OCTOBER 2019 NUMBER 6 A TECH PUBLICATION

palcotronic

OUR RETRO-HALLOWE'EN SPOOKTACULAR!



SCARY GAMES!

BUILD YOUR OWN SCREAMING JACK O' LANTERN!

TUT-TUT FOR ZX SPECTRUM

HAUNTED HOUSE BOARD GAME

GERBIL IN A MICROWAVE

MAY THE FORTH BE WITH YOU

+ MUCH MORE!

TERRIFYING TECHNOLOGY

A GALLERY OF MONSTERS & MONSTROSITIES


our turtles will amaze you
Explore a virtual 3D world created by turtles and code, a place of wonders where the only limit is your imagination...
paleotronic
microSpaces
microspaces.org
paleotronic

In the beginning, there was the void.



The void was black nothingness. Then, there was the pixel. It was white (or orange, or green) and there could be more than one of them (but all the same colour). When people decided to make games in the void (as they do), the void was interpreted as outer space. And so there were space ships and asteroids and aliens. So many aliens. The void was no longer empty. But the aliens would not rule over it for long.

Pixels became smaller, and there was more of them. They could be different colours too! While space games weren't going anywhere, they started to have to share the void with other types of games: maze games, platform games, racing games... but these games were still heavily reliant on their mechanics and light on style.

As video graphics became more and more sophisticated, so too did the content of those games and the presentation of that content. This gave them more of the flexibility previously only afforded to television and cinema, and opened the door to other genres that relied more heavily on their aesthetic – in particular, horror.

Working in tandem with spooky soundtracks and grotesque storylines, games that employed the horror milieu were able to tap into primal fears that lurked within their players, providing some of the best early videogaming experiences during a time when the technology behind them was still too crude to provide a truly immersive experience to genres such as racing or action.

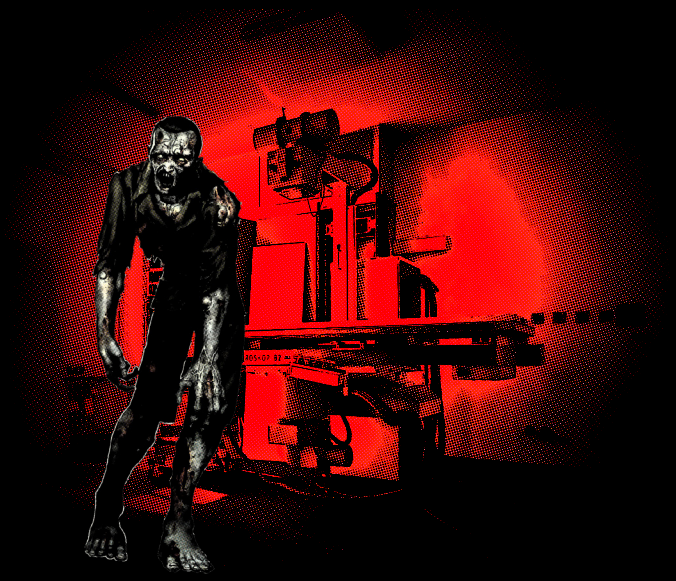
Fear is the ultimate human driver, and by exploiting our fears – in particular the fear of death – horror





the importance of the aesthetic. Just putting a hockey mask on your character and a chainsaw in his hands doesn't make your game good, if the rest of it is uninspired. It may still be horrifying to those who make the mistake of buying it, but not in the way you intended.

In this issue, we're going to take walk through our little hospital of technological horrors and peer through those little windows in the reinforced doors at a number of terrifying 'subjects', including several horror-themed videogames,



Previously we worked to dispel the notion that technology would eventually doom us all to a life of robotic servitude, robbing us of our creativity and reducing us to fleshy drones doing the bidding of a gigantic electronic machine, but given the theme of this issue, we will choose instead here to amplify those fears, looking

games have the power to more easily disarm our disbelief and make us more invested in the fate of the game's protagonist. This also means we will put more money in the machine, or buy the software in the store, which makes the genre attractive to those hoping to make a fast dollar.

But when the aesthetic is everything, it can also be tricky to pull off properly. By no means was every horror-themed game a success, although those failures can almost universally be laid at the feet of lazy developers who failed to realise



some of which are scary-good, and some of which are just scary.

However, games are not the only frights to be found in our hospital.



WELCOME TO PALEOTRONIC'S

back at techno-horror movies and the dystopian futures they predicted.

If these movies are to be believed, maybe the robots _are_ coming to kill you, after all! Or at least enslave you.

But not all technological horror is found in fantasy – there are some real-world terrors, such as the microwave (scourge of gerbils), the electric chair and electro-shock therapy, the latter of which is a





common treatment for recalcitrant inhabitants of our hospital of horror – whether they need it or not.

Would you like to give it a try?

You might prefer it to spending time with the Virtual Boy or Windows Millenium, both of which have a place in this issue, for being terrifyingly terrible. If you're not careful, you could be forced to play Atari 2600 Pac-Man!

Some of our inmates also include the unloved and unwanted – 8-bit computers that never found a home, and went insane!

They while away their time with failed consoles such as the Atari 5200 and the Commodore 64GS (the latter just a poor helpless computer who had its keyboard surgically removed!), and mourn their pitful existences in the company of the Capactitance Electronic Disc – a video 'record' that went head-to-head with the VCR and lost, horribly.

There's zombie turtles, a brand-new ZX Spectrum action-puzzler featuring mummies, a computerised trivia board game that takes place inside a haunted house and more, so wander our halls and see what lurks within. You may never leave!



HOSPITAL OF HORRORS

0 Patient Zero

5 A Nightmare on Retro St.

10 Frightening Futures

15 The Horrors of CED

19 A Terrifying Trio of Movie Games

23 Gadget Graveyard: The Virtual Boy

27 More Tricks than Treats

31 Loading Ready Run... for your life!

35 Haunted Emulation Station

36 Point and Click: Windows ME

39 Rabid Arcade Rats

43 The Probe Shock

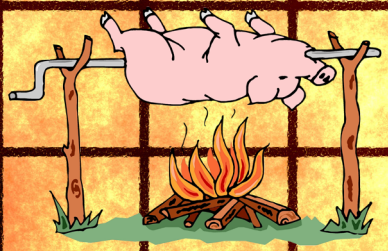
44 Heavy Duty: Electric Chair

45 Radio Death Rays: Gerbil in a Microwave

















PALEOTRONIC

49 The Vampire's Inn: Castlevania

55 Tut-Tut: Mummies Haunt the Spectrum

61 Chip to be Scared: BBC Radiophonic Workshop

65 Electronic Funeral Music: Hammond

67 The Cursed Toy Store

69 No Carrier: The Scary 80s

71 Piracy In Print: Hardcore Computist

73 The Demon of Doom

75 Bringing Disks Back from the Dead!

80 Back in the Slay

81 Radio Ghost Stories

83 May the Forth be with you

85 microM8 Update: Zombie Turtles!

88 The Haunted House of Retro

95 The Oregon Trail of Death!

101 Android Nightmares: The Case of the Portable Computer

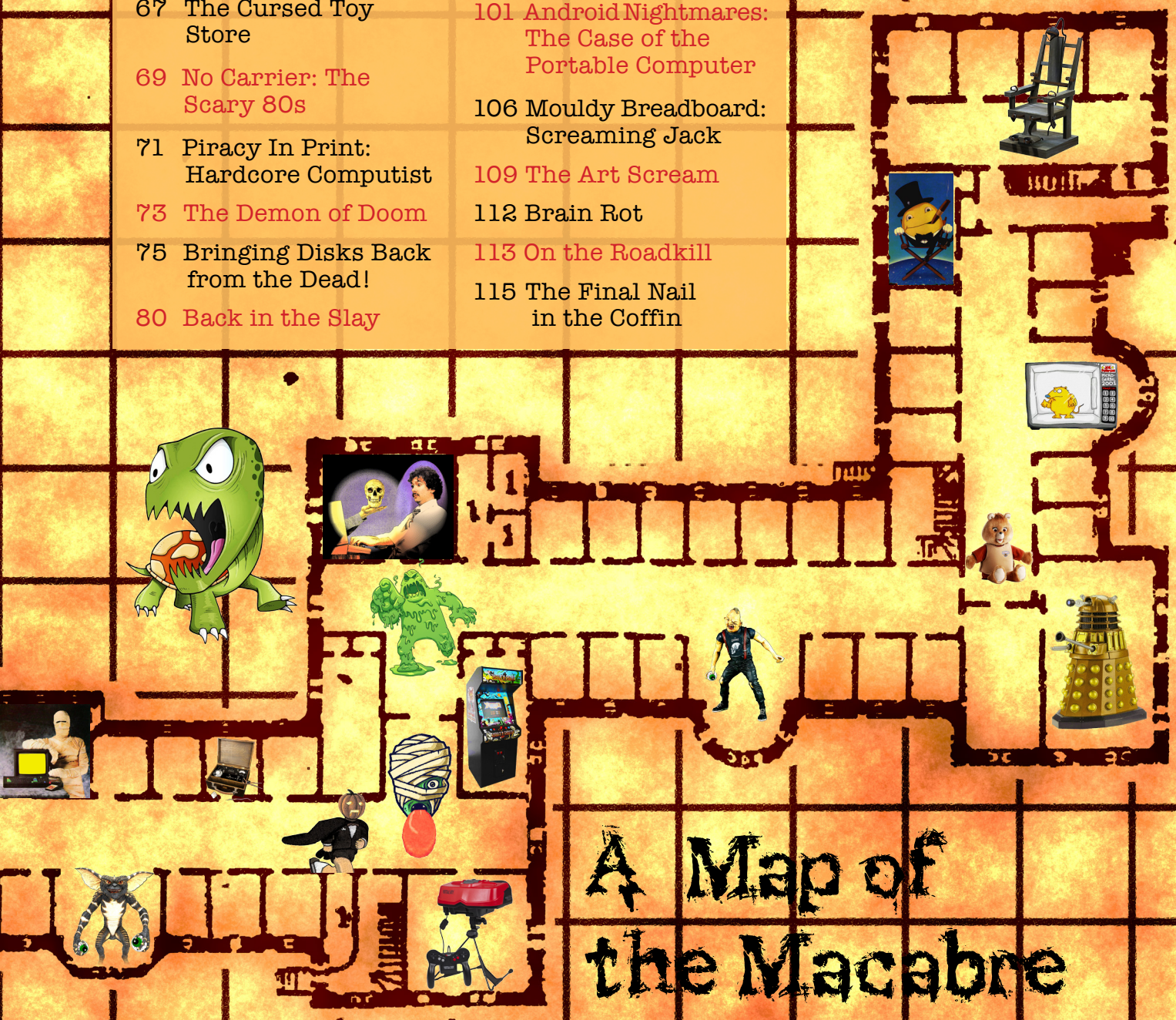
106 Mouldy Breadboard: Screaming Jack

109 The Art Scream

112 Brain Rot

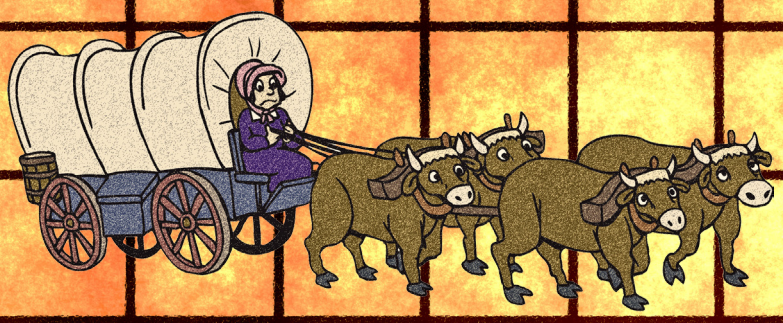
113 On the Roadkill

115 The Final Nail in the Coffin



A Map of the Macabre





A SYLUM

A NIGHTMARE ON RETRO ST

HORROR AT HOME

People love to be scared, and the forms of media we consume reflect that. From Mary Shelley's novel, Frankenstein to Capcom's Resident Evil series, audiences have actively sought out fear in its various incarnations. It's a little bit silly when you think about it...



Though games such as Codemaster's Ghost Hunters provided 80s gamers with pixelated horror, hardware limitations meant that they were unable to provide a fully immersive experience. It was the 486 era that bought about a new age of PC gaming. Higher resolution graphics and quality CD audio brought about a new age of digital entertainment, and with better quality games came better quality scares!

1992 saw the release of the Lovecraft inspired Alone in the Dark (AITD) by Infogrames. Taking full advantage of the new hardware, this horror themed adventure created an immersive experience for the time. With the player taking the role of protagonists Edward Carnby or Emily Hartwood, AITD entertained the notion of diversity in gaming years before it become a controversial talking point.



The game required a powerful CPU to move the polygons around as you scoured the mansion, searching for a piano. As you enter the mansion the door shuts and the monsters emerge from the shadows, doing











their best to ensure your life does not meet its natural conclusion. Initially you are forced to resort to hand to hand combat, though weapons can be found scattered throughout the rooms.

The changing camera angles can take some getting used to. You have no control over them, but you learn what works in specific rooms very quickly. This can cause problems with the monster fights, though the puzzles are manageable. With that said, many of them are quite tricky and will take some thought before you can solve them.

AITD is not the fastest moving game around, moving at a relaxed, yet cautious pace. When confronted with enemies your heart races as you forget about the spooky mansion and focus on the action. It is only once you have despatched the monsters that you realise the potential horrors that lay ahead, leaving with a constant feeling of unease.

The opposite could be said for iD Software's most famous game, Doom. Released a year after AITD, this first person shooter moves at a relatively fast pace, requiring you to shoot at and weave through hordes of monsters as you venture down to hell itself.

The plot is hazy and inconsistent depending on where the information is sourced from. One of the generally accepted stories is that the main character is called Corporal William Blazkowicz III, though he is commonly referred to as "Doomguy". This potentially ties the game into previous iD titles such as Wolfenstein 3D (in which the protagonist has the same surname) and Commander Keen (featuring Billy Blaze). Allegedly the manual does not name the protagonist at all, leaving him as a blank avatar for the player to inhabit.

From there, most reports state that Doomguy was stationed on Mars for assaulting a senior officer who ordered him to fire on civilians. During an experiment on inter dimensional travel a swarm of monsters from hell overrun the base, killing all they encounter or turning them to zombies. Help arrives but is shortly defeated, leaving Doomguy as the only survivor of the attack.

This highly advanced version of 3D Monster Maze will see surprises and shocks around every corner, from devoured corpses to some of the most horrific beasts you will ever see lying in wait for you. For those users still using 386 hardware the screen could be resized to speed up the action, allowing those who have yet to upgrade the opportunity be scared and horrified.

The monsters from hell vary in size and shape, from demon-like imps to spherical cacodemons. Pixelated blood sprays from them, and upon death they fall apart in gory fashion with accompanying death grunts. While it is not the scariest game in this feature it is definitely one that can force you to jump out of your chair in shock.

Doom was followed by Doom 2, Ultimate Doom and Final Doom in 1995. The latter was a misnomer as 10 years later Doom 3 was released by iD Software and the sequels keep on coming with Doom Eternal due for release in late 2019.

Even with these high definition sequels, the original games continue to be played in all their pixelated glory. The Doom modding community is as popular now as it has ever been, with fan creations being available on websites such as Doom World (www.doomworld.com). Many of these feature altered graphics and maps that can break all the rules. These mods cost nothing, allowing Doom fans a potential lifetime of free gameplay.

Two years after the release of Final Doom came 'Blood', another first person horror title from Monolith Productions. Using an enhanced version of the engine previously used for Duke Nukem 3D, Blood allowed players to explore a 2.5D maze. This provided the game with more scope than the aforementioned Doom, which was limited to a strictly 2D map.

The second game in the series acknowledges that the events of Blood take place in 1928. Like Doom, the backstory to Blood appears to be have been somewhat of an afterthought. Former cult leader, Caleb, finds himself mysteriously returned to life after an untimely demise. Naturally he is out for revenge and to find out why he was killed in the first place.

The enhanced engine used by Blood allows for more detail and additional gore. Like Mortal Kombat, the graphical violence is highly exaggerated in places, and 'Blood' certainly earns its name through the excessive use of the red substance. While the killing style of Doom is relatively simple and the animations the same each time you kill a cacodemon, for example, Blood allows you to be more creative when despatching your enemies.

Heads can be blasted off, bodies can be burned and holes appear in enemies that are shot. You can occasionally find an item that allows you to wield two weapons at the same time, allowing for additional car-













nage. When you do not completely destroy a monster you might see its body twitch upon death. It really is the little details that make all the difference.

As you progress through the game you can feel the layers of atmosphere that combine through the graphics, music and level design. The game feels more '3 dimensional', with monsters popping out of the screen and causing varying levels of shock in gamers. The music is moody, rather appropriate for the horror themed levels. The sound effects have been upgraded from the grating, low-fi screams found in Doom. Monsters will roar to intimidate you and sound like they are in pain when shot. The atmosphere makes for some intense gameplay through the difficult levels. It should be noted that Blood is not an easy game to complete, so expect many deaths as you work through the levels.

With the enhanced game engine, Blood can allow portions of the map to overlap letting players venture to rooms that are on top of existing rooms. Levels can twist and turn in the most unpredictable manner. In an earlier 3D game like Doom you know where the walls are, and you know there is no way to go through them. With the extra dimension in map design Blood keeps the player guessing and makes hidden rooms much more difficult to pinpoint.



As well as first person shooters, the late 90s saw a boom in third person titles such as Mario 64 and Tomb Raider. Naturally horror themed games were coveted by fans of the genre, and Konami met the demand with Silent Hill.

The game sees exploits of Harry Mason, a man on holiday with his daughter. Their plans for some time away end up in disaster as the duo end up in a motor vehicle accident, leaving Harry unconscious. Upon waking up he finds his daughter missing, so he ventures into the nearby town of Silent Hill to see if she made her way there. Few people can be found, but monsters are plentiful. Harry must find a way to save his daughter and discover what has caused these demonic creatures to appear



Unlike Doom and Blood, Silent Hill focuses less on action and more on the fear factor. If you are looking for that 'jump out of your seat' scare then this is the game for you. Not bad for a game that has not aged particularly well graphically! Silent Hill contains a few elements of another Konami classic, Metal Gear. You can combat your enemies, but you are far better off sneaking up on them and doing them in without them

even realising you are there. You are encouraged to use the darkness to your advantage, leaving the flashlight off and clobbering anything that is not human.

Solving puzzles is key to Silent Hill, and many of them will keep you guessing for a while. Well, that is those of you who do not just visit GameFAQS and find a play guide. Many of the puzzles feel like 'Legend of Zelda-esque' side quests, though most are required to progress through the game.

Silent Hill is brutal, both in terms of its content and gameplay. You need to keep your wits about you, as killing monsters may not be the best way forward. Resisting the urge to use your weapons means you have more equipment available to you when you reach the eventual boss. There is a frustration factor attached to the game, so if you are not a fan of multiple deaths then maybe give this a miss. You will die, and often!

Silent Hill has spawned two sequels, a remake and a tie-in motion picture. So if you enjoy the first game there is plenty more where that came from. Recognised as one of the greatest games of all time, this Konami classic is definitely worth a play through at least once in your life.

These four games feature varying degrees of horror, allowing retro gamers to pick their level of shock value when considering what to play over Halloween. Do you want the macabre horror of Silent Hill, or the 'house of horrors' feeling offered by Alone in the Dark? Maybe you would prefer something with a bit more action like Doom, or some over that over the top horror that can be found in Blood.

Whether you choose one of these four titles or something else, we wish you the happiest of Halloweens and hope you don't get too scared... unless you want to of course!












paleotronic



FRIGHTENING FUTURES

ISAAC ASIMOV'S THREE LAWS OF ROBOTICS:

1. A ROBOT MAY NOT INJURE A HUMAN BEING OR, THROUGH INACTION, ALLOW A HUMAN BEING TO COME TO HARM.
2. A ROBOT MUST OBEY ORDERS GIVEN IT BY HUMAN BEINGS EXCEPT WHERE SUCH ORDERS WOULD CONFLICT WITH THE FIRST LAW.
3. A ROBOT MUST PROTECT ITS OWN EXISTENCE AS LONG AS SUCH PROTECTION DOES NOT CONFLICT WITH THE FIRST OR SECOND LAW.

Realising that an entity of pure logic might pose a threat to humanity, science fiction author Isaac Asimov penned the above three laws for robots... they seem sensible enough, but what if, when the time comes, these laws are ignored?

What if the robots rebel?

To begin, we need to start with 2001: A Space Odyssey (1968). Sure, Hal isn't a robot per se, but he basically controls an entire space-ship so, close enough. He can still suck all the oxygen out of a room and watch intently as you suffocate. Dead is still dead!

But still, it's a bit scarier when the computers are mobile, in a chasing-after-you sense. So let's move on to Westworld (1973) – a theme park of sorts where humans can freely abuse the robot inhabitants. Well, you can guess that the robots aren't going to take that sort of treatment forever! They don't, and mayhem and murder ensues (although in the original movie, not the HBO remake, this is simply blamed on some sort of robot virus... yeah, okay, we can see why HBO changed that a bit). Anyhow, fun times.

Back out in space, there followed The Black Hole (1979) – this 'kids' film featured a killer robot named Maximillian, who would happily chop up humans for general amusement. In the end (spoilers) Maximillian goes to Hell – literally. This is a Disney film? Whoa. Apparently Disney ordered a script for a remake earlier this decade and shelved it because it was too dark! The writer was like, "this is The Black Hole, right? What did you expect?" Kids scarred for life!



BLADE RUNNER



1982 brought the world Blade Runner. Based on Phillip K. Dick's novel Do Androids Dream of Electric Sheep? (1968), Blade Runner is set in a dystopian future Los Angeles of 2019 (hey, wait…) where synthetic humans known as 'replicants' are engineered by evil corp. Tyrell to slave away in off-world colonies. But when a group of them, led by Roy Batty (Rutger Hauer, left) escapes back to Earth, it's left to former cop Rick Deckard (Harrison Ford, right) to hunt them down. Deckard used to be a 'blade runner', someone whose job is to hunt down replicants and 'retire' them. One of the replicants has infiltrated Tyrell and shot another blade runner, and there are worries that more mayhem may be in the offing.

Blade Runner is a slow film that questions what it is to be human – questions are even raised about Deckard's humanity, both figuratively and literally!





There were two killer robot movies in 1984 – one famous and one not-so-famous. Let's start with the not-so-famous one: Westworld writer / director Michael Crichton returned with a flick called Runaway, about a cop (Tom Selleck, of Magnum PI fame) whose job is to deal with malfunctioning robots (Runaway is set in a parallel world where robots become common by the mid-1980s). But one day he encounters a robot purposefully programmed to kill, and uncovers a conspiracy to create an army of killer robots. Oh my!



The other was:

THE TERMINATOR

which is kind of the grandpappy of killer robot movies.



You can say what you like about Schwarzenegger, but The Terminator wouldn't have been quite the same had it been played by someone else – he nails big, dumb and single-focussed to a tree, then carves it up like a Jack O'Lantern. He's one scary dude, who does scary things to kill his target: Sarah Connor, whose son John will, in the future (he's a time-travelling robot, even?) cause all sorts of trouble for Skynet, an artificially intelligent defense computer network in charge of all the nukes that has taken the Earth over with robots that are systematically eliminating its organic inhabitants. Anyway, the Terminator, model T-800, has been sent back to kill her, but she ain't having it!





With the help of Kyle Reese (Michael Biehn, left), Sarah (Linda Hamilton, right) flees from Arnie – for a while, at least.

Made for a mere US$6.4 million, The Terminator would make close to US$80 million at the box office, ensuring a sequel:

TERMINATOR 2 JUDGMENT DAY

because Skynet has a time machine, and plenty of Terminators, so it just sends back another one – except this one is more advanced, because technology in the future keeps marching along. Time has also marched along in the past, so this time it's a young John Connor it's after. But the rebels have sent back an 'old' T-800 to protect him. So Arnie's a good guy this time! With more punch lines.



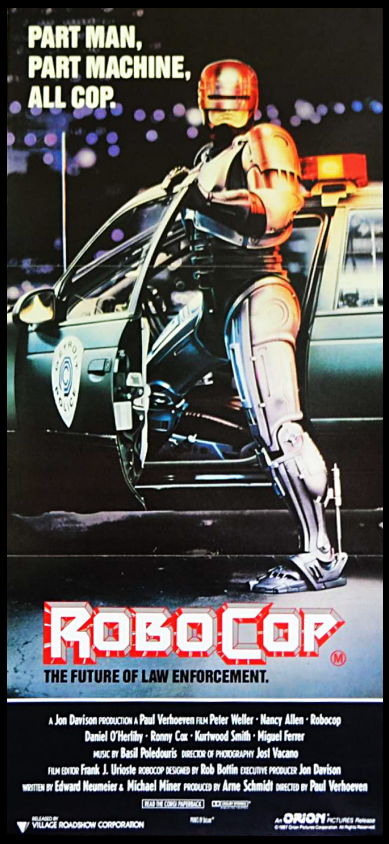
The robots even invaded the 80s teen horror genre in 1986's Chopping Mall, a comedy wherein a young group of shopping mall employees stay late to party, but are unaware of the new 'high tech' security system the mall's owner has installed, featuring roller shutters over all of the exits, and three robots, equipped with tasers and tranquiliser guns, which are programmed to apprehend thieves using all means at their disposal.

As the teens have their fun, a lightning storm rages outside. Lightning strikes the mall and damages the computer that controls the robots; the robots then kill a janitor and some technicians before roaming the mall, aiming to kill anyone they encounter. Fun times.

Originally released as Killbots, it didn't do well at the box office – but then a janitor at the studio suggested Chopping Mall was a better name, and ticket sales improved somewhat. But it did much better on video.

Next stop: Detroit.





So, it's the future and Detroit is a hole. Crime is rampant and the streets are run by gangs.

One of these gangs kills police officer Alex Murphy (Peter Weller), who is subsequently turned into a cyborg by conglomerate Omni Consumer Products (OCP). They call their new creation RoboCop.

OCP has agreed to take over the police force in exchange for the right to redevelop part of the city into a gated community for the rich called Delta City. In addition to RoboCop, OCP also creates the ED-209 (right), a pretty dumb robot that has a bad habit of inadvertently killing people.

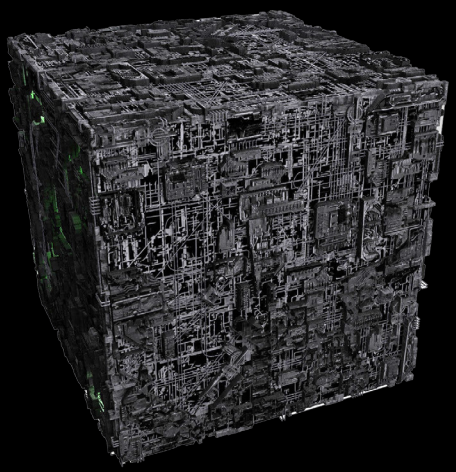


Anyway, despite erasing his memories, RoboCop begins to remember his previous life as Murphy, and tracks down the leader of the gang that killed him, who (surprise, surprise) reveals that OCP paid him to find a cop they could convert. RoboCop/Murphy is pissed!

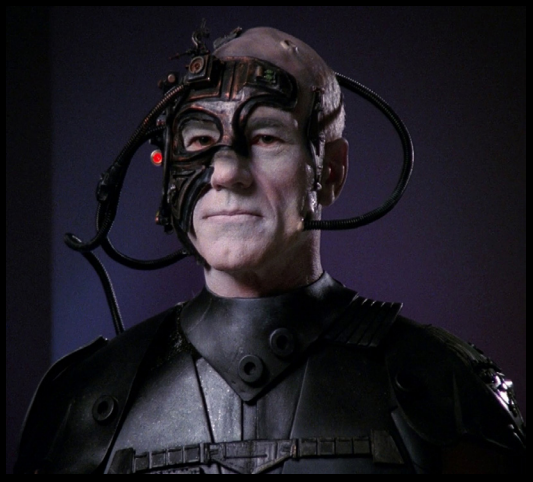
Lauded as one of the best films of 1987, RoboCop would spawn two sequels, a TV series and a remake.

"We are the Borg. You will be assimilated!"

1987 also brought the revival of Star Trek, Star Trek: The Next Generation. TNG featured the usual Star Trek baddies: Klingons and Romulans, but also brought in some new foes, most notably the Borg, a race of collective cyborgs that take over organic civilisations and convert their members into more Borg drones.



The Borg travel around in cubes, because cubes are cool, right? Anyway, our heroes have a number of tangles with the Borg, one of which temporarily led Enterprise Captain Jean-Luc Picard to experience what it was like to be a Borg first-hand (right).

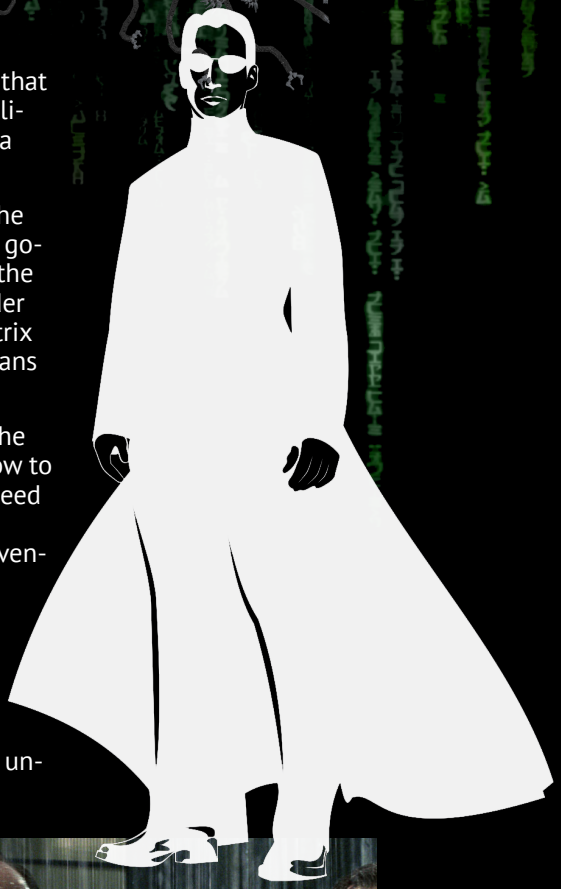


The Borg are a reoccuring villain throughout TNG and subsquent Star Trek spinoffs and movies, including Star Trek: First Contact (1996).

"Resistance is futile."

STAR TREK
THE NEXT GENERATION

THE MATRIX



Fast-foward to 1999 and you'll encounter The Matrix, the Wachowski siblings' science-fiction masterpiece. The core concept of The Matrix is that humanity is trapped inside a virtual reality created by an artificial intelligence that has enslaved them in reality, using their physical bodies as a power source.

A computer programmer, Thomas Anderson (Keanu Reeves), known in the hacking scene by his alias Neo, begins to suspect something strange is going on with his reality, and he pursues mysterious online mentions of "the Matrix", eventually leading him to Morpheus (Laurence Fishburne), leader of a group of rebels that fight back in both the virtual world of the Matrix and the real world, a barren wasteland ravaged by a war between humans and artificially intelligent machines.

Morpheus brings Neo into the real world in order to help him defend the last city of free humans, Zion, from destruction. He also teaches Neo how to manipulate the Matrix so that he can perform extraordinary feats of speed and strength inside of it. The ease at which Neo adopts these abilities leads Morpheus to suspect he is "The One", a human prophesiesed to eventually free humanity and end the war.

But to do this, he has to battle the AI both inside and out: inside the Matrix he faces the Smiths, a series of clone 'agents' who are as powerful as Neo is, and will do anything to eliminate the threat he poses.

Outside, there are the Sentinels, octopus-like robots on a perpetual seek-and-destroy mission, whose object is to eliminate all remnants of unenslaved humanity from the face of the Earth.

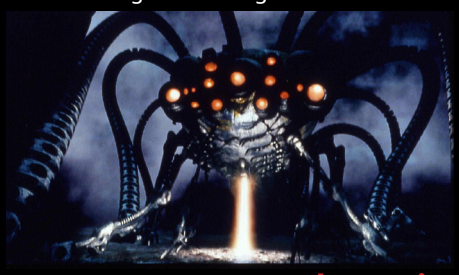
To save themselves and defeat the AI, Neo and crew will need to wake up all of humanity to its predicament – a process that (spoilers!) will take a couple more movies.





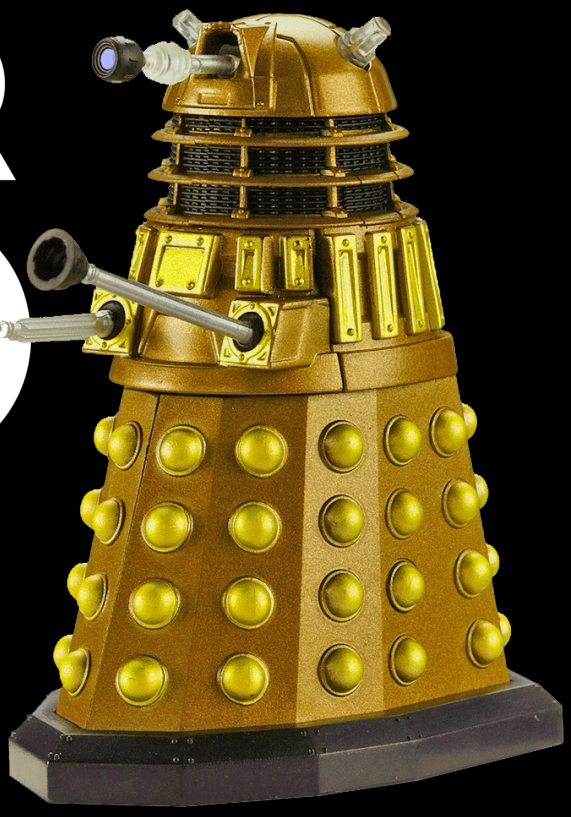
The Matrix was extremely successful both critically and commercially, grossing US$463 million worldwide but only costing $63m to make. Some critics have described it as one of the greatest science-fiction films of all time, and the most influential movie of its generation. However, its philsophical undertones have been underlooked by many viewers, some of whom have described the film as pretentious and "overlong, high-concept hokum". In any case, The Matrix portrays a sufficiently nightmarish world of robots-gone-wrong to earn a significant place in our gallery of technological futures we would rather not have any part of.

There's just one more stop, the planet Skaro...



DOCTOR WHO

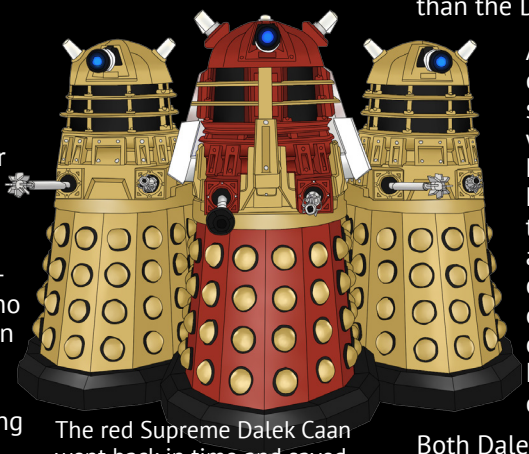




We save, arguably, the best for last. The British science-fiction program Doctor Who has featured a number of villanous aliens during its 56 years of slightly on-and-off existence, but there are two particular baddies that have made regular appearances on the show: the Daleks, and the Cybermen.

The creation of Doctor Who writer Terry Nation, the Daleks first appeared in the show's second story, which began airing in late 1963. Nation wanted an alien enemy that was more than a simple 'man in a suit', one that had no legs. Designer Raymond Cusick was given only an hour to come up with the Dalek's design, which he based on a man sitting in a chair (something that would become more apparent in the presentation of the Dalek's leader, Davros). Nation said that the name Dalek simply "rolled off his typewriter", in any case, their creation would go on to a long life of infamy, appearing in dozens of Doctor Who episodes, comic books, stage plays, movies and more. Daleks are more recognisable worldwide than the Doctor him (or her)-self!

The Cybermen, meanwhile, are a race of cyborgs, technologically augmented humans who 'convert' others into Cybermen against their will. They first appeared in 1966; the Cybermen were created by Dr. Kit Pedler (the unofficial scientific advisor to the show) and story editor Gerry Davis. In some Doctor Who stories, the Cybermen originated on another planet, in others, a parallel version of Earth. In either case, they're still scary customers! Getting exterminated by a Dalek is a more appealing fate to getting sliced-and-diced into a Cyberman yourself. And so the Cybermen appear in Doctor Who often.

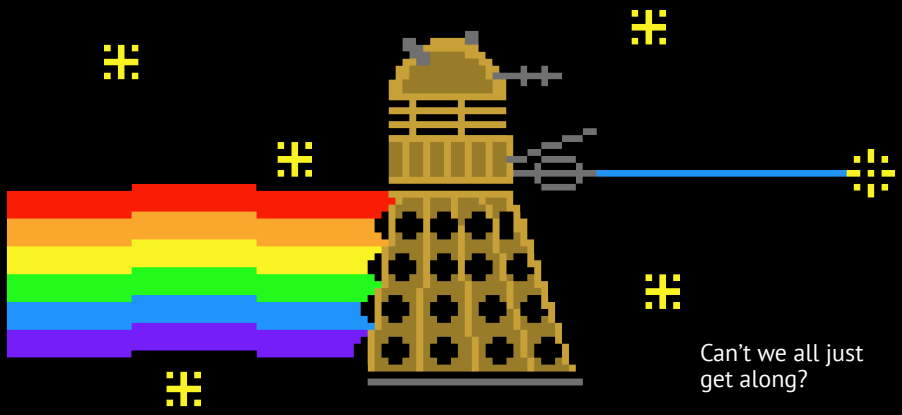


The red Supreme Dalek Caan went back in time and saved Davros from the Time War with Gallifrey, then created a new race of Daleks.

A Dalek is actually a mutated Kaled (a creature native to Skaro) in a robotic suit, a product of a thousand year war with another species, the Thals. Daleks have no personality, beyond an utter hatred of any other lifeform, which they see as a potential threat to them and must be "exterminated", the Daleks' catchphrase. They are conditioned to obey the orders of their superiors without question, and are easily provoked. Not something you want to meet in a dark alley!

Both Daleks and Cybermen are the result of technology being used to adapt an organic species for conditions that they are otherwise unsuited for: the Daleks for war, and the Cybermen to survive a harsh life in space. While these portrayals are designed to shock and frighten, there's no denying the potential for technology to advance the evolution of the human race.

However, cyborgs and artificially-intelligent robots pose interesting questions about the future that may not be answered until after we're deep into their existence – do cyborgs maintain their humanity, or will they lose it to their techological components? Can robots develop sentience and by extension empathy? Will either consider unaugmented humans to be inferior, a waste of resources, or a potential threat that needs to be eliminated? Or will they become caretakers of humanity, recognising the value of its pure form?



Can't we all just get along?

THE HORRORS OF CED





Much like Dracula, this Capacitance Electronic Disc (CED) player has seen better centuries! But that's what happens when your manufacturer abruptly discontinues your format and nobody makes any more discs for you to play... you become unwanted very, very quickly, and left to languish in dark places...

While Asian manufacturers were feverishly working on perfecting videotape, American RCA was working on a videodisc system – not a laserdisc system, which did not contact the surface of the disc, but instead a system similar to a phonograph record, where a needle sat in a groove carved into the disc.

RCA first began researching a method of recording video on to a disc in 1964, however they didn't devote a lot of resources to it and with only four people working on it development was slow. But by 1972 the team had produced a prototype disc system capable of holding 10 minutes of colour video.

The system worked by making the disc conductive – that is, electricity could pass through it. The video signal is stored on the disc by varying the depth of the grooves to correspond to the waveform of a frequency-modulated (FM) video signal – similar to a broadcast television signal. A diamond stylus sits in the groove, a metal electrode attached to it. The capacitance (that is, the amount of electrical charge necessary for current to pass from the disc to the electrode) is measured, and because this varies based on the depth of the stylus in the groove (the higher it is the more charge is required) a signal can be reconstructed.

This system was dubbed 'Capacitance Electronic Disc' or CED.



CED encoded the video signal on a disc, much like an audio record, but up and down instead of side-to-side, and with much finer grooves.

While LaserDisc used a laser to read discs, which meant there was no contact with them and they could theoretically last forever, in the 1970s and early 1980s they were super-expensive and thus adoption was limited to only true videophiles.

RCA had hoped to capitalise on the exotic public perception of disc-based video by offering a more affordable alternative. But key features of LaserDisc, such as random access seeking (used in games such as Dragon's Lair) and the robustness of the discs were absent, and this strategy backfired, framing CED as an inferior 'copycat' and discrediting it in the minds of consumers, who elected instead to buy nothing and wait until they could afford a VCR.

Which was a shame, really, because CED was truly a viable alternative to nothing, and much better than broadcast television with its multitude of commercials.

However, because there is physical contact between the stylus and the disc, both the grooves and the stylus can wear over time, similarly to vinyl records. As with records, if they wear too much they can 'skip', which is an even less desirable event when watching the climax of a movie! RCA attempted to solve this by constructing a complicated layered disc made of a vinyl substrate, a layer of nickel, an insulation layer and finally a top layer of silicone but this did not entirely solve the issue of stylus or disc wear, and so it was decided to make the system cheaper to manufacure and sell, so that discs and stylii would be cheaper to replace, should they wear out.

As such, the final video discs were made of PVC, blended with carbon to make them conductive, and then coated with a thin layer of silicon lubricant. However, there was still another problem: originally, RCA executives had imagined that the videodiscs would be packaged and sold similarly to vinyl records, with the disc in a sleeve that would be removed by the user and placed in the player, like with LaserDisc. However, particles of dust and fingerprints were gigantic in comparison to the tiny grooves in the videodisc, and could easily cause playback to 'skip'. A dusty disc could skip hundreds of times during playback, shortening a 90 minute movie to 30 seconds – not the sort of edit the director had in mind.



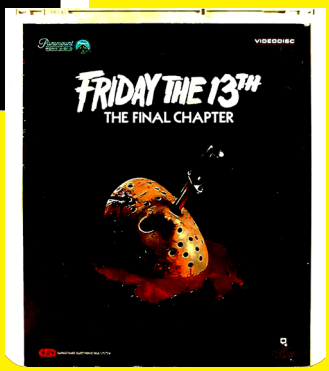


A videodisc player's stylus.

To protect videodiscs from damage, either from fingerprints, dust, children or naughty pets, RCA placed them into a plastic 'caddy' which was unlocked by the videodisc player when the caddy was inserted. But it was not foolproof.



RCA released over 1700 NTSC (US) videodiscs over the short period of CED's existence, including a number of horror movies. But many of these were 'classic' titles such as Frankenstein and Dracula. Also, some new releases failed to appear on videodisc due to the lower royalties paid out to movie studios, as RCA attempted to keep disc prices lower than videotapes to encourage adoption of the format.



This lack of support from studios had the negative side-effect of signalling to consumers that they were backing tape and that if you wanted to see their movies you might need a VCR, and as such CED was seen as a 'dead man walking'.



So a 'caddy' system was devised that kept the discs in a protective plastic cover, unexposed to dusty environments and untouched by human hands. The sleeve was inserted into the player, which could unlock the inner caddy holding the disc and keep it in place while the sleeve was removed. To attempt to mitigate any dust that might have settled on the disc if and while it was left in the player (something owners were warned not to do!) the sleeves often contained strips of felt that brushed the disc as it was inserted and removed.

The caddy became a selling point, as parents could be comfortable with their children using the player, as it was hard to damage the disc.

The ENTERTAINMENT CENTRE







And this was a good thing because kids would need to handle the discs a lot. While RCA had managed to increase the amount of video that could be stored on a single side of the disc to an hour, this meant that almost every movie needed to be stored on both sides of the disc. Halfway through playback, the viewer would need to 'flip' the disc, by inserting the caddy, withdrawing it, turning it over, inserting it again and removing it again! This was time consuming and annoying.

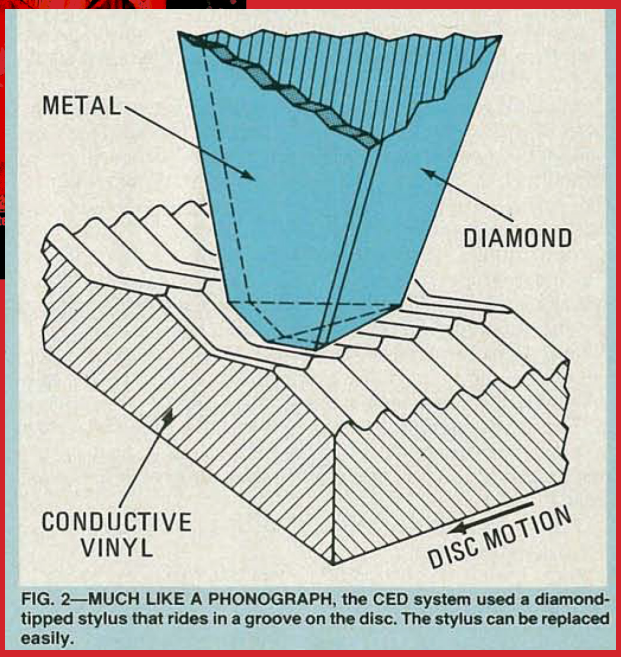


FIG. 2—MUCH LIKE A PHONOGRAPH, the CED system used a diamond-tipped stylus that rides in a groove on the disc. The stylus can be replaced easily.

If the movie was more than two hours long you would need to insert a second disc to finish it. And often, users would put the wrong side of the sleeve in, meaning that if you thought you were inserting side one, you could end up starting to play side two – spoilers! Although, children could (and did) insert sandwiches and all sorts of other things into VCRs, so the annoyances could be forgiven, at least for the certainty that foreign objects were unlikely to end up either on the disc or in the player.

RCA released its first videodisc player on early 1981 – 17 years after it started to research the idea. Unfortunately, all of that time spent messing about would quickly doom the format.

CED had initially been scheduled for release in 1977, a time when it would have had almost no competition from tape, but the discs were only able to hold 30 minutes at that point, and the discs themselves were not robust. And so the release was delayed for four years.

While videotape players had been expensive through the late 1970s, their costs had gradually come down over that time. Although the videodisc player was still cheaper than a VCR (by over a third), a used VCR could be had for the price of a new CED player by the time CED was released. RCA attempted to compensate for this by releasing discs cheaper than their videotape versions – a videotape could cost US$50 while the videodisc may cost $25-30 – but rental stores often charged the same to rent both, and since most people rented movies rather than buying them there was no benefit to the CED.

And speaking of renting, not very many stores stocked CEDs, and those that did didn't typically have anywhere near the selection of what they had on tape (even though some 1700 NTSC titles were released, although many of those were episodes of TV shows). Some rental outfits complained about the finicky nature of the machines and the potential for customers to damage the disks by leaving them in the machines and/or smoking around them. Demand for CED players dropped and discounting began. Department stores began to drop them from their inventory.

Although you didn't have to rewind a CED, you couldn't see the screen while seeking on most players either – something you could do with a VCR, and yet another advantage of tape that CED owners lusted after. CED simply became a stepping stone to VHS for most people – once the price of VHS VCRs dropped sufficiently enough, the CED player found itself replaced, and languishing in a basement or a garage, forgotten.

Although models featuring stereo sound, infrared remote controls and random access capabilities appeared in 1982-83, they still couldn't record, and uptake remained limited.

By passing an electrical charge through the metal electrode affixed to the diamond stylus riding in the groove and through the disc (as the diagram from Radio Electronics above demonstrates), an FM carrier signal could be reconstructed. That carrier signal in turn contained an amplitude-modulated signal (it's turtles all the way down!)

As Radio Electronics said, "The varying capacitance that results (from the varying depth of the groove) is then coupled to a 910MHz tuned line in the resonator assembly that is driven by a 915Mhz oscillator. The changing capacitance modulates the resonant frequency of the 910Mhz tuned line, thus changing the operating point of the 915Mhz oscillator energy on the tuned line. This in turn amplitude modulates the 915Mhz oscillator signal. The modulated 915Mhz signal is then applied to a peak detector circuit. The signal recovered by peak-detecting the oscillator signal is an electrical replication of the information (contained) in the grooves of the videodisc." Whew!

Basically, the changing capacitance slightly altered the frequency of a carrier, which was then used to change the amplitude of a third 915Mhz wave, creating an amplitude modulated signal. This signal itself contains both the audio and the video signals (luminance or brightness, and chrominance or colour) which are each then demuxed from it. However, in most players these signals were then passed to an RF modulator, which combined them all back into a TV signal.

Melody's Memories of CED



RCA licensed CED to a number of other companies so they could manufacture their own players, including Toshiba. Its VP-100 CED player (1981) was the only player to have a transparent window on the top through which you could view the videodisc while it spun.

My family bought a Toshiba CED player on sale in 1982 or 83. We weren't the only ones we knew, either – we lived in a less-affluent part of our city and there were several neighbours that took advantage of the low-cost of the CED system. After all, it was the early 1980s and the ability to play video at home was a novelty previously only afforded to those in much higher tax brackets!

We rented discs while they were available, and bought a few as well (including Planet of the Apes and Sunset Boulevard, each of which I must have seen dozens of times, and which reflected the large percentage of CED movies drawn from films studios were no longer making much of a profit from, and thus demanded low royalties from their distribution.

But despite the age of some of our movies, it was still magical seeing them on our TV, on demand.

The CED player gave us a glimpse of the future that was to come, one where you wouldn't be a slave to a schedule when it came to visual entertainment, a future where you could just pick up a movie and pop it into the CED player, or VCR, or DVD player, or Blu-Ray player or Netflix app.

And it gave that glimpse to working-class kids who may not have even seen a videotape player at school by that point (static film strips played along to a record were still a thing then, and if you were lucky a couple times a year you got to watch a 16mm movie!)

But of course, when an affordable VCR happened along we jumped on it. It was 'better'.

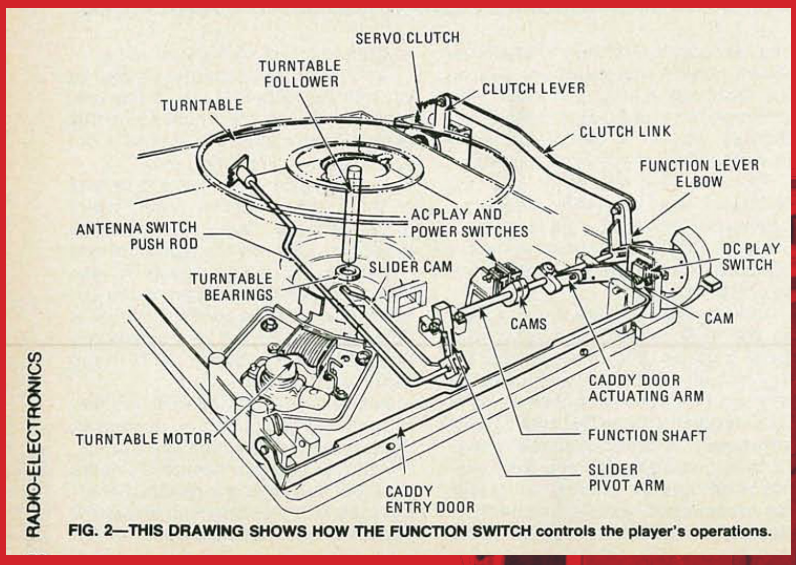


FIG. 2—THIS DRAWING SHOWS HOW THE FUNCTION SWITCH controls the player's operations.

Despite having sleek, futuristic exteriors, internally CED players behaved much like their audiophonic counterparts. There was a turntable driven by a motor, an arm that held the stylus as it rode in the groove and so forth. Also much like a record player, playback could 'skip' if the player was jostled, or if there were any contaminants in the grooves. While dust could usually be dislodged by the diamond stylus if the disc was played a few times, a scratch was forever and could render the disc permanently unplayable!

However, despite these downsides, it was still pretty cool you could watch a movie with what was, in effect, a record player. Sadly though, once they were discontinued it became hard to get movies, stylii, parts or find someone to repair them, and they quickly vanished from society, lost to time.

Despite aggressive discounting and giveaways of free discs, in early 1984 it became obvious RCA's ambition of having CED in 50% of American homes by the following year wasn't going to happen, and recognising that the system was never going to be profitable RCA announced that they were discontinuing the production of new players in April.

Some CED enthusiasts began to hoard discs and so RCA decided to continue to manufacture them for three more years, but stopped after two as demand had dwindled to almost nothing by that point. The last disc produced was a documentary about the history of CED called 'Memories of Videodisc', released in 1986.

Despite its kid-friendly nature, superior video quality when compared to standard VHS and the disc's general robustness in comparison to tape, CED was inferior to LaserDisc and couldn't record like VHS, and thus was doomed to be quickly dispatched by its competitors, to become a curiosity of electronic history.

POPPED EYEBALLS

The 1980s are famous for its horror-action-comedy movies, three of the most well-recognised being Gremlins, Goonies and Ghostbusters.

Of course, given their popularity, they all had computer games made for them as well!

Let's take a look at them... while we still have eyeballs to see them with!



You need to keep the Mogwai away from the food, or they will turn into Gremlins. Puddles of water cause either to split into two. Televisions distract Gremlins while refrigerators toss out food.



You can use a camera flash to freeze the the Gremlins and Mogwai temporarily. There's also a time limit – if you survive without being killed by a Gremlin or clear the level before then, you move on to a more complex level.

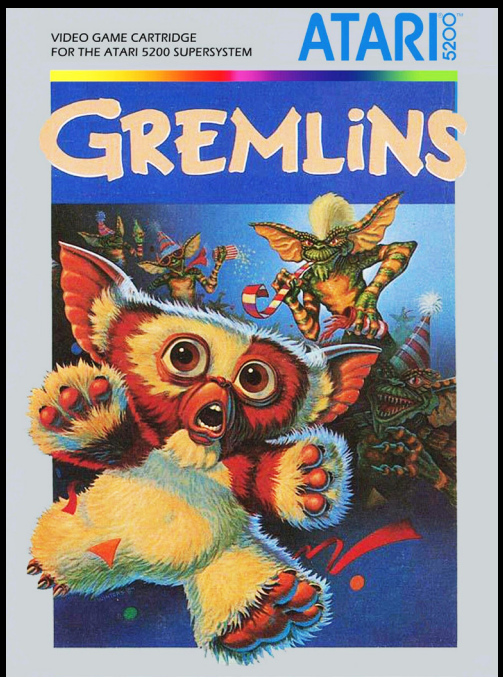
A father gives his son Billy a unique pet, a Mogwai, that comes with the warning: "Do not feed after midnight." Or get wet. Or expose to bright light. Of course, these things happen and hilarity ensues when the pet in question, Gizmo, begins to spawn little green lizard creatures that terrorise the town.

This is the plot of Gremlins (1984) , a comedic horror movie that would eventually gross over US$150 million. Obviously videogame makers wanted to cash in., and at that time Atari had the biggest pockets. First they released a Gremlins game for the Atari 2600, but it was a silly ripoff of other games.

A second version of Gremlins was produced for home computer systems, including the Apple II, Commodore 64 and IBM PC. In it, you control Billy, who has to capture all the Mogwai and return them to their cage, while destroying all the Gremlins with a sword.

A text adventure game was also made for the Acorn Electron, BBC Micro, ZX Spectrum and Commodore 64. Based on scenes from the film, some platforms had full colour illustrations.

The better action version of Gremlins would also be released for the Atari 5200, but due to the sale and restructure of Atari, not until 1988, and it would be that console's last game. In the case of the 5200, the Gremlins ultimately won.



The following year saw the release of The Goonies, a comedy adventure created by Steven Spielberg and Chris Columbus (the same pair behind Gremlins). In it, two brothers discover a treasure map purporting to lead to the fortune of fictional pirate "One-Eyed Willy". Arrrrrrgh!

The brothers hope to recover the treasure and use it to stop property developers from evicting them from their housing complex in order to build a golf course. They team up with several of their friends, and collectively calling themselves "the Goonies" they set off to find the treasure, but discover the entrance is hidden beneath a restaurant inhabited by a crime family made up of a matriarch and her three sons.

One of the sons, severely disfigured Lotney – cruelly nicknamed 'Sloth' by his brothers – decides to help the Goonies. The movie was fairly successful (although not as successful as Gremlins), with a worldwide gross of $US60 million.

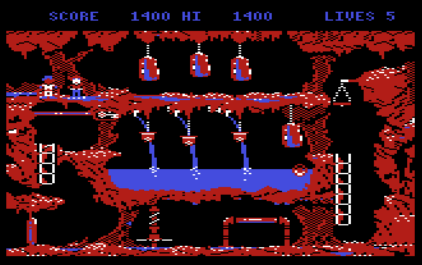
This time it was software publisher Datasoft that would win the rights to release a Goonies videogame. It's a puzzle / platform game where the player controls two of the Goonies (one at a time) in order to solve each puzzle and move on to the next level.

There are eight levels in total, with the last one(the pirate ship) requiring specific Goonies to accomplish specific tasks. The retail version of the game came with a 'hint sheet' containing a rhyme for each level, such as "Rocks that crush, pots that pour, bats that fly, you can't ignore."

The game received mostly positive reviews, with computer gaming magazines giving it an average of 7/10.







Datasoft was founded in 1980 by Pat Ketchum. Based in Chatsworth, California, Datasoft mostly produced titles licensed from arcade games, movies and TV shows, including arcade hits Pole Position, Mr Do!, Pooyan and Zaxxon, and screen-inspired titles such as Goonies, Bruce Lee, Zorro and Dallas Quest. Datasoft is also known for a number of other titles such as the Alternate Reality series, Canyon Climber, O'Riley's Mine and Tomahawk.



Datasoft's *Goonies* was available for the Apple II, Commodore 64, Sinclair Spectrum and Atari 8-bit computers, and was, ironically, widely pirated.



A somewhat different, more straightforward platform game was made by Konami for the Famicom.

GREMLINS, GOONIES & GHOSTBUSTERS

A TERRIFYING TRIO OF MOVIE GAMES



THEY'VE GOT THEIR ACT-IVISION TOGETHER

(AND ARE TAKING IT TO THE BANK)

By Randi Hacker

Doctors aren't the only ones who have discovered the benefits of specialization. In the video game industry, there are the general practitioners who manufacture both hardware and software and then there are those who mainly concentrate on creating new cartridges. They're software specialists, so to speak.

The leading specialist in the business is Activision. Formed in 1979 by four renegade game designers from Atari and a record company executive, the company was the first to recognize the vast market potential for a software-only manufacturer. Since Atari owns the largest market share for TV-game systems, it was logical for Activision to develop its initial programs to play on Atari's Video Computer System (VCS).

Activision has very methodically made its presence known, releasing two cartridges each quarter since 1980. Its game library has been hailed by critics as the most diverse and creative in the burgeoning software arena. Considering the technical limitations of the five-year-old VCS, Activision's accomplishments thus far are doubly remarkable.

Unlike many of its rivals, this Santa Clara firm has a distinct aversion to translations of popular arcade games. Despite the trend in this direction, Activision owns no licenses and has no plans to acquire any. All of its games such as Fishing Derby, Laser Blast, Freeway, Skiing and Kaboom! are totally original concepts.

Judging by Activision's growth, it would seem that this policy is sound. Over the past three years, the company has gone from $6 million to over $60 million in sales and increased its number of employees from 22 to almost 100. During this past March alone, they shipped over one million cart

"The lesson in all of this," Tom Lopez, "is that original material is the very best p policy."

Activision got its start in the video game industry almost by accident. In 1979, GRT, a Sunnyvale-based record and tape company, was in financial difficulty. Jim Levy, a former GRT executive with an entrepreneural flair, was putting together some capital to buy a division of GRT that he felt could become successful in what was then a very difficult time for the music industry.

While making these plans, Levy received a call from an attorney friend who had been talking to four Atari designers (Al Miller, Dave Crane, Bob Whitehead and Larry Kaplan), who had a

JIM LEVY AT THE HELM: "I think we electrified the

VIDEO GAMES

After Atari was sold to Warner Communications, the new management treated its game developers less like rockstars and more like the house band, giving them no credit for the games they produced nor the sorts of royalties others in the industry were receiving at the time.

And so, many of the developers left to start their own companies, including Activision and Imagic. Warners was not impressed.

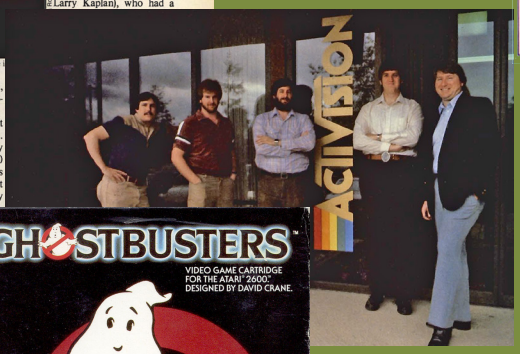


Atari and Activision Bury Hatchet

The long-standing feud between Atari and Activision, the Santa Clara software producers, has finally reached an amicable, out-of-court settlement. The original bones of contention concerned Activision's title **Dragster** and the very concept of producing and selling Atari-compatible software.

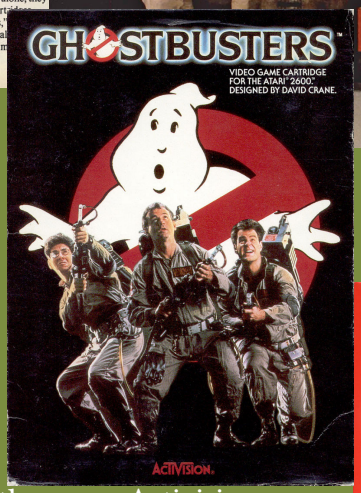
In any case, with several new companies, such as Imagic and Games by Apollo, already producing VCS software and an entire herd of manufacturers poised to jump on the VCS bandwagon, the original litigants agreed to a long term licensing arrangement that allows Activision to go ahead with the Sunnyvale game titans' full approval and leaves unsettled the question of VCS-software licensing.

Electronic Games
June 1982

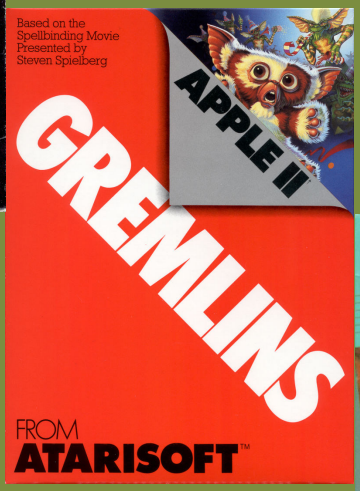


In response, Atari attempted to enforce ownership of the intellectual property behind the Atari 2600, claiming that the knowledge of how to interface cartridges with the console was a 'trade secret' and that Activision's founders had 'stolen' it. Eventually, Activision agreed to pay royalties to Atari, which legitimised third-party game development, and opened the door to other companies to develop not jiust for the 2600 but for later consoles as well.

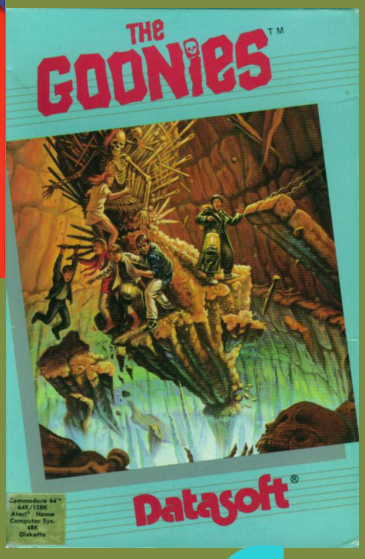
Atari would itself get into the third-party development game by releasing versions of its games for non-Atari hardware under the Atarisoft brand name (purportedly to avoid causing confusion with consumers, but more likely so they weren't labeled hypocrites).



In 1979 a number of Atari game designers, including future Ghostbusters programmer David Crane, decided they had had enough and left to start their own videogame company. They found an attorney, Jim Levy, who helped them secure US$1 million in funding and who coined the name Activision as a portmanteau of 'active' and 'television'. Levy would also serve as CEO and keep Atari off of their backs while the designers concentrated on making new games. With their knowledge of the Atari 2600, they were able to create games that used special tricks that made them distinctive from Atari-produced games. In 1982, Activision released Crane's Pitfall!, which was a hit and sold more than 4 million copies. By 1983 Activision had US$60 million in revenue and 60 employees. Through Levy's leadership, Activision managed to survive the 1983 videogame crash, and despite a number of other challenges it has lived on to the present day.



Datasoft, meanwhile, sought to capitalise on other creative properties, such as movies and TV shows, creating videogames based on them for a variety of computer platforms, not an uncommon business strategy.



ACTIVISION
Datasoft
ATARISOFT

Three movies, three games, three software companies...

They're the GHOSTBUSTERS and they're EVERYWHERE!



...even on CED...

While Gremlins and The Goonies were certainly successful films, neither would even come close to touching the crown held by Ghostbusters. Released in 1984, Ghostbusters was a runaway hit, with an eventual worldwide gross of $US295 million!

In the movie, three former parapsychology (the study of hypnosis, telepathy, etc.) professors set up a ghost removal service in New York City, after encountering a ghost in the public library. Luckily for them, a further rash of supernatural occurances kickstarts their otherwise floundering business, and the 'Ghostbusters' soon set off to look for the source of them.

Activision successfully negotiated the license to produce a game of the movie, which was initially designed by David Crane, who had previously produced a number of titles for both Atari and Activision including Outlaw (Atari 2600) and, most famously, Pitfall!

Crane wrote the game, initially released for the Atari 800 and Commodore 64, but later for the Apple II, Sinclair Spectrum, Amstrad CPC and MSX, in about six weeks. He managed this by basing the game on an incomplete game called Car Wars that featured armed cars roving around a city, leading to the in-game concept of buying items, such as a 'ghost vacuum' with which to outfit the Ecto-1, the car driven by the Ghostbusters in the movie. The final week of development was spent orchestrating the Ghostbusters song for the title screen.

In the game, the player moves from location to location on a map, controlling the Ghostbusters as they capture ghosts. As you do so, you earn money you can use to buy better equipment, such as a PKE Meter which lets you see where ghosts will appear next. Eventually you face off against the Stay-Puft Marshmallow Man.

Ghostbusters would later be ported to a number of consoles including the Atari 2600, Sega Master System and Nintendo Entertainment System, the latter more difficult than the other versions and ending with some humorously bad 'Engrish'.









The movie was so popular there was a 1989 sequel, which was of course followed by a sequel computer game, Ghosbusters II. Once again published by Activision, the (non-DOS) game features three distinct levels based on scenes from the film. In the first, Ray is lowered into a subway tunnel to collect slime while using three different weapons to deter various spirits. The second level has the player shoot fireballs from the Statue of Liberty at ghosts while it walks along Broadway. Finally, the third level has the player safely insert the Ghostbusters into the art museum, where they battle Vigo.

The game was released for the Amiga, Amstrad CPC, Atari ST, Commodore 64 and ZX Spectrum. It was praised for its graphics and sound but many reviewers found the gameplay lacking and the constant disk-swapping infuriating.





The first and last screens are from the original computer game.

The second screen is from the 1990 Sega Genesis game, and the third the 1993 Game Boy version.



Computer and video game companies often dive into the deep end of innovation in a bid to capture the next big thing in gaming. The driving force is revenue, profits and capturing market share from competitors. Some innovations will be major financial successes, many others though will be mega financial disasters.

Like any other company in the video game industry, Nintendo have had their fair share of successes and failures. You remember the Nintendo Power Glove from 1989 don't you? It was popularized in the film, The Wizard, as some sort of awesome extra gaming power controller to play your games and amaze your friends with. In reality it was a failure, it only lasted a year on the shelves, only had two compatible games to use it with and became the butt of jokes and social media memes because it turned out to be utterly useless and a crap gimmick at best.

The Gameboy on the other hand, also launched in 1989, was a worldwide success story for Nintendo. This innovation brought portable gaming to millions of game players across the world. By 1995 the Game Boy phenomenon had also brought rise to the girl gamer market, Nintendo stated that 46% of Game Boy gamers were female. The Game Boy is one of Nintendo's best innovations, becoming a video gaming industry cultural icon.

Like most years throughout the 1980's and 1990's, the video game market was powering ahead. Nintendo had become the biggest home video game and console company dominating world wide sales. 1994 / 1995 proved to be a very challenging year for Nintendo though. Its competitors Sega, released the 32 bit, 5th generation, Sega Saturn console and Sony released the 32 bit, 5th generation, Play Station console. In comparison Ninetendo had decided to discontinue sales of the NES, relying solely on the SNES as its main home console in the marketplace. It decided not to release any new normal consoles as its competitors had. The N64 would not hit shelves for at least another year. To coin a phrase it was a year of transition for Nintendo.

What Nintendo decided to do in 1995 was take a gamble on one of the biggest buzz words in gaming during the 1990's - "VR". Virtual Reality was "in" and normal gaming was "out". Movie titles including The Lawnmower Man (1992), Brainscan (1994), Arcade (1993), Disclosure (1994), Johnny Mnemonic (1995), Strange Days (1995) and Virtuosity (1995) all helped to foster the belief that VR was the future of gaming. Arcade venues and movie theatres were places where people could try out this new VR goggle technology. Nintendo had seen the new VR market was emerging which led them in 1995 to launch their own version of VR called the Virtual Boy.

Straight to the point - Nintendo's Virtual Boy dubbed the "goggles on legs machine" was a spectacular failure. It lasted just 6 months after its initial release. Why did it fail ? It wasn't from a lack of development, Nintendo had spent four years and millions of dollars advancing the project which had originally been code named "VR32" - presumably and obviously because The Virtual Boy was a 32-bit video game console. Such was the high expectations of VR gaming, Nintendo had built a dedicated manufacturing plant in China to manufacture and work on the Technology of The Virtual Boy.

Where the VR technology came from within the Nintendo Virtual Boy is traced back to an American company called Reflection Technology Incorporated (RTI). As early as 1985, RTI had developed a red LED eyepiece display technology called the Scanned Linear Array. It produced a "3D" stereoscopic head tracking prototype called the Private Eye, featuring a tank game. RTI had been demonstrating and pitching the technology to all the major toy and computer game companies but most of them declined to use it because of the single colour display and concerns about motion sickness for the wearer of the headset.

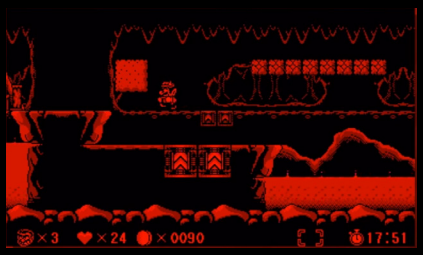
Gunpei Yokoi, the then General Manager of Nintendo's Research and Development arm and the inventor of the highly successful Game & Watch and Game Boy handheld consoles, embraced the new VR tech demonstrated by RTI. Where others had dismissed it, Gunpei Yokoi looked at it as a unique new technology that Nintendo's competitors would find difficult to emulate.



The Virtual Boy's flagship game was... Warioland? That seems fitting somehow...







If Nintendo had believed in VR gaming so deeply, then why did the Virtual Boy fail ? Was it because the tech was inferior as to why it failed? Well, yes. Even though consoles were advancing more rapidly than ever, gamers still loved the traditional console entertainment package - a console hooked up to a tv with a controller to play their favourite games. Nintendo's Virtual Boy was completely different to the normal console. It marketed and advertised the Virtual Boy as the 'first ever mobile console' capable of displaying stereoscopic "3D" graphics. Very strange when you consider the unit was quite bulky and heavy to actually be called a mobile console. While it sounded like awesome new technology, breaking ground and breaking barriers in traditional gaming, it didn't really offer anything different at all. The main change in game playing came about in how a gamer played their games and this proved to be one of the Virtual Boy's many downfalls.

To use The Virtual Boy console you didn't wear it like you would wear normal VR devices of the time period - no not on your head, instead you placed your head against the eyepiece of the Virtual Boy console. You had to crouch down to be able to see inside it The reason for this headless design came about from new concerns over children developing lazy eye symptoms and new laws, in particular, Japan's new Product Liability Act of 1995. The head mounted google design was scrapped because of these and other safety concerns. The company also feared that wearers of a head mounted goggle based gaming machine, could fall down a flight of stairs in their homes, injuring themselves while playing the mobile battery packed portable VR machine. So with Nintendo's legal team worrying about future liability costs, a heavy steel shielded table top design was implemented conformant to the recommendation of the Schepens Eye Research Institute.

When you looked into the Virtual Boy to play games you received a view of an uninspiring monochrome display of red and black. VR had been widely popularized in movies and tech mags as being a new world of amazement, an extraordinary colourful fantasy land that would blow your mind, yet Nin-



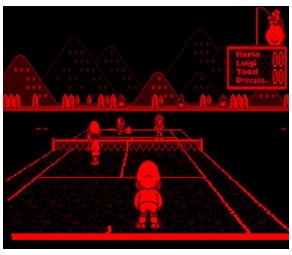
GADGET GRAVEYARD


breaking

VR32: a clearer picture emerges

Nintendo's 32bit "Virtual Boy" is scheduled for worldwide shipout in April next year






breaking

Virtual Boy: Nintendo names the day

August 14 — mark the date in red for Nintendo's latest system launch

Howard Lincoln on Virtual Boy


breaking

Nintendo pins hopes on **Virtual Boy**

But the ill-advised 32bit VR system simply makes gamers see red

It is...

BY GEORGE BACHAELOR

tendo's Virtual Boy was monochrome! Furthermore, to create an illusion of depth or a "3D" environment, games on the Virtual Boy used a parallax effect, which was not anything new or groundbreaking.

Why the choice of monochrome colours ? Nintendo had been very successful with bringing colourful games to their NES, Super NES and arcade cabinet games, why was Virtual Boy different ? Gunpei Yoko stated that "we experimented with a color LCD screen, but the users did not see depth, they just saw double. Colour graphics give people the impression that a game is high tech. But just because a game has a beautiful display does not mean that the game is fun to play. Red uses less battery and red is easier to recognize. That is why red is used for traffic lights."

Another reason for the use of a monochrome display was due to costs. RTI's red LED was used in Nintendo's Virtual Boy because it was the cheapest to manufacture. A colour LCD display would have put a huge cost on the project and would have meant the store price would have put it out of reach of many people. Colour LCD displays were also said to cause "jumpy images" in device and game testing.

At a retail launch price of US$179.95, the Virtual Boy was far cheaper than the Sega Saturn's US$399 and Sony's Play Station US$299. Yet the Virtual Boy just could not meet its lofty sales targets. Nintendo Japan initially projected sales of 3 million consoles and 14 million games. Nintendo of America had projected 1.5 million Virtual Boy console units and 2.5 million in games sales by the end of the year, the reality was that Nintendo shipped 350,000 units of the Virtual Boy by December 1995, three and a half months after its North American release. Nintendo never made a PAL version of the Virtual Boy console. According to data that Nintendo provided to Famitsu after the system's cancellation, 770,000 Virtual Boy units were sold worldwide, including 140,000 in Japan. As an indication of just how poor this is in the overall scheme of console failures, the Virtual Boy ranked 5th on Game Pro's "Top 10 Worst Selling Consoles of All Time" list in 2007. The Virtual Boy is Nintendo's second lowest selling console after the 64DD. Virtual Boy's sales figures pale into insignificance when compared to Nintendo's other consoles. The Super NES had sold

at least 20 million units worldwide by 1995, the NES sold 61.9 Million units while the Game Boy had sold 40 million units.

With such a short life span only 22 games were made for the Virtual Boy console, 14 of those released games landed in the USA. Four games were launch titles - Mario's Tennis, Red Alarm, Teleroboxer, and Galactic Pinball. In North America, Nintendo shipped Mario's Tennis with every Virtual Boy console sold and "3D" Tetris (1996) was the last official commercial title sold for the Virtual Boy. Nintendo did announce more games for the console at the E3 Expo in 1996, but these were never released. Most games were by Nintendo's high standards below average, hitting the bottom of the barrel in terms of colour, graphics, gameplay and sounds. Most games were developed by Nintendo Corp with a few games like Jack Bros by Atlus and Panic Bomber by Hudson Soft developed by 3rd party game developers. Virtual Boy Wario Land is considered the best Virtual Boy game to have been released. It is one of the few games that actually takes advantage of the Virtual Boy's hardware allowing Wario to travel back and forth between foreground and background with the environment.



This ironic ad said everything there needed to be said about the Virtual Boy: It was arse.

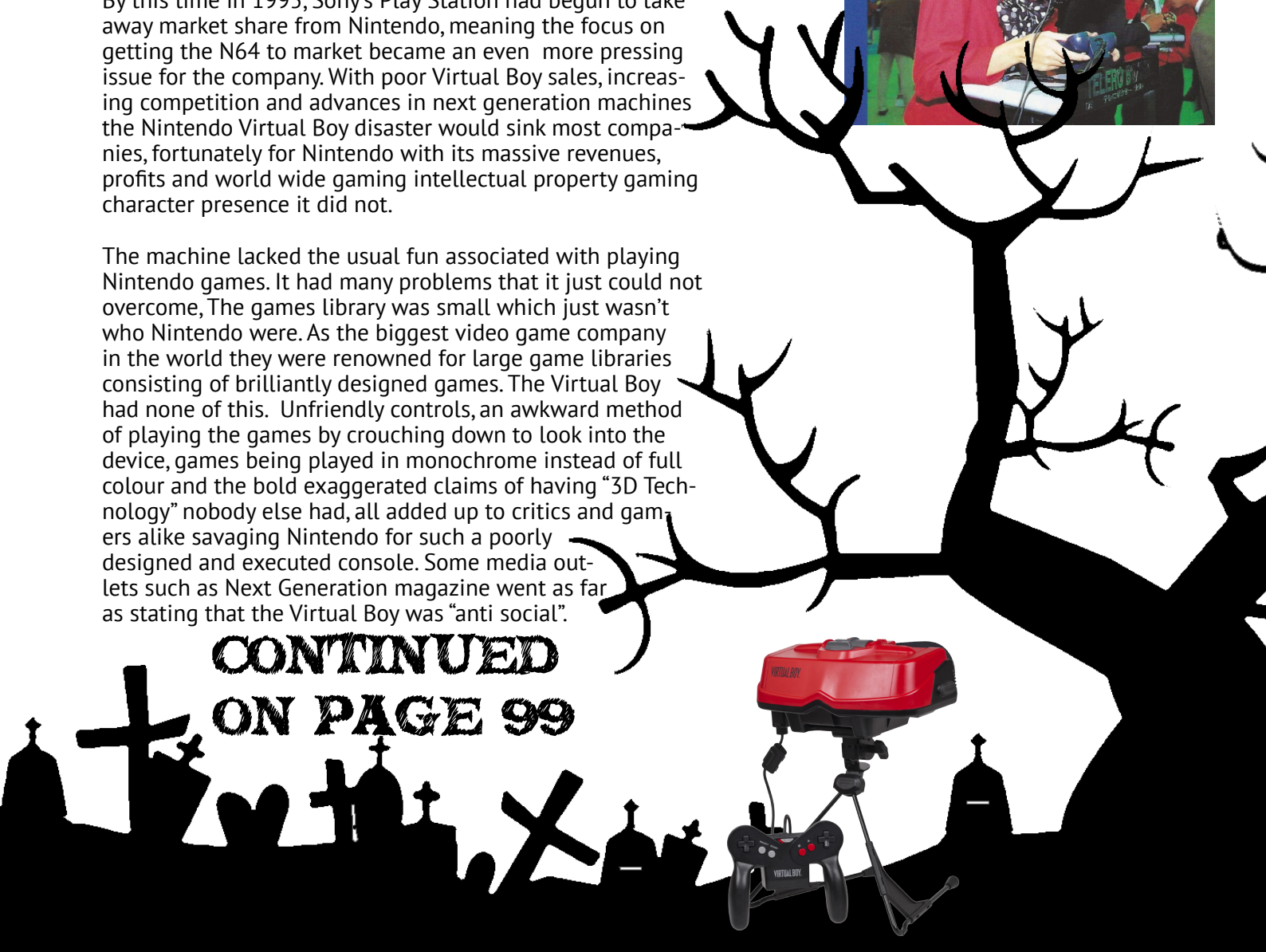
The reason why Nintendo's Mario is only featured tokenly in a few games on the Virtual Boy is because the then Nintendo President Hiroshi Yamauchi, had instructed Gunpei Yoko to de-emphasize the use of Mario in any Virtual Boy games as the company viewed the Virtual Boy as a 'fill in' concept before the launch of the N64 machine to be released a year later, in 1996.

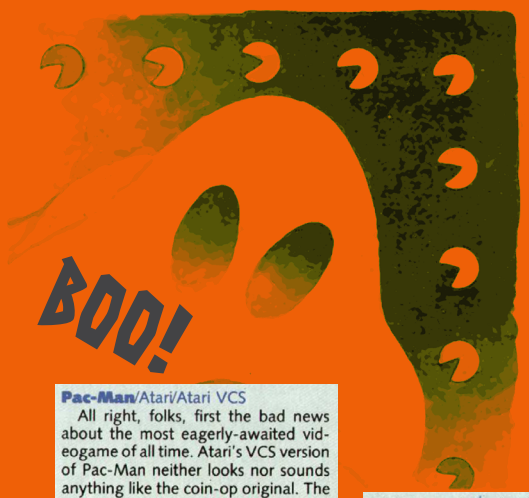


By this time in 1995, Sony's Play Station had begun to take away market share from Nintendo, meaning the focus on getting the N64 to market became an even more pressing issue for the company. With poor Virtual Boy sales, increasing competition and advances in next generation machines the Nintendo Virtual Boy disaster would sink most companies, fortunately for Nintendo with its massive revenues, profits and world wide gaming intellectual property gaming character presence it did not.

The machine lacked the usual fun associated with playing Nintendo games. It had many problems that it just could not overcome, The games library was small which just wasn't who Nintendo were. As the biggest video game company in the world they were renowned for large game libraries consisting of brilliantly designed games. The Virtual Boy had none of this. Unfriendly controls, an awkward method of playing the games by crouching down to look into the device, games being played in monochrome instead of full colour and the bold exaggerated claims of having "3D Technology" nobody else had, all added up to critics and gamers alike savaging Nintendo for such a poorly designed and executed console. Some media outlets such as Next Generation magazine went as far as stating that the Virtual Boy was "anti social".

CONTINUED ON PAGE 99





Pac-Man/Atari/Atari VCS

All right, folks, first the bad news about the most eagerly-awaited videogame of all time. Atari's VCS version of Pac-Man neither looks nor sounds anything like the coin-op original. The graphics are clunky and unsophisticated—there are no changing bonus items such as cherries, limes, keys, but simply an orange square with a blue dot inside—and the sounds, except for an in inappropriate metallic "boing" whenever the gobbler consumes a pill, are virtually nonexistent Joystick response on all game variations, but especially game 1, is horrible.

it's disappointingly difficult to find anything positive to say about this game. Considering the anticipation and considerable time the Atari designers had to work on it, it's astonishing to see a home version of a classic arcade contest so totally devoid of what gave the original its charm. There is none of the whimsey of the Namco/Midway version, nor any of the delightful graphic elements. Even the famous Pac-Man theme is missing. The game looks suspiciously like a project where the creators were so afraid of not measuring up to their source of inspiration that they simply avoided any conflict. The only area where the games go head to head is in the gobbler himself, and here Atari's version makes the transition quite satisfactorily.

Pac-Man teamed up with ET: The Extra-Terrestrial to in large part bring about the Great Video Game Crash of 1983. People got sick of forking out cash for crap! Who can blame them?



Pac-Man was the hottest arcade game of 1981 and Atari saw an opportunity to capitalise on it with a VCS version...

By the end of that year, people had pumped more money into Pac-Man machines then they had paid for Star Wars tickets, making the game the highest-grossing entertainment product of all time. The idea of a home Pac-Man was a no-brainer. But, unwilling to pay its game developers what they were worth, Atari had been hemorrhaging them to companies founded by former employees such as Activision and Imagic.

One of the few programmers that remained was Tod Frye. Atari had licensed Defender and Pac-Man, and although Frye had wanted to do the Defender conversion, he was given Pac-Man instead.

Management demanded that he fit the game into 4KB of ROM, and gave him six months to finish it. These two factors conspired to ensure the game would have limited features in comparison to the arcade original, and that needed optimisations were not completed, such as the mitigation of sprite flickering. But despite internal warnings, Atari management released it anyway, to a chorus of boos.



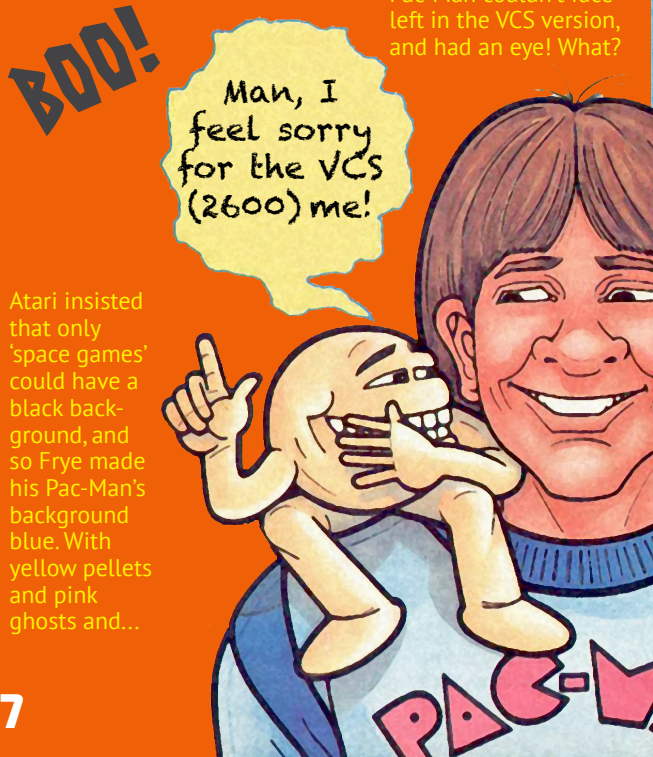
When it was released, Pac-Man VCS (2600) cost as much as US$60, $156 in today's terms (and no refunds!) No wonder people were pissed off.

Retailers in turn were stuck with thousands of cartridges they didn't want, and so they liquidated them, selling them off for US$5-10. While some bargain seekers scooped them up, most languished in bins. This then caused a number of game makers to exit the market (since you couldn't even manufacture a cartridge for US$5!) and it would take until the late 1980s to recover.

Despite the poor reception, Pac-Man's popularity and the relatively slow dissemination of reviews in the print media of the day ensured the game sold like crazy, quickly becoming the best-selling videogame of all time by that point, and making Frye a millionaire in the process, due to Atari's manufacturing of 12 million copies of the game (they sold 7 million – where'd the other 5 go? Oh yeah, the bargain bin) and in spite of his paltry 10 cent royalty per cartridge sold.



Pac-Man couldn't face left in the VCS version, and had an eye! What?



Atari insisted that only 'space games' could have a black background, and so Frye made his Pac-Man's background blue. With yellow pellets and pink ghosts and...

PUMPKIN PLAYAS



MORE TRICKS THAN TREATS

Technology was marching on and the Atari VCS was lagging further and further behind: competitors such as the Intellivision were eating into Atari's profits and the Colecovision loomed as a potential major threat. Atari needed a new videogame console, and it needed it fast!

It was proposed that the chipset from Atari's home computer line could be adapted for use in a console. In fact, that chipset was originally developed for use in a second-generation console that never materialised, as home computers had become popular in the late 1970s and they had a higher profit margin than consoles.

And so the Atari Video System X – Advanced Computer System" was born. The new console would have much better graphics and sound than the Atari VCS, and would be better suited to arcade conversions – an area the VCS had severely lacked in. Like the early Atari 8-bit computers, it would also have four controller ports. Its controllers had a numeric keypad, like the Intellivision, but a stick like the Atari VCS. You could even add a trackball!

All of this was really great, except it had two major problems. Firstly, it couldn't play Atari 2600 games. This meant VCS owners had to have two systems if they wanted to play their



ELECTRONIC FUN · COMPUTERS & GAMES

E.F.G. Times

VOLUME ONE, NUMBER FIVE — MARCH 1983

WALL STREET LAYS ELECTRONIC EGG

Are we going to wake up one morning and find that there are no more video games? Ever since the video game phenomenon began, people have been saying it was a fad, another hula hoop. Suddenly, on December 16, Atari announced that its 1982 earnings would be "substantially below previous expectations." All hell broke loose. Video game stocks dropped so fast that the New York Stock Exchange halted trading in Warner and Mattel stocks. The TV news shows speculated, "Are video games played out?"

No, and we'll tell you why. A year and a half ago, when Atari made its somewhat outlandish projections, it was the only kid on the block. Since then, about 20 video game companies have formed, many making games for the Atari VCS. For instance, in 1982, Parker Brothers entered the field with two strong games, *The Empire Strikes Back* and *Frogger*. These two games alone accounted for over $30 million. Had Parker not released these games, that $30 million might have gone into the coffers at Atari. Add the hit games from Activision, Coleco, Imagic, Starpath, Spectravision, Fox, M Network, Tigervision, etc. and you've got a lot of cash funneled away from Atari—and fewer cartridge sales.

At the same time, Atari's games in the second half of 1982—

Continued on page 18

All hell broke loose. Video game stocks dropped so fast that the New York Stock Exchange halted trading in Warner and Mattel stocks. The TV news shows speculated, "Are video games played out?"

The winners: Mr. Ed and Ed

Father and son video jocks!

Nowadays, kids don't want to borrow dad's car—they want to borrow dad's *Astrosmash* cartridge. That's probably why Mattel decided to throw the first parent/child video game tournament.

There were 17 dad/son or mom/son teams competing for the combined high score in six Intellivision games—*Frog Bog, Astrosmash, Night Stalker, U.S. Ski Team Skiing, PGA Golf* and *Lock 'N' Chase*. The winners, after four furious hours and 119,540 points, were Edward L. Mandzuik and his son Ed, of Lincoln, Michigan. The father and son Eds took home $5,000 and an RCA 45-inch projection TV. Mattel also donated $10,000 to the Variety Club.

SNEAK PEEKS!

BERMUDA TRIANGLE
Data Age/Atari VCS

FRANKENSTEIN'S MONSTER
Data Age/Atari VCS

Two new games from Data Age

Mays plays

New career for

ELECTRONIC FUN WITH COMPUTERS AND GAMES 17







ATARI 5200

Video fans everywhere are anxiously awaiting Atari's new System X or Atari 5200 (the company has not decided on a definite name yet). The new home video-game system will retail for about $330, and cartridges will cost from $32 to $40. Here are some of the system's features:

- a universal controller that includes keyboard, joystick, and paddle controls.
- a joystick that controls speed, as well as full circular direction
- a controller that fits comfortably into almost any hand and has left- and right-handed fire buttons
- a single wire that connects to the television (once connected to the set you never have to touch the back of the TV)
- better graphics (an improvement over Atari's VCS 2600)
- a special feature that puts the screen to silent black when you change cartridges (no more raspy white noise).

Atari spokesman Jeff Hoff told *JoyStik*, "We'll have 13 cartridges for the 5200 by Christmas. These will include Asteroids, Space Invaders, Missile Command, Star Raiders, Super Breakout, Galaxian, Pac-Man, Baseball, Soccer, Football, Tank, Qix, and Centipede."

Atari's new system is expected to compete head-to-head with Mattel's Intellivision. Pre-Christmas sales will tell which system emerges from the battle as winner.



existing library of games. Second, while the Video System X used the same chipset as the Atari 8-bit computers, it wasn't compatible with their software library either! Atari attempted to mitigate this by renaming the VCS to the 2600 and the X to the 5200 – 2600 being the model number (CX2600) of the VCS, and 5200 being "twice as good – and stating that the 5200 was complementary to the 2600 and not a replacement for it.

So, with a limited selection of games and no backward compatibility the 5200 was basically a rich-kids' toy ("what kid needs more than one videogame console?") and after its release in 1982 it sold like one – that is, not very well. And so Atari didn't invest much effort in making more games for it, instead concentrating on making yet more Atari 2600 games. And so it continued to not sell very well. To make matters even worse, Coleco released an adaptor for its Colecovision that could play 2600 games!

In 1983 Atari released a revision to the 5200 that allowed for the use of its own adapter, but that just further annoyed existing 5200 owners. Atari decided to offer an 'upgrade' (more of a hardware patch) so that they could use the adapter, but they had to take their console to a dealer to get it done. So many simply didn't bother.

Behind the scenes, Atari began development of the Atari 7800 (three times the fun, get it?) and stopped making any games for the 5200 (although they weren't making much of an effort by that point, anyway).

Then, due in part to this whole fiasco, Warners got sick of it and sold Atari to Jack Tramiel.

5200 OBSOLETE?

I am an owner of the Atari 5200, and was a little upset when I heard about Atari's 7800. Will this make my 5200 obsolete?

Erik DuRon
New York, NY

Ed: Atari stopped production of the 5200 towards the end of last year, so like it or not, the answer is yes, your 5200 is obsolete. **Electronic Games**

FRIDAY THE 13TH
THE CURSED GAME

THE EPITOME OF THE BAD 'MOVIE GAME', EVERY INCARNATION OF IT SUCKED.

"The game of the movie" was a popular way for dodgy software companies in the 1980s and 90s to make a quick buck. They would simply purchase the licensing rights for a platform of less interest to the 'big players' such as the Sinclair Spectrum, then hopefully one of the larger software houses would release a fairly decent game for another platform that would then power interest and sales in their crappy game (which was usually just a variant on another of their crappy games with different sprites). Crappity crap.

However, videogame adaptations of horror flick 'Friday the 13th' had no decent game hidden within their ranks – instead, they universally sucked. Let's begin with the Spectrum version. In it, your job is to prevent Jason from killing your friends by leading them to safety. You can use chainsaws, pitchforks and other weapons to try to fend Jason off, but sometimes Jason can masquerade as one of your friends, and if you inadvertently lead him to your "sanctuary" the other campers run off and you have to start over. If you succeed in herding all of the campers and / or kill Jason, the scenario repeats.

UK magazine Crash hated it with a passion, giving it an overall score of 32% and calling it publisher Domark's "worst game ever", "the return of that old Domark bad taste and ineptness of production", and "compelling it ain't". Your Sinclair and Sinclair User similarly gave it 3/10. The Commodore 64 version (a 'port') didn't fare any better, garnering a paltry (and tongue-in-cheek) 13% from ZZap!64. It suck-suck-suckity-sucked.

Three years later, Japanese developer Atius said "hold my beer" and released a "13th" game for the Nintendo Entertainment System through publisher LJN. In this version, you play a camp counsellor who needs to stop Jason before he kills all of the children. The game warns you when Jason is about to kill someone and you have to rush there before he does. There's also enemies such as zombies and wolves to contend with.

Critics hated everything about the game, even the box art (which is, admittedly, pretty bad.) It was too hard. It was too cheap. It was too repetitive. It wasn't gory enough.

The art sucked.
The music sucked.
The gameplay sucked.

It just plain sucked.

Poor Jason.



Dracula was not happy. "I thought I'd be playing Jason! What fun is it trying to stop him?" Well, it's not!


Reviews

FRIDAY 13th

Producer: Domark
Retail price: £8.95

If you've seen the film(s) then you'll already know the background to this game. For the benefit of those who missed them, here's a quick summary: people staying at a quiet holiday camp at Crystal Lake find their peace shattered when a young boy, Jason, accidently drowns. His mother is so distraught at his death that she blames the other campers who did nothing to save him. One by one they are all murdered by Jason's Mum, until only one girl remains alive. She manages to kill Jason's psychopathic mother. All alone in the middle of the lake, the lone survivor waits while slowly the ghost of Jason rises from beneath its murky depths to take his revenge.

immune from the growing frenzy of your fellow sunworshippers.

The status of your character during the game is displayed at the foot of the screen. Three windows are used to indicate the levels of panic, strength and sanity you possess. Gradually, as panic levels rise, the hair on the head of a little portrait in the status area begins to stand on end. An ice hockey mask — as worn by Jason — fills in on another window to indicate the mental state of the character you are playing, the more mask the madder you are! Strength is displayed via a barbell which rises and falls, mirroring the physical status of the hero or heroine of the tale as it unfolds. Ten little icons on the right of the status area represent the campers at Crystal Lake, and as Jason eliminates them their figurines

Half of the team of campers who "holiday" in FRIDAY 13th, the jolly murdering game from Domark

Chug chug goes the tractor. Buzz buzz goes the saw. Kill kill goes Jason, in Domark's FRIDAY 13th

The game picks up where the film leaves off. You are now a camper at the ill-fated holiday camp and Jason, predictably enough, is still wreaking havoc. It is up to you to find a sanctuary which Jason won't enter and then persuade the other nine campers to join you there before Jason sends them on permanent holiday.

At the start of the game the computer selects one of the ten campers at Crystal Lake, and you take on his or her personality. The holidaymakers all have individual personalities and react differently during the game according to their particular strengths and weaknesses. Jason is a cowardly soul and always attacks the person whose panic level is the highest. Although it is up to you to save your friends from a grizzly death, you are by no means

are replaced with tombstones.

Jason scampers around the playing area selecting weapons from his arsenal and eliminating campers one by one, starting with the most panic stricken holidaymaker. The ultimate aim of the game is to save all the campers from an untimely end by killing Jason before he kills them. Although he's a homicidal maniac, Jason is frightened of a cross which can be found on the campsite — collect this and deposit it in a room and Jason can't harm anyone who stays with the cross.

Once a sanctuary has been set up by depositing the cross in the barn, church or house, you must persuade your playmates to take refuge. Walking up to a camper, it's possible to shepherd him or her to the Sanctuary you have established. These people are on holiday, however, and des-

pite the fact that there's a murderous loony at the resort they're determined to have fun! It is quite hard to get them to stay indoors, and they regularly wander off to go sunbathing or even swimming in Crystal Lake.

Jason looks just like a regular holidaymaker — he can only be spotted when he's killing someone on screen. As it is impossible to distinguish Jason from the other characters, you may try to lead him to the Sanctuary, in which case he scares the campers off, and you have to move the cross to another location, set up a new sanctuary and start herding the campers to safety once more.

To even the odds a little in the game, Jason is careless with his weapons, leaving them lying around. There are ten in all and you can pick up and use a weapon you come across. Only one death dealing impliment can be carried at a time, though — there's no point in getting greedy. If you succeed in saving all the campers and kill Jason too, then he takes on the personality of your character and the game moves to the next level of difficulty where you assume the persona of another camper.

CRITICISM

● "There was a lot of hype over this game, in fact the Newsfield office is still knee deep in headless rubber bats and plastic knives from Domark's visit a few months ago. After playing the game for a bit I feel that

COMMENTS

● "The film is great, with Jason running around chopping people's heads off, but disappointment hits me once again. If Domark had tried, Friday 13th could have been a good game with such a scary storyline. On the inlay it says 'lock all doors' — but why? No spectacular graphics, and a few colours on buildings and more would be better. Sound is scarce as not much came to my attention throughout the game and qualities like this aren't going to keep your eyes on the screen or fingers on the keyboard for long. All I can suggest is close all windows and doors, hire a video and watch that instead."

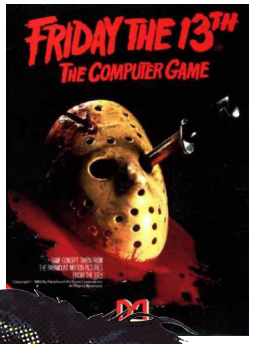
● "For a while it seemed that Domark's standards were actually improving — Gladiator really wasn't that bad. Friday the 13th, however, sees the return of that old Domark bad taste and ineptness of production. I'm sorry, but it's just absolutely awful. What's really bad is that as with most naffo releases, the program's main selling period will be over by now and any punter who was going to be had by the excessive hype already has been. For anyone considering buying this release the fairest thing to say is have a look at it first as anyone who then thinks it's quite decent deserves the horrors that the game is replete with."

Control keys: Q up, A down, O left, P right, M fire
Joystick: Kempston

Use of computer	44%
Graphics	31%
Playability	38%
Getting started	45%
Addictive qualities	32%
Value for money	25%
Overall	32%

130 CRASH June 1986







LOADING... READY. RUN... FOR YOUR LIFE!

CREEPY CLONES! FREAKY FAÇADES!

Welcome to our computer laboratory of horrors! Come as we take a tour of some of 8-bit computing's most unloved monstrosities.

Our terrors today come in two categories: First, you may not know this, but not every 1980s home computer was a success. Some were major flops!

Second, some of those that were successful sought to extend their time in the spotlight with a bit of literal plastic surgery. Oh, the humanity!

IF YOU HAD BOUGHT ONE OF THESE, YOU WOULD HAVE MOURNED FOR YOUR MONEY!

THE JUPITER ACE

JUPITER ACE

Go Forth and conquer the personal computer market.

That's the hope of Cambridge-based Jupiter, which announced its Jupiter Ace microcomputer this summer.

The Ace is unusual in its departure from Basic as the main programming language.

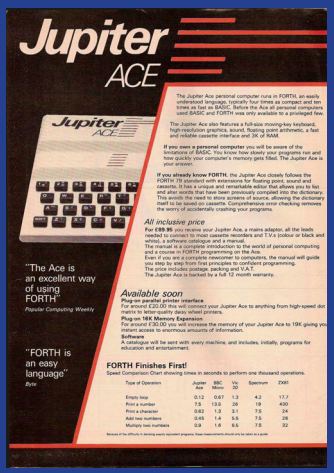
Instead it is offering "the language of the future", Forth.

For a price of £89.95, the Ace comes with 3K of memory.

It is a high resolution black and white microcomputer designed and produced by two ex-Sinclair engineers.

Jupiter claims that Forth, which can be found on several other microcomputers as a compiler cassette or cartridge, is easy to learn but operates faster than Basic.

The Jupiter Ace is a small computer with push button type keyboard.





You might have thought Richard Altwasser's follow-up to the Sinclair Spectrum would have been a smashing success. But... it used Forth. Forth?!? The language of the *future*? Wait... Forth?!? Uh...

Almost all home computers of the day used BASIC, so this was an incredibly ambitious proposition, and unfortunately one that was doomed to failure. Although Forth was much faster and used less memory, it was difficult to convince people, especially developers, to learn a different language, and with little published software its case was not helped. It flopped. Badly.



THE FRANKLIN ACE

Franklin Computer Corporation came into existence with a singular aim: to clone the Apple II. It called its abomination the Ace. Its motherboard was practically identical to the Apple II; Franklin also copied the Apple II ROM verbatim. They released the Ace in 1982 and unsurprisingly Apple sued... and lost! Franklin argued that because computer code wasn't printed on paper it couldn't be copyrighted. In 1983 a judge ruled against Franklin, but it would take five more years of legal battles before Apple was able to force it from selling Apple clones. Nightmare!

THE SAM COUPE



Sam had a 6Mhz CPU – twice as fast as the Spectrum – and much more memory.

In addition to the Spectrum's graphics mode, Sam had 256x192 16 colour and 512x192 4 colour modes similar to the Atari ST. It also had six channel stereo sound, although apparently not AY-8910 compatible.

After the initial collapse of Miles Gordon Technologies in 1990, a revived SAM Computers Ltd. would limp along until 1992, when all the remaining Sams would be bought by liquidator West Coast Computers and sold off.


NEWS 'N' PREVIEWS

STUFF THAT HAPPENED — STUFF THAT WILL

Sam's our man

STop the press

TECH TIPS

Bytes 'n Icket

GUEST LIST

A.K. Battock, Maidstone, Kent.
Martin Wheeler, Strood, Kent.
Michael Carter, Neecastle-upon-Tyne.
Ian Webster, Kettering, Northants.

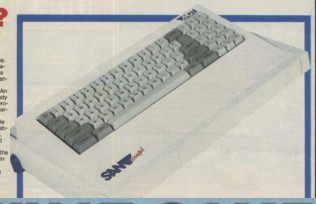


S'AMAZING!

The Coupé arrives at last!

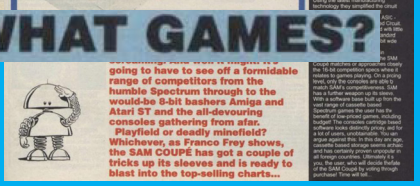
£150 SUPERCOMPUTER?

MGT turbocharge 8-bit computing



FERDICT

SAM, THE BABY



GAMES? WHAT GAMES?

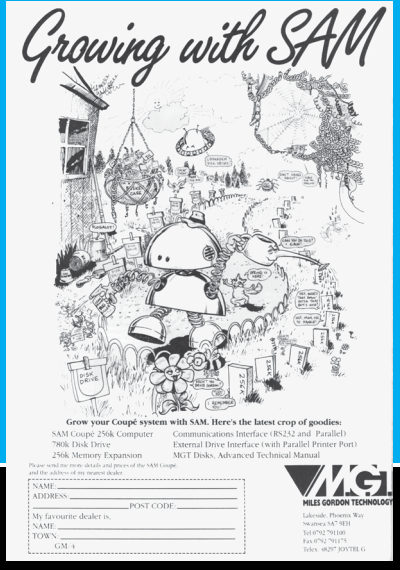
THE OBITUARY COLUMN

Finally, we have (or had) Miles Gordon Technology, they who would have liked to have brought you the SAM Coupe. Unfortunately the idea of a souped-up Spectrum never really caught the imagination of a public lusting after Amigas, STs and consoles, and the machine was plagued with delays and problems with the ROM (which recently had to be reissued). What is particularly tragic about the SAM's demise is that software houses were just about to start producing games exclusively for it, Enigma Variations' Defenders of the Earth being the first.

Sam came into a market dominated by 16-bit computers such as the Atari ST and did not fare well, particularly due to a lack of new games for it.

After Amstrad bought the rights to the Sinclair Spectrum, they did little with it aside from release some trivial modifications to the Spectrum 128K, mainly adding a built-in tape / disk drive to make the line similar to its CPC offerings. Two former Sinclair Research employees, Alan Miles and Bruce Gordon (two people with four first names!) thought that more could be done with the aging 8-bit platform and set out to make a Spectrum-inspired (and compatible) computer of their own. They developed peripherals (including a disk drive) for the Spectrum to finance their super-Spectrum project.

Bruce Gordon was meticulous in the machine's design, aiming to drive down costs while making the machine expandable for those with deeper pockets. On paper, it looked great: it could run thousands of existing Spectrum software packages, it had additional graphics and sound features to allow for new, better games and applications, it was much cheaper than other (mainly 16-bit) computers on the market, and there was scope for peripherals such as mice and hard disks – but Gordon may have taken too long with his design, because by the time the machine was released it was late 1989. MGT missed the Christmas sales rush, where the Coupe may not have done well anyway, given aggressive discounting of the Atari ST. To make matters worse, the machines they did sell had a bug which meant they had to ship a new ROM to customers. The company collapsed twice, first in mid-1990 and then in July, 1992. Scary!


Growing with SAM

Grow your Coupé system with SAM. Here's the latest crop of goodies:

SAM Coupé 256k Computer
796k Disk Drive
256k Memory Expansion
Communications Interface (RS232 and Parallel)
External Drive Interface (with Parallel Printer Port)
MGT Disks, Advanced Technical Manual

MILES GORDON TECHNOLOGY


SAM hits the Street!

See the exciting new SAM Coupé Computer at your local computer store now!

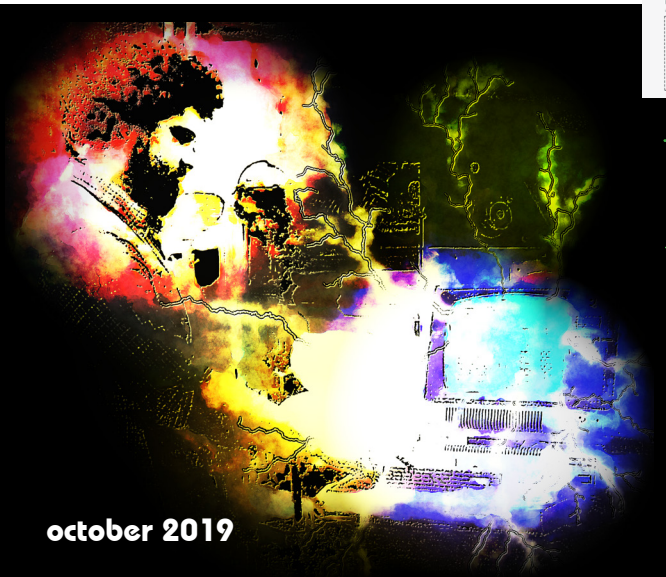
SHOP THAT SELLS COMPUTERS

SAMANTHA

SAM COUPÉ HITS THE STREET

SAM Hits the Roadshow

MILES GORDON TECHNOLOGY PLC



DOCTOR FRANKENSTEIN'S COMPUTER LABORATORY

THE ATARI XEGS

Jack Tramiel saw how Nintendo was cleaning up the market and the man he was, he wanted a piece of that action. In 1987 he released the delayed Atari 7800 and the smaller, cheaper Atari 2600 Jr. in an attempt to do that, but he thought, why not put all of your cards on the table? If the 5200 had failed because it wasn't compatible with Atari 8-bit computer software, why not make a console that was? A repackaged Atari 65XE, the XEGS could be made into a fully functioning home computer, with an external keyboard, disk drives, modem, etc. or just be plugged in to a TV and used as a game console, with joysticks and light gun. There were new light gun games and older games repackaged in cartridge format, which also worked with existing Atari 8-bit computers (and were popular for that reason). But retailers discounted the 65XE in response to the XEGS and so it sold but not well.





THE AMSTRAD GX4000

Hey, it worked for Atari, didn't it (didn't it?) Amstrad had spent the late 80s milking the heck out of its 8-bit CPC computer line, but sales had begun to slow, chiefly because of 16-bit competitors such as the Atari ST. So the thought occurred, why not make an Amstrad CPC console? And they actually kind of went all in on it – the GX4000 looks like they made an effort. Magazine reviewers were impressed – although they weren't fond of the NES-style controllers and the sound was a bit shaky. Amstrad thought it had a winner, spending £20 million on advertising in Europe. But it had a hard time pushing developers to continue making games that would work with the console, and interest from magazine publishers quickly dropped off. Amstrad discounted the GX4000 to as low as £30 in an attempt to grow the userbase and encourage developers but they were more interested in making games for the Sega Mega Drive and the Super NES. At least the GX4000 left a good looking corpse!

THE COMMODORE 64GS

So Commodore was like, hold my beer. It was pretty desperate by 1990; sales of its flagship 16-bit Amiga computer weren't stellar and Commodore 64 sales were starting to drop off, as publishers were no longer making new games for the platform. In an attempt to revive it, Commodore decided to thinly repackage the 64 as a game system, thinking that it might get a new life in the console market. However, software publishers would need to tweak their games to work without a keyboard, and many were unconvinced it would be worth their time to do so.

Ocean Software in the UK was one of the few who were willing to give it a go, and so the 64GS was released in Europe in December 1990, just in time for Christmas. A few other British publishers also converted some of their cassette-based games to work on cartridges – but not many. It probably would have helped if cartridge-based games had been more common on the Commodore 64, but they were not, and the small number (compared to cassette and disk) that did exist typically needed the keyboard.

Anyway, if someone was interested in playing Commodore 64 games, they just bought a Commodore 64 – it was the same price, so you got a keyboard for free! (ooh!) And the ability to use a cassette or disk drive (wow!). Commodore's weak death-spasm just hastened its eventual demise four years later, after its Amiga console similarly failed.



Last month we learned production of the C64GS, the console version of the C64, had ceased. Commodore in the UK (the only place the GS was released) were originally expecting sales of around the 100,000 mark in the first year, but in fact only managed slightly more than 15,000. Prices of the GS have now been reduced considerably as Commodore faces a massive stock surplus.

On the plus side, the GS has created some good for C64 gamers. The 'cartridge-only' unit prompted some excellent new game releases in the much preferred cartridge format, which is compatible with standard C64s. Let's hope for more game releases in this format.

THE IBM PCJR

By 1982 IBM had been growing increasingly envious of the profits made by manufacturers of computers oriented towards the home market, such as Commodore and Atari, and made the decision to start development of a home computer of its own. Its 1981 IBM PC, a response to the intrusion of microcomputers into its mainframe business, had been a success, and IBM felt there was no reason why an IBM product targeted at the home user shouldn't do similarly well – after all, it would be an IBM. Codenamed Peanut, news of the new computer shook up the existing home computer market, with wild speculation regarding its features and eventual price. "Peanut Panic" ensued as rivals worried that if the Peanut was compatible with the PC it would quickly take over the home computer market, and their stocks were punished by investors with similar concerns.





However, it turned out their fears were largely unfounded. On November 1st, 1983, Big Blue, in its not-so-infinite wisdom, announced the PCjr. It was not cheap – IBM figured that its target customer for the machine was white-collar parents who used an IBM PC at work, and who would want compatibility so they could run software at home.





Too late, too expensive and too weird, this Frankenputer was doomed...

However, IBM seemed incapable of deciding just who the computer was for. They decided to give it a 'chiclet'-style keyboard that would appeal to kids. Okay, but adults hated that keyboard – so what was the point of compatibility with a software library of what was largely business applications? But more perplexing, the cheap model didn't even come with a disk drive!

"But that's not a problem!" IBM said, "you can load software off of cartridges." Cartridges? But my copy of Lotus 1-2-3 is on disk!



The press generally 'loved' the Peanut, but it was IBM, and IBM was (and still is) adept at keeping the press on its side...

But the Peanut was ultimately unloved.



I'm sure they would happily have sold you a copy – if they could have, but the cheap Peanut (still US$669 – US$1683 in 2019) only had 64K of memory, not enough for PC business apps – may as well buy the much cheaper Commodore 64; it had much better games, and you could get it with a disk drive for the same price as the PCJr. A lot of people did just that.

Anyway, the Peanut bombed. How spectacularly, you ask? Pretty darn spectacularly. First, they missed Christmas 1983 and didn't release it until the following March – for a computer that was supposed to be for your kids to do schoolwork, this was an odd time given North American children start school in September. The more expensive model only had 128K of RAM which was the same as the Apple IIe, except the IIe could run virtually every program made for an Apple II, and most of its business software was still holding up in 1984.

So, if you were buying a computer to share with your kids you probably went with an Apple; if you had deep pockets you would buy an actual IBM PC. This left Junior out in the cold.

Initial sales were tepid. IBM panicked, offering new keyboards with a more traditional design and an upgrade to 512KB of RAM, but there were still numerous compatibility issues with existing software and the only way people would buy the Peanut was if they got it at a serious discount. Obviously IBM was not in the business of charity, and soon put a stake in Junior, discontinuing the computer in March 1985. Alas, poor Peanut, we hardly knew ye.



Now, companies like Microsoft and Apple can take years to phase out support for computers and software, but in the 1980s companies often just pulled the plug, leaving you with a 'dead' computer.

COMMUNICATING WITH THE SPIRITS OF DEAD COMPUTERS

Some vintage computers, such as the Jupiter Ace, aren't as common as the Commodore 64, and you're unlikely to be able to get your hands on one of your own (at least not cheaply). But although you may never be able to physically touch one, through the miracle of emulation it's possible to experience what it was like to use them.



Creating an emulator is a fun and common way for programmers to learn a bit more about how (older) computers work, and so there are a lot of emulators, at least one for pretty much every computer that ever existed.

And so it didn't take much of a search to find emulators for three of the computers we just covered in the previous section, the Jupiter Ace, the Sam Coupe and the IBM PCJr.

Check them out! They're your ticket to a trip through computing history!

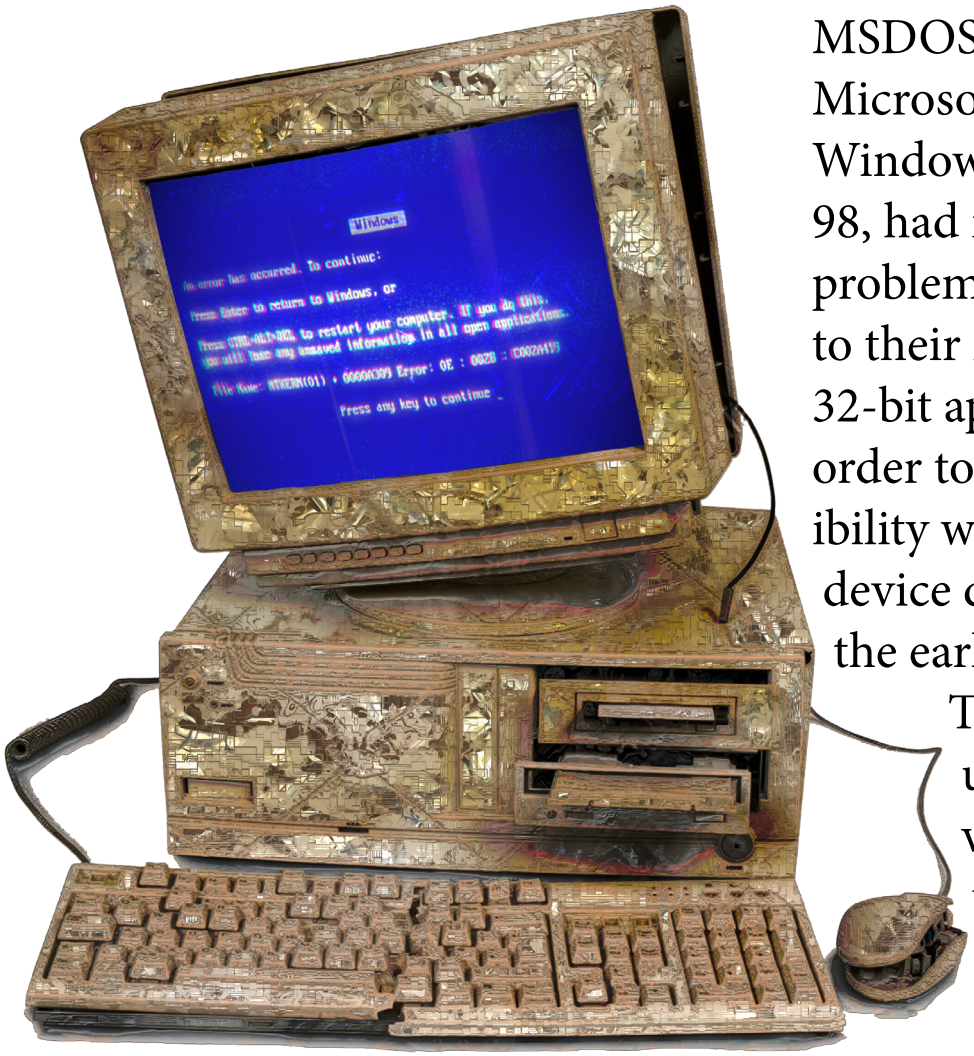
SpudACE for Windows and other Jupiter Ace emulators:
https://jupiter-ace.co.uk/index_emulators.html

SimCoupe emulator for MacOS, Windows and Linux:
http://www.simcoupe.org/

Tand-Em PCjr and Tandy 1000 emulator:
http://www.oldskool.org/pc/tand-em/



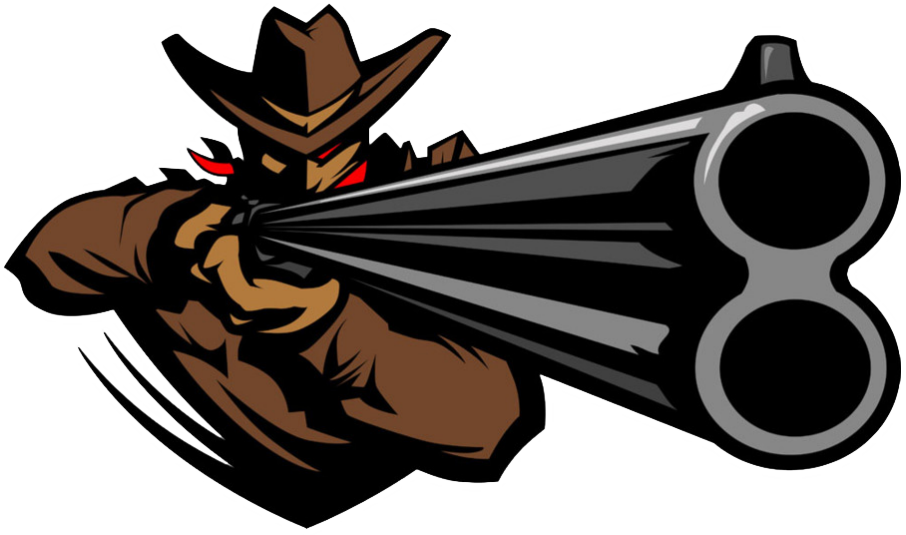
THE BLUE SCREEN OF DEATH



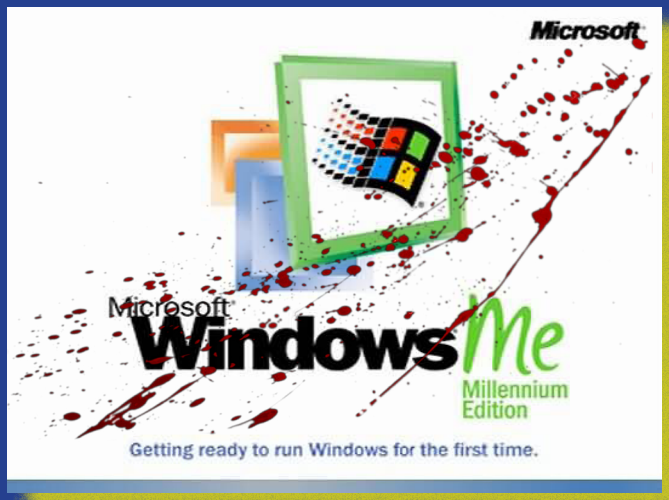
MSDOS-based versions of Microsoft Windows, such as Windows 95 and Windows 98, had notorious stability problems, due in large part to their mixing of 16-bit and 32-bit application code (in order to maintain compatibility with programs and device drivers written for the earlier Windows 3.1).

The last, and most unreliable of these versions of Windows was Windows Millennium Edition, or Windows ME.





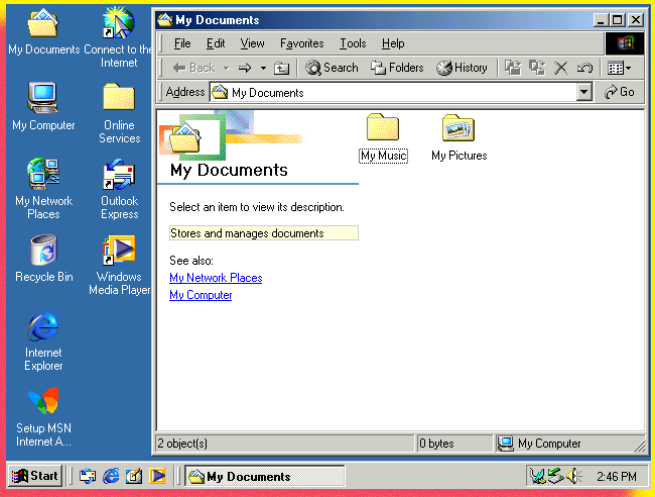
POINT AND CLICK

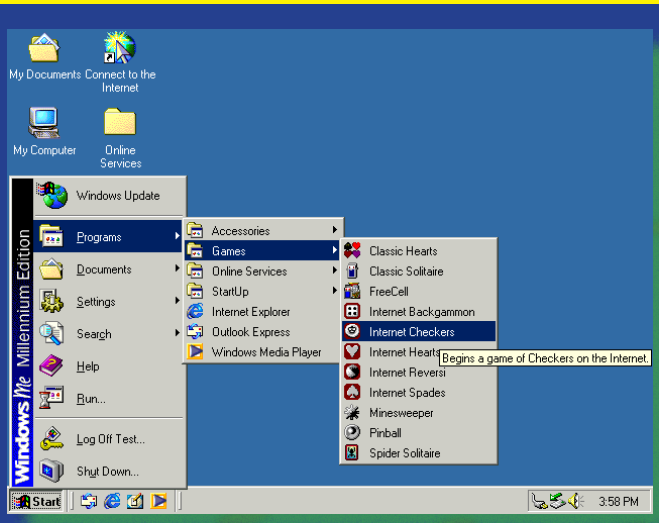


We're in trouble now! This screen would always elecit groans from computer technicians in the early 2000s, because it meant solving the user's problems was unlikely to be easy.

Released in 2000, Windows Millenium Edition (ME) was the last stop in the line of MSDOS-powered operating systems that had started way back with Windows 95 (or earlier, if you consider DOS versions of Windows previous to 95 'operating systems' even though they often did not start up when the computer booted).

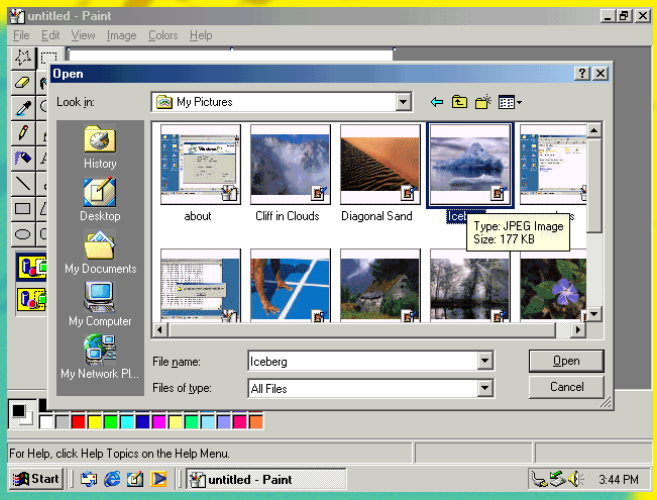
Windows ME (or 'me' as Microsoft pronounced it in marketing material, although almost nobody else did) built on features introduced in Windows 98SE, an upgrade of Windows 98, itself an extension of Windows 95. Windows ME adopted much of the enhanced user interface functions Microsoft had designed for the business-oriented Windows 2000 operating system, such as personalised menus, customisable Windows Explorer toolbars, auto-complete, advanced file-type association features, an integrated search pane, additional themes that changed the visual look of Windows, and updated graphical elements (also from Win2K)





Microsoft also attempted to improve a number of facets of Windows including speeding up boot times by removing traditional MSDOS features such as the AUTOEXEC.BAT and CONFIG.SYS, instead embedding essential DOS drivers such as HIMEM.SYS and SMARTDRV.EXE into IO.SYS (one of the main DOS system files). This meant that Windows ME relied on 'Plug-and-Play' based peripheral cards, as the ability to load DOS drivers for these devices was restricted (although you could hack ME to bring it back). Many users complained that their legacy devices no longer worked, and their only option was to upgrade.

Microsoft also reduced the number of times Windows accessed the System Registry, which stored internal Windows configuration data. This was problematic, as it meant you could lose registry information in the event of a crash or power failure, leaving the computer in an inconsisent state, which could happen quite frequently due to hardware which used WDM (Windows Driver Model) drivers that had not been properly modified to account for Windows ME's idiosyncracies – this was sometimes seen even in new computers that had shipped with Windows ME!



And if your computer did crash, not to worry, Microsoft included an automated System Restore feature that was meant to roll-back changes that caused it to crash – except that sometimes it couldn't roll back, or it couldn't roll back far enough, and you could end up stuck in a loop you would have to call a technician to come out and fix. Ironically, Windows ME had a lot of features intended to improve stability that ultimately made it unstable!





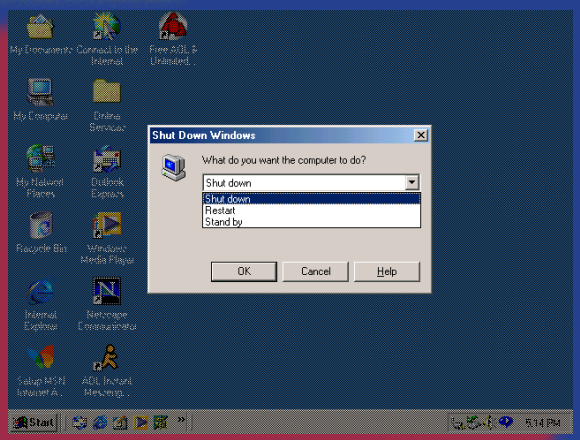
Aside from operational 'improvements', Windows ME also included 'updated' versions of applications such as Windows Media Player, which catered better for music, providing 'jukebox' (shuffle) functionality, support for CD burning and the ability to transfer songs to portable MP3 players. It also provided the ability to connect to web radio stations. Windows Movie Maker provided simple movie capture and editing capabilities, while Windows DVD player used a software decoder to play back DVDs, something that previously had required a hardware decoder card.

Windows ME also introduced improvements to its networking subsystem including a periodic 'crawler' that searched the local network for printers and file servers, a good idea that in practice was less than reliable. However, Microsoft also replaced the Windows TCP/IP "stack" with the one from Windows 2000, making both local network use and Internet use generally more stable, although you were often lucky if you got that far, given Windows ME's largest issue was crashing on boot, either with a Blue Screen of Death or endlessly boot-looping.

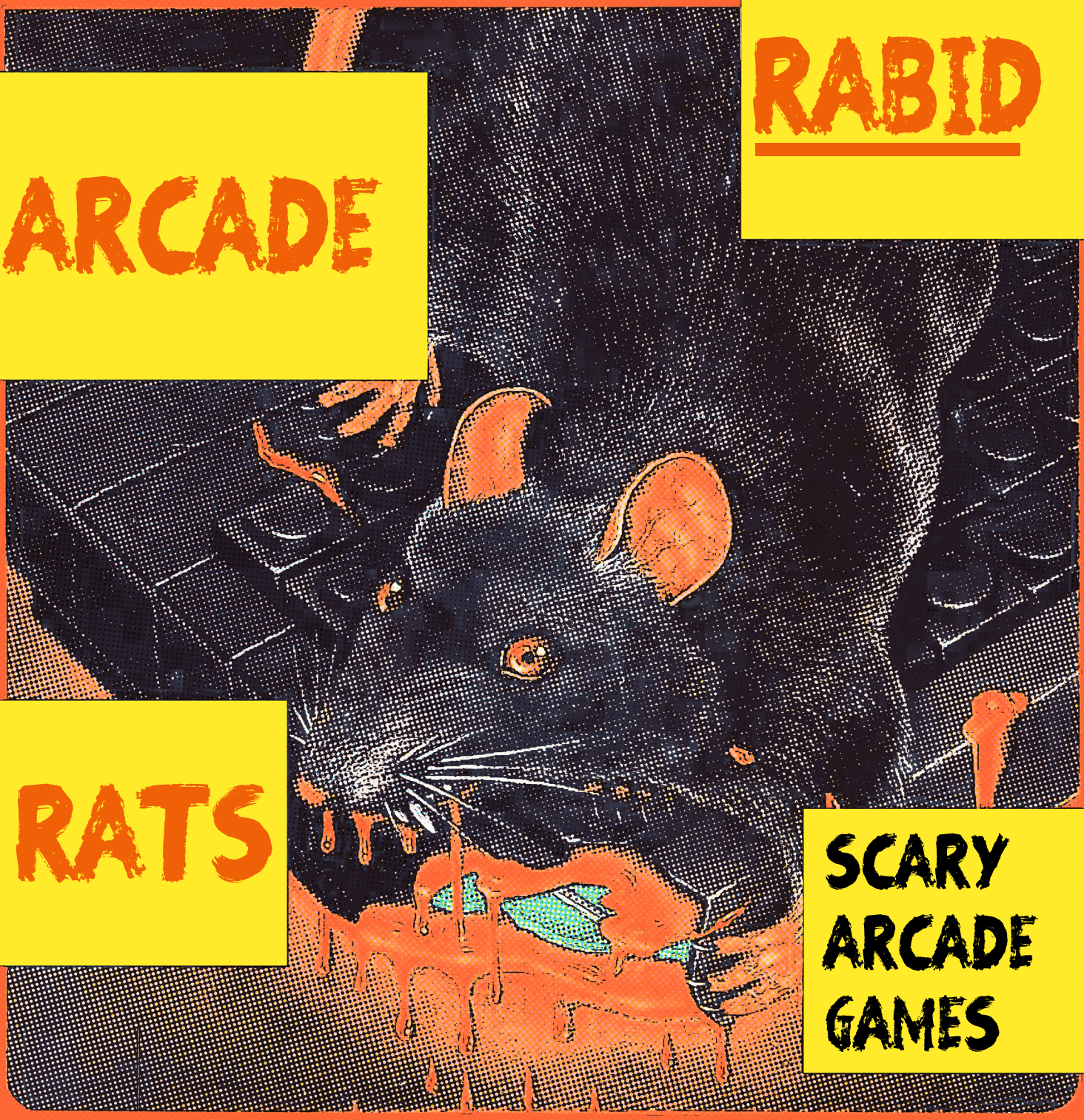


Ultimately the solution to these problems was to either downgrade the user to Windows 98SE (Second Edition), which really wasn't any less featureful, or upgrade them to the Windows NT (New Technology)-based Windows 2000, at least until a year later when Windows XP was released, making Windows Millennium a short footnote in history – you can't help but think even Microsoft knew Windows ME was a bad idea, given how quickly they got rid of it!

From 1995 to 2001 Microsoft would release seven different operating systems before taking a break for five years, and then releasing Windows Vista – another nightmare...



RABID ARCADE RATS



SCARY ARCADE GAMES

As this issue of Paleotronic magazine is Halloween themed, being asked to write an article discussing the history of arcade horror games fits perfectly, even if you are not a big fan on the horror aspects of this crazy celebratory day. While some countries around the globe really get into the swing of this whacky tradition of dressing up in spooky, scary horrifying and even cosplay character costumes for trick or treating, on October 31st each year, it is usually a great deal of fun and not as terrifying as it is made out to be. The same could be said for many of the horror themed arcade games.

Arcade game developers and publishers didn't start to cash in on horror video games titles until the early 1980's. To understand where it all began, we have to go back to 1975 when Atari released Shark Jaws. This is the very first horror arcade game I could find while researching the topic. Playing it today, this primitive looking scuba diving game of catching fish while avoiding being eaten by a large shark doesn't resemble anything terrifying these days, it really shouldn't be in a list of horror themed arcade games, but back in 1975, Shark Jaws was released at a time when the movie, Jaws, shook people to their cores at cinemas everywhere.



As far as a full list of horror games tracking the history of the genre goes, I couldn't find anything comprehensive on my google searching. It was quite tricky to research, but where Google failed me, You Tube came to the rescue. Over the course of a weekend I was able to devise my very own horror arcade games list. I wouldn't call it definitive by any means as i am sure there are arcade games out there I have not mentioned other people would be sure to remember.

I would say though that my horror arcade gaming table I have constructed is particularly extensive from the 1980's through to the early 2000's. The years between 2009 and 2018 I ran out of time to find the games to include them (work and real life always getting in the way). From my research I have categorised game releases in chronological order. That is the games are listed by the year they were released. There may be some inaccuracies as some arcade games were released in Japan in one particular year only to be released to the rest of the world a year later.

BY GEORGE BACHELOR



After the first horror arcade game in 1975, It took another seven years before we saw more horror themed games appearing in arcade amusement centres. Monster Bash by Sega and Satan's Hollow by Bally Midway were released in 1982 but neither were groundbreaking nor did they set the arcades on fire with awesome gameplay or graphics. Both games were rather primitive, but this was common for the era. Monster Bash is a platform based game of climbing up and down ladders set inside and outside a haunted mansion where you play the role of "Little Red" - a red haired kid fighting to stay alive against the likes of Dracula, Frankenstein and a Chameleon Man.



Satan's Hollow is a shoot 'em up in the vein of Space Invaders and Galaxian. Playing as a rocket launcher you must shoot down waves of enemies flying down towards you while avoiding their attacks. The horror part of the game is battling against Satan. He appears on screen after you have picked up enough pieces to form a bridge from shooting down those swarms of enemy attacks. Destroying him scores bonus points based on the number of waves completed to that point, and also upgrades your rocket launcher. You then repeat the battle only this time it gets harder, with building a new, longer bridge in order to fight Satan again. The sky darkens on later waves, making it harder to see the enemies as they now begin to throw exploding eggs, along with rocks that can destroy bridge sections. Satan will occasionally float around the screen and spit fire just to make your game feel like hell.





Three more years would pass before an arcade horror game classic would be born. In 1985, Capcom released Ghost N Goblins. This run 'n jump, shoot 'em up game, I would say took horror arcade gaming to a whole new level. Despite its reputation of being 7 levels of sheer hell to play, Ghosts 'n Goblins is addictive gaming. What set it apart from earlier horror games was its storyline. You play as the brave knight, Arthur, on a quest to save princess Prin-Prin from the Demon King Astaroth. A map represents the kingdom with various themed levels: Graveyard and Forest, Town, Caves, Bridge, Castle lower level, Castle upper level and Final Boss. Scrolling from left to right across the screen as the game's name suggests you battle against a hoard of different ghost and goblin like enemies including bats, blue killers, blue crows, red crows, flying knights, goblins, green monsters, magicians, petite devil's, skeletons, tower monsters, woody pigs and zombies.

The constant changing background settings and horror themed enemy foes that you encounter as you progress on your journey are just one aspect that makes this game much loved. When it came to gameplay though it stood out because it required two hits from an enemy attack to lose a life. The first hit destroys Arthur's armour revealing that underneath he has nothing but his underpants on, adding humor to what is meant to be a game full of horror based themes.



Bonuses and new weapons can be picked up by killing an enemy monster that is carrying a pot. Arthur can only carry and use one weapon at a time against the enemy monsters. Armour can be replaced by jumping up at certain hidden spots on some levels. This action causes a pot to appear. Shooting at a gravestone fifteen times will summon a demon who casts a spell that turns you into a frog for a limited time. At the end of each stage a much bigger and harder end-of-level monster must be destroyed. Ghosts 'N Goblins was breaking new ground in arcade horror gaming - it combines a horror themed storyline with excellent graphics, dramatic music, a monstrous cast of in game enemies and even better end of level monster boss battles, establishing it as the original horror arcade game for others to follow.

Ghosts 'N Goblins worldwide success would see Capcom release a sequel three years later, in 1988, titled Ghouls 'N Ghosts. This time Lucifer, the ruler of the Demon Realm, takes away the souls of everyone in the kingdom, including Knight Arthur's beloved Princess Prin Prin. You must travel through six eerie levels defeating a new enemy character set of undead and demonic creatures to again save Princess Prin Prin, and return the souls back to the people of the kingdom. Although the original gameplay style of side scrolling, run 'n jump, shoot everything on screen remained, due to advances in arcade technology at that time, everything about Ghouls 'N Ghosts had been enhanced. Smoother more fluid movement, bigger more colourful graphics, bigger more graphically detailed end of level bosses, a greater number of enemies, more challenging gameplay, improved sound track and inclusion of new bits of humor as well as many other features.

These included a variety of new weapons and armor to uncover and pick up from blasting away at those treasure chests that will pop up from under the ground. Finding gold armor will provide Arthur the ability to charge up a special weapon to release a powerful magical attack. As well as this new feature Arthur can fire directly upward and directly downward while in mid air which was not possible in Ghosts 'N Goblins. Elements of humor found in the first game have also remained in the sequel. When you find an evil magician in one of the treasure chests, Arthur changes into an elderly man or a helpless duck momentarily. Both games are arcade gaming classics in the horror gaming genre.

At least 14 more horror themed arcade games were to be released by the end of the 1980's. These included titles such as Chiller, Xenophobe, Wardner, The Real Ghostbusters, Alien Syndrome, Shadow Land, Devil World, Karnov, Splatterhouse, Haunted Castle (Castlevania arcade), Bonze Adventure, Demon's World, Beast Busters and Laser Ghost. Some were outright horror based games like Chiller and Splatterhouse, others like Karnov and Bonze Adventure were borderline on the horror theme.



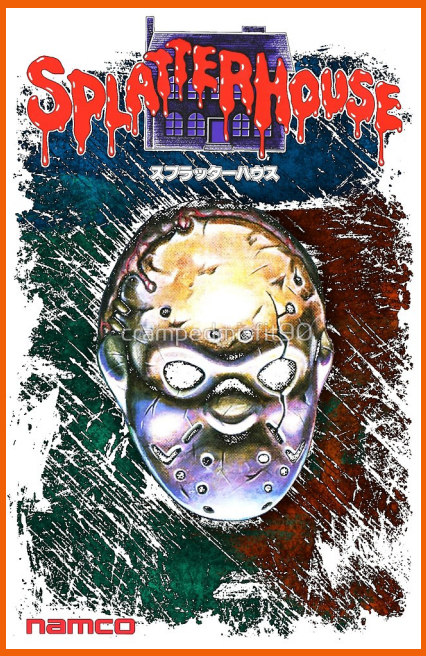
Chiller, a light gun shooter, released by Exidy in 1986, would become known as the first real gory arcade horror game. Such was the depiction of horror, Chiller is renowned as one of the most controversial arcade games to this day. Completely brutal and horrifying macabre, playing Chiller will send chills down your spine, it is probably the most offensive arcade game I have seen or played. It doesn't have ground breaking graphics or game play by any high standards, it's the complete opposite. The precise detailed depiction of blood, gore and slaughter of innocent people inside a torture chamber is too crazy to say the least. It basic graphic display is meant to shock you which it does all too well. It crosses the boundaries of where people will ask are video games too violent and in this case it is one game that would be.



The level of violence hits you right from the outset of the game. Inside the "Torture Chamber," you find several prisoners against a wall backdrop strung up in Medieval apparatus: an iron maiden, a guillotine, a set of shackles fixed to the stone walls and for no reason at all with your light gun you shoot at them blasting off limbs, faces, and abdomens in any order you like. It is bizarre because unlike most other games with a premise or story, in Chiller, there is no reason why you perform these actions. The screen fills up with blood and body parts leaving an uneasy feeling in your stomach. Moving on to the second level, to enter the "Rack Room," you'll find more bondaged prisoners, this time stretched out on wooden torture racks. Levels three and four - the Hallway and Graveyard transition from the macabre settings to the more traditional shooting gallery. Here you blast away



at ghosts, ghouls, and zombies. Not The greatest horror game ever made, but it will shock and horrify you that's certain.



After releasing their first fairly placid horror themed arcade game Shadow Land in 1987, Namco quickly followed up with a more violent and terrifying second horror themed arcade game in 1988, called Splatterhouse. Due to its graphic violent horror content, it has become one of the most recognizable 1980's horror themed arcade games. Splatterhouse is a homage to many violent horror flicks of the 1980's, it was heavily influenced by American slasher films such as Friday the 13th and Evil Dead II.

In this seven stage side scrolling beat 'em up thriller, two local university students, Rick Taylor and Jennifer Willis, take refuge from a lightning storm inside West Mansion, a local landmark known as "Splatterhouse". Legend has it that hideous experiments have been conducted there by the missing parapsychologist, Dr West. When the game starts you find yourself playing as Rick wearing an ancient relic possessing tremendous power known as the "Terror Mask", also known to horror film fans as a hockey mask made famous in Friday the 13th movies.

From the first level in the dungeon under the mansion, Splatterhouse depicts horror in great detail. Wearing the "Terror Mask", while holding large weapons such as meat cleavers and swords, Rick looks and plays the ultimate horror arcade game character. Background images of blood and gore add more volume and depth to the horror theme. If that was not enough hordes of different enemy creatures come at you exploding in pools of blood as their skin tears apart from Rick's violent kill attacks.



When Rick finds his girlfriend Jennifer safe on a couch, you think the game is won, unfortunately the hideous experiments and creatures inside the West Mansion have transformed Jennifer into a large gruesome fanged monster. Rick is forced to kill his girlfriend if he is to stay alive and conquer not only the beasts that remain but also the West Mansion itself. All of the levels consist of walking left to right, however, alternative pathways through sections of the house are possible by falling down through holes or jumping up onto ladders. Levels culminate in boss fights that take place in a single room. Rick can only move in a two-dimensional environment. He has the ability to jump, punch and kick. He also has a special attack, performing a dropkick that sends him skidding along the ground, damaging any enemies he hits. Rick can also perform a low kick, low punch, and jumping attacks, as well as pick up and use various weapons placed in the levels.



Spaltterhouse's distinctive graphic nature symbolizes horror scenes and gameplay in an arcade game that would be any horror gaming fan's dream. The atmospheric horror tunes and soundtrack reinforces the horror and gore narrative, it is an arcade game that excellently executes a horror theme which has stood the test of time.

The 1990's saw horror themed arcade games as a genre take a different turn from platformers and beat 'em ups. Sure these games were still produced such as Evil Stone (Spacy Industrial, 1990), Night Slashers (Data East, 1993) and Dark Stalkers (Capcom, 1994). For some unknown reason arcade game publishers thought horror games would work in the puzzle format, which turned out not to be the case. Ghost Lop by Data East (1996), is a very rare prototype, never officially released at the arcades. It does not ooze out terror or horror as in the previous mentioned games. The game is played in the vein of Magical Drop, where you can throw two ball colours which are Red and Blue to destroy the red and blue ghost balls hanging above you. Even though the game was never officially released by Data East, the prototype is actually a 100% complete game. Monster Sliders by Visco Games released in 1997, should not be classed as a horror themed arcade game. The only real reference to horror is the use of skull images in a game that plays like Tetris or Puzzle Bobble. The gameplay sees you matching the same coloured blocks and looks much too cute to be called a horror based game.

CONTINUED ON PAGE 77

THE PROBE SHOCK

The words "electroshock therapy" tend to conjure images of darkened rooms in insane asylums where inmates are mercilessly tortured via electrocution. But this is largely an unfair construction of Hollywood movies and television shows, out to scare their viewers. The reality is that for some people, electroconvulsive therapy (or ECT) is a lifesaver.



In the 1940s, American psychiatric hospitals were being overrun by patients that doctors were at a complete loss to treat, let alone cure. While lobotomies would make an inmate (it's hard to call these poor people patients!) more passive and controllable, it was a permanent procedure, and considered a method of last resort. A more temporary, less drastic solution needed to be found in order to calm violent inmates.

In the late 1930s, Italian psychiatrists, who already knew that seizures appeared to cause some sort of 'reset' in the brain, had been triggering them with a chemical that had unfortunate mental side-effects, filling their patients with a sense of terror. They wondered if they could trigger the seizures with electrocution instead, and if this would eliminate the side-effects.



Italian neurologist Ugo Cerletti was visiting a local butcher shop when he saw the butcher electrocute a pig to stun it before slaughtering it. Cerletti wondered if he could obtain the same effect with a human, and if it would be as effective as chemically-induced seizures. In 1938, he treated his first human patient, a schizophrenic, and it was a success.

Their experiments of using electricity instead of chemicals were a success – but the procedure was still somewhat unpleasant, with some patients being injured due to the physical effects of the seizure, or suffering pain from the electricity. As such, some patients were not encouraged to participate, and had to be forcefully restrained – this is largely where the haunting images the general public sees when they think of ECT come from.

It also didn't help that ECT was used to attempt to "treat" conditions that we no longer consider to be "illnesses", such as homosexuality. Although the psychiatrists sincerely believed they were trying to help these people, their patients often didn't feel that way!

And so ECT's reputation was largely soiled by the late 20th century, despite the fact that it likely helped more people than not. Antidepressants and other pharmaceuticals became the solution-du-jour. However, since the 1980s many of those that medications did not help have turned to ECT (with consent) to help them recover from severe depression. Today, thousands get ECT treatments. Some swear by it.

But this is not without consequences: memory loss appears to be a common side-effect, the extent of which varies from patient to patient. However, to many, this is an acceptable price to pay in order to live a fulfilling life. Psychiatrists hope that over time, ECT's bad reputation will fade, and more will turn to it to get the help they need.



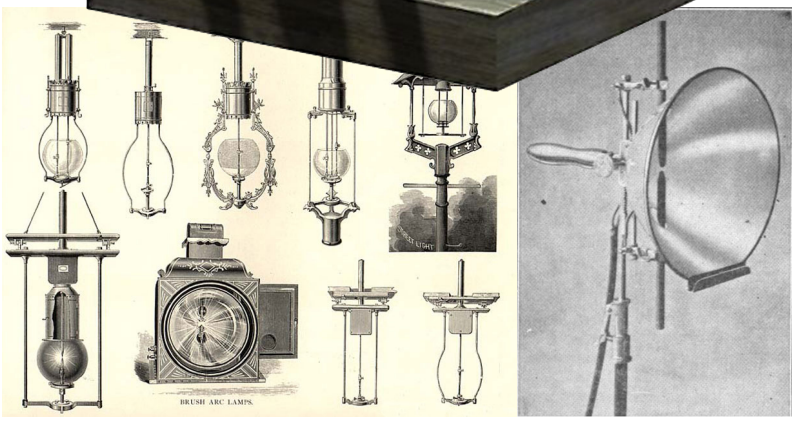
HEAVY DUTY



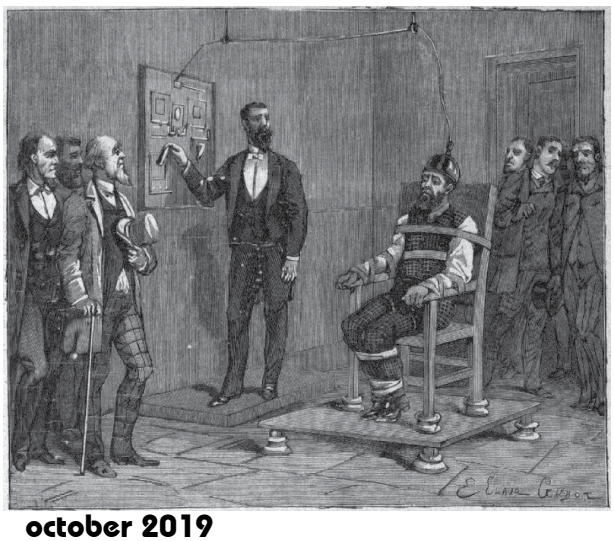
However, while electrocution can often save lives – not merely through ECT but also defibrillation – it can also take them, and not just accidentally.

For centuries, the typical method of capital punishment had been by hanging. Traditional hanging had simply put a noose around the condemned person's neck and hung them, eventually killing them through strangulation. In the mid-1850s a drop was introduced in order to break their necks which was seen to be more humane. But even "long-drop" hanging had frequent complications: sometimes the condemned person's neck didn't break and they would be left to suffocate, as before. Or, on the other end of the spectrum, they could be decapitated! Quelle horreur!

In 1881 a Buffalo, New York, dentist named Alfred Southwick got the idea that, since the newfangled 'electricity' used in contemporary arc street lighting could kill people accidentally due to its high voltages (3000-6000 volts), maybe it could be done on purpose, in the place of hanging. However, it couldn't just be done willy-nilly – the point of this was to be more humane, not less! And so, Southwick got together with a local physician and the head of the local dog pound and began electrocuting stray dogs. They electrocuted them in water, out of water, using various electrode types and placements (poor doggies!) and eventually they came up with a repeatable method that did the job quickly and cleanly.



Carbon arc lamps worked by jumping a high-voltage current between two carbon rods. The rods would heat up and melt, the electricity vaporising the carbon and producing a bright light. Over time, the rods would need to be pushed closer and closer together, eventually needing replacement.



A series of botched hangings provided an opportune time for Southwick to promote his method for the execution of humans. He modified a dental chair to restrain the victim, as they were an obviously unwilling participant! A commission was formed to study Southwick's proposal and others, and Southwick's proposal won out. Three prisons in New York State were to be outfitted with electric chairs: Auburn, Clinton and the infamous Sing Sing prison.

The first person to be executed (left) was William Kemmler, convicted of murdering his wive with a hatchet. His appeal against his sentence, based on 'cruel and unusual' punishment, had failed, and on August 6th, 1890, he was strapped into the chair. But the first shock wasn't enough to kill him, and a second attempt, while successful, was gruesome, causing his blood vessels to burst!





In 1999, the Internet went nuclear over an Macromedia Flash animation that allowed the user to microwave a cartoon gerbil until it exploded!

Joe Cartoon was a website created by Joseph Shields that featured crude cartoons animated using Macromedia Flash, a browser plug-in that allowed for the creation of simple applets. Flash was a revolution at a time when the web consisted mainly of images and text, with the occasional low-resolution video, although it was notoriously unstable and prone to security issues. But Gerbil in a Microwave, while grotesque, did demonstrate its potential effectively, and users flocked to the Joe Cartoon website to microwave the poor gerbil millions of times, generating over $US25,000 in advertising revenue for Shields at the peak of its popularity.

But how do microwaves really work? What is a 'microwave'?



Microwave transmitters can be directional, allowing for multiple signals to be broadcast from the same location without interference.

Microwaves are radio waves that have short wavelengths of between one metre and one millimetre, frequencies between 300MHz and 300GHz, above those of ordinary radio waves and below infrared light. Unlike lower frequency waves, microwaves can only travel by line-of-sight; they do not diffract around hills, reflect from the ionosphere or curve around the earth's surface, so they are limited to the distance of the visual horizon (about 64km).

Although at the lower end of the band waves can pass through walls, usually objects must be avoided to ensure transmission. Higher frequency microwaves can be absorbed by moisture or even gases in the atmosphere, limiting their range to around a kilometre. Above 100GHz the absorption of electromagnetic radiation by the atmosphere is so great, microwaves are consumed almost instantly!

And so, microwaves are useless for broadcasting. But they are great for narrowcasting! If you want to send a signal somewhere with a reduced risk of it being intercepted by someone else, microwaves are the way to go. Even better, because they are so small, you don't need a huge antenna to either send or recieve them – in fact, you can use a parabolic dish, which means that you can transmit on a certain frequency without worrying about interference from other transmitters, or their being interfered with by you.



Before the advent of fiber-optic transmission, microwave transmittion was commonly used for long-distance telephone calls, which were carried by networks of microwave radio relay links, up to 70km away from each other. Using frequency-division multiplexing (a way of shifting signals into different basebands in order to carry multiple signals on a single frequency) up to 5400 telephone calls could be carried simultanously on a single microwave radio channel, with up to ten channels broadcast by each antenna!



But microwave transmitters weren't just useful for making phone calls...

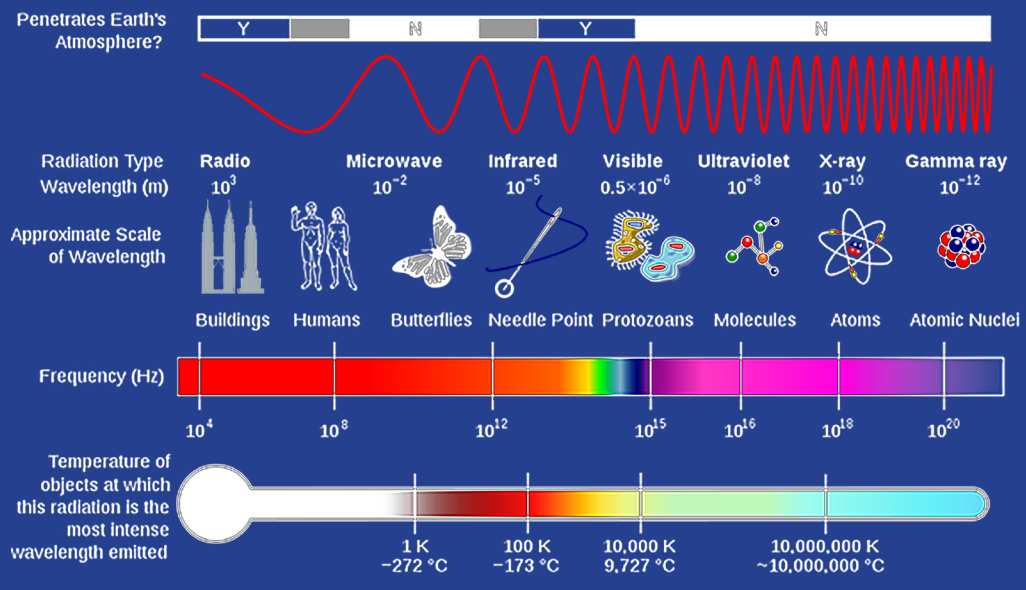








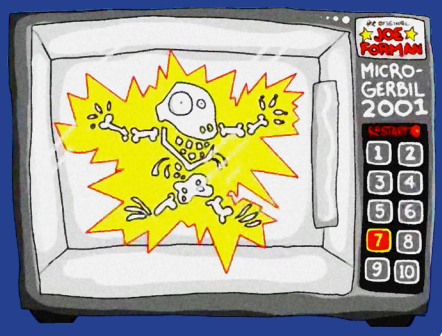
They were also perfect for use in radio and television broadcasting, either to transmit a signal for broadcast from the studio to the transmitter for distribution to the public, or from remote units to the studio, either directly or by way of a remote pickup unit (RPU), usually placed on a local mountaintop. In the US, these microwave signals are usually sent in the 2Ghz band. Because the transmission needs to be largely unobstructed, remote transmission vans generally hoist their transmitters up on telescopic masts in order to get over buildings and trees. This capability and others led to the rise of Electronic News Gathering (ENG), the modern process of reporters creating stories largely in the field, either live or recorded, that could be transmitted instantly or near-instantaneously. This allowed for events to be covered in real-time, rather than having to wait for a reporter to return to a newsroom before broadcasting.

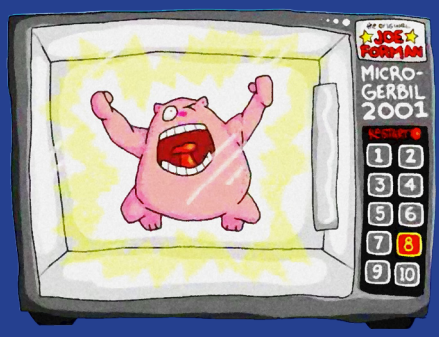


The electromagnetic spectrum contains radio waves, various forms of light, and radiation that can penetrate objects and the Earth's atmosphere to varying degrees. At the lower part of the spectrum is the Seafarer transmitter, which could penetrate water and communicate with submarines, although its antenna was 52km long! Above that sits weather and navigation transmitters, then AM radio, amateur and CB radio, FM radio, VHF TV, UHF TV and then microwaves. As the frequency goes up, the length of the wave goes down, and the smaller is the antenna needed to broadcast it. Above microwaves are infrared light, which can be used for remote controls; above that is visible light, then ultraviolet, x-rays and gamma radiation.

Wait, I have a 2.4Ghz wireless modem!

This doesn't mean that you're going to be cooked like the gerbil. In small amounts, microwaves are harmless. And in fact, the microwave spectrum is used for all sorts of things, not just for WiFi signals but also Bluetooth and cellular phone signals, the Global Positioning System, and satellite television. Microwaves allow these devices to work while staying clear of the crowded UHF spectrum. Wherever microwaves are practical, they are used, in order to save spectrum for applications that really need it.





How can microwaves cause a gerbil to explode?

So, now that we know all about microwaves, how do they cook things? Well, remember that water vapour absorbs microwaves – what do you think happens to that energy? It's converted into heat! And what are meat and vegetables mostly made out of? Water! So, if we expose food to microwaves, in theory it should get hot and cook, right?



Around 1890 French physician Jacques Arsene d'Arsonval , who had been studying medical applications for electricity, discovered that frequencies of alternating current above 10kHz did not cause electric shock but instead warming. However, using electrodes in contact with the skin eventually caused burns in subjects, but he discovered that insulated capacitive plates and inductive coils also produced the warming effect – that is, the radiation from the plates or coils caused the warming effect in tissue without direct contact. In 1908 German physician Karl Nagelschmidt coined the term diathermy to describe electromagnetic heating, and by the 1940s microwaves were being used experimentally.



Meanwhile, at the 1933 Chicago World's Fair, American manufacturer Westinghouse demonstrated a system for cooking food that consisted of two metal plates hooked up to a 10Kw 60MHz short-wave transmitter. Food placed between the plates cooked in minutes. But it took a lot of power!





These were initially quite expensive and were thus marketed mainly for commercial use.

RadarRange (initially spelt Raydar-Range after developer Raytheon) was an early line of microwave ovens.



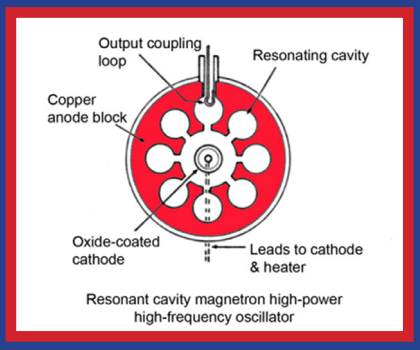
However, the development of radar during World War II necessitated the creation of a microwave generator, in order to improve radar's resolution, and decrease the size of the antenna required. A number of efforts were made by scientists in a number of countries, and they eventually developed the cavity magnetron. A magnetron uses a magnetic field to direct a stream of electrons from a cathode past a metal cavity. to an anode. By tuning the magnetic field precisely you



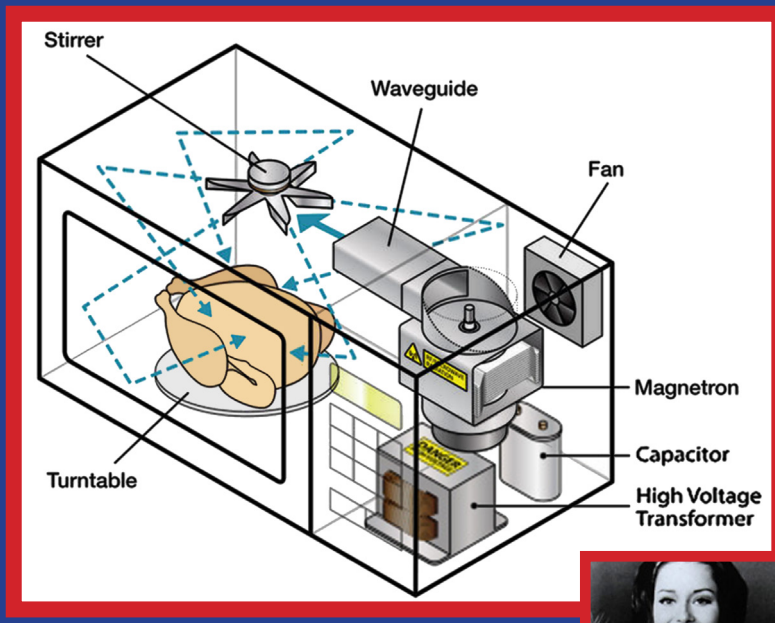
can cause some of the electrons to not quite make it to the anode, and circle back toward the cathode. As they circle around they generate radio waves in the cavity, much like blowing air over the mouth of a bottle causes it to whistle.



But it was initially difficult to tune the magnetic field precisely, and only small numbers of electrons experienced what is now called the cyclotronic effect. To be practical, many more microwaves needed to be generated compared to the power expended. This problem was solved by creating a ring of cavities around a chamber inside a solid copper cylinder. At the centre of the chamber is the cathode, which runs the length of the cylinder. The anode is actually the copper cylinder itself. A magnetic field causes the electrons to cycle around the inner chamber. As electrons strike the anode, they repel other electrons, causing an oscillating current to form, which as it passes by the cavities generates a large amount of microwaves. These microwaves can be captured using a wire at one end of the cavity, or by opening the cavity into a larger channel called a waveguide.



Resonant cavity magnetron high-power high-frequency oscillator



The cavity magnetron allowed for radar systems that could be compact enough to be used on and detect small airplanes. Invented by the British, it was offered to the US in exchange for help with the war effort. Contracts were awarded to Raytheon and other companies for mass production of the magnetron. The advanced radar capabilities it provided would be crucial in winning the war.

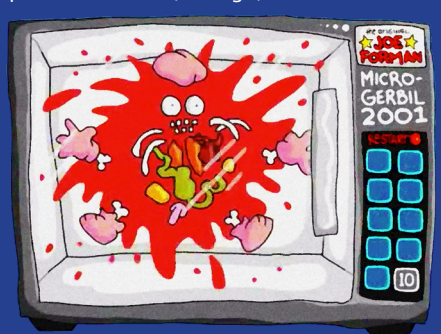
But the frequency of the microwaves can vary, making them impractical to use in more advanced phased-array radar introduced after the war. What to do with all these magnetrons? Well, in 1945 an engineer at Raytheon named Percy Spencer discovered that the radar set he was working on melted the chocolate bar in his pocket! Percy created a metal box which reflected microwaves injected into it around inside.


The waveguide directs the microwaves generated by the magnetron into the stirrer, which then directs the waves around the inside of the interior cavity, which reflect off the walls. Newer ovens have a turntable that rotates the food.



He cooked popcorn with it, and inadvertently exploded an egg! (something children have done ever since). Raytheon filed a patent on the process and in 1947 introduced its RadarRange. It was very expensive, but over time advances in manufacturing and safety drove costs down and made microwaves more appealing for home use.


A gerbil in a microwave won't actually explode. It will die, though, so don't do that.



The first microwaves cost over US$50,000 in today's money! They also had no safety features, and if left on without any food to absorb the energy could overload and damage the magnetron. But by 1967 home models were introduced that cost around US$4000 in today's terms, and by the 1980s they could be had for a few hundred dollars, speeding adoption and leading to microwaves becoming commonplace.

George Bachaelor looks back at one of the greatest horror video-game series of all time in...

the VAMPIRE'S inn



No other video game franchise screams Halloween more than Castlevania. 33 years of Dracula whipping fun, quirkiness and extreme frustration has spanned more than 30 game releases of hunter versus vampire killing across various arcade, console and handheld machines.

Castlevania brought to life gloomy horror filled 17th-century gothic graphics, with some of the best soundtracks that could be heard on an NES machine. It was an integral part of the Nintendo success story, helping drive sales of the machine worldwide, providing another exclusive hit in the competitive 8-bit gaming market, further increasing its intellectual proprietary characters already boasting the likes of Donkey Kong, Donkey Kong Junior, Mario Bros, Kid Icarus, Legend of Zelda and Metroid.

In all started in 1986. Hitoshi Akamatsu and Konami introduced Castlevania to Japanese gamers of Nintendo's Family Computer Disk System console (FCDS). However, it would be eight months later in May 1987 when it was ported to cartridge on the NES in North America, that the ongoing war between the Belmonts and the Lord of Darkness - Dracula, that Castlevania's world wide popularity and legacy would begin. Such was its success, by 1990, versions of the game were released for the IBM, the Commodore 64 (both developed by Unlimited Software), and the Commodore Amiga (developed by Novotrade).

The coolest looking and most bad ass horror character of all time, Dracula, appears in almost every Castlevania game ever made. Most games in the series are set in Dracula's castle located in Transylvania, Romania, although, before Castlevania Symphony Of The Night, the original games had added gameplay set in cemeteries and forests as well.











The video game series loosely based on the mythology of Bram Stoker's novel Dracula, incorporates a variety of horror cliches within each game - mummies, monsters, bats, Frankenstein, hunchbacks even the Grim Reaper! These monsters serve to obstruct the path to Dracula but are rarely tied to game plots in the series.

Legend describes Dracula being resurrected every 100 years. The Belmonts are the chosen ones to whip Dracula and his horror horde to their gruesome deaths in a final cataclysmic battle to send Dracula's castle crumbling to the ground. Simon Belmont is the original whip wielding warrior of Castlevania. The whip used by the Belmont clan is as important to the game franchise as the rest of its history and has remained the weapon of choice from the outset. The whip, a relic called the Vampire Killer, has been blessed with the power to destroy vampires and other creatures of the night.

Simon Belmont features as the hero in as many as eight Castlevania games - Castlevania (FCDS and NES), Vampire Killer (MSX2), Haunted Castle (Arcade), Castlevania II: Simon's Quest (NES), Super Castlevania IV (SNES), Castlevania Chronicles (PS1), Castlevania Judgment (Wii), and Castlevania: Harmony of Despair (PS3 and Xbox 360).

Castlevania 3: Dracula's Curse (Konami, 1990), would introduce new members of the Belmont family. You were now able to play the game as Trevor Belmont, Simon's ancestor, along with Sypha Belnades, a young sorceress with poor physical attack power but powerful elemental magic spells; Grant Danasty, a pirate with the ability to climb on walls and change direction in mid-jump (a rare ability in earlier games of the series); and Alucard, Dracula's son, a dhampir with the ability to shoot fireballs and transform into a bat.

As the game evolved over the years onto other machines so did the characters and their abilities. None more so than in Super Castlevania IV. The Super NES game allows Simon Belmont to slash his whip in as many as eight different directions. He can moonwalk along stairs, move while crouching, perform whip tricks and swing on his whip to get to higher platforms.

The word "Castlevania" was created by Emil Heidkamp, Konami of America's senior vice president at the time. He believed the game's Japanese name translated as "Dracula's Satanic Castle". He chose to change it to Castlevania based on religious grounds. The word is something of a misnomer, presumably being a word play on Transylvania.

Creator, Hitoshi Akamatsu, was an admirer of cinema, approaching game projects with a "film director's eye", and said the visuals and music for Castlevania were "made by people who consciously wanted to do something cinematic". With Castlevania, he wanted players to feel like they were in a classic horror film - which it captured quite brilliantly with the first three games, as well as Vampire Killer, featuring a film reel motif on the title screen. Other games in the series would also include movie like cut scenes and storytelling.

Castlevania was among the first video games to feature a Gothic horror storyline, that has remained part of its identity to this very day. While the platform gameplay is considered to be amazing, what is even more amazing about the game is its quirky elements and very high difficulty levels that plagued it especially during the earliest games of the series.

Gameplay of the first Castlevania involved the player to whip candles in order for hearts to be dropped to the ground for the player to collect. In most games a heart will replenish health or restore lives but in the original Castlevania game hearts are ammunition for whatever weapon you are holding. To replenish Simon's health you must slash the walls with your whip to find food behind them, its bonkers logic. Perhaps this weird humor appealed to the mostly younger NES audience? Maybe because of its many weird quirky differences 'to the norm', they added more to its appeal and have brought back many nostalgic memories for gamers to remain in love with the series ?

Castlevania is renowned for being one of the hardest video games ever made. In the first game, the main reason for this is because when Simon gets hit by a monster he instantly jumps backwards. You could have full health but if you happen to get hit and fall backwards into a pit behind you then you're dead. If that wasn't bad enough, boss battles such as the one with the Knight are impossible. There are no wave patterns to learn to actually have a chance of defeating it. You can only take 4 hits from flying objects before you die in a heap on the floor but to kill the Knight boss it requires 9 hits, it's just frustrating as hell gameplay.

Castlevania the series is nothing short of a classic, that's a fact. Graphics and music in Castlevania games are often of the highest quality. But the early games were dogged by playability issues and were very difficult to play to say the least. The main culprit was the





controls. These problems made your gaming experience totally and utterly a nightmare worse than being bitten by Dracula. It took five years and eight different games for the unfair fight against Dracula and his family of horrifying monsters to finally be a fair fight. The sluggishness and awkward movement found in the early games was rectified in Super Castlevania IV. In this game you actually have control of your character, you aren't frustrated by ridiculous difficulty or cheaps deaths and 100% perfect jumps. The fluidity of movement made the game so highly playable that it felt like Simon Belmont could do anything. Super Castlevania IV is highly regarded in the Castlevania series as well as the platform gaming genre.

Not all the games in the series were great to play, or fondly remembered by Castelvania enthusiasts. Castlevania Dracula X (SNES, 1995) and two N64 games titled Castlevania and Castlevania Legacy of Darkness (1999), were shockers that saw the series go backwards in its development.

Instead of keeping the gloomy horror themed atmosphere and music from Super Castlevania, Castlevania Dracula X went back to the basics of the originals giving the series a comic feel which meant the game lost a bit of its soul. Control of your whip slashes and jumps are unlike the awesomeness of the previous game, and the game is relentlessly difficult. The problems may have occurred because Dracula X was actually a port of the TurboGrafx 16 CD-ROM game, Called Devil's Castle Dracula: Rondo of Blood.

Then came the 3D Castlevania universe on the N64. Both of these games suffered control problems and the gameplay made no sense at all. The 3D camera itself was terrible, it pointed wherever it wanted so you couldn't situate your character where you wanted to go, rendering the game almost unplayable. The fantastic music scores found in earlier games was non existent in these N64 versions, it was plain awful a real blight on the series as great music was part

of the Castlevania identity. The puzzles you are required to complete certain tasks were bewildering. Searching in game items for clues provided no real understanding as to what you needed to do and if you were carrying an item you could not simply drop it. What this meant was that if you had picked up the wrong item first you couldn't complete the task, you would have to start the game again. If a bit of the Castelvania soul was lost in the Dracula X game then it was sent to the graveyard in the N64 games of the series.

The two standout games in the Castlevania series are Castlevania II: Simon's Quest and Castlevania: Symphony of the Night. Both games are considered to be fantastic games in their own right, but both shaped the direction of the Castlevania series in different ways.

Castlevania II: Simon's Quest (Konami, 1988) the second game in the series, demonstrates what the franchise would eventually become. Breaking away from convention with a day / night cycle, quest lines and character leveling, it showcased that platformers in this era of gaming could be more than just linear adventures. The gameplay mechanics were changed as it extended to a more open world feel, opposed to the linear style seen in the original Castlevania. This open world and non linear style would go on to become one of the cornerstones for future castlevania games.

Simon Belmont sets out on a journey to undo a curse placed on him by Dracula at the end of their previous encounter. With Dracula's body split into five parts, Simon must find and bring them to the ruins of his castle and defeat him. Similar to the non linear gameplay of Metroid, Simon's Quest features RPG elements such as a world map which the player is free to explore and revisit. Simon can also interact will local villagers who offer him clues or lies. Merchants will sell items, either for fighting enemies or for traversing to otherwise unreachable areas. To pay for them, Simon must collect hearts, which are dropped by defeated enemies. In addition to the ordinary items in Simon's inventory, he can also purchase new whips in certain locations of the game. He begins with a standard leather whip, and can upgrade to stronger ones with each new purchase. Simon's Quest introduces an Experience Rating (ER) system, which is increased by collecting hearts. After he finds a sufficient amount, his level and maximum health will increase with his ER.

The period of time in Simon's Quest cycles between daytime and nightfall, which has a prominent effect on the game and Simon's encounters. During the day, the enemies outside of villages in the game are weaker. At night time, they gain strength and inflict more damage to Simon's life points, though when defeated, they drop more hearts. The villagers and merchants in their respective locations are no longer available to talk to during night time, and are replaced by zombies.

Despite the departure from the previous game, there are elements from it that have remained. This includes the magic weapons, which are secondary weapons to Simon's whip. Each of them have a different use. Like most games in the series, some of these require the usage of hearts. One of them returning from Castlevania is the holy water, a small glass which can disintegrate walls that conceal hidden items. Some magic weapons make their first appearance in Simon's Quest, such as the diamond, which attacks enemies while bouncing off any surrounding walls.

The objective of the game is to travel to the five mansions to find the body parts of Dracula's corpse, and an item known as the magic cross. The body parts can be utilized to support Simon in the game. For example, Dracula's rib can be used as a shield to block any projectile attacks fired from an enemy. Finding all of the required items will allow Simon to clear the blockade in front of Dracula's castle to fight the last boss. After the player defeats Dracula, there are three possible endings based on the time taken to complete the game. The best ending is achieved when the player beats the game in eight game days.

There is a far greater world for Simon to discover. Simon's Quest is more involved. The game takes place in various backdrops - graveyards, rivers, forests, and castles in whatever order you decided to go. New items open new paths, exploration and experimentation replaced timing and memorization of the first Castlevania.

The origins of Simon's Quest began with a lesser discussed version of the game. In 1986, Konami brought Castlevania to the MSX2 personal computer called Vampire Killer. It kept the general atmosphere while transforming the levels into branching mazes. On top of dodging devil-femurs and whipping bats, players had to hunt down keys, deal with merchants, and explore everything thoroughly. The first Castlevania limited its secrets to breakable blocks and hidden treasures, but both Vampire Killer and Simon's Quest pushed the idea in new directions.

Simon's Quest is not the best platform game in the series yet it does provide gorgeous gfx and awesome sounds. It keeps the soul of the original game adding some cool upgrades, however it boasts many quirks and flaws just as its predecessor did.

Collecting hearts this time around are used for currency purposes to buy things. But as mentioned above the stores only open in the day not at night so this makes it difficult to play while the game is in night mode, it becomes rather tedious waiting for daylight to reappear. It makes little sense that you might be out

slashing demonic creatures in the forest then all of a sudden get told it has become night and be transported to the castle to keep fighting but still have to wait for morning to be able to complete tasks. What is more annoying is that the message boxes appear on screen too frequently, taking away your enjoyment of the game.

Simon's Quest is riddled with spelling errors throughout the many messages popping up like spam on the game screen. The translation from Japanese to English coupled with the many misspelled words make understanding the clues within the game almost impossible, much of it just doesn't make any sense. The gameplay is just as difficult as the first game, this time bouncing blobs are an irritating frustration that you can't get away from, even when you are on the stairs. Your mechanic for jumping is ridiculous. This is the major frustration of the game. Jumping from ledge to ledge appears impossible and the space between them just doesn't appear to have enough room at times. Then when you are tasked with jumping from block to block over water if you are not standing at the very edge of a block when you must jump long distances you just fall into the water and die, it's tear your hair out craziness!

The boss battles in Simon's Quest are a real walk in Dracula's castle - literally. The first game boss battles were super hard but in Simon's Quest, it's totally the opposite. I have never ever seen an easier boss battle in a game than walking past the Grim Reaper to defeat him - it happens in Simon's Quest, unbelievable but true. The final boss battle against Dracula is just as easy - throw a few fireballs and it's all over.

Simon's Quest, though, would heavily influence and be the inspiration for future titles in the series such as Castlevania: Symphony of the Night. Symphony of the Night's assistant director, Koji Igarashi, said the critical reaction to Simon's Quest and its gameplay allowed them to pitch Symphony of the Night to Konami. The plot of Simon's Quest would also be directly referenced in later Castlevania games. In the Game Boy Advance version, Castlevania: Harmony of Dissonance, the protagonist, Juste Belmont recounts when his grandfather, Simon, had to search for Dracula's body parts. In the game, the player must also find them again.







Symphony of the Night

Castlevania: Symphony of the Night (Konami, 1997) is considered to be the best game in the vampire hunting, horror themed franchise. It is the sequel to Castlevania: Rondo of Blood on the PC Engine's Super CD-ROM (Konami, 1993). It was the first game in the series appearing on Sony's Play Station and the second game in the series to use CD technology after the PC Engine version mentioned above.

Symphony of the Night was considered a huge risk at the time of its release. Using hand drawn artwork at a time when 2D popularity had been overrun by game developers pushing 3D worlds onto nearly every big name game seemed as weird an idea as some of the series previous game ideas and characters, but it worked! Played as a side-scroller, it no longer featured Simon



by George Bachaelor

Belmont as the lead hero, instead it brings back Dracula's dhampir son, Alucard, introduced in Castlevania III, (Dracula spelt backwards is Alucard). The objective of the game is exploring Dracula's castle to defeat an entity who is controlling Richter Belmont, the self-proclaimed Lord of the castle and hero of the events which took place in Castlevania: Rondo of Blood. The entity can only be seen with a particular item obtained during gameplay. Once it is defeated, the second portion of the game is revealed, eventually leading to the final battle with a newly awakened Dracula.

Storytelling became a main point of difference between Symphony of the Night and other Castlevania games before it. While not groundbreaking and the voice overs telling the story may have sounded off key, the use of the Play Station's CD technology added incredible music, sounds, and more depth to a game that would introduce even more complexity to its gameplay.

Heralded as a major turning point in the Castlevania series, Symphony of the Night changed the direction of the Castlevania series, as it was the dominant game style that other games in the series would follow. It is also credited with defining an entire genre of gaming. Drawing equal inspiration from its own predecessors and from landmark action RPGs like Zelda II and Metroid, Symphony of the Night became identified as a classic "Metrodavina" game. Metroid had popularized the idea of non-linear level design ten years prior, but Symphony's game style saw the word "Metroidvania" associated with it everywhere.

Most Metroidvania games owe Symphony of the Night a great deal of debt. After all, without it, it wouldn't exist at all. Symphony of the Night is a perfect amalgamation of RPG gameplay infused with extensive exploration, incredible pixel art, music, and, above all, a sense of fun. The game has an incredible replay value and unforgettable boss fights. Some of the moves were incredible. Now you could perform sliding attacks, run faster, shoot more weapons, jump higher, kill bigger enemies with one attack, it was leaps and bounds ahead of the other games in the series.



In a Castlevania first, Alucard outfits himself like an RPG hero. He gains levels by defeating enemies, and he progresses further by equipping armor, items, floating familiars, and varied weapons from swords to nunchucks. Instead of linear stages, the castle unfolded before him like a Metroid map, offering a complexity well beyond the minor detours of Simon's Quest and Rondo of Blood. New abilities opened up new areas, secrets abounded in the walls, and a reversed version of the entire castle awaited players who found the proper secrets. Alucard also broke from the Belmont model with his more fluid control and greater repertoire of moves, resulting in a game that wasn't quite as stringently hard as past Castlevanias.

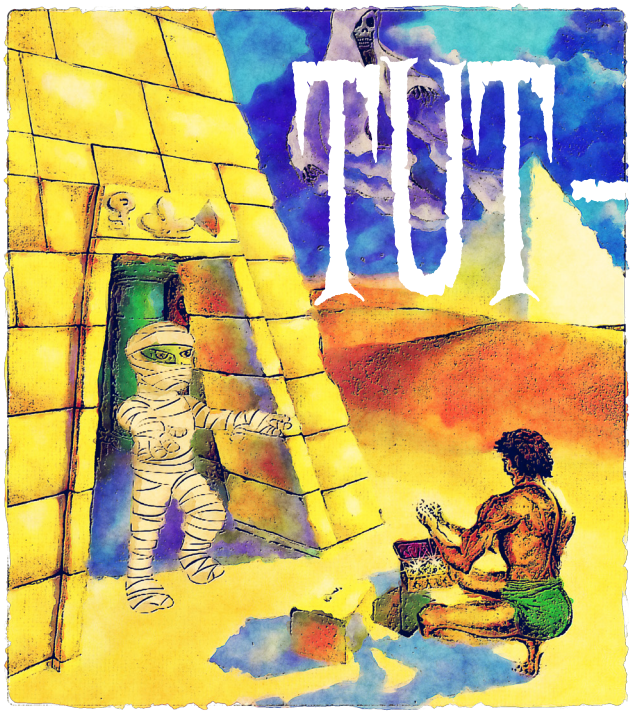
The game is not without its problems. You start off as Richter Belmont battling Dracula but for the rest of the game you play as Alucard. Maybe that's not so bad, but it would have been great to play as different characters during the game, you can only unlock Richter once the game is completed. Alucard is a real destroyer of anything that moves, he has super capabilities, strong as an angry rhino, but when you meet Death, he takes away all of Alucard's weapons, now the game is a real grind to get back upto the level of Alucard kicking supernatural monster butt.

To start the game with amazing powers but then take them away from you just doesn't seem fair play at all. Games aren't supposed to give you nightmares, but the act of dying and restarting in Symphony of the Night is its worst characteristic. In other games in the series you are given a continue screen but in Symphony Of the Night you must go through a series of events that takes forever, then reload your saved game, it truly is the stuff of gaming nightmares.

Having said that, the game is huge, it takes hours and hours to get through the whole castle. When that is done, you must complete the map upside down. Boss battles in Symphony, are the most incredible battles in the series. At the end you face off against a dark priest named Shaft before you enter the epic final battle against Dracula.

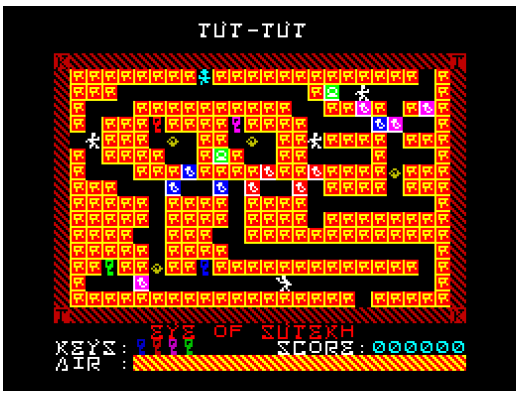
Castlevania is a series of games that has evolved over time, some great, some not so great. The amount of games released on so many different machines is testament to its incredible fan base and cult status among gamers world wide. As a series of games, Castlevania is not without its faults. There is one thing Castelvania has done, and done very well - it has changed the way we play platformers. From basic linear to nonlinear, from 2D to 3D, from RPG to the Metroid connection. It has been a hell of a Vampire killing ride. All of these events have enhanced our love for the game, it's taken us in many directions over the 30 plus years and has ingrained its popularity among gamers across all age groups making the game series an all time classic.

If horror and Halloween are your thing, if you get enjoyment from pitting yourself against the supernatural, the creepy, the eerie, the strange, the downright gruesome and even the unexplainable, then the Castelvania series of games will fill that void more than any other game in the horror gothic genre. If you are searching for a horror themed game to play this Halloween, Castlevania should be on your go to games in your collection.



TUT

A NEW GAME FOR THE ZX SPECTRUM



Can't wait to play Tut-Tut? Don't want to type in the listing?

You can download a Spectrum tape image at paleotronic.com/tut-tut.tap but be warned... *your trip into the pyramid may already be doomed!*

The only way to be sure the game will play fair is to type Tut-Tut in!

BY DAVID STEPHENSON

It's coming to the end of 1921's digging season in Egypt's Valley of the Kings. Your excavations have not gone so well this year, failing to find any trace of the legendary and as yet undiscovered Pharaohs tombs. Then in your final weeks wild stories recounting the wrath of vengeful mummies strangling local would-be tomb raiders filter back to base camp.

At last some concrete leads worth looking into, and opportunities too good to pass up. Occulist tales of curses be dammed, you're an Egyptologist and grand adventurer, such nonsense can't possibly hurt you.

Or can it?

Tut-Tut is one-part puzzle, two parts arcade action game comprising of 15 levels. To complete each level the player will need to collect keys, open doors, move blocks and find exits to lower crypt levels. All this and more while keeping an eye out for Pharaohs roaming guardians.

Keys are: 'O' left, 'P' right, 'Q' up, 'A' for down and 'R' to reset the level (at a cost). Good luck adventurer.

How it Works

Type in BASIC games have a reputation for being notoriously slow on the ZX Spectrum, even early commercial titles tended to suffer from significant slowdown. With a little creative and careful programming, coders could find numerous ways to overcome the limitations of the system, putting together some surprising examples.

Tut-Tut takes advantage of the Spectrum's inherent characteristics and some known workarounds dedicating as much processing power to the BASIC gaming experience as possible. Hopefully the end experience is more akin to playing an early machine code Spectrum game rather than a BASIC type in form an 80s magazine.

Tut-Tut's BASIC Program Structure

Due to the nature of Sinclair BASIC the order of program flow is of vital importance. To this end variables are defined first, followed directly by the core of the Tut-Tut Game code.

It is important to declare variable at the beginning of a program, as every BASIC reference to variables first checks the initial declaration point in our program. If a variable is declared later in a listing, say at the end, then BASIC will need to read though the entire program before changing or referencing a variables value. Of equal importance is the order of variable declaration. Important and highly used variables are declared first, as these will be at the top of the variable stack. The further down the stack the longer it will take to reference them.

In a similar way to variables, Sinclair BASIC programs generally take longer to process instructions the further down a program listing they are kept. To keep game speeds high Tut-Tut's main loop is located directly after variable definitions., with the most often accessed in game sub-functions situated directly afterwards. Functions not required for immediate in game purposes, such as the screen setup are located further down the Tut-Tut BASIC listing.

Finally, towards the end of the program listing come the User-defined Graphics and level information, all held in DATA statements.

VARIABLES	GAME FUNCTION
V, C, B	Counters and General Maliciousness
N, Z	Counters for Main Loop
S	Air / Timer Countdown
$Z, $C	General Strings
U	Screen Offset
$T	Game Tile String
M(x)	Mummy Positions
D(x)	Mummy Direction
X,Y	Player Positions
W,Q	Player Position Reference / Temp
K(x)	Player Keys Held
G	Player Score

LINES	PROGRAM STUCTURE
35 - 120	Main Loop
	Check for player input
	Mummies movement
125 - 175	Mummies Change Of Direction
	Check where player is and try to follow if possible
180 - 245	Move Player Character
	Check for keys and gems
	Move walls
250 – 270	Update Score And Update Collected Keys
	265 REM POKE 23296,243: POKE 23297,201: RANDOMIZE USR 23296
275 - 305	Play Caught By Mummies
	Re-read player stating position from level DATA
310 - 320	Music For New Games And End Of Levels
325 - 525	Main Menu And Attract Screens
530 - 580	Main Display And Screen Setup
585 - 600	Information Panel Template
605 - 635	Setup For Next Level Or New Games
640 - 685	Load UDG Tile Sets And Game Tittle Screen
690 - 830	Read Level DATA And Build On Screen Game Levels
835 - 935	UDG Character Set DATA
940 - END	Level DATA
	3 DATA lines per level

Maintaining Game Speed

The greatest challenge, after knowing the above is how to keep in game speed as high as possible. There are several methods employed in Tut-Tut.

All instructions are kept as mathematically simple as possible. It takes considerably longer for Sinclair BASIC to process multiplication and division than simple addition or subtractions. Diligent use of mathematical comparisons, for example the use of IF NOT a is equivalent to IF a <> 0 only with the former achieving a significant speed increase.

To be any fun at all games have be responsive to player inputs, in Tut-Tut player interaction and movement is given priority over enemy movements. There are four enemy mummies in the game and these move at half speed of the player character. Functionally the mummies are processed in groups of two, so for every player action only 2 mummies are moved at a time.

One thing affecting game speed more directly are the differences between how enemy and player characters are tracked. Enemy mummies are tracked using their position on the colour attribute layer, while the player characters position is held using x,y screen coordinates. In fact, mummy characters are pre-drawn to the display at level setup time, with their colour attributes set to 0. During game play colour attribute at a mummy's given position are POKEd on (or off), revealing the movement of the enemy character.

Enemy characters are handled in this fashion as PRINTing directly to the screen at named locations is costly in processor cycles. Poking attributes directly to memory on the other hand is considerably faster, particularly when dealing with four individual enemy character positions. Unfortunately, player character coordinates can't be tracked in the same manner, the player character must be printed directly to the screen as the mummies need to be removed and printed over for the player graphic to appear. Regardless only having to process one character this way instead of five has much less an impact on game speed.

The ZX Spectrum's colour attributes are used extensively throughout the game. For example, the exact location of static objects is not actively tracked by positioning variables.



The player and mummy characters interact with object colour attribute to determine if there are keys, doors, walls or gold in any character's path. With player charters relying entirely on an objects colour attributes to ascertain how an object should be used.

Another speed enhancement trick deployed in Tut-Tut is the disabling of the Spectrums keyboard reading routines. Under normal conditions the ZX Spectrum checks for keyboard activity 50 times per second. Switching this behaviour off and checking at specific times during program execution gains us a final speed boost. Line 265 of the program turns of the keyboard reading functions, this is actually a small machine code program held in the printer buffer.

```
265  POKE 23296,243: POKE 23297,201: RANDOMIZE
USR 23296
```

Certain commands such as BEEP will automatically switch keyboard reading back on after execution, therefore line 265 is always run directly after the playing of end of level tunes or other sound.

One side effect of using the method is that if you SHIFT BREAK to halt the executing program the keyboard will become completely unresponsive. The Spectrum will need to be reset before normal keyboard behaviour is restored. For this reason the line is REMed out in the printed listing of Tut-Tut, you should only enable it once the typed in program is otherwise fully functional and or saved to tape (or disk or flash cart etc).

Level Definitions

Game level data is stored from line 940 onwards. Each level consists of three lines of DATA blocks.

The first line of each level contains the resources to build the playing field of 24x15 character squares. Each line of play is 24 characters long, represented by 8 character digits holding 3 squares of the play field each. These digit values are used to reference STING t$ that contains 8 possible tile variations.

Our second DATA object stores level object placement information. Objects are stored in the following order, 4 keys, 4 monsters, 4x4 colour blocks (16 in total including exits) and finally 4 Gems. Item location is relative to it's position on the ZX Spectrum's colour attribute layer. Objects given a 0 value are unused within the described level.

The final DATA block holds the players starting location and level name.

Entering the code into the ZX Spectrum

Typing the listing into the Spectrum is relatively straight forward, but there are a couple things to take note of.

The listing uses '\' notation in PRINT and some STRING functions to denote User Designed Graphic characters. Where characters are slashed enter the appropriate graphic character in accordance with the ZX Spectrum Manual.

As mentioned in the above article, line 265 containing POKE and RANDOMIZE USR 23296 instructions should be REMed out until the game is otherwise working correctly and has been saved. It may then be enabled, be sure to save another copy and then run the game as normal. The game does not require line 265 to execute, and these instructions are used as a final measure to speed up BASIC execution.






```
   10 DEF FN r(a,b)=a-(INT (a/b)*b): DEF FN
m(a,b)=INT (a/b)
   15 LET v=0: LET c=0: LET b=0: LET z=0: LET
y=11: LET x=18: LET q=y: LET w=x
   20 DIM m(4): DIM d(4): LET n=0: LET s=0: DIM
k(4): LET g=0: LET u=3: LET t=0
   25 LET z$="": LET c$="": LET t$="\b\a\b\a\a\
a\b\b\b\a\a"
   30 GO SUB 640: GO TO 325
   35 FOR n=1 TO 25
   40 FOR z=1 TO 2
   45 IF ATTR (y,x)=71 THEN GO SUB 275: GO SUB
255: GO SUB 225
   50 IF INKEY$="q" THEN LET y=y-1: GO TO 70
   55 IF INKEY$="a" THEN LET y=y+1: GO TO 70
   60 IF INKEY$="o" THEN LET x=x-1: GO TO 70
   65 IF INKEY$="p" THEN LET x=x+1
   70 LET c=ATTR (y,x): IF y-q+x-w AND c<>114
THEN GO SUB 180
   75 LET y=q: LET x=w
   80 FOR v=z TO z+2 STEP 2
   85 LET c=m(v)+d(v): IF PEEK c AND PEEK c<>69
THEN GO SUB 125: GO TO 95
   90 POKE m(v),0: LET m(v)=c: POKE c,71
   95 NEXT v
  100 NEXT z
  105 IF INKEY$="r" THEN GO TO 480
  110 NEXT n
  115 LET s=s+1: POKE 23229-s,16: IF PEEK
23208=16 THEN GO TO 480
  120 GO TO 35
  125 LET c=y*32+x+22528-m(v): LET b=m(v)
  130 IF c>16 AND NOT PEEK (b+32) THEN LET
d(v)=32: RETURN
  135 IF c>0 AND NOT PEEK (b+1) THEN LET
d(v)=1: RETURN
  140 IF c<-16 AND NOT PEEK (b-32) THEN LET
d(v)=-32: RETURN
  145 IF c<0 AND NOT PEEK (b-1) THEN LET d(v)=-
1: RETURN
  150 LET b=d(v)
  155 IF b=1 THEN LET d(v)=-1: RETURN
  160 IF b=-1 THEN LET d(v)=-32: RETURN
  165 IF b=-32 THEN LET d(v)=32: RETURN
  170 LET d(v)=1
  175 RETURN
  180 IF NOT c THEN GO TO 225
  185 IF c=71 THEN GO SUB 275: GO SUB 255: GO
TO 225
  190 IF c=6 THEN LET g=g+25: GO SUB
255: GO TO 225
  195 IF c>64 AND c<69 THEN LET k(c-
64)=c: LET g=g+10: GO SUB 250: GO TO
225
  200 IF c=16 THEN RETURN
  205 IF NOT k(c-120) OR c<120 THEN RE-
TURN
  210 IF c=124 THEN LET t=t+1: LET
g=g+25*(t+1)-FN r(s*(t+1),5): GO SUB
255: GO SUB 310: GO TO 610
  215 LET v=y+(y-q): LET b=x+(x-w): IF
ATTR (v,b) THEN RETURN
  220 POKE 23693,c: PRINT AT v,b;"\e"
  225 POKE 23693,0: LET c=FN r(q+w,2)
  230 IF NOT c THEN PRINT AT q,w;"\b":
POKE 23693,69: PRINT AT y,x;"\i"
  235 IF c THEN PRINT AT q,w;"\c": POKE
23693,69: PRINT AT y,x;"\h"
  240 LET q=y: LET w=x
  245 RETURN
  250 LET c=c-64: POKE 23693,k(c)+56:
PRINT AT u+17,u+4+c;"\e": IF c=4 THEN
PRINT AT u+17,u+4+c;"\f"
  255 IF g<0 THEN LET g=0
  260 LET z$="0"+STR$ g: POKE 23693,69:
PRINT AT u+17,u+26-LEN z$;z$: BEEP
.005,14
  265 POKE 23296,243: POKE 23297,201:
RANDOMIZE USR 23296
  270 RETURN
  275 LET g=g-25: GO SUB 225: OVER 1
  280 FOR c=2 TO 5: PRINT AT y,x;"\b":
FOR b=66 TO 70: POKE 23693,c+b: PRINT
AT y,x;"\h": NEXT b: NEXT c
  285 OVER 0: PRINT AT y,x;"\h": GO SUB
225: GO SUB 315
  290 RESTORE 940+15*t+10
  295 READ z$: LET c=VAL z$: LET x=FN
r(c,32)+u+1: LET y=FN m(c,32)+u: LET
n=23
  300 GO SUB 225
  305 RETURN
  310 BEEP .25,-2: BEEP .125,8: BEEP
.125,5: BEEP .25,5: BEEP .25,-2: BEEP
.25,5
  315 BEEP .25,-2: BEEP .125,3: BEEP
.125,3: BEEP .25,8: BEEP .125,-2: BEEP
.125,-2
  320 RETURN
  325 GO SUB 530
  330 FOR b=10 TO 1000
  335 FOR z=1 TO 600
  340 IF INKEY$<>"" THEN GO SUB 310: GO
TO 605
  345 IF z=1 THEN GO SUB 410
  350 IF z=200 THEN GO SUB 445
  355 IF z=400 THEN GO SUB 375
  360 NEXT z
  365 NEXT b
  370 GO TO 605
  375 GO SUB 585: POKE 23693,70
  380 PRINT AT u+3,u+7;"\m\l\t\p";TAB
17;"\d  10"
  385 PRINT AT u+5,u+7;"G\lM\p";TAB
17;"\g  25"
  390 PRINT AT u+7,u+7;"\lXI\q";TAB
17;"\f  50"
  395 PRINT AT u+9,u+7;"\jI\o";TAB
20;"*\p"
  400 PRINT AT u+11,u+14;"\b -25"
  405 RETURN
  410 GO SUB 585: POKE 23693,71
  415 PRINT AT u+3,u+4;"\kO\n\n\l\k\q"
```

```
  420 PRINT AT u+5,u+4;"* \m\l\t\p \p\nID\l
W\j\n\n\p"
  425 PRINT AT u+7,u+4;"* \j\n\n \qH\l G\
lM\p"
  430 PRINT AT u+9,u+4;"* G\o\l\lN \m\l\t \
lXI\q\p"
  435 PRINT AT u+11,u+4;"* \jVOID M\sM-
MI\l\p"
  440 RETURN
  445 GO SUB 585: POKE 23693,69
  450 PRINT AT u+3,u+8;"L\lF\q";TAB 18;"'O'"
  455 PRINT AT u+5,u+8;"\oIGH\q";TAB
18;"'P'"
  460 PRINT AT u+7,u+8;"\sP";TAB 18;"'O'"
  465 PRINT AT u+9,u+8;"DOWN";TAB 18;"'A'"
  470 PRINT AT u+11,u+8;"\o\l\p\l\q";TAB
18;"'R'"
  475 RETURN
  480 GO SUB 585: POKE 23693,69
  485 PRINT AT u+6,u+7;"R\l\qR\t \n\l\r\l\n"
  490 PRINT AT u+8,u+5;"(\t)\l\p  O\o  (N)
O"
  495 GO SUB 315
  500 FOR z=1 TO 2000
  505 IF INKEY$="y" THEN LET g=INT
((g+.1)/2): GO SUB 310: GO TO 615
  510 IF INKEY$="n" THEN LET z=2000
  515 NEXT z
  520 GO SUB 315
  525 GO TO 325
  530 POKE 23693,16
  535 LET c$="\m": FOR z=1 TO 24: LET
c$=c$+"\u": NEXT z: LET c$=c$+"\q": PRINT
AT u-1,u;c$
  540 LET z$="": FOR z=1 TO 24: LET
z$=z$+"\a": NEXT z: FOR v=u TO u+14: PRINT
AT v,u;"\u";z$;"\u": NEXT v: LET z$=""
  545 PRINT AT u+15,u;"\q";c$(2 TO 25);"\m":
POKE 23693,0: PRINT AT u+16,u+1;c$
  550 POKE 23693,71: PRINT AT u-3,u+9;"\q\
s\q-\q\s\q"
  555 POKE 23693,71: PRINT AT u+17,u;"\m\l\
t\p:";: POKE 23693,0: PRINT ;"\d\d\d\d";
  560 POKE 23693,71: PRINT TAB 17;"\p\kO\
o\l:";: POKE 23693,69: PRINT ;"000000";
  565 FOR z=1 TO 4: POKE 23693,(z): PRINT
AT u+17,u+4+z;"\d": NEXT z
  570 GO SUB 255
  575 POKE 23693,71: PRINT AT u+18,u;"\jI\o
:";: POKE 23693,114: FOR z=4 TO 24: PRINT
;"\u";: NEXT z
  580 RETURN
  585 LET z$="": POKE 23693,0
  590 FOR c=1 TO 20: LET z$=z$+" ": NEXT c
  595 FOR v=u+2 TO u+12: PRINT AT v,u+3;z$:
NEXT v
  600 RETURN
  605 LET g=0: LET t=0
  610 IF t>14 THEN LET t=1
  615 FOR z=1 TO 4: LET k(z)=0: NEXT z: LET
s=0
  620 GO SUB 530
  625 RESTORE 940+15*t
  630 GO SUB 690
  635 GO TO 35
  640 BORDER 0: POKE 23693,0: CLS : RESTORE
  645 FOR z=97 TO 117
  650 FOR c=0 TO 7: READ z$: POKE USR CHR$
(z)+c,VAL z$: NEXT c
  655 NEXT z
  660 POKE 23693,70: PRINT AT u+2,u+7;"P\
j\n\lO\q\oONI\k";AT u+4,u+9;"P\o\l\p\lN\q\p"
  665 POKE 23693,71: PRINT AT u+7,u+9;"\q\
s\q-\q\s\q"
  670 POKE 23693,69: PRINT AT
u+10,u+12;"by";AT u+12,u+5;"David Stephen-
son"
  675 POKE 23693,7: PRINT AT
u+14,u+11;"2019"
  680 FOR z=1 TO 150: NEXT z
  685 RETURN
  690 FOR z=1 TO 15
  695 LET c$="": READ z$
  700 FOR c=1 TO LEN z$: LET d=VAL z$(c):
LET c$=c$+t$(d TO d+2): NEXT c
  705 POKE 23693,114
  710 PRINT AT z+u-1,u+1;c$
  715 POKE 23693,0
  720 FOR v=1 TO LEN c$
  725 IF c$(v)="\b" THEN LET c$(v)=CHR$
(145+FN r(v+z,2)): PRINT AT z+u-1,u+v;c$(v);
  730 NEXT v
  735 NEXT z
  740 POKE 23693,0
  745 FOR z=1 TO 8
  750 READ z$: LET c=VAL z$
  755 IF z<5 AND c THEN LET v=FN
r(c,32)+u+1: LET b=FN m(c,32)+u: POKE
23693,z+64: PRINT AT b,v;"\d"
  760 IF z>4 THEN LET m(z-4)=VAL
z$+22528+u*32+u+1: POKE m(z-4),71
  765 NEXT z
  770 BRIGHT 1
  775 FOR z=1 TO 5
  780 FOR b=1 TO 4
  785 READ z$: LET c=VAL z$
  790 IF c AND z<5 THEN LET v=FN
r(c,32)+u+1: LET c=FN m(c,32)+u: PAPER 7:
INK z: PRINT AT c,v;"\e": IF z=4 THEN PRINT
AT c,v;"\f"
  795 IF c AND z>4 THEN LET v=FN
r(c,32)+u+1: LET c=FN m(c,32)+u: POKE
23693,6: PRINT AT c,v;"\g"
  800 NEXT b
  805 NEXT z
  810 READ z$: LET c=VAL z$
  815 LET x=FN r(c,32)+u+1: LET y=FN
m(c,32)+u: LET q=y: LET w=x: GO SUB 225
  820 READ z$
  825 POKE 23693,66: PRINT AT u+16,u+12-INT
(LEN z$/2);z$
  830 RETURN
  835 DATA "127","65","91","67","109","111"
,"127","0"
  840 DATA "24","216","76","62","7","12","2
0","50"
  845 DATA "24","24","18","126","176","24",
"52","38"
  850 DATA "60","36","44","60","24","16","2
8","28"
  855 DATA "127","103","71","107","109","11
5","127","0"
  860 DATA "127","99","93","93","99","65","
127","0"
  865 DATA "0","0","24","36","86","60","24"
,"0"
  870 DATA "24","60","24","72","126","24","
44","32"
  875 DATA "24","60","24","19","126","24","
52","4"
  880 DATA "0","8","20","20","36","34","66"
,"78"
  885 DATA "0","126","68","64","64","64","7
0","126"
  890 DATA "0","126","68","32","28","32","7
0","126"
  895 DATA "0","78","36","40","48","40","36
","66"
  900 DATA "64","48","16","16","16","16","4
8","62"
```

```
  905 DATA "0","126","66","66","94","80","7
6","66"
  910 DATA "0","126","68","32","16","8","10
0","126"
  915 DATA "0","126","20","16","16","16","4
8","56"
  920 DATA "4","66","68","36","36","40","40
","16"
  925 DATA "4","66","68","68","68","68","68
","124"
  930 DATA "4","66","36","24","16","16","48
","56"
  935 DATA "204","102","51","153","204","10
2","51","153"
  940 DATA "44444444","67777778","45444544",
"45444544","45444444","67777778","44444544",
"44444544","44444544","67777778","45444444"
,"45444444","45444544","67777778","44444444"
  945 DATA "0","0","0","438","50","167","30
0","418","0","0","0","0","0","0","0","0","0","0
","0","0","0","33","0","0","0","54","161","
310","417"
  950 DATA "113","H\tPOG\l\sM"
  955 DATA "44444444","44444422","44477777",
"43422422","67824322","44224382","44267322",
"47824428","44244422","44245422","43677782"
,"43444342","43244344","47777778","44444444"
  960 DATA "323","374","0","175","79","214"
,"330","424","84","307","0","0","75","170",
"0","0","0","0","0","0","0","143","0","0","0","
203","205","207","227"
  965 DATA "99","\jN\qICH\jMB\lR"
  970 DATA "44444444","67734444","42477778",
"54434443","57773443","54434443","54434443",
"57777873","55434443","55438444","57738442"
,"55437778","55434442","57777778","44444444"
  975 DATA "74","242","135","418","240","29
7","354","438","84","213","0","0","136","19
4","0","0","406","0","0","0","301","0","0",
"0","300","332","333","364"
  980 DATA "68","\p\jN\k\q\sM"
  985 DATA "44424442","68464468","24424442",
"26777782","24422442","26777782","24424442",
"24468442","24426442","24425442","24425442"
,"24427442","68424468","56777783","44444444"
  990 DATA "418","51","364","179","22","34"
,"114","165","374","0","0","0","394","0","0
","0","74","0","0","0","43","0","0","0","36
","100","115","164"
  995 DATA "437","\k\jR\qO\s\kH\l"
 1000 DATA "44444444","67777778","24443442",
"24463442","24463442","24463442","25754778",
"25777842","67855842","24453442","24468578"
,"24424542","24424542","67777778","44444444"
 1005 DATA "300","33","54","200","38","161"
,"423","438","107","229","231","239","139",
"230","240","331","171","232","238","299","
235","237","0","0","76","213","394","417"
 1010 DATA "337","\kINO\o\qO\lL\jP"
 1015 DATA "44247773","67773424","24444464",
"67774573","44264568","44254542","44677777",
"67723441","24465781","24461421","24441441"
,"67781771","44443545","67777777","44444444"
 1020 DATA "171","234","202","21","44","275
","362","438","135","148","266","401","139"
,"177","182","0","83","201","205","0","147"
,"307","0","0","65","204","353","417"
 1025 DATA "236","\mH\sF\s\p M\j\pK"
 1030 DATA "44444444","77777778","24535342",
"24628842","24677842","24743742","45186184",
"57777774","58622863","68222258","64822648"
,"24322542","45322534","25422432","44444444"
 1035 DATA "182","172","106","161","33","54
","426","429","140","143","0","0","136","23
5","0","0","36","227","259","291","353","41
7","438","0","48","137","421","434"
 1040 DATA "374","\jN \jT\q\lN"
 1045 DATA "44444444","67744474","24644414",
"24634414","87777714","88344454","82344454",
"46777778","54442252","57732252","52442242"
,"67778242","54442242","57177778","44444444"
 1050 DATA "135","137","364","163","52","22
8","418","424","65","103","269","324","105"
,"322","355","397","104","133","136","196",
"97","297","0","0","33","34","131","246"
 1055 DATA "336","\k\jRN\jRVON!"
 1060 DATA "44444444","67744444","42554578",
"46573442","42443442","67777342","24441578",
"24441544","24441543","27781573","23421443"
,"28787443","23421443","68421773","44444444"
 1065 DATA "75","417","81","360","33","82",
"170","426","171","0","0","0","341","0","0"
,"0","418","0","0","0","358","0","0","0","1
73","359","365","0"
 1070 DATA "101","\q\j\n\j\q\j\q"
 1075 DATA "45444444","57777773","55444443",
"55447773","57733443","44443543","27777713",
"22441443","26476773","62435443","52434443"
,"52477773","68434443","46777778","44434443"
 1080 DATA "137","356","273","438","36","19
9","257","431","69","238","276","387","393"
,"437","0","0","203","388","0","0","193","0
","0","0","101","367","420","424"
 1085 DATA "212","\p\q\l\n\l"
 1090 DATA "78677844","14244242","77877778",
"12434442","12234678","12273242","12257242",
"18262222","12222678","12222222","12226678"
,"77724442","52477778","62444244","56777844"
 1095 DATA "273","135","4","417","224","240
","263","456","118","203","307","357","66",
"170","276","399","204","274","354","355","
243","334","0","0","65","269","301","333"
 1100 DATA "277","\q\jIN\p"
 1105 DATA "44454444","57777778","45552242",
"57572272","41456812","61264412","25777776",
"24273252","24254258","68267852","42254242"
,"22277268","22234222","26877778","44444444"
 1110 DATA "34","425","203","308","35","211
","421","438","107","267","277","393","100"
,"165","200","231","205","240","336","0","3
53","366","385","417","54","193","373","403"
 1115 DATA "112","\p\j00\j\o\j"
 1120 DATA "44444544","77777778","22443442",
"22543442","22543442","22547782","22543432",
"22543432","24543432","67733432","24443432"
,"27733432","24433242","67787778","44444444"
 1125 DATA "400","370","228","104","39","17
8","296","436","173","0","0","0","43","0","
0","0","290","418","0","0","426","0","0","0
","136","168","355","356"
 1130 DATA "17","W\l\n\n OF O\pI\oI\p"
 1135 DATA "44444444","57177778","54442242",
"67778242","52442242","57732252","54442252",
"46777778","82344454","88344454","87777714"
,"24634414","24644414","67744474","44444444"
 1140 DATA "327","329","108","291","34","40
","228","436","132","205","359","385","77",
"99","130","361","260","325","328","360","1
69","353","0","0","246","323","417","418"
 1145 DATA "144","\pH\jB\qI"
 1150 DATA "44544442","47777678","63445312",
"25424778","85863354","24813718","63243354",
"47777354","45424778","45424344","46484444"
,"45467778","55544442","67777778","44444434"
 1155 DATA "392","101","106","386","51","12
8","175","430","115","199","230","233","204
","207","235","238","82","86","116","420","
48","169","0","0","134","139","212","389"
 1160 DATA "8","\l\t\l OF \p\s\q\l\mH"
 1165 CLEAR : SAVE "tut-tut" LINE 10
```

As a child born in the seventies and who grew up in the eighties one of my biggest memories is of the long running BBC science fiction show Doctor Who. It was pretty much always being shown, with repeats of previous series both plentiful and common. Weirdly I always imagined what it would be like to be inside a Dalek, but not as a monster, I imagined myself as a person in a Dalek shell, and also not evil, in my mind I was a good, human, Dalek.



But I digress…

Part of storytelling is building the world in which the tale is being told, with books you can build the world with the words, describing enough to bridge the gap between the words and the readers imagination. For television, and more so, radio, the sound plays a huge part in bringing the story to life for the viewer or listener. The sound can help stimulate and emotional response to the story being told and draw you further into the story being told. Sound can lift you up, or send you scurrying behind the couch in fear. All this helps build a world in your mind, tapping into your imagination to put the icing on the world building cake, and transport you to unexplored realms.

The soundtrack of a TV show or movie requires a lot of work to get right, you need to understand where the story is taking you, and what sound can bring to the journey. In the case of TV shows, the opening theme also plays a huge part in setting up the tone of the show being watched.

I remember sitting down in front of the TV as a child and waiting for the Doctor Who theme to start, possibly one of the most recognizable theme tunes ever broadcast, and one born of the BBC's Radiophonic workshop; the institution that has been responsible for music and sounds of some of the best Sci Fi shows to come out of the BBC. The era I remember was of the older traditional theme, with its dun dee dun dun dee dun bass line leading into the rising crescendo of sound with seeping noises and earie sounding music, all a product of the department founded by the BBC, the Radiophonic Workshop.



In 1958, pioneering electronic musician Daphne Oram and her colleague Desmond Briscoe convinced the BBC to set up the Radiophonic Workshop, one of the first specialised studios for creating sound effects, atmospheres and background music. However, her male colleagues at the Workshop called her difficult to work with (presumably because she didn't take their crap) and she was forced out in 1959.



BBC

RADIOPHONIC WORKSHOP

CHIP TO BE SCARED

Founded in 1958, the workshop was setup with a minimal budget, reportedly just £2000, and access to surplus equipment at the BBC, from this would be built the studio that would produce music and effects for many of the BBC's Sci Fi shows, most notable among them Doctor Who and Blakes 7.

These days we take for granted big budget special effects and music productions in movies, but Doctor Who had its origins in the sixties, and was a relatively low budget BBC production, so how did they produce both the music, and the sound effects for what became a cult Sci Fi show. This was in the days before synthesisers were around, meaning all the sounds had to be physically produced somehow, and then manipulated to achieve the desired result.

The workshop was founded to allow the BBC to produce audio that was not commonly available, to service the productions they were working on for both radio and television. In a time before computer generated sounds were a thing you needed people who understood how to get sound out of the things around them. Even today's big budget movies can have sound effects produced by an interaction of physically produced sounds and electronic post processing.

In the case of the Radiophonic workshop, it was understanding the types of things that would give you a soundscape suitable for the type of programming being produced that would allow them to innovate and capture some of the definite sounds of modern science fiction television.

The story of how the workshop was about taking what you can get your hands on equipment and repurpose it to perform a different task entirely. The workshop when it was founded did not have a budget, so they had to scrounge equipment that could be used to realise the vision they were trying to achieve in sound.

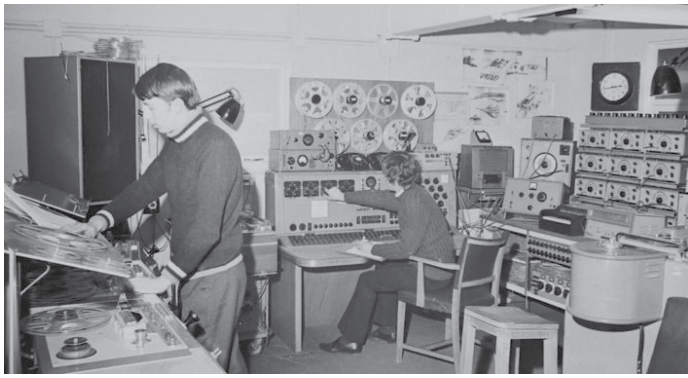
During the 1950's the BBC was producing more and more programming that called for more experimental sound tracks to suit the content that was being broadcast at the time. In France workshops had already been set up to produce music and sounds for a more modern style of story telling, and it was after this that the BBC would model the workshop.

So in 1958 Desmond Briscoe with Daphne Oram were able to finally convince the BBC to found the workshop, which started in a space previously occupied by an ice skating rink. Having been given a small budget and access to surplus equipment they set about creating something that would endure until the late nineties.

The iconic theme tune for the series was originally composed by Australian composer Ron Grainer, which was then realised by Delia Derbyshire and Dick Mills. Grainers score gave an idea of tune as well as descriptions of sweep-











ing sounds he envisaged, not a traditional way to score a theme at the time. The theme was assembled in three components, the rhythm, the melody, and the other incidental sounds, each track being initially assembled, literally, on mono tape. Each of these tapes was hand cut together out of the individual sounds to make the complete tune.

The distinctive rhythm of the theme tune was formed using a string stretched tight across a box, and being plucked, creating a single note which could then be manipulated to achieve varying tone and pitch, but it started out as a single note. From this single bass note, the other required notes were created by varying the speed of the recording to alter the pitch. This was then painstakingly stitched together to create the distinctive and memorable bass line we know today.

To create the main theme on top of the bass the Radiophonic Workshop utilized a series of tone oscillators, known as the Wobbulator, which was also used to augment the bass track. The Wobbulator consisted of twelve oscillators controlled by a small keyboard, which was made from scavenged musical keyboard parts, and could in its own way be played like a miniature, futuristic sounding piano, albeit a very short one.

Finally the incidental sounds in the theme were created, you can hear those as the wooshing sounds and the like during the music, providing the audible equivalent of icing on the cake.

The level of effort was staggering, when you also realise that they had to create each individual note that was needed from scratch, and then to produce the tune they actually cut and spliced pieces of recording tape together, in the correct order, to make the tune.

Then, all three tracks were merged by literally hitting play on the three players simultaneously and recording the output. An incredibly laborious and time-consuming way of assembling the final tune.

The track had some echo effects added and along with the incidental sounds formed the base of the theme which has become iconic.

This was then played back to Grainer, who was happy with the outcome, reportedly exclaiming “Did I write that?” in surprise, and the rest as they say, is history.

To think that arguably one of the most iconic themes in television history was created on equipment that was basically taken from surplus bins and junk piles is something quite remarkable, and a real testament to the imagination of those involved being able to take things and give them a different purpose and use that to produce something so incredibly memorable. These days we take modern synthesizer technology for granted, but none of this was available

BY ANDREW AYRES











at the time, so a lot of thinking outside the box was required.

From there a legend was born, and in the second ever story one of the great villains of Doctor Who appeared on the screen, for which the workshop would again play a key role, the Daleks. Part of what made them so memorable and a long lasting villain was the sense of dread they could inspire, and part of that was down to the vocalization, and that was down to the work by the workshop which defined the sound of the Doctors first enemy way back in 1963.

Peter Hawkins and David Graham were the original actors to voice the Daleks, giving them the speech pattern we know today through the choices they made in performing the lines of dialog, the harsh, statico speech patterns, which have become synonymous with the Daleks, came into being at this time. Their performances however were augmented heavily by the workshop. The process used for this is known has ring modulation, and at it's simplest level is taking one signal, in this case the recording of the actors playing the Dalek's dialogue, and multiplying it with another track to produce an output. In the case of the Daleks, the actors performances were mixed with a 30hz sine wave to give us the performance that set the standard to this day for the voice of the Daleks in Doctor Who. To this day, the actor Nicholas Briggs who voices the Daleks for both Big Finish Audio and BBCs current run of Doctor who uses a ring modulator to produce the correct voice. In fact when Nicholas Briggs was asked to perform the Dalek voices for the modern series of Doctor Who, the BBC had to ask him to bring his own ring modulator as they didn't have one, but Briggs, who had already voiced many a Dalek for Big Finish audio books, did.

The third, but not least, sound to be produced for Doctor Who is the sound that the Doctors ship, the TARDIS, makes when materializing and dematerializing. It is an iconic sound in its own right, and one that is instantly recognizable when it is heard. Believe it or not, this effect is actually based upon the sound a key makes being scraped along a piano wire, the bass string to be precise, and with some reverb added to the mix, and that is how the sound of the TARDIS taking off was realised.

When Doctor Who launched in 1963 there was not the technology yet toy artificially create the effects for the series, and so it was left to the imaginations of talented sound engineers to create the effects from things they could lay their hands on.

It is perhaps a great example of how limitations of resource lead to inspired creativity, and make something that is quite remarkable, even now fifty six years later. The genius of the Radiophonic Workshop team was in understanding what they had, and how to put it to the best use.

The workshop would go on to provide music and sound to numerous other BBC productions, Blakes 7 and The Hitchhikers Guide to the Galaxy notable among them.

But as technology moved on, so did the workshop, and electronic synthesizers became more common place, and while the soundscapes produced are still remarkable, they perhaps lack something in the sheer determination to make something out of nothing from which the workshop was born.

The workshop was sadly closed for good in 1998, however it had not done any real work since 1995. Its legacy includes one of the most easily recognized themes tunes of the twentieth century, as well as contributions to countless shows produced by the BBC, and redefined the possibilities when it comes to producing unique sound to aid in story telling.



Dearly beloved, we are gathered here today to reflect on the life of the Hammond Organ...



Born in 1935, the Hammond was the descendant of the telharmonium, an instrument created in 1897 by Thaddeus Cahill. The telharmonium used electric alternators to generate tones, but needed very high voltages because valve amplifiers hadn't been invented yet! But while it wasn't practical, the teleharmonium did seed the concept of an electronic replacement to the traditional pipe-based church organ.

Laurens Hammond started a clock company in the 1920s. The tones created by the moving gears of his electric clocks inspired him to develop a 'tonewheel' - a toothed wheel that revolves next to an electromagnetic 'pickup'.

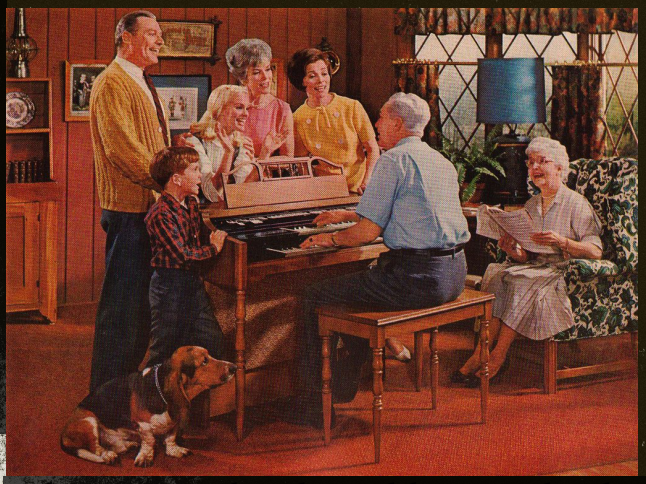


As each of the teeth pass near the pickup, the magnetic field increases, and as it moves away, it decreases. This generates a waveform, which if the teeth are spaced properly, oscillates at the same frequency as a musical note. Hammond realised that using contemporary electronics, he could combine the sound created by multiple tonewheels together, and then amplify it. This not only allowed for multiple notes to be played at the same time, but it also allowed for 'harmonics', subtle additional frequencies that occur along with the root frequency in acoustic instruments such as the piano, to be emulated, producing a sound that rivaled that of the traditional pipe organ enough that Hammond became confident he could sell his electronic organ to churches tired of the ongoing maintenance and expense that acoustic organs required. In the first three years of manufacturing, he sold over 1,750 organs to churches.

However, in 1936 the US Federal Trade Commission filed a complaint, alleging that Hammond was making misleading claims in advertisements for its organ, including that the Hammond could produce "the entire range of tone coloring of a pipe organ". Hammond and the FTC would fight over the next two years, at one point pitting the Hammond against a pipe organ to determine if people could tell the difference, with mixed results and accusations of tampering leveled against Hammond. Finally, the FTC ordered Hammond to stop claiming its organ was the equivalent of a $10,000 pipe organ, but Hammond wasn't unhappy – the publicity generated by the dispute had translated into curiosity on the part of organists and additional sales! By 1966, an estimated 50,000 churches had installed a Hammond, and its sound had become synonymous with church-going, including weddings and funerals.



As the pubic became accustomed to the sound of the organ, Hammond began to market its organs more to families, its advertising emphasising the possibilities for communal activities and the potential for children to learn music by way of the instrument. However, while they found some success there, Hammond's full-size organs weren't cheap! And so, they created some additional organ models, known as Spinets, that had two 44-note keyboards that were offset (as opposed to the two 61-note keyboards present in the more expensive models, such as the popular B-3 (below).

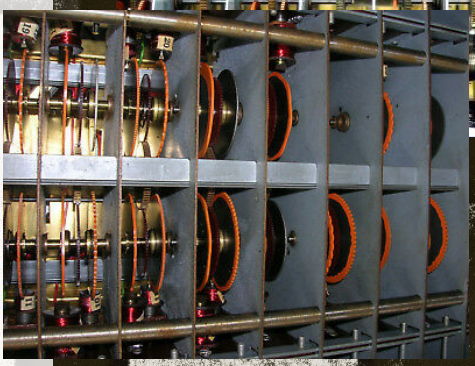




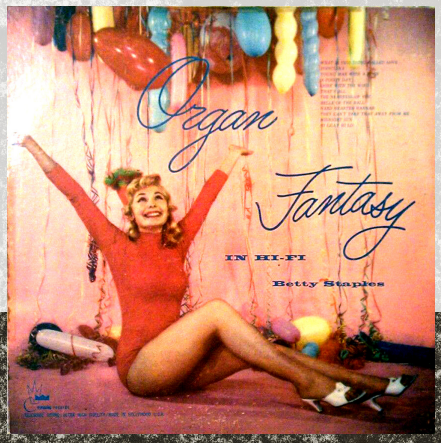
The spinets, such as the model portrayed in the advertisement above, were more like what we tend to thimk of as a home organ, with a smaller 12-note pedalboard and a limited number of "stops" and drawbars. Although the sound they produced were not as sophisticated as their bigger brothers, they retailed for less than US$1000, which was a significant drop from the B-3's US$2745 (1954) price tag. However, in the 1970s fully transistor-based organs from a number of manufacturers began to invade the market, causing Hammond's market share in the home to significantly decline. Eventually the home organ would die out altogether.

However, Hammond would find a lasting clientele in musicians, a market it had largely overlooked, assuming that musicians didn't have the kind of money Hammond wanted for its organs. In spite of this, the organ became popular with bands in the 1960s, and became a central part of a number of hit songs , including Procol Harum's "A Whiter Shade of Pale", and Steve Winwood's "Gimme Some Lovin'". The Hammond also became a vital part of the sound of groups such as the Allman Brothers Band, and Deep Purple, whose Jon Lord connected a Hammond to a Marshall amplifier stack to give it an overdriven sound. A number of albums were also released during the 1970s featuring Hammond organ versions of popular songs, and it's still used by some musicians, even today.





The tonewheel generator inside a Hammond B3 organ. The various wheels create different tone frequencies.







ELECTRONIC FUNERAL MUSIC



the CURSED toy store

1979 TV show "The Dukes of Hazzard" heavily features a Dodge Charger the protagonists in the show, the Duke boys, call the General Lee. In their escapades, the Dukes frequently jump the General Lee. Electric slot-car racing, where toy cars powered by an electric motor move along a track containing electrical contacts, guided by a pin held in a slot, was popular during the early years of the show, and so in 1981 a Hazzard-themed slot-car set was released.





The twist? It had a jump ramp!

Unfortunately, slot-car racing was unreliable at the best of times, with the cars frequently flipping off on corners if the track wasn't set up "just-so". And so it was with the ramp - if it wasn't accurately placed to the micrometre, the Duke boys were going to have a very bad day! This was one Christmas gift that was in the closet by Boxing Day – permanently.



Next up on our toy list of doom is the Nintendo Power Glove. What's not to hate about the Power Glove? A cheap knockoff of a much superior VR controller (the Dataglove), it used ultrasonic speakers and microphones to attempt to detect the location of the glove relative to the TV screen – and attempt is the operative word here, because it super sucked at it! But not that you could tell, because the glove didn't come with any games. Buy some? Sure! There's two, and they both suck. And you'll get your arse kicked by your friend using a normal controller! Lame.



1985's Teddy Ruxpin was a creepy animatronic bear that tried to convince unwitting children it was their 'friend' but in reality it was just a fancy cassette tape player!



The right audio track of the tape contained Teddy's speech, while the left held special control signals that operated the servomotors that moved the bear's eyes and mouth. Scary!





An extensive advertising campaign ensured that Teddy was the best selling toy of 1985, but it was arguably deceptive, given that the reality was the bear was literally scripted, and not that much of a friend at all! Boo!



Ruxpin's manufacturer, Worlds of Wonder, made a tonne of money on the back of the bear, much of it in the form of the tapes that needed to be continously bought in order to keep the toy novel to the child that possessed it. This caused Worlds of Wonders stock price to skyrocket, but investers became spooked by some dodgy trades by WoW directors and its stock crashed!



A decade and a bit later, crap LCD handheld game maker Tiger would come out with the Furby, a terrifying hamster-owl hybrid that babbled Furbish, a made up demon language. Eventually it "learns" to speak English, but this is just a matter of the Furby being on long enough (and devouring a significant quantity of batteries). In 2005 Furby was brought back (left), to freak out even more kids!



The original demon Furby.

Around the same time, the Tamagotchi appeared to wreak havoc on the self-esteem of that period's youth. Basically the deal with this idiocy is that every so often you have to 'tend' to this 'virtual pet' by pushing some button or another, and if you don't, it dies! You horrible, irresponsible child! No wonder your mother won't let you have a dog!

I hate you, you hate me, let's hang Elmo from a tree; with a big fat stick will hit him in the head, beat him up until he's dead! (I know, that's Barney the Dinosaur's song but still, Tickle-Me-Elmo was sooooo annoying!)



That said, he was what every child wanted for Christmas 1996, so much so that shoppers trampled a Wal-Mart employee who made the mistake of showing they had one in their possession. Gruesome!

Tickle-Me-Elmo sold for as much as US$1500 to desperate parents whose kids couldn't live without one.

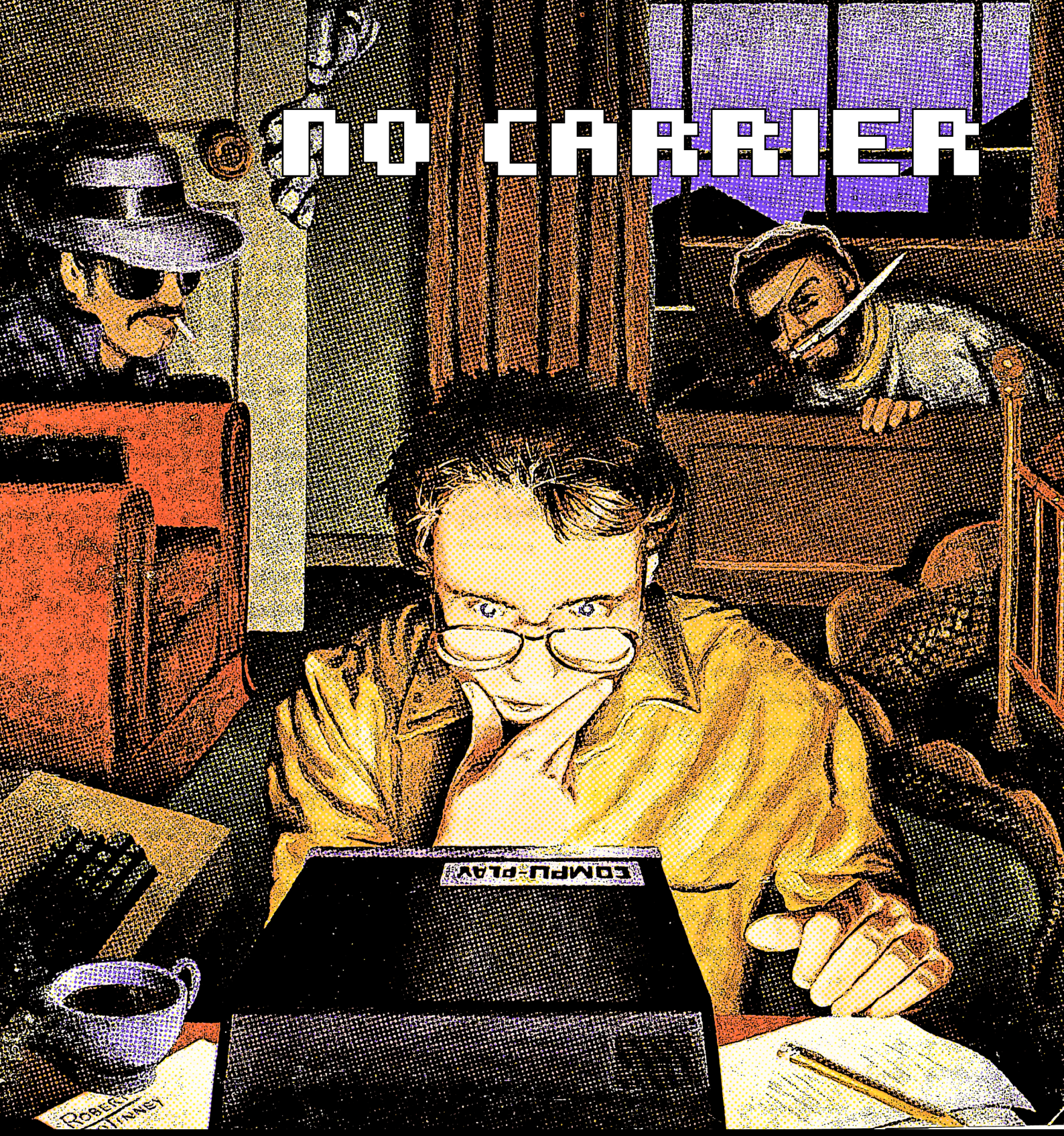




Finally, we leave you with the Easy Bake Oven. Introduced in 1963, it contains a high-watt light bulb that gets hot enough to burn small amounts of food... and fingers. Ow!



The Easy-Bake oven is also a frighteningly sexist "toy" that has been accused of priming young girls for domestic servitude. Want dinner, boys? Learn to cook it yourself!



Going on-line in the 1980s was exciting, but was not free of dangers. While you could meet all sorts of characters, not all of them were savoury, and some could be downright nasty! They could be manipulative and exploitative of naive newcomers. It was also a promising greenfield for the trade of illicit goods and services, and those involved in that sort of business saw the opportunity that the anonymity of early bulletin-board and chat systems could provide.

Although that anonymity was not guaranteed: on-line stalking and 'doxxing' is by no means a new invention – tracking down those for whom you either had an affection or hatred was a not uncommon activity in the 1980s. And to make matters worse, many of those involved, either victim or perpetrator, were children.

While children in the 1980s lived a much 'freer' life than kids today tend to, with the ability to roam about their neighbourhoods free of most restrictions, it was still relatively sheltered, in the sense that the 'adult' world did not intrude that much.

However, when children began to use personal computers in the early 1980s, the addition of a modem gave them access to online services and local bulletin-board systems where they could interact with adults on adult terms, and whose management was largely unprepared for the ramifications of admitting younger users – and who, in many cases, simply didn't care whether they did or not.

Not that there was much they could do about it – those that attempted to enforce an age policy simply had users lie about their age. Some asked people to send in photocopies of their drivers licence – although this was a pointless effort, as children simply copied and sent in their parents' licences! The fact was, children liked the taboo nature of their interactions with these 'masked' personalities and enjoyed them, feeling more 'grown up' as a result. But while many communities did their best to be self-policing, bad actors were an always-present danger.

Often, the only recourse parents had was to take the modem away, or just accept the risks and hope their kid wasn't dumb enough to fall prey to the predators lurking at the other end of the telephone line.





The only problem with that was that some of these bad actors could come across as really nice people! But instead of candy they gave out copied games, or alcohol, or drugs. Some online communities, such as BBSes, would arrange 'meets', where members gathered in person, to socialise and in many cases consume illicit substances, and (of course) young users would find their way as well, wanting to get their own piece of the action.

But when the lines between children and adults blur, bad things can happen. Not only do the kids want to 'fit in' with their peers – which in this case are largely adults – the adults don't really want to think of the children as children, because that would make life uncomfortable and complicated. And so both sides tend to encourage relationships that, while intended to be 'equal', have a huge power imbalance in the sense that the adults have money, connections and a physical advantage over the children. This can lead into bad situations, and most certainly did.

And then the children themselves, forced to grow up rapidly to deal with the complexities of relationships with adults, then get into conflicts amongst themselves, for reasons such as sex or drugs, far too early than they otherwise would have, had they not dialed that modem. This led to fighting and bullying, harassment, intimidation... the modem was fun until you inadvertently made an enemy out of the biggest bully at your school, or a teacher, or the vice-principal!

Eventually the police in many jurisdictions began to patrol BBSes and chat systems attempting to catch bad actors out, but their success was limited.

The 1980s was ultimately the start of the short, quick death of innocence, for what innocence does the modern generation have? They're all on the Internet, there is very little separation now between children and adults – the adult world is plain for any child to see, warts and all (and despite the modern parent's best efforts). Now, more than ever, it's a jungle out there.

GEEK SIX FEET UNDERGROUND



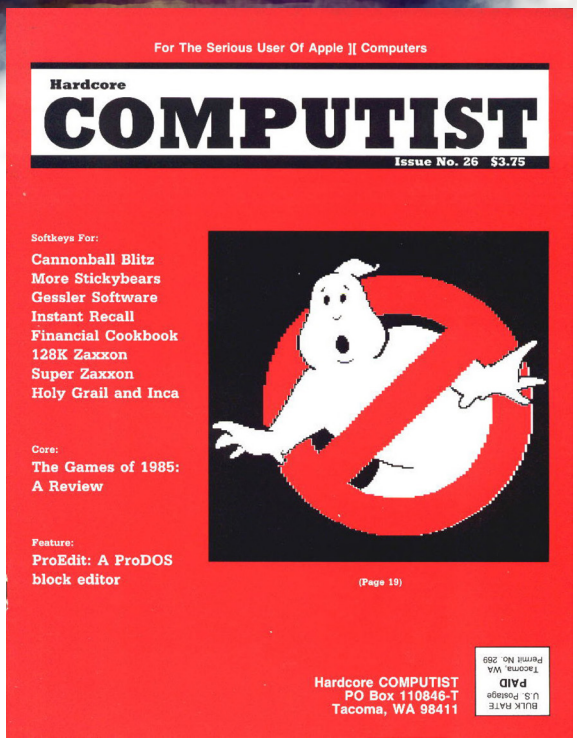
Cracking Software for Fun, Fame and Profit

So you wanna crack some software? Maybe so you can give copies to your friends and be 'cool', or add a 'crack screen' with your handle on it and upload it to a BBS, so you can become infamous? Well, you could find a BBS that had text files on it on how to crack games... but those sorts of places could be really picky about who got access...

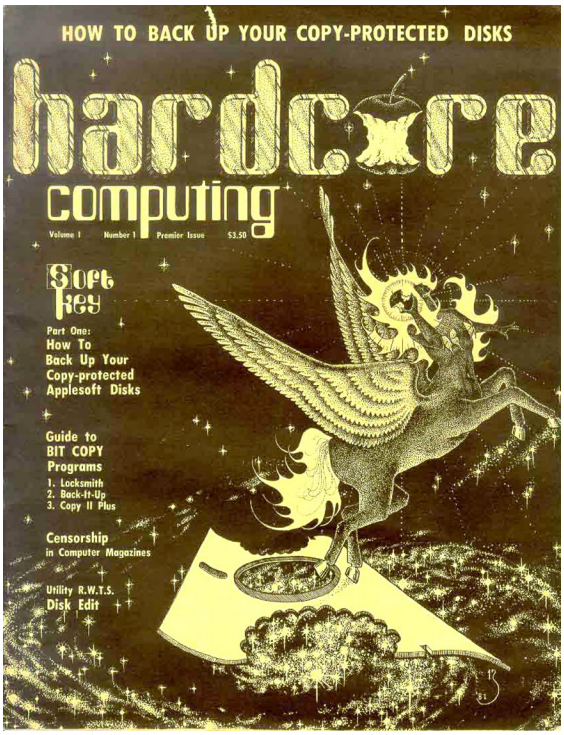
...or you could just subscribe to a magazine!

You think I'm joking but I'm not. In the early days of hobby computing, piracy was rampant. User group members freely traded software, which was not protected. But as the personal computing industry began to emerge, software publishers began to look at ways they could protect their software from being copied. But some of those who had come from those hobbyist computing groups with their culture of sharing were not happy with this. One of those people was Charles R Haight.

Haight believed that once you purchased software you should be free to do as you like with it – he argued publicly that by this he meant the freedom to make backup copies, in case the original became damaged, but this became somewhat questionable after most manufacturers began offering free replacement copies of their software in exchange for damaged disks. In any case. he decided he should create a magazine to publish techniques to de-protect software, to share the love.



Who ya gonna subscribe to? How about Hardcore Computist? For a mere US$20, you could get six issues full of guides on how to crack new and popular software... oh, but not for piracy! You wouldn't subscribe so you can pirate that software, would you? You can only use it for backup purposes! Pinky swear, or we won't send it to you! Oh, you swear? Good. We believe you. We really do. We really, really do... <|;-)

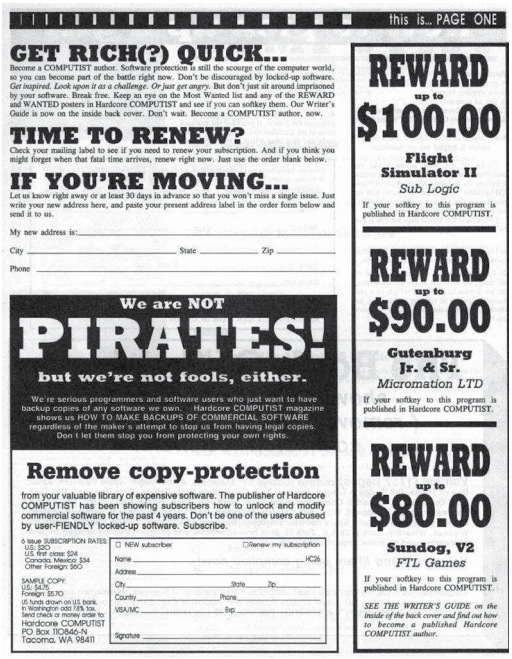


So, in 1981 he launched Hardcore Computing, the magazine for "serious" computer (Apple II) users. Its first issue featured topics such as Censorship in Computer Magazines, wherein editor Bev R. Haight (presumably Charles' wife) railed against other computer magazine publishers for refusing to publish advertisements for Hardcore Computing, and The Cold Hard Chains of the Software Industry where she declared that she didn't condone commercial software piracy, and believed that publishers' refusal to buy advertisements in her magazine and computer stores' refusal to carry it constituted a violation of her freedom of speech, or somesuch. This was a drum they consistently beat throughout their run, I suppose to help make their readers feel righteous about what they were doing.

But most importantly for readers of Hardcore were the guides, called SoftKeys, that detailed how to de-protect games such as Akalabeth: World of Doom (aka Ultima I). The magazine also had articles on various disk copy programs. There were articles on a few other things but let's be honest: the name 'Hardcore' was appropriate, in that people weren't buying the magazine for anything other than the cracks.

And in fact they needed to drop the 'Hardcore' part of the name eventually, after younger 'computists' (another change made in an attempt to make the enterprise seem more legitimate) had their magazines confiscated by their parents, thinking they might contain pornography.

The Haights wrote letters to a number of other magazines in an attempt to win the debate between the negative effects of piracy and the right of the user to copy their software, a debate they arguably lost in the mainstream, but they continued to publish their underground-but-not-underground magazine for a dozen years, printing their 89th and final issue in 1993. By that time it had gone through a number of changes in format and content, with subscriptions and contributions gradually falling off as interest in the Apple II computer family waned, and the release of new software to crack slowed to a trickle.


this is... PAGE ONE

GET RICH(?) QUICK...

Become a COMPUTIST author. Software protection is still the scourge of the computer world, so you can become part of the battle right now. Don't be discouraged by locked-up software. *Get inspired. Look upon it as a challenge. Or just get angry.* But don't just sit around imprisoned by your software. Break free. Keep an eye on the Most Wanted list and any of the REWARD and WANTED posters in Hardcore COMPUTIST and see if you can softkey them. Our Writer's Guide is now on the inside back cover. Don't wait. Become a COMPUTIST author, now.

TIME TO RENEW?

Check your mailing label to see if you need to renew your subscription. And if you think you might forget when that fatal time arrives, renew right now. Just use the order blank below.

IF YOU'RE MOVING...

Let us know right away or at least 30 days in advance so that you won't miss a single issue. Just write your new address here, and paste your present address label in the order form below and send it to us.

My new address is:

City State Zip

Phone

We are NOT

PIRATES!

but we're not fools, either.

We're serious programmers and software users who just want to have backup copies of any software we own. Hardcore COMPUTIST magazine shows us HOW TO MAKE BACKUPS OF COMMERCIAL SOFTWARE regardless of the maker's attempt to stop us from having legal copies. Don't let them stop you from protecting your own rights.

Remove copy-protection

from your valuable library of expensive software. The publisher of Hardcore COMPUTIST has been showing subscribers how to unlock and modify commercial software for the past 4 years. Don't be one of the users abused by user-FIENDLY locked-up software. Subscribe.

6 issue SUBSCRIPTION RATES
U.S.: $20
U.S. first class: $24
Canada, Mexico: $34
Other Foreign: $60

SAMPLE COPY:
U.S.: $4.75
Foreign: $5.70
(If funds drawn on U.S. bank in Washington add 7.8% tax. Send check or money order to:
Hardcore COMPUTIST
PO Box 110846-N
Tacoma, WA 98411

☐ NEW subscriber ☐ Renew my subscription
Name HC26
Address
City State Zip
Country Phone
VISA/MC Exp
Signature

REWARD up to $100.00
Flight Simulator II
Sub Logic
If your softkey to this program is published in Hardcore COMPUTIST.

REWARD up to $90.00
Gutenburg Jr. & Sr.
Micromation LTD
If your softkey to this program is published in Hardcore COMPUTIST.

REWARD up to $80.00
Sundog, V2
FTL Games
If your softkey to this program is published in Hardcore COMPUTIST.

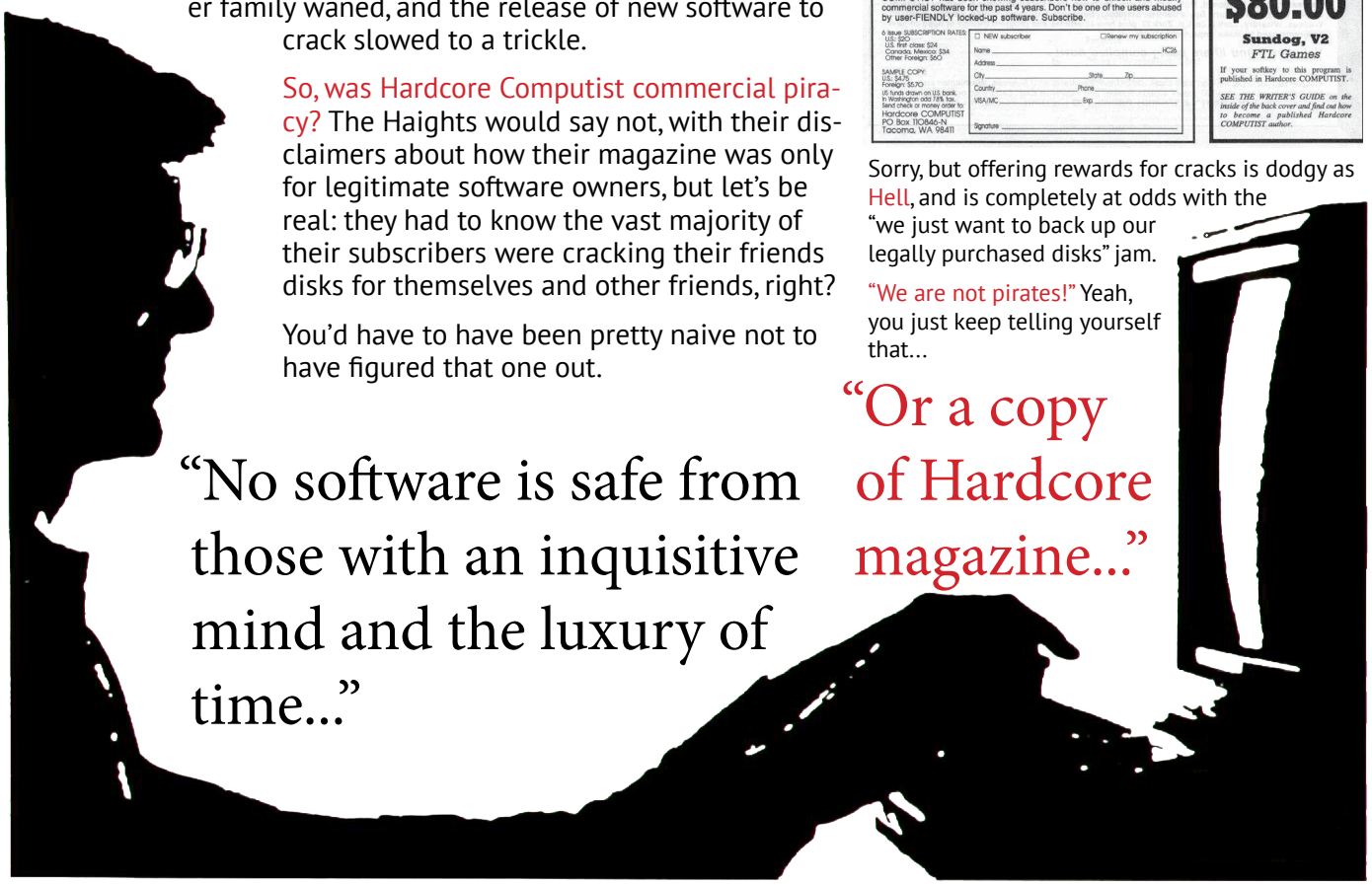
SEE THE WRITER'S GUIDE on the inside of the back cover and find out how to become a published Hardcore COMPUTIST author.

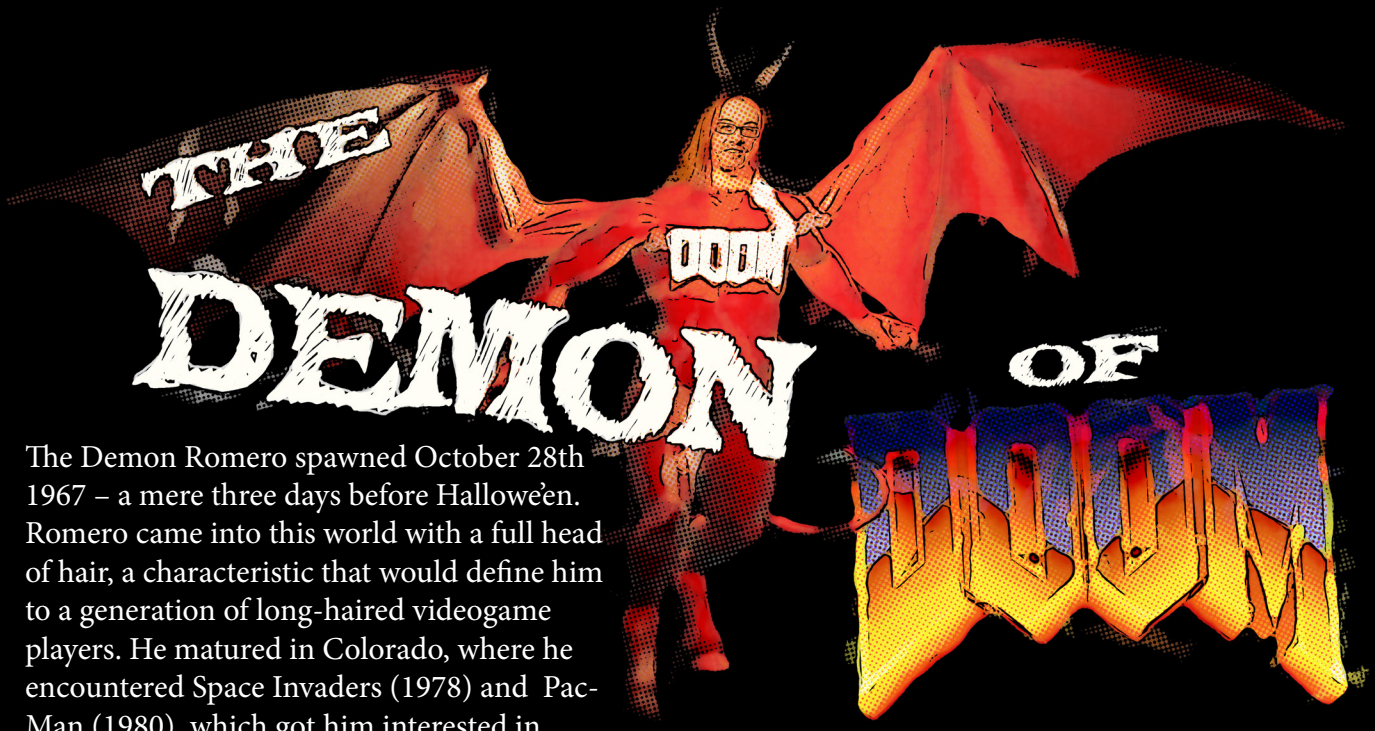
So, was Hardcore Computist commercial piracy? The Haights would say not, with their disclaimers about how their magazine was only for legitimate software owners, but let's be real: they had to know the vast majority of their subscribers were cracking their friends disks for themselves and other friends, right?

You'd have to have been pretty naive not to have figured that one out.

Sorry, but offering rewards for cracks is dodgy as Hell, and is completely at odds with the "we just want to back up our legally purchased disks" jam.

"We are not pirates!" Yeah, you just keep telling yourself that...





The Demon Romero spawned October 28th 1967 – a mere three days before Hallowe'en. Romero came into this world with a full head of hair, a characteristic that would define him to a generation of long-haired videogame players. He matured in Colorado, where he encountered Space Invaders (1978) and Pac-Man (1980), which got him interested in game design.

He acquired an Apple II and started to explore coding, His first completed game was a clone of Crazy Climber, in which the player climbs skyscrapers, but it was never published. But he kept at it, and his game Scout Search was printed in inCider magazine in 1984. In 1987 he got a job with Origin Systems, porting the game 2400AD from the Apple II to the Commodore 64, but the project was scrapped due to poor sales of the Apple II version.

Romero later co-founded Inside Out Software, which ported Might & Magic II from the Apple II to the Commodore 64. He did the artwork for the Apple IIGS version of Dark Castle, and co-founded Ideas from the Deep with Lane Roathe; together they wrote the disk operating system for Infocom games Zork Zero, Shogun, Arthur and Journey.

In 1989 the demon and Roathe went to work for Softdisk, a disk magazine publisher. While there, Romero started a PC games division called Gamers' Edge, hiring John D. Carmack and noving Adrian Carmack (no relation) in from another department. He persuaded Tom Hall to come in at night and help with game design. In 1990, John Carmack developed a way to make side-scrolling videogames work on PCs, and he, Romero, Hall, Adrian and Roathe developed a demonstration version of Super Mario Brothers 3 – however Nintendo was not interested in computer versions of their games, and they did not invest.

But Apogee Software, a company whose business model was 'shareware' – the releasing of a fully functional but incomplete version of a game through bulletin-board systems and online services – approached them about developing a game using the engine, and they worked during nights and weekends for three months to create Commander Keen.

Keen was an instant success for Apogee, and the team soon left Softdisk to develop their games full-time.



Romero's uncompromising vision would lead to both the critical and commercial success of a number of games, including Commander Keen, Wolfenstein 3D, Doom, and Quake, but his refusal to compromise was incredibly irritating to those who worked with him, leading to constant friction inside id Software.

Even though the other members of the company literally put his head on a stake in Doom II, Romero didn't get the hint (and still doesn't seemingly make the connection) and during the development of Quake, John Carmack, sick of the constant delays Romero's changes and pickyness introduced, had it out with him, and Romero left id.



THE DEMON ROMERO'S APPLE II

Softdisk was not happy about the development of Keen using their computers, and the new company agreed to produce a series of games for Gamers' Edge. While developing these games, they honed their skills, with John Carmack developing a rudimentary 3D game engine,limiting it to flat surfaces and 90 degree angles, and only rendering visible surfaces in order to make it performant on PCs.

In late 1991 Carmack added texture-mapping to the engine, and as they were finishing the second Commander Keen game and had almost fulfilled their obligations to Softdisk, the team met to plan out their next major game.

The demon Romero suggested a 3D remake of the 1981 game Castle Wolfenstein, where the player controls a POW attempting to escape from a Nazi prison. As several members of the team had fond memories of the game, and its maze-like shooter style fit with the 3D concept, they were easy to convince. Adrian Carmack wanted to move away from child-oriented gameplay and graphics to something more mature and violent.

The team learned that Castle Wolfenstein's developer and successor companies no longer existed and so they were free to use the name for their new game. Apogee agreed to pay them US$100,000 for the game and another company offered to distribute it in retail form. John Carmack added the necessary elements to his game engine, such as doors, while Romero designed the maps, and Adrian Carmack the graphics.

As development continued, the company, now known as id Sofware, moved to Texas near Apogee's headquarters. In response to concerns over the game's violence, the team worked to make it as violent as possible, adding corpses, skeletons, blood and more Nazi elements. This strategy paid off, and after the games release it was overwhelmingly successful.In its first month after release, id received a cheque from Apogee for another US$100,000 in royalties! The team spent the summer developing additional levels for the retail version titled Spear of Destiny, while John Carmack began work on a more sophisticated game engine.

The team thought about making a more sophisticated sequel to Wolfenstein 3D, but they were tired of the concept, and instead opted for something with a science-fiction theme, an idea John Carmack had proposed where a future "space soldier" fought demons, a mix of Aliens and Evil Dead II. They titled it 'Doom'.

They moved into a dark office building and called their space Suite 666, drawing inspiration from the noises emenating from the dentist's office next door. However, this darkness was not always beneficial for the game's development – rifts in the team began to appear, with disputes over the game's design. A storyline was developed by Hall and then scrapped by Romero. The original military-base inspired level designs were changed by Romero to be more abstract, to show off the new game engine's abilities.

Tom Hall, meanwhile, grew more and more frustrated with Romero's changes and stopped coming into work. He went to work for Apogee, and id hired game designer Sandy Petersen. He and Romero finished the game levels while John Carmack finished Doom's multi-player functionality.

At midnight on December 10th 1993, the team uploaded Doom to the Internet. They had decided to distribute the game themselves, exclusively as shareware. Within hours, university networks began to crash as users set up servers to play multiplayer Doom games. Many companies banned Doom from their networks.

Doom received overwhelming praise from game magazines, and id Software found itself making US$100,000 a day! It would sell over 2 million copies. In late 1995, Doom was estimated to be installed on more computer than Microsoft's new Windows 95 operating system!

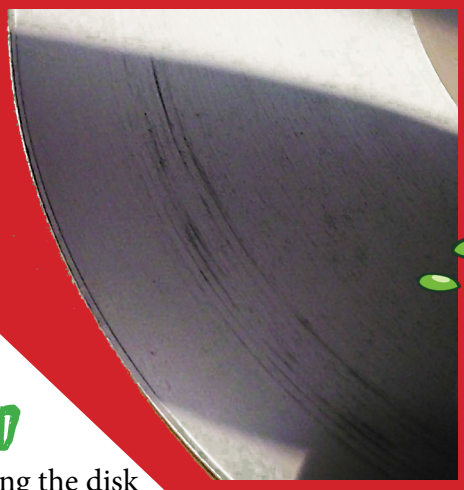
id would make a sequel, Doom II, which ended with Romero's head on a stake. The demon Romero would leave id and find his own Doom, in a game called Daikatana.

BRINGING DISKS BACK... FROM THE DEAD!

So you want to try to recover some files you created as a kid, or your parent created as a kid, but not only do they not read, they kill the disk drive! Aaargh! You've been defeated by... **THE MOULD MONSTER.** But how could you have prevented it?

Well, our magical archivist deals with mould every day, and here's what he does to defeat it...





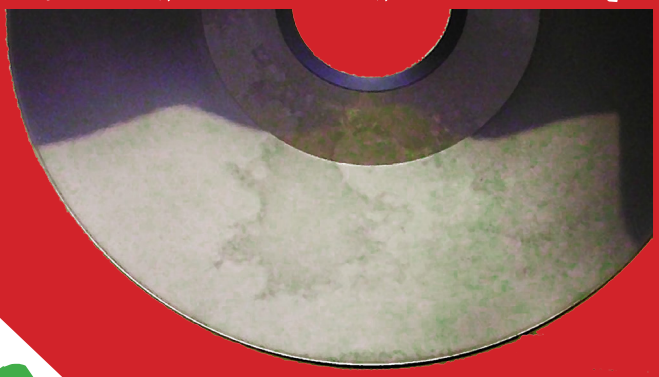


A FLOPPY DISK'S GREATEST ENEMY... THE MOULD MONSTER!

1... INSPECT
SPOT THE MOULD

While odd noises reading the disk can implicate mould, by that point it could be on the disk head, which could damage both the disk it came from and further disks! So you're much better off to inspect the disk first for visual indications of mould. When disks are stored in a humid environment (like a shed) for a long time without being used, mould can flourish between the disk and its jacket. These disks need to be cleaned before they can be used.

Mould can grow on the surface of the disk (right) and when the head tries to read it, it can end up smeared along the tracks (above). It can also collect on the head and damage other disks!



First, you can look through the disk 'window' (you will need to slide the metal cover on 3.5 inch disks to open it) under a bright light. If mould has grown on the disk, it will often have grown in the window, but even if the window area looks clean, carefully turn the disk media to see if it's lurking inside. Compare with a known clean disk if you're uncertain what you see is mould.

Carefully cut open the jacket of 5.25 inch disks and slide the disk out. 3.5 inch disks can be carefully dismantled, although the metal gate may not be able to be replaced.

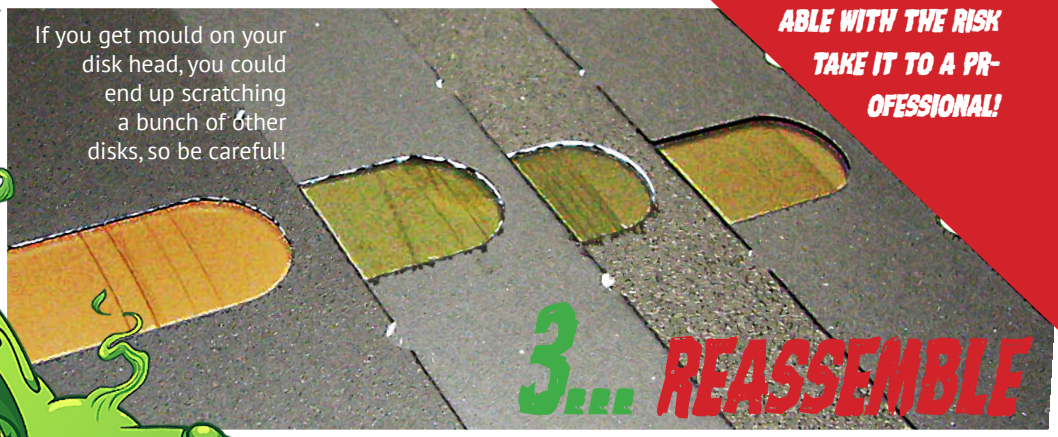


The best way to keep the mould monster at bay is to store your disks in a climate controlled environment!

2... CLEAN
DISK AND DRIVE

WARNING!

YOU COULD POTENTIALLY DAMAGE THE DISK EVEN MORE BY TRYING TO CLEAN IT, SO IF YOU'RE NOT COMFORTABLE WITH THE RISK TAKE IT TO A PROFESSIONAL!



If you get mould on your disk head, you could end up scratching a bunch of other disks, so be careful!

3... REASSEMBLE & READ

This is okay though, the gate is not necessary for reading. There are two methods for cleaning the disk surface: first, you can use antiseptic cotton balls and 90%+ isopropyl alcohol to swab the mould off the disk. You could do this through the window BUT you might smear the mould around as you rotate the disk! Second, you can wash the disk in a gentle solution of water and a little soap. But if you see any of the surface flaking off (which can happen with really cheap disks), stop! Dry the disk with warm air (not a hair dryer, which can melt the disk!)

Place the disk into a CLEAN jacket (open an unused blank disk), make sure you use a head cleaning diskette on your drive before you insert the disk, and hopefully your disk will read, and you will have defeated the mould!

RABID ARCADE RATS

These horror puzzle games failed to capture what a horror arcade game should be. Enter the 'rail shooter'. Throughout the 1990's arcade horror games took the lead from one of the most popular rail shooters ever created, the machine gun classic, Operation Wolf (Taito 1987). With rail shooter games the player control is limited to directing where to fire a virtual gun; the player does not control the path.

Space Gun, by Taito in 1990, set a new standard for all other rail gun horror themed games to follow. Described as the unofficial Aliens movie arcade game, this first person shoot 'em up, is set aboard a crippled space station that has been overrun by hostile alien creatures. The objective is to rescue human crew members while destroying all alien creatures. The horror aspects of the game are shown when the player shoots limbs off the creatures, resulting in blood splatters on the playing screen. Occasionally, a human hostage will mutate into an alien to be killed. The arcade cabinet rapid-fire weapon is your standard killing machine but you can also use four other weapons to kill enemy aliens in horrific fashion by using a flamethrower, a grenade launcher, a freeze bomb, or a blade bomb. Each of these weapons requires ammunition you can collect throughout the stages, and are activated by the player using the pump action of the mounted gun. The arcade cabinet features foot pedals that, when pressed, reverse the player's direction. Space Gun was one of my favourite arcade games to play when I was hitting the arcades at a younger age, it features large enemy sprites, cool explosions, a large number of enemy hordes to kill, great horror visuals when alien body parts are blown to pieces, smooth fast paced action and addictive gameplay.

If Space Gun had set the standard in 1990, Sega trumped that in 1993 with Alien 3. Its double gun, multi player arcade cabinet set a new standard in arcade themed horror gaming. Stephen Kleckner of Games Beat wrote about Alien 3: The Gun, saying it is his "must-play" of Alien titles. He stated that it is better than 2006's light gun game Aliens: Extermination. According to Retro Gamer, the "terrifying and glorious "Alien 3" went leagues beyond the other shoot 'em ups. Jon Thompson of All Game Guide gave it four stars out of five, calling it an "exciting shooter that does the movies proud, creating a horror-filled, action-packed atmosphere that should impress both die-hard and casual fans".

The gameplay uses a large light gun, modeled after machine guns featured in the Alien films, to kill various Alien creatures such as facehuggers and soldiers, unlike the film, which featured only three Aliens. One or two players can take the role of a pair of United States Colonial Marines in an altered version of the film's storyline. You play the game by controlling a space Marine tasked with reaching the prison colony featured in the film, in order to rescue prisoners who are under attack by the Aliens. The game is played across seven levels, based on sets from the film and takes players through the Mess Hall, Infirmary, Lead Works and more. It features various boss enemies, which look and sound creepy, unnerving and scary. There are power-ups within the game to help you combat enemy hordes. Alien 3 is so fast and frantic, by the time you have splattered green alien blood everywhere more aliens come out you from all directions, they are everywhere which makes this game so addictive. The horror may not be as in your face as previously mentioned games but it still leaves you feeling chills down your spine when you play it.

By 1995, rail shooters had become highly profitable for arcade game developers but also they had become predictable, none more so than Zombie Raid by American Sammy. Set in 1918 England, a small village is over run by heavily armed zombies. Playing as a private detective Edward Windsor you must shoot everything that moves except innocent bystanders. The look of enemy characters are great for the horror theme genre, it has a large amount of blood spatter when zombie creatures are killed. The wide array of zombie like creatures and end of level monsters are probably the best part of the game. The most frustrating part of the game is the continuous pumping of the gun to reload your bullets, the sound drives you mad.

House of The Dead, released by Sega in 1996, became the horror game of all horror games. The gripping realistic storyline sent chills through your whole body before you even started playing. Before you even inserted your coins to play a game the scare factor ramps up when you are requested on the arcade cabinet "don't go in the house….alone!"

Such was the success and impact on the horror gaming genre, the House of the Dead franchise lead Sega to release another five arcade games after the original: The House of the Dead II (1998), The House of the Dead III (2002), The House of the Dead 4 (2005), The House of the Dead 4: Special (2005) and House of the Dead: Scarlet Dawn (2018).

Why House of the Dead was so popular back in 1996 and remains as popular today is that the game is just so terrifying awesome to play. Cut scenes depict exactly what horrors you would encounter before and during play of this mega zombie creature killing spree. It is so realistic that you can't help but be engrossed by the game from start to finish. The game itself has incredible horror movie like animation, graphically it is horrifyingly brilliant and the sounds haunt you every second of the four levels of gameplay. House of the Dead captivates the player unlike any other horror themed game before it.

As for the gameplay, you take on the role of Special Agent Thomas Rogan who receives a cry for help phone call by his fiance Sophie Richards, saying "please help everyone is getting killed". Sophie works for the DBR corporation (short for DNA Bio Reactor corporation). The research for the DBR corporation takes place in a European Mansion owned and lived in by obsessive mad scientist, Dr Roy Curien. The research conducted there involves artificial intelligence, sustain-

YEAR	GAME	GENRE	PUBLISHER
1975	Shark Jaws	Adventure	Atari
1982	Monster Bash	Platformer	Sega
1982	Satans Hollow	Shooter	Bally Midway
1985	Ghost N Goblins	Platformer	Capcom
1986	Chiller	Light Gun	Exidy
1987	Xenophobe	Run N Gun	Bally Midway
1987	The Real Ghostbusters	Shoot Em Up	Data East
1987	Alien Syndrome	Run N Gun	Sega
1987	Wardner	Platform	Taito
1987	Shadow Land	Platform	Namco
1987	Devil World	3 Player RPG	Konami
1987	Karnov	Platform	Data East
1988	Ghouls N Ghosts	Platform	Capcom
1988	Splatterhouse	Beat Em Up	Namco
1988	Haunted Castle	Platform	Konami
1988	Bonze Adventure	Platform	Taito
1989	Demon's World	Shoot Em Up	Taito
1989	Beast Busters	Rail Shooter	SNK
1989	Laser Ghost	Rail Shooter	Sega
1990	Aliens	Shoot Em Up	Konami
1990	Space Gun	Shoot Em Up	Taito
1990	Evil Stone	Beat Em Up	Spacy Industrial
1990	Golly Ghost	Shooter	Namco
1993	Alien 3 - The Gun	Rail Shooter	Sega
1993	Night Slashers	Beat Em Up	Data East
1994	Dark Stalkers	Beat Em Up	Capcom
1994	Monsters World	Shoot Em Up	TCH
1994	Ghost Hunter	Shooter	LAI
1995	Zombie Raid	Rail Shooter	American Sammy
1995	Crypt Killer	Shooter	Konami
1996	Ghost Lop	Puzzle	Data East
1996	Resident Evil	Shooter	Capcom
1996	House of The Dead	Rail Shooter	Sega
1997	Monster Sliders	Puzzle	Visco Games
1998	Carn Evil	Rail Shooter	Midway Atari
1998	Chaos Heat	Shooter	EON Digital
1998	House Of The Dead II	Rail Shooter	Sega
1999	Ghoul Panic	Shooter	Namco
1999	Zombie Revenge	Beat Em Up	Sega
2000	Nightmare In The Dark	Platform	SNK
2001	Resident Evil II	Shooter	Capcom
2002	Demon Front	Run N Gun	IGS
2002	House of The Dead III	Rail Shooter	Sega
2005	House of The Dead 4	Rail Shooter	Sega
2005	House of the Dead 4: Special	Rail Shooter	Sega
2007	Death Smiles	Shoot Em Up	Cave
2007	Silent Hill	Shooter	Konami
2009	Castlevania: The Arcade	Shooter	Konami
2018	House of the Dead: Scarlet Dawn	Rail shooter	Sega

ing life forms and anything involved with discovering the nature of life and death. While supported by the DBR Corporation and its own team of scientists, Curien's relentless pursuit of his goal has driven him insane. His experiments take a gruesome turn, as he has re-animated the dead and let them loose inside the mansion where all the employees inside are being killed. You and your partner Special Agent "G" rush out there to save all the scientists and your fiance Sophie Rihcards from being killed.

As well as shooting anything that moves on screen, it pays to keep an eye on environments while progressing. Shooting scenery such as boxes will reveal special items, which could be an extra life pack, coins, or golden frogs (which also increase life points). Throughout the game, you'll frequently stumble upon hostage rescue scenarios. These are very short but enjoyable sequences that break up the non-stop shooting action. Shooting a hostage always takes away one of your life points, saving them will sometimes yield a bonus life pack.

Throughout the course of the game, players are faced with numerous evil creatures that attack you from every angle. The enemies whether a half eaten faced zombie, a chainsaw wielding creature or those ground dwelling evil slug like creatures, they always look huge on the screen, which is a good method, this game uses to amplify the horror effect.

Your action or inaction will have an effect on the direction of gameplay. This is exemplified in the opening stage of the game when a hostage is about to be thrown from the bridge to his death. If the player saves the hostage, they will enter the house directly through the front door; however, if the player fails to rescue the hostage, the character is redirected to an underground route through the sewers. If the player rescues all hostages, a secret room full of lives and bonuses is revealed towards the end of the game. In one alternate ending, Sophie is reanimated and becomes an undead. In another alternate ending, a far view of the mansion is shown and Sophie is absent leaving it unknown if she survived or not.

House of the Dead was developed on the Virtua Cop game engine and came in two cabinet formats, both upright: one with a 50 inch monitor and one with a 29 inch monitor. The House of the Dead arcade game generally received positive reviews, the arcade version being held in the highest regard with All Game awarding it 4.5 out of 5 stars. Next Generation reviewed the arcade version of the game, rating it four stars out of five, and stated that "Overall, this is an excellent take on the light-gun genre - a sheer bloody scream."

The impact House of the Dead games have had is demonstrated by it being credited with popularising the zombie video game genre, as well as re-popularising zombies in wider popular culture leading to renewed interest in zombie movies during the 2000's.


HAPPY HALLOWE'EN!
IT'S BEEN SO MUCH EASIER TO FIND THE RIGHT CURSE SINCE I PUT ALL MY SPELLS ON THE COMPUTER!
31 OCT
11:59 P.M.
JsD'Angelo



Plenty of computer and videogame magazines have gotten into the Hallow'een spirit over the years, or just used creepy covers to sell their magazines year-round...







Even the Wireless Age got in on the action way back in November 1922 with a cover showing a little prankster preparing to use a radio for nefarious purposes – at the time, I'm sure he scared the bejeezus out of people!







Since then, we've been frightened by television, video and computer games, and magazines have covered these like a zombie horde!

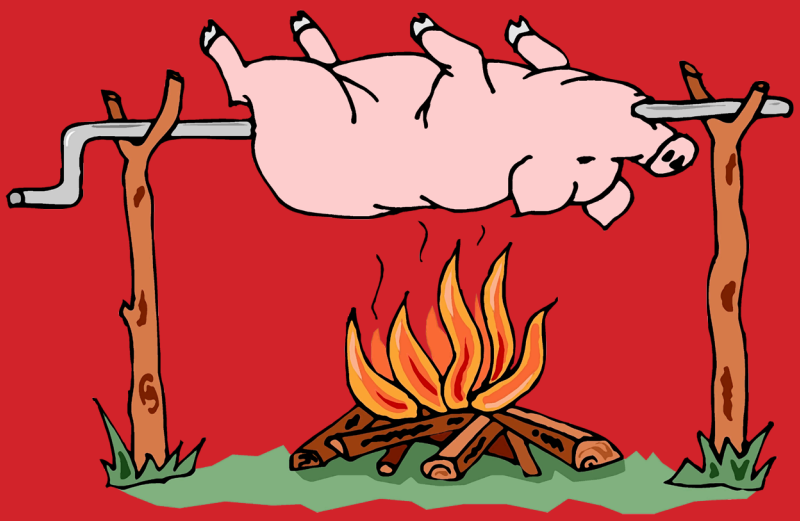
We've taken artwork from a number of Hallowe'en and horror-related issues to make this issue of Paleotronic. We thank the original artists.





BACK IN THE SLAY





RADIO GHOST STORIES

SMOKED HAMS

Shortwave radios can be really spooky!

Ghostly interference that sounds like someone whispering in the wind, cosmic radiation and atmospheric disturbances creating sound effects from 1950s sci-fi movies, weird 'numbers' stations that broadcast in codes that could kick off a nuclear holocaust – you can encounter all of these phenomena and more using a shortwave radio.

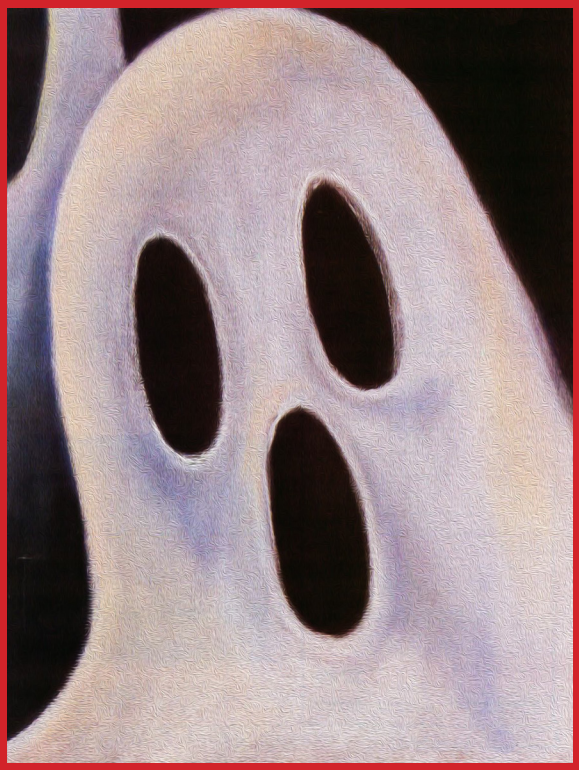
ELECTRONIC VOICE PHENOMENA

Sometimes, certain patterns of interference can be interpreted by the brain as speech – this is normal, our brain is built to try to make sense of things. And usually we can explain away any strange voices we hear on this misidentification of what is effectively random noise. But it becomes more difficult to explain away when that random noise talks to you directly!

In 2010, David Greer was chatting with an old friend over his shortwave radio, and when they took a short break, he heard a faint voice call out an old pseudonym of his from the late 1970s, "Tired Old Broadcaster".

He called out on the frequency for the voice to identify itself, but to no avail. Was it a ghost from the past? Not likely. But listening to radio interference and searching for recognisable voices is a technique modern-day mediums use to try to communicate with the dead, so it's no wonder David was creeped out!





Echoes can also be spooky – although it is common to hear echoes in shortwave radio broadcasts, they happen usually only 1/7th of a second after the original transmission, the time it takes for the signal to travel around the Earth once. But in 1927, Norwegian engineer Jørgen Hals was listening to a Dutch shortwave transmission when he noticed that there was a background echo up to three seconds after the original transmission!

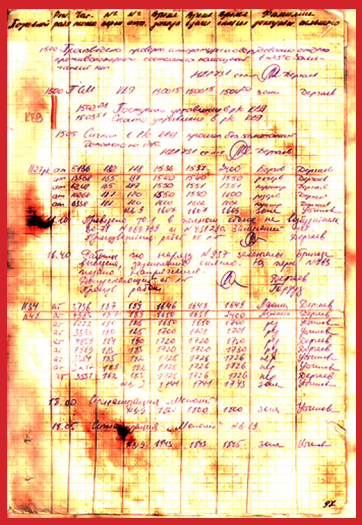
Over the following decades, it has been proposed that the signal Hals heard (and many others since) could have bounced off of the Moon, which would take around 2.5 seconds, or clouds of ionised gas. But in 1960 Ronald Bracewell, an Australian-American astronomer, proposed that these echoes could be aliens, reflecting our messages back to ourselves as a form of communication. Scary!

Lurking in the four megahertz band at 4625 KHz is what is colloquially known as "The Buzzer", a spooky buzzing tone emenating from Russia. The tone repeats 25 times a minute and it broadcasts perpetually (mostly). It was first noticed by radio users in 1973, during the height of the cold war, which has led to great speculation about just what, exactly, the buzzing is for.

Is it part of a missile detection system that looks for reflections or distortions in the signal? Is it a "dead hand", a doomsday mechanism that will automatically launch a nuclear attack in the event the signal stops? Is it a beacon for aliens?





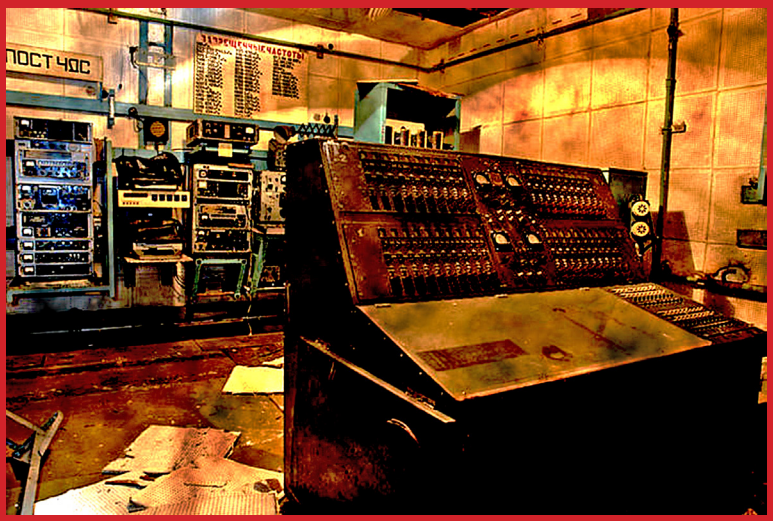


These pictures are from an abandoned facility in Povarovo, Russia, 10km north-east of Moscow that some people thought used to house The Buzzer, which was moved to another location near Saint Petersburg in 2010. In 2011 a group of urban explorers went in to the Povarovo site, taking these pictures and finding a radio log (left) that confirmed the broadcasts.

But The Buzzer doesn't just buzz: very occasionally there are mysterious messages in Russian, that typically start off with the station's apparent call sign, UVB-76. For example, this message was heard on Christmas Eve, 1997: "`Ya UVB-76, Ya UVB-76. 180 08 BROMAL 74 27 99 14. Boris, Roman, Olga, Mikhail, Anna, Larisa. 7 4 2 7 9 9 1 4`"

These coded messages are more typical of "numbers stations", frequencies on which cryptic messages are occasionally or regularly broadcast, to be understood by spies or the military. But these numbers stations don't normally broadcast a buzzer, so this does not necessarily explain The Buzzer's purpose.





Sometimes, noise is heard behind The Buzzer, assumed to be technicians maintaining the broadcasting equipment, or even The Buzzer itself, which could be the tonewheel from something like a Hammond organ, an argument supported by The Buzzer's fluctuating frequency. Whatever The Buzzer is, it's creepy, and it makes perfect Hallowe'en accompanyment.

You don't even need a shortwave radio to listen to The Buzzer; there are several web interfaces to radios that you can use, for example http://websdr.ewi.utwente.nl:8901/?tune=4625 which supports multiple users listening to different frequencies simultaneously.



MAY THE FORTH BE WITH YOU

A LANGUAGE INVENTED TO HELP SEE LANDS FAR, FAR AWAY A LONG TIME AGO.

We've talked a lot about BASIC and Logo in previous issues, but there were other computer languages used in the 1980s including C, Pascal and Forth.

```
CR .( HELLO, WORLD)
```
Displays "Hello, World"

In 1968, Charles Moore was working at the United States National Radio Astronomy Laboratory, and invented the initial version of Forth to help control radio telescopes.

Moore saw it as a successor to third-generation programming languages that required compilation in order to run, and so while he was working on it he placed it in a folder he wanted to name FOURTH but the computer (IBM 1130) he was using only allowed 5 character file names, and so he shortened it to FORTH, and it stuck.

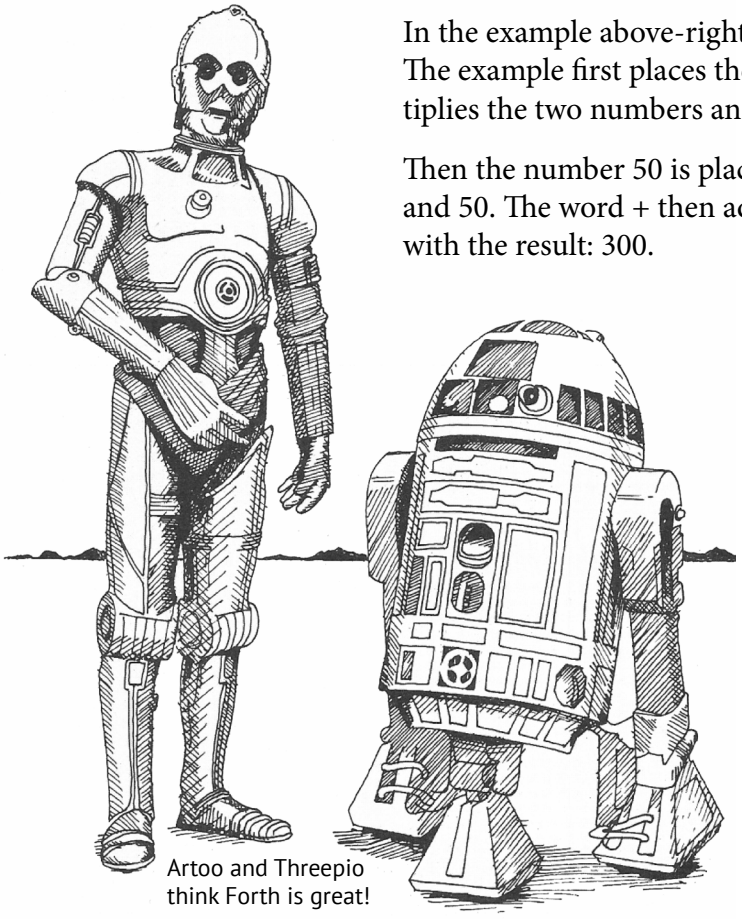
```
: HELLO ( -- ) CR
." HELLO, WORLD!" ;
```
Creates a HELLO word

```
HELLO <CR>
HELLO, WORLD!
```
Use of HELLO word

Forth relies heavily on stacks. Like other languages such as BASIC, Forth has a control flow stack that stores return addresses and loop counters, but a second separate stack (called the data stack) contains the parameters that 'words' (functions) use. Words take the parameters off the top of the stack and then replace them with their output.

Forth also uses Reverse Polish notation. In RPN, the operator (for example *) is placed after the operands (the numbers to be multiplied) rather then between them. So, for example, you want to multiply 25 by 10, you enter 25 10 *. This is similar to how Hewlett-Packard calculators worked.

```
25 10 * 50 + CR .
300 OK
```
Example of RPN math



Artoo and Threepio think Forth is great!

In the example above-right, 50 is added to the result of 25 * 10 to make 300. The example first places the numbers 10 and 25 on the stack. The word * multiplies the two numbers and replaces them with its output: 250.

Then the number 50 is placed on the stack, making the top two numbers 250 and 50. The word + then adds those two numbers together and replaces them with the result: 300.

Like Logo, Forth allows the programmer to create new words (functions or subroutines). Words are created by starting a line with a colon (:). Then you specify the name of the word (SQUARE). By convention you then put a comment (in round brackets) that lets other programmers know what the word is doing: (n -- n^2) telling them that the word will take a number off of the stack and replace it with its square. Next, since we want to square the number on the stack we first need to duplicate it, using the word DUP. Finally, we add the word * to tell our new word to multiply the top two values on the stack, and then finish the word definition with a ; like so:

```
: SQUARE (N -- N^2) DUP *;
```

To use our shiny new SQUARE word, we first put the number we want to SQUARE on the stack, by simply declaring it, then SQUARE. Like Logo, words are simply processed in order on the line, so we follow SQUARE with CR (because Forth does not by default advance to the next line on the screen before displaying output) and then . (period) which writes the top number on the stack to the display. Forth then outputs OK to let you know that it is finished.

```
5 SQUARE CR .
25 OK
```
Use and output of SQUARE

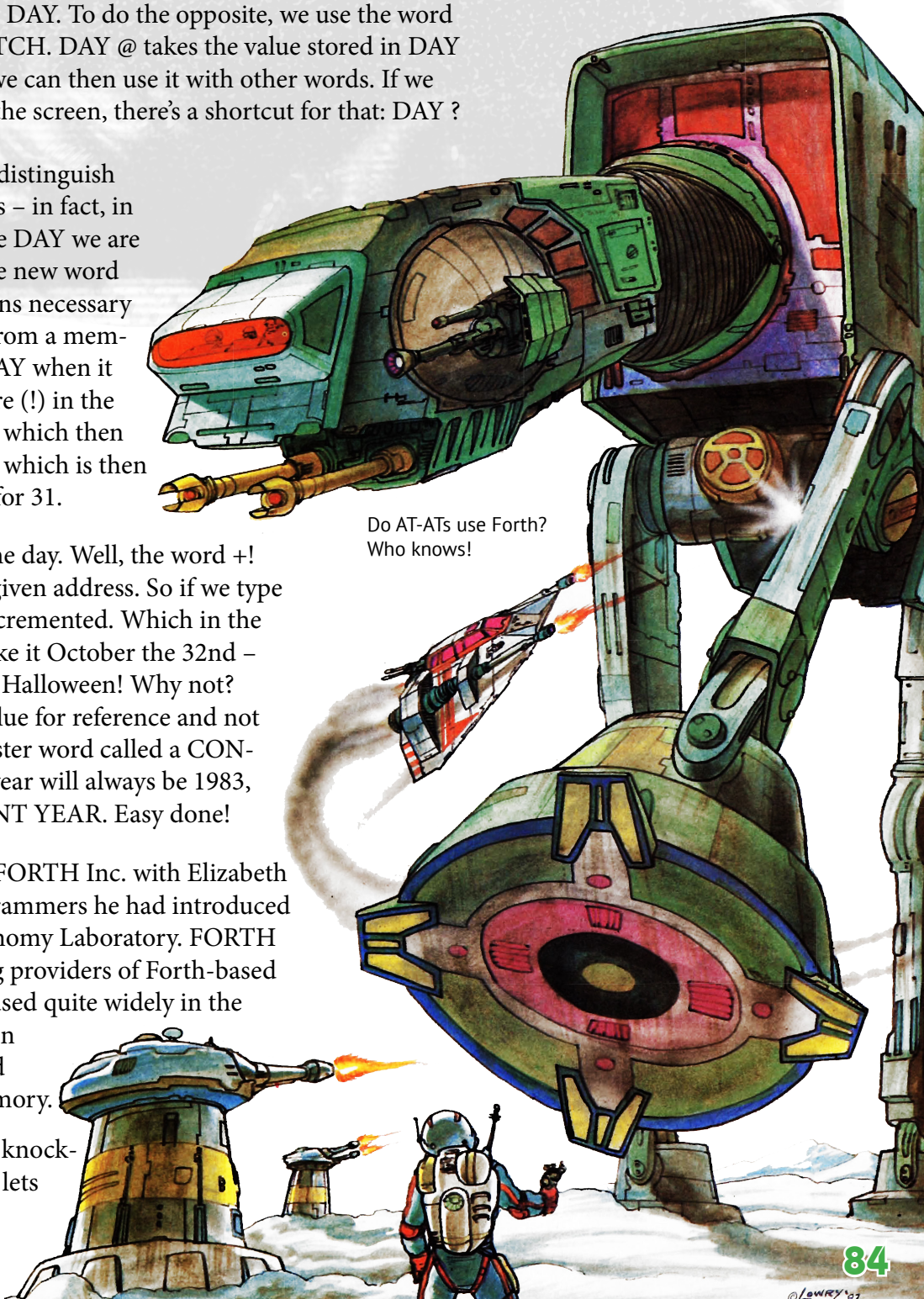
Although the stack is useful for storing values temporarily, it becomes a problem if you want to store them more permanently. In Forth, you can solve this by using the VARIABLE word. For example, if you wanted to store the day of the month for later, you could declare VARIABLE DAY. Then, if the day is the 31st (Halloween!) you would type 31 DAY !

```
VARIABLE DAY
31 DAY !
```
Example use of VARIABLE

The word ! (exclamation mark) is pronounced 'store'. It takes the top value on the stack and puts it into the specified variable. Thus the phrase above stores 31 into variable DAY. To do the opposite, we use the word @ (at sign), pronounced FETCH. DAY @ takes the value stored in DAY and puts it on the stack, so we can then use it with other words. If we just want to output DAY to the screen, there's a shortcut for that: DAY ?

```
DAY @ CR .
31 OK
```
Example use of @ (fetch)

Now, Forth doesn't actually distinguish between variables and words – in fact, in our example, when we create DAY we are actually creating a word! The new word DAY contains the instructions necessary to load and retrieve values from a memory address encoded into DAY when it is created. When we call store (!) in the example above, it calls DAY, which then returns its memory address, which is then used by ! as the destination for 31.



Do AT-ATs use Forth? Who knows!

Say we wanted to advance the day. Well, the word +! adds the given value to the given address. So if we type 1 DAY +! the date will be incremented. Which in the case of our example will make it October the 32nd – hey, we have an extra day of Halloween! Why not? If we only want to store a value for reference and not change it, we can create a faster word called a CONSTANT. So if we figure the year will always be 1983, we can type 1983 CONSTANT YEAR. Easy done!

In 1971 Moore co-founded FORTH Inc. with Elizabeth Rather, one of the first programmers he had introduced the language to at the Astronomy Laboratory. FORTH Inc. is still one of the leading providers of Forth-based solutions, and Forth is still used quite widely in the astronomy niche, as well as in embedded systems that need to use small amounts of memory.

So if the Empire ever comes knocking, it may be the Forth that lets us see it coming.



MICROM8 UPDATE

ZOMBIE TURTLES!



paleotronic.com/microM8

Part of the fun with microLogo has been taking a wonderful language Logo, and adding new and interesting features to it for a modern generation. In the beginning, this was the addition of 3D graphics using OpenGL, but then things like multiple turtles so that multiple items could be mapped out independently. However, it was still all being executed as a single thread of execution, which was complex. You could draw a line with one turtle, then switch to another turtle, draw another line, switch turtles again, and so on and so forth.

It was then we started to think. Why not allow these multiple turtles to execute programs simultaneously, so that each need only be concerned with what it was drawing. Thus, logo routines were born.

A logo routine is a routine that executes logo code. We created them as an abstraction of goroutines which are provided by the language (Go) that microM8 is written in. What is a goroutine though? A goroutine is a lightweight thread of execution that allows running a function. More than one goroutine can run a time, and in some respects they are a much lighter version of threads.

In order to implement them in logo, we need to create an independant run space for each logo routine, so that each has its own execution stack, local variables, but they share the logo workspace (procedures and global variables). This allows us to share data in the globals, and also to share code. Even if two logo routines are running the same procedure, they both maintain independent run state. This is important, as we don't want them stomping all over each others state. We like polite zombie turtles.

Take the following simple example procedure: -

```
TO RANDTURTLE :turtle
      SETTURTLE :turtle
      SETPC (RANDOM 15) + 1
      FD RANDOM 20
      RT RANDOM 360
      WAIT 3
      IF (RANDOM 100) > 90 [CS]
      RANDTURTLE :turtle
END
```

This procedure takes an input zombie :turtle, which represents the number of the turtle to use. MicroLogo supports multiple turtles, so this allows us to specify which turtle to use for drawing.

The routine sets a random pen color between (1 and 15, since 0 is transparent), then moves forward a random amount, and then turns a random number of degrees to the right. It then waits three 60ths of a second, and clears the turtle track if a random number between 0 and 99 is greater than 90.

Last but not least, it calls itself again in order to continue running. This procedure is recursive.

The LOGO keyword takes a list of commands and runs them as a separate logo routine. For example, so run our RANDTURTLE proc with 3 different zombie turtles, we can do the following: -

```
? logo [randturtle 1]
? logo [randturtle 2]
? logo [randturtle 3]
```

You will notice that we are back at the prompt again. This is because all of the commands are running in their own independent logo routines.

You can see them running using the "routines" command. It will list out the running logo routines, each with a unique numeric id.

```
?routines
    ID  STATE      ERR
    ==  =====      ===
    1   running
    2   running
    3   running
```

BY APRIL AYRES-GRIFFITHS
microM8 Senior Developer

We need this id, so that we can kill a running routine (and a zombie turtle) using the following command:

```
? kill 2
```

If you wanted to stop all of the logo routines (and kill all of the zombie turtles), you can do:

```
? killall
```

If the logo routines were not recursive, but each did some work and then exited, what if you wanted that work to happen concurrently, but wanted to continue execution of your main program once all the work was done?

In this case, you can use the "dawdle" command which waits around until all the running logo routines have completed.

Take the following example procedure: -

```
TO randwait
    WAIT RANDOM 300
END

? logo [randwait]
? logo [randwait]
? logo [randwait]
? dawdle
```

This will wait several seconds at the dawdle command, then return to the prompt. This is because it waits until all 3 running logo routines have completed. All three routines run concurrently, so dawdle will pause for the run time of the longest randwait instance.

Whilst data can be shared between logo routines by using global variables, there is a nicer way, also modelled on Go. Go provides a wonderful concept called "channels" which allow goroutines to "share data by communicating", rather than "communicate by sharing data". A channel is effectively a pipe that can be read from or written to by one or more routines. If a routine reads from a channel, but there is no data to be read, it will block and wait until data is supplied.

This allows us to have multiple logo routines passing data between each other, in a nice, safe way.

We can create a channel using the "channel" command, which works similarly to make in that it declares a special channel variable.

```
? channel "pizzaorders
```

In Logo, a channel can take any valid logo data type, for example numbers, words, lists etc.

```
TO orderpizza :flavour
    transmit "pizzaorders :flavour
end

TO cookpizza
    LOCAL "pizza
    MAKE "pizza RECEIVE "pizzaorders
    PR SE [got an order for] :pizza
    cookpizza
END
```

Let's start our pizza cook.

```
? logo [cookpizza]
```

"cookpizza" will wait to receive a value from the "pizzaorders" channel, then output a message at the prompt.

So, let's order a pizza, using the "orderpizza" procedure, which takes a string as input.

```
? orderpizza "anchovy
```

Immediately, another message appears at the prompt: -

```
got an order for anchovy
```

This is because the cookpizza routine was waiting to receive a pizza order from the "pizzaorders" channel. As soon as it receives it, it springs to life, outputs the message, and then launches itself again. Once again it will block waiting for another order.

Of course this is just a simple example, and you could do much more complex work with more complex data, and even pass the result to a further channel, to be handled by another logo routine.

The possibilities are endless.

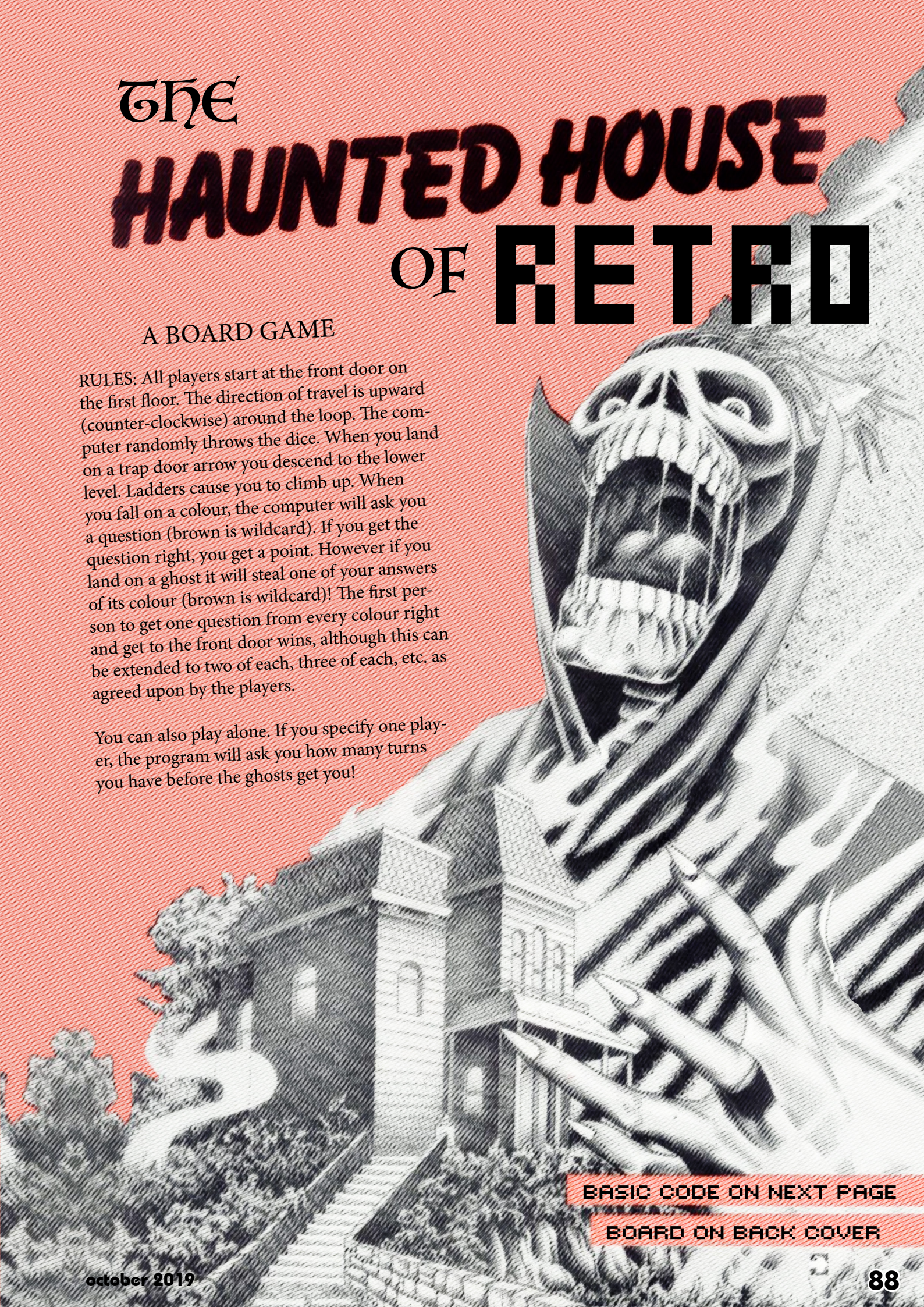

DON'T TAKE IT TO YOUR GRAVE
R.I.P
LET YOUR PROJECT LIVE ON, MAKE IT OPEN SOURCE

THE HAUNTED HOUSE OF RETRO

A BOARD GAME

RULES: All players start at the front door on the first floor. The direction of travel is upward (counter-clockwise) around the loop. The computer randomly throws the dice. When you land on a trap door arrow you descend to the lower level. Ladders cause you to climb up. When you fall on a colour, the computer will ask you a question (brown is wildcard). If you get the question right, you get a point. However if you land on a ghost it will steal one of your answers of its colour (brown is wildcard)! The first person to get one question from every colour right and get to the front door wins, although this can be extended to two of each, three of each, etc. as agreed upon by the players.

You can also play alone. If you specify one player, the program will ask you how many turns you have before the ghosts get you!



BASIC CODE ON NEXT PAGE

BOARD ON BACK COVER

```
10  DECODER = 960

20  dim QUESTION$ ( 5 , 10 )

30  dim COUNT ( 5 )
 :  for LOOP = 1 to 5
 :  COUNT ( LOOP ) = 1
 :  next LOOP

40  dim ANSWER$ ( 5 , 10 , 4 )

50  rem Decode Data

60  print "Decoding data..."

70  read IN$
 :  if IN$ = "END" then goto 160

80  QCAT = VAL( IN$ )

90  read IN$

100  gosub DECODER

110  QUESTION$ ( QCAT , COUNT ( QCAT ) ) =
OUT$

120  for LOOP = 1 to 4
  :  read IN$
  :  gosub DECODER
  :  ANSWER$ ( QCAT , COUNT ( QCAT ) , LOOP
) = OUT$
  :  next LOOP

130  COUNT ( QCAT ) = COUNT ( QCAT ) + 1

140  goto 70

150  dim LAST ( 5 , 10 )

160  print
  :  print "Welcome to the Haunted House of
Retro!"
  :  print
  :  print "To win, a player must have at
least one point per category and make it
back to"
  :  print "the front door!"
  :  print

170  input "How many players? " ; PCOUNT
  :  print

180  if PCOUNT = 0 then goto 170

190  dim NAME$ ( PCOUNT )
  :  dim PLAYPOS ( PCOUNT )
  :  dim SCORE ( PCOUNT , 5 )
  :  for NAMES = 1 to PCOUNT

200  print "Player " ; NAMES ;
  :  input "'s name? " ; NAME$ ( NAMES )

210  PLAYPOS ( NAMES ) = 1
  :  next NAMES

215  print
  :  print "How many points from each cate-
gory do"
  :  input "you need to win (default is 1)?
" ; TOTAL

216  if TOTAL = 0 then TOTAL = 1

217  print "Total required is " ; TOTAL

220  if PCOUNT = 1 then print
  :  input "How many turns before the
ghosts get you? " ; LIMIT
  :  print "Turn limit is " ; LIMIT

230  print
  :  print "You creep up to the front
door..."

240  PLAYER = 1

250  rem Main Loop

260  print
  :  print "Press any key to continue:" ;
  :  get KEY$
  :  print

270  TURNS = TURNS + 1
  :  if TURNS > LIMIT and PCOUNT = 1 then
print
  :  print "Sorry, the ghosts got you!"
  :  end

280  print
  :  print "It's " ; NAME$ ( PLAYER ) ; "'s
turn..."
  :  print

290  print "Your score is: " ;
  :  CUMULATIVE = 0
  :  for LOOP = 1 to 5
  :  print SCORE ( PLAYER , LOOP ) ; " " ;
  :  CUMULATIVE = CUMULATIVE + SCORE (
PLAYER , LOOP )
  :  next LOOP
  :  print "(" ; CUMULATIVE ; ")"

300  MOVE = INT( RND( 1 ) * 11 ) + 2

310  print NAME$ ( PLAYER ) ; " rolls a " ;
MOVE ; "!"

320  PLAYPOS ( PLAYER ) = PLAYPOS ( PLAYER
) + MOVE

330  if PLAYPOS ( PLAYER ) > 41 then
PLAYPOS ( PLAYER ) = PLAYPOS ( PLAYER ) - 41

340  print
  :  print NAME$ ( PLAYER ) ; " is on
square " ; PLAYPOS ( PLAYER )
  :  print

350  if PLAYPOS ( PLAYER ) = 2 or PLAYPOS
( PLAYER ) = 4 or PLAYPOS ( PLAYER ) = 6 or
PLAYPOS ( PLAYER ) = 41 then CATEGORY = 1
  :  print NAME$ ( PLAYER ) ; " landed on
a LIGHT BLUE square!"
  :  gosub 600
  :  goto 580
```

```
360  if PLAYPOS ( PLAYER ) = 8 or PLAYPOS (
PLAYER ) = 10 or PLAYPOS ( PLAYER ) = 12 or
PLAYPOS ( PLAYER ) = 14 then CATEGORY = 2
   :  print NAME$ ( PLAYER ) ; " landed on a
AQUA square!"
   :  gosub 600
   :  goto 580

370  if PLAYPOS ( PLAYER ) = 18 or PLAYPOS
( PLAYER ) = 20 or PLAYPOS ( PLAYER ) = 22
or PLAYPOS ( PLAYER ) = 24 then CATEGORY = 3
   :  print NAME$ ( PLAYER ) ; " landed on a
PURPLE square!"
   :  gosub 600
   :  goto 580

380  if PLAYPOS ( PLAYER ) = 25 or PLAYPOS
( PLAYER ) = 27 or PLAYPOS ( PLAYER ) = 29
or PLAYPOS ( PLAYER ) = 31 then CATEGORY = 4
   :  print NAME$ ( PLAYER ) ; " landed on a
YELLOW square!"
   :  gosub 600
   :  goto 580

390  if PLAYPOS ( PLAYER ) = 33 or PLAYPOS
( PLAYER ) = 35 or PLAYPOS ( PLAYER ) = 37
or PLAYPOS ( PLAYER ) = 39 then CATEGORY = 5
   :  print NAME$ ( PLAYER ) ; " landed on a
DARK BLUE square!"
   :  gosub 600
   :  goto 580

400  if PLAYPOS ( PLAYER ) = 7 or PLAYPOS
( PLAYER ) = 16 or PLAYPOS ( PLAYER ) = 40
then CATEGORY = INT( RND( 1 ) * 5 ) + 1
   :  print NAME$ ( PLAYER ) ; " landed on a
RANDOM square!"
   :  gosub 600
   :  goto 580

410  if PLAYPOS ( PLAYER ) = 3 then if
SCORE ( PLAYER , 1 ) > 0 then ATE = INT(
RND( 1 ) * SCORE ( PLAYER , 1 ) + 1 )
   :  print "Ghost ate " ; ATE ; " of " ;
NAME$ ( PLAYER ) ; "'s " ; SCORE ( PLAYER ,
1 ) ; " light blue points!"
   :  SCORE ( PLAYER , 1 ) = SCORE ( PLAYER
, 1 ) - ATE
   :  goto 580

420  if PLAYPOS ( PLAYER ) = 11 then if
SCORE ( PLAYER , 2 ) > 0 then ATE = INT(
RND( 1 ) * SCORE ( PLAYER , 2 ) + 1 )
   :  print "Ghost nommed " ; ATE ; " of " ;
NAME$ ( PLAYER ) ; "'s " ; SCORE ( PLAYER ,
2 ) ; " aqua points!"
   :  SCORE ( PLAYER , 2 ) = SCORE ( PLAYER
, 2 ) - ATE
   :  goto 580

430  if PLAYPOS ( PLAYER ) = 19 then if
SCORE ( PLAYER , 3 ) > 0 then ATE = INT(
RND( 1 ) * SCORE ( PLAYER , 3 ) + 1 )
   :  print "Ghost munched " ; ATE ; " of "
; NAME$ ( PLAYER ) ; "'s " ; SCORE (
PLAYER , 3 ) ; " purple points!"
   :  SCORE ( PLAYER , 3 ) = SCORE (
PLAYER , 3 ) - ATE
   :  goto 580

440  if PLAYPOS ( PLAYER ) = 30 then if
SCORE ( PLAYER , 4 ) > 0 then ATE = INT(
RND( 1 ) * SCORE ( PLAYER , 4 ) + 1 )
   :  print "Ghost swallowed " ; ATE ; " of
" ; NAME$ ( PLAYER ) ; "'s " ; SCORE (
PLAYER , 4 ) ; " yellow points!"
   :  SCORE ( PLAYER , 4 ) = SCORE ( PLAYER
, 4 ) - ATE
   :  goto 580

450  if PLAYPOS ( PLAYER ) = 32 then if
SCORE ( PLAYER , 5 ) > 0 then ATE = INT(
RND( 1 ) * SCORE ( PLAYER , 5 ) + 1 )
   :  print "Ghost consumed " ; ATE ; " of "
; NAME$ ( PLAYER ) ; "'s " ; SCORE ( PLAYER
, 5 ) ; " dark blue points!"
   :  SCORE ( PLAYER , 5 ) = SCORE ( PLAYER
, 5 ) - ATE
   :  goto 580

460  if PLAYPOS ( PLAYER ) = 26 then RCAT =
INT( RND( 1 ) * 5 ) + 1
   :  if SCORE ( PLAYER , RCAT ) > 1 then
ATE = INT( RND( 1 ) * SCORE ( PLAYER , RCAT
) + 1 )
   :  SCORE ( PLAYER , RCAT ) = SCORE (
PLAYER , RCAT ) - ATE
   :  print "Ghost ate " ; ATE ; " of " ;
NAME$ ( PLAYER ) ; "'s ?? RANDOM ?? points!"
   :  goto 580

470  if PLAYPOS ( PLAYER ) = 5 then PLAYPOS
( PLAYER ) = 34
   :  print NAME$ ( PLAYER ) ; " falls
through weak floorboard to square 34!"
   :  goto 580

480  if PLAYPOS ( PLAYER ) = 13 then
PLAYPOS ( PLAYER ) = 1
   :  print NAME$ ( PLAYER ) ; " trips into
a hole in the floor to the front door!"
   :  goto 540

490  if PLAYPOS ( PLAYER ) = 15 then
PLAYPOS ( PLAYER ) = 1
   :  print NAME$ ( PLAYER ) ; " tumbles
down a hole in the floor to the front door!"
   :  goto 540

500  if PLAYPOS ( PLAYER ) = 21 then
PLAYPOS ( PLAYER ) = 11
   :  print NAME$ ( PLAYER ) ; " steps on a
trap door to square 11!"
   :  goto 580

510  if PLAYPOS ( PLAYER ) = 23 then
PLAYPOS ( PLAYER ) = 9
   :  print NAME$ ( PLAYER ) ; " slides down
a hidden chute to square 9!"
   :  goto 580

520  if PLAYPOS ( PLAYER ) = 36 or PLAYPOS
( PLAYER ) = 38 then PLAYPOS ( PLAYER ) = 1
   :  print NAME$ ( PLAYER ) ; " climbs up a
ladder to the front door!"

530  rem Door

540  if PLAYPOS ( PLAYER ) <> 1 then print
NAME$ ( PLAYER ) ; " is safe... for now!"
```

```
  :  goto 580

550  for LOOP = 1 to 5

560  if SCORE ( PLAYER , LOOP ) < TOTAL
then goto 580

570  next LOOP
  :  goto 920

580  PLAYER = PLAYER + 1
  :  if PLAYER > PCOUNT then PLAYER = 1

590  goto 260

600  print "The category is: " ;

610  if CATEGORY = 1 then print "Video
Games!"

620  if CATEGORY = 2 then print "Computer
Data"

630  if CATEGORY = 3 then print "The
Breadboard"

640  if CATEGORY = 4 then print "Radio
Waves"

650  if CATEGORY = 5 then print "Consumer
Elecronics"

660  print

670  PICK = INT( RND( 1 ) * ( COUNT (
CATEGORY ) - 1 ) ) + 1

680  for CHECK = 1 to COUNT ( CATEGORY ) -
2
  :  if LAST ( CATEGORY , CHECK ) = PICK
and COUNT ( CATEGORY ) > 2 then goto 670

690  next CHECK
  :  for CHECK = 1 to COUNT ( CATEGORY ) -
2
  :  LAST ( CATEGORY , CHECK ) = LAST (
CATEGORY , CHECK + 1 )
  :  next CHECK
  :  LAST ( CATEGORY , COUNT ( CATEGORY ) -
1 ) = PICK

700  print QUESTION$ ( CATEGORY , PICK ) ;
"?"

710  print

720  ORDER$ = ""

730  CHOICE$ = CHR$( 49 + ( INT( RND( 1 ) *
4 ) ) )

740  for LOOP = 1 to 4
  :  if MID$( ORDER$ , LOOP , 1 ) = CHOICE$
then goto 730

750  next LOOP

760  ORDER$ = ORDER$ + CHOICE$

770  if LEN( ORDER$ ) < 4 then goto 730

780  for LOOP = 1 to 4

790  print CHR$( 64 + LOOP ) ; " " ;
ANSWER$ ( CATEGORY , PICK , VAL( MID$(
ORDER$ , LOOP , 1 ) ) )

800  next LOOP

810  OFFSET = 0

820  print

830  input "Choice: " ; USER$

840  if USER$ <> "A" and USER$ <> "B" and
USER$ <> "C" and USER$ <> "D" and USER$ <>
"a" and USER$ <> "b" and USER$ <> "c" and
USER$ <> "d" then print "Bad input!"
  :  goto 830

850  if ASC( LEFT$( USER$ , 1 ) ) > 68 then
OFFSET = 32

860  USER = ASC( LEFT$( USER$ , 1 ) ) - 64
- OFFSET

870  CHECK = 1

880  if MID$( ORDER$ , CHECK , 1 ) <> "1"
then CHECK = CHECK + 1
  :  goto 880

890  if USER = CHECK then print "Correct, "
; NAME$ ( PLAYER ) ; "!"
  :  SCORE ( PLAYER , CATEGORY ) = SCORE (
PLAYER , CATEGORY ) + 1
  :  goto 910

900  print "Wrong! No point for " ; NAME$ (
PLAYER ) ; "!"

910  return

920  print NAME$ ( PLAYER ) ; " wins with "
;

930  for LOOP = 1 to 5
  :  FINAL = FINAL + SCORE ( PLAYER , LOOP
)
  :  next LOOP

940  print FINAL ; " points!"

950  end

960  rem Decoder

970  OUT$ = ""
  :  OFFSET = 1

980  for POSITION = 1 to LEN( IN$ )

990  OUT$ = OUT$ + CHR$( ASC( MID$( IN$ ,
POSITION , 1 ) ) - OFFSET )

1000  if OFFSET = 1 then OFFSET = 3
  :  goto 1020

1010  OFFSET = 1
```

```
1020  next POSITION

1030  return

1039 rem Video Games

1040  data “1”,”Xkbw!|fds#ele#Bwbuj#shmhb
vf#ukf#WFT”,”2<8:”,”2<86”,”2<88”,”2<94”

1050  data “1”,”Xkfq!zbv!wih!QFV!ufofdthe#
jq!Dvvuubojd”,”2<9:”,”2<96”,”2<98”,”2<:4”

1060  data “1”,”Ddvvfg!wih!4:;4#wlehp#hdn
h!fsdtk”,”FW”,”Elh#Exh”,”Eronf|!Npqh”,”Rly”

1999 rem Computer Data

2000  data “2”,”Drnppgpuf*t#chtw.vfomloj!fp
pqxuhs”,”D95”,”Bfpuo”,”JLD”,”NF.41”

2010 data “2”,”Qrqxmds#2<93t#fgvfbwjrod
m#hdnh;#Ukf#`b`b`b`#Uublm”,”Pufjpq”,”Jgb
kp”,”Bobebpb”,”Edlrud”

2020 data “2”,”Cuvff#Hrsgpq(v!lmo.ibwfg
!Vqhdwsxn#txdffvtrs”,”Tdn”,”Gufg”,”Hhpuh
h”,”Idsuz”

2999 rem The Breadboard

3000  data “3”,”Xkbw!fppqrohow!lnsfgfv!f
vushow!lo#b#dlsfvlu”,”shtltwpu”,”ddqd
dlurs”,”elpgf”,”drsq!filq”

3010 data “3”,”MHE#twbqev!ipu”,”Mlhku#F
pjwuloj!Gjreh”,”Mrbg!Hnhoduloj!Gjvd”,”Mh
bg!Hufihe#Elbjsdn”,”Mlukjxn#Fqfuh|!Gbqdh“

3020 data “3”,”Qdtvjyf#Jqgubufg!Vfqtrsv
!zpul#c|!gfwffuloj!wilt”,”Ihbw”,”Mdvjiwf
u”,”Tpfom”,”Idqsjqfvt”

3999 rem Radio Waves

4000  data “4”,”Ukf#G#jq!IN#twbqev!ipu”,
”guftvhofz”,”gxsqjwvuf”,”gupj”,”gobs”

4010 data “4”,”Ddmo!vjjo#pi!vqrpnz#Sxtvj
do##ev}{hs%”,”VYC089”,”BED037”,”SWB027”,
”RRD0:8”

4020 data “4”,”Jq!d!pjfsrxdwh!rwho#ukf#
nldupzbyfv!dsh!jfqfubwfg!ez#b”,”ndhqfwsr
o”,”hubyjwsro”,”nldupwsro”,”nhhduupq”

4999 rem Consumer Electronics

5000  data “5”,”Ukf#D#jq!wih!FFG!yjgfr!gj
vd#t|twfp!vudogt#grs”,”Ddqddludoff”,”Dkjom
l”,”Ddsepq”,”Dlsfvlu”

5010 data “5”,”Ukjv!dogsrjg!efds#xdt#or
ukjqh#nrsh!wido#b#udqh!smdzhs$”,”Uhegz#S
xysjq”,”Gufge|!Gj{qxo”,”Gxsez”,”Fonr”

5020 data “5”,”Ukf#Idnppqe#puhdo#vvfg!d
!vqloqjqh#eltn!norxq!dt#b#`b`b`#xkfhm”,”
uroh”,”xkjvuof”,”rxbfl”,”tfshbp”

9999  data “END”
```

The following program encodes the quiz data so you can add more questions. Uncomment the REM in line 90 if you’re using microM8 and it will copy the encoded string into the paste buffer.

```
 10  input PHRASE$

 20  ENCODE$ = “”
  :  OFFSET = 1

 30  for LOOP = 1 to LEN( PHRASE$ )

 40  ENCODE$ = ENCODE$ + CHR$( ASC(
MID$( PHRASE$ , LOOP , 1 ) ) + OFF-
SET )

 50  if OFFSET = 1 then OFFSET = 3
  :  goto 70

 60  OFFSET = 1

 70  next LOOP

 80  print ENCODE$

 90  rem @TEXT.COPY{ ENCODE$ }

100  rem Let’s make sure it’s
okay...

110  PHRASE$ = “”
  :  OFFSET = 1

120  for LOOP = 1 to LEN( ENCODE$ )

130  PHRASE$ = PHRASE$ + CHR$( ASC(
MID$( ENCODE$ , LOOP , 1 ) ) - OFF-
SET )

140  if OFFSET = 1 then OFFSET = 3
  :  goto 160

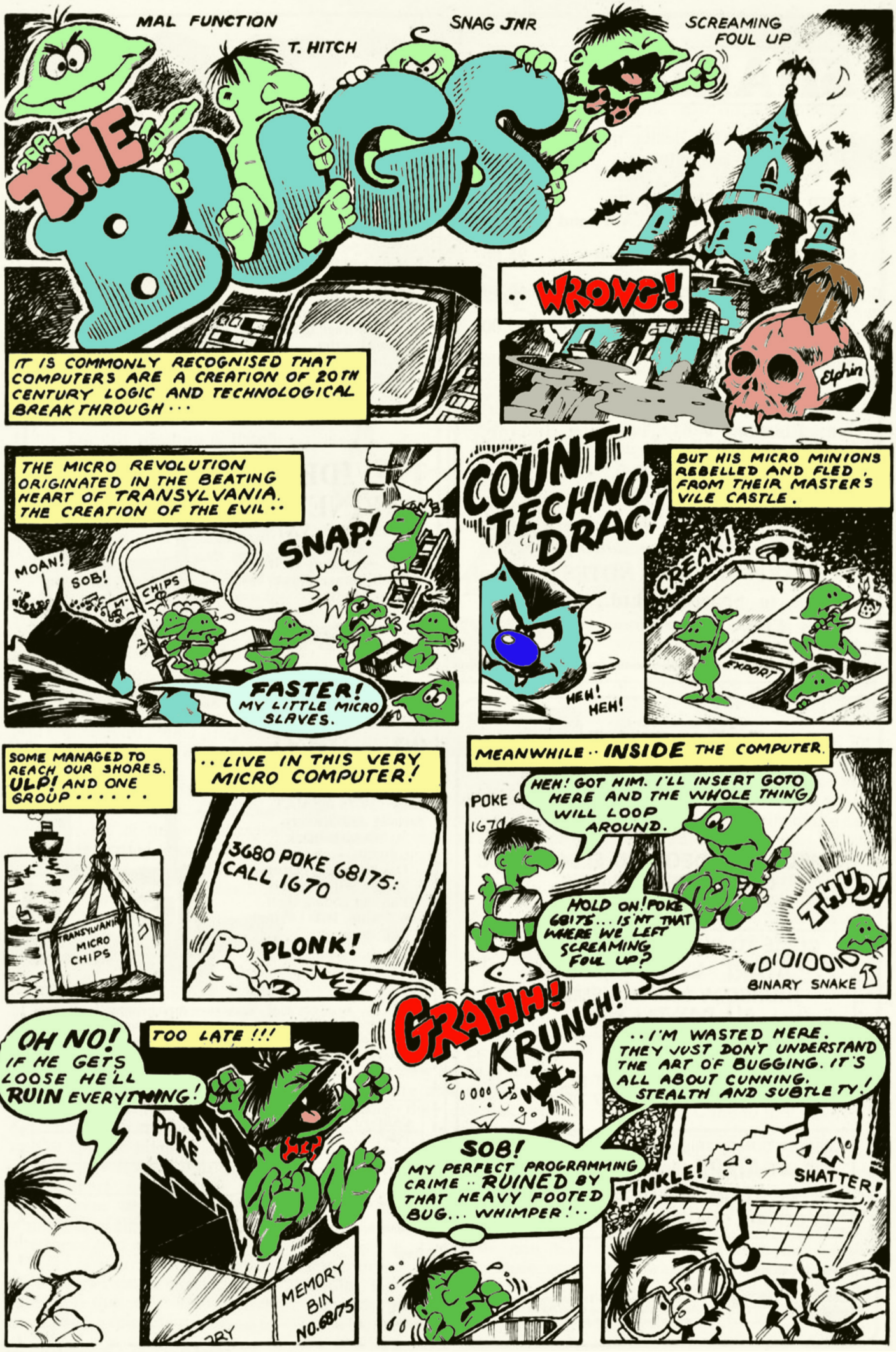
150  OFFSET = 1

160  next LOOP

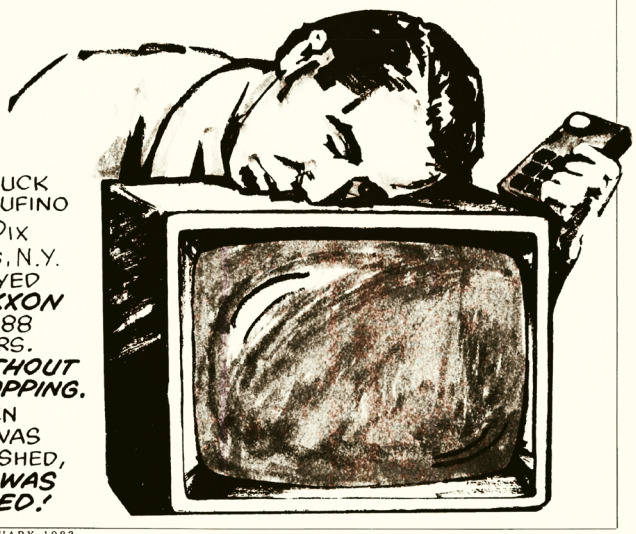
170  print PHRASE$

180  goto 10
```

Use the encoded strings to create a DATA statement of the format “CATEGORY (numeric, not encoded)”,”QUESTION”,”RIGHT ANSWER”,”WRONG ANSWER 1”,”WRONG ANSWER 2”,”WRONG ANSWER 3”


MAL FUNCTION
T. HITCH
SNAG JNR
SCREAMING FOUL UP
THE BUGS
IT IS COMMONLY RECOGNISED THAT COMPUTERS ARE A CREATION OF 20TH CENTURY LOGIC AND TECHNOLOGICAL BREAK THROUGH ···
.. WRONG!
Elphin
THE MICRO REVOLUTION ORIGINATED IN THE BEATING HEART OF TRANSYLVANIA. THE CREATION OF THE EVIL ..
MOAN!
SOB!
CHIPS
SNAP!
FASTER! MY LITTLE MICRO SLAVES.
COUNT TECHNO DRAC!
HEH! HEH!
BUT HIS MICRO MINIONS REBELLED AND FLED, FROM THEIR MASTER'S VILE CASTLE.
CREAK!
EXPORT
SOME MANAGED TO REACH OUR SHORES. ULP! AND ONE GROUP ·····
TRANSYLVANIA MICRO CHIPS
.. LIVE IN THIS VERY MICRO COMPUTER!
3680 POKE 68175: CALL 1670
PLONK!
MEANWHILE .. INSIDE THE COMPUTER.
HEH! GOT HIM. I'LL INSERT GOTO HERE AND THE WHOLE THING WILL LOOP AROUND.
HOLD ON! POKE 68175... IS'NT THAT WHERE WE LEFT SCREAMING FOUL UP?
THUD!
BINARY SNAKE
OH NO! IF HE GETS LOOSE HE'LL RUIN EVERYTHING!
TOO LATE !!!
POKE
MEMORY BIN NO.68175
GRAHH!
KRUNCH!
SOB! MY PERFECT PROGRAMMING CRIME .. RUINED BY THAT HEAVY FOOTED BUG... WHIMPER!..
..I'M WASTED HERE. THEY JUST DON'T UNDERSTAND THE ART OF BUGGING. IT'S ALL ABOUT CUNNING. STEALTH AND SUBTLETY!
TINKLE!
SHATTER!

RIPOFF'S Believe it or not!



GHUCK RUFINO of Dix Hills, N.Y. PLAYED *ZAXXON* FOR 88 HOURS. *WITHOUT STOPPING.* WHEN HE WAS FINISHED, *HE WAS TIRED!*

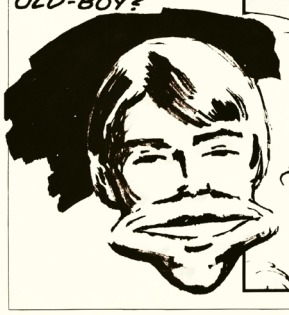
Drawings by Bob Winterson. Lettering by Janice Chiang



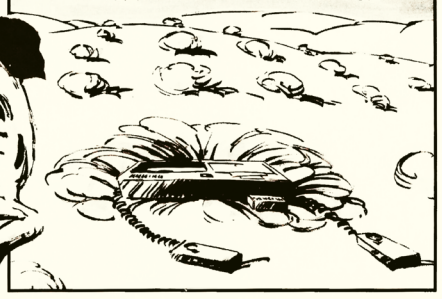
OVER THE COURSE OF A YEAR, ROGER BROWN of Silver Springs, Md. *ATE AN ENTIRE PAC-MAN MACHINE!*

GORF SPELLED BACKWARDS IS FROG!! ROBOTRON SPELLED BACKWARDS IS NORTOBOR!! GALAXIAN SPELLED BACKWARDS IS HARD TO PRONOUNCE!!

DID YOU KNOW THAT AN INTELLIVISION CONTROLLER WILL FIT *COMPLETELY* IN THE MOUTH OF A *THREE-YEAR-OLD-BOY?*



ARABELLA SMITH of Seward, Ne. GREW A CABBAGE IN THE *SHAPE OF A COLECOVISION.* "NEXT YEAR I'M HOPIN' TO GET A POTATO IN THE SHAPE OF AN ATARI EXPANSION MODULE," SHE SAID.





ATARI-COMPATIBLE TREE Wilkes Barre, Pa.

JAMES BARDWILL 14, of Encino, Ca. THINKS HE'S *BERZERK.* HE HAS EATEN NOTHING BUT QUARTERS SINCE HE WAS *11.* (FOR TWO GAMES 50 CENTS IS REQUIRED.)

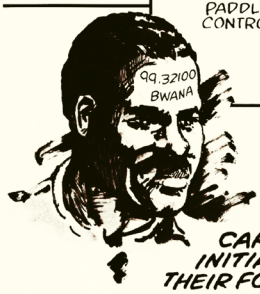
IF YOU TAKE 25 WHITE RATS AND LOCK THEM IN A ROOM FOR 48 HOURS WITH A *TURBO* GAME, *THEY WILL GET GOOD AT IT. DAMN GOOD!*



CALVIN LOUIE WAS *RAISED BY A PACK OF ASTEROIDS MACHINES!* TO THIS DAY, THE ONLY WORDS HE KNOWS ARE *"PING!" "BLEEP!"* AND *"KA-POW!"*

STALACTITES IN A CAVE IN WISCONSIN *GROW IN THE SHAPE OF JOYSTICKS!* UNFORTUNATELY, THE CAVE MUST BE PLAYED USING THE PADDLE CONTROLLERS.

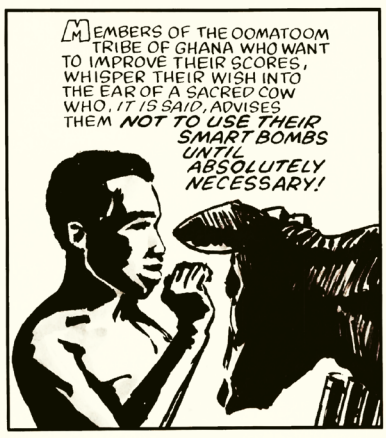




THE FIRST VIDEO GAME WAS INVENTED IN 393 B.C. *IT DID NOT WORK!!!*

SHILLUK TRIBESMEN of Africa, *CARVE THEIR INITIALS IN THEIR FOREHEADS* TO INDICATE HIGH SCORES AT *JUNGLE HUNT!*

MEMBERS OF THE OOMATOOM TRIBE OF GHANA WHO WANT TO IMPROVE THEIR SCORES, WHISPER THEIR WISH INTO THE EAR OF A SACRED COW WHO, *IT IS SAID,* ADVISES THEM *NOT TO USE THEIR SMART BOMBS UNTIL ABSOLUTELY NECESSARY!*





PAC-ROC, Mount Adu, India NATURAL ROCK FORMATION.



THE OREGON

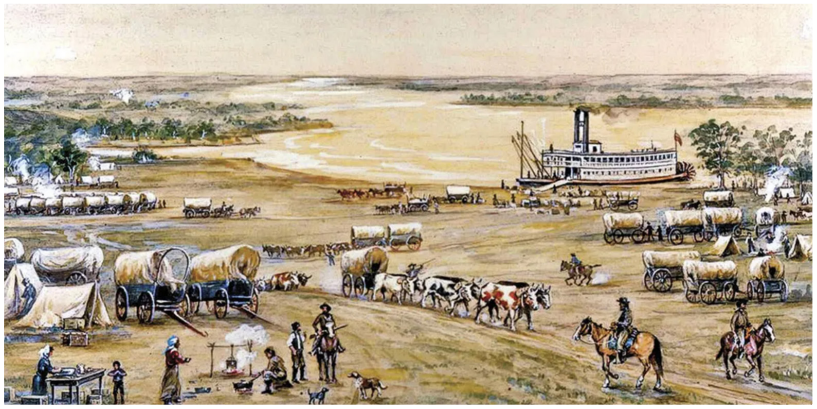
The trail covers the modern-day American states of Kansas, Nebraska, Wyoming, Idaho and Oregon. Originally a horse trail, it was opened as a wagon trail in 1836, when the first wagon train travelled to Fort Hall in Idaho.

The Oregon Trail is an 3490 km route from Kansas City, Missouri to the Willamette Valley in what was the Oregon Territory, now Oregon State.

From the 1830s to 1870, some 400,000 settlers, farmers, miners, ranchers and others travelled the trail, facing its dangers and surviving – or not.

When a student teacher in 1971 wrote a game to teach his students about life on the Oregon Trail, little did he know that it would turn into a multi-generational worldwide sensation!

Don Rawitsch, a senior at Carleton College in Minnesota, was teaching an eighth-grade history class when he realised he could write a computer program to help teach the subject of the settlement of the American west. He enlisted two other friends and student teachers to help him, and they wrote the first Oregon Trail game in BASIC on an HP minicomputer.



Despite being presented to students on a teletype terminal, OREGON was a very popular program, which Rawitsch made available to other schools via the computer network owned by Minneapolis Public Schools. But when the next semester ended, Rawitsch printed out a copy of the games code and deleted it from the server.

The game was made up of a few components that would also form the core of later versions:

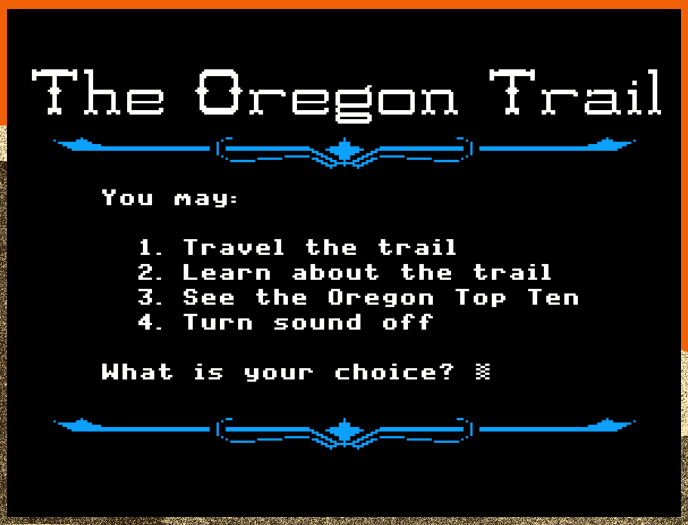
1. There is an initial purchase of supplies. Players need to be strategic about what they buy.
2. You can hunt for food during the journey, which means you can buy less food at the start, although the availability of game is not guaranteed.
3. But you can buy more supplies at forts along the trail (if you can reach them).
4. The time it takes to travel is affected by weather conditions and the health of your party.
5. Frequent misfortunes happen, such as illness, injury and death.
6. The game ends when either all members of your party end, or you reach Oregon.



During your journey you need to maintain a steady supply of food (so you don't starve to death) while keeping your wagon and oxen in good order and being prepared for issues with either. You need ammunition to hunt game and to keep enemies at bay. You need goods such as warm clothing so you do not freeze to death, and potentially to trade with, as money may not be accepted. Finally, you need the constitution to persevere. Think you can hack it?

TRAIL OF DEATH

As many as 21,000 travellers are estimated to have met their end on the trail, most of them lost to diseases such as Cholera.



The 1985 version of The Oregon Trail for the Apple II is probably the best-known version of the game, being fully graphical and a common purchase by schools.



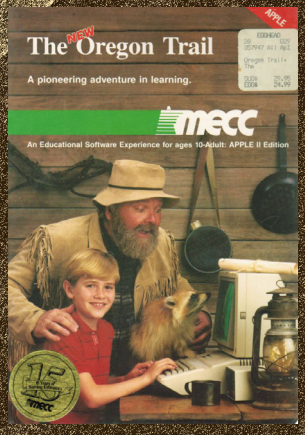
In 1974, Rawitsch was hired by the Minnesota Educational Computing Consortium (MECC), a state-run organisation that developed educational software. He uploaded the game to MECC's computer network by retyping it in. He improved upon it by fine-tuning the frequency and type of the random misfortunes that befall players of the game based on real accounts of trail travellers. In 1975, when his updates were finished, he made the game available to all of the schools on the network, where thousands of students played the game monthly.

In 1978 Rawitsch published the game in Creative Computing magazine. MECC began writing software for the Apple II, and OREGON was adapted for it by John Cook. Once it was distributed it began to appear in public domain libraries around the country and subsequently the world. It was further adapted by J. P. O'Malley, who added a graphical hunting sequence (the original was only text) and a few other improvements.

Other causes of death included attacks from Native Americans, freezing, getting run over by livestock or wagons, drowings, shootings (accidental and as the result of robberies), scurvy, snakebites, stampedes and lightning strikes! Ouch.

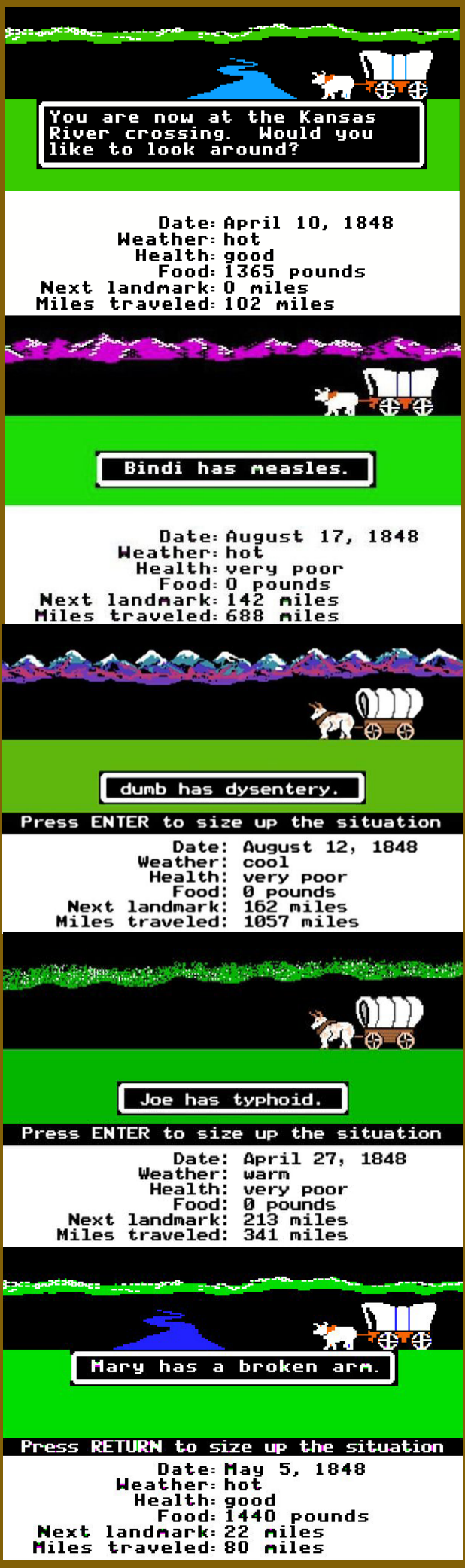
In the early 1980s MECC decided to rework OREGON into a fully-fledged computer game, intended for commercial sale. It was designed by R. Phillip Bouchard, who added various landmarks that served as breaks between sections of the trail, as well as places to stop and learn a bit about the history of it. These are frequently river crossings which can result in the loss of goods and supplies. The hunting sequence was reimagined; the player had to manage the wellbeing a 'party' of family members and not just themselves; difficulty levels; and a point system was added to give a score at the end.







Scurvy could even get you after you got to your destination: the poor diet of salt pork and flour consumed on the trail weakening some travellers to the point that they were unable to recover and died, particularly miners who ate no better once they reached the camps. Some believe as many died after the trip as during it!



The diseases that family members could be afflicted with also became more specific, and they could either improve or deteriorate based on the amount of rations the player allowed the party to consume, the pace at which they travelled, and other factors. This led players to play a sub-game of sorts where they gambled on what was going to befall and / or kill a member of their party next! It certainly made the game memorable, and after its release in the autumn of 1985 it quickly became a mainstay of North American classrooms.

Those children who grew up during the 1980s have been called the "Oregon Trail Generation" due to the games popularity during their time in school. The term 'Xennial' has also been used to describe this transitional generation of children who were exposed to technology as part of their formative years and became 'early adopters' both in the sense of the early stage of that technology but also their age. The Oregon Trail was a key part of warming up children to the use of personal computers and would assist in their eventual widespread adoption. (The 1978 version was the first computer game I ever played, in 1980!)

Over the following years, further versions of OREGON were released for other computer platforms such as the Macintosh, IBM PC DOS and Microsoft Windows. These added additional character classes such as Blacksmith or Doctor, each with their own strengths and weaknesses. There is also an ability to load and save a game that is in progress, and a distinction made between perishable and non-perishable food. You can travel at different eras of the trail, with later years providing more waypoints and an easier journey, forage for edible plants, and fish. Players can even talk to other settlers and ask their advice! These later versions also have improved graphics and sound.

Cumulatively, The Oregon Trail has sold over 65 million copies, made up of ten versions released over forty years. This has made the game a cultural icon, with exposure to the game almost universal. As a result, the causes of death in the game have become 'memes', such as "You have died of dysentery".

As a result, the Oregon Trail is the only educational game inducted into the World Video Game Hall of Fame, and Time Magazine has placed it ninth on its list of the 50 best video games of all time – not bad for a program whose origin was a Minnesota classroom.

Recently, a handheld version of The Oregon Trail was released in department stores in the United States. It features the MS-DOS version of the game, and the ability to save scores. You can also play it online at the Internet Archive.





Come to think of it, moving from place to place, dying of random things, does sound a bit like a survival horror... kind of like the Walking Dead. Well, someone was bound to put that together...

Enter Organ Trail, a zombie-themed spoof that has you traverse the United States in an attempt to survive a zombie apocalypse by reaching a zombie-free sanctuary. Like the Oregon Trail, players need to manage limited resources such as food, ammunition and fuel for their vehicle, and also like the Oregon Trail, different characters have different traits.



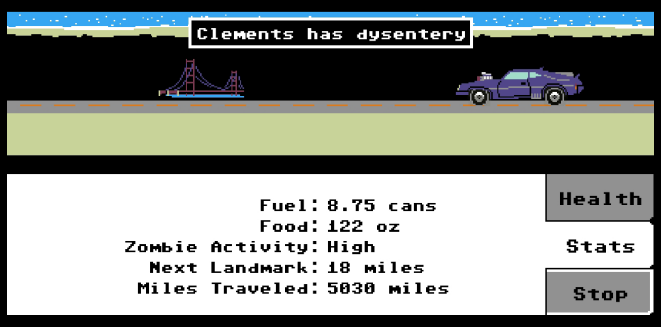


Organ Trail was first released as an Adobe Flash game in 2010, and later as a Facebook app. Due to its popularity, Organ Trail's developers, 'The Men Who Wear Many Hats', held a Kickstarter campaign to raise funds to make an expanded PC and mobile version called The Organ Trail: Director's Cut, which they released in 2012.



The Director's Cut implements a number of features based on fan feedback and suggestions, such as the ability to customise your character, choose-your-own-adventure style random encounters, 'boss' fights, achievements and on-line leaderboards. The game is available for Windows, Linux, macOS, iOS, Android and Ouya (ooh-what?)

Organ Trail 'Complete Edition' came out in 2015 for the PS4 and PS Vita with heaps of even more stuff!







GADGET GRAVEYARD

What was promised by Nintendo's Virtual Boy was a 3D virtual reality experience like no other. The end result was far from what everyone had been thinking of, hoping for and wanting. The Virtual Boy did not provide any real 3D experience, it did however provide a VR experience like no other - a VR experience that just didn't feel real. Closer to reality than virtual, the Virtual Boy failure brought about the demise of the original developers of the technology, RTI. They could not recover from the experience closing down its operations in 1997. Reports in game magazines at the time suggested that Nintendo had placed blame on the failure of the Virtual Boy directly on Gunpei Yokoi. He would later atone the Virtual Boy failure with better success in launching the Game Boy Pocket, ultimately leaving Nintendo in 1996 to start a new company.

Virtual Boy may have been dead and buried back in 1995 but it did not stop Nintendo's development approach or focus on innovation. The company continues to prosper and be a leading innovator in developing new games, new consoles and new intellectual property. The Nintendo hand held console launched in 2011, saw games with real autostereoscopic "3D" visuals. It was able to do so by producing the desired depth effects without any special glasses and was light and portable, a complete contrast to the Virtual Boy. Surprisingly, new games have been made for the Virtual Boy. The hobbyist community at Planet Virtual Boy has developed Virtual Boy software. Two previously unreleased games, Bound High and the Japanese version of Faceball (known as NikoChan Battle) were released. Despite its poor reputation as a games console and a complete failure commercially, Nintendo's Virtual Boy and games are now considered valuable collector's items as so few were sold at its release.

Virtual Boy Specifications

Processor
NEC V810
32-Bit RISC Processor at 20 MHz clock speed
1MB of DRAM, 512 of KB P-Sram
1 KB Cache
Display
Reflection Technology Inc SLA dual mirror-scan, high resolution LED displays
Resolution: 384 x 224 pixels
50.2 Hz Horizontal Scan Rate
4 colors with 32 levels of intensity
Power Supply
Six AA batteries (lasts for approximately four hours) or an AC adapter
Sound
16-Bit Stereo
Built-in Stereo Speaker
Serial Port
8 Pin Cable
Bandwidth 50-100 KBit/second
Weight
760 g
Dimensions
8.5"H x 10"W x 4.3"D

Cartridge specifications
128 MBit addressable ROM space
128 MBit addressable RAM space
60-pin connector
Toshiba TC538299AFT and TC5316200AFT ROM chips in 16 bit mode.



But who will buy it? It's awkward to use, it's 100% antisocial, it's too expensive and the 'VR' (i.e. the 3D effect) doesn't actually add to the game at all: it's just a novelty

Nintendo chairman Hiroshi Yamauchi put on a brave face

form. First up was *Mario Bros VB* (no, really) — imagine a static screen and Mario hopping from platform to platform. Another was *Space Pinball*, a standard pinball game with the 3D effect allowing the ball to travel beneath the table. *Telero Boxing* is just plain weird. Needless to say, all three were extremely early versions.

Ironically, Nintendo is expecting great things from the Virtual Boy. The company has stated that it plans to sell three million hardware units and 14 million game cartridges in Japan alone in the period from its launch in April 1995 to March 1996. The system will retail at ¥19,800 ($207), and three games will be available at launch, costing between ¥5000 ($52) and ¥6000 ($62) each.

NCL officials demonstrated the Virtual Boy to show delegates. Few were impressed with the crude monochrome display and lack of genuine portability

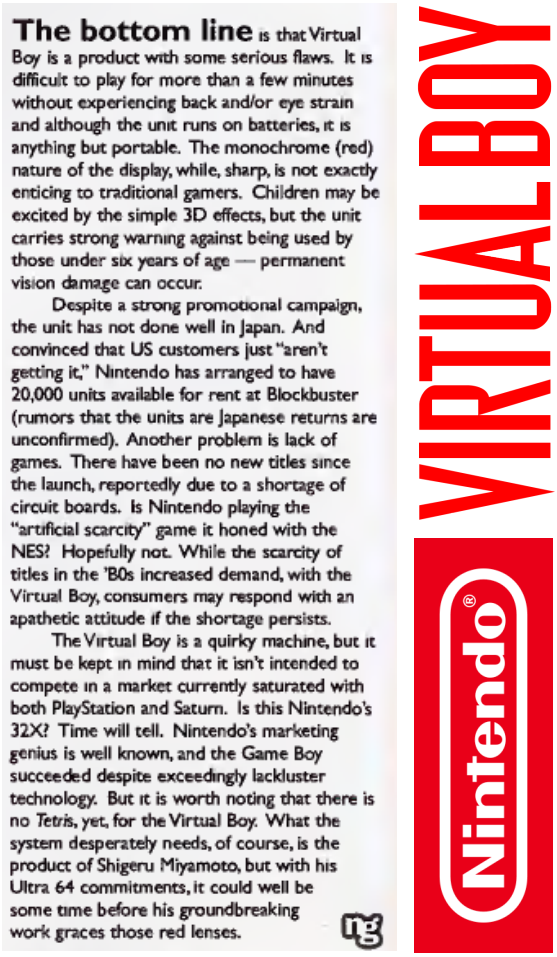
Specs
CPU: 32bit NEC V810 @ 10MHz
Dimensions: 217x254x110mm
Power: 6 AA batteries
Weight: 760g (body only)
Accessories: AC 100V adapter, Battery charger
Screen Color: Any color you want (as long as it's red)

Looking through the goggles of Virtual Boy is like duct-taping two red Game Boys to your face. The 3D effect is seemingly impressive, but — so far — adds nothing to the game itself

Virtual Boy as captured by the NEXTGen-cam. Title screen complete with zooming letters (top left). *Mario Bros VB* — possibly the 'flagship' title (top right). The slick, but ultimately underwhelming *Space Pinball* (bottom right). *Telero Boxing* — hardly a threat to PlayStation *Boxer's Road* (left)

But who will buy it? It's not portable. It's awkward to use, it's 100% antisocial (unlike multiplayer SNES/Genesis games), it's too expensive and — most importantly — the 'VR' (ie 3D effect) doesn't add to the game at all: it's just a novelty.

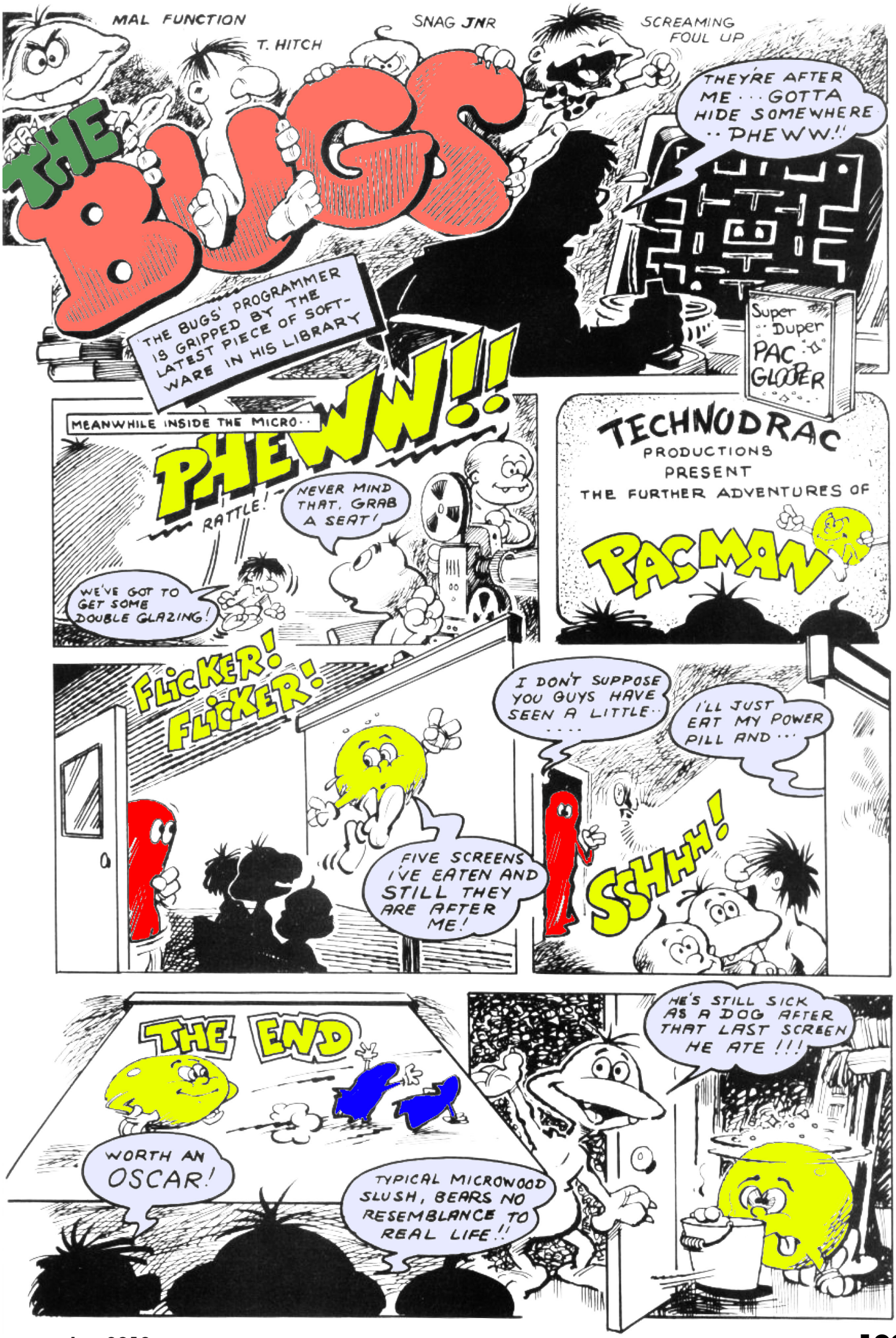
Next month **NEXT Generation** quizzes Virtual Boy's designer, Gumpei Yo (also the creator of the Game Boy) in Japan, and asks: Just what is Nintendo up to?



The bottom line is that Virtual Boy is a product with some serious flaws. It is difficult to play for more than a few minutes without experiencing back and/or eye strain and although the unit runs on batteries, it is anything but portable. The monochrome (red) nature of the display, while, sharp, is not exactly enticing to traditional gamers. Children may be excited by the simple 3D effects, but the unit carries strong warning against being used by those under six years of age — permanent vision damage can occur.

Despite a strong promotional campaign, the unit has not done well in Japan. And convinced that US customers just "aren't getting it," Nintendo has arranged to have 20,000 units available for rent at Blockbuster (rumors that the units are Japanese returns are unconfirmed). Another problem is lack of games. There have been no new titles since the launch, reportedly due to a shortage of circuit boards. Is Nintendo playing the "artificial scarcity" game it honed with the NES? Hopefully not. While the scarcity of titles in the '80s increased demand, with the Virtual Boy, consumers may respond with an apathetic attitude if the shortage persists.

The Virtual Boy is a quirky machine, but it must be kept in mind that it isn't intended to compete in a market currently saturated with both PlayStation and Saturn. Is this Nintendo's 32X? Time will tell. Nintendo's marketing genius is well known, and the Game Boy succeeded despite exceedingly lackluster technology. But it is worth noting that there is no *Tetris*, yet, for the Virtual Boy. What the system desperately needs, of course, is the product of Shigeru Miyamoto, but with his Ultra 64 commitments, it could well be some time before his groundbreaking work graces those red lenses.


MAL FUNCTION
T. HITCH
SNAG JNR
SCREAMING FOUL UP
THE BUGS
THEY'RE AFTER ME ... GOTTA HIDE SOMEWHERE .. PHEWW!!
THE BUGS' PROGRAMMER IS GRIPPED BY THE LATEST PIECE OF SOFT-WARE IN HIS LIBRARY
Super Duper PAC GLOOPER
MEANWHILE INSIDE THE MICRO..
PHEWW!!
RATTLE!
NEVER MIND THAT, GRAB A SEAT!
WE'VE GOT TO GET SOME DOUBLE GLAZING!
TECHNODRAC PRODUCTIONS PRESENT
THE FURTHER ADVENTURES OF
PACMAN
FLICKER! FLICKER!
I DON'T SUPPOSE YOU GUYS HAVE SEEN A LITTLE.. ....
I'LL JUST EAT MY POWER PILL AND ...
FIVE SCREENS I'VE EATEN AND STILL THEY ARE AFTER ME!
SSHH!
THE END
WORTH AN OSCAR!
TYPICAL MICROWOOD SLUSH, BEARS NO RESEMBLANCE TO REAL LIFE!!
HE'S STILL SICK AS A DOG AFTER THAT LAST SCREEN HE ATE !!!

Trick or treaters had been coming and going all night, but their flow had slowed to a trickle after the skies over Schenectady, New York had opened up, drenching anyone who dared to venture out on All Hallows' Eve, and providing an impressive display of lightning and thunder.

When there was a knock at the door, young Jamie Silicon expected to encounter a soggy ghost or goblin on the other side, not a soaking wet detective with a grim look on his face.

"Peter has escaped, hasn't he?" Jamie wasn't one to engage in pleasantries when the unpleasantness of the visit was obvious. Peter - his mother's stalker, the reason for her faked death and absence from her children's lives for OVER A YEAR – was a little too wily to remain in prison for long, and if Jamie was being honest, the only real surprise here was that it had taken ten months for him to figure out how to sneak away.

Ten months of peace and quiet for the Silicons, mind you, and Schenectady – the Sliced Salami Society, the Silicon children's sleuthing side-project, hadn't had a case since they had solved their mother's disappearance and captured Peter. Sarah Silicon came to the door, along with Pippin, their younger brother. "Peter's escaped", Jamie told them.

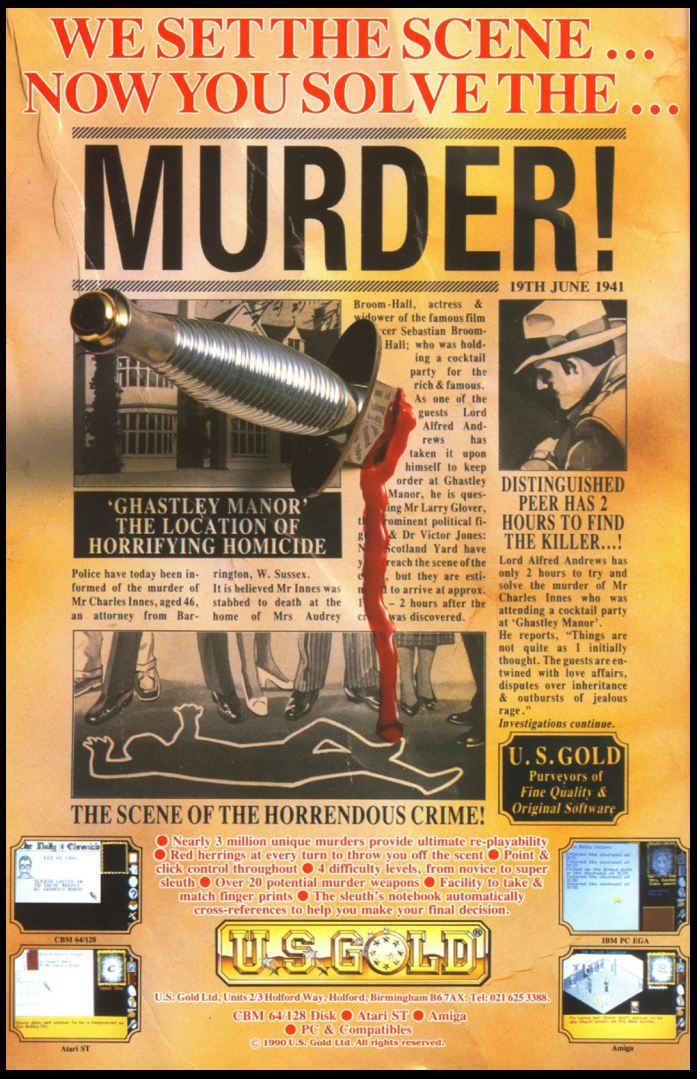
"Probably not coincidentally," the policeman said, shaking the rain off his hat, "a computer scientist and a professor at the university was killed there earlier this evening, and his portable computer stolen. Apparently the computer belongs to some kind of defense contractor, and they won't tell us anything about him, or the computer, or anything. But they sounded really worried and that has me spooked, since they're a defense contractor, it's Hallowe'en and Peter might be the killer, – and he's both intelligent and homocidal."

Jamie nodded. "He did say at his trial he was going to blow up the entire town."

"That too. I was hoping that I might as your father some questions. Is he around?" Unfortunately, the elder Silicons were currently in transit, returning from a trip to Australia, where they had been negotiating with an electronics retailer to carry their new Silicon brand of PC-compatible computers. They wouldn't return until at least late the next day. "Well, you kids are smart too, maybe you'd be willing to take a look through the professor's belongings up at the university? If you could find out anything, that would be more than what I currently have."

They agreed and, bundling Pippin up against the cold, the Sliced Salami Society packed into the back of the police car for the trip to the university, their eyes fixed on the darkness, constantly on the hunt for Peter, the man who had declared himself their mortal enemy.

At the university, it quickly became apparent that the professor's specialty was encryption.



Professor Sanders had been working on new and novel ways to hide data on a computer in such a way that it could still be decoded by a software application without that application itself revealing the method of encryption – a neat trick, if it could be done. Based on his notes, his method appeared to use a combination of self-modifying software and specialised hardware – in particular, memory chips that had been specially engineered to behave in incredibly idiosyncratic ways. He even proposed modifying the CPU in the computer to have a few additional, hidden instructions, which would make any attempt to disassemble the encryption software pointless.

His main point was that, since computers were becoming increasingly portable, there was no need to solve the problem of keeping secrets using only software. A hardware solution would also be immune to brute-force attacks, a failing of password-based encryption. No, the computer itself would know how to decrypt the data – but it would only do it if the user jumped through a series of hoops, those hoops obfuscated and presented from hidden areas of memory, using secret CPU instructions and even erasing themselves if the user failed at their gymnastics too many times.

This way, there was no need to rely on the user to keep the password secret – the technology could be relied upon instead, its mysteries known only to an anonymous inventor, such as the professor.

As a proof-of-concept, Professor Sanders had been tasked with building a hack-proof computer , a modified Osborne 1 - for communicating with an orbital weapons platform – Reagan's "Star Wars". Its software would only allow communications to happen at certain times, under certain conditions, and couldn't be reverse-engineered to discover what those times and conditions were. With layer upon layer of riddles and red herrings, no unauthorised person would ever be able to use the computer for nefarious purposes.

However, this was not the computer that had been stolen. That was the 'good news' Sarah relayed to the detective via telephone once that had been surmised. However, the 'bad news' was that the computer that had been stolen was the prototype – and that prototype had many of its successor's secrets laid out plain to see. But that was only a problem if Peter also had the second computer in his possession – but that was locked up safe and sound.

Wasn't it? There was an anxious silence at the other end of the line, broken by an admission that the second computer had indeed been stolen from the defense contractor's facilities mere moments earlier – this was the detectives 'bad news'. But there was also a bit of 'good news': Peter had left the prototype on the side of the road, probably having no further need of it, its secrets revealed to him, and the police had recovered it – they were in no hurry to turn it over to the less-than-forthcoming defense company, and were happy to let the Silicons take a look at it.

And so, they returned to their home, arriving during the witching hour, with sleep a luxury afforded to only Pippin, his older siblings tasked with extracting what knowledge they could of the prototype's inner workings, in the hopes that a clue might be uncovered as to just what Peter may be intending to do, and when and where he may be intending to do it.

There were no floppy disks in the drives of the Osborne, but Sarah had surmised that this was not an issue – whatever software the computer had for communications wouldn't have been placed on a disk – that would have been too insecure. Instead, Sarah was convinced it was lurking inside the computer's read-only memory (ROM) somewhere, to be revealed only by executing a program at a particular memory address, that bank of memory possibly hidden, and needing to be revealed by first triggering a 'soft-switch' of some kind.

But after Jamie had dismantled the computer and extracted its ROM chip, a comparison with the ROM of the Silicon's own Osborne revealed it was exactly the same – no secret code was hidden here. With nothing obvious apparent from a cursory visual inspection, the ROM chip was reinserted and the computer powered on. Sarah inserted her CP/M utility diskette and it booted, to a prompt:

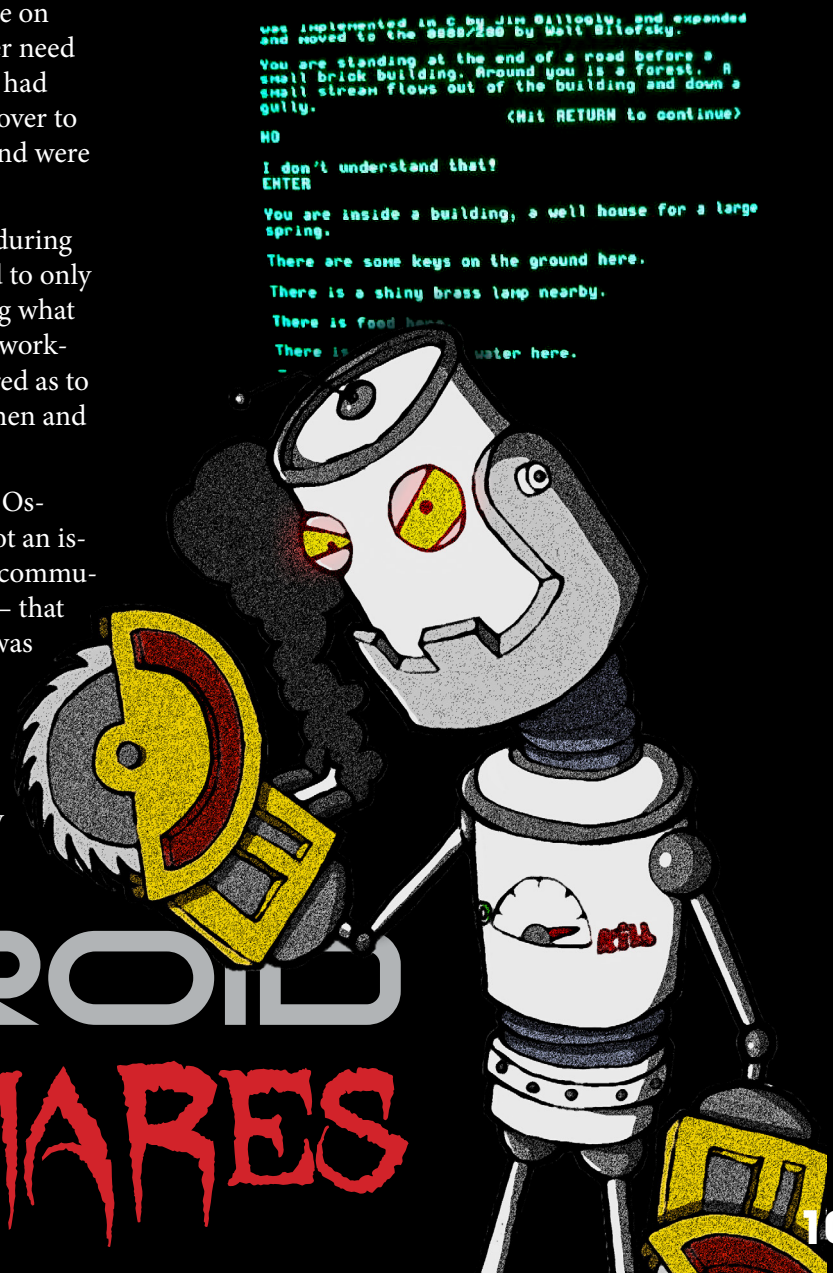
```
A>
```

Sarah typed `DIR`, to obtain a list of the disk's contents, and searched it for a memory editor she was certain was on it.

```
A: CAT      COM : CONFIGIO BAS : DDT      COM : BOOT     COM
A: MFT      COM : PATCH    COM : CPM60    COM : PIP      COM
A: STAT     COM : ASM      COM : AUTORUN  COM : LOAD     COM
A: COPY     COM : APDOS    COM : SUBMIT   COM : XSUB     COM
A: DUMP     ASM : DUMP     COM : DOWNLOAD COM : MBASIC   COM
A: ADVENT   BAS : GBASIC   COM : ED       COM : MEDIT    COM
```

"Hold on a minute," said Jamie, "did that disk always have ADVENT on it?" Sarah wrinkled her nose in thought, then removed the disk and placed it in the Silicon Osborne. Booting it, the file was absent.

"Very clever, Professor," Sarah murmered in admiration. She ran ADVENT.



Somehow the professor had managed to 'hook' into the normal operations of the Osborne's CP/M operating system to insert Colossal Cave Adventure, the first text adventure game. Sarah ran a simple test, reading and writing to the computer's memory, and found that half of its memory couldn't be written to! Where did all the memory go? The professor must have exchanged some of the computer's RAM chips with WORM – Write Once Read Many – chips. But when she tried to read them they just came back as zeroes – empty. There must be one or more additional softswitches that needed to be accessed in order to make the memory readable... but which? It seemed hopeless. "Curse you, Professor Sanders", she swore quietly to herself.

"Why don't you just let me play the game?" Jamie pleaded, "I'm good at games!"

Sarah threw up her hands. She was stumped, for the moment, so why not let him try? She nodded and Jamie went to it. "I've played this game before, let's see if there's anything different."

The game seemed largely the same, but after a few minutes of play, it declared:

```
HIDDEN HIGH
```

"Okay, so that's weird." Sarah came over to look.

"Maybe it's a clue. Keep playing." Jamie continued.

```
DOWN BELOW
```

and then:

```
I MAKE YOUR TOWNS AND CITIES GLOW!
```

```
WHAT AM I?
```

"Try 'STAR WARS'", Sarah told him.

```
>STAR WARS
I KNOW THAT GAME. WOULD YOU LIKE TO PLAY
IT?
>YES
FIRST, TELL ME WHO MY FATHER IS, LUKE!
>SANDERS
YOU'RE NOT SUPPOSED TO KNOW THAT!
```

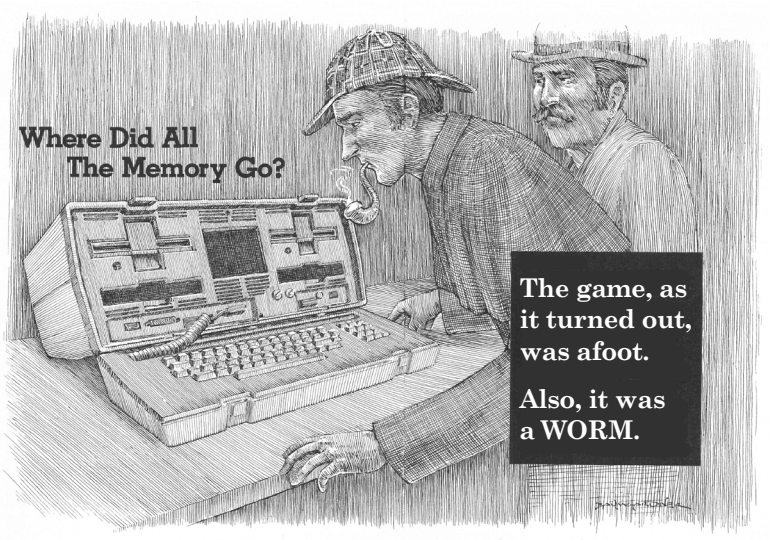
The game froze. "This must be one of his traps," said Sarah. "We're not supposed to know who he is. Play the game again, and when that question repeats type REAGAN."

```
>REAGAN
THAT'S HIM! WHO YA GONNA CALL?
```

Jamie took a punt.

```
>DADDY
DIALING...
ATDP2026139535
```

"202 is Washington DC," Sarah remarked. "Should we plug it into the telephone line? This all seems pretty insane so far, how much worse can it get?"



"Maybe that's the point, though," Jamie mused. "The only way to get anywhere is to play the game, and that takes time. Time to think about what you're doing."

"I wonder, did Peter even get this far?"

"Can we take the chance?"

They plugged the computer's modem into the phone line, and waited for it to dial. After a few moments,

```
WE'RE IN.
STILL WANT TO PLAY STAR WARS?
>YES
OKAY... SO YOU'RE DARTH VADER, AND YOU'RE
COMMANDING THE DEATH STAR. YOU WANT TO
DESTROY THE REBELS. WHERE DO YOU POINT THE
DEATH STAR?
```

"It's asking for co-ordinates," Peter said, cocking his revolver. Startled, Jamie and Sarah turned around to find Peter in their house, pointing a gun at them. "I knew you'd figure it out. All I had to do was leave the prototype somewhere for the cops to find, and I was pretty sure they would turn to you for help. Especially if I reported the other one missing – that would make it all pretty urgent, and with your parents out of town it would be left to you two to solve the puzzle before I did. Only I didn't need to solve it, just watch and wait."

"So what, you're going to drop a nuke on Schenectady?" Jamie laughed. "Not even you're that crazy."

"Maybe I am! All I ever wanted was happiness, and you took that away from me! There's no point in going on – but if I'm going to Hell, I'm taking you with me!" Peter punched the co-ordinates for Schenectady into the computer.

```
PROCESSING CO-ORDINATES...
```

```
YOU CAN'T NUKE YOURSELF, STUPID!
FRUIT-LOOP DETECTED...
SENDING IN THE NATIONAL GUARD.
```

Peter wasn't waiting for them to show up. He briefly contemplated shooting the Silicons before deciding the National Guard might take care of that for him.

"I may not be able to nuke Schenectady, but I'm damn well going to nuke something!" He locked the Silicons in their house's root cellar, grabbed the computer and hastily made a run for it.

As they sat there in the dark root cellar, waiting for the cavalry to arrive, they considered their next move.

"We know the phone number of the computer in Washington, maybe we can call it using another computer?"

"The prototype used encryption to talk to it, I'm certain. That was the professor's thing after all, encryption."

"Are you sure? I mean, he talked big but in the end he just hid things inside a game. The key was just to know the game was there, play it, wait around, and answer the dumb questions."

"That's true, but still... anyway, I have another idea."

The national guard showed up with the cops, and they let the Silicons out. "I think I can stop Peter from trying again," Sarah told the detective.

The Silicons had three phone lines: one for the telephone, one for their father's fax machine and one for the kids bulletin-board system. Sarah connected computers with modems to all three lines, and used them to repeatedly connect to the Washington computer, of which their appeared to be only the one. Peter or not, it wouldn't be a bad thing if it was unavailable for a while.

"Hopefully, this should prevent Peter from connecting." Meanwhile, they needed to track him down, before he decided to lower his aspirations and use his revolver to orchestrate a murder-suicide. The police got out the dogs and began a search of the neighbourhood, but they quickly came upon someone who claimed to have been 'carjacked' by a guy with a sewing machine – what a non-computer savvy person would think the Osborne was.

Sarah was sure Peter would have vacated the immediate area but she wasn't convinced he would travel very far beyond that – he was going to want to make a second attempt at nuking something, and he wasn't going to waste too much time before that happened.

The detective managed to get in touch with the Department of Defence, and they were making arrangements to shut down the "Star Wars" mainframe computer, but due to national security concerns (and the fact it was the 1980s), this was going to take some time. And so it was still imperative that they find Peter.

However, Sarah realised that Peter was the sort of person to appreciate irony, and if he couldn't bring the bomb down on the Silicon household, he might consider the Silicon's computer shop to be the next best thing. She imagined that he might take the Osborne into the store because its modem "wasn't working properly", and get some help "testing" it.

Sarah tried calling the store to warn the staff, but the line was busy – this increased her concern, because while they were "wardialing" Washington to keep its line occupied, it was more than possible that Peter could get lucky and break through. She told the police of her hunch and they raced to the shop.

Sure enough, Sarah's intuition was spot-on, and when the police arrived, Peter was inside. They cut the phone line and ended his bid to bring about a mini-apocalypse, and he took the employees hostage. Sarah's parents arrived just in time to watch a sniper take Peter out, permanently.

And that was how the Silicon children saved the world on Hallowe'en. Or Schenectady, anyway.

The Sliced Salami and the Devlish Case of Society and the the Portable Computer



After Adam Osborne sold his computer book publishing company to McGraw-Hill in 1979, he decided he wanted to design and market a portable computer with bundled software that would cost much less than contemporary computers with similar retail software packages. Designed by Lee Felsenstein, the resulting computer was the Osborne 1 (right). It had a 12.7cm 52-column display, two floppy disk drives, a Z80 microprocessor (CPU), 64KB of RAM. It used CP/M as its operating system and came bundled with WordStar, BASIC, and SuperCalc, a spreadsheet program. Osborne managed to get the price down by offering suppliers shares in Osborne Computer Corporation, and the unit sold for US$1795 (around US$5000 today). Unfortunately, while the machine initially sold well, Osborne made the mistake of spruiking a planned successor, the Osborne Executive, with dealers, who then stopped ordering the Osborne 1. Yowzers!

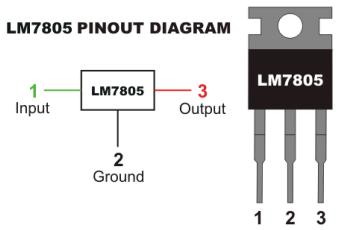


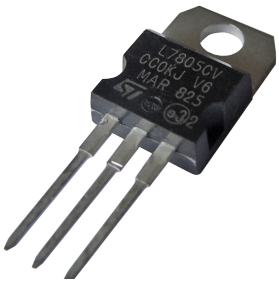
We have a Hallowe'en-themed electronic project for you this issue: a motion-activated "screaming" audio generator for your Jack O'Lantern or other spooky decoration.

Ghosts, goblins and integrated circuits? Electronic devices are a fairly common part of Hallowe'en today, so let's make one ourselves!

By connecting a Passive Infrared Sensor (PIR) to a relay that controls an oscillator connected to a speaker and an LED, we can create an electronic monster of sorts to scare unwary trick-or-treaters, or the neighbourhood alley cat. Let's take a look at how it works.

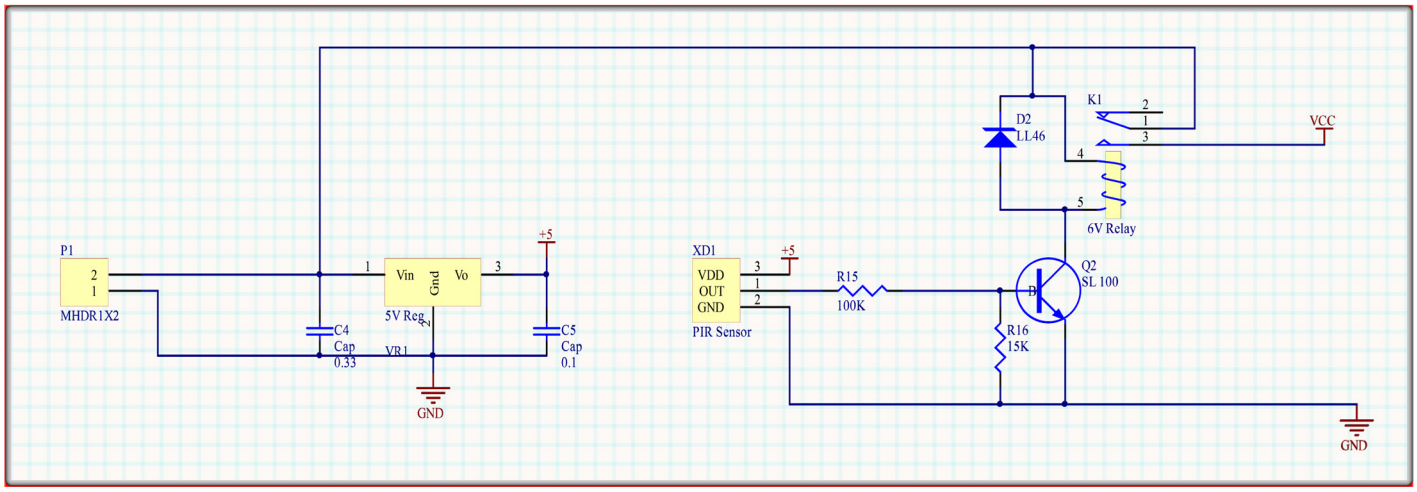
The Screaming Jack circuit consists of four basic sections. The first is a power supply of a 9-volt battery connected to P1 this leads to a 7805 voltage regulator which provides power to the Passive Infrared Detector and the two Dual op-amps.

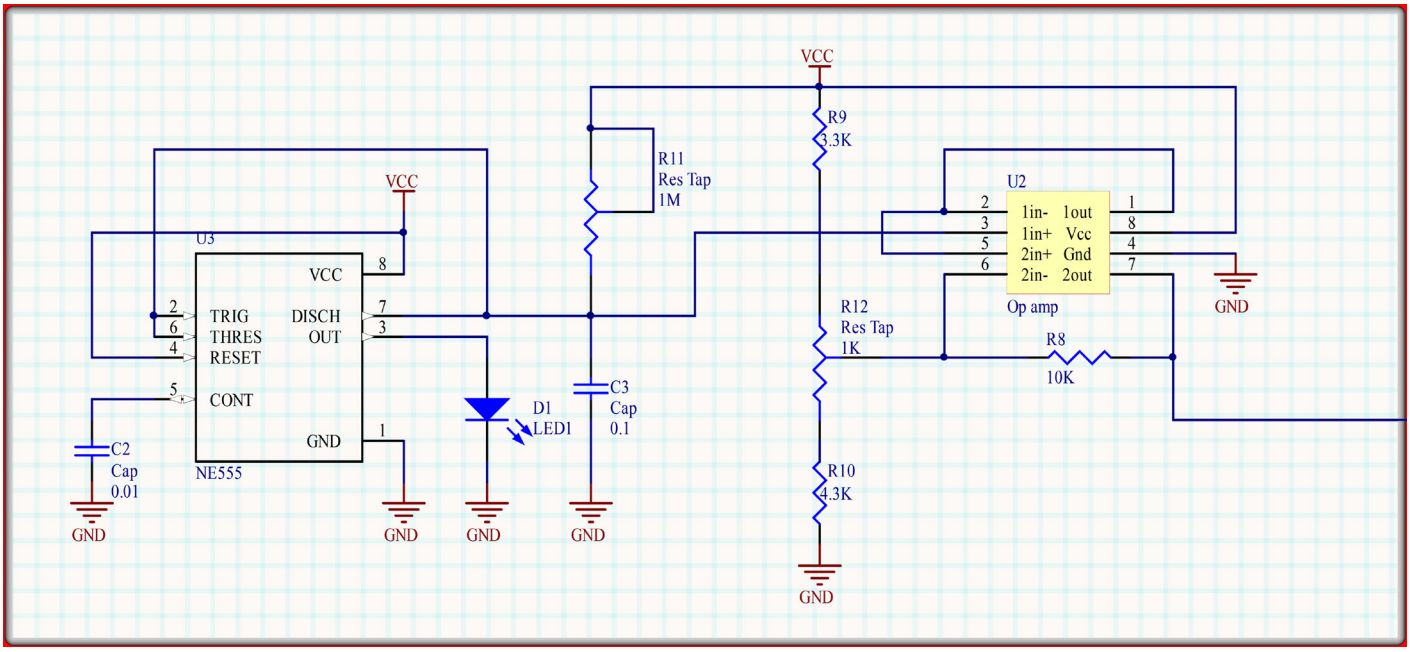




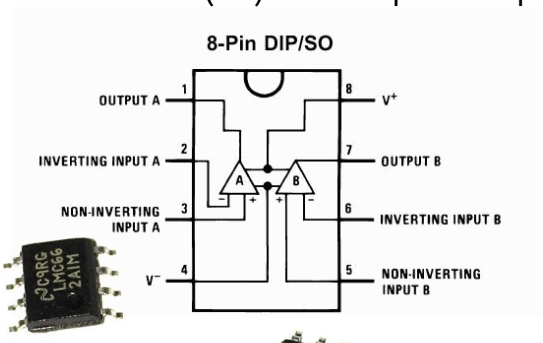
The 78xx family are self-contained linear voltage regulator ICs. The last two numbers indicate the output voltage, for example the 7805 has a 5V output. They have three terminals: input, output and ground.

The sound circuit is enabled when the PIR detects motion causing the OUT to go to 2.5V turning the transistor on and the relay to close.



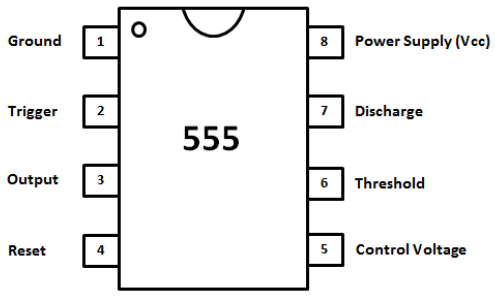


U2 LMC662 is a dual op-amp creating a saw-tooth waveform that drives the voltage controlled oscillator. This circuit contains a NE555 timer (U3) that outputs a square wave to drive the generator circuit. There are two controls for this circuit, R11 which controls the frequency and R12 which controls the waveform.

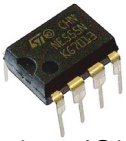


LMC662





NE555



AMN31112 PIR



An operational amplifier (op-amp) is a high-gain electronic voltage amplifier with a differential input and a single-ended output. It is designed to provide an output that is hundreds of thousands of times larger than the potential difference between its input terminals. They have their origins in analog computers, where they were used to perform mathematical operations. Op-amps are some of the most widely used electronic components used today, present in a vast number of electronic devices.

The 555 timer IC is an integrated circuit used as an oscillator. Introduced in 1972 by Signetics, the 555 is still in widespread use due to its low price and stability, and is the most popular integrated circuit ever manufactured.

Passive Infrared Sensors work by detecting heat energy radiating from objects. When the level of radiation received by the sensor changes, it assumes that the objects in front of it have changed, eg. something has moved.

Project Designed By Don Griffiths

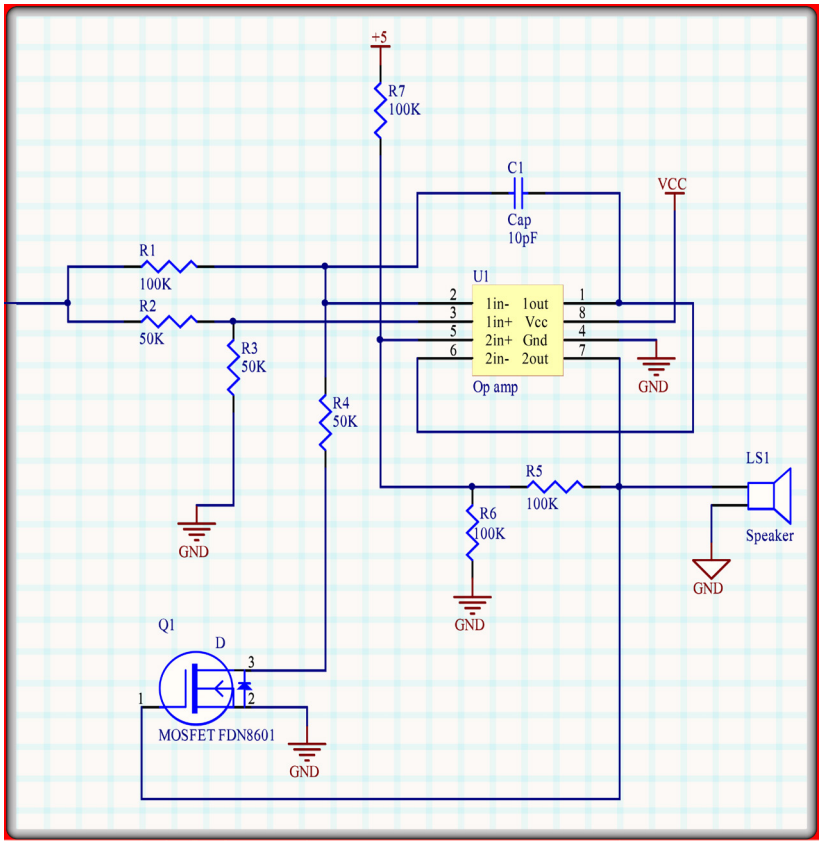
the Mouldy Bread board



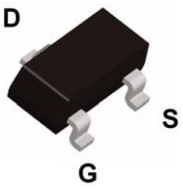
The output frequency is determined by the values of R and C. F = 1.44/RC.

The voltage controlled oscillator U1 outputs a square wave at a frequency proportional to the input from the saw-tooth generator.

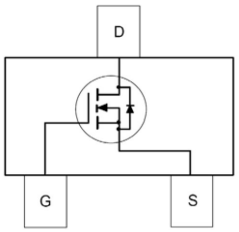
The output gets feed back to the FET which acts as a switch to the first op-amp. The higher the voltage on the input the higher the frequency for the square wave output. The two 50K resistors in op-amp1 act as a voltage divider holding the non-inverting input to ½ of the signal voltage. The inverting input is driven by the n-MOSFET that is turned on by the Audio Out. When the two voltages are equal then the op-amp turns on to drive the inverting input of the second op-amp. The non-inverting input of the second op-amp is held at 3.33 volts until the inverting input matched that voltage putting the output low. This drops the non-inverting input to 1.66 volts and when the waveform from op-amp1 reaches 1.66 as well the op-amp turns on again.

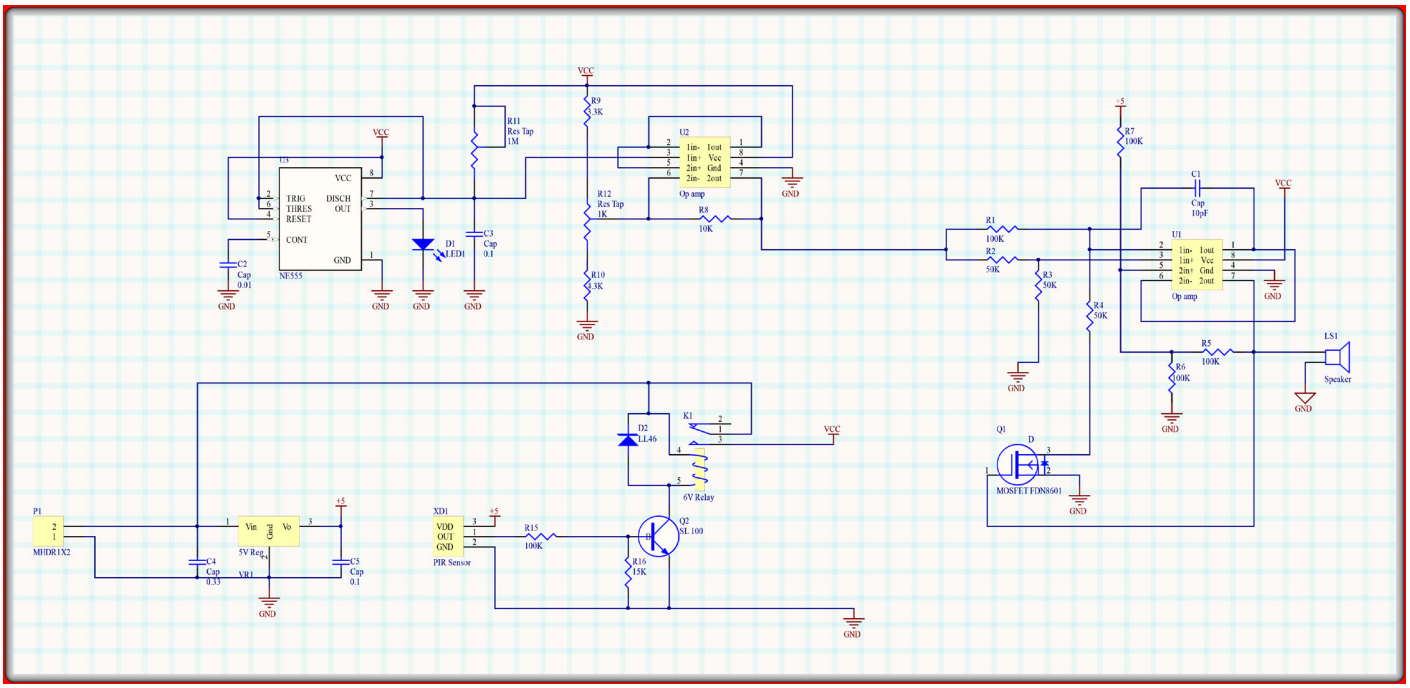


By attaching the LED, speaker and motion sensor to wires, you can put the board someplace else (like in a cigar box under the pumpkin) and run them into the pumpkin or other decoration.



MOSFET
FDN 8601





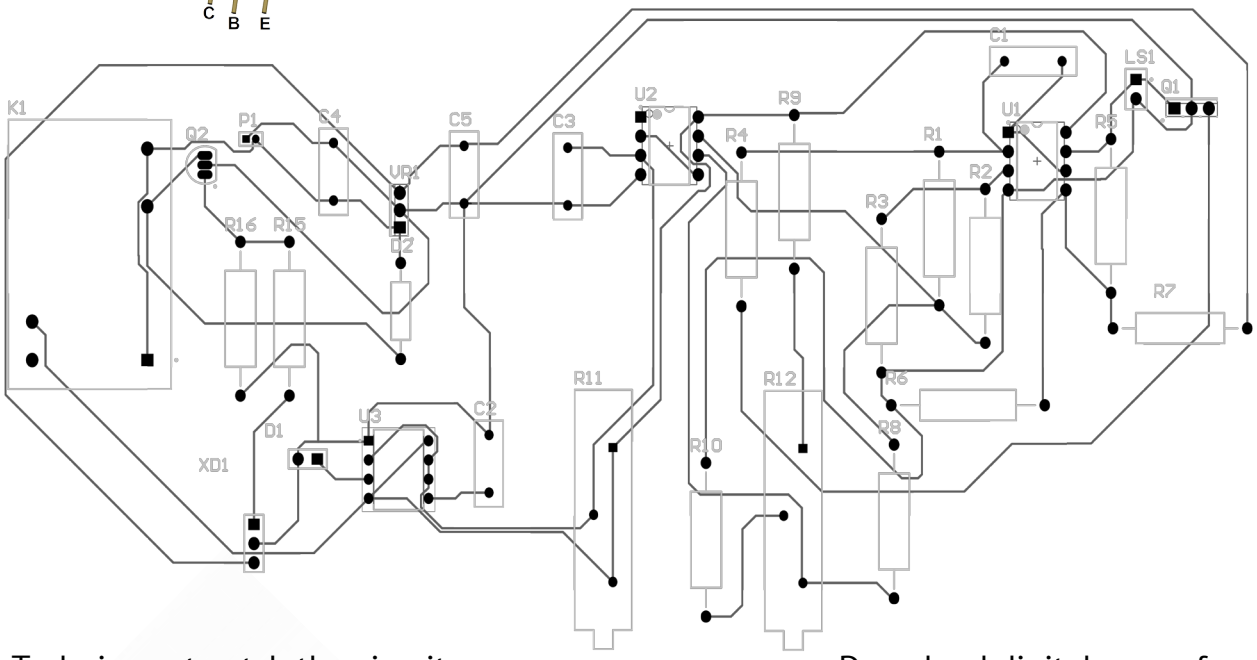
SL100
NPN
Transistor



CIRCUIT BOARD



Red
LED



Techniques to etch the circuit board are described in issue 4.

Download digital copy of project from paleotronic.com/pumpkin.zip

PARTS



All resistors are one quarter watt



LL46 Diode

D1	Red LED
D2	LL46
K1	6V relay
Q1	MOSFET FDN8601
Q2	SL100
R1	100K
R2	50K
R3	50K
R4	50K

R5	100K
R6	100K
R7	100K
R8	100K
R9	3.3K
R10	4.3K
R11	Tap resistor 1M
R12	Tap resistor 1K
R15	100K
R16	15K

Speaker	4W 3”
C1	10 pF
C2	0.01uF
C3	0.1 uF
C4	0.33 uF
C5	0.1 uF
VR1	7805 regulator
U1,U2	LMC662
XD1	AMN31112
U3	NE555

NOTE!

You can find out more about Eric Rangell’s MIDI project from the last issue at his GitHub: https://github.com/erangell/A2NoSlotMIDI and we hope to revisit the project in future issues of RetroMaker.

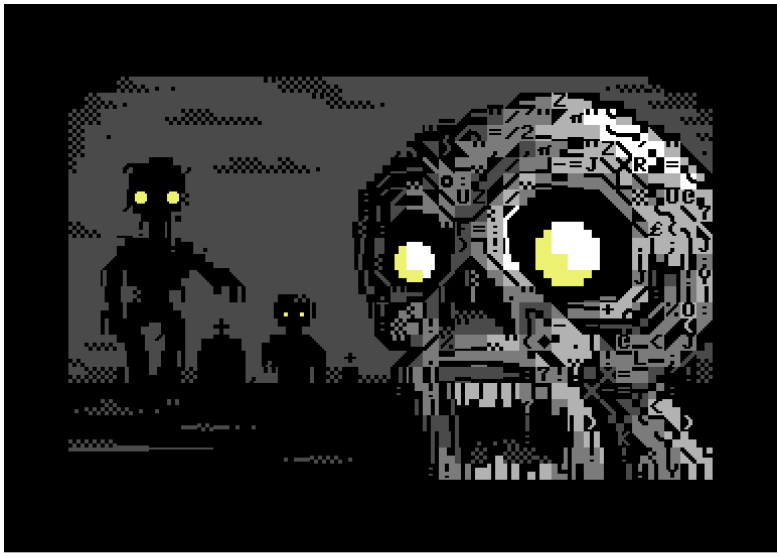




CAL SKULTHORPE



CHUPPIXEL



MANUEL VIO





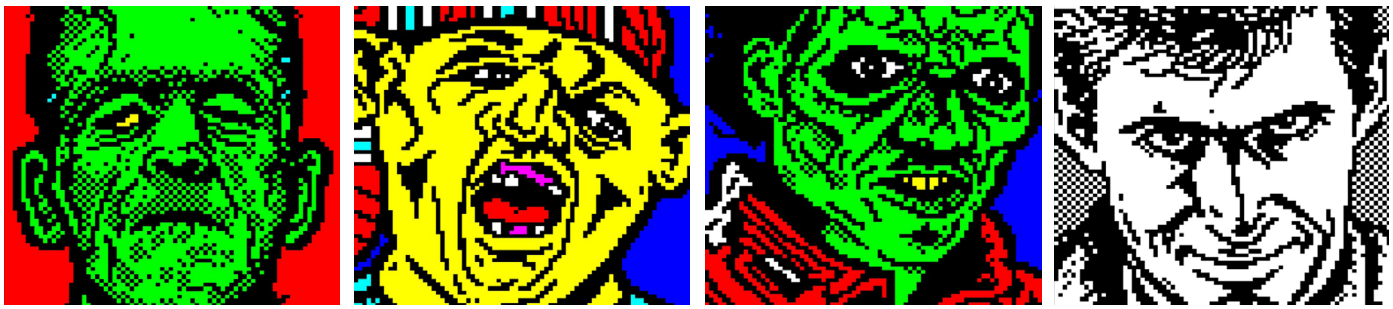


MANUEL VIO

mistigris.org

PIXEL FART



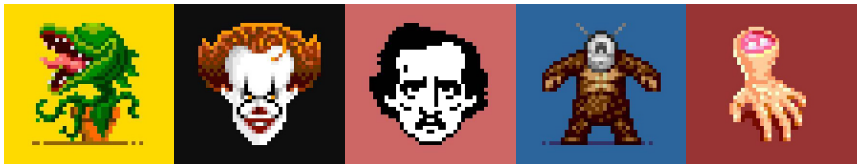


HORSENBURGER

8BIT POET

A selection from Mistigris' 2018 Hallowe'en art pack

THE ART



See more scary art at
16colo.rs/pack/mist1018/

SCREAM

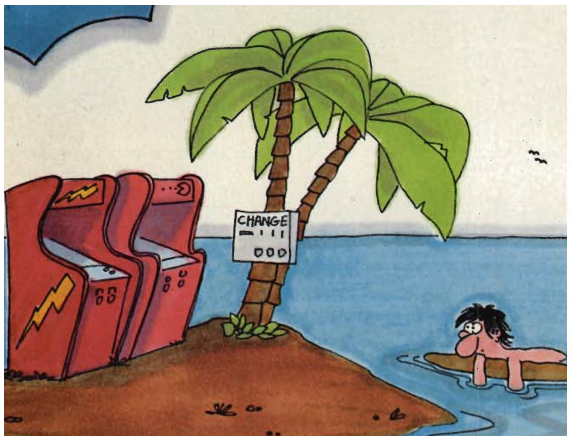

MAL FUNCTION
T. HITCH
SNAG JNR
SCREAMING FOUL UP
THE BIG HALLOWEEN!
IS THERE ANYBODY THERE?
JUST PAST THE WITCHING HOUR ON OCTOBER 31ST .....
HUH!
KNOCK!
KNOCK!
ARE YOU IN THE COMPUTER UNCLE STAN? KNOCK ONCE FOR YES...
KNOCK!
YOU ARE IN THE COMPUTER AUNTIE FLO ALWAYS SAID YOU'D WANTED TO GET INTO NEW TECHNOLOGY..
IT'S ABOUT THAT NEST EGG YOU HAD HIDDEN AWAY .. WELL I COULD REALLY DO WITH SOME DISC DRIVES..
TAP!
SHRIEK!!!
CHOMP!
KEY LIFTED OPEN!
THROB!
STOMP!
PACMAN
THANKS A LOT BOYS, WE COULDN'T HAVE STOOD ONE MORE TURN AROUND THAT MAZE!
HEE! HEE! HEE!
WORST CASE OF PACMAN FINGER I'VE EVER SEEN

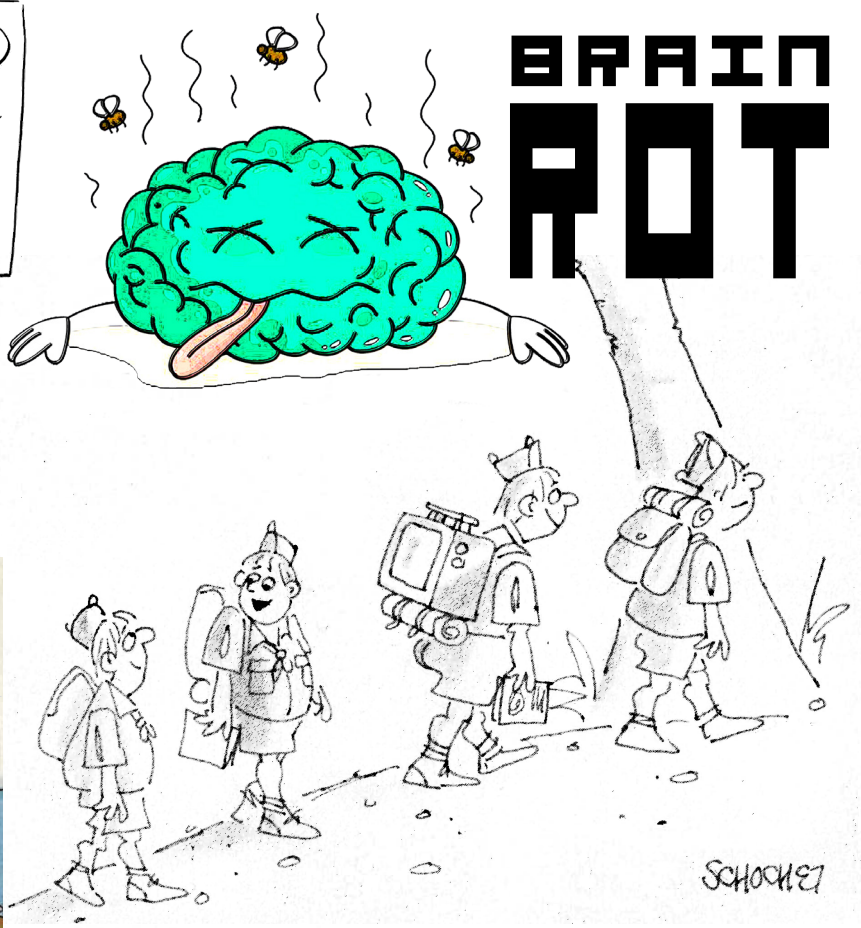


BRAIN ROT



"Don't panic, man. They come in once a month to pick up their money and service the machine."

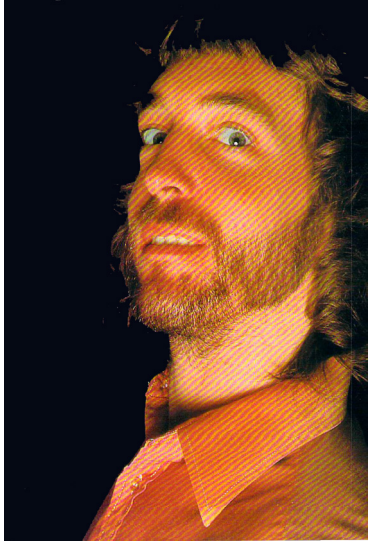




"There's nothing like playing Space Invaders by campfire."



"I think managers have realized that most software people are slightly brain damaged."
Eugene Jarvis



DOONESBURY

by Garry Trudeau



© 1982. G. B. Trudeau. Reprinted with permission of Universal Press Syndicate. All rights reserved.

TANK McNAMARA

by Jeff Millar & Bill Hinds



© 1982, Universal Press Syndicate. Reprinted with permission. All rights reserved.

CATHY

by Cathy Guisewite



© 1982, Universal Press Syndicate. Reprinted with permission. All rights reserved.

1UP ARCADE

230 LYTTON RD
(BASEMENT LEVEL)
MORNINGSIDE QLD 4170
OPEN 2PM-10PM
WEDNESDAY TO SUNDAY









There are plenty of classic favourites to choose from, and you can play them all because entry is a flat rate, either to play pinball, video games or both.

We're not one to pass up a good long drive, particularly if there's a decent retro arcade on the other end, and 1UP Arcade in Brisbane did not disappoint!

1UPARCADE.COM.AU







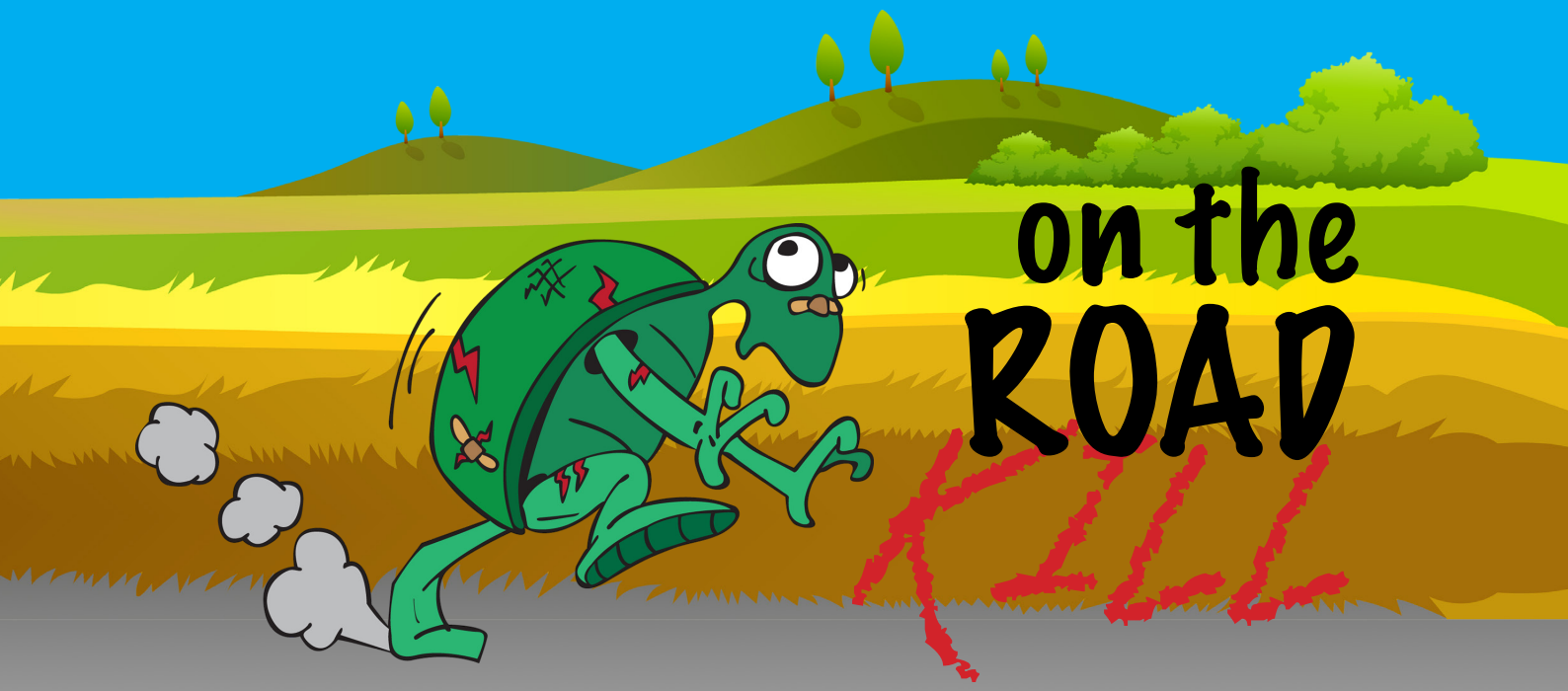


IN A BID TO ESCAPE THE DOLDRUMS OF A SOUTHERN AUSTRALIAN WINTER, WE FLED NORTH TO SUNNY QUEENSLAND, WHERE WE CAME ACROSS ONE **HELL** OF A RETRO ARCADE...



The collection of a private individual, the arcade serves to make it available to the public, so that it can be enjoyed by all. It contains 180 arcade games and 20+ pinball tables from the 1970s through to the 2000s.

You'll want to allot plenty of time when you visit, it's easy to kill a few hours in here, or much, much more if you want to play every game through to its conclusion, which you can because they are all on free play!



UNDERTAKER

And so, it's finally come down to this.

Paleotronic Magazine has reached its end. Here's our last words:

La Trobe University here in the state of Victoria, Australia has recently been helping guide us to find a sustainable product more people want. As discussed (and partially presented) last issue, we see microMates (a more kid-oriented magazine) to be the direction we want to go. But extrapolating that further, there appears to be room in the market for a project-based retro magazine full stop. And so, we propose Retro Maker.

Retro Maker will have fewer pages, but come out more frequently. microMates will be included as part of Retro Maker, to encourage participation by younger children, while the rest of Retro Maker will be oriented towards teens and adults. As the title implies, Retro Maker will be project-oriented, with each article having a practical activity associated with it in the arenas of coding, hardware, electronics or digital creativity.

For more information, see retromaker.org



Paleotronic Magazine was published by Teaching Electronics and Computing History, an Australian not-for-profit organisation dedicated to retrotechnology-based education.

Paleotronic used images and clippings taken from a number of vintage publications, and we thank the original creators for their efforts, and hope that by reprinting them, we are honouring their legacy.

Editor: Melody Ayres-Griffiths

Contributors:

George Bachaelor,

Paul Monopoli,

David Stephenson,

Donald Griffiths,

Andrew Ayres,

April Ayres-Griffiths

The Final NAIL in the Coffin

Paleotronic may be *dead*, but its spirit still lives on...

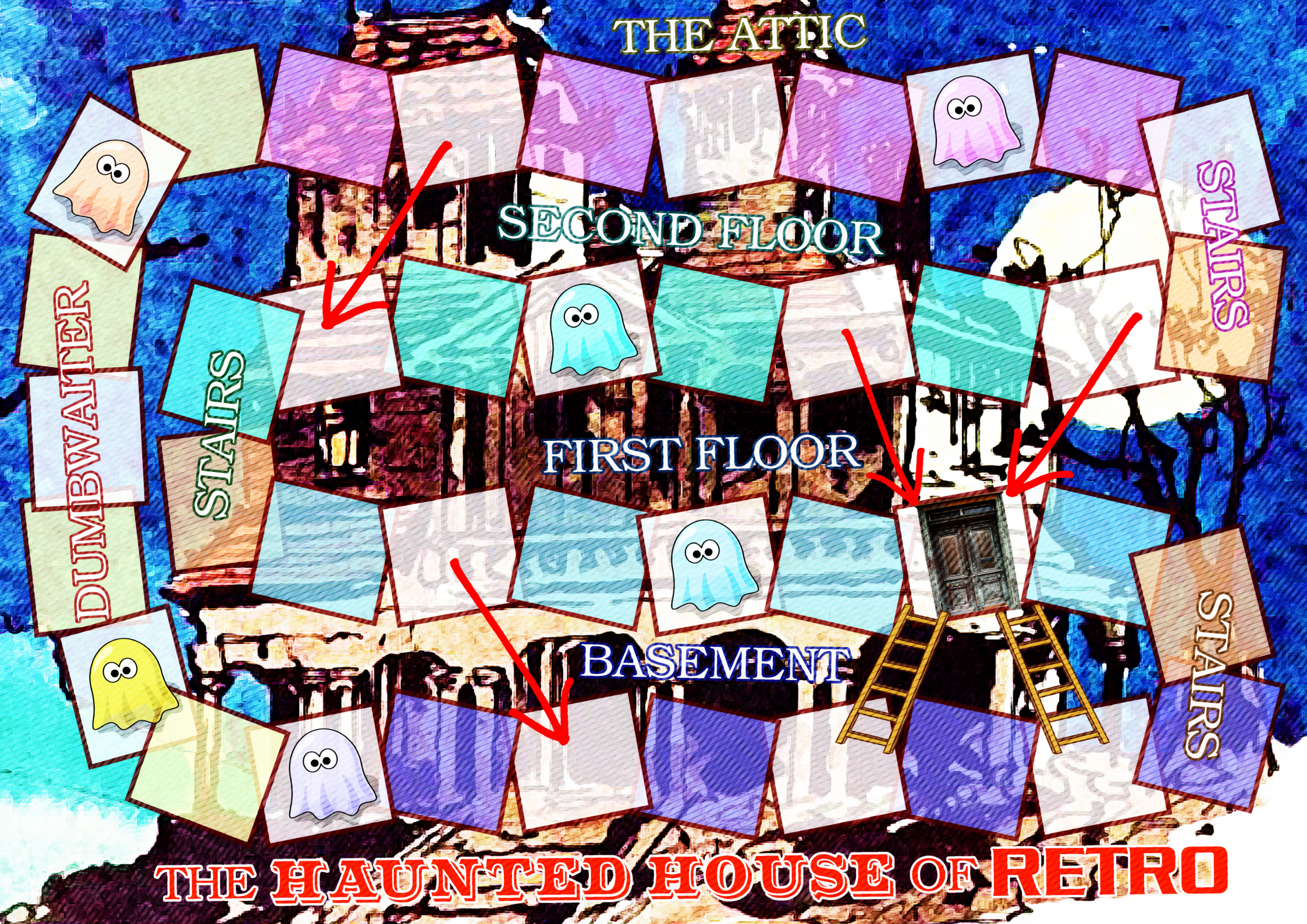
In back issues!



Complete Your Set...

Get All Six!

Find our how at Paleotronic.com


THE ATTIC
SECOND FLOOR
FIRST FLOOR
BASEMENT
DUMBWAITER
STAIRS
STAIRS
STAIRS
THE HAUNTED HOUSE OF RETRO