

# The Adventures of

# MAJOR



ATARI'S VECTOR ARCADE GEM MAJOR HAVOC HAS REMAINED INCOMPLETE FOR NEARLY FOUR DECADES. HOWEVER, THE GAME'S CREATOR, OWEN RUBIN, AND A GROUP OF PASSIONATE FANS HAVE JOINED FORCES TO CREATE THE ULTIMATE VERSION OF THE GAME, THE PROMISED END

WORDS BY LD MURPHY



## IN THE KNOW

- » **PUBLISHER:**  
N/A
- » **DEVELOPER:**  
OWEN RUBIN,  
JESS ASKEY,  
BRYAN ROTH,  
SCOTT SWAZEY,  
AND DAVID  
'JERKY' JURY
- » **RELEASED:**  
2022
- » **PLATFORM:**  
ARCADE
- » **GENRE:**  
ACTION



» The *Promised End* is going to be the game that Owen Rubin always wanted it to be.



Although *Major Havoc* is fondly remembered today for being a wildly ambitious game that's utterly stuffed to the brim with

content, it didn't start out that way. Inspired by the classic *Star Trek* episode Tholian's Web, *Major Havoc* began as a simple game where players had to guide their spaceship out of a perilous labyrinth of death. The game's creator, Owen Rubin, thought the concept was interesting, but it just wasn't enough and, worse still, it was more of the same. Owen's earlier games, such as *Space Duel* and *Tunnel Hunt*, were fun, but relatively simple affairs. To be fair, most games were at the time, but Owen yearned to create something deeper for a change. "I often found videogames to get boring very quickly," Owen confessed to us, "I'd play [*Defender*] for a while and get bored, same with *Battlezone*. All those games you could play for a long time and you just kept doing the same thing over and over. I liked that games on the home consoles... had a complexity that made them go on and I wanted [to make] a game that was complex."

Owen added more and more features to flesh the game out, but with each new addition his ambitions continued to grow. There didn't seem to be an end in sight either. At a time when Atari typically pumped a game out within six months, *Major Havoc* spent around 18 months in development. Despite constant pressure from Atari's management, the game avoided the chopping block. Owen stated, "[*Major Havoc*] never got cancelled, because it was still progressing and when we [playtested it] people liked it." Still, Owen's luck couldn't last forever and, as it turned out, neither could the game's memory space. *Major Havoc's* scope finally expanded further than its hardware could handle. To make

matters worse, Owen still had a lot of ideas that he hadn't managed to implement yet. The most pressing of all was the missing finale.

*Major Havoc's* opening text scrawl tasks players with battling their way to the home world of the evil Vaxx empire, Maynard, to free the Major's enslaved people. This wasn't a mere afterthought, Owen saw the game as a story and every tale needs an ending. He envisioned a massive maze world to serve as the game's ultimate climax, but it couldn't be done. There wasn't enough vector memory nor RAM space to account for it. Owen eventually came up with the idea of splitting the Vaxxian home world into four separate mazes played back to back. However, between the programming, animating, design and testing duties – not to mention looming memory constraints – it would have taken another five or six months to pull off.

Unfortunately, time had finally run out too. A slot in Atari's manufacturing schedule opened up and Owen was sent the order, "I was the closest to being finished, so [Atari's management] said, 'Just wrap it up. Stop

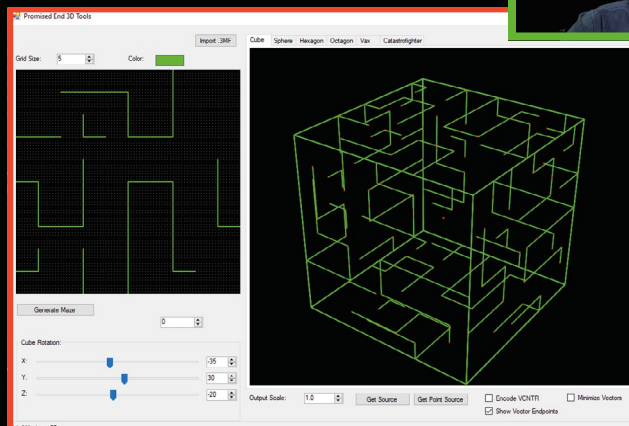


## DEVELOPER HIGHLIGHTS

- SKYDIVER**  
SYSTEM: ARCADE  
YEAR: 1978
- TUNNEL HUNT**  
SYSTEM: ARCADE  
YEAR: 1982
- SPACE DUEL (PICTURED)**  
SYSTEM: ARCADE  
YEAR: 1982



» Jess Askey is working with others to finish Atari's classic arcade game.



» An early version of the *Star Castle*. Its complexity caused too much screen flickering so it was scrapped in favour of a simpler design.

# HAVOC

## THE PROMISED END

"I LIKED THAT GAMES ON THE HOME CONSOLES HAD A COMPLEXITY THAT MADE THEM GO ON AND I WANTED [TO MAKE] A GAME THAT WAS COMPLEX"  
**OWEN RUBIN**

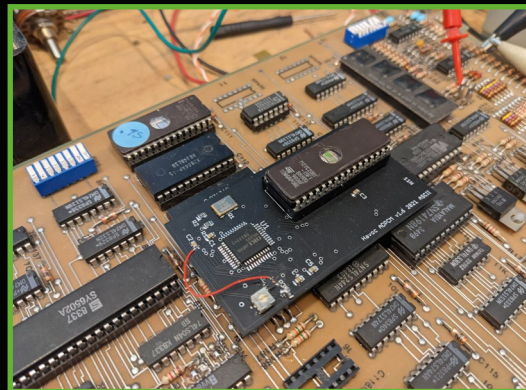
### SPEAK TO ME

ADDING NEW SPEECH TO AN OLD GAME

■ As ambitious as Owen was, he never planned to include speech in *Major Havoc* back during the game's development. Mysteriously and completely unknown to Owen however, someone in Atari's hardware department tested adding speech capability to the game. *Major Havoc's* PCB has integrated circuit locations specifically laid for Texas Instruments' TMS-5220 chip. The chip was the cutting edge of speech emulation software in the early Eighties. Atari used it in a number of its arcade games, such as its smash hit *Star Wars* from 1983. With some work, *Major Havoc* could have joined those hallowed halls.

The team is determined to make that a reality in *The Promised End*. As he decided how to add speech into the game, Owen reflected back on the media that inspired *Major Havoc*. Alluding to the Mother computer in Ridley Scott's *Alien*, Owen imagined a cold feminine voice dispassionately counting down a space station's destruction after its reactor is set off. The team loved the idea, but it hasn't been easy to pull off.

After recording audio samples and figuring out how to program them into the antiquated chip, the results were disappointing to say the least. The TMS-5220 works best at producing deeper voices. The higher the pitch, the more squawky and unintelligible it sounded. That pushed Jess to think outside of the box... or rather, the chip. Peeking inside Atari's *STUN Runner*, which features a smooth feminine narrator, Jess hacked together a way to fit the game's more advanced sound chip onto *Major Havoc's* PCB via a daughtercard. Now, with a bit of audio trickery, the team can emulate the distinctive sound of the TMS-5220 in the game without suffering from its limitations.



» A peek inside Jess' programming environment for *The Promised End* with some code for the new French edition of the game.



» Jon Koople tests a build of *Major Havoc: The Promised End* on his original arcade cabinet.



» [Arcade] The Star Castle battle will put players' skills to the test. They're going to have to earn the right to reach the home world.



» [Arcade] After a long, long journey, Major Havoc finally descends upon the mythical Vaxxian home world, Maynard.

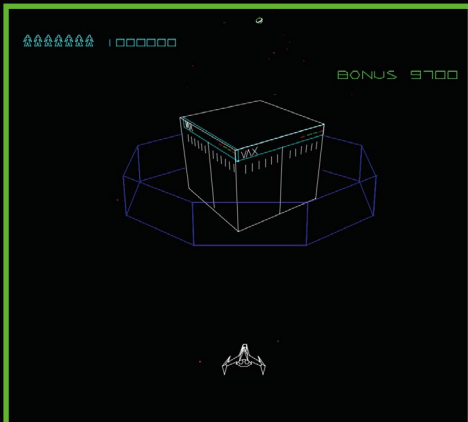
# STORM THE STAR CASTLE

BRINGING BACK THE ULTIMATE SPACE WAVE

■ During the development of *Major Havoc*, Owen designed a particularly tough encounter with a space station dubbed the 'Star Castle'. This was a reference to Cinematronics' *Star Castle* from 1980, one of Owen's favourites. Similar to that game, players had to blast through the space station's shields before they could destroy its defences within. It was a tough fight, perhaps too tough even. When Owen and his co-workers at Atari tested the Star Castle, it took them upwards of three minutes to beat by itself. Owen knew it was too long and Atari agreed, it generally didn't want arcade games lasting longer than 90 seconds per credit. In the end, the Star Castle became yet another casualty on the cutting floor.

When it came time to decide what to add to *The Promised End*, the Star Castle was on the top of Owen's list. Unfortunately, the code for it is long lost. This forced Jess to recreate it from scratch, which has brought on a number of challenges. The first major hurdle came from something seemingly as banal as the Star Castle's shape. Jess explained why he had to redesign the Star Castle to be eight-sided rather than Owen's original six-sided creation, "[It's] easier to code in powers of two. [Six-sides were] killing me, because it was hard to write to work as it really started to slow down the game whenever there were all these enemy ships running around you, this Star Castle moving around shooting fireballs and all that jazz."

Since then, the Star Castle has been upgraded into *The Promised End*'s final boss that stands between players and the long-awaited Vaxxian home world.



▶ developing, it's good enough." Owen's grand plans for an epic conclusion of *Major Havoc*'s tale had to be dropped, there was nothing he could do. Instead, he turned all his attention towards getting the game ready for arcade floors as fast as possible. However, in his mad dash Owen never changed the game's opening story to account for the fact that there wasn't a home world to reach. He also completely forgot about the in-game text in one of the levels which read, "Keep playing, the home world is near."

**T**he mistake haunted Owen throughout his life as he'd constantly be asked by fans and peers alike about the home world.

At one point he received a call from Dan Van Elderen at Atari years after he left the company. Dan called to confirm whether the home world really did exist or not as a fan sued Atari after purportedly spending several thousands of dollars attempting to find it. Fortunately for everyone involved, Atari was able to settle the case out of court. Elsewhere, another diehard *Major Havoc* fan saw the cut conclusion as an opportunity for creation rather than litigation.

Enter Jess Askey. While visiting the Playland Arcade in State College, Pennsylvania, virtually a second home for the 13-year-old at the time, Jess caught sight of a brand-new arcade game

still in its shipping box sitting in the corner. He watched as the arcade operator unboxed the game and set it up. It was called *Major Havoc* and it would change Jess' life. He was instantly enamoured by how much the game had to offer, "[*Major Havoc*] had a little bit of everything in it. It was like a kitchen-sink bagel!" With the help of his friends and watching older kids play the game, he memorised *Major Havoc*'s warp codes to skip to later levels. However, no matter how many quarters he plunked into it, the Vaxxian home world eluded him as he could never beat the game's brutally difficult later stages.

Years passed when Jess, now working as a pinball and arcade machine repairman, got another chance. Playland dropped off its cabinet of *Major Havoc* at his shop for repairs. Jess called over his buddy Bryan Roth and the two spent the next three nights playing the game non-stop in hopes of seeing the ending at last. Alas, even on free-play they couldn't get past the 15th level before Jess had to return the game. They might have been defeated, but they weren't out yet. Jess and Bryan sought out *Major Havoc*'s printed circuit board (PCB), pooled their money together to buy it, and hooked the board up into a *Tempest* cabinet. Eventually with enough practice and patience, the duo managed to blow past the 15th level, but

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OWEN RUBIN

» [Arcade] *The Promised End* includes quality-of-life improvements such as this in-game settings menu. Fiddling with DIP switches will be a thing of the past.





## THE ADVENTURES OF MAJOR HAVOC: THE PROMISED END

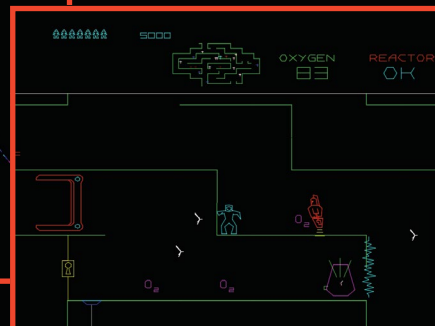
there was a problem. Instead of sending them to the Vaxxian home world, the game began repeating levels.

They were in too deep to back out now so Jess devised a different approach. He recalled, "That's when I learned how to disassemble ROM images. So, I disassembled [*Major Havoc's*] ROM and printed it out in binary. I figured out where the number was in the binary code for the number of lives and I changed it so that you got 120 lives." With this cheat, Jess and Byran managed to reach as far as the 88th level, but the game continued repeating endlessly. The search was put on hold again before the pair could try anything else. They had bigger things on their plates as they parted ways to go to college.

Nevertheless, that message, "Keep playing, the home world is near," kept haunting Jess over the years. He eventually decided to start learning how to program on his nights after work. Jess figured there was no better way to achieve this than reverse engineering *Major Havoc*, "That's the way I do a lot of things in life, I learn through a goal. And my goal was obviously to find the home world. It was sort of a puzzle that kept [creating] more questions. As an inquisitive person and sort of a slave to curiosity, [*Major Havoc* became] a bottomless pit of questions to try to answer – culminating in how does this whole thing work?"



» [Arcade] The Max robot enemies were cut from the original game, but in *The Promised End* they'll ruthlessly track down players throughout mazes once activated.



» [Arcade] It's hard to believe that at one point these labyrinth waves were all that *Major Havoc* had to offer.

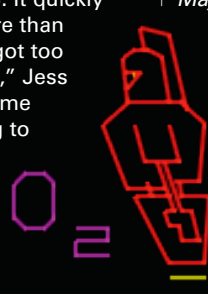
**A**fter digging through the code enough, Jess finally confirmed that there was no home world in *Major Havoc* after all. While it was disappointing, that's when a new idea struck him: he'd make his own home world. He fantasised working at Atari creating arcade games in his youth, but it was the Nineties by now and the Atari he knew (as well as the entire arcade industry for that matter) had changed. Creating the long-awaited ending to *Major Havoc*, a game that meant so much to him over the years, was the next best thing. Moreover, Jess believed that he had learned the game well enough that it wouldn't be too hard to make a couple more levels.

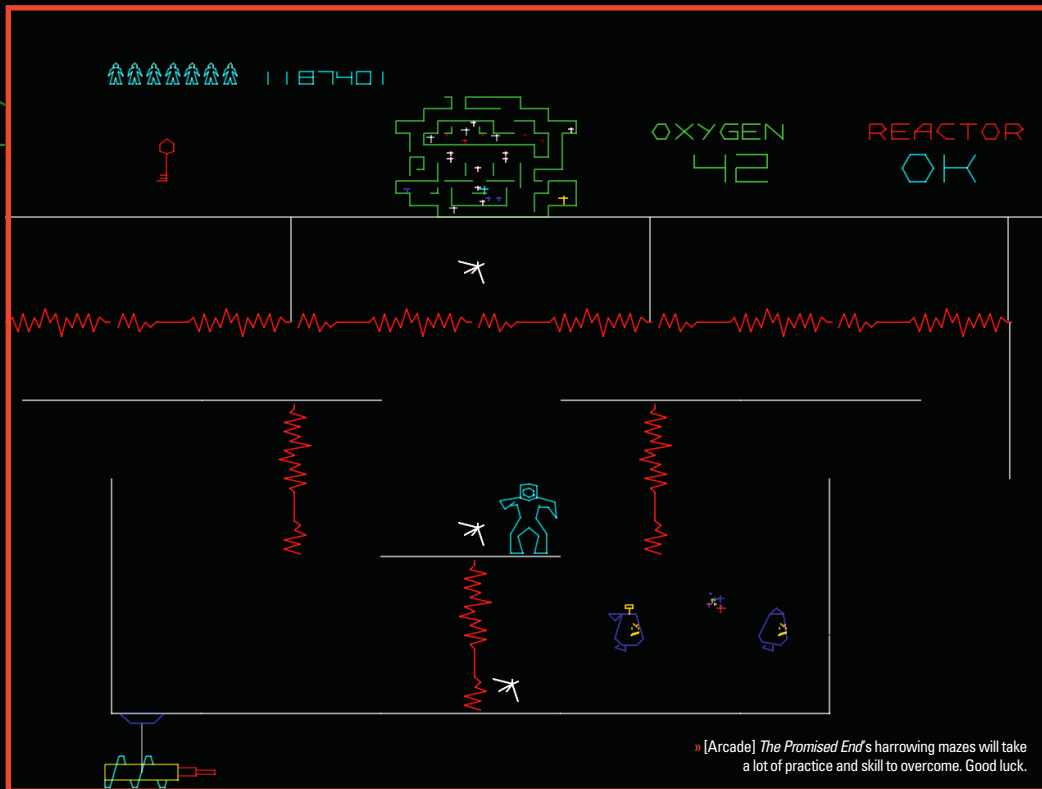
The project was dubbed *Major Havoc: Return To Vaxx*. Jess created a few levels by editing the game's binary code in a hex editor and re-burning the ROMS. It quickly became clear that he bit off more than he could chew, though. "It just got too complicated to do anything else," Jess said, "I [wanted to] make the home world, but that just wasn't going to work that way of doing it. It was way too complex to do something that large of an endeavour." For instance,

a long process kicked off each time Jess found something wasn't quite working as he intended in a level. He'd have to erase the EPROM, go back into the code to make the change, burn the EPROM again, and put it back into the game. This took around 20 minutes per change. It was a gruelling process that drained his enthusiasm.

Jess vented his frustrations on the Reg. Games.Video.Arcade.Collecting (RGVAC) Usenet newsgroup, a hotspot for retro gamers back in the early days of the Internet, when a member by the name of Al Kossow reached out to him. As luck would have it, Al knew Owen and offered to get the two in touch to help Jess complete *Return To Vaxx*. Owen recalled how impressed he was with Jess' dedication, "I was blown away that someone had put this much effort into [completing *Major Havoc*] and I wanted to help him! If

he was this interested, then [I'd] make him successful." Owen dug out a copy of *Major Havoc's* source code from his garage and helped Jess gradually recreate it. It was a gargantuan task that took years, but to Jess it was worth it, "Instead of me just hacking numbers, I could write code, make loops, change the structure of things and recompile it to ▶





» [Arcade] *The Promised End's* harrowing mazes will take a lot of practice and skill to overcome. Good luck.



» [Arcade] Cruel traps await unsuspecting gamers. Stay on your toes if you want to beat *The Promised End*.



» [Arcade] Keep finding more oxygen pick-ups and don't lose track of time within the mazes. Suffocation can sneak up quickly on slow or careless players.



► make ROMs.” Additionally, Jess was able to optimise the code, freeing up valuable memory space which greatly expanded the potential of what else could be added to the game.

**W**ith this breakthrough, Jess turned his work towards creating the *Major Havoc* level editor. This graphical development interface allowed him to build mazes, place enemies, set up their movement parameters, and more – all directly (and visually) within the program. Afterwards, he'd load his work from the level editor into the source code and compile it directly into the game. Jess was ecstatic, “That took six weeks to do [while I was working on] *Return To Vaxx*. Now, with the level editor and the way I created my source code, I could make a level in an hour.”

The year was 2002 and at last creating the Vaxxian home world didn't seem so impossible anymore. Jess reached out to Owen and pitched the idea of working together to finish *Major Havoc* once and for all. Owen was all for it, but just as things seemed primed to take off, life got in the way. Jess just started a family with the arrival of his first child and Owen was busily working in the exploding tech start-up scene. As passionate as they were, the fact of the matter was that they didn't have the time anymore so the idea was shelved.

Then in 2016, another member of the RGVAC community came to the project's rescue. Scott Swayze was working alongside Luke Dyson on creating reproduction boards capable of playing *Major Havoc* as well as other vector games. Scott was familiar with *Return To Vaxx* and emailed Jess and Owen if they ever planned to finish the project. If so, Scott wanted to design the boards to be compatible with *Return To Vaxx* before they released it. This turned out to be the catalyst the project needed to finally kick into gear. Owen, Jess, Scott and Luke spent the next three months discussing in detail what they needed to finish *Return To Vaxx*. Jess realised that this was their best and potentially last shot at concluding this decades-long journey. He told Owen, “We've talked about this for many years now – let's do it. If we don't do it now, it's not going to happen.”

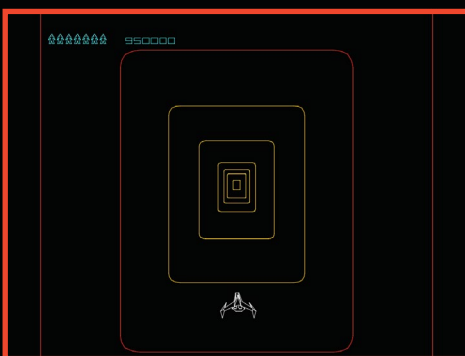
However, if they were going to do this, Jess wanted to go all out to truly make it worth the time and effort. Not only would they create the long-awaited Vaxxian home world, but with Owen's direction they'd restore other cut content like the Star Castle wave. Furthermore, they'd create even more new levels, add speech compatibility, make quality-

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**JESS ASKEY**

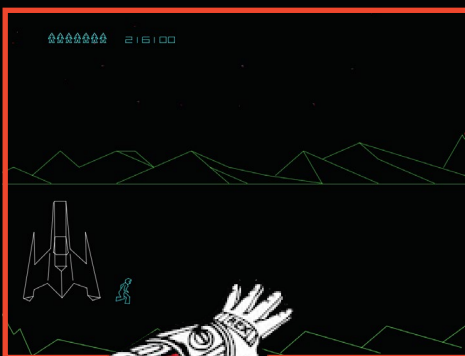
of-life improvements, and much more. They were going to release the ultimate version of *Major Havoc* that fans could enjoy for years to come. As such, *Major Havoc: Return To Vaxx* didn't fit the scope of the project anymore. Courtesy of Luke, it was rechristened *Major Havoc: The Promised End*.

**S**ince then, Jess has been slowly, but surely designing and coding *The Promised End* in his free time. Meanwhile, Owen guides him on bringing cut content back to life and also offers advice on fitting new features into the game. The team has grown beyond just Owen and Jess though. For example, Bryan, who aided Jess on his mad search in their teenage years, has come back into the fold to help further improve and expand the *Major Havoc* level editor. Jon Koople ensures that anything Jess adds to the game works just as well on real hardware as it does in MAME. Scott continues to assist the project however he can too. He played a key role in bringing David 'Jerky' Jury onto *The Promised End's* team. Jerky has painstakingly created numerous new levels for the game as the project's lead level designer and also serves as the lead playtester too. Whenever Jess codes in a new addition to the game he creates a special ROM that warps directly to that level. Jerky takes the ROM, boots it up into MAME, tests it and gives Jess feedback. Jess tweaks it and sends it back to be tested again. This process continues until the feature is just right.

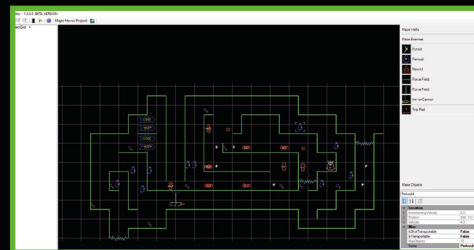
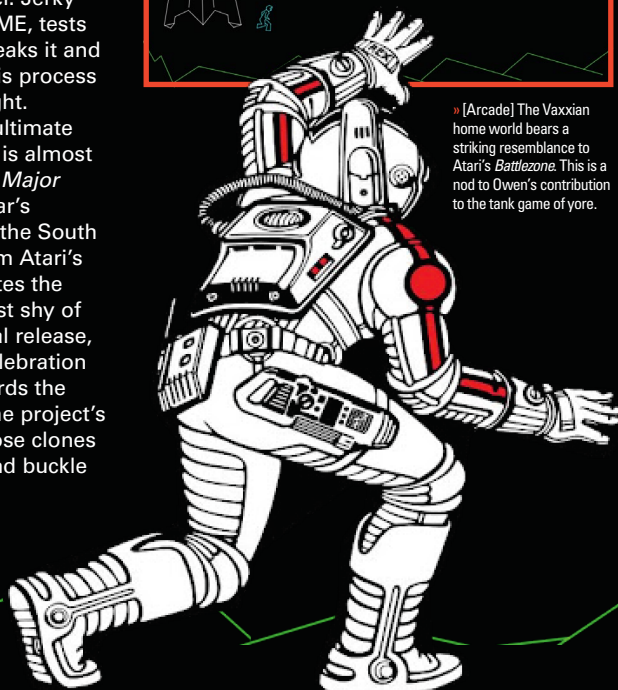
Thanks to all this hard work, the ultimate version of Atari's vector cult-classic is almost at hand. The team plans to unleash *Major Havoc: The Promised End* at this year's California Extreme, a convention in the South San Francisco Bay Area (not far from Atari's old stomping grounds) that celebrates the world of arcade gaming. Coming just shy of 40 years after *Major Havoc's* original release, the team is busily planning out a celebration that will be worth the wait. Afterwards the game will be released for free via the project's website at [mheddit.askey.org](http://mheddit.askey.org). Get those clones ready, fire up the Catastrofighter, and buckle in... the home world is near. ★



» [Arcade] *The Promised End* includes brand-new warps. They'll either take you further on your journey to the home world or to secret detours.



» [Arcade] The Vaxxian home world bears a striking resemblance to Atari's *Battlezone*. This is a nod to Owen's contribution to the tank game of yore.

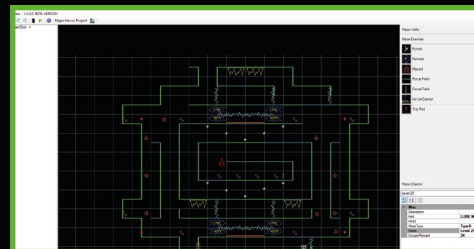


# MAZE MASTER

ENJOY THEIR MAZES OR MAKE YOUR OWN

■ The level editor first started as a basic tool that allowed Jess to visualise the binary data that made up each level of *Major Havoc*. Over the years, Jess evolved it into a full-blown development program – largely coded in hotel rooms or high up in the sky as he travelled for work. While he got to a somewhat functional state, it was far from perfect. Jess then hatched a scheme to rope his friend Bryan in to help truly fine tune it, “[Bryan] wanted to make a *Tempest* level editor. [I told him,] ‘You should take my *Major Havoc* level editor and make it also do *Tempest*. By the way, it’s really broken. Do you want to fix it?’” While Bryan still hasn’t gotten around to modifying the level editor for *Tempest* yet, he has taken Jess’ work and improved it ten-fold.

Thanks to Bryan, the level editor allows users to build out mazes within the program and playtest them in MAME with the click of a button. Users will also be able to edit every single level within *The Promised End*, both new and old, potentially making their own version of the game. The truly ambitious can even create custom *Major Havoc* ROM hacks consisting of entirely new levels using the program. The final build isn’t out yet, but a prerelease version can be freely downloaded on *The Promised End's* website right now. The team also plans to release the level editor’s source code as well, allowing future *Major Havoc* fanatics and retro game designers to easily utilise decades of work in their own projects.



» One of the new secret levels hidden within *The Promised End*. Finding them will be half the battle, beating them is the real challenge.