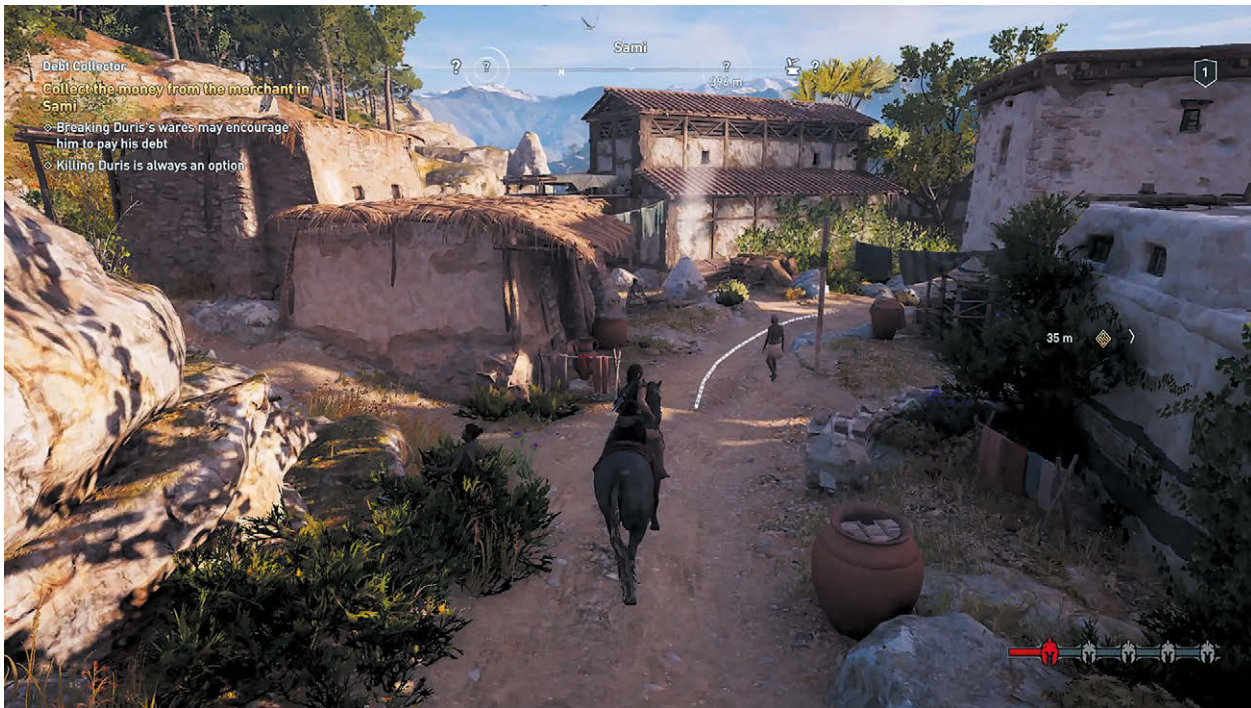
For Neutronized, though, it seems the place for simpler projects may remain those first ten years. Keen to further cement the growing community of *Super Cat Tales*, Pesaresi enthuses about “putting more care into my games” and taking on bigger challenges. “It’s funny to think that when I started, a browser game took a couple of months to complete,” he says. “Now, *Super Cat Tales II* has been going on for two years – and I’m still working on its finale! But then that’s my goal: to increase the popularity of *Super Cat Tales*. I’d really love to turn it into something big.”



ART ATTACK

When first creating pixel art, Pesaresi recommends not biting off more than you can chew: “Start simple, keep it polished, and improve little by little while having work by pixel artists you like to hand as reference.” Another good tip is to record and play back footage of your favourite pixel art games at slower speeds: “Then you can notice every detail, frame by frame, and work out how to achieve certain things – for example, particle effects, matching animations with movement, and playing with invisible frames and screen shake.”





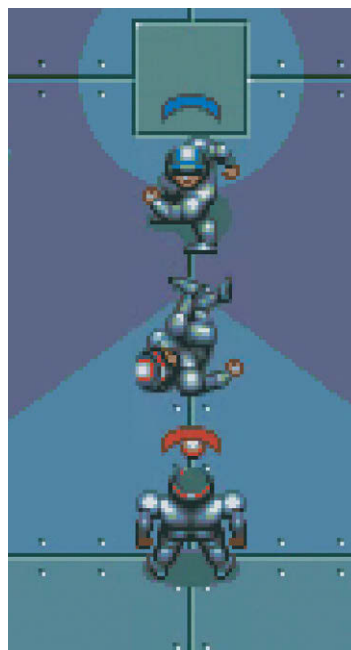
FIGHTING THE TIDE

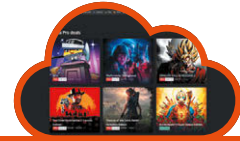
The streaming future is apparently here. Wireframe sits down with some offerings to find out: is the cloud-based future all it's cracked up to be?

WRITTEN BY IAN DRANSFIELD

Downloading games has been around longer than many of us think. It's the same with streaming: Google's Stadia isn't the first, not by a long shot. Nor is Sony's PlayStation Now. It's not even OnLive, much as it'd be nice to focus on that particular missed opportunity. No, it was tech from a Finnish company called G-cluster; set-top boxes released around 2010 and cloud-based gaming around Japan on mobile phones and via IPTV provider Hikari.

So game streaming isn't new – why talk about it now? Because it's reached the point where a bunch of the big-hitters are doing it. There are services out there backed by many millions of pounds, all clamouring for your hard-earned cash and telling you this is the future of all the games. It's Wireframe's civic duty, therefore, to sit down with a selection of these platforms and answer the two big questions: does it work, and is it worth it? Spoiler: yes, and maybe. 🐼





GOOGLE STADIA

Price: £8.99/month
(free version coming 2020)

Works on: Chrome, Chromecast Ultra, (some) smartphones

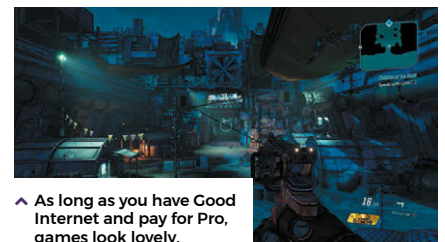


The absolute best compliment that can be thrown at the feet of Stadia, Google's attempt to make cloud gaming mainstream, is that I started playing *Borderlands 3* on it by accident. Genuinely. That's how easy it is to get something up and running once you're all set up. Trying to find out some info (HDR support, fact fans) led to the game launching in a few seconds after clicking on its logo. Idiot-proof stuff, this.

And that high quality mark – smart design, clarity, attractive branding – runs through a lot of what Stadia offers. This is an incredibly good service when it works, which it usually does, and is definitely a bar-raiser for game streaming. If you've got the Pro subscription and a minimum 35mbps connection you're looking at 4K, 60fps streaming with HDR on supported displays – however you look at it, that's impressive. Even on slower connections, the 1080p resolution doesn't look at all bad, and the convenience of the whole thing, with you just needing a Chromecast Ultra or even just the Chrome browser on your computer, makes Stadia genuinely exceptional in a few ways. This could well be the first major step towards a very different future of gaming. Except...

It's still early days – Google acknowledges this isn't Stadia's full public rollout yet, and at the time of writing it's still reliant on invites to get in unless you fork out £119 for the Founder's Edition. That's worth pointing out: it's still very much a beta, with features not working fully, or at all, for now. All the same, it is limited in some very silly ways – no wireless controller support for smartphones; no ability to download/save/share your screenshots, and videos short of a complete Google Takeout data export; there's no integration with Google Assistant or anything that was promised on stage in 2019, like sharing slices of games with others and such. It's just a limited selection of games you can play without dedicated hardware.

Then we get to the current killer: this is not Netflix for games. While that might have been believed briefly after Stadia's announcement, Google hasn't made a claim even close to that before or after launch. Your subscription bags you an ever-



▲ As long as you have Good Internet and pay for Pro, games look lovely.

changing selection of free games to add to your collection, but it's limited at best. *Destiny 2*? Sure. *Farming Sim*? Huh? And beyond the paltry offering for those paying just under a tenner a month, you have to buy the games you want to play. If you're used to the world of Steam, GoG, Epic, and sales, you're in for a rough ride here as prices – even

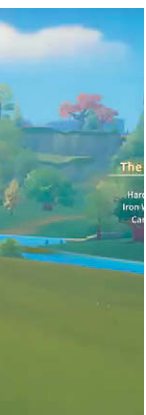
when discounted – are still very much on the high side. Given there are so few exclusives on Stadia, if you've picked up any PC games in the last few years, there's likely to be at least some crossover here, and the expectation that you'll drop £50 to buy something, again, that you already own, is a bit much to bear.

You need to pay for superfast broadband, an £8.99-a-month subscription, the £119 buy-in fee that comes with the Chromecast Ultra and controller (which is very good, bar a dodgy D-pad), then another £50 or so for a title like *Red Dead Redemption 2*. Add all that together, and you get a situation that feels far less worth it, hosted on a system that is lacking those extra special bells

and whistles that make it something memorable. Playing *Borderlands 3* by accident was near-revelatory, and the scale by which Stadia could grow is incredible. But right now, it's hard to recommend this as anything other than a fairly expensive curio. ➔

“It's still very much a beta, with features not working fully or at all for now”

RATING
6/10





Price: £8.99/month
(£7.67 3-month plan, £4.17 annual plan)

PLAYSTATION NOW

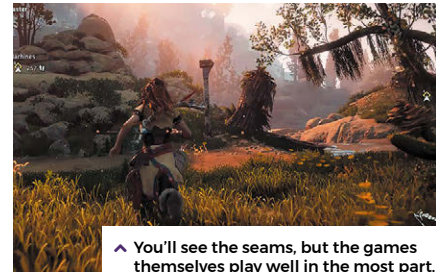
Works on: PS4, PC

The grandparent of this group is, somewhat surprisingly, Sony's own streaming service – PlayStation Now launched in the States in 2014, making it just over six years old. The offspring of the platform holder's acquisition of Gaikai, PS Now has been quietly trundling along, slightly tweaking itself along the way, until reaching its current form. And that is... well, half-decent, actually. Surprisingly so, come to think of it.

The thing with playing games on PS Now is that they don't look great. Sat next to something running on Stadia Pro, with its 4K resolution and HDR support, PS Now titles look positively *retro* by comparison. Washed out textures, muddied visuals – a generally lower-res look to things, when compared to their non-streamed versions. But the games work, and they work well: I wouldn't want to play *Ultra Street Fighter IV* at tournament level via PS Now, but the likes of *Dirt Rally* and other reaction-based titles proved responsive and playable even with the inevitable input lag from a streaming service like this. Honestly, it's hard to notice any, it's that well done.

You're not limited to playing on your PS4 console, with PS Now functionality added to the PC back in 2016 via a bespoke app. You can control things using a DualShock 4 or any other PC controller, though you miss out on touchpad features with the latter, and games are restricted to 720p. That's in keeping with the service as a whole, really – restrict the pretties to make sure it all functions at the core. That said, I did experience far more dropouts via the PC than I did on the PS4 itself, so there could be something untoward going on there.

Aside from those less-than-stellar visuals, what really holds PS Now back is its selection of games. It hits the right note in that you pay a subscription fee and that's it – you then have access to a pre-existing library. It's the fabled 'Netflix of games' (and has been for years). There are classics in there like *Horizon Zero Dawn*, the *God of War* series, and *Metal Gear Solid*. There's also *Alex Kidd in Miracle World*, oddly. Or you can play *Brink*, which



^ You'll see the seams, but the games themselves play well in the most part.

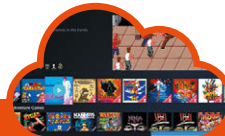
has literally zero players online at any one point. Curation would be welcome here, because while Sony might boast of hundreds of games being available, a fair few are utter tosh.

It's a mixed outing from PlayStation Now, but of the streaming services tested for these pages, it holds the best mix of good enough performance, decent pricing, and a strong library (there *is* chaff, but there's also *Resistance 3* and *The Last of Us*). Rather a rough diamond, but a diamond nonetheless.

RATING
7 / 10

ANTSTREAM

Price: £9.99/month
(£7.99 on annual plan)



Works on: PC, Mac, Android, Fire TV, Nvidia Shield

On paper, Antstream is brilliant: thousands of retro games from the likes of the Amiga, Spectrum, C64, Arcade, and Mega Drive; developers like Technos, SNK, and Data East on board; all playable through a frontend you can use on your computer, smartphone, and others. The problem is, it doesn't work perfectly, and the entire concept of retro games being streamed doesn't have legs. It's a real shame.

Getting up and running in Antstream is easy, the frontend is well designed and provides a dash of info on games, and it's a click or two to get into things. Challenges throw you into a save state

with a goal to achieve and are, by and large, very enjoyable. The problem is, regardless of how you're playing, it's never long until the signal degrades and games display visual glitches, slow down, and generally have issues you wouldn't expect of a platform focused on 30-ish-year-old titles.

There are inconsistencies, with some games offering save states and others, for some reason, not. While there are three input methods supported (controller/keyboard/touchscreen), there's no way to remap your controls, thus limiting accessibility. There's a strange related quirk, too: the insert credit button is mapped to start. This is also the *start button*. So if you press start, you add a credit. It stops you from having any sort of controlled credit run on a game like *Metal Slug*.

But that's nitpicking, there are bigger issues. Antstream works, and you can get lost in the nostalgia

of playing true classics. But then the screen gets hectic in *Speedball 2*, say, and there's slowdown, image distortion, buffering. You're right back out of it again. Considering some games are over 30 years old and the entire title can be a few kilobytes, it's galling to see the lag here. It's more complex than 'game is small, should be easy to do', but you can download these titles in full – often legally – in a fraction of a second. It renders the whole point of Antstream moot.

It's tough, as Antstream chimes very much with us. Retro is cool. The UK/EU scene doesn't get enough of a look in, so it's great to highlight the

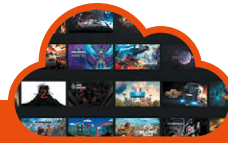
region's classics (and *Renegade III*). Challenges are brilliant. The platform itself is well designed. But a tenner a month to be able to play 30-year-old Mega Drive games that frequently lag on a 330mbps connection? There needs to be more to it than that.

RATING
4 / 10



GEFORCE NOW

Price: £7.49/month
(free version available)



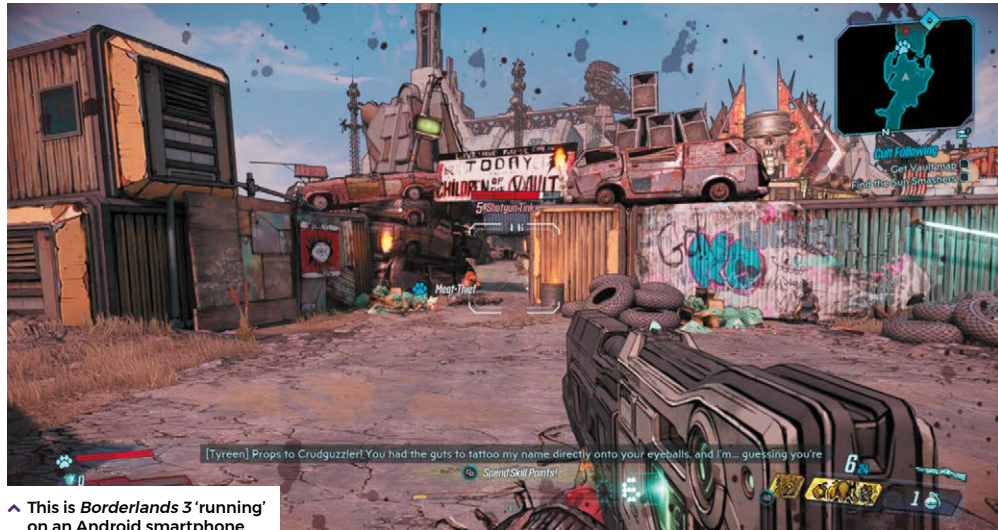
Works on: PC, Mac, Nvidia Shield, Android

Nvidia's GeForce Now has been running in one form or another since around 2015, but it wasn't until February 2020 that it launched in full to the world. This latest incarnation of the GPU manufacturer's game streaming service operates differently to the others, in that you don't pick from a list of games as a part of the service, but instead bring along your own titles to stream to systems that wouldn't otherwise be able to handle them. It works by linking you through Steam and Epic Games accounts – your own accounts, which you have to log in to – and playing through a virtual PC link via server. While it didn't result in me playing *Borderlands 3* by accident, it did result in me playing my game of it, using my own save, on my smartphone in the living room – and that's something to be impressed by.

Requirements to hit 1080p at 60 frames per second land around the 50mbps mark, but even with my speedy home connection there were plenty of hangs, enough stuttering to make something like *Fortnite* unplayable at busy times, and even the odd dropout (in *My Time at Portia*, for some reason). When GeForce Now works – which to be fair isn't exactly a rarity – it's more than acceptable. As long as you're not playing something incredibly new, with a lot going on on-screen, it's going to at the very least be playable.

The fact that you're playing *your* games and saves can carry between GeForce Now sessions and those on your home PC is a lovely little bonus, too, making things feel less disjointed and alien than they do on something like Stadia.

You *do* have to pay, though. You really do. There's a free tier, and when it does work, you get an hour playing a game at a decent visual spec before you're kicked off – a great feature, no



▲ This is *Borderlands 3* 'running' on an Android smartphone.

doubt. But the problems arise from the fact you have to queue, and at the time of writing it seems the queuing system is bugged – more than once I sat in a queue to play a game, working down from a place in the hundreds to the 'you're next!' spot, only to stay there for over an hour each time. Paying the subscription fee skips the queues (as well as adding RTX functionality and extending allowed playing time), so really – you *have* to pay.

GeForce Now's main problems right now are ones that are out of the company's hands, in the form of publishers removing their available titles from the platform (Activision, Bethesda), and another that really needs work: congestion. That latter aspect impacts the experience massively



through lag and game dropouts, as well as those gosh-darned eternal queues on the free version, resulting in something that's sometimes great, but just as often *not great*, and almost entirely

pointless as a free service. The bring-your-own system is a solid one, and though Nvidia's streaming solution is around five years old already, there's still room for it to grow into something better. For now, though, it's not quite there. ☹️

“GeForce Now is almost entirely pointless as a free service”

RATING
6/10

AND THEN...

There are others out there – like Shadow – but the biggest on the upcoming radar has to be Microsoft's xCloud, set to start rolling out later this year and currently in closed beta. There isn't much detail doing the rounds at the time of writing, but backed by Microsoft's formidable tech know-how and the Xbox's plethora of fantastic games (as well as the fact it looks to be entirely platform agnostic), there's real potential here. Tie it in with Game Pass Ultimate, and it could be game streaming's killer app. That is unless whatever Amazon's doing with streaming blows everything out of the water, of course.



Awards Script Jokebot 3000



STEVE MCNEIL

Steve might not get to work on telly with Dara anymore, but he can still write his jokes for him. That's showbiz.

"It's been such an odd year for gaming"

Despite literally having a piece in my recent stand-up show* called 'The top five jokes that got cut by Dara and/or BAFTA!', I've somehow been asked back to write Mr Ó Briain's script again for this year's Games Awards. Writing jokes for someone else is a strange thing at the best of times, but this year's going to be particularly tricky as it's been such an odd year for gaming.

As is tradition, with the latest consoles from Microsoft and Sony due to land at the end of the year, many big developers have been delaying and deferring their releases. What this means is that the light this year is being shone more brightly on games that, in a 'vintage' year, may have fallen by the wayside to more traditionally expected nominees.

Knights and Bikes, a Kickstarter-funded indie title from a team of developers behind titles like *Tearaway* and *LittleBigPlanet* (and *Wireframe*

#15 cover star), has managed four nominations, the same as the return-to-form behemoth, *Call of Duty: Modern Warfare*. The latest title from *Katamari Damacy* creator Keita Takahashi, *Wattam*, is a slight piece of kiddy-friendly fluff that, in this unusual line-up, sits comfortably alongside *Star Wars Jedi: Fallen Order* and *Apex Legends* (in fact, *Wattam* has grabbed one more nomination than either of those two).

Several other unusual indie games have also managed a couple of nods, titles like *Ape Out*, *Baba Is You*, and *Concrete Genie*. This is all wonderful news, but also hugely problematic. In years when there are just one or two curveball indie games, hacks like me can just write "Hahaha, look at this stupid game with a silly central conceit LOLZ", and take that money to the bank without having to do any proper research. This year, because all the generic identikit triple-A open-world titles have fallen by the wayside, I'm having to read about and, heaven forbid, play, loads of cool games. Woe is me. (I love my job, and I am very lucky.)

The one saving grace is that Google Stadia is in no way attached to the awards, so that should give us all plenty to laugh about, and if that won't quite do it, we can all have fun remembering that Nintendo have now hired a guy whose surname is Bowser. That's not laugh-out-loud-funny per se, but people love to show other people they understand jokes by making loud noises with their mouth, so it'll appear that people found it funny to anyone watching the ceremony live online and, in the end, isn't that the same?

Of course, I'm being a bit naive. All of this effort is for nothing. Dara'll turn up on the day, get paid far more than me, and then riff his way as quickly as possible away from what I've written for him, onto reliable material from his most recent tour instead. But that's only right and proper. It wasn't 'Steve McNeil's Go 8 Bit', after all. 🙄

▼ Steve, seen here performing jokes about jokes he wrote for someone else.



* Available now from wfmag.cc/Listen

Toolbox

The art, theory, and production of video games

28. CityCraft

Using urban functions in your games

30. Squeezing the NES

Fitting Super Robin Hood into just 64kB of NES memory

36. Quick tips

Simple tricks for making better games

38. Lessons from Telltale

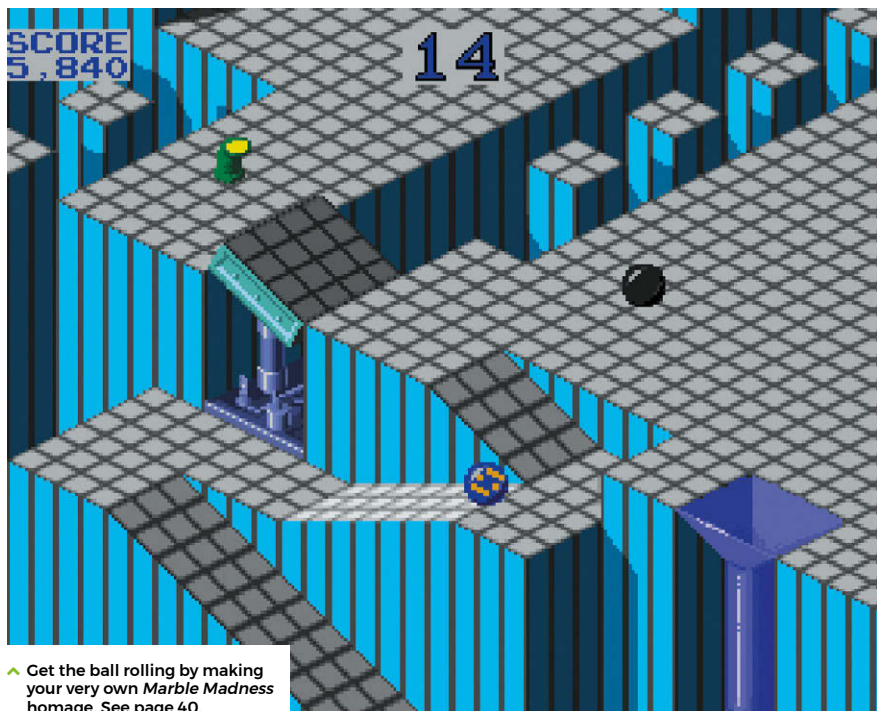
Storytelling in *The Walking Dead* and more besides

40. Source Code

Recreate the arcade classic, *Marble Madness*

42. Directory

An upcoming event for disabled gamers



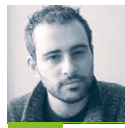
^ Get the ball rolling by making your very own *Marble Madness* homage. See page 40.



^ Uncover some of the storytelling techniques behind *The Walking Dead* and more on page 38.

Playing with urban functions

Mining towns, empty, futuristic metropolises – cities built around a single function can make for great video game locations



AUTHOR
KONSTANTINOS DIMOPOULOS

Konstantinos Dimopoulos is a game urbanist and designer, combining a PhD in urban planning with video games. He is the author of the forthcoming *Virtual Cities atlas*, designs game cities, and consults on their creation. game-cities.com



▲ The factory created – and completely dominated – the booming industrial cities of the 19th century.

A city's functions lie at the heart of its urban planning and geography. They describe both what a city does and what it needs to do in order to provide its residents with the absolute basics. Allowing the survival and enabling the political and economic activities of human societies, sheltering them from invaders or the elements, and occasionally ensuring that the status quo never changes are all common civic goals. Similarly, residence, social interaction, access to food and water, ideology, transportation, communication, production, consumption, reproduction, and governance are all key urban functions, and have been viewed as such throughout history.

Nothing is static, though. As humanity moves forward, and economic and political systems succeed each other, creating new needs and new problems, urban functions evolve,

get forgotten, or are replaced by others. In certain cases a function – new or old – grows to dominate whole towns and cities, shaping everything around it.

DOMINANT FUNCTIONS

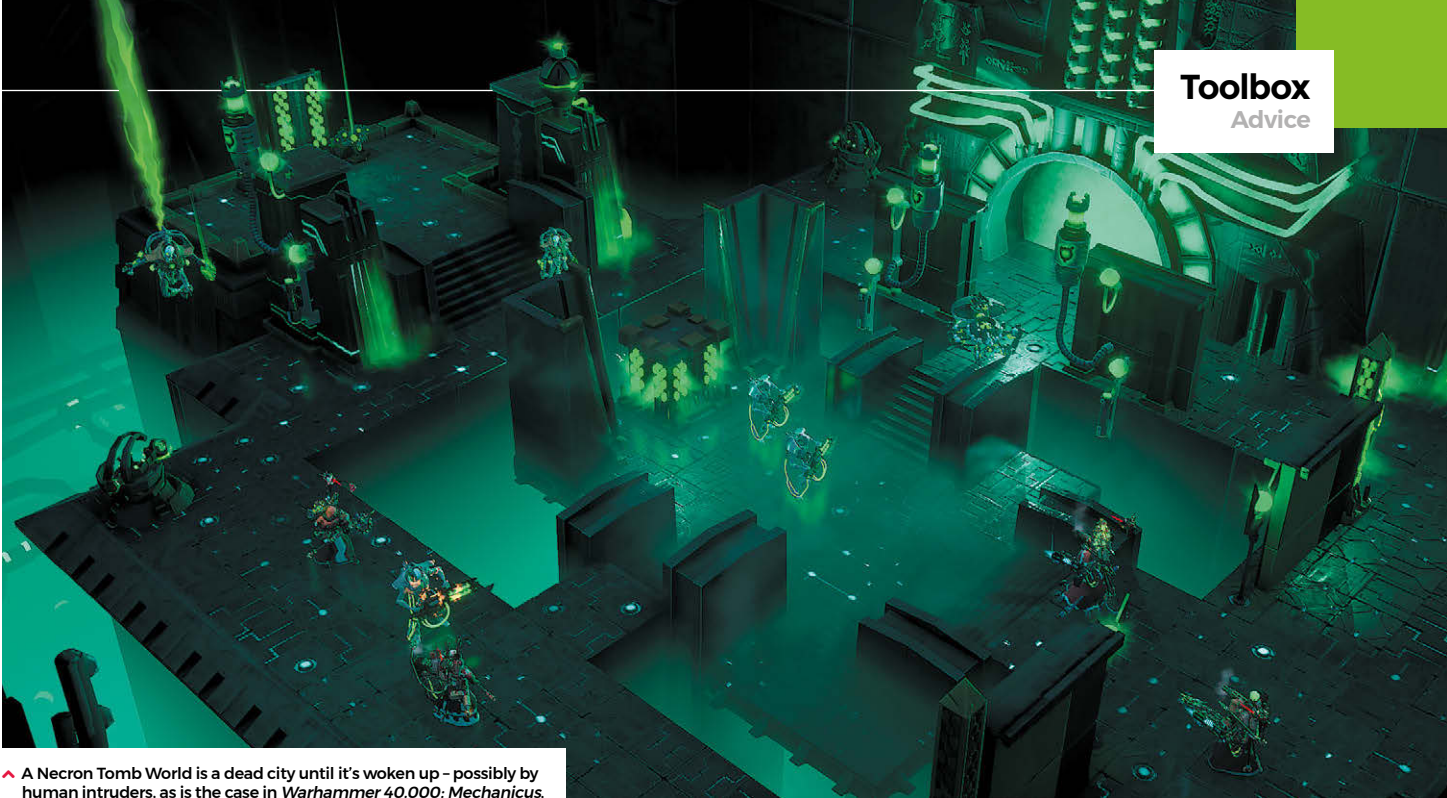
Think of a fishing village or a mining town. These are settlements focused almost exclusively on a specific type of production. Fishing or mining towns need supporting functions to ensure human survival – people still have to eat or have a drink at a tavern – but if the mines or the sea stopped providing, these places would quickly wither away. Everything is built around the main, dominant function.

Meanwhile, holy cities – say, Mecca or medieval Rome – are focused on a totally different type of function: publicly celebrating the glory of God, while welcoming pilgrims from across the world. Similarly, ancient Delphi in Greece was a settlement built around its oracle. Less spiritual, but equally easy to recognise thanks to their tall chimneys, dense housing, and smog, the industrial towns of the 19th century grew explosively (usually from tiny villages) around the revolutionary new function of capitalist production.

Other examples of urban centres dominated by a single function include fort cities at imperial borders, transportation hubs at railroad crossings, port towns, logging settlements, and meticulously planned, almost utopian cities designed to serve a population working at a major nuclear energy production facility; the Soviet city of Pripyat next to Chernobyl, for example. In prehistoric times, simply being next

▼ The human fields of *The Matrix* aren't really settlements, despite the density of people existing and (in a way) interacting close to each other.





▲ A Necron Tomb World is a dead city until it's woken up – possibly by human intruders, as is the case in *Warhammer 40,000: Mechanicus*.

to a river with potable water or fertile soil would be enough to give rise to a new settlement.

A dominant function influences most aspects of city life and spatial organisations, including architecture (the chimneys of industrial towns, the spires of holy cities), and local attitudes (superstitions, reactions to tourists). Fictional examples of a single function town include Tolkien's mines of Moria, once a stunning underground dwarf kingdom founded on the excavation of Mithril, and the *Babylon 5* space station – a multicultural, multispecies hub of diplomacy crucial for galactic peace. The *Resident Evil* franchise's Raccoon City, the Martian research facility in *Doom*, and *Frostpunk*'s post-apocalyptic cities are all great examples of settlements dominated by a single function in video games.

A MOTIONLESS CASE STUDY


A central function can provide a strong theme for a video game city, but it's more interesting to play with functions in more extreme, less realistic ways. What would a megacity focused on planetary defence look like? What if a long-dead town projected the illusion of activity? How would ant-like creatures organise their space, and how would a holy city with a living god at its centre function?

More difficult to design would be a city that does away with a core function, violating fundamental aspects of urbanism. Take away a city's ability to move things and people around, for instance, and you have an impossible-sounding place without transportation. Lacking

an element that defines urban environments, this would be a truly odd creation wherein even a simple crate of food couldn't be delivered to a hungry inhabitant. Such an agglomeration could serve as a fine starting point for crafting an otherworldly experience.

Another option could be to come up with a setting that's a city in name only: a futuristic, *Matrix*-like metropolis of comatose inhabitants would make for the perfect static city, and could serve as a handy storytelling device with its vast, dust-covered, life-preserving machines. Stationary robot arms would fix damage; windows and doors simply wouldn't be needed; the only light would come from tiny screens of indecipherable text.

Then again, how about a necropolis never meant to be disturbed yet mirroring the forms of the living? Such motionless places can be fun to play in, explore, and interact with, while also showcasing the point of thought experiments like this one.

But how could a motionless settlement really function? Would the lack of movement only apply to its residents, or would everything have to be stationary? As designers, it's up to us to make up the rules. And what if a city only seemed motionless because its traffic was relegated to some hidden level? What if all movement consisted of tiny robots ferrying things around? And what about telepathic beings of pure energy, or alien, super-smart fish, each living in its own bowl? Exploring ideas like these can lead to all kinds of unique locations and storytelling possibilities. 

“A city's functions lie at the heart of its urban planning”

▼ *Frostpunk* built both its evocative cities and strategic gameplay on a single dominant function: shelter from natural dangers.



Echoes of Civic Life

Dead cities, ruins, and extinct societies are more interesting when their previous function is still evident. Walking around an ancient forum, say, or roaming the steps of Machu Picchu feels more meaningful when we understand their purpose, or can deduce hints thereof. There's no reason why imaginary ruins shouldn't have this quality too: randomly arranged stones or walls are meaningless and often boring.

Squeezing the NES

How the Oliver Twins managed to fit Super Robin Hood onto a 64kB NES cartridge



AUTHOR
PHILIP AND ANDREW OLIVER

The Oliver Twins have been making games since the early eighties, and can now be found at their new consultancy firm, Game Dragons. gamedragons.com



We came late to the development of NES games, having decided to write *Fantastic Dizzy* in early 1990. We stayed longer on 8-bit computers than other developers, due to the success we were having with the *Simulator* and *Dizzy* series. We had a slick pipeline and tools, and could design and produce games quickly across the Spectrum and Amstrad, which then got ported to C64, Atari ST, and Amiga.

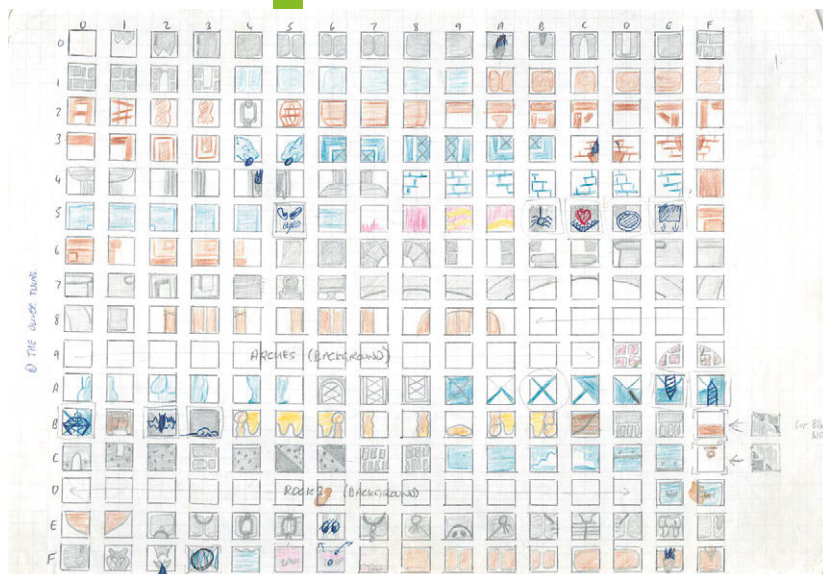
We'd resisted change because it meant we'd have to learn new computer architectures, 68000 assembler, then recode all our engine,

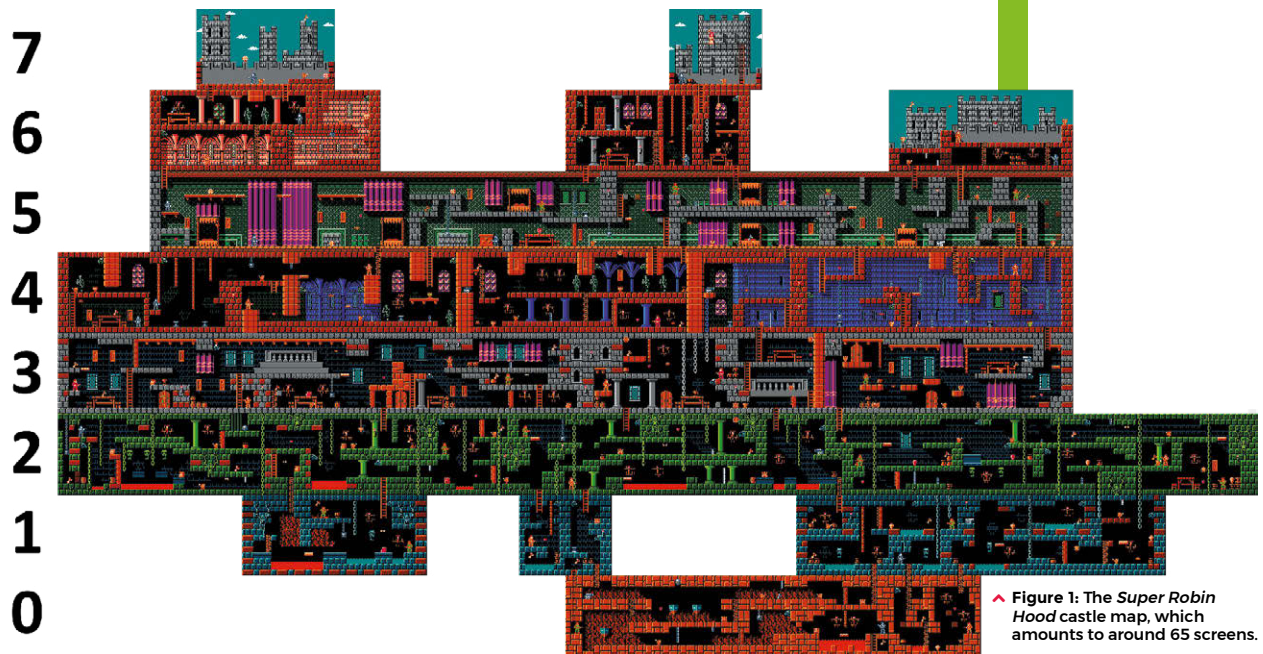
tools, and get hit with large bills for all the artwork and music. It would have been a massive investment of time and money, and we could see that many developers were struggling to make money on the ST and Amiga due to the high costs of development and the ease with which players were able to pirate the finished games.

When we visited the Consumer Electronics Show in January 1990, we saw the success Nintendo were having, that they had eliminated piracy and were selling games at high prices and in vast numbers. We looked at these games and were confident we could do something of similar quality – and in the same amount of development time – to our current titles: that is, about four to six weeks each. The NES was based on the 8-bit 6502 chip, which we already knew from the Commodore 64, and we knew we'd still be able to do a lot of the graphics ourselves if we needed to.

Our first game for the NES ended up being *Fantastic Dizzy*, released in 1991, which was a mash-up of ideas from our first three *Dizzy* titles in one large game, with a few other subgames added for maximum value. It took about nine months to write, and used an expensive 128kB cartridge. Codemasters had signed a distribution deal with Camerica in Canada to sell NES titles in the US and Canada; they needed a catalogue of games, so we needed to start producing them faster and cheaper. A lot of our time was spent on learning how the console worked and producing the toolchain, standard library routines, and the overall development environment.

▼ The Oliver Twins' sketches for *Super Robin Hood's* background graphics.





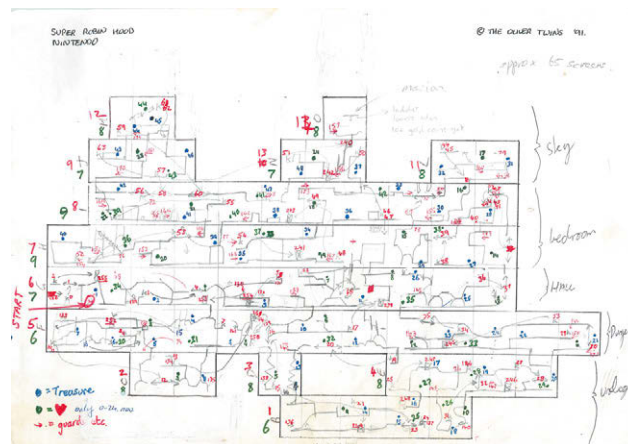
▲ Figure 1: The *Super Robin Hood* castle map, which amounts to around 65 screens.

Our development environment consisted of two 8086 PCs, both fitted with floppy drives and 20MB hard drives. These had PDS (Programmer Development System) cards installed, cabled to Codemasters NES Development Boards, that in turn were cabled to retail NES consoles. Each PC had a text editor and 6502 compiler. We'd back up and transfer data between the PCs via 5¼ inch floppy disks. The PCs had

“Our development environment consisted of two 8086 PCs”

monochrome monitors, while the NES consoles were connected to colour TVs – one was PAL and the other NTSC, to ensure compatibility with televisions in other parts of the world. In addition, we had an Amiga 500 with a colour monitor running Deluxe Paint III, a package we used for creating all the graphics. The whole set up cost almost £10,000. In today's money, that's around £20,000 – and as self-employed developers, we had to pay this up front and recoup the cost via royalties, so it was a huge investment.

For our second NES game, we decided to revisit the first title we made for Codemasters, *Super Robin Hood*, first released for the Amstrad CPC in 1985. The game had a fundamentally good concept and didn't need a huge story with lots of scripts and puzzles; it could make ➔



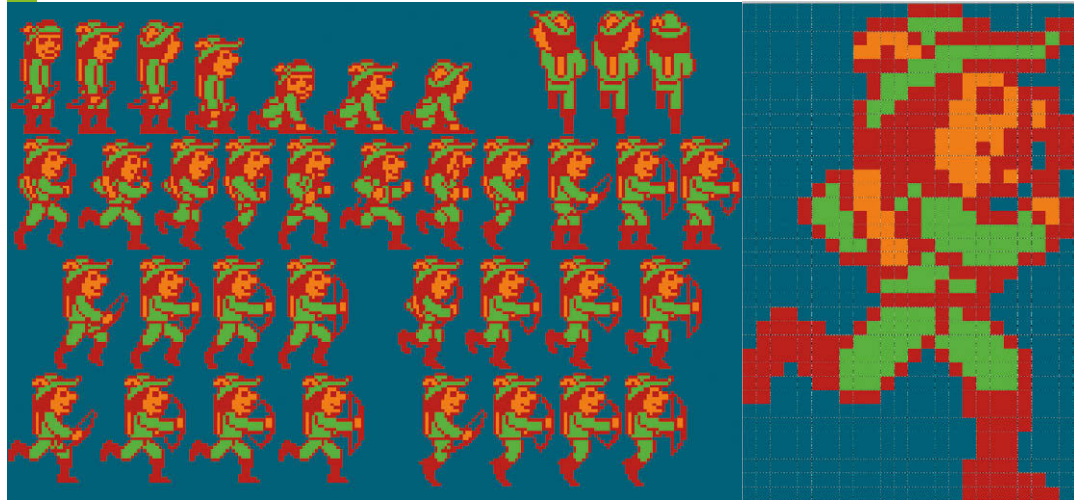
◀ An early sketch of the map, with the player's path and items carefully plotted out.



THE TITLE SCREEN

Once the overall game was complete, we saw how much memory was left and allocated this to the title screen. This picture only used about 400 unique characters, which took around 8kB memory, with the character map being 32 wide by 30 high, plus the colour palette colour information. We also used a trick so that halfway down the screen an interrupt swapped the Sprite Character set with the Background Character set.

► **Figure 2:** A few of Robin Hood's sprite animations. These were flipped when Robin Hood moved left.



INSIDE THE NES

First hitting Japan in 1983, the Nintendo Entertainment System was Nintendo's debut games console. Inside the grey box, there was a MOS 6502 CPU, similar to the Commodore 64. It contained just 2kB of onboard RAM; game cartridges could increase this, but doing so made them more expensive to produce. Cartridge sizes ranged from 8kB to 1MB, but 128kB to 384kB were the most common. There was an additional 2kB video RAM, 256 bytes of 'object attribute memory' to store the positions, colours, and tile indices of up to 64 8×8 pixel sprites on the screen, and 28 bytes to allow selection of background and sprite colours. The standard display resolution was 256 horizontal pixels by 240 vertical pixels, and could display up to 24 colours at once from a palette of 52. The NES could display 32 × 30 background characters with up to 64 overlaid sprites. The graphics for the characters were held in the game cartridge, either fixed in ROM or reprogrammable in more expensive RAM.

good use of a set of solid routines and game mechanics developed for *Dizzy*, and we'd be able to produce it much faster and for a cheaper 64kB cartridge. We also relished the idea of making scrolling levels, as they'd feel so much nicer than the original, flick-screen game.

THE GAME

Super Robin Hood was a typical platformer, but its English folklore theme meant we had a built-in plot (Robin rescuing Maid Marion) and a great projectile weapon: a bow and arrow was much better for an 8-bit game than a gun, since the arrows can move slowly and are more visible as a result. When the enemies use these, it also makes sense in terms of gameplay, since there's time for the player to dodge the arrows. (Bows and arrows don't tend to attract the negative political baggage that guns tend to come with, either.)

The game was set in a medieval castle filled with guards and other obstacles to navigate. The adventure element was made more interesting by the inclusion of keys to open new routes, ensuring it wasn't a linear game, and took some memory and navigation to work out the best routes. The castle itself was a side-on maze, with each floor distinguished by its own theme: the lowest floor consisted of chain-lined dungeons and rocky walls, and as you rose up through the floors, you passed through feast halls, living rooms, bedchambers, and ultimately the ramparted roofline and towers, where Maid Marion awaited rescue.

TECHNICAL DESIGN

The game was written to fit on a 64kB ROM cartridge, which also had 8kB RAM for redefining

the background character and sprite graphics. To put that in perspective, *Super Mario Bros.* was a 40kB cartridge: 32kB for the game and data, with 8kB ROM for the background and sprite character sets.

The NES's architecture forces some great memory-saving restrictions. First, it allows up to 256 four colour, 8×8 pixel characters for the backgrounds, and 256 characters for sprites. Each character set adds up to just 4kB in total, which is really efficient on memory – by contrast, a single iPhone App Icon amounts to about 43kB (120×120 pixels in 24-bit colour).

When printing a background character, the NES also uses different predefined palettes – 48 in total. We typically chose black for the background, and then three shades of a colour for each of the palettes. The background was character mapped (32 × 30 characters) and also had the ability to scroll – which kind of made us wish we'd had a C64 back in the day, as this is such a powerful feature.

CASTLE BACKGROUNDS

When the player started the game, the background level graphics needed to be transferred into the background character set. We could load in different graphic sets from the main game ROM, which was great for changing background level graphics between floors. We decided on eight floors in the castle, but only three unique background character sets, as we had a couple of floors that used similar environment styles and used colour palette changes to make them look more varied:

Floors 0, 1, and 2 – Dungeons – all used the same character set.



^ *Super Robin Hood* saved memory by reusing some background sprites with different colour palettes, like the stone blocks you can see here.

Floors 3, 4, and 5 – Halls and Bedrooms – share the same character set.

Floors 6, 7, and 8 – Ramparts, End Screen, Font – all in the third character set.

With each background character set taking 4kB, this amounted to 12kB for all background graphics. The rippling lava in the deepest parts of the dungeons was achieved by redefining the lava character between a set of different characters, each with ripples in different positions, rather than changing the characters on the screen.

The background maps for all the levels took a large chunk of memory by themselves. The full castle map took up around 65 screens (see **Figure 1**). With each screen being 32 characters wide and 30 characters high, this translated into 62kB of memory if it wasn't optimised or compressed in some way. We started by mapping everything with 256 unique 2x2 character blocks, reducing this to almost a quarter. In fact, the map only had to be 14 blocks high, as TVs used to lose a little around the edges and you could set edge characters to black, creating a slight black border top and bottom. This meant the map data took 14.5kB of the ROM (65 screens x 16 vertical strips x 14 blocks per strip).

FOREGROUND GRAPHICS

Hardware sprites were similar to background characters, except colour 0 in each palette was always transparent, and you could display up to 64 sprites anywhere on the screen simultaneously. These would display on top of the background without taking up any

processing power – this was a big step up from pixel-mapped computers like the BBC, Spectrum, and Amstrad, where displaying sprites took most of the available processor time. The sprite graphics were largely taken up by Robin Hood's animations – all the guards and other enemies were static, so they only took up 4kB of memory.

The NES's hardware did come with one minor restriction: it couldn't display more than eight sprites on a single horizontal raster line. We did our best to design around this restriction by alternating the order we displayed the sprites – this meant that, when more than eight sprites needed to be displayed on a line, you'd see some flickering of the first and last sprites. In *Super Robin Hood*, this led to some

arrows flickering as they approached Robin. We did our best to position guards and other enemies on different levels to reduce this. Vertical adversaries like

spiders and chains with spiked balls used lots of sprites; these were in vertical lines and so didn't cause such issues, but it was challenging coming up with lots of vertically based threats that made for good gameplay.

The Robin Hood animation should have used around 12 sprites (typically 3 characters wide by 4 deep) per frame, and there were 74 frames of animation, which without optimisation would have required a whopping total of 888 characters. Obviously, we didn't use this amount; to reduce it, we developed a special tool that helped locate duplicate characters, allowing us to move the sprites to create blanks, and look for opportunities to mirror existing characters – for when Robin Hood was moving left and ➔



TECH NOIR

Fun fact: The Apple II, which used the Motorola 6502 processor, was featured in James Cameron's 1984 film, *The Terminator*. It clearly shows that Arnold Schwarzenegger's T-101 ran on 6502 code, taken from the Apple II manual.



^ Due to licensing disputes with Nintendo, *Super Robin Hood* didn't emerge until 1993, on the *Quattro Adventure* four-in-one cartridge.



Super Robin Hood's sprite set, which largely comprised Robin Hood's animations. The rest was given over to assorted enemies, barrels, and other objects.

Figure 3: The Super Robin Hood cartridge's memory map.

| Memory Type | Address Range | Size | Contents |
|-------------|---------------|------|--|
| ROM | \$C000 | 16k | DUNGEONS Bank Switching Memory Top 16k Can switch Sprite Char Set [4k] Background char sets level data Music track data DATA BANK B |
| | \$A000 | 16k | HALLS & BEDROOMS Each Bank Contains 2 Background Char Sets [4k] 585* Strips of Map Data ~36 Screens [8k] Indexed in 256, so 2-3 strips Music Track Data DATA BANK C |
| ROM | \$8000 | 16k | RAMPARTS & FONT Contains Background char set 2 level strips Title & End Screen Data Char set for Title & Font Music Track Data DATA BANK D |
| | \$0000 | 16k | Object Data Positions and timings of Guards, spiders, mace etc All Program Code 8k Stays permanent DATA BANK A |
| SRAM (VRAM) | \$6000 | 8k | Screen Character Map |
| SRAM (VRAM) | \$4020 | 2k | Expansion RAM Space [on cartridge] Character Set Data [4k] Sprite Set Data [4k] |
| | \$4000 | 2k | 32 I/O Registers |
| | \$2008 | 8k | Not Usable |
| | \$2000 | 8k | 8 I/O Registers |
| RAM | \$0800 | 8k | Mirrors \$0000-\$07FF (Not Usable) |
| | \$0300 | 3k | Usable RAM (1280 Bytes) |
| | \$0200 | 2k | Sprite Positions |
| | \$0100 | 1k | Stack |
| | \$0000 | 1k | Zero Page |

right, say. This was another of the NES's great hardware features. By doing this, we were able to create all 74 frames of animation from just 120 unique sprite characters (see Figure 2).

AUDIO

The music and sound effects were developed by Allister Brimble to meet the brief we delivered. We weren't musicians, and always outsourced all our audio. The music driver was written by Gavin Raeburn, and was the driver we used on all our Codemasters NES games. There were ten soundtracks and around 20 sound effects. Altogether, the data and code took only 4kB.

BANK SWITCHING

The ROM size of *Super Robin Hood* was 64kB, which seems like the obvious convenient 'addressable' size of memory given that two 8-bit registers (16-bit addressing) can index memory up to 64kB.

The console reserves the first 32kB for its local RAM for variables, character data, and screen memory, but, this is *not* 32kB of usable memory

(see the memory map in Figure 3). The 64kB cartridge ROM is split into four banks of 16kB each; the first remains permanently mapped at \$8000. Banks B, C, and D can switch, but are only accessible when resident at \$C000.

PROGRAMMING

The NES used the 8-bit 6502 chipset, which predates the Z80 chipset from the ZX Spectrum and Amstrad. It only has 56 instructions, and when you remove the useless ones like BCD (Binary Coded Decimal), it leaves less than 50 instructions and feels far more limited than the Z80. Fundamentally, you have three registers:

A (main Accumulator)

X & Y (for indexing and arithmetic).

S (stack pointer – note it's only 8-bit, which means you can't nest routines too deeply)

P (Processor status – a set of flags).

8 bits = 1 Byte = 0–255 number possible. In HEX, this is \$00–\$FF.

The processor makes good use of 'paging' its memory. That is, you have a total addressable memory up to 64kB using 16-bit addressing (two bytes combined – high and low). But if you use a high byte to address each 'page' (256 bytes) then you can index into the next 255 bytes, only using the 8-bit X or Y registers.

RESERVED PAGES

#00 'Zero Page': General variable workspace. Anything here only uses 1-byte indexing, which is shorter and faster. We put *all* variables for the entire game in these 256 bytes. Remember, since the game is stored on a cartridge, it's entirely ROM (Read Only Memory).

#01 'Stack': The 'S' register stores 2-byte addressed 'return locations' here, when it enters subroutines.

A simple piece of code will look like this:

```

Add7to16bitVariable ; Routine Label
    CLC ; Clear the Carry flag.
    LDA $23 ; Load Accumulator, getting
the low byte of a variable in Zero Page
[usually given a name]
    ADC #$07 ; Add a Constant 7, carry will
be set if result > 255 # Means Number, $
means HEX
    STA $23 ; Store Accumulator - saving
    
```



^ The score was placed high on the screen so as to avoid a clash with other sprites on the same horizontal line.

```

the low byte
LDA $24 ; Load Accumulator - getting
the high byte
ADC #$00 ; Add with Carry - adding zero
to add any carry that might have been set
above
STA $24 ; Store Accumulator - saving
the high byte
    
```

You can also see a longer code snippet in **Figure 4**. With such basic instructions, each piece of code might look long-winded at first glance. Bear in mind though, that most lines of code only take up one or two bytes, so while it looks long, it takes up very little memory. If you're interested in learning more about 6502

“The NES used the 8-bit 6502 chipset, which predates the ZX Spectrum and Amstrad”

assembly, you can find more information at wfmag.cc/6502, and you can even take a look through *Super Robin Hood's* complete source code at wfmag.cc/wfmag34.

RELEASE

Sadly, *Super Robin Hood* was released over a year late, and amid some thorny distribution issues – essentially, Codemasters didn't have official Nintendo approval for publishing games on the NES. Eventually, *Super Robin Hood* was sold as part of a collection of games called *Quattro Adventures*, released in 1993, and it didn't sell very well or earn us much money as a result. Still, we were proud of what we created, and hired some developers to convert the game to the Atari ST and Commodore Amiga, and even to

the ZX Spectrum and Amstrad CPCs, where it was retitled *Robin Hood: Legend Quest*.

Writing code in 6502, on the NES in such small amounts of memory was a challenge, but also hugely satisfying. We're still proud of the final game to this day; it was a fine example of elegant design, code, and art all coming together beautifully to create a fun, slick adventure. 🎮

✓ **Figure 4:** The entire code base of *Super Robin Hood* is 8kB. Instructions vary between 1-3 bytes. So, assuming an average of 2 bytes, this means there are around 4000 lines of code and it really does look like code, which is how the publisher got its name: Codemasters.

```

;Instructions and registers in CAPITALS
;
; findblock
; STX temp ; store X register to 'temp' variable
; LSR temp ; all these Logical Shift Rights & Rotate Rights
; ROR temp ; to divide 16bit number by 16!
; LSR temp
; ROR temp
; LSR temp
; ROR temp
; LSR temp
; ROR temp
; ROL temp1 ;X*strip x
; LDR mappointer ;which chr
; ADD times14tablelo,X
; STA address
; LDR mappointer+1
; ADC times14tablehi,X
; STA address+1
; TYA ;transfer Y to A
; LSR ;Logical Shift Right - Assumes A unless X or Y in acronyma
; LSR
; LSR
; TRY
; ROL temp
; LDR (address),Y ;gets block num
; STA blockfound
; STX blockxx
; STY blockyy
; JSR checkchangedblock; Jump Subroutine Relative. - uses 8 bit address offset
; LDA blockfound
; RTS
;
; ;With only 3 registers there's always a lot of shuffling to maintain registers
;
; ;16 Map blocks can change. Things like doors remaining open
; ;uses 64 Bytes of the valuable 2K Ram!!!
; changedblocksmap DEFB 0,0,0,0,0,0,0,0, ; (16) ;Define Byte(s)
; changedblocksx DEFB 0,0,0,0,0,0,0,0, ; (16)
; changedblocksy DEFB 0,0,0,0,0,0,0,0, ; (16)
; changedblocksnw DEFB 0,0,0,0,0,0,0,0, ; (16)
;
; checkchangedblock ;given X,Y coords changes blockfound if it is in change table
; LDX changedblockspointer ;increments each time a block is changed
; BEQ 12
; LDR currentmap
; CMP changedblocksmap,X
; BNE 12
; LDR blockxx
; CMP changedblocksx,X
; BNE 12
; LDR blockyy
; CMP changedblocksy,X
; BNE 12
; LDR changedblocksnw,X
; STA blockfound
; LDX blockxx
; RTS
;
; 12 ;Return from subroutine
; DEX ;Decrement X
; BNE 11 ;works backwards through the list of changed blocks
; LDX blockxx
; RTS
;
; ;on reflection this method does mean the routine gets slower
; ;the further you get through the game,
; ;a bad problem, but never actually caused any slowdown.
    
```



Always design your game character first, and then build the world around them.



AUTHOR
STEVEN GOODWIN

Steven Goodwin is a veteran of over 20 years, having worked as a game developer, author, and general-purpose computer geek. He is currently experimenting with his own VR engine, and can be found lurking at MarquisdeGeek.com

Quick tips for making better games

Making games isn't just about having more time or people: it's also about finding ways to best apply your resources

Better games are not simply 'faster', or have 'more graphics'. They present a coherent game world where the player will never say "Why did that happen?", "That looks unfinished", or "That's out of place."

OUT OF SIGHT

Improving a game is more about what the player doesn't notice than what they do. Every game should set the mood before the first bug-eyed monster is killed, through the visuals and soundtrack of the title and menu screens. For example, which of these two fonts looks like a horror game?

Using a basic sans font

Haunted House

Using 'Halloween Thin'

HAUNTED HOUSE

Maintain consistency by using the font throughout, and ensure you hold that mood by getting into the game with, at most, two clicks. Consign any credits, advertising, and unnecessary tutorials to a submenu.

Still with visuals, consider the look of the interface itself. A button should not be just a square box with the word 'OK' in it. Ask yourself: If this interface existed in the game world, what would it look like? What sound does the button make when you press it in? When you let go? Create custom visuals to go along with each state of 'in', 'out', and 'hover.'

This brings us nicely onto the law of 'cause and effect'. When you walk and your foot hits the floor there is a sound, so you should include it in the game, even if it's not visible on-screen. If a box is dropped onto the floor, it too should make a sound. This was something noted by Hollywood sound designer Jack Foley, and applies equally well to games. Frequently occurring sounds, like footsteps, must have variations to make them sound more natural and less machine-like.

Furthermore, if you're able to walk on different surface types, such as carpet, concrete, or gravel, you then need a different set of footstep sounds for each. If you have a shooting game, then you will need a different gunshot sound, and muzzle flash



graphic, for each gun. But furthermore, you will also need unique ricochet sounds for each type of surface it hits. And decals for the bullet holes. And sounds for the shell casings when they hit the floor (for each different type of floor!).

CAUSE AND EFFECT

As a general rule, try to make all parts of the game as data-driven as possible so other people can help out in the final stages of development to fix spelling errors, improve the menu layout, or even translate the text into other languages. Load each game level from its own file. Read the button text for each menu from a file, and use another file to describe how those buttons are laid out. Then, yet another to describe how you navigate between those menus.

Having spent quality time building a good UI system outside of the game, strive to remove as much of it as possible from inside the game. If you can remove a bullet count from the interface, and make it a natural part of the world, you have made an improvement because every on-screen element which isn't part of the game detracts from the gameplay. The player, after all, wants to see the game action, and not spend time being distracted by the spreadsheet of numbers in the UI depicting time, health, bullets, or some other such parameter. You can easily replace the numbers with graphical bars, which change colour when they change, or flash when reaching critical levels, since there is more information in knowing your health is low than the specificity of whether it's at two or three percent.

When you have to resort to using words, make them good words! A war game would never (and should never!) describe your progress as 'Level 1' or 'Level 2'. Why? Because they don't describe the world. However, by simply changing the text



to 'Private', 'Corporal', and 'Sergeant', it creates an instantly more immersive experience.

If sentences are dynamically generated then ensure they are grammatically correct. Mixing 'a' and 'an' is a common mistake, as is writing '1 points'. So isolate that logic like this:

```
getText(points, "You have %d point", "You have %d points");

function getText(count, singular, plural) {
    var text = (count === 1) ? singular :
    plural;
    return text.replace("%d", count);
}
```

The first level is the most crucial because it's the only one that your players are guaranteed to see. So finish it last to ensure it doesn't look dated, and make it impossible to lose so players are encouraged to continue!

“Improving a game is more about what the player doesn't notice than what they do”

This – and every – level should contain non-threatening sections where each new enemy, or control system feature, are introduced one at a time so the player is never overwhelmed and learns about the game organically by 'doing'. This is better than forcing the player to go through a specially created tutorial level, which almost always bores the player with something little more than a memory test.

Finally, be disciplined in what you decide to add or change. Even if you think a code change 'will only take an hour', you have still failed to consider the time to build, test, and polish it. And if there are just 100 things like that, then you have just added two weeks to your schedule. Follow these quick and easy tips, and you'll be on the right track – and saving time – in no time. ☺

▲ You can demonstrate the state of armour without using a number.



▲ *Dead Space* is the gold standard for HUD-less design, and something to draw real inspiration from.

Telltale's explorable spaces

From *The Walking Dead* to *Guardians of the Galaxy*, John revisits the evolution of Telltale's 'freewalk' sections



AUTHOR
JOHN MAULDIN

John is a writer and programmer with a passion for interactive narrative and story-driven design, having worked on games like *Fables: The Wolf Among Us*, *Tales from the Borderlands*, and *Guardians of the Galaxy: The Telltale Series*.

Telltale reinvigorated the ageing point-and-click adventure genre by simplifying and expanding on its mechanics and marrying them to dramatic, branching, episodic narratives. The end goal was to better plug its players into what was the most fun and engaging for them: their stories. One of the most fascinating parts of working at Telltale over the years, though, was getting to see how they evolved one of the genre's oldest mainstays – exploration, or, the 'adventure' part of the point-and-click adventure.

In Telltale terms, we called these sections 'freewalks', because we were giving our players free rein to move their characters around. In classic point-and-click games, these were sections where puzzles lived, and advancing

the story often meant exploring a scene and dissecting the set-piece's elements. What became a constant push at Telltale over the years, though, was to learn from movies and television. Scenes became more tightly focused, and systems like inventories were scrapped in order to keep the player closer to the plot.

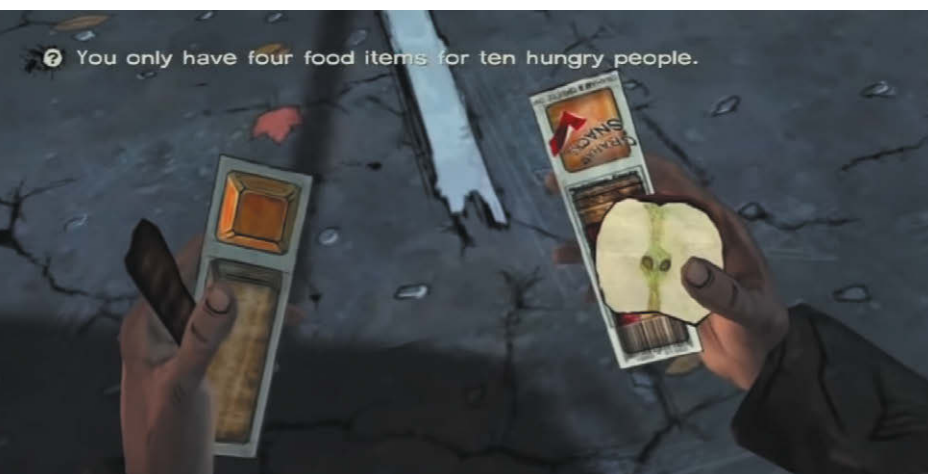
This balancing act of staging, interaction, and narrative intent are well worth examining as one long conversation about how to effectively fill an explorable space. So, here's a quick close-up on a few of the memorable freewalk sections that have stuck with me after all these years.

SCARED IS HARD, HUNGRY'S HEAVY

In episode two of *The Walking Dead*, *Starved For Help*, the game takes a slight departure from the nightmare-fuelled action of previous scenes to give players a different taste of our characters' reality. Having secured themselves at an abandoned motel, our caravan is running low on food. Instead of timers, fail states, and immediate danger, however, we're safe to explore our surroundings at our own pace. This feels like a much-needed breather, and we actually have the chance to talk with everyone, in any order, before moving forward. This is partly because the point of this scene isn't about 'winning', but having more time and freedom to absorb the weight of the current situation.

As it turns out, our player only has four food items with which to feed ten hungry people (see **Figure 1**), which is made clear at the beginning of our scene, but not truly felt until the scene plays out. It feels and plays slowly, like a classic,

▼ **Figure 1:** As Telltale evolved, inventory systems were relied on less and less because they became a barrier to entry for new players. That didn't stop us from developing mechanics that were only used for one particular scene.





▲ Telltale's first episodic outing was *Sam & Max Save the World* in 2006, and there would be six years, and 14 games, before making *The Walking Dead* in 2012.

open-ended adventure scene, but it's grounded by a one-off mechanic to make the scene feel more special.

Our mechanic takes less than a second to explain, and we don't even have to worry about who likes what kind of food. It's a simple-to-understand task that, at first, makes the time and safety we have to catch up with our party members feel like a gift, until we realise there's no way to 'win', and help everyone. This is a clear case of the 'weight' of our scene mattering more than completing a puzzle; the stakes aren't life or death, but about how the rest of the caravan members will 'remember' you going forward.

“We were giving our players free rein to move around”

END ON THE PIG

Faith, episode one of *Fables: The Wolf Among Us*, actually has one of the shortest scenes in the whole game, but this is also what makes it flow so beautifully. In this scene, we're seeing the small space Bigby (the sheriff) lives in, but the big reveal is seeing who he's sharing it with, and our players getting to talk with the character Colin (the pig). In the original layout for this scene, however, there were actually more cameras and objects to interact with. But as short as it was, there were still multiple cuts made to the scene – specifically, to the number of camera shots.

In the end, things are tightly framed to give the scene an almost staged, linear flow. We start inside the kitchen, head out, around the corner, and towards a chair where our player finds – what else – but a fairytale pig, fast asleep. And what everyone realised about this scene was, once the pig is on camera, there's nothing more interesting in the scene, so why encourage backtracking, or going anywhere else but forward? In the end, we decided to let the scene get to its most interesting point as quickly as we could, and called it a day.

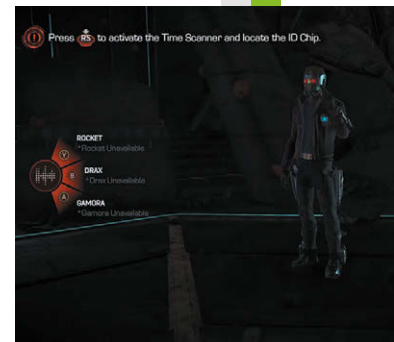
THROWING EVERYTHING AT THE WALL

These are moments where I think Telltale became more focused and streamlined in its approach to freewalks. My final example, meanwhile, comes from *Guardians of the Galaxy: The Telltale Series*, and, in this particular case, the lesson we learned was to throw everything at the wall.

Unlike other franchises where mechanics were stripped out in order to keep the player focused, *Guardians of the Galaxy* was a case where one of its characters, Peter Quill, had powers that the team felt would be fun to try to realise within our world as best we could.

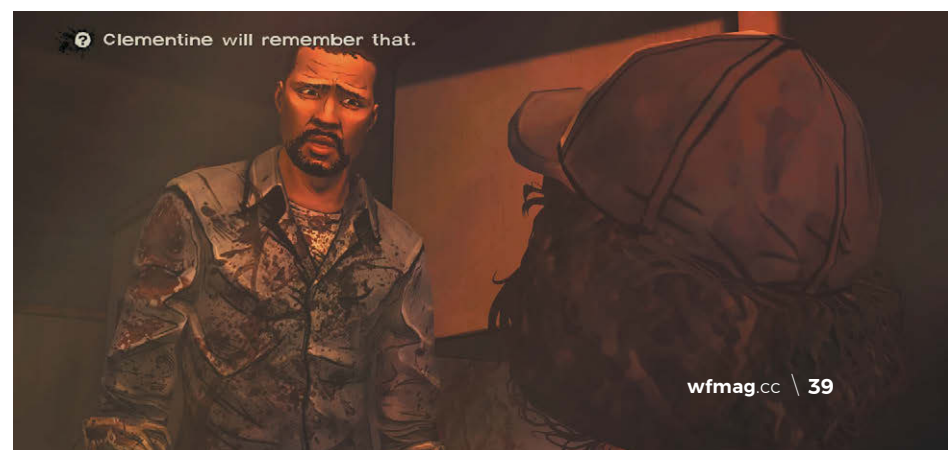
This meant expanding and stretching the limits of our freewalks by adding in three entirely new mechanics just for *Guardians* (see **Figure 2**), each of which had to play well with one another, and work simultaneously together, because we wanted our player to feel connected to their teammates, and to have some futuristic gadgets at their fingertips the way Peter Quill would in the comics and movies.

Not every game could support such full and expansive mechanics as *Guardians of the Galaxy*, but our aim was to always make these freewalk moments – whether they involved starving survivors or slumbering pigs – as focused and as memorable as we possibly could. 🗣️



▲ **Figure 2:** In *Guardians of the Galaxy*, we tried to deepen our freewalks by adding jet boots, a comms link, and a Pulse Scanner.

▼ **“So-and-so will remember that”** was a visual mechanic Telltale created to continually remind the player that they were an integral part of – and having an active effect on – the ongoing narrative.



🗣️ Clementine will remember that.

SCORE
5,840

14



- ^ Each of the six levels got progressively harder to navigate and had to be completed within a time limit.
- v Although the designer was against it, Atari wanted the marbles to have smiley faces on them. The idea didn't make it to the game but is reflected in the game logo.



Source Code

Code a homage to Marble Madness

Code the map and movement basics of the innovative marble-rolling arcade game



AUTHOR
MARK VANSTONE

Hitting arcades in 1984, Atari's *Marble Madness* presented a rather different control mechanism than other games of the time. The original arcade cabinet provided players with a trackball controller rather than a conventional joystick, and the aim was to guide a marble through a three-dimensional course in the fastest possible time. This meant that a player could change the angle and speed of the marble as it rolled and avoid various obstacles and baddies.

During development, designer Mark Cerny had to shelve numerous ideas for *Marble Madness*, since the hardware just wasn't able to achieve the level of detail and interaction he wanted. The groundbreaking 3D display was one idea that made it through to the finished game: its pre-rendered, ray-traced isometric levels.

Marble Madness was the first game to use Atari's System 1 upgradeable hardware

platform, and also boasted the first use of an FM sound chip produced by Yamaha to create its distinctive stereo music. The game was popular in arcades to start with, but interest appeared to drop off after a few months – something Cerny attributed to the fact that the game didn't take long to play.

“The ball physics are calculated from the grey-shaded heightmap”

Marble Madness's popularity endured in the home market, though, with ports made for most computers and consoles of the time – although inevitably, most of these didn't support the original's trackball controls.

For our version of *Marble Madness*, we're going to use a combination of a rendered background and a heightmap in Pygame Zero, and write some simple physics code to simulate the marble rolling over the terrain's

flats and slopes. We can produce the background graphic using a 3D modelling program such as Blender. The camera needs to be set to Orthographic to get the forced perspective look we're after. The angle of the camera is also important, in that we need an X rotation of 54.7 degrees and a Y rotation of 45 degrees to get the lines of the terrain correct. The heightmap can be derived from an overhead view of the terrain, but you'll probably want to draw the heights of the blocks in a drawing package such as GIMP to give you precise colour values on the map.

The ball rolling physics are calculated from the grey-shaded heightmap graphic. We've left a debug mode in the code; by changing the debug variable to **True**, you can see how the marble moves over the terrain from the overhead viewpoint of the heightmap. The player can move the marble left and right with the arrow keys – on a level surface it will gradually slow down if no keys are pressed. If the marble is on a gradient



Rolling marbles in Python

To get Mark's code running on your system, you'll need to install Pygame Zero – all instructions are at wfmag.cc/pgzero.

```
# Marble Madness
from pygame import image

HEIGHT = 570
WIDTH = 600
gameState = 0
marble = Actor('marble', center=(300, 45))
marbleh = Actor('marbleh', center=(300, 60))
marble.dir = marble.speed = 0
heightmap = image.load('images/height45.png')
# set debug variable below to True for debug mode
debug = False

def draw():
    if(debug):
        screen.blit("height45", (0, 0))
        marbleh.draw()
    else:
        screen.blit("map", (0, 0))
        if gameState == 0:
            marble.draw()
        else:
            if gameState == 2:
                screen.draw.text("YOU WIN!", center = (300,
300), owidth=0.5, ocolor=(255,255,255), color=(0,0,255) ,
fontsize=80)
                marble.draw()
            else:
                screen.draw.text("GAME OVER!", center = (300,
300), owidth=0.5, ocolor=(255,255,255), color=(0,0,255) ,
fontsize=80)
                screen.blit("overlay", (0, 0))
```

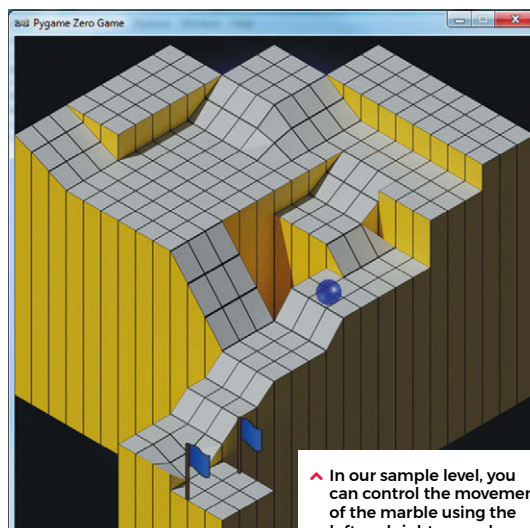
```
def update():
    if gameState == 0:
        if keyboard.left:
            marble.dir = max(marble.dir-0.1,-1)
            marble.speed = min(1,marble.speed + 0.1)
        if keyboard.right:
            marble.dir = min(marble.dir+0.1,1)
            marble.speed = min(1,marble.speed + 0.1)
        moveMarble()
        marble.speed = max(0,marble.speed - 0.01)

def moveMarble():
    global gameState
    ccol = getHeight(marbleh.x,marbleh.y)
    lcol = getHeight(marbleh.x-10,marbleh.y+10)
    rcol = getHeight(marbleh.x+10,marbleh.y+10)
    if ccol.r == 0:
        gameState = 1
    if (lcol.r < ccol.r or rcol.r < ccol.r):
        marble.y += marble.speed
        marble.speed += 0.03
    marbleh.x += marble.speed*marble.dir
    marbleh.y += marble.speed
    marble.x = marbleh.x
    marble.y = (marbleh.y*0.6)+((255-ccol.r)*1.25)
    marble.angle = marble.angle + marble.speed*marble.dir*-10
    if marble.angle > 0 : marble.angle = -50
    if marble.angle < -50 : marble.angle = 0
    if marbleh.y > 610: gameState = 2

def getHeight(x,y):
    return heightmap.get_at((int(x),int(y)))
```

on the heightmap, it will increase speed in the direction of the gradient. If the marble hits a section of black on the heightmap, it falls out of play, and we stop the game.

That takes care of the movement of the marble in two dimensions, but now we have to translate this to the rendered background's terrain. The way we do this is to translate the Y coordinate of the marble as if the landscape was all at the same level – we multiply it by 0.6 – and then move it down the screen according to the heightmap data, which in this case moves the marble down 1.25 pixels for each shade of colour. We can use an overlay for items the marble always rolls behind, such as the finish flag. And with that, we have the basics of a *Marble Madness* level. 🎮



Module Madness

We use the image module from Pygame to sample the colour of the pixel directly under the marble on the heightmap. We also take samples from the left diagonal and the right diagonal to see if there is a change of height. We are only checking for left and right movement, but this sample could be expanded to deal with the two other directions and moving up the gradients, too. Other obstacles and enemies can be added using the same heightmap translations used for the marble, and other overlay objects can be added to the overlay graphic.

Directory

Space Invasion 2020, 27 March

Invade a space and play games to help disabled gamers

GET INVOLVED

Do you have an online tutorial you'd like to share with readers? Have you created an online resource that other game developers might find useful? Maybe you have a local code club you're keen to promote? If you have something you'd like to see featured in the Directory, get in touch with us at wfmag.cc/hello

What is Space Invasion?

To put it simply, it's a day to invade a space, play games, and raise money so that disabled people can also enjoy our favourite hobby.

This is your opportunity to put on a gaming-themed fundraiser and get creative: see who's the best at *FIFA*, maybe, or finally get a colleague to try out *Just Dance*. We've set aside Friday 27 March for the event, and you can put on your fundraiser at any time of day, or even a different day that week if you want to.

Space Invasion is about raising funds for charity Everyone Can, but raising awareness is also key. We've seen first hand the benefits of playing games, so now it's your time to help spread the word.

About Everyone Can

Everyone Can helps disabled people around the UK to speak, control their environment, gain independence, and have fun. The charity helps

them to access technology so they can achieve their goals, whether it be to play video games, communicate, or use a PC – all the little things able-bodied people take for granted.

At our Technology and Gaming Centre in Manchester, we run gaming sessions for disabled children and adults. We provide an inclusive, accessible environment for people with physical disabilities and learning disabilities. We're all about gaming together, having fun, and ensuring that everyone can play.

You can find out more about what we do at everyonecan.org.uk.

How can I get involved?

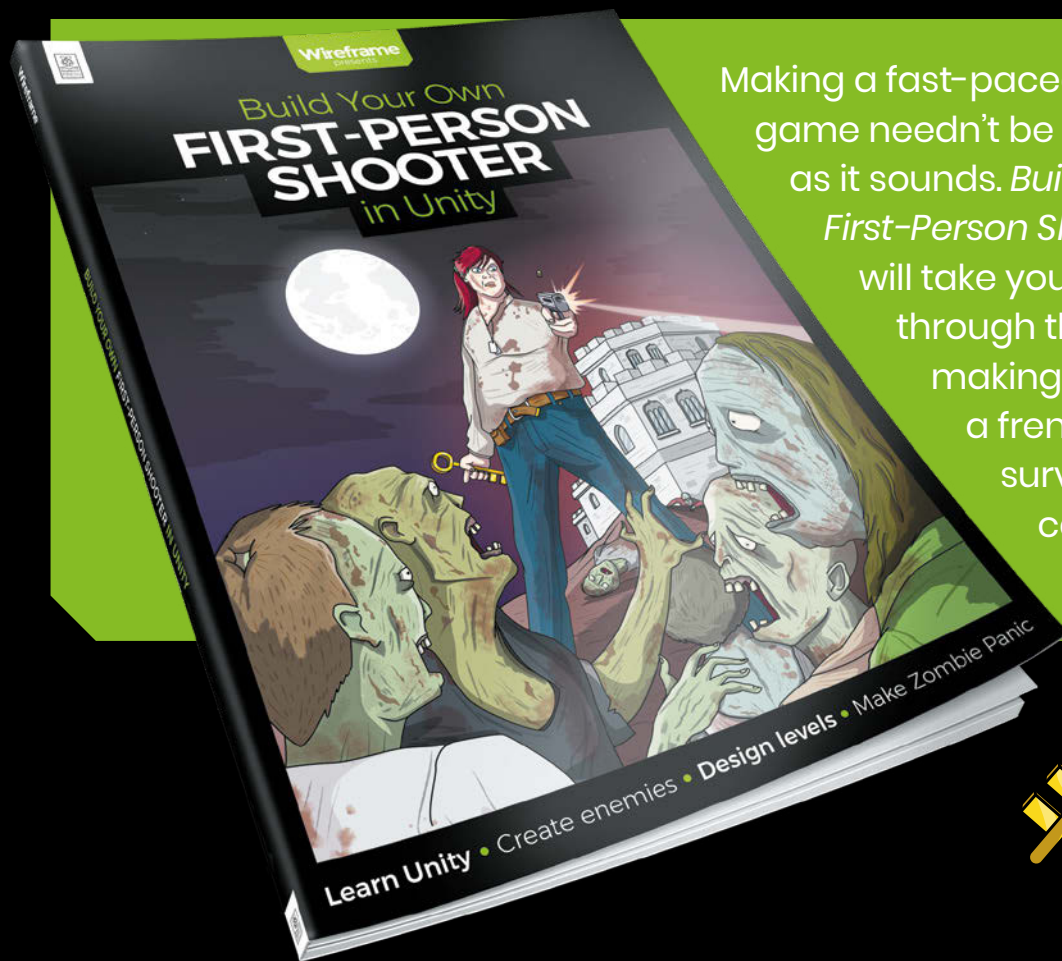
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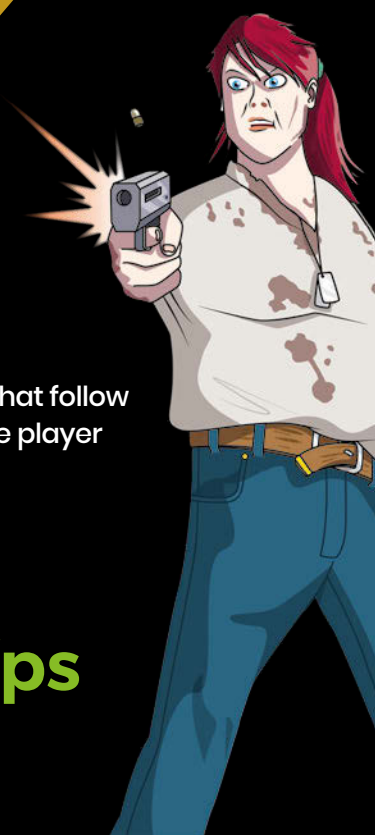
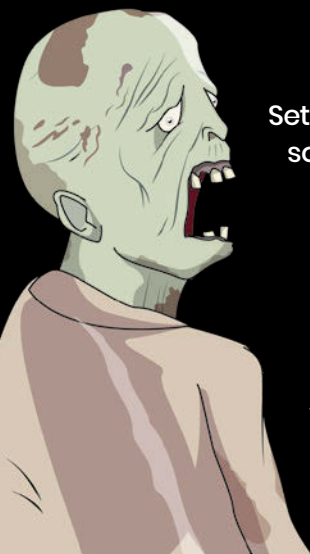
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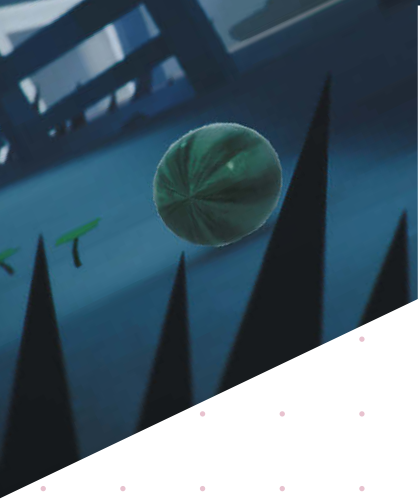


It started with a GAME JAM

We speak to four developers about the impact of game jams on their careers

WRITTEN BY
KATE FANTHORPE





The road to a successful career in games development isn't marked on a map. Talk to any developer, and their journey from idea to game will differ from the next, and the next, and the next. There is one stop on the road that most game devs have in common, though, and it's perhaps the best training ground of all: game jams.

Whether online, physical, large, or small, game jams have become the perfect testing ground for developers' skills. As we explored in issue 15, these short events are a perfect storm of low expectation and a tight turnaround that help creativity flow and form in ways it otherwise might not. But what happens after the jam is over?

We spoke to four developers who started their game careers in jams to learn about the projects that came out of them, and the work they've done since. Whether they've formed studios through their experiences or are still going it alone, these

developers have found their voices through jams. But has that translated into lasting success?

FINDING YOUR TEAM

When Martin Kai Sommer, CEO of Game Swing, entered Nordic Game Jam with his student friends in 2013, he had no idea that the group would go on to form a studio. Back then, they decided to enter the jam purely for a chance to gain some experience. "When we started out, our motivation was the dream of releasing our game on the consoles we'd grown up playing, which was a tremendously exciting prospect," Sommer says. "An added bonus was that we could perhaps use this opportunity to get our foot in the door to the games industry. We were all very aware that the first game job can be a big challenge, so if we could gather a little practical experience in the process, it would do us good."

The result of this first experience was *Stikbold!*, a playful dodgeball co-op game which might ▶

Interface

It started with a game jam

have been the result of a few too many drinks. "As I remember, we were incredibly hungover when the game jam started, and thought it would be fun to make a local multiplayer game," Sommer tells us. "After that, we just bounced some ideas around, and ended up with a whiteboard of keywords about Sweden, athletes from the seventies, and dodgeball. I think it helped that people were too tired to care if this was actually a really good idea."

Thankfully, it was, as the vibrant and colourful game won him and his team a prize for 'Most Fun' game of that year. It's a project Game Swing have been working on ever since.

After Nordic Game Jam, the team entered *Stikbold!* in as many showcases and conferences as they could. They also continued in a similar vein to the jam work ethic, focusing on the project in intense and small periods of time. In hindsight, Sommer suggests, this might not have been the tidiest approach. "Every showcase gave a boost to the morale as we experienced real players' reaction to the latest progress, and we would return to the office afterwards with new inspiration based on the feedback," he recalls. "The negative side effect of this approach was that we rarely had time to pause progress to clean up the project and rework things in a more sustainable way."

When *Stikbold!* launched in 2016, three years after its time in-jam, the response from players was positive, but for Sommer, the real feeling of success came from seeing the growth of his team. "Today, we have an extremely strong foundation and are about to take the company to a new stage with other challenges," he says. "We've been through a lot to make it this far, and there's an enormous trust within the team because we know each other so well, both personally and professionally. Running a game development startup can be extremely taxing at times, but it seems like we're heading in the right direction, so it feels really cool to think, 'We're doing it, and we're doing it our way.'"

ROAD TO REBELLION

The two founders of Space Backyard studio know all about the desire to do things their own way. When Alessandro Arcidiacono and Simone Tranchina met, they were already working together at a large games company, but it wasn't the environment either of them hoped for. "We felt trapped, crushed by a mechanism that



▲ *Stikbold!* fulfilled Game Swing's ambition to make a multiplayer game – up to eleven people can be connected at once.



GREAT DANE

Taking place each year in Copenhagen, Nordic Game Jam is by far one of the largest physical game jams in the world. It takes place over 48 hours, and sees around 500 developers in attendance. In 2018, developers from 31 different nations took part.



left us no room for manoeuvre," they tell us via email. "We were lucky enough to be surrounded by many talented people, but in time, they all left for places where their skills were put to better use. This is why we felt the urge to change direction, start believing in our own vision and capabilities, and set sail to new adventures."

Entering the Watermelon Game Jam in 2016 was the first step in their new career. The game they created, *The Story of the Revolutionary Watermelon*, asked the player to slap a real watermelon – the aim being to help the fruit on the screen escape a farm (if you want to build your own watermelon controller, by the way, instructions can be found at wfmag.cc/melons).

Revolutionary Watermelon is, Space Backyard say, pretty symbolic of the studio's real-life journey. "It was a barbaric cry against the industry," they write, "and our first act of freedom."

The game was picked up for exhibit at the indie game festival, Game Happens. It was here that Space Backyard met festival coordinator

“AS I REMEMBER, WE WERE INCREDIBLY HUNGOVER WHEN THE GAME JAM STARTED”



^ Since its release, *Like Roots in the Soil* has travelled to several European festivals, and even appeared at the ZKM Museum in Karlsruhe, where you can play it with a custom controller.



^ Game jams invite all sorts of weird ideas - like using a watermelon as a controller, as seen in *The Story of the Revolutionary Watermelon*.

Maddalena Grattarola, who would later join the team as writer, alongside programmer Gianluca Pandolfo. The Watermelon Game Jam worked its magic, and by the time the team entered its next jam, the studio comprised four members that are still together today.

“In founding the studio,” they say, “we were driven by an uncontrollable desire for freedom, and yes, as of today, it still smells of freedom: it’s the secret ingredient we can no longer do without, the engine that keeps us going, and the only true source of sincere inspiration. Our games, like those of many other indies, couldn’t possibly be born in any other place than the small studio in which they were made.”

ALWAYS BE JAMMING

Four years on, and game jams have continued to play a part in Space Backyard’s story. The studio’s

most recent game was *Like Roots in the Soil*, their 2017 submission to Post-Apocalyptic Jam, which was nominated for A MAZE. in Berlin and exhibited at EGX’s Leftfield Collection in London in 2018. It’s easy to see what the fuss is about: short and poetic, *Like Roots in the Soil* casts you as two characters, an old man and a young man, walking down the same street in two different conditions – one damaged and one whole. Moving around your controller allows you to explore the split-screen points of view so you can compare side-by-side views of the young man’s modern town and the old man’s crumbling city, while text at the bottom narrates your journey. It was the jam environment, the studio writes, that gave rise to such a simple, beautiful tale: “When you have little to no time, and no budget, you tend to work frugally, to economise. And this, to us, means to look for the most simple or essential solution, which often turns out being also the most elegant and sincere.”

Just like Sommer and his team, Space Backyard have retained this way of working even out of jams. One of their most recent projects, *Bird of Passage* – their first creation outside a jam – had them working in a very similar fashion. The studio tells us: “The approach to making *Bird of Passage* was similar to that experienced during a jam: we self-imposed a short deadline and developed the game in less than a month, working remotely and part-time... we may say that this ‘jam-like’ method allows us to remain super-focused on the essential elements of the game, forcing us to constantly question what is superfluous. In the end, the final result represents the most sincere and direct take we could provide on the chosen subject.”

Bird of Passage brings together everything the studio is best at, from its poetic writing style to the clean aesthetic. It explores Tokyo, telling the story of a passenger and the taxi drivers they encounter. While the game showcases the studio’s strengths, it’s also a culmination of what the quartet is continually striving toward, Space Backyard say. “As a studio, our main goal is to maintain our identity and to bring the same ▶



^ *Bird of Passage* is focused on the Great Kantō earthquake, which shook Japan in 1923. You’ll also uncover some botanical facts about the ginkgo tree.



SPACE JAM

The four members of Space Backyard are scattered around the globe, with the members at the present moment living in Genoa, Tokyo, Weimar, and London. Despite this distance, “what keeps [them] united is having interests and abilities that complement and support each other, while sharing the same values.”

Interface

It started with a game jam

▼ Arvi Teikari, whose game jam gem *Baba Is You* became an even better commercial release.



BABA IS FUN

For *Baba Is You* developer Arvi Teikari, going full-time hasn't taken the fun out of game development. "If anything," he tells us, "it has taught me several useful lessons in how to appreciate working on a project, even during the less motivated phases of the development."

▼ In the wonderful *Baba Is You*, the player can get around anything by creating the right word combination.



▼ Watch the seasons pass in Galen Drew's *Cycles*

freshness to new projects that can have a wider market; to work on more complex and structured games without forgetting how to experiment and improvise... Our games maintain a certain level of naivety, something that the big industry cannot possibly afford. What we make still isn't enough to support us financially, but it works like a charm as a creative way to vent."

SIDE HUSTLE

Galen Drew, creative director of the Seattle-based developer very very spaceship, has had a rather different outcome from his time in game jams. A graphic designer when he first started making games, Drew didn't initially take development as a career particularly seriously. "I started off my career as a graphic designer working at a series of startups, mostly on websites," he says. "I'd been working on little game projects on the side for a while with very little knowledge of programming or Unity. I was just faking it as best I could."

It took meeting Kevin Maxon, founder of Ice Water Games, to get Drew to take his "little game projects" more seriously, and that's when he decided to enter his first jam. In order to test out his Unity skills, Drew entered a screensaver-themed jam, which resulted in the game *Sequence*. "This was the first of these ambient games that were focused on the feeling and colour that I'd made," Drew says. "After I spent



"I WAS JUST FAKING IT THE BEST I COULD"

some time working on some terrible personal projects that never saw the light of day, I decided to take another pass at the idea of *Sequence*, but now with some knowledge of code. This ended up being *Cycles*, released under the Ice Water Games label."

With this experience under his belt, Drew moved on from his previous position to work as a UI designer at very very spaceship, the company where he's now creative director. Despite the new role, however, he wasn't quite finished with game jams yet. "I decided I wanted to work on a game about procedural worlds, so I started a bunch of prototyping," Drew explains. "When PROCJAM came along, I leapt at the opportunity to submit the game." The result was *Pattern* – a project that has really earned Drew some attention. Since the jam in 2018, it exhibited at 2019's Leftfield Collection at EGX, and was released later that same year.

MAKING IS BREATHING

Pattern sees the player waking up by a campfire in an eerily empty, low-poly world. In the distance lies a plume of smoke from another fire, rising up into the starry, psychedelic-hued sky. Walk towards it, and you'll receive the command to sleep. Sleep, and you wake to find the world reset, sometimes with a colour change, sometimes suddenly surrounded by too-large objects to observe.

Despite his success with solo projects, Drew's career in games still takes somewhat of a back seat from his role at very very spaceship. Jams have given Drew the perfect outlet, then, to work with little pressure and little expectation. "I don't



▲ Game jams: a quietly frantic hive of creativity.

have a super-defined method for balancing my time other than I have a *ton* of work to do at the studio, and I put a lot of my free time into my other side projects,” he says. “For me, making is breathing, so it’s hard to stop.”

HOBBY TO CAREER

In Arvi Teikari’s case, game jams haven’t just been one stop on the road, but rather a continual creative exercise from the beginning of his career. After attending jams for over a decade, Teikari won Nordic Game Jam in 2017 with *Baba Is You*, a unique puzzler where moving blocks changes the game’s fundamental mechanics. Around the time Teikari made the game, he still viewed full-time development as somewhat unattainable. “Back when I was making games as a hobby,” he says, “the concept of making them commercially was one of those abstract distant-future goals to dream about, kind of like being mentioned on a bigger website or winning a game-development competition. At first, I didn’t really even strive towards making game development my job because I was afraid of the uncertainty of earning my living via making games, as well as the potential of it becoming a chore due to no longer being something I do just for fun.”

As well as getting a chance to make prototypes of his ideas, Teikari primarily saw game jams as a chance to meet people and grow as an individual. “Physical jams, such as No More Sweden, were a way for me to visit completely different social environments and get accustomed to travelling on my own, so the social interaction and meeting indie developer friends was and has been the main draw with them.”

It was the people Teikari met at jams that encouraged him to release *Baba Is You* as a full game – a process he was initially anxious about. “When making a game for a jam, I generally acknowledge that what I’m doing won’t be

▲ *Pattern’s* procedurally generated world resets after you sleep at the camp-fire, meaning your only real objective is to get back to sleep. Relatable.

PROCJAM
Make Something That Makes Something

PROC AND ROLL

PROCJAM is relatively relaxed in comparison to other jams. Originally founded in 2017, the online jam allows developers ten days to work on projects. They can be related to that year’s theme or not at all – as long as developers make a game that ‘makes something’, they can enter.

extendable into a full game as is,” Teikari explains. “The code/art/audio will be rushed and hacky, and large parts of the game will have to be redone from scratch to be more dynamic and nicer to work with. There was a period of time right after the jam where I was somewhat anxious about how I would need to ‘upgrade’ the game in order to make it more appealing or marketable.”

As you’ll know from reading Wireframe’s review of *Baba Is You* in issue 10, though, Teikari really had nothing to worry about – it’s easily one of the best indie puzzlers we played in 2019. But even after all the critical success, Teikari’s cautious nature hasn’t left him, he says. “At this point, it’d seem that releasing an indie game that’s successful enough to permit working full-time on another commercial indie title is tough enough that managing to do it ought to be described as a career success. By this metric, I’d say that I’m successful at the moment – but I’m not sure if I believe I’ll be successful in the future.”

REAL-WORLD SUCCESS

Teikari may be right to be cautious about the precarious nature of success in the games industry, but there’s no denying that the developers we’ve spoken to have been able to forge interesting careers out of their time at jams. Teikari is rare in being able to financially depend on these however, as developers like those at Space Backyard still take on outside projects to supplement the time they spend making games.

Yet, if you measure success in the output of creative and innovative games, these developers are overflowing with it. The jam experience has been formative for each of them, not only for the connections and bonds formed, but the work ethic it helps instil – an ethic that has kept these small studios growing and evolving ever since. 🌱



System Profile

PC Engine

The eighties console that, for many in the British Isles, remained tantalisingly out of reach

For all but a lucky few in the UK, the PC Engine was a console that only existed in magazines. In the May 1988 edition of Computer and Video Games, two pages were devoted to this new wonder machine from Japan: freelance writer Tony Takoushi talked in glowing terms about the system's tiny form factor, its even tinier media (roughly the size of a credit card), and the quality of the games packed onto them. *Victory Run*, Takoushi wrote, was "the finest car racing game in the world for a home micro." Playing martial arts opus *The Kung Fu* was, he said, "like taking part in a film." At the end of the article came the bad news, however: "NEC has no plans to release the console in the UK at present."

This set the tone for the PC Engine's existence in the UK: first released in

Japan by NEC in 1987, the console appeared in the US as the TurboGrafx-16 in 1989, and a European launch was widely expected to take place not long after. But like a mirage, the PC Engine kept receding from view, at least for gamers who couldn't afford a grey import; Ludlow-based company Micro Media began placing adverts for imported consoles in British magazines around the spring of 1989, with PAL-compatible PC Engines on sale for £224.95 and games available for £29.99 each. NEC had talked vaguely about giving the PC Engine an official release in Europe – under its bulkier, TurboGrafx-16

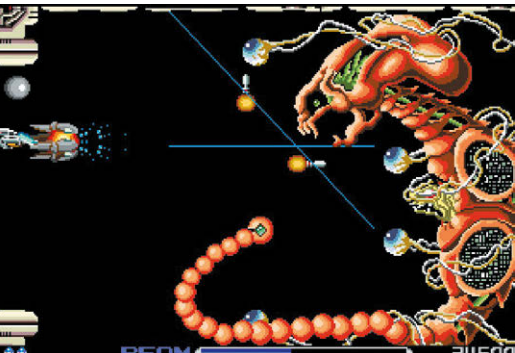
form factor – and even got as far as producing a run of PAL-compatible models for our region. The firm quickly changed its mind when it saw US sales begin to slow down, though, and the few official PAL-compatible systems left over from the abandoned venture were sold via mail order in the UK by Telegames.

It was all a far cry from the PC Engine's triumph in Japan where, at the height of its powers, the console captured as much as 50 percent of its home market, briefly knocking Nintendo's all-conquering Famicom into second place. Even 33 years later, it's easy to see the PC Engine's appeal: its compact design was eye-catching and practical – the perfect fit for the compressed space of your typical Tokyo apartment – while its hardware made the four-year-old Famicom look archaic. Sure, it was still an 8-bit console like its rivals, but the PC Engine's 16-bit GPU meant that it could recreate arcade games like *Image Fight* and *R-Type* with the kind of fidelity the Famicom or Sega Master System could only dream of. And while Sega may have been priming its own next-gen console – the Mega Drive would launch in the autumn of 1988 – NEC was also thinking ahead, with its CD-ROM² attachment, also released in 1988, making the PC Engine the first home system to adopt the format.

The PC Engine enjoyed a healthy library of games, too, thanks to prolific



▼ The PC Engine's 16-bit graphics meant that it could handle the large, colourful sprites of a contemporary shooter like *R-Type* – albeit with a bit of flicker here and there.



▼ You needed a multi-tap to use more than one controller on the PC Engine, but games like *Bomberman '94* made the peripheral a must.





◀ The PC Engine (left) and its US incarnation, the TurboGrafx-16 (above). Radically different designs, but both used Hudson Soft/NEC's proprietary HuCards as media.



▲ Japanese developer M2, who worked on the Mega Drive Mini, is handling the Mini's emulation, so we can hopefully expect a similar level of quality here.

output from Konami, Hudson Soft – who collaborated with NEC on the console's development – and Namco, whose president had a public falling out with Nintendo over its business practices, and decided to shift its loyalty to NEC and Sega as a result. Much-loved *Castlevania* sequel *Rondo of Blood*, Hideo Kojima's cult favourite *Snatcher*, and *Bubble Bobble/Rainbow Islands* sequel *Parasol Stars* all got their start on the console, and are just three highlights from a broad spectrum of around 680 releases.

It was the quality of those games that saw the PC Engine glimmer for a short while in the US under its wider, heavier-looking TurboGrafx-16 guise; unfortunately for NEC, the rest of the games industry was catching up with it by 1989, and the system found itself struggling against the ever-popular Nintendo Entertainment System and the hugely popular Sega Genesis, which hit the States that August. We can only

wonder what might have happened had NEC opted to roll the PC Engine out in Europe first, where Nintendo had less of a stranglehold on the market in the late eighties, and where the Mega Drive didn't launch until September 1990. Instead, NEC's missteps with the enhanced but slow-selling SuperGrafx, and the rapid ascent of the Super Nintendo, launched in 1990, hastened the system's decline.

“At the height of its powers, the console captured 50 percent of its home market”

All of this makes the imminent UK release of the PC Engine CoreGrafx Mini an unusual proposition. Unlike, say, the Nintendo Classic Mini, it isn't necessarily tethered to nostalgic memories of a console that a generation of gamers once owned and then sold on. Rather, it's a chance for many of us in the UK to finally sample what's akin to a plastic Holy Grail – an enigmatic console long described by excitable journalists, but only owned by the most dedicated of import gamers. Fittingly, the “finest car racing game in the world”, *Victory Run*, is included among the Mini's 50-or-so titles. Inevitably, it's not quite as good as we were led to believe. 🎮

Fearsome Engine

After the release of the PC Engine and the CD-ROM², NEC then embarked on a bewilderingly broad series of upgrades and alternate designs, ranging from the aforementioned SuperGrafx, the portable TurboExpress and PC Engine LT systems, and the Duo series, designed to play both HuCards and CDs. Our favourite, at least from a visual standpoint, was the PC Engine Shuttle, a stripped-down version of the system aimed at a younger market. With its rounded front and fins, it looks like something out of an eighties sci-fi movie.



PC Gamer

10 PC Engine obscurities

A selection of curios you (sadly) won't find on the PC Engine Mini

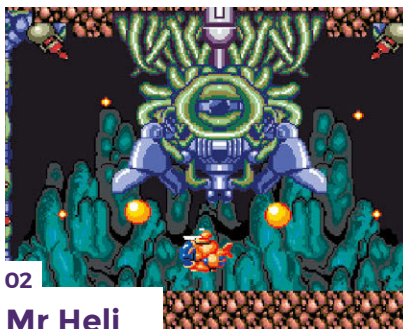


01

Kato-chan & Ken-chan

HuCard – 1987

This one's a bit of a cheat, since its US counterpart, *JJ & Jeff*, will be available on the PC Engine Mini. But the western release removes the original's Japanese comedians, and some of their racier abilities – here, Kato and Ken are capable of stunning enemies with rollicking gales of flatulence, and there are various other puerile gags dotted throughout.

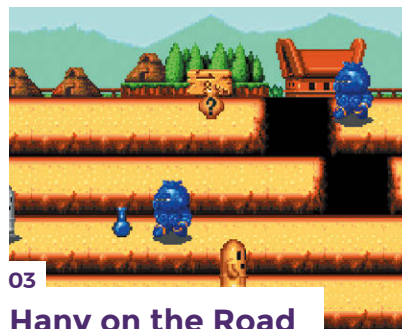


02

Mr Heli

HuCard – 1989

Irem's answer to Sega's hit *Fantasy Zone* (also available on the PC Engine), *Mr Heli*'s star is, yes, a sentient helicopter, but it's otherwise a conventional multi-directional shooter. The act of digging out crystals and spending them on upgrades gives *Mr Heli* its own flavour, though, and the game as a whole is as well-made as you'd expect from the creators of *R-Type*.



03

Hany on the Road

HuCard – 1990

This game's hero is a *Haniwa* – a type of clay figure you may recognise from *Animal Crossing* – and it's an action game in the vein of Capcom's *SonSon*, with items to collect and enemies to avoid on a scrolling road. Developer Face also made a similarly odd sequel – a shooter called *Hani in the Sky*, which was marked out by a really eccentric control scheme.

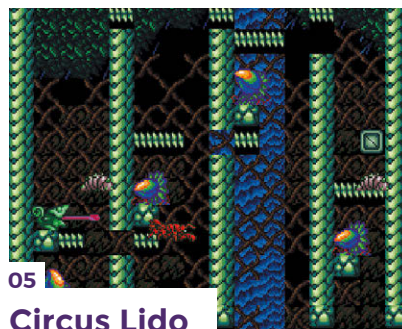


04

Long Nosed Goblin

HuCard – 1991

This is the kind of game that made importing such a delight in the early nineties. Where else could you find a shooter – outside Konami's *Parodius* series – so steeped in Japanese humour and folklore? Expect to encounter mischievous raccoons, fruit-throwing insects, and witches riding vacuum cleaners. It's colourful, cheerful, and generally glorious.

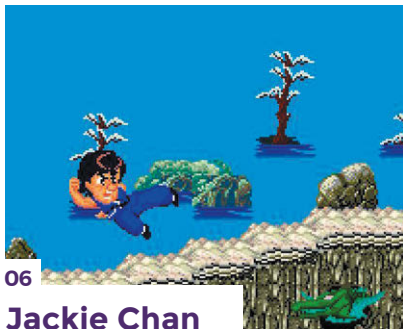


05

Circus Lido

HuCard – 1991

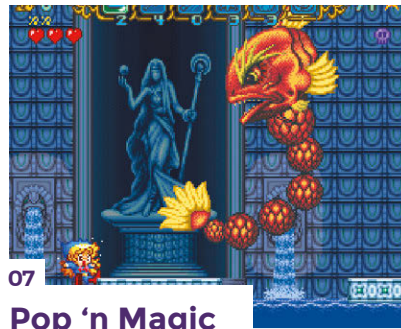
The action-puzzler equivalent of *Little Shop of Horrors*, *Circus Lido* casts you as a chameleon named Leon, whose sole aim is to swallow insects and then spit them into the mouths of carnivorous plants. It's a process that requires a fair bit of thought as the level layouts grow more complex. Why is it called *Circus Lido*? We honestly have no idea.



06
Jackie Chan

HuCard – 1991

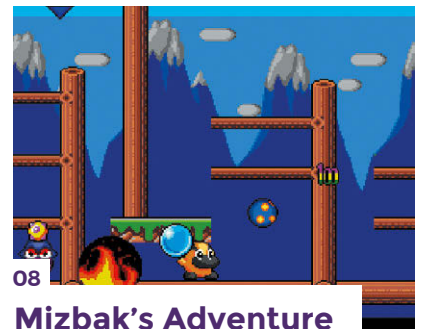
Arcane licensing issues might be behind this title's absence from the PC Engine Mini's roster. This is a shame, because *Jackie Chan* (aka *Jackie Chan's Action Kung Fu*) is a cracking platform beat-'em-up, with far more care in its design than you might expect from a licensed game of its vintage. Also, Jackie gets to kick cartoon frogs directly in the face. Outstanding.



07
Pop 'n Magic

Super CD-ROM² – 1992

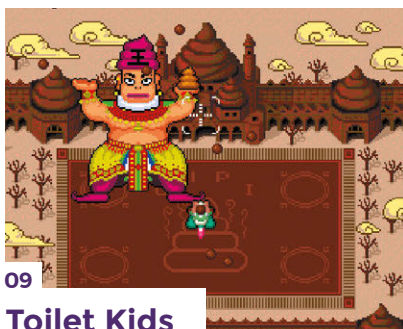
The action in this colourful fixed-screen platformer may be a derivative of rival arcade games like *Bubble Bobble* and *Rodland*, but it's still slickly made and lots of fun: you use your magic wand to zap enemies and trap them in coloured bubbles; throwing different coloured bubbles at each other will result in satisfying showers of items and points.



08
Mizbak's Adventure

HuCard – 1992

Also known as *Liquid Kids*, this is one of Taito's more obscure arcade platformers, and followed in the wake of titles like *Rainbow Islands* and *The NewZealand Story*. *Mizbak's Adventure* – starring a water bomb-lobbing platypus – plays similarly to the latter game, albeit less harsh in its difficulty. It arguably ranks among the PC Engine's most charming titles.



09
Toilet Kids

HuCard – 1992

A top-down shooter in the mould of Konami's *TwinBee* series, *Toilet Kids* was, we've been informed, intended as a send-up of a certain kind of childhood learning book available in Japan. Wherever the idea came from, the game's lavatorial humour – seriously, there are dollops of cartoon poo everywhere – makes it one of the weirdest action games ever made.



10
Gekisha Boy

HuCard – 1992

For sheer strangeness, this platformer takes some beating. When student David Goldman's parents die in a plane crash, he's challenged to take photos by a university dean. The weirder the pictures he takes – UFOs, Marilyn Monroe, King Kong – the more points he'll get. Believe it or not, the core game behind this premise is actually quite good.



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Daniel Lipscombe

HIGHLIGHT

The way *Superliminal* messes with your perceptions is a definite highlight: you'll click on an object and get to know its weight and heft, only to click on the same object later and watch as it crumbles into dozens of smaller pieces. In *Superliminal*, there's never a comfort in knowledge.

✓ Exits are clearly marked, but using them takes more skill than you would think. And a little bit of manipulation.



Superliminal

Size definitely does matter

What is *Superliminal*? On the surface, it would be easy to say it's a puzzle game which taps into the vein opened by *Portal* and games of that ilk.

This is justified to some extent. It's certainly a puzzler, and it's played in a first-person view. The character we control is trapped within a science experiment and puzzles are solved by thinking laterally. It's not necessarily a linear journey, but there are no branching pathways.

There's plenty of humour, some creepy moments, and a few minor frustrations along the way. So yes, *Superliminal* can be easily compared to *Portal*, or specifically *Portal 2*, with its lashings of wit. However, rather than playing with portals or swapping colours, here it's all about perspective.

Our hero is trapped within a sleep experiment about dreams – *Inception* minus the DiCaprio – and we become stuck in a loop, moving through many levels of subconscious to find the 'exit'. To do this, we solve puzzles, and they vary wildly. Perspective is used throughout – it's always the key to the level's doors. Let's say a chess piece sits on a table. We can pick it up and move

around with it. If our view of the chess piece becomes closer, the object is effectively growing. By moving around and looking at things from new angles, we can change shapes and sizes, or even conjure objects from thin air by lining up perspectives.

Some levels stop you from taking objects; some play with light, others replicate the object by clicking on it to produce hundreds of copies of that item. There's a very loose story playing along in the background, but most of the 'wow' moments come from the puzzles themselves, or their outcome. You might click on an object, expecting it to act as it had on previous levels – for it to replicate and force you to, again, change your perspective. It feels too simple to just say '*Superliminal* is remarkably clever', but perhaps that's the best way to say it. *Superliminal* is remarkably clever.

Early examples of puzzles include decreasing the size of an object to squeeze it through a gap into the next room, where a switch awaits

➤ Alarm clocks are just as important as chess pieces. They reinforce the sense that you're in a dream, though they are used a bit too often at times.





▲ A step to the left or right will line up seemingly meaningless images to construct a new, important object.



▲ I'm not sure if the developers are traumatised by the game of chess, or just really into it. There are a lot of chess pieces.

its pressure to open another door. Tiny dice can be blown up in scale, providing a leg up to a yawning doorway. You can even use a wedge of cheese to create human-sized ramps.

The developers lull you into a false sense of security only to swiftly pull out the rug. Just when you're comfortable with these random physics, things could literally be tipped upside down. Step by determined step, the game sprawls out through labyrinthine corridors, vast ballrooms, underground corridors, and hotel suites, each area a figment of dreamlike imagination. It's not only physical perspective that's constantly changing, but our assumptions and what we take for granted.

Old-fashioned boom boxes lie throughout, playing tapes from an unseen Dr Pierce as he attempts to free you from this endless path. Gradually, the puzzles become more surreal. You click on the exit door only for it to detach from its hinges, revealing a brick wall behind. Or clicking on another simply creates a cascading number of doors, creating a faux stairway.

Towards the latter half of the game, some levels can feel as if they're overstaying their welcome as the developers try to cram in a few too many ideas, but it's hard to be frustrated when everything looks and sounds so sublime; you hear melodic harmonies as you pass through open-plan art deco lobbies, then through a doorway into a basement with echoing screams bouncing from its dingy walls. And is that blood splattered about the place?

I lost count of how many 'oohs' and 'aahs' I let out while playing *Superliminal*. Some came from finding a solution, one from simply clicking the mouse, creating ever-smaller objects, like a digital matryoshka doll; others occurred while simply noticing patterns occurring throughout the game, enforcing the idea of our subconscious ruling our dreamscapes.

M.C. Escher would have had a field day with *Superliminal*, as the last hour moves into brain-warping levels of trippy. It's abstract and surreal,

like walking into a painting and exploring at will. Imagine walking through a door and it leading to a new world, but you can move the door, pick it up, shrink it – shrinking yourself in the process – and emerge on the other side faced with a huge vending machine, like something from *Land of the Giants*.

Superliminal wields a special kind of magic. It's only towards the end where the game jumps the shark, stripping everything down to basic functions, but in doing so, it forces the player to rely on trial and error rather than tried and tested, previously discovered solutions or ideas. But it all leads somewhere, and that final destination is something special.

I'm not ashamed to say that the final moments misted my eyes, as the game changed once more, yanking the rug a final time and enveloping me in its world, passing on a message of beauty. I played the entire game in one sitting, never wanting to drag my eyes from the wonders of the journey. While in places *Superliminal* lacks an original spark – every game in this genre owes at least something to *Portal* – it still feels like a breath of fresh air, especially if you're fed up with the same old perspectives in the world around us. 🗨️

“You can use a wedge of cheese to create ramps”

VERDICT

Perhaps lacking in originality, *Superliminal* makes up for it in design, charm, and 'wow' moments.

80%



▲ Some areas are vast in scale, filled with items meant to put the player at ease with their familiarity.

HIGHLIGHT

It does falter, and you are sometimes taken out of the experience, but generally speaking *GYLT* is home to a solid sense of place. It's no small compliment to say the game, at times, conjures up a similar feeling to that of *Silent Hill*: a weird town full of weird things, and a bit scary too. Good stuff.

Review

▲ Bullying plays a big part in *GYLT*'s story, though narratively it all feels a bit underbaked.

▲ This... is genuinely unsettling. Fair play.

Info

GENRE
Stealth-horror
FORMAT
Stadia (tested)
DEVELOPER
Tequila Works
PUBLISHER
Tequila Works
PRICE
£29.99 (free w/
Pro subscription)
RELEASE
Out now

REVIEWED BY
Ian Dransfield

VERDICT

Sometimes good, largely middling, *GYLT* isn't a great advert for Stadia.

60%

GYLT

Leaves you feeling distinctly not-GYLTy

You need to come out strong, otherwise, you run the risk of being quickly overlooked, and soon after forgotten about. Google's Stadia needs a killer app; that one exclusive game to really sell people on the idea of a streaming future where we don't need dedicated hardware, and anyone who can afford the subscription fee and good internet is on a level footing. *GYLT* is not that game. *GYLT* is a game from 2011 in shinier clothes, bereft of any real excitement, repetitive to the point of banality, and not the sort of thing you'd be able to sell an £8.99 a month subscription off the back of.

That's what it isn't – but what *is* *GYLT*? It's a third-person horror-narrative-puzzler, basically. You take on the role of Sally, a young girl who refuses to give up looking for her disappeared cousin. Chased by the bullies who have been hounding her through her few years on the planet, Sally ends up stumbling into a living nightmare – the town she knows so well, but twisted, weird, and *wrong*. Her hunt for the missing cousin continues nevertheless, but instead of bullies on her tail, it's a bunch of monsters and other supernatural sorts that come out to play. Basically, imagine a world where someone played *Silent Hill* then watched *Stranger Things*, and you've got the idea.

What you actually do in *GYLT* isn't all that exciting, really. Exploration around the nightmare

incarnation of the town, a lot of stealth as you sneak about avoiding the gaze (and hearing range) of the plentiful monsters, and some very basic puzzle solving. It's not ridiculously easy to blunder through things in the most part – you can and will fail at times – but there's really not much in the way of challenge. A powerlessness against the monsters soon fades away as new items and abilities come to the fore, so any real frights are reserved for the odd cheap jump scare. Why would a monster be in any way horrifying when it struggles so much to see or hear you coming, and you can one-hit stealth kill it?

And that's what *GYLT* all comes down to, really: it's just not weighty enough an experience. It can be spooky, sometimes scary, but that atmosphere is inconsistent. Monsters are initially worrying, soon enough hardly relevant. The story sounds like it's going to be a big driver of things, but ends up almost an afterthought. Tequila Works' Stadia debut – the first exclusive on the fledgling platform – isn't what Google needed to kickstart its would-be revolution. But away from that aspect, it's also not what the third-person horror-narrative-puzzler genre needed, either. You can turn off the brain and gather some enjoyment here for the few hours it lasts, and there are just about enough scares to keep the adrenaline higher than resting levels. But there's zero revelatory about *GYLT*, and little reason for this to be a platform exclusive. 🗿

“It can be spooky, but that atmosphere is inconsistent”

HIGHLIGHT

Your in-game smartphone is where you'll find BlipBlop, a devilishly simple game within a game in which you tap a button to get points. You spend those points on upgrades which generate more points. It's madly addictive, and perfectly satirises the simple but devastating gameplay loops of exploitative F2P mobile games.



◀ This is BlipBlop. *Mosaic* is worth getting just for BlipBlop. BlipBlop on its own would get 90%. BlipBlop. (Now available on its own.)

✓ No, funnily enough, I never envisioned becoming a human meat cube and then discussing the career implications of it with a sentient goldfish while riding to work on a ham-fisted metaphor. When is this out on Switch?

Review

Mosaic

What a way to make a living

Work is rubbish, innit? Especially nowadays, where doing it for 60 hours per week isn't even a guarantee that you'll earn enough dosh to pay for opulent luxuries like basic sustenance and somewhere dry to sleep or scroll through Twitter. You have to wonder why anyone bothers. Apart from the ever-looming threat of starving or freezing to death, obviously. *Mosaic* is a short narrative experience about, well, all of the above. You play a dishevelled Office Man who does an indescribable job for a gigantic faceless megacorp, and would much rather be doing something else. The job ostensibly allows him to be a productive, fed, and sheltered member of society, but in truth, he barely earns enough money to stay afloat, doesn't get enough sleep to concentrate, and is on the verge of being sacked and suffering a mental breakdown.

What starts as a Groundhog Day loop of a barely tolerable morning routine develops into a series of hallucinatory escapades which keep interrupting the daily grind, and hinting at something more, some deep, soul-felt yearning to be... in a jazz band, or something?

Mosaic is comically ham-fisted in its portrayal of working life, yet borderline abstruse in its messaging – beyond the core idea that having to go to work, y'know, sucks. It's difficult to get a read on what the game actually wants us to take away from its admittedly beautiful and arresting imagery. Its oppressive, dehumanising cityscapes.

Its well-executed but sophomoric sequence of surrealist metaphor, where the protagonist turns into a piece of human chewing gum and gets repeatedly stepped on, to pick one example.

Office Man gets up, cleans his teeth, ignores the final notices, mucks about with his phone on the tube, sees homeless people huddled on the streets and thinks "that's awful" while ignoring them, and dreams about a talking goldfish. He's sad, and going mad. It's the millennial experience deconstructed and, for unclear reasons, presented back at people living it.

Mosaic feels more like an art installation than an adventure game. It's a collection of scenes, which are very well constructed and give the viewer a lot of imagery to mull over. But, it feels a little toothless, as it holds up many mirrors to reality without any of them being windows to greater

"More like an art installation than an adventure game"

understanding. It doesn't skewer the office grind in the way that, say, *Death Stranding* does the gig economy. It just sort of goes, "This is all crap, eh?" Thanks for pointing that out, video game narrative.

There is a lot to like here – the art direction is sublime, with memorable setpieces that dare to play with the camera, colour, and perspective in ways that are genuinely quite rare and brilliant. Every scene carries the perfect essence of some universal facet of modern life – from the way your alarm rips out of your cotton-wool dreams every morning, to the way it just feels like everyone else is handling all of this better than you.

Mosaic contains no revelation, no great insight. But it will assure you that you are not alone. 🐾



Info

GENRE
Adventure

FORMAT
PC (tested) / Mac / Linux / iOS (Apple Arcade)

DEVELOPER
Krillbite Studio

PUBLISHER
Raw Fury

PRICE
£15.49

RELEASE
Out now

REVIEWED BY
Dave Hurst

VERDICT

The messages are muddled, and the point is hard to find, but it's a beautiful experience full of moments you'll recognise, and perhaps see with fresh eyes.

63%

Rated
Review



✓ The parallels that Paintbucket Games draw between our current political climate and Nazi Germany are welcome, but not always subtle.



Review

HIGHLIGHT

Through the Darkest of Times smartly captures the numb fear and near-hopelessness of life under tyranny. Though we, as the player, know that Hitler will eventually fall, struggling through a virtual decade of resistance makes the inevitable seem almost impossible.

▲ Before each strategic section, brief scenes will play out between party members in the resistance's HQ.

Through the Darkest of Times

Slim, stylish strategy with something to say

Info

GENRE
Strategy / Visual novel
FORMAT
PC (tested) / Mac
DEVELOPER
Paintbucket Games
PUBLISHER
HandyGames
PRICE
£13.49
RELEASE
Out now

REVIEWED BY
Andrew King

VERDICT

Through the Darkest of Times is rarely compelling as a strategy game, but its narrative of resistance in Nazi Germany is frequently gripping.

68%

As the air raid sirens echo over the streets of Berlin, frightened Germans crowd into metro tunnels for shelter. Falling bombs whistle above. My character, a procedurally named member of an unnamed resistance movement, notices a flash of yellow on a nearby man's folded coat: a Star of David.

It's 1945, there are few Jews left in the German capital, and none that do remain should be allowed in the tunnel during an air raid. I have the option to warn the man that his star is showing, saving him from harassment or worse. Then, I have the option to stash his jacket and let him borrow mine. A moment later, when the tunnel collapses, he offers a hand to pull me out of the rubble. When we emerge from the wreckage, he thanks me, and we go our separate ways.

Through the Darkest of Times succeeds in these moments. Developer Paintbucket Games excels at telling the human stories of life under devastating oppression. The game's at-times-jazzy, at-times-eerie score, red-white-and-black colour palette, and staccato dialogue combine to create a tense and unsettling world. The game uses touchstone phrases like "drain the swamp" and "fake news" to draw parallels between Nazi Germany and Trump's America, but it doesn't need to. *Through the Darkest of Times* brilliantly captures the queasy hopelessness that comes with the dawning

realisation that the people you care about may proudly support naked cruelty.

The problem is, *Through the Darkest of Times* is being marketed as a strategy game. And for roughly half of its ten-hour campaign, it is. But, at least on the less challenging of the two difficulty settings it offers, succeeding in this aspect requires little thought. As the leader of a resistance group, you recruit new members, maintain morale, and manage finances. You accomplish this by selecting activities for each party member to perform. Some, like asking for donations, bring in money. Others, like buying red paint to scrawl anti-Reich graffiti, take it away. Each mission carries a degree of risk which can be ameliorated by assigning party members with certain skills or equipping helpful items, like a stolen SA uniform or a fake passport.

All of this, conceptually, is interesting. In practice, it feels simple after a few hours of play. I never worried that I might fail, and I only dipped into the red once. Again, I've only dabbled with the harder difficulty, dubbed 'Resistance Mode,' but in 'Story Mode' the strategy bits felt like a boring distraction from the game's gripping, visual novel narrative.

Through the Darkest of Times may have been more compelling as a purely narrative-driven experience. Despite some sleepy strategy sections, Paintbucket does an excellent job of connecting the authoritarianism of the past to the authoritarianism of the present. 🗣️



Review

Skellboy

A hero with no skin in the game

S kellboy's hero, Skippy, isn't so much a character as a group of parts. His skull, ribcage, and legs can be swapped for anything of similar size and shape, until there's nothing of the original left. The head of a fallen enemy replaces his own noggin, a bale of straw becomes a makeshift torso. To succeed in your quest, you mix and match identities, becoming whatever's required to get by.

It's a versatile idea. As you traverse the land, accosted by monsters, you'll grab parts that help you survive, such as the head of a plant that spits projectiles, a pumpkin body that adds armour padding, or a full set of zombie bits that allows you to walk among the undead. Or you'll don certain items to unlock the next path forward, such as putting together a princess disguise to gain access to the castle, or switching your head for a bomb to blow up a wall.

The changes knit together the action, which alternates between a gated overworld and interiors filled with traps and switches. There's a pleasing contrast between the two, as you slice your way through the creatures in the fields above, then carefully work through winding passageways below. And the way each new area loops back to previous locations, gradually linking the parts together, is admirable. It's not quite *Dark Souls*, but it makes the world feel singular and coherent.

Yet ultimately, the body and outfit swapping doesn't bring as much to the table as it might.

There aren't that many varieties, and mostly it's easiest to stick to whatever grants a decent health boost, unless you need a specific piece to advance. Combat, meanwhile, comes down to wafting some lightweight weapons around, and despite all the different types, there's no real tactical element to consider.

The game's retro presentation also does it no favours. Incessantly repetitive chiptunes recall a part of gaming history that's best left there, while the distinctive visual style, with its pixel art characters mounted on wooden boards in 3D

landscapes, is crudely drawn and indecipherably blocky up close. When it shows off some depth and detail in the outdoor sections, it's spoiled by jolting pauses as each

chunk of scenery loads in.

Most damningly, the combination of style and perspective takes the precision out of your actions. Foreground objects obscure the view, and the minimal animation makes your movements feel clumsy. Basic platform tasks and battles become needlessly tricky as you struggle to gauge distances and manoeuvre awkwardly in tight spaces.

With these frequent moments of frustration and nothing really game-changing to discover, it's hard to find much incentive to explore. Skippy's laborious walking speed doesn't help there, either. In his defence, he's a rough construction of simple parts that functions adequately but isn't a pretty sight. In that sense, the game suits him rather well. **W**

HIGHLIGHT

There are times when the cardboard construction of the world is incorporated into play to good effect, such as when you work your way behind a fireball-spitting statue and render it harmless by shoving it flat on its face. Pushing two-dimensional cows over is also fun.

▲ Conversation with NPCs is played for laughs, which mostly boils down to a load of strained puns.

Info

GENRE
Action-RPG

FORMAT
Switch

DEVELOPER
Umaiki Games

PUBLISHER
Fabraz

PRICE
£18.00

RELEASE
Out now

REVIEWED BY
Jon Bailes

VERDICT

A scruffy adventure that doesn't fully capitalise on some decent ideas.

47%

Rated
Review

HIGHLIGHT

The game's art is a real strong point. Though its locales vary from the everyday to the magical, there's a coherence tying everything together. This is only enhanced by *LUNA*'s fantastic hand-crafted animation, which brings its characters and world to life.

Review

LUNA The Shadow Dust

Rising out of a crowded field

^ Though it lacks any words or dialogue, the game does have cutscenes throughout, which tell its story visually.

Info

GENRE

Adventure

FORMAT

PC (tested) / Mac
/ Linux

DEVELOPER

Lantern Studios

PUBLISHER

Application
Systems
Heidelberg,
Coconut Games

PRICE

£16.99

RELEASE

Out now

REVIEWED BY

Paul Walker-Emig

VERDICT

A cosy and confident
point-and-click puzzler.

74%

Long-time perusers of the world's PC digital storefronts will know that these places are far from shy of indie point-and-click adventures that are, you know, *fine*. I'll be honest: I was expecting *LUNA The Shadow Dust* to be yet another of these *very OK* puzzlers. I was delighted to discover that I was wrong.

The game begins with a child falling from the sky and landing at the base of a huge tower. The reason is revealed as you progress towards the game's climax, but your goal from the outset is obviously to get to the top. Each room of the tower is a self-contained puzzle – there are no items to pick up – that you must solve by switching between the child and a cat-like companion you meet early on. There's no text or dialogue in the game, so there's often a bit of experimentation needed to work out what you need to do and how you should go about achieving it, ensuring that there are lots of satisfying little eureka moments. There's nothing groundbreaking about *LUNA*'s puzzles, but they are nevertheless well designed and varied, and the game gets good mileage from its character-swapping mechanic. Every time I thought it was settling into a rhythm, it would come up with something new: the idea of your cat companion being able to leap into the realm of shadows or a season-swapping dimensional door.

What I really like about the game, however, is much more intangible and difficult to articulate. That is, the feeling it evokes. Through its music, its art, its animation, and its storytelling, it

creates a gestalt of sentimental cosiness. In that sense, it is reminiscent of the films of Studio Ghibli. They are clearly an inspiration for *LUNA*'s beautiful art and, unlike many other games that have also employed that style, it manages to capture something of the spirit of those films: that homeliness; that sincere kindness; that bittersweet sensation of nostalgia; that aforementioned gestalt of sentimental cosiness.

The argument here isn't that *LUNA* is as 'good' as a Ghibli film, rather, that it resonates in similar ways. It cushions notes of sadness in affability and warmth, making it a pleasant place to inhabit and generating plenty of affection in its favour.

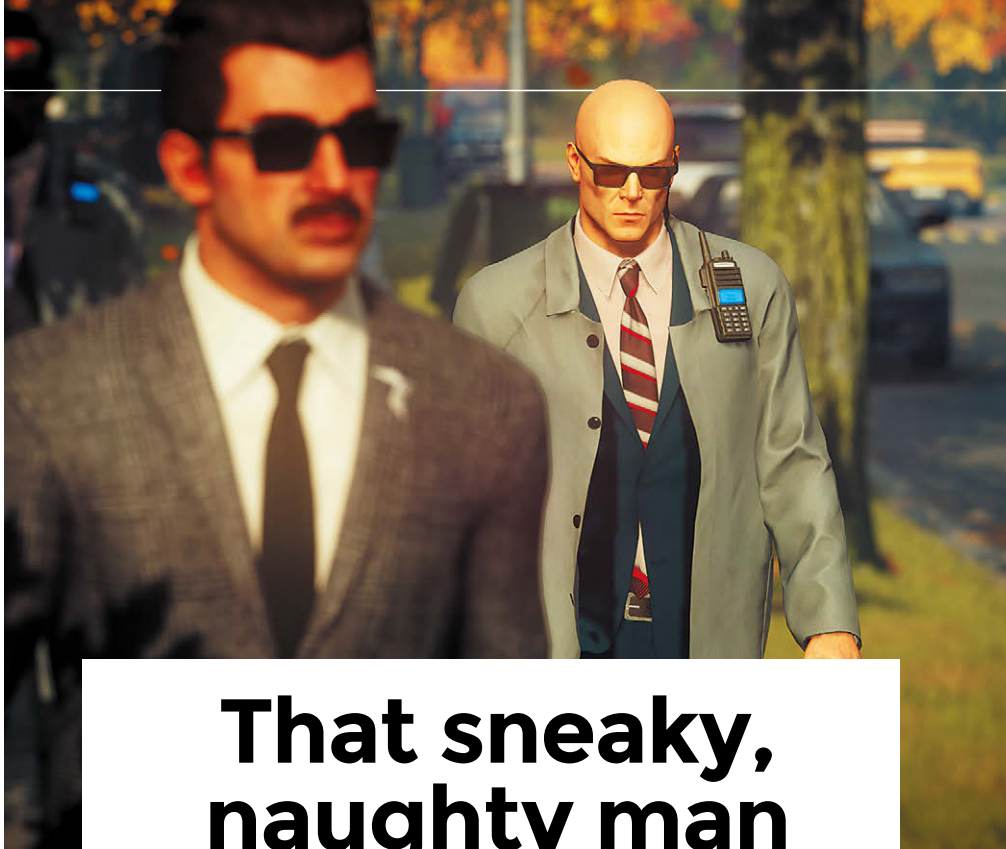
LUNA delighted me on many occasions – with a stunning flash of colour from stained-glass windows, the scale of a wonderful magical library, a moment of insight that allowed me to penetrate the logic of one of its character-swapping puzzles – but I'm not going to claim it's going to shock you with anything revolutionary. There are no grand claims to be made about it 'pushing the genre forward' or anything of the sort. But who cares? It's a good adventure game and a lovely place to spend a few hours. 🐾

^ The rooms of the tower range from functional, to cosy, to magical.



^ That instrument lets you clone your little cat companion – and who among us can truly say we wouldn't want multiple versions of that chunky little cutey?





That sneaky, naughty man

Hitman 2 puts a lot into its story; Ian wonders why

It felt overwhelming: these massive levels full of all manner of different approaches, where you could succeed in a dozen different ways and fail in a few dozen more, all backed by a vague cynicism you only find in European-made games. The *Hitman* series is a personal favourite, and *Hitman 2* seemed like it would be the pinnacle – at least until the inevitable sequel – ramping all those dials up a number past where you’d usually expect them to stop. But that was the problem: it’s too much. I don’t have time. There are other, less daunting things to be getting on with.

I’m sure we’ve all been there, increasingly so as you get older: there isn’t enough time to play everything, even the stuff you know you’ll love. As such, it did take me over a year to actually bother starting up the latest wacky adventures of Agent 47 and his rubber duckies. But I got there. I’m in. I’m working my way through things, trying to take it as slow as I always do, on the path to that oh-so-wonderful sense of achievement on landing a Silent Assassin rank for completing a level nigh-on perfectly. It’s great, I love it, I wish I’d started sooner.

And yet. What’s with all this focus on story? I know it’s always been there – I’ve been knee-deep in the series since the first time a game called *Hitman 2* came out, all the way back in 2002, and there’s always been the mystery of Agent 47’s origins, his ever-growing friendship

with handler Diana, many international conspiracies and everything else. But this time around, I’m actually finding it quite grating.

Is it the fault of the game? Absolutely not. It’s the fault of life. It goes back to that delay – that need to get on with other things in life before settling in to something seriously meaty, that you know you’ll love. I took time getting there, and when things felt right I dove right in, knowing what I wanted. That being: playgrounds of pain, sandboxes of surreptitious behaviour, and... courtyards... of clandestine dealings. Story?

Pah! I don’t have time for that nonsense, even if I did before.

What has *Hitman 2* done wrong? Why am I so *enraged*? Well, it hasn’t done anything wrong, and it’s not rage – it’s just a frustrated jab of the skip

button every time more exposition rears its head. I no longer want to know the whys and hows of a particular mission. I don’t care about the needs of the people behind these things, I just want to get in there and figure out how to murder someone in the best way. Or the most efficient way. Or the funniest way.

So yes, video games in isolation don’t make you violent, that’s a given. But combined with age, a lack of time, and the desire to just *get on with things*, they do seem to have made me a remorseless killing machine, bereft of a need for any reason as to why these folks need to die.

Touché, *Hitman 2*. 🗡️

“Story? Pah. I don’t have time for that nonsense”

Wireframe Recommends



Dishonored

PC, PS4, XBO, MULTI

I can’t recommend the sequel as, well, I haven’t got around to playing it yet, even though I know I’ll love it. Sigh. Regardless, the first game is still a brilliant take on sandboxy murder.



Metal Gear Solid V: The Phantom Pain

PC, PS4, XBO, MULTI

It’s been recommended on these pages before, but it’s worth repeating for this particular tie-in: the sandbox freedom offered in *MGSV* is absolutely, unquestionably, magnificent. The game is a pittance these days. Buy it.



Sniper Elite 4

PC, PS4, XBO

A sandbox gem that flew under the radar for many on release in 2017, *Sniper Elite 4* offers an organic level of freedom that’s utterly intoxicating. Oh, and massive gun-based violence too, of course.

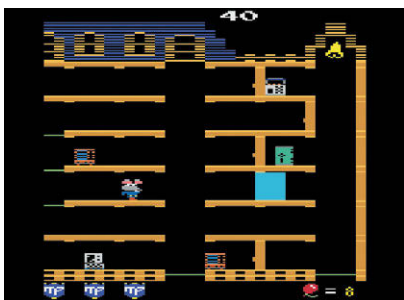
Backwards compatible

WRITTEN BY RYAN LAMBIE

Super Scaler

Anyone who suffered through the lumpen, austere driving of *OutRun* on the ZX Spectrum will recall that, in the eighties and nineties, home conversions of much-loved arcade games could be a decidedly hit-or-miss affair. In recent years, though, we've seen developers and hobbyists make old computers and consoles do things that might once have looked impossible. In the Amiga scene, for example, a collective of Finnish multimedia artists called dA JoRMaS has made a 'proof of concept' port of Sega's 1985 arcade racer, *Hang-On*, running at a silky smooth 50 frames per second. "In theory," the collective writes on its website, "the Amiga hardware is a reasonable fit for a racing game of the era, with the dual playfield mode giving good control over the race track and the objects on top."

Certainly, the results are a lot smoother than the fun yet somewhat choppy Amiga port of the game's sequel, *Super Hang-On*, programmed by Zareh Z.K. Johannes and released in 1988. That game was, admittedly, more complex than *Hang-On*, with undulating tracks and more roadside objects zooming past at any



one time, and dA JoRMaS are quick to point out that their demo is more of a technical exercise than a serious attempt to make a finished game. Still, it's impressive stuff – you can take a look at all the sprite-scaling goodness for yourself at wfmag.cc/hang-on.

There's another superior arcade port that caught our eye recently: *Mappy*. In 2018, programmer John W. Champeau released an unofficial Atari 2600 version of Namco's arcade classic – a feat we only



stumbled on recently after randomly finding a YouTube video of it. Given the restrictions of that four-decade-old console, it's a remarkably faithful rendition of the cat-and-mouse platformer – right down to its infuriatingly catchy

soundtrack. It's a spectacular-looking piece of work – certainly well in advance of some arcade adaptations we saw back in the Atari 2600's lifetime – and if you're interested, there are even physical copies available to purchase from AtariAge's website (wfmag.cc/mappy).





Prince-like

Over on Twitter, Brazilian developer Junior Correia recently unveiled his current work in progress: an isometric action-adventure simply called *Escape from Prison*. If the image accompanying this piece looks a bit like Jordan Mechner's original *Prince of Persia*, then wait until you see the game in action: you'll immediately recognise the smooth animation and the trap-filled dungeon built from austere stone blocks. The isometric viewpoint gives it a strikingly different look, though, and Correia says *Escape from Prison* won't be a straight clone of Mechner's game, with more features due to be added over the course of its development. You can see it in action at wfmag.cc/prison.



In memoriam

Some sad tidings to add to this edition's Backwards compatible: developer Kazuhisa Hashimoto, most famous for the Konami code, has passed away. The news was broken by Yuji Takenouchi, the composer who worked with Hashimoto at Konami in the eighties. Although it was popularised by the NES port of *Contra*, the Konami code first appeared in the adaptation of *Gradius*

for the same console, which Hashimoto developed in 1986. Hashimoto reportedly found the shooter so difficult that he added a cheat code to help him play through it – up, up, down, down, left, right, left, right, B, A, Start – then promptly forgot to remove the code before the finished game was shipped. And thus, a legend was born. Hashimoto, Wireframe salutes you.

Mystery of Zelda



Thanks to video game history and game preservation website GamingAlexandria.com, a small yet enduring mystery has finally been solved. Around the time of *The Legend of Zelda's* Japanese release in 1986, Nintendo partnered with instant ramen manufacturer Myojo Charumera to run a competition. The prize: one of 1500 special copies of the Famicom Disk System game, which carried a different label from the standard retail release. In the years since, however, rumours have circulated that it wasn't just the label that was different – the game itself had subtle changes made to it, too. After an ultra-rare copy of the promo disk was acquired (for \$1000), [Gaming Alexandria's](http://GamingAlexandria.com) Dustin Hubbard began combing through its data to see whether there were any differences



between it and the regular version of the game – you can read about this detective work in full at wfmag.cc/ramen.

It turns out that both versions are, well, identical. It's a disappointing anticlimax, but the Charumera mystery was at least worth a careful investigation – especially given that altered, promo versions of games were by no means unknown in mid-eighties Japan. In 1986, ramen firm ArchiMENdes gave away limited edition copies of Konami's *Gradius*, in which all the power-up sprites were replaced with cartons of noodles. Like the *Zelda* promo disk, these ramen-themed *Gradius* carts are now sought-after collector's items. 🍜



Dragon Breed

Here be dragons – and a neat mechanic that surely deserves further development

IREM / 1989 / ARCADE

The rapid and noisy proliferation of shoot-'em-ups in late-eighties arcades left developers with a major problem to solve: how could they make their game stand out from the crowd? Japanese firm Irem, who'd helped trigger the whole shooter arms race with 1987's *R-Type*, came up with a better gimmick than most in *Dragon Breed*. You controlled a crossbow-wielding warrior – named Kayus – who rode around on the back of a limbless, fire-breathing serpent. (Thinking about it, this could make *Dragon Breed* the first-ever game to be influenced by the 1984 children's fantasy flick, *The NeverEnding Story*, where its young hero soared around on the back of Falkor, the benign luckdragon.) While Kayus was vulnerable to attack, bullets and enemies positively rolled off the dragon, so you could use the beast's segmented tail as both a shield and a weapon – an idea other shooters had toyed with in varying ways, from the markedly similar *Saint Dragon*, developed by Jaleco, to Irem's own *X-Multiply*, with its ship protected by indestructible, whip-like tendrils.

Dragon Breed's real innovation, though, was the player's ability to park the dragon up and have Kayus jump off its back and walk around on foot, making the game something of a shooter-platformer hybrid. Admittedly, Sunsoft introduced a not dissimilar idea in its action title *Blaster Master* a year earlier on the NES, but that game's mix of on-foot sequences and tank

driving felt closer in style to one another – and more clearly delineated – than in *Dragon Breed*, where the act of controlling Kayus on the ground was markedly different from the freedom of zooming around on the screen on the back of the serpent.

The curious thing about *Dragon Breed* was that it barely explored the unique possibilities of its own concept; there were early moments that required you to disembark and snag handy power-ups on low platforms, then hop back on to continue your journey, but these were comparatively rare. Indeed,

take a look at some 'let's play' videos on YouTube, and you'll find expert players who can complete *Dragon Breed* without ever letting Kayus step off the dragon at all. It's as though Irem started off down one design path, started to get cold feet, and retreated

to the safer confines of a more typical arcade shooter.

This is an unusual Killer Feature, then: a kind of what might have been. The *Dragon Breed* we got was a rock-solid, playable shooter, but it could have been even more than this – a true hybrid that mixed the requisite monster slaughter with areas that only Kayus could clear on foot, or sequences that encouraged the player to repeatedly switch between human and dragon.

If any developers reading this, we're basically saying we're keen to play a shooter-platformer mash-up that takes the idea Irem dropped in 1989, and explore it to its fullest potential. Our thumbs are primed and ready. 🎮

“It barely explored the unique possibilities of its own concept”

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