Rocket Racer, Veronica Voltage, and the Legend of LEGO® Racers

LEGO Racers started life in a digital brick vacuum.

High Voltage Software founder Kerry Ganofsky became obsessed with the idea of creating a video game that would allow players to build little cars with digital LEGO bricks, and then plop them onto a track and race them against minifigs.

While LEGO Fun to Build was the first video game featuring the colorful bricks, it was an educational title released only in Japan in 1995 on the short-lived SEGA Pico.

So, when Ganofsky started dreaming up his idea for playable brick cars and minifig drivers, he did so without any of the experience, or releases, that would hit in the coming years.

Ganofsky believed in the idea so strongly that he finagled a phone call with the LEGO Group and gave the company an elevator pitch for his idea. It went so well that High

Voltage Software was invited out to LEGO headquarters in Billund, Denmark where they pitched the idea directly to the LEGO Group. He arrived with an early demo of a character creation tool and another showing a car made of LEGO bricks rotating in 3D.

Shortly after that pitch, the LEGO Group traveled to High Voltage Software's Illinois studio to dive a bit deeper into the idea. Despite not yet having a deal confirmed, the studio had already started prototyping not just digitally, but also with physical creations.

"I think a lot of a lot of how we were able to get that gig was we really just were persistent and passionate, and we didn't know any better," said Eric Nofsinger, chief creative officer at High Voltage. "We just had this idea that we were really excited about."

The studio was so excited that, to prepare for the LEGO Group visit, they built giant vignettes of the game featuring brick and clay models of the race tracks.

"I mean, these were massive things" Nofsinger said. "Our office had been taken over with LEGO bricks. It was just a big playground for us."

And it worked. The LEGO Group signed a deal with High Voltage by 1997, kicking off what turned into three years of game development.

The development was difficult for several reasons, including working to capture the look and feel of the LEGO bricks in a format that wasn't too large for video game consoles to run. While the LEGO Group's SPU Darwin research group sent over digitized assets to the studio, they were so large that typical computers struggled to display a single brick.

The studio's biggest challenge, though, was creating a system from scratch that could mimic the feel of snapping digital LEGO bricks together in a 3D environment that wouldn't be too complex for children to use.

Ultimately, it took High Voltage a year to nail the look and feel of the game's building system. The studio's approach allowed as much freedom as possible to build with a variety of bricks.

"There was a lot of nuance to how we did this and the iterations we went through," Nofsinger said. "It took a good year to build that system because it involved having the ability to build this stuff and then have it welded together into real-time assets that then could be optimized and then generate levels of detail."

A breakthrough in nailing the feel of building came when lead programmer Dwight Luetscher reverse engineered a formula that would essentially filter what a player could and couldn't do, thereby ensuring that they wouldn't break the game.

This was important because the physical design of the cars impacted things like center of mass and physics when they hit the track.

To ensure that the game could handle these complex creations, LEGO Racers producer Keith Morton said they decided to turn the vehicles made of multiple pieces into a single piece in the background, once it was time to race.

The team also had to figure out how to animate the LEGO minifigures in a way that both looked good in a game, but also didn't violate the LEGO Group's brand rules. While LEGO Island was in development already by another studio, no game had featured animated, playable minifigures.

"When a character moves, can we move the arms and bend them at the elbow? Or can we not do that, because that's not what the LEGO Group does?" Morton said. "We went through that whole process and what we got, in the end, [was that] we were able to move the legs, bending them at the knees, arms bending at the elbows, and actually it really helped."

Around the time High Voltage was working through the look and movement of LEGO minifigs in their game, another LEGO game hit the scene, and it also featured racing, to the surprise of High Voltage.

"It made us nervous," Morton said. "It definitely made us nervous. One of the things that we kind of talked about over the course of a couple days after we found this out: Was is this really a conflict? Or is it not? And the reality is that our game is a different experience than LEGO Island. So what we decided to do was just, like, not freak out. Let's not change any of the design. We've got something very solid and fun here, right now. Let's keep going. And that's what we did. So we kind of stuck to our guns on that. And I think that that was the right choice."

One of the big standout features of LEGO Racers was that it was – like Mario Kart and Diddy Kong Racing – a kart racer. That meant a specific sort of design aesthetic, simplified driving mechanics, over-the-top tracks, and, of course, power-ups.

To give the game's power-ups a LEGO brick feel, the designers created a system that involved picking up colored brick power-ups and then finding extra bricks to stack on top of them and modify what they do.

The way stacking worked was that a player would grab a colored power-up. Then they could pick up white bricks to stack on top of it, and that would change what the power-up did. So, for instance, a red brick would give the player's car the ability to shoot a cannonball. Stacking one white brick on top of that turned it into the grappling hook. Stacking one more turned it into a lightning wand, and a third white brick gave the car three guided rockets.

After roughly three years of development, LEGO Racers launched for Windows PC, Nintendo 64, and the original PlayStation throughout the second half of 1999. (It also technically hit the Game Boy Color in 2000, but that was a significantly different game, developed by another studio.)

The main game was fairly well received when it came out, though some people were unhappy with the lack of multiplayer options. Keith Morton said the decision was made early on to just offer one form of split-screen play that allowed two people to race against

one another. They hoped that it would encourage family and friends to sit on a couch and play side-by-side.

The LEGO Group was so happy with the game that they showed off a special arcade-version of the game at the LEGOLAND Windsor resort.

Today, more than 20 years since its release, many fans of video games and LEGO toys still fondly recall playing LEGO Racers. Keith Morton has his own theory about why the game remains such a popular LEGO title.

"I think there's two really big reasons for that," he said. "I think everybody, regardless of their interest in LEGO bricks and building and stuff, they know what it is. It's interesting, and you can customize it to make it your own. And that's really the LEGO brand. The other part of it is the game itself. When you play it, especially in the beginning, it is really easy to get into. You can see the different personalities that you're racing, and it kind of sucks you in."

And Eric Nofsinger said that the studio still hears from LEGO Racers fans about the game.

"It's been over 20 years since we shipped it and, to this day, both Kerry Ganofsky and myself receive regular – I would say at least multiple times a week – emails from fans saying how much this game impacted their childhood.

"It's humbling to think that we had that kind of impression on so many people, and that so many people still recall the game fondly, and put in so many hours of their lives being entertained. I've worked on more than 100 games, and I can say that one of my proudest accomplishments is being a part of the LEGO Group's history, being part of this universe, making something special that touched so many people."

Explore more...

In order of appearance:

LEGO Fun to Build – Brickipedia

SEGA Pico – Wikipedia

LEGO Loco – SimCity Inspired a Living LEGO Railway Video Game

High Voltage Software – Official website

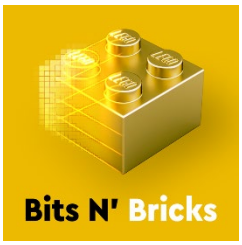
LEGO Island – LEGO Island: Birth of a LEGO Video Game

SPU Darwin – Inside the LEGO Group's Secretive Strategic Product Unit Darwin

Transcript

Bits N' Bricks Season 2 Episode 26: Rocket Racer, Veronica Voltage, and the Legend of LEGO® Racers

June 30, 2021 · 47:04



Prologue – 00:00

Announcer

Please note that this episode of Bits N' Bricks contains instances of misuse of the LEGO trademark, which must always be used as an adjective and never a noun. As a reminder, it is never appropriate to refer to the company that designs and produces LEGO brand products as LEGO. Rather, the correct name for the company overall is the LEGO Group. I hope that was severe enough. Was it severe enough?

Studio Engineer

Yeah, that was great, Ben. We got it.

Announcer

Alright. On with the show.

Bits N' Bricks: Introduction – 00:39

(Child's voice announcing Bits N' Bricks)

Ethan Vincent

Welcome to Bits N' Bricks, a podcast about all things LEGO games. I'm Ethan Vincent.

Brian Crecente

And I'm Brian Crecente. Together, we look back at the rich 25-year history of LEGO games, chat with early developers and seasoned studios, who have all tackled the creation of video games for one of the most popular and respected toy companies in the world: the LEGO Group.

Ethan Vincent

So this week, Brian, our episode is about a LEGO gaming classic. LEGO Racers, right?

Brian Crecente

Yes. And you know what? It is a fan favorite. It seems like every time, Ethan, that you and I asked people what their favorite LEGO video games are, LEGO Racers always seems to be on the list.

Ethan Vincent

Always. Yes.

Brian Crecente

And you know, if you haven't played it, it's this fun little kart racer that feels a little bit like Mario Kart or maybe Diddy Kong Racing, but with a very LEGO brick twist. You actually get to build your own cars out of bricks before bringing them to the track. And then you compete against the likes of Veronica Voltage, Captain Redbeard, and of course, Rocket Racer. So this was the very first LEGO game on console outside of Japan and when it hit in '99, people loved playing it on the PlayStation and the Nintendo 64.

Ethan Vincent

That's right. But you know, getting from the idea to a playable game was quite the journey.

(Tune)

Chapter 1: High Voltage Software; From Idea to Pitch – 02:14

Brian Crecente

LEGO video games got their innocuous start back in 1995 with LEGO Fun to Build, which was released only in Japan on the Sega Pico. Two years later, a game co-created by the LEGO Group would arrive featuring the colorful bricks and their cheerful minifigs, and that was of course, LEGO Island, which in 1997 did so much to establish the tone, the look, and behavior of a LEGO video game for decades to come. But in that short window between the easily missed Fun to Build and the genre-establishing arrival of LEGO Island, another LEGO video game was sort of percolating. Unlike other LEGO games in the late 90s, it wasn't the result of a LEGO Group initiative. It wasn't, in fact, part of the trio of 1998 games that declared LEGO Media International's push into the world of gaming. That, of course, included LEGO Loco, which, Ethan, you and I've talked a great deal about – we did an episode on. So instead, it was LEGO Racers, which was instead this idea born of a developer and his love of LEGO bricks.

Ethan Vincent

Yeah, and chances are that these days if you play video games, you've probably played a High Voltage Software game or something they've quietly helped create. Kerry Ganofsky

founded a studio in 1993, and its first four employees spent their first few years creating games on makeshift desks made of old doors and saw horses, but by 1995, they were releasing titles attached to properties like Star Trek and White Men Can't Jump. They would go on to work with everyone from Atari and Midway to Activision, 2K, Ubisoft, and Capcom. With more than 100 titles shipped, High Voltage Software is more than big. It's diverse, ranging from Dora the Explorer to Call of Duty, and Mortal Kombat. With Conduit, they helped to define what a shooter should look like on Nintendo's motion-controlled Wii console, and even lent a hand with Epic Games' seminal title Fortnite, but back in 1996, Kerry Ganofsky was thinking about building with LEGO bricks. That's where LEGO Racers began, according to High Voltage's Chief Creative Officer Eric Nofsinger.

Eric Nofsinger

Well, it all started with an idea, really. Kerry Ganofsky, our CEO and founder, had this simple but really pretty cool idea at the time, which was to build your own, personalized car out of LEGO bricks, and race it. It was a really elegant idea that we were all passionate about. We all loved playing with LEGO bricks as kids, and (as I think a lot of developers did), and we just really got into that idea of we should do this.

(Tune)

Brian Crecente

Kerry believed in the idea so strongly that he finagled a phone call with the LEGO Group and gave the company an elevator pitch for his idea. It went so well, that High Voltage Software was invited out to LEGO headquarters in Billund, Denmark, where they pitched the idea directly to the LEGO Group. He arrived with an early demo of a character creation tool and another showing a car made of LEGO bricks slowly rotating in 3D. Now keep in mind, this is 1996 before any LEGO video games had been released outside of Japan. LEGO Island was in development, but Kerry and his team had no idea it existed.

Eric Nofsinger

We believed in the idea so much that we went ahead and mocked up a little demo of a character creation with LEGO minifigs. And that was a little character creation tool. And we went out and showed that to them, or Kerry did, and presented his pitch. So it all really started with a simple idea, and then, you know, we're a small indie group that had been making games just for a few years at that time. We just really loved playing with LEGO bricks, you know? (laughs)

Ethan Vincent

Shortly after that pitch, the LEGO Group traveled to High Voltage Software's Illinois studio to dive a bit deeper into the idea. Despite not having a deal confirmed, the studio had already started prototyping, not just digitally, but also with physical creations. Eric Nofsinger explains.

Eric Nofsinger

That time, you know, the digital arm of LEGO Media was pretty fresh. That was a pretty new thing. Honestly, I think a lot of how we were able to get that gig was we really just were persistent and passionate, and we didn't know any better. You know, we just, we just had this idea that we were really excited about, and we came and showed it off. Even subsequent to them saying, "OK, we want to do this," the first time they came out to the office, we built giant models of the race tracks, like physical models, not just out of LEGO bricks, but also out of clay, and we painted it, and I mean, these were massive things. Our office had been taken over with, you know, LEGO bricks. We built a lot of LEGO cars, obviously. We built a lot of physical LEGO tracks, not just with LEGO bricks, but with every LEGO component we could muster. The whole thing was, it was just a big playground for us. I think the main thing that won the LEGO Group over was our passion and our enthusiasm. We had lots of materials. I mean, we had storyboards and concept drawings, we had physical maquettes, we had all sorts of playsets that we built, made our own custom things from existing sets. And all this really impressed them and wowed them, but really it all came down to just how big of nerds we were about LEGO Media and the LEGO Group in general. We just love LEGO bricks. We love playing with them.

Chapter 2: The Digital Brick Challenge – 08:28

Ethan Vincent

By early 1997, the LEGO Group signed the deal to make the video game with High Voltage, and the team quickly got to work on the game. But it would be more than a year before they got past their first major hurdle: recreating the experience of building with LEGO bricks in digital form.

Brian Crecente

The LEGO Group provided High Voltage an enormous amount of reference material from high resolution images of the bricks, to theme sets, to meticulously documented characters. And the team used that material to augment the work they'd started.

Eric Nofsinger

We'd actually already started prototyping, and we prototyped a lot of different – everything from physical things to prove out ideas, to actually starting to develop multiple revisions of character creation systems, multiple revisions of the vehicle creation systems – as I said, that took like a good year to develop. But we went through a lot of different iterations that I still don't know if we entirely nailed it. I mean, it was definitely fiddley, but we didn't really have a blueprint to go off of. There really weren't many games like that where you could create character and vehicle and then drive it, and then it was targeted at such a broad range of gamers. We did a lot of iterations on that, and then we did early driving simulations. And, you know, there were a lot of debates throughout the entire

development of how much we wanted to have that creativity to allow people to build whatever they want and how much that was going to affect how the cars drove. You know, there were a lot of systems that we wanted to make, not just building, but also having cars break apart and things like that. And unfortunately, we weren't able to pull them off with the hardware of the time.

(Tune)

Ethan Vincent

About two dozen people worked on the game, and they quickly realized that their biggest initial challenge was the building element. The idea, as originally pitched, was that a player would have access to a bunch of bricks with which to build their own cars. The car they created would behave differently based on each design and could, of course, then be used in races in the game. Keith Morton, producer of LEGO Racers, said that building was the key element of the game. While it was a wonderful idea – one that tapped perfectly into the inherent creative nature of playing with LEGO bricks – it was also something that hadn't been done in a LEGO video game. Keith Morton here explains.

Keith Morton

The number one thing that he focused on was that you could build your car, it would affect how it races, and you can go race it. That was kind of the whole foundation of it. And we went through several different interfaces to do that. Once you start trying to do 3D, at least back then, people just aren't familiar with it, so you try to have like a 3D interface where you're placing bricks, and it was a constant iterative process to make sure people understood what was happening on the screen. And then once we got through that, it was really more about like the car racing, and being able to say, "OK, look, I got this. I built my car, and it's a giant tank, and I can knock it around a little bit more" as opposed to saying, "Hey, I built this car, and it's really sleek, and really small, and it can go faster." Like, those kinds of things were relatively new back then. And I loved it, and yeah, I really enjoyed it a lot.

Brian Crecente

The process of creating it involved not just digging in and failing a whole bunch, but defining boundaries.

Keith Morton

Hugely challenging (chuckles). We had the high concept of, "OK, we want to build a car with LEGO bricks. We can kind of do what we want, but what are the limitations? How high can you build it? How wide can you build it?" And then, as we just kind of kept going deeper and deeper into that, you know, started to realize that it takes a little bit of time, but you can really build your own car in the game to your specifications, and then race it based on weight of the car, or how light or how heavy it was, and then that would affect

how the car goes in-game. But there were other limitations that we had to do. We had to come up with a simple base for the car. I guess what I mean by that is we call it a chassis, which is basically the tires and a flat piece of LEGO brick attached to it. And we had to keep those kind of confined, so we couldn't just do it forever, or have like, you know, 100 studs-wide car or something like that. We had to keep it kind of constrained, so we did that, and we were able to still have a lot of creativity when you're building the cars, even within that kind of limitation of that virtual box. So that was interesting. And the whole interface about moving a brick to place it somewhere, to secure it to a brick, that whole thing was very, very iterative. And we actually had other people who weren't familiar with it, try to use it. And that was was pretty cool because it gave us insight into people who didn't necessarily know the design of it, or the execution of it, but then when they get into it, they're kind of confused a little bit. And so then we go, "OK, what do we do? Where do we put our highlighted brick? What kind of audio do we need to reinforce the movement of the bricks or the placement of the bricks locking into other bricks?" So all that kind of happens like iteration over time – several months. So, it was fun, but it was challenging.

Brian Crecente

It took the studio about a year to nail the behavior and feeling of building with LEGO bricks, and then turning what players built into drivable creations. The studio's approach allowed as much freedom as possible to build with a variety of bricks. They also focused on making sure it was simple to use, despite being in a 3D environment. Eric Nofsinger explains.

Eric Nofsinger

Well, there was a lot of nuance to how we did this and the iterations we went through. It did take a good year to build that system: You know, having the ability to build this stuff and then have it welded together into real time assets that then could be optimized, and then generate levels of detail so that, when the vehicles were distant in space, it wasn't drawing at the higher resolution. It was tricky. It was a tricky challenge, but as far as like how it affected abilities and things like that, the chassis is what we landed on, as far as that was going to be the core thing that made the most difference. The driver did not affect the gameplay. We wanted that to be a neutral thing that people could be whatever character that they created, and that wasn't going to affect how the vehicle performed. The bricks did have some effect on how the vehicle drove, but it ended up being quite subtle, because what we found is that it was more fun for the player to be able to make whatever they wanted on this chassis. You know, the chassis that they selected would have some attributes that would lean one way or the other, and the bricks would modify that a bit, but really, we always looked for where the fun was. That's really was our guiding principle throughout was, if it was fun, that trumped everything. We didn't want to stifle that creativity that if people wanted to make these crazy vehicles, and they wanted to make something really fun and silly, we didn't want to penalize them for having fun. You know, we wanted to reward players as much as possible for doing fun things.

(Lively tune plays)

Ethan Vincent

The breakthrough and nailing the feel of building came when lead programmer Dwight Luetscher reverse engineered a formula that would essentially filter what a player could and couldn't do to ensure they wouldn't break the game. This was important because the physical design of the cars impacted things like center of mass and physics once they hit the track. To ensure that the game could handle these complex creations, Keith said they decided to turn the vehicles made of multiple pieces into a single piece in the background once it was time to race.

(Sounds from LEGO Racers)

Keith Morton

Basically, I mean, we had to do it that way –

Brian Crecente

This is Keith Morton speaking.

Keith Morton

– just because at the time the complexity of having every individual brick on every car being rendered was, it wasn't possible. The game wouldn't perform. So prior to loading into a game, on the coding side, they basically just said, "OK, well, let's take these two bricks that are stacked on top of each other and just make it one." And that kind of optimization happened all the way through for all the cars. The other thing that we did that was really interesting that Dwight did, it was really smart, he put up, I think what we called, car cards. So like, if a car is in the distance, we're not continually rendering it. We render a piece of it onto like a flat plane, and it becomes just a static image, but it's still moving, like the car moves. So in the distance, you can't tell. But we had to do that as an optimization to make sure the game was running well.

Brian Crecente

Eric says it was not an easy process and one that took longer than the team had expected it would.

Eric Nofsinger

To get that feeling of building with actual LEGO bricks was not easy. It was something that we just tried a lot of different things. We tried and failed, quite honestly. It was a lot of iteration, and fortunately, we had the leeway to do that, which was relatively rare in those days to be able to do that much iteration before successfully saying, "This works." And I can't say that we completely nailed it. It definitely had its flaws, you know, but I think it did enough to actually give that feeling of exploration and play and identity that I think is something that was really special to us as developers,. We all had those childhood memories of being nerds and collecting LEGO bricks. And the final result was a bit fiddly,

but it's still, I think it worked pretty well. I mean, I think people had a lot of fun with it. And then we added things like quick build and the mix options and things so that people could just – even for folks that didn't want to spend that time in the front end just building and doing that, they could get in and race right away, or they could just see silly, fun, randomized contraptions. You know, we found a lot of kids would just sit in that front end just doing that over and over and just seeing what would surprise them.

Chapter 3: Remembering SPU Darwin and the Art of LEGO Racers – 19:29

Ethan Vincent

So, I guess if you know your LEGO history, Brian.

Brian Crecente

And we definitely know our LEGO history.

Ethan Vincent

Yes, you may have noticed that not only was LEGO Racers in development at the same time as LEGO Island, which came out in 1997, but the game was pitched in 1996 when the Strategic Product Unit Darwin was in full swing. I found that really interesting.

Brian Crecente

Yeah, and for those of you who are not LEGO Group history buffs, like Ethan and I, SPU Darwin was this fascinating research and development skunkworks group in Denmark that launched in 1996, with the idea of exploring the digitization of the LEGO brick. You really owe it to yourself to go back, I think, and listen to our episode about Darwin. It has a lot of fascinating history, and it really is this amazing story about some buddies getting together to create a LEGO movie from scratch, and then using that to convince the LEGO Group to invest heavily in their ideas.

Ethan Vincent

It's great stuff. And it matters here because a big part of what they were doing at SPU Darwin was taking each and every brick and element the LEGO Group created, and turning it into a digital asset. I mean, they were very ambitious, they wanted to create a whole database that would have every single LEGO brick in digital form. And, you know, they wanted these exact copies that they then could deliver to designers and people doing motion graphics or instructions. They wanted to, you know, create movies with them and video games. I mean, it was this whole thought of creating the plastic bricks in digital format. That was their ambition.

Brian Crecente

Well, yeah, at least that was the idea. It turned out that the group, which at one time had one of the largest computer installations in northern Europe, with an impressive array of top-of-the-line Silicon Graphics machines, didn't quite achieve its goal. There were a lot of reasons for that, but the biggest was those files – the digital recreations of the LEGO bricks. It turns out, they just weren't very practical.

Ethan Vincent

Yeah, and that's where we kind of get back to LEGO Racers, and we're going back here to 1996. The LEGO Group had just approved a pitch for High Voltage Software to create a game featuring cars made of LEGO bricks, and LEGO Island is in the middle of development with a bit of help from Darwin and LEGO Media International, or LMI as we've often called it. So the folks at Darwin must have seen this as another opportunity to help out. And Cary Penczek was the art lead on LEGO Racers, and it was his job to take what SPU Darwin sent over, these files, and somehow turn them into something that both looked good and worked on very early 3D-capable consumer hardware.

Cary Penczek

The consoles that we were working with was the Nintendo 64, PlayStation, and PC. And at that time, those consoles were just starting 3D. So there was a lot of learning curve on what we can get away with with 3D. And as you know, LEGO bricks, they're square. You can't really reduce in polygons or anything. They are what they are. The LEGO studs that are on top, those all have to be represented in some way. And we could not model them per se because they would put us way over our performance on all those consoles. So we had to do them as a texture pass. You know, you had to stay within the LEGO guidelines of representing their pieces and stuff to make sure it all was cohesive and matched their quality. We were able to succeed in a lot of that with the lower-end hardware, compared to what's out there now.

Ethan Vincent

Cary said that, early on, his team received a library of art from Darwin, which was made up of high resolution 3D modeled bricks. But the files were so detailed that even a single brick was too large and complex for a console at the time to render. Cary explains.

Cary Penczek

A perfect example is they have the LEGO studs, which are those curved cylinders on top with the LEGO logo name etched in top of them. That was representative in these bricks. So all that detail, making it really smooth, and that high fidelity was something that a system during that time would not be able to push graphically, performance-wise. So you would not be able to even view it on a system, much less make a game around it. That's how high poly it was, or high fidelity it was.

Brian Crecente

Cary quickly realized that the files had been created on Silicon Graphics machines. Coincidentally, they had one in their offices, but that was unusual. At the time, the machines were typically the sort used for things like creating the special effects in Terminator 2 or the animation in Pixar's Toy Story. High Voltage Software only happened to have one of the machines on a fluke. They were using it to test different ways of creating art for games. And that's how they were able to check out the art they received from the LEGO Group's SPU Darwin.

Cary Penczek

I was not aware of that part of it. I was more of, we got these pieces from them, and they asked us to analyze them and see what we can use and what we can get out of it. And that's where I came in and was looking at some of the files with some of the other artists and stuff, and we pretty much as we are knowledgeable of what you can do with games, we knew we pretty much couldn't use them verbatim because they would be too high. But it was definitely helpful in learning what, like I said, what they were looking for, and all their intricacies of what makes a LEGO brick a LEGO brick, versus other companies. In some cases, we would, you know, if there was a specialized brick that we had, we maybe would try to model on top of it, but even that was a little tough because the software had to push that performance as well, and that was not always the quickest method. So we would use it as mostly reference. If we didn't have those bricks in-house at the time, we could use that as reference.

Ethan Vincent

Ultimately, LEGO Racers' look came from a mix of things and a lot of trial and error, Cary said.

Cary Penczek

If you look at the game that we produced, there's a combination of a stylized, realistic kind of look, versus the LEGO bricks look. Like we'll have pads that look like they're dirt, but you know, stylized, cartoony, but we wouldn't make them out of LEGO bricks per se, because the LEGO studs, they're very costly in performance if you model them. We would do it with textures. They also did the same thing with the LEGO studs is, the graphical, the kind of the noise that they produce a little bit, because there's a lot of contrast between them, and there are a lot of them on screen, it would deter from the visuals of it. So we use them sparingly where we needed to make the sets look better, meant to incorporate that LEGO brick feel into all of our designs, but we still wanted to keep a little bit of a toony realism set to it, so we weren't overloading it with LEGO studs for the most part. And they worked out really well, and we got the LEGO studio and LEGO Media on board fairly quickly with that, because, that obviously was something that could have been a sticking point, in the sense that we wanted to keep it all LEGO brick looking, but we did a very good job of

mixing the two to get a nice overall look and still keep the LEGO brick feel of all the other assets that we had to do.

Chapter 4: Designing LEGO Racers – 26:49

Brian Crecente

Now more than a year into development, the team shifted their attention to the rest of the game, from the design of the tracks and minifigs, to the playstyle and special abilities. Because this game was such an early example of bringing minifigs to life, High Voltage had to wrestle with the proper way to do that in a game, Eric said.

Eric Nofsinger

We had a ton of those discussions. When you're creating assets in 3D, you want to make them feel alive. And, you know, there really weren't a lot of examples of what a 3D minifig should look like, moving. And, we had discussions of should this look more like stop motion? Or should this look more fluid? And there's a process in making a 3D model where you can weight the skinning on it, so it has some flexibility and it bends. The model itself has deformation to give it more natural bends when it moves. That was a huge debate for a long time. We did a lot of different iterations of that because, what should this look like? Should they actually just move only like what the LEGO bricks can can move like? Or should there be some squash and stretch to them? Should they bend a little bit? And we tried to dial in a sweet spot that felt like it was true to the physical sets, but we didn't have to worry about them feeling clunky and inanimate.

Ethan Vincent

The team also created two unique minifigs for the game, Rocket Racer and Veronica Voltage, Keith said.

Keith Morton

We ended up doing the Rocket Racer character. He was a little special in a way because he was in one of the cinematics. And we kind of went back and forth on this. We're trying to define, it's not just the LEGO character that we're making, we're trying to define like his inner personality. And we made him kind of cheesy, at least that's the American view. The view in the U.K., over the pond, is more cheeky they called it. So, you know, we wanted to make it a little bit cheesy, like this guy likes to kind of troll people a little bit. And that was fun. And we put a couple special effects in there to kind of emphasize that and worked through LEGO Media with that. And it was really fun and they loveed the end result. It was really great.

(Tune plays)

Ethan Vincent

Now deep into development of the game, the team was surprised in September 1997 when another LEGO game hit stores.

(Commercial: "Well, it's time for the toy industry's biggest show of the entire year. This is not the world of LEGO that you're used to. For the first time in LEGO's 65-year history, LEGO characters come to life with voices and personalities in the interactive CD-ROM game Adventures on LEGO Island.)

Ethan Vincent

LEGO Island was soon met with rave reviews and steady sales. But it also had a built-in racing game, which to put it mildly, didn't go unnoticed by the developers at High Voltage.

Eric Nofsinger

Yeah, when we first saw that in LEGO Island, we're like, "Oh, no, does this completely water down what we're working on?" But at the same time, it was very different. I mean, it was from a first-person perspective. It did not have a lot of the kart kind of feel that we were going for. LEGO Island was very ambitious in the different things that it was trying to do. And we were ambitious in our own way. But we were very focused on making a exceptional kart racer that was true to the LEGO Group ideals and values.

Keith Morton

It made us nervous.

Ethan Vincent

This is Keith Morton.

Keith Morton

It definitely made us nervous. One of the things that we kind of talked about over the course of a couple days after we found this out was that, is this really a conflict or is it not? And the reality is, is that it's a different experience than LEGO Island.

(Excerpt from the game LEGO Island "Ladies and gentlemen, start your engines please, and go!)

Keith Morton

And so what we decided to do is just like, "OK, let's not freak out. Let's not change any of the design. We've got something very solid and fun here right now. Let's keep going." And that's what we did. So we kind of stuck to our guns on that. And, you know, I think that that was the right choice.

(Sounds from LEGO Racers)

Brian Crecente

Fortunately, the group decided early on, they wanted to create a kart racing game, something that was similar to games like Mario Kart and and Diddy Kong Racing. In general, kart racing games have simplified driving mechanics, over-the-top race track designs with unusual obstacles, and a form of vehicular combat, usually through power-ups.

Keith Morton

Well, we knew that we were very much a kart racing game, right? So we're not, you know, we're not like a realistic racer. It's a fun game for a lot of people to easily get into and play. So as we were building the tracks, we wanted to make sure that there were, especially early in the game, it's a very wide track, we want to make sure that people have an easy time going through it and focus more on the race itself, as opposed to wiping out or getting off the tracks. So we tried to really confine it, as far as the entire scope, so it wasn't too big and confusing. And at the same time, the paths themselves were wide enough to allow several cars to be passing each other at one time. And that was important, too.

Ethan Vincent

Power-ups were another big feature of the game. They included things like a shield, a cannonball, oil slick, and turbo boost. But figuring out which power-ups to include, and how they would work ended up to be a bit of a struggle, at least initially. In particular, the designers wanted the power-ups to evolve, and also incorporate some form of building.

Keith Morton

That we struggled with as well. We knew we wanted to bring a LEGO element into the power-ups. And we weren't sure how to do that at first, but eventually, after several different ideas and iterations, we came up with a stacking. So you could stack a power-up to level one, two, or three. And that fit the LEGO theme. You're building something, right? You're building something that's better. So that worked out pretty well. There was a power-up that we had, was the grapple hook. And this is actually kind of a cool story because we all came up with these ideas. We had ideas for power-ups, and we're working on them, and we're implementing them or tweaking them. And we came to this grappling hook idea, and we're just like, "Oh my gosh, how do we do this? (laughs) How are we going to be able to grapple onto other cars and swing around them? And is that going to be OK? Is that going to break anything?" And the entire team, the people who are implementing it and myself, too, were kind of nervous about it, but once we got it in there, it became one of the most awesome power-ups I think in kart racing games, being able to grapple onto the guy in front of you with your LEGO brick grapple, and then be able to say, "OK, I'm just totally passing you right now." It was really fun.

(Sounds from LEGO Racers)

Brian Crecente

The way stacking worked was that, first, a player would grab a colored power-up. Then they could pick up white bricks to stack on top of that, and that would change what the power-up did. So, for instance, a red brick would give the player's car the ability to shoot a cannonball. Then, if you drove over and picked up a white brick and stacked it on top of this, it would turn that cannonball into a grappling hook. Stacking one more turned it into a lightning wand, and a third white brick gave the car three guided rockets.

Keith Morton

Yeah, so we had different power-ups, you know, kind of the traditional shield and so forth. Level one would give you like a hit from from somebody. So if somebody hits you with a level one, then you're going to have a shield and you're going to stop it and not be affected. If they had a bigger one than that and you only had a level one, chances are you're going to get knocked out. So we kind of use that level system to be able to play with the game balance of that and make sure that people were – they felt powerful when they got it, but they knew that they had to go and get the higher power-up because that's what's gonna really, really gonna save you. One of the things I used to do is that, on the last lap, I would just go for shields (chuckles) if I was in first place. Because then, if I can build my shield up high enough, they can shoot me, and I can still win the race without incident. That was fun.

Ethan Vincent

As the team built the tracks and racing mechanics, they also had to populate those tracks with racers. All said, the game featured 16 minifig racers like Willa the Witch, Black Knight, and Governor Broadside. LEGO Racers had also seven circuits to race in, each of which had its own champion. Those champions included Captain Redbeard, King Kahuka, and High Voltage's original creation, Rocket Racer. Veronica Voltage appeared as a challenger in the time races. Each racer had to challenge the player in different ways during a race. Usually, that meant programming artificial intelligence to drive the different cars in different ways. But that's not what happened with LEGO Racers. Eric Nofsinger explains.

Eric Nofsinger

There are a lot of challenges over the course of development. That first year was building the core tech. Then the next year was really building a lot of the racing mechanics and getting that tuned in, building all the tracks. We had 24 tracks, you know, building the different systems. The AI in the game is pretty fun. Those are all just recordings that the lead engineer did of the development team playing the game. That data is all us developers playing the game, and then it was normalized and had some randomization put in there, but the the data is actually just recordings of us playing the game, so anyone that ever has played LEGO Racers has played against the developers. So it's kind of kind of weird being this ghost in the machine that, like, 21 years later, all the developers are still playing somewhere digitally in this game.

(Tune)

Chapter 5: Game Launch – 37:06

Brian Crecente

After roughly three years of development, LEGO Racers launched for Windows PC, Nintendo 64, and the original PlayStation, throughout the second half of 1999. It also technically hit the Game Boy Color in 2000, but that was a significantly different game developed by another studio. The main game was fairly well received when it came out, though some people were unhappy with the lack of multiplayer options. Keith Morton said the decision was made early on to just offer one form of split screen play that allowed two people to race against one another. They hoped that it would encourage family and friends to sit on a couch and play side-by-side.

Eric Nofsinger

When the game released. I think the results were pretty positive.

Brian Crecente

This is Eric Nofsinger singer speaking.

Eric Nofsinger

I mean, consumers seemed to love it, and I know the game sold very well. I think the LEGO Group was was very happy with what we accomplished. The critical reception, I think, was mixed. You know, I think some people got it, and they were really into it, and I think other people not so much. But really, ultimately, we made that game for LEGO brick fans. You know, we made that game for ourselves and for gamers that love playing with LEGO bricks. I think we succeeded in that. We made something that, still to this day, we're proud of. If you visit our office, in our display case up front, there's a large section still dedicated to that game. There are a couple of things in there that are one-of-one items in that case, including – well actually I should correct myself. There is a one-of-two, ever actually created Rocket Racer minifigs that was gifted to Kerry by the LEGO Group, which was pretty awesome to have this exclusive figure made by them that was a character we created for them, and then they they gifted us this actual production figure.

Ethan Vincent

Keith Morton remembers showing the game off to the LEGO Group's marketing team and a classroom full of kids.

Keith Morton

Yeah, I actually had a chance to go back there to the headquarters in London, and show it to a couple of marketing folks and executives. And I let them play the game at the time,

and they were doing it, and they were laughing so hard and having fun. One of the folks (laughs) actually was playing the game and then knocked over her water (laughs) onto the table because she was so into the game she just wasn't even aware of her surroundings, and then spilled everywhere. It was a good time, so yeah, being able to show that to people and have that reaction is pretty huge. One of the other things that I did during development, before the game came out – my mom was a fourth-grade teacher. And so I was able to work with Kerry, get the approval. I took the game into her classroom, and let the kids kind of play with it. That was probably one of the most powerful experiences I've had. Being able to see, even at that age, the different personalities coming out, wanting to do different things. Like, "I want to build a character" or no, "I want to race." It was really interesting, and everybody was into it, and they were really, really happy to see it.

Chapter 6: Conclusions – 40:20

Ethan Vincent

The LEGO Group was so happy with the game that they even showed off a special arcade version of the game at the LEGOLAND Windsor Resort. Today, now more than 20 years since its release, many fans of video games and LEGO toys still fondly recall playing LEGO Racers. For Keith Morton, the game was a seminal part of his career.

Keith Morton

That was a huge, huge learning experience for me, and I really took a lot of that seriously in future projects and how to manage people. I think over time, what I kind of learned there was people are dedicated and work hard. But as a manager, you need to kind of support them with every effort that you have. And I remember talking to folks and people working hard, and I'm like, "OK, you need a day off. Go. Take a day off and get some rest." And being able to kind of have that camaraderie and that trust between the team was something that was really, really big, because like I said before it's – you're looking at a game that required a ton of iteration. It wasn't just write a design document, make a game and ship it. It was write a design document, make the game, analyze it, redesign it, iterate on it, and then ship the game and do that thousands of times. So, in that kind of unknown process, having the camaraderie there, I think is key to making sure that game got out, and that it was good quality.

Brian Crecente

Keith also has his own theory about why the game remains such a popular LEGO title.

Keith Morton

I think there's two really big reasons for that. I think everybody, regardless of their interest in LEGO bricks and building and stuff, they know what it is. It's interesting. And you can customize it to make it your own, and that's really the LEGO brand. The other part of it, I

think, is that the game itself, when you play it, especially in the beginning, it is really easy to get into. You can see the different personalities that you're racing, and it kind of sucks you in. Especially at that time I remember going through some of the cutscenes to kind of emphasize the characters in the game – you know, the pirate character and everybody – those were really important because I think, especially with the younger crowd, which is what the LEGO Group kind of caters to. If you can have something in there that's fun, or that's, like I said, cheesy or cheeky (laughs), that's something that people kind of grasp on to. So I think that both of those factors matter.

Brian Crecente

Art lead Cary Penczek says LEGO Racers remains one of his proudest achievements.

Cary Penczek

I've had people that we've hired that were very young, that came up to me and shook my hand and said, "Thank you for helping me through my childhood by playing some of the games you created, or you worked on," and LEGO Racers was definitely one of them. The LEGO franchise and LEGO Media is very popular, obviously, and whenever I would do any talks to high school kids or to grammar schools and stuff, I would definitely bring in the LEGO Racers game, and I'd have parents come up to me and go, "Oh, we bought that game," so it definitely has a really good mark on as far as our history of what games we worked on. And there's always a special place when I look at my shelf and I see it and, you know, some of the memories of what we went through and how we achieved it. And again, we were very young, very new to a lot of the stuff, so a lot of that stuff it was like pie in the sky when we started in, like, thinking how the fact that we could create a game and millions of people can play it and see it around the world and have fun with it is very encouraging and very, you know, makes my heart feel very full when you sit back and think of it. And I think that's part of what I end up doing is I step away from being, you know, working on it and knowing that ultimately there's going to be people playing this and there's definitely a lot of pride and definitely feeling grateful for what I get to do and how some of these kids that see this stuff and how they react is amazing.

Brian Crecente

And Eric says to this day, the studio still hears from LEGO Racers fans about the game.

Eric Nofsinger

Well, it's been over 21 years since we shipped it. So it's a – I mean, to have this impact on so many people. And, to this day, both Kerry Ganofsky, our CEO and Founder, and myself, we receive regular, I would say, at least multiple times a week, emails from fans saying how much this game impacted their childhood. And, I mean, that's over 21 years later. It's humbling to think that we had that kind of impression on so many people and that so many people still recall the game fondly and put in so many hours of their lives being entertained. And, you know, it's why we do this in the hopes that, you know – I've worked on more than

100 games, and I can say that one of my proudest accomplishments is being a part of the LEGO Group's history – being part of this universe, making something special that touched so many people.

(Postscript music)

Bits N' Bricks: Credits – 45:45

Ethan Vincent

Bits N' Bricks is made possible by LEGO Games. Your hosts are Brian Crecente and Ethan Vincent. Producing by Dave Tach. Our executive producer is Ronny Scherer. Creative direction and editing by Ethan Vincent. Research and writing by Brian Crecente. Art direction by Nannan Li. Graphics and animations by Manuel Lindinger and Andreas Holzinger. Mixing and sound design by Dan Carlisle. Disclaimer voice is Ben Unguren. Opening's child voice is Milo Vincent. Music by Peter Priemer, foundermusic.com, excerpts from the games LEGO Racers and LEGO Island, as well as Henrik Lindstrand from the award-winning game LEGO Builder's Journey, which you can play on Apple Arcade, Windows PC, and Nintendo Switch. We'd like to thank our participants: Keith Morton, Eric Nofsinger, and Cary Penczek. We'd also like to thank the entire LEGO Games' team. For questions and comments, write us at bitsnbricks@LEGO.com. That's bits, the letter N, then bricks@LEGO.com. And as always, stay tuned for more episodes of Bits N' Bricks.