



**BOB COONEY**

**IAAPA  
2022 EDITION**

**30+**

PRODUCTS REVIEWED

**THE NEW  
VR ARCADE  
ECOSYSTEM**

Why it's a game-changer  
for operators

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BIRTHDAY PARTY  
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With the Spree Arena



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## WIN AN HTC VIVE FOCUS 3 AT IAAPA.

During the IAAPA Orlando show, go to the booths showcasing the products in this guide showing the  and scan the QR code in the booth. The more booths you scan, the more chances to win. I will give away the headset on Thursday afternoon.

Happy scanning!



# From the Virtual Desk of Bob Cooney



## Welcome to my second VR Arcade Buyer's Guide.

A lot has happened since the last one. We had a global pandemic, the entire industry shut down, and the entire labor market shifted. VR has gone from a promise to a practical technology product. The Oculus (now Meta) App was the #1 download on the app store last Christmas. The Quest 2 is selling faster than the new XBOX. Facebook changed its name to Meta and is investing \$10 billion a year in building the technology that will power the metaverse. They just released the Quest Pro, the first mainstream VR headset designed for work. I am writing this from inside the Quest Pro headset using an app called Immersed VR.

As a global nomad, I rely on a 13-inch MacBook Pro for writing. That little screen can be restrictive. The Quest Pro features mixed reality so I can see my desk and laptop while I type. Immersed lets me have three massive virtual monitors projected in front of me. I can rearrange and resize them, and move them closer or further away. It's crazy cool, like science fiction coming true right now. I'm not sure I can ever go back to typing on a laptop screen. There is some latency, but I imagine with some tweaking I can fix that.

This is still bleeding-edge tech, so please don't throw out your computer monitors and order VR headsets for your staff. But I can safely predict that within five years, we will all work in headsets. Which is hard to imagine for most people. It was not long ago that only some people had color monitors, and only recently LCD screens felt like a luxury.

Virtual reality is the next computing platform. It's inevitable. It is so much better than anything we use today. It's just a function of time. I remember when Intel created the [Open Arcade Architecture](#) in 1997, to get manufacturers to switch from dedicated printed circuit boards. At the AMOA show in 2000, Microsoft [jumped on board](#). Most of the industry scoffed, though everyone was excited that big tech companies were paying attention to the arcade industry.

It's only been 20 years since the first arcade games using PCs began showing up on show floors. Within 10 years, the dedicated PCB was gone from arcades. VR started showing up in arcades in 2017. Factories are getting ready to release their sophomore VR products. How long before all video arcade games are VR games? I predicted five years ago that it would take 10 years. I am sticking with that prediction.

This buyer's guide attempts to educate and inform operators on virtual reality technology and the business models emerging. I highlight the top 10 products worth checking out at the IAAPA Expo in Orlando this year, some new products coming, and more. I intend to make it easier for you to decide what to buy for your business.

If you need personal guidance, my virtual door is always open. I invite you to contact me anytime at [bobc@bobcooney.com](mailto:bobc@bobcooney.com). The only stupid question is the one that goes unasked.

With love and respect,

*Bob*



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# VR is Here to Stay

Virtual reality continues to expand into the location-based entertainment market, and the use of the technology will continue to accelerate.

As our games get more immersive, complex, and expensive, operators need to gain a deeper understanding of the trends, technologies, and business models that will drive our business over the next few years.

I've been working in "immersive entertainment" since 1989 and founded one of the first "successful" laser tag companies. Laser Storm expanded to 230 locations in 30 countries. We were the first to apply storytelling and theming to laser tag, first with our own IP. Galactic Marauders and Circuit Commandoes were created by published science fiction writers. We then launched Stargate and Marvel X-Men Laser Tag, bringing movie-based IP to family entertainment centers way before it became a trend. As far as I can tell, it was the first immersive entertainment concept to scale globally.

Along the way, I've also worked at the intersection of VR and LBE going back to 1992 when Edison Brothers Mall Entertainment brought Virtuality to the US. It was the first VR arcade game and was way ahead of its time.

Since then, I have been fortunate to help launch some of the most successful VR products in the LBE market. I've worked with over 20 virtual reality developers to help them hone their games for different market segments. Some have been more successful than others, and some are just now finding their stride. From Global VR's Vortek featuring Beachhead 2000 in the late 1990s to Zero Latency, Hologate, Virtuix Omni, and VRsenal in this latest wave, I've been more deeply involved in bringing more virtual reality to the LBE market than anyone else.

Thirty years of virtual reality from both an operations and manufacturing perspective gives me a unique view of the market. In this guide, my goal is to translate that experience into clear recommendations so operators can navigate the complexity and confusion of this rapidly evolving market. I see lots of mistakes made by operators in their VR acquisition strategies. Mostly, this is because they see virtual reality as a product category. Nothing could be further from the truth.

## Not All VR is the Same

VR is a display technology. The tracking systems enable players to immerse inside the game so their bodies become the controllers. The best systems create experiences that cannot be replicated in the real world and transport players into alternate realities. That's the power of virtual reality.

Seeing all VR as one product category would be like seeing all games that spit out tickets as the same. But decades of experience have taught us there is nuance in balancing redemption games in an arcade. There are high play-value games like Skee-Ball and Connect 4 Hoops, and money eaters like Big Bass Wheel (Best. Game. Ever.) and Tower of Tickets. And then there are coin pushers, cranes, and self-redemption machines. Any well-designed arcade will have a balance of these games.

Operators are advised to look at virtual reality the same way. Like redemption games, there are many product segments in the VR landscape. A mix of VR is important and that will vary for different locations. For those operators looking to have multiple VR attractions, understanding this balance can be the difference between bringing in lots of new traffic and increasing per-cap spending, versus blowing their capital budgets on the shiny new object.

This guide will break down various products into segments and categories. Categorization is a subjective exercise. My segments might differ from other pundits'. That's OK. If you get the concept of how these products are both different and similar, you're on your way to making smarter decisions.

I reached out via email multiple times to every company listed as a VR supplier on the IAAPA website to get their most recent information. Some companies responded, while others did not. For those that did not respond, I used the best public information I could find. Usually, I used the information they supplied as background. If I missed anyone, I apologize. Let me know and I will include you in the post-IAAPA update.

Many companies are not showing up at IAAPA this year. Some of these are from Russia, Ukraine, and neighboring countries affected by Putin's war. Some have chosen not to exhibit because of the expense, which is getting obscene with inflation and supply chain disruptions. I will include the Russian, Ukrainian, and some other companies and products I think are worthy of investigating in a future update.

## Disclosures and Relationships

I have been widely considered the leading expert in location-based VR since 2016 when I helped launch Zero Latency to the world. Since then, I have worked with more than half of the companies in the LBVR market. Often, that work came down to helping with positioning the products so they could find a niche where their product would resonate with a market need. Sometimes, I would advise them on product development, as many companies didn't understand the needs of the LBE

market. Some of those engagements were for a single day. Some have lasted for years.

My position in the industry has led me to have financial relationships with many companies in this guide. I have been transparent about my financial relationships and incentives for any products listed.

I have tried my best to not let these personal financial incentives impact my reviews. I only enter relationships with companies committed to delivering the best products for our market.

**Seeing all VR as one product category would be like seeing all games that spit out tickets as the same.**

I believe, as do they, that my continued involvement with them is better for the industry. I am also human, and we all have unconscious biases. If you have doubts about any recommendations in this guide, the best solution is to do your research. My goal here is to surface what I believe are the best products in the industry to save you time and money.

The statements here are my informed opinions. They are not the opinions of anyone else who might have helped me edit, print, publish, or distribute this guide. I've traveled almost two million miles in the last six years, reviewing and researching virtual reality attractions. Even though my opinions are well-informed, they are still my opinions. If you disagree with them, I invite you to email me at [vrbob@bobcooney.com](mailto:vrbob@bobcooney.com) and tell me why. I am always interested in other perspectives.

Some companies in this guide are past clients, and some I am working with at the time of this publication. I will disclose my relationship with any business where money has changed hands between us. If there is no mention of it, that means I have never had a commercial relationship with them. I have not listed companies that have been sponsors of my events, or advertisers in this guide as I do not believe that creates a conflict and would become boring and redundant for the reader.

I rarely charge operators for advice on equipment purchases. I am on the Innovation Committee for Funlab, an Australian-based LBE operator, for which I am paid. At the time of this publication that is the only commercial relationship I have with an operator. I am open to more relationships in this area (hint, hint).

I have strategic influencer engagements with suppliers that are performance-based. I advise them on go-to-market strategy including product and content development, distribution, marketing, and sales. I receive compensation based on the total sales of a product in a region. At the date of publication, Spree, VRsenal, and VAR BOX are all on my strategic influencer programs.

I never take a product or company into a strategic influencer program if I do not believe they have the best product for a market segment. If I am recommending a product I get paid for, I will disclose it. It's up to you to decide if my recommendation is biased. I do my best to separate my financial incentives from my recommendations. But I am human, and we all have blind spots. Other relationships, past and present, are revealed in the Directory Section of this guide.

With all of that out of the way, let's go!

## Looking Forward

As the virtual reality ecosystem evolves rapidly, here are challenges and opportunities for our industry in the next year.

### CHALLENGES

#### VR is still expensive.

Often, the simple ROI equation you use for a redemption game will not pencil. You need to look more holistically at the benefits VR can bring to your center.

#### Reliability is a challenge.

The core hardware and software are still based on consumer technologies. Some suppliers have done a better job than others in hardening these products for commercial use. New products this year like VRsenal's Monolith hope to solve the reliability issue. (See the sidebar *VRsenal is the creator of the rugged, fully automated VR arcade game system.*)

#### Parts supply has been unreliable.

Last year, there was no stock of replacement cables for many headsets on the market. This year, the VIVE Pro is end of life. Production of Lighthouse cameras is "temporarily" shut down. Consumer technology lifecycles continue to haunt us.

#### VR can be labor intensive.

In a time when labor costs are skyrocketing, and workers are scarce, developers of multiplayer games have been slow to adapt their solutions to be unattended.

## Looking Forward

Despite those challenges, the future of virtual reality attractions looks bright.

### OPPORTUNITIES

#### Next-gen headsets are better.

HTC Focus 3 has a host of features that meet the demands of the LBE market. The brand-new Pico 4 pushes the envelope on small and light hardware. "Prosumer" headsets are a new segment with the Meta Quest Pro and the rumored Apple headset. This competition will continue to drive innovation.

#### Tracking is more accurate.

The new inside-out tracking systems are getting better at enabling multiplayer experiences over larger areas. The latest update from HTC for VIVE Pro enables tracking individual objects in space.

#### Chips are more powerful.

The onboard XR2 chipset from Qualcomm is enabling native experiences without computers that rival the graphics of gaming consoles from a few years ago.

#### Wi-Fi 6E is here.

Ultrafast, stable multiplayer streaming is a reality, offering high-quality PC experiences with no wires.

#### People love VR.

According to a recent Harris Poll, 23% of Americans have tried VR, and two-thirds say they will "definitely do it again". But with only about 10 million headsets in homes, the only way for most people to play VR is in arcades.

## A New Arcade Business Model

That last point is worth a few more words.

Back in the day, the arcade business exploded due to the popularity of video games. By the early 2000s, gaming consoles took over. The Sony PlayStation, Microsoft XBOX, and Nintendo consoles made gaming more accessible in the home. As the quality of those experiences increased, arcade video games didn't sufficiently differentiate, so our industry moved on to redemption. Operators saw that as a defensible product strategy with entertainment that could not easily be replicated in the consumer market.

As the shift from arcade to consumer was happening there was an opportunity to build a windowing strategy like the Hollywood movie model. I was with a virtual reality startup called Global VR. We had pioneered taking consumer games and porting them into VR arcade games. One of our partners was Electronic Arts. Since virtual reality was a niche product, Global VR licensed Tiger Woods PGA Tour Golf and Madden Football to create standard upright arcade versions of those popular PC gaming titles.

Electronic Arts was interested in the arcade market. The vision I shared with EA was to use arcades to promote their latest games to new audiences. Our developers, who understood arcade game mechanics, would work with them to create more casual versions of their increasingly complex games. EA would play ball. Activision was interested too.

I presented this thesis to the coin-op industry, but alas it was not ready for revenue share. Operators expressed disdain for "the hand in my pocket". Their fear outweighed the existential risk of letting a multi-billion dollar business opportunity evaporate like a summer Las Vegas rain shower. I was labeled a heretic in an [article](#) by Vending Times (which I took as a compliment). The window on that opportunity slammed shut as the consumer market eviscerated the video arcade business.

Since then, redemption has been the savior of many locations and the arcade/FEC industry. Parents may dislike the compulsion, but the allure of an hour of bliss while junior sets his sights on winning a prize is compelling. Sure, quick and intuitive play with a reward is fun but as consumer attitudes increasingly shift towards experiences and minimalism, people want, expect and deserve more.

There is no doubt that VR offers more immersive and memorable experiences. I've seen thousands of people experience VR for the first time. It never gets old. This is why two-thirds of people who have tried it say they "definitely want to do it again". Yet in most of our arcades, we are giving them a taste of VR. There is little to no opportunity to "do it again" because there are only one or two games or rides.

Imagine you're walking in the mall, and someone hands you a sample of a Mrs. Fields cookie. It's all warm and gooey fresh out of the oven. As soon as you taste it, endorphins kick in



# Mixed Reality Playground

The world's first mixed reality playground for up to 6 players. An unattended play arena that combines high-quality video games and physical movement.

*"For me, the best thing about ValoArena is to observe groups and how they have fun together. They compete with each other or cooperate, and they are laughing. People are completely immersed in the game, and they are visibly have fun playing,"*

Steffen Brunckhorst, CEO of FEC Abenteuerland, Germany

- **Game session:** up to 6 players, approx 5 minutes/session
- **Hourly throughput:** 70
- **Monetization:** single tickets, group access, parties
- **Easy operations** with no wearables, no staff needed

As seen at:



SUSTAINABLE EXHIBITOR 2022

demanding more of that delicious sugar and fat combination humans find so irresistible. (I might be projecting.) When you detour to the counter, they say, "sorry, we don't have any more cookies. But if you want to spin this wheel, you could win an ankle bracelet".

When people experience VR, and they've been blown away by the experience, what else are you offering them that keeps them on that high? If you're giving people something they love and want to do again, give them more than a sample.

## But VR Arcade Games Don't Make Enough Money

I am hearing this from operators a lot lately. Once the novelty of their first VR piece wore off, they were left with increased operating costs, reliability issues, and high-priced equipment that took a year or more to "pay off".

The problem is they're comparing the ROI with a virtual reality game or attraction to a more traditional arcade and redemption games. And this presents a false economy.

VR has a different value proposition than other games. It offers unique, and sometimes transcendent, experiences that people get nowhere else. What kid hasn't wanted to battle Darth Vader in a lightsaber battle? Or capture ghosts with their Proton pack? Or paraglide over a rocky landscape? All these are available with VR for your arcade.

Operators need to consider different factors when weighing an investment in virtual reality.

1. Will the experience thrill my customers, leading them to tell their friends, or maybe even return with them more often?
2. Will the game or attraction bring in new revenue to my arcade, or just shift money from other games? How can I use a pricing strategy to encourage the former?
3. How will it impact my brand? Will it elevate my business in the minds of my customers above that of the competition?

Despite the exploding cash box of that last redemption game you bought, it's worth analyzing if you really made money. Or did it just shift revenue from older machines to the new shiny one? Are you getting your money back in five weeks on that new pusher? It can make us feel great when we do the math; like we are financial geniuses. But who are we fooling?

## Can Arcades Become Culturally Relevant Again?

There's another reason to get behind VR. We have another chance to build a new content distribution model for arcade games based on VR technology. With VR headsets still new, there's a real opportunity to position arcades as the place where people experience the best and newest VR games.

Studios are interested. Sony and Hologate are collaborating on a new Ghostbusters Academy VR arena game and an update to their Blitz motion driving platform where players can drive a "prototype" flying ECTO vehicle. Will Sony put that vehicle debut in the upcoming Ghostbusters: Afterlife sequel slated for late 2023? If they do, it will validate this opportunity for our industry.

Developer nDreams, who worked with Zero Latency on Ubisoft on the [Far Cry: Dive Into Insanity](#) free-roam VR game, is also working on the new [Ghostbusters VR consumer](#) game for Quest 2 and the upcoming PlayStation VR2.

And Embracer Group, a US\$5 billion decentralized collection of entrepreneurial game developers and publishers, through their Vertigo Games subsidiary, is heavily invested in the success of VR arcades. Embracer now owns IPs like Tomb Raider, Lord of the Rings, and Deus Ex.

This goes to show that there's a ton of interest from studios to create amazing, immersive experiences for fans of their biggest IP. And there's an opportunity to align these forces to build an efficient content pipeline that leverages the work of building AAA consumer VR games into the arcade business. But this will take some vision, faith, and scale. Operators need to be willing to invest in the future of our industry.

If you approach VR arcade game investment strategically, you can attract new customers to your arcade. You can also increase per-cap spending from a percentage of your existing customers through creative pricing and bundling strategies. And you can move our industry into a place where we play a critical role in the global video game market.

Or we can just keep doing what we've done before. We can take the myopic view and focus on moving credits from one machine to another, while the VR market just uses us as a stepping-stone to a more lucrative consumer market.

But we've all seen that movie, right?



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## OPINION PIECE

# Predicting the Future: The New VR Arcade Ecosystem



The VIVE Focus 3 VR headset is set to become the new standard for location-based VR, and it's going to be a game-changer for operators. It's lighter and more reliable than the original VIVE and VIVE Pro, the two most common arcade headsets. It has fewer parts to break and the sizing dial looks way more reliable. And its ability to reliably stream content over Wi-Fi 6E means no more backpacks and cables.

Focus 3 and VIVE's LBSS will make free-roam VR more accessible. And with solution providers all selling the same hardware, I expect the pricing of turnkey hardware solutions will continue to plummet. It was only five years ago that Zero Latency was selling its custom arena-scale VR system for almost \$700,000. Now the core tech of their Gen 3 system based on Focus 3 probably doesn't cost over 10% of that.

With HTC delivering most of the hardware solutions, the value exchange between suppliers and operators will shift more toward content. This will have a massive impact on the supplier, distributor, and operator ecosystem. The best way to explain how this might play out is to analyze the TV streaming networks.

Cable TV used to rule the world. To deliver content, "networks" like HBO delivered "shows" like Game of Thrones via devices called set-top boxes controlled by "cable providers" like Comcast. The internet and smart televisions broke down that system.

Now, networks deliver their shows through their own apps. These apps are available on various devices like phones, tablets, smart TVs, and devices like Fire Stick or Roku. Each device has its own interface or launcher.

I travel with an Amazon Fire Stick 4K. Wherever I am, I plug it into the TV. I subscribe to Apple TV+, HBO Max, Amazon Prime, Hulu, Disney+, and Paramount. There are a couple of shows on each network I love. The Fire Stick interface is the launcher from which I select the app that carries the show.

## THIS IS HOW I SEE THE VR LANDSCAPE DEVELOPING

Springboard VR and Synthesis offer the launchers.

Game developers will become the studios that offer the apps.

Games are the shows in those apps.

In this scenario, HTC becomes like the TV manufacturer, building the devices we experience the content on. The whole value chain becomes abstracted. Why will this new model work for operators?

When an operator spends \$100K on a VR solution, they're betting that the solution provider will continue to develop the best content. But if someone comes out with a great game they want, the switching cost is prohibitively high because they would need to replace the hardware.

But what happens when all the hardware is the same? Operators can choose the best games for their customers, and the switching cost is nil.

*Imagine a Spree Interactive Network, with the best games for kids and families.*

*A Hologate Network with the best studio-based IP like Ghostbusters.*

*And the Springboard Network with hit games like Arizona Sunshine and After the Fall.*

This new model could prove challenging to developers who have relied on hardware margin. But it will enable game developers to focus on what they do best...create games. And it will enable operators to spend less on hardware, freeing up capital to invest in software.

Operators need to become more comfortable with content subscription models. We now live in a subscription economy. I probably have close to 100 subscriptions in my business. For decades we joked that arcade operators were in the furniture business, because we moved wooden cabinets around. Now operators are in the technology business.

The whole game is changing.

## VR Terms You Need to Know

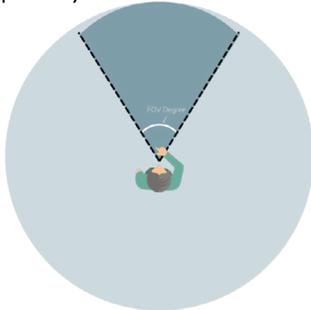
### ALL IN ONE

"All in one" or standalone headsets incorporate the main processor, GPU, and tracking cameras into the headset. No external computers or cables are required. Most of these headsets run a system on a chip from Qualcomm called the XR2. The new Pico 4 and Meta Quest Pro run the XR2+ which has more onboard memory. Apple will release a headset soon that runs some version of their new A or M class chips.

Developers are learning to get more and more out of these chips. While it will be a while before they compete with gaming consoles for graphic quality, the immersion, cost, and convenience more than make up for it.

### FIELD OF VIEW (FOV)

FOV is the amount of the virtual environment a user can see while wearing a device. In VR, the FOV is typically stated as horizontal because that's the primary limitation of the technology right now.



A human FOV is about 220°. The best headsets for LBVR are the Focus 3 and VIVE Pro 2 at 120°, both from HTC.

The Pico Neo 3 and the HP Reverb G2 only offer 98° (not to be confused with the boy band).

The upcoming Pico 4 ups the FOV to 105° and the newly released Meta Quest Pro is 106°. Both of these headsets use what's called Pancake Optics (see description below), which trades off FOV for weight and volume. If that trade-off is worth it is a matter of opinion.

For gaming, FOV is important. Your peripheral view lets you see and react to things in your environment. This increases immersion and depth of gameplay. Weight and volume are important too, especially as younger audiences embrace virtual reality. But for LBE, with most games being short, I would probably choose a wider FOV over pancake lenses for now. Within two years, you won't need to worry as I expect the FOV of pancake optics to continue to widen.

### OPTICS

The most recent version of VR headsets mostly used Fresnel optics, which offer a wider field of view, but increased distortion. Software calibration is used to offset the distortion, taking up valuable processing power.

The newest versions, like the Pico 4 and Quest Pro, use pancake optics, which employs a strategy of bending the light through multiple curved lens layers. This greatly reduces the distance required between the user's eyes and the light source, reducing the size of the headset. Pancake lenses also require brighter light as the lenses are multi-layered. But with battery and processor efficiency gains, these trade-offs are manageable now.

### DPI AND RESOLUTION

Most of us are used to seeing pixel counts represented, like 1920x1080. But for VR, pixel density is much more important. Apple coined the term "Retina Display" when their LCD screens reached a pixel density so the human eye could no longer perceive individual pixels.

Retinal resolution is 60 pixels per degree, or one arc-minute per pixel. Without getting into how the eye works, if you take the horizontal pixels per eye of the headset, and divide by the field of view, the resulting measurement is the pixel density. The closer this gets to 60, the better the resolution.

The original Oculus DK1 had a 640 (horizontal) x 800 (vertical) display per eye, which is a FOV of 90° for a pixel density of just 7. Remember 60 is the gold standard.

Here is the pixel density of the most common headsets on the market today:

VIVE Focus 3 and Pro 2: 2448x2448 per eye @ 120° FOV = 20.4

VIVE Pro: 1440x1600 @ 110° FOV = 13

Oculus Quest 2: 1720x1890 @ 96° = 17.9

Quest Pro: 1800x1920 @ 106° = 17

Pico Neo 3: 1832x1920 @ 98° = 18.7

Pico 4: 2160x2160 @ 105° = 20.5

HP Reverb G2: 2160x2160 @ 98° = 22

3Glasses: 1440x1440 @ 90° = 16

As you can see, there has been significant improvement in resolution over the last couple of years in pixel density and FOV. Ideally, you're looking for a balance between both, with the VIVE Focus 3 and Pro 2 leading in this important category.

Resolution is important to the experience in two key areas. In shooting games, accuracy at distance is critical. The poor resolution of early headsets made it difficult to accurately target characters farther away. Another place resolution matters is in escape games, or anything that requires the player to view small controls or readouts. Driving and flying sims are another place where seeing detail at distance matters.

Considering how much modern VR attractions cost, be aware of headset resolution. Consumers now have 4K televisions at home with pixel densities over 100 at typical viewing distances. And ask about upgrade paths, so as pixel density increases over the coming years, you can stay with the times.

## DEGREES OF FREEDOM (DOF)

DOF is how we talk about headset tracking. There are 3 DOF and 6 DOF headsets. 3 DOF only tracks head rotation while 6 DOF tracks both rotation and movement in space. The difference is significant. If you wear a 3 DOF headset and lean forward, instead of your perspective shifting in the virtual environment, the entire virtual environment moves with you. Cue barfing.

Many Chinese sims have 3 DOF headsets. Never buy a motion simulator with a 3 DOF headset. In fact, there is no reason to buy a 3 DOF headset at all. They should be reserved for media viewing in a seated static position. The HTC VIVE Flow is an example of a modern 3 DOF headset. It's designed for things like meditation. For location-based entertainment, stick to 6 DOF.

## TRACKING

Tracking technology has advanced to where external cameras are almost a thing of the past. Most modern headsets now have tracking built into the device. This "inside-out" tracking is what you will find in the VIVE Focus 3, Quest 2 and Pro, Neo 3 and Pico 4, and the HP Reverb. The only major headset that doesn't include inside-out tracking is the VIVE Pro 2, which still relies on Valve Lighthouse cameras.

Most major free-roam VR experiences have dumped the external cameras for inside-out. Zero Latency, Phenomena, and Hero Zone have all gone with the VIVE Focus 3. Spree is using the Pico Neo 3. Where Virtual Rabbids from LAI uses Lighthouse and the VIVE Pro 2, King Kong of Skull Island went with the HP Reverb and inside-out tracking.

Spree is one of the few companies using hybrid tracking systems. The early versions of inside-out tracking suffered from drift. This is when player positions would become less accurate the longer players were in a virtual arena. Over time it became dangerous. New approaches to tracking, using visual anchors like QR codes or other bold graphic objects on the floor and walls, enable headsets to recalibrate themselves continuously.

One advantage of inside-out is that Lighthouse cameras can interfere with one another. A common problem was that FECs running both Hologate and Rabbids would have to position them far away from each other because they both use Lighthouse cameras.

On the downside, inside-out requires a reasonable amount of light, as the cameras use machine vision vs. the infrared lasers of Lighthouse. Despite those limitations, the cost savings and reliability will favor inside-out tracking.

## HAND TRACKING

One of the most exciting new developments in VR is hand tracking. At first the purview of a company called Leap Motion (now part of UltraLeap), hand tracking tech has seen major investment from all the major headset manufacturers. Meta is in the lead here, but HTC and Pico are hot on their heels.

Hand tracking tech uses onboard cameras to track and replicate hand movements in VR. It promises new modes of user control, potentially eliminating controllers. I have yet to see any great implementations of hand tracking in arcade games, but I expect to see this develop over the next year or two.

## INTERPUPILLARY DISTANCE (IPD)

The distance between the pupils in our eyes varies from person to person. When you get fitted for corrective lenses, the optometrist will measure your IPD to make sure the focal point of the lenses is a perfect fit. Since VR headsets put lenses close to your eyes, the IPD is critical to focus and comfort. Early headsets offered mechanical adjustments to IPD. The latest higher-end HMDs with eye tracking electronically measure and adjust for IPD. This feature will become standard soon.

## EYE AND FACE TRACKING

The newest headsets incorporate the ability to track where your eyeballs move, when you blink and raise your eyebrows, and how your mouth moves. Eye or gaze tracking enables something called "foveated rendering". This is when the HMD intelligently increases the pixel count in the area of focus and decreases the pixels in your peripheral vision. It's a more efficient use of processing power and has little to no impact on the user experience.

Face tracking lets avatars show emotion and other physical cues for a better sense of presence and connection. For now, they're being applied to cartoon avatars. But the improvement in technology will bring photorealistic versions that show real emotion, making that sense of presence lifelike.

## PASS-THROUGH VIDEO

Another exciting area of development is the ability of headset cameras to show real-time video of the physical environment. This capability enables easier transitions from the real to the virtual worlds. Imagine putting on a headset and still seeing everything around you. It enables players to navigate confidently until they are safely inside the play space, at which point the virtual world takes over.

Other use cases will be to continue play on arcade games. Today if a player wants to go again, they need to take off the headset, find their play card or wallet, and then find the payment peripheral before putting the headset back on. All of that takes time and breaks immersion. Soon, games will switch to pass-through mode so players can swipe their cards and get right back into the action.

Finally, mixed reality is coming. Meta showcased this at their Connect conference in October with the Quest Pro. Mixed reality will add virtual objects into the real world. Think laser tag with real walls, but also virtual robots flying around the room. So far only the Quest Pro offers full color, 3D, low-latency pass-through necessary for this capability. The Pico 4 has full-color pass-through, but only one camera so it's not 3D. But I suspect within two years this will be a standard feature of most headsets.



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## OPINION PIECE

# Cut the Crap:

## Competitive Socialization

Everybody wants to create competitive VR games. I get it. Esports is getting lots of attention. And the term “competitive socialization” (worst buzzword ever) is being used to describe the emerging category of social experiences like ax throwing, bowling, mini-golf, and other turn-based leisure activities.

The reason these games are popular is that people can do them while holding a conversation, and a beer. They have a cadence that lets one person take their turn, while the rest of the group continues the conversation. The turns are short so they don't miss out. It's one of the reasons that Connect 4 Hoops is so successful as an arcade game.

But, all competition is not equal. It's important to understand the difference between social competition and hardcore competition like esports, laser tag, or go-kart racing. These activities appeal to a different psychographic segment of your customer base.

Creating compelling, competitive video games is hard. Many companies have tried and failed. Most of the successful VR games in our industry are cooperative. If you want to look at competitive VR games, check out Overkill from VAR BOX at IAAPA booth 202. They've created the best player-vs-player (PvP) VR game I've seen. And they've built an entire esports ecosystem around it.

The best way to create a social experience around VR is with esports tournaments, building a community of players. TrainerTainment and I will launch a program teaching operators how to do it. Watch for an announcement at IAAPA.



**Creating compelling, competitive video games is hard. Many companies have tried and failed.**

## The Major VR Headset Suppliers

### HTC VIVE AND THE FOCUS 3

HTC VIVE was the first headset to dominate the VR arcade space. They were the first major company to support licensing for arcades. Their original VIVE, VIVE Pro, and now VIVE Pro 2, dominate the market for tethered, PC-based VR experiences. But PCVR is expensive. It requires high-end gaming computers, tracking cameras, and headsets with fragile cables.

HTC was a late entrant into the all-in-one game. Their original Focus+ headset, announced in 2017 and released in April 2019, fell flat. The original Oculus Quest was released a month later and essentially ate its lunch.

But I give credit to HTC for staying in the game. They listened to the market, and two years later announced the VIVE Focus 3. Most industry observers immediately considered it the best all-in-one headset on the market.

#### The VIVE Focus 3 features:

- Swappable batteries
- Magnesium alloy frame for strength
- Easily adjustable IPD for comfort
- 3D spatial sound (though I wish it was louder for trade shows)
- Magnetic face and head pads for ease of cleaning
- Wi-Fi 6E for reliable PCVR quality streaming video
- Integrated fans to prevent lens fogging
- Its comfortable AF



Image: Focus 3 Headset

This year, they released their Location-Based Software Suite. You guessed it, it's a set of software and services specifically designed for the LBE market. They are the only company to go to this length to support arcades. LBSS enables:

- Free-roam spaces up to 1000 square meters, (around 10,000 square feet)
- Share one or multiple maps with multiple headsets with one click via Wi-Fi
- Visual Odometry lets players enter a virtual space instantly with no calibration
- Hybrid Mode lets users put on the headset in a staging area and then move seamlessly into the play space
- ArUco markers, like QR codes, let the VIVE Focus 3 instantly calibrate players in the space, eliminating drift

- They also offer engineering support for developers to integrate their attractions

The VIVE Focus 3 and LBSS combination is the biggest leap forward for location-based VR since the original VIVE. It's going to spur a whole new level of innovation, and I can't wait to see what developers do with it. For more information on Focus 3, click [this link](#).

### PICO

In August of 2021, ByteDance, the owner of TikTok and the largest private tech company in the world, acquired headset manufacturer Pico. It was a bold move to challenge Meta in its dominance of the VR market.

At the time of the acquisition, I was unsure if Pico would continue to support B2B and LBE, as the consumer market is way bigger. But they released the Pico 4 for Business at the AWE show in Lisbon, Portugal. And I've spoken to executives at Pico actively recruiting and hiring to build out their B2B channel. So, for now, Pico is still a player in the LBE market.

Pico was one of the first companies to offer engineering-level support for their all-in-one headset, the Pico Neo 3. Companies that tried the Quest quickly pivoted to Pico, giving them significant market share in the LBVR space. Their new Pico 4 is a great headset. It features pancake optics and a color pass-through camera. But it doesn't have removable batteries, and the software support is nowhere near the level of HTC.

### META, THE QUEST 2 AND QUEST PRO

I have been intentionally harsh in my reviews of Facebook, now Meta, and their moves into the VR space. For a company that's exhibited the lack of humanity, now documented by Facebook, to own the future of VR and the metaverse frightens me.

However, I also applaud their research and development in the space. Meta is doing more to advance the technology of virtual reality than any other company in the world. Their work on tracking, optics, photorealistic avatars, and EMG measurement as a human-computer interface, is world-class.

On October 12, 2022, Meta unveiled their new business-class device, the Quest Pro. It is the most complete, sophisticated mass-market headset to date. I ordered one right away, despite the US\$1500 price. I will probably use it a lot. But, it is not an LBE-ready device any more than the Quest 2.

LBE requires a unique set of software and hardware features. Only two companies have shown a sufficient level of engineering support for suppliers to build VR attractions that work for operators: Pico and HTC VIVE. Meta has consistently tried to distance itself from LBE, including explicitly restricting arcade usage in its Terms of Service.

Every company that released an LBE product based on the Quest has moved to another headset. The low price point is alluring. But you get what you pay for. Buyer beware.

# VR for Birthday Parties

## Add Up to \$150K Per Year in Party Revenue

Birthday parties are the lifeblood of any FEC. Over the last couple of years, savvy operators use VR attractions to dramatically increase birthday party revenue.

Beth Standlee from TrainerTainment suggests that FECs limit birthday party offerings to three packages. This eliminates decision paralysis and makes it easy to buy.

Then the key becomes getting people to buy the top package. This is where a VR attraction comes in. Urban Air uses its VR Portal attraction to drive people to their platinum package, increasing the spend by \$7 per child. During a year this adds \$50-150K in revenue.

The best VR attraction for the birthday party market is the Spree Arena. It's specifically designed to appeal to kids 4-12 years old, which according to Party Center Software represents 74% of birthday parties.

Spree's games last about three minutes each and can accommodate 10 players at once. Parties can play together without having to break into smaller groups. An FEC can easily put 100 kids an hour through the system, handling as many birthday parties as you could throw at it.

If you have at least two party rooms, you can host 26 parties in a weekend. Over a year that's 1300 parties with 13,000 kids. At \$7 each that's \$91K of additional potential revenue.

### Birthday Party Kids Make Up Generation Alpha

Gen A is the newest label created by demographers. It includes anyone born after 2010 – making the oldest about 12 years old. They're the first generation born fully in the 21st century. They've never known a time without smartphones, iPads, or online games.

Generation Alpha will learn, play, and interact in new ways than any generation before them. They rely on technology to discover the world.

- They are hyperconnected
- They have digital identities
- They're experts in using new technology
- They have short attention spans
- They spend their time in the metaverse

That last point might be controversial. I am extending the term "metaverse" to include online worlds like Fortnite, Roblox, and Rec Room. Don't get stuck on the terminology.

What's important to recognize is these kids love being in online worlds with their friends. Why not offer them the unique opportunity to experience the ultimate online world playing with their friends on one of the most important days of their year?

Adding virtual reality to your party packages will separate you from your competition, increase your revenue, and most importantly, make a birthday kid's important day more memorable.



**Generation Alpha will learn, play, and interact in completely new ways than any generation before them.**

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# VR Product Reviews and Directory

This year, I am highlighting products that do not require an attendant. This seems to be the biggest consideration for operators as the labor crisis shows no signs of letting up.

Most unattended products have VR headsets built into arcade cabinets. I expect to see more multiplayer unattended products in the next year as the technology improves, and the headwinds of labor continue to make it harder for suppliers to sell attractions with a high employee-to-player ratio.

When I wrote my first guide to VR in 2016, I recommended looking for at least four players for each employee required. That number is higher now. Probably six, and maybe even 10. There are exceptions to this rule. Virtuix Omni Arena is a 4-player system, but the price per game and overall revenue in the right location can be high enough to call for a dedicated staff member. At this moment, it's the only 4-player attended attraction I recommend, though Hologate is making a run at this, especially when combined with Blitz in the Ghostbusters VR Academy.

I will also denote what I believe are games versus attractions. I wrote a blog post on this you can see [here](#).

I will note the winners of the VR Bobble Award. Since 2019, I've been recognizing, people, companies, and products pushing our industry forward. You can see a full list of the winners at this [link](#). And don't forget the Focus 3 Headset Giveaway!

KEY				
				
UNATTENDED	VR BOBBLE AWARD	VIVE FOCUS 3 HEADSET		
				
GIVEAWAY	ATTRACTION			

# Bob's Top 10

Following are the products I most often recommend to operators. To make this list, the product must meet most of these criteria, within the scope of the VR market:

- Provide an outstanding customer experience
- Offer a good return on investment
- Be reliable and easy to operate
- Be proven in the market

## Virtual Rabbids: The Big Ride Ultra HD from LAI Games

BOOTH 831

D-BOX and Ubisoft created the VR arcade game motion ride category when in 2015 they showed a reference design for what would become VR Rabbids: The Big Ride from LAI Games. This unique partnership of a core technology provider like D-BOX and a world-renown game studio Ubisoft was looking for a company to build and sell the first compact, VR roller coaster.

They partnered with LAI Games and made it a triad. LAI added its expertise in the coin-op industry, creating a cabinet that worked for operators like a normal coin-op arcade game. LAI proved to the industry that a VR game could be unattended, which has led to a spurt of innovation. It also had massive curb appeal that was a perfect fit for the FEC market. It's since become the standard by which all VR arcade game cabinets are judged.

LAI unveiled the finished product at IAAPA in 2017. It hit the sweet spot for operators looking for something new. It was the first VR product that lived up to the "unattended" claim. Early adopters were rewarded with crazy high earnings, driven by high price per play. More than one operator told me the story of directing a location to price the ride at \$10, meaning \$5 per person. But when staff priced the ride at \$10 per person, and people still lined up to play, cashboxes exploded.

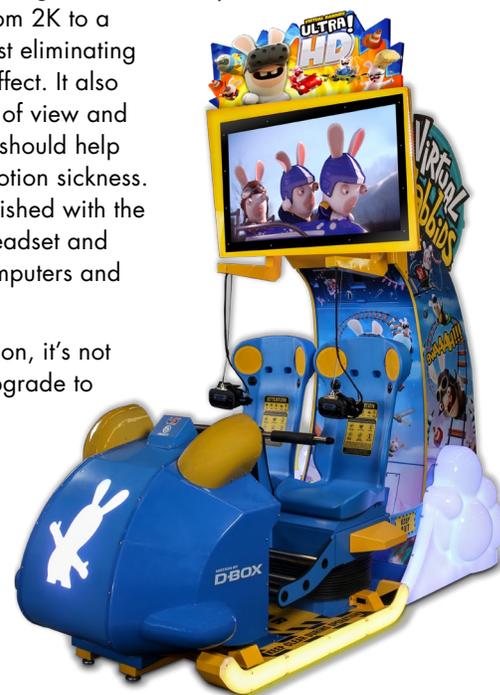
Virtual Rabbids: The Big Ride created the category of VR arcade motion rides. LAI Games took a reference design from Ubisoft and D-BOX at IAAPA 2015 (or maybe it was 2016) and turned it into the first breakout VR hit for FECs since Global VR's VR Vortek in 2000.

Rabbids has over 1000 units installed, which makes it the best-selling VR arcade game based on both locations, and the number of headsets (or player positions).

LAI has shown continued commitment to the platform, having released The Big Expansion Pack in 2019, which increased their library to six experiences, including Space Skirmish, their version of interactive gameplay using head tracking.

Their latest iteration, dubbed Virtual Rabbids: Ultra HD, improves upon the original HTC VIVE system, taking graphics from 2K to a stunning 5K, almost eliminating any screen door effect. It also increases the field of view and frame rate, which should help reduce cases of motion sickness. This is all accomplished with the new VIVE Pro 2 headset and more powerful computers and graphics cards.

As of this publication, it's not available as an upgrade to existing units.



**FOOTPRINT** 50 sq ft

**PLAYERS** 2



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SUSTAINABLE EXHIBITOR 2022

## King Kong of Skull Island: from Raw Thrills

BOOTH 615

When Eugene Jarvis speaks, the industry listens. Raw Thrills' release of King Kong of Skull Island was a resounding endorsement of virtual reality as a display technology.

Raw Thrills has done the best job of integrating hand tracking as a gaming element to a VR motion ride. Players swat at prehistoric bugs, people-eating plants, and even dinosaurs (watch your fingers) while a jeep careens through a prehistoric forest. With Raw Thrills' expertise in gameplay, the Kong VR ride might be the most interactive of the products in this category.

Raw Thrills is playing from strength to strength, building on their blockbuster Jurassic Park arcade game. Ultimately, Kong makes an appearance, but this game is chock full of dinosaurs. And people love dinosaurs.

**FOOTPRINT** 40 sq ft

**PLAYERS** 2



## Monolith from VRsenal

BOOTH 427

### Zombieland VR: Headshot Fever

From award-winning VR studio XR Games, Zombieland VR combines the best of the light gun games of the '90s with the racing games of today. It features the movie characters Tallahassee, Wichita, Columbus, and Little Rock from the blockbuster Sony movies.

In the game, they're teaming up in Silicon Valley to run the Zombieland Invitational, the fastest, most dangerous zombie-killing racecourse ever devised. It's reminiscent of the great arcade games of the past like Time Crisis and House of the Dead. It features cartoon violence and being true to the source material, is layered with humor. The original game was nominated for VR Game of the Year at the 2021 VR Awards. The only negative thing I could read in reviews was it was too much like an arcade game, which might make it the perfect arcade game.

VRsenal is creating a 2-player version of the Monolith for Zombieland VR. Prices will be released before IAAPA, but word is it will be priced aggressively.



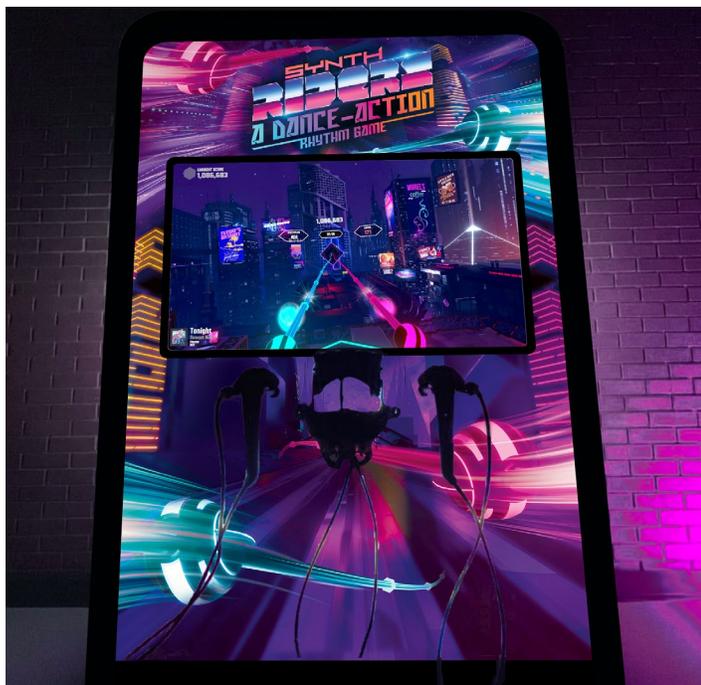
## Synth Riders

VRsenal followed up the amazing Beat Saber game with Rythmatic from Blackwall Labs. Unfortunately, that title didn't live up to its inspirational predecessor. It's an adequate replacement for VR arcades that charge by the hour for unlimited play, but in the competitive FEC arcade world where hundreds of games are battling for every swipe, it just didn't compete.

So VRsenal partnered with Kluge Interactive to bring the highest-rated VR music rhythm game to their new Monolith platform. Synth Riders was the #1 rated game on Metacritic released on PS4 in 2021 – not just VR, but of ANY game. It nails the feeling of riding on the waves of music.

Synth Riders finally presents a worthy follow-up to Beat Saber, a VR arcade game that unfortunately was stolen from us by lawyers and corporate greed, way before its time was up.

**One note:** *Synth Riders is the perfect arcade game for adventure and trampoline parks. When I played an early release at the trampoline park show in Nashville in September, after a 3-minute game my heart rate was up over 150 beats per minute. If you want to offer an arcade game true to the brand spirit of an active entertainment center, there is no better game on the market.*



**FOOTPRINT** 7.5 sq ft

**PLAYERS** 1 or 2



**Disclosure:** *I have worked with VRsenal since 2019 on product strategy, marketing, sales, and content licensing. I was involved in the licensing of Zombieland VR: Headshot Fever and have an ongoing financial incentive from the sales of VRsenal's products.*

## VRSENAL

### VRsenal is the creator of the rugged, fully automated VR arcade game system.

Since 2017, they've been working relentlessly to improve the reliability of VR equipment to meet the needs of the arcade market. Their innovations include the first armored headset and controllers and the first automated retraction system, and they were the first company to figure out how to prevent other Lighthouse tracking cameras from interfering with their system.

David Meyers from HTC VIVE claims that VRsenal's engineering team is the best in the location-based VR industry. And this year, that team has been hard at work trying to fix one of the biggest challenges vexing operators — the dreaded headset HDMI cable failure.

VR headset cables are notoriously fragile. They contain more than 20, hair-thin wires that transmit the signals from the computer. These cables are not designed to stand up to the rigors of an arcade. VRsenal's approach was to house the cable in rugged nylon with military-spec strain reliefs. VRsenal also encased the headset in armor to protect it from physical abuse.

VRsenal then suspended the whole thing from a retraction system to stop it from being dropped. It also had a ratcheting system so kids could not use it as a swing, which they observed in their early testing. While most operators say the system offered the best protection of any VR system, the added complexity and many moving parts came with their own set of problems.

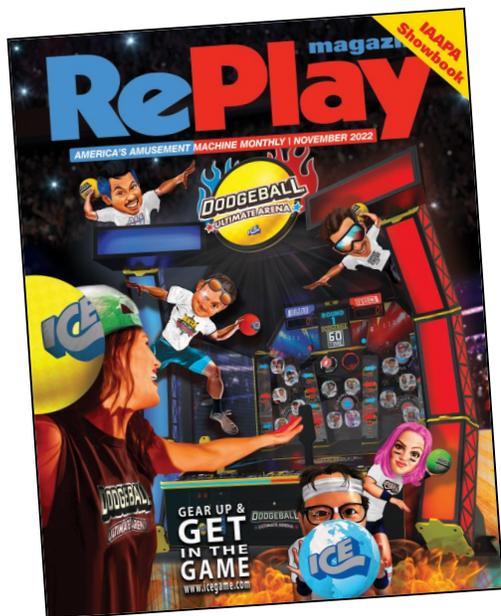
**VRsenal has been testing a new system dubbed the Monolith at trade shows and arcades since June 22. The Monolith has three major changes that reduce cost and complexity and increase durability.**

1. VRsenal replaced the fragile headset cables with the same power cables used on their controllers. These cables have proven to be the most rugged part of the VRsenal system. Proprietary software and circuitry enable the system to transmit all the data necessary with 95% fewer wires, which means the wires can be thicker and more durable.
2. They upgraded the headset to the VIVE Focus 3 with new armor. The Focus 3 is the first headset designed for the arcade market. Combined with VRsenal's armor and a thick rubber floor mat provided with each game, the headset is rugged enough to survive the occasional drop to the floor.
3. The new cables and headset mean VRsenal can eliminate the complex retraction system, further simplifying the system, and removing cost and maintenance issues for operators.

VRsenal is so confident in this system they are offering a two-year warranty on their headset cables and a one-year on all other parts. Considering standard headset cables from other suppliers can fail monthly and cost hundreds of dollars, this system will save operators thousands of dollars in parts, plus labor and lost revenue, each year.



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## Spree Arena from Spree Interactive

BOOTH 3888/3889

Spree Interactive was born Holodeck VR when they were spun out of Fraunhofer IIS, one of the world's leading applied research institutes. Undertaking a rebranding in 2019, with investment from ProSiebenSat.1, the leading entertainment media company in Germany, Spree Interactive is one of the fastest-growing location-based VR companies in the world.

The Spree Arena is the highest throughput VR attraction available today for FECs. With 10 players in 1000 square feet playing family-friendly mini-games, a Spree Arena can handle well over 100 people per hour. This is why chains like Urban Air are rolling it out as a feature in their new urban adventure parks.

Spree Arena is the only VR product that focuses on the 4–12 year old market. According to Party Center Software, 74% of parties are for kids 4–12 years old. These Generation Alphas are the most technologically savvy generation ever. Yet most high-tech attractions are inaccessible to them. Urban Air includes a custom version of the Spree Arena they call the VR Portal in their most expensive admission and birthday party tiers. It's a key to them driving increased spending per family.

Spree's special sauce is creating games that a 4-year-old can play with no instructions, but a parent or grandparent can still find joy in. They have a large library of games like Anteater, where players must swing their giant proboscis noses to catch bugs, to Jump A Cheese, where moon-based mice jump to squish worms and bugs.

They also have STEM content from Galileo, the world's most successful science magazine TV show called Mission to Mars. Developed in partnership with Hollywood SFX house Pixomondo, it takes groups of explorers to the surface of Mars to conduct science experiments. And they're about to release a game based on the Einstein Brain Training games. If you have an FEC with a large birthday party and school group business, Spree is one to look at.



**FOOTPRINT** 387 sq ft or 1076 sq ft

**PLAYERS** 6 or 10



**Disclosure:** I have been on the board of directors of Spree since 2019. I also helped partner Spree with Urban Air in 2020. I have financial incentives tied to the sales of Spree products in certain markets.

## ValoArena from Valo Motion

BOOTH 4879

While not technically virtual reality, there is a new category worth mentioning I'm calling mixed reality playgrounds. The first product I have experienced in this category is from Valo Motion. They're famous for their augmented reality climbing wall, which blew up on YouTube with millions of views back in 2016. They've since built a reputation for active, immersive entertainment focused mainly on adventure and trampoline parks.

The ValoArena is a 6-player, unattended, mixed-reality arena. Players enter a space with hi-resolution projections on opposite walls. Players are tracked in the space, and their actual video images are projected onto the wall into a virtual scene. The player's full-body movement is reflected in their real-life image's position, so their body is a full-motion controller.

This is the first 6-player system I've experienced that is unattended. Valo Motion nailed the customer experience. The system has entry and exit kiosks that support multiple forms of payment and pricing.



Operators can charge per play, for time, or even give out codes that can be input for birthday parties. The system supports debit card systems too. The exit kiosk offers players a downloadable video that can be shared on social networks to capture email addresses.

The ValoArena comes with three games.

- An endless-runner game where players must jump over and dodge obstacles
- A cartoon-themed party battle where players collaborate using their arms as weapons to bat away silly objects
- My favorite is the floor-is-lava game called Groundfall. Players must survive 10 rounds of tiles falling away so they don't drop into the lava. Nearly every parent has played the floor is lava with their kids in the living room. I expect this to spark joy in families.

**FOOTPRINT** 530 sq ft

**PLAYERS** 6



**Disclosure:** I worked with Valo Motion in the early stages of this product's development and leading to the launch. I have no ongoing financial relationship with the company or incentive to promote this product.



## VALO MOTION

### How many amusement products have come from post-doctoral theses?

CEO and founder Raine Kajastila's research to determine if technology can motivate people and teach them skills to participate in sports led to the creation of ValoClimb, the world's first augmented reality climbing experience.

ValoClimb projected graphics onto a climbing wall, encouraging climbers to try new paths and gamifying practice. One of their first social posts on Facebook blew up, garnering eight million views in a weekend. It eventually eclipsed 250 million views and led to a Discover Network story.

The response from the active location-based entertainment market was overwhelming, requiring Valo Motion to grow its headcount to deal with the inquiries. They have not stopped growing since. Now Valo Motion encourages active, healthy entertainment in over 1000 locations across 65 countries recording more than 150,000 plays every day.

One of the biggest segments attracted to ValoClimb was the emerging market of trampoline parks. This led Valo Motion to their second product, ValoJump. By extending their tracking technology and mixed reality to the core activity of jumping on trampolines, they found a perfect bullseye of product/market fit.

Raine's core belief is that people don't get enough activity in their daily life. As an avid outdoor and climbing enthusiast, he, and the team at Valo Motion, create active experiences that empower people to find the joy of movement. By mixing sports, technology, and game mechanics, their products engage generations of kids and adults who increasingly seek fun playing video games online.

Taking a cue from online games, they've built a cloud-based infrastructure to track performance and reliability and deliver new games and experiences to their network. That system has now been integrated into a mobile app for players, fostering a global community and competitions. It's early days, but the notion of Valo Motion games playing a role in the nascent world of location-based esports seems likely.

Their newest product, ValoArena, further extends their reach from trampoline parks into the broader market of family entertainment centers. It stays true to Valo Motion's core of active entertainment but dials down the physicality while increasing social engagement and throughput. Completely unattended, it lets six players run, jump, and play in an immersive environment. No headsets (so it's not technically virtual reality), it's helping define a new category of FEC products, the mixed reality playground.

I expect the ValoArena to pave the way for more unattended, multiplayer virtual and extended reality systems. For now, it's the best example of social, multiplayer, immersive gaming you can get without requiring dedicated staff.



## Hero Zone from Pixnami

BOOTH 3486

Hero Zone is a newcomer to IAAPA Orlando. They launched their first system at IAAPA in Paris in the fall of 2019 as we were about to enter the pandemic. Over the next several years, they sold their system as a software-as-a-service model to VR arcades around the world.

Hero Zone launched a new turnkey solution at IAAPA London in September to rave reviews and commercial success. It takes advantage of the new HTC VIVE Focus 3 to create a small, affordable, free-roam arena for up to 6-players. They offer five very different games. I have played them all and the quality is top-notch. They're fun, well-designed, and easy to learn but hard to master. The shooting games use cartoon violence, so it's appropriate for all ages.

One thing I like about Hero Zone is its friendly licensing model. Operators can choose monthly, annual, or pay-per-play licensing models. There's no minimum term and you can switch models whenever you want. The turnkey price is affordable, and considering that Focus 3 is the new industry standard, switching costs to another software provider will be low (see The New VR Arcade Ecosystem on page 12).



**FOOTPRINT** 400 sq ft

**PLAYERS** 6



**Disclosure:** I worked with Pixnami, the developer of Hero Zone, in the early stages of this product's development in 2018. I currently have no financial relationship with the company or incentive to promote this product.

## HERO ZONE

I first met the team at Hero Zone in the summer of 2019. It was a small team that developed a 4-player, free-roam, compact sci-fi shooter set to '80s themed music. It was cool, different, and fun. But it was just a game. They brought it to IAAPA Europe in Paris later that year in a compact, 4-player package. It was well received, but the pandemic was close behind, stealing any momentum they might have generated.

They continued the development of more games, and a launcher and backend system. In a smart pivot, they licensed their software to indie VR arcade operators. Their licensing model was appealing and low risk. Operators could pay for unlimited use month-to-month with no commitment, or even on a per-play basis with no minimums. Over a couple of years, they found themselves in close to 100 locations.

VR arcade owners like do-it-yourself solutions. They're comfortable building their own PCs and VR rigs. They often construct their own play spaces. And they're passionate about the promotion of virtual reality.

But the VR arcade business is challenging for game developers. They compete for both space and time within the limited capacity of a VR arcade. Free-roam takes up space, and many arcades only offer it on a limited basis for groups and parties. If the owner/operator doesn't actively promote it, the developer makes no money.

But Hero Zone continued to support this market and learned a lot along the way. They first offered their software on the Oculus Quest 2, which appealed to the cash-strapped indie arcade market. But the Quest wasn't enterprise-grade and didn't fit the market requirements of the mainstream amusement market.

But when the HTC VIVE Focus 3 hit the market, they saw an opportunity to move into the bigger, potentially more lucrative FEC market. At IAAPA Europe in London this year I got to check out their new Hero Zone arena. It was a great addition to the emerging compact free-roam VR segment that's rapidly developing.

Built on the VIVE Focus 3, Hero Zone's turnkey arena offers up to 6 players to compete across five titles. The original Cyber Shock game joins four other games. They offer both PvP and co-op games. Their zombie shooter has a hilarious cartoon art style and a great selection of weapons including melee options like a chainsaw and axe.

Hero Zone is a great option for operators interested in free-roam but not ready for a 6-figure commitment into something like Zero Latency. These compact free-roam systems built with Focus 3 offer operators the protection of easily switching to other content providers, as the tech at this point doesn't seem able to be locked down to one software system. It should help remove the paralysis of analysis that can occur when looking at all the different systems. If after digesting this guide, you still need help deciding what to buy, just reach out and ask at [bobc@bobcooney.com](mailto:bobc@bobcooney.com).

## Ghostbusters VR Academy from Hologate

BOOTH 2883/3083

Hologate has one of the most exciting new products in years launching at IAAPA. Ghostbusters VR Academy represents one of the best examples of a movie studio partnership. Sony Pictures successfully rebooted the 37-year-old franchise in 2021 with Ghostbusters: Afterlife. It grossed over \$200 million at the box office, breathing new life into the beloved franchise. There's a sequel slated for the holiday season in 2023.

Ghostbusters VR Academy has two parts. The 4-player Hologate Arena is where recruits train to become Ghostbusters, traveling through beautifully rendered haunted environments. In my demo at IAAPA London, I loved how Hologate employed their bHaptics vest to simulate when the free-floating apparition passes through you. Players use their Proton Packs to trap ghosts, and (spoiler alert) ultimately battle the Stay-Puft Marshmallow Man. Do NOT cross the streams.

The part that excites me most, which I have yet to try, is the new Ghostbusters game designed for the Blitz. The Blitz is an interactive, high-end 6 DOF motion simulator. It originally launched at IAAPA 2019 with a racing game called Hyper GP. This placed the Blitz in the niche premium driving simulator market. But this new title could catapult the Blitz into an entirely new, mass market segment.

In the Ghostbusters VR Academy Blitz game, players will take the wheel of a prototype, jet-powered flying ECTO vehicle. If the environments are anything like the Arena version and live up to Hologate's reputation (they will), then this game will excite Ghostbusters fans young and old. The combination of a 4-player Arena with two or four Blitz units creates a Ghostbusters-themed anchor attraction that should be able to be run with one employee. But no matter how you configure it, the Ghostbusters IP, with a new movie launching next year, should give this product tremendous legs.

## DIVR from Ballast VR

BOOTH 847

Ballast VR offers virtual reality for waterparks and resorts. They created a waterproof VR headset that enables locations to turn waterslides and pools into next-gen attractions. For locations with waterslides, Ballast comes in and measures how guests speed through different sections. They then create custom content that maps guest velocity, and augment that with sensors in locations where data from different riders is inconsistent. This approach maximizes user comfort over a broad and diverse user set.

They have six waterslide content offerings, each adding a level of immersion and entertainment that goes way beyond staring at the inside of a tube. They're also creating custom content to fit specific themes and integrating support for music. And at IAAPA they will showing new interactive gameplay modes, where guests will play for high scores while sliding.



**FOOTPRINT** 136 sq ft or 289 sq ft

**PLAYERS** 2 or 4



**Disclosure:** I helped Hologate with its distribution strategy leading up to and through its initial launch at IAAPA in 2017. I currently have no financial relationship with the company or incentive to promote this product.





## HOLOGATE

If there's one company to credit with the beginning of the VR arcade revolution for family entertainment centers, it's Hologate.

They burst on the scene at IAAPA in 2017 with the first turnkey VR attraction that hit the bullseye for operators. It was compact, efficient, good-looking, and easy to operate. It was even value-priced at the time for a cutting-edge attraction. Their launch games offered great variety, and their anchor title, Zombyte, was the perfect combination of fun and intensity.

Fast forward to 2022, and Hologate has maintained its leadership position in the VR industry. They offer the largest and most diverse library of VR games on any platform with a solid combination of first-party and name-brand third-party titles. Their games cover all the bases, co-op, and player-vs-player shooters, dance rhythm, cooking, escape room, and kids' games. Their IP games range from niche IPs like the Canadian animated TV show Slugterra and the PSVR game Blasters of the Universe to the blockbuster Angry Birds, which generates over a quarter billion dollars in revenue worldwide for Rovio Entertainment.



Hologate is taking its content library to the next level this year. In partnership with Sony Motion Pictures, they're releasing Ghostbusters VR Academy at IAAPA this year. It's a multi-platform experience encompassing both the Hologate Arena and their Blitz motion simulator.

Hologate has taken its success with its Arena and pushed into other product segments, both virtual and physical. The Blitz is a full motion, 6 DOF interactive driving, and flying simulator. By itself, the Blitz was just another product for Hologate. Now with the Ghostbusters license, the combination of the Arena and Blitz creates a world-class attraction for family entertainment centers. And with Sony as a partner, the marketing opportunities are vast. Sony has been the most aggressive of the movie studios working in location-based VR, and Jake Zim, their SVP of virtual reality is a full supporter of the industry. This isn't a money grab by the studio like some other IP licenses.

They're fully committed to location-based virtual reality and have been since the first iteration of Ghostbusters with The VOID.

During the pandemic, Hologate opened a licensed Extended Reality (XR) entertainment center in Germany. Hologate World is a 13,000 square foot immersive playland featuring all the best Hologate products under one roof. It's given them a place to test new concepts before bringing them to market, which is the hallmark of a company dedicated to quality. Early conversations suggested they're testing the concept as a possible franchise.

One product launched at Hologate World we wish we'd get to experience at IAAPA is Hologate X. It's their first entry into the Hyper Reality experience market, pioneered by The VOID in 2017. Hologate X features high-end PCVR streamed to VIVE Focus 3 headsets via Wi-Fi 6E. This is the most cutting-edge implementation of virtual reality you can find anywhere right now. The X arena features full environmental haptics like wind and scent, and THX surround sound. They also promise full-body haptics, likely with the bHaptics vests that are optional in the Arena, and full-body tracking.

The Hologate X incorporates a pre-show, two dedicated suit-up areas to maximize throughput efficiency, and a game arena. The price is yet to be revealed, but considering The VOID was north of a million dollars, it's great to see the leading VR company make a move in this direction. It's important as you evaluate a product like Hologate X, that you understand it offers a premium experience that will support a premium price point. The VOID charge \$40 for a 15-minute experience in hyper-reality. It was a true destination. Their research showed that 70% of their guests at Westfield London had never been to the mall before.

Hologate is also unveiling a dedicated Tower Tag VR Esports attraction called Battlezone. Tower Tag is one of my all-time favorite VR games, and one of the few PvP games I ever recommended. Tower Tag Battlezone will scale from two up to eight players. The hallmark of Tower Tag is its unique locomotion system. It was the first VR game to eliminate motion sickness. Players shoot a line (think the lasso from Wonder Woman) to the tower they want to teleport to. Then they "pull" themselves across the expanse. It's incredibly satisfying and intuitive.

The towers offer protection for players on the narrow platforms. Offering a physically mapped tower adds to the realism and immersion. Tower Tag Battlezone is another shot across the bow of laser tag. And Hologate is also releasing its Esports solution at IAAPA, which promises global and regional esports opportunities, leagues, and tournaments.

Hologate's booth this year will be a hive of activity. If you want to ensure a demo, reach out in advance and make an appointment. It's sure to be crammed.

Waterslides are inherently fun though, so you'll need to be confident that your customer base will pay the extra fee for a VR experience down the slide. With the increasing media around VR and the metaverse, the VRSlide® is something worth considering.

What's more interesting is their DIVR product, which won a VR Bobble in 2019. DIVR takes an ordinary swimming pool and turns it into a VR snorkeling attraction. It uses the weightlessness of floating in the water to create an unparalleled VR experience. Guests don a snorkel and mask, but instead of a see-through lens, it's a waterproof VR headset. You can snorkel through the lost city of Atlantis, or float in space above the International Space Station. The experience of floating in space was transcendent for me.

Ballast also offers a version called DIVR+ with a sensory device that looks and feels like an underwater sea scooter. It mounts to the side of a shallow pool, cavitates, and emits bubbles, creating a real sensation of movement through the water. It's one of the most realistic virtual experiences I've done.

Ballast VR is a unique product for a specific market. It's been installed at Kalahari Resorts, Welk Resorts, and even Space Camp in Alabama. The opportunity of generating additional revenue from an under-monetized amenity like a pool sounds too good to be true. But it's not. Locations report ROI in under six months with DIVR.

**FOOTPRINT** N/A

**PLAYERS** Unlimited



## Omni Arena from Virtuix BOOTH 1828

The Omni Arena was the first VR attraction to embrace esports. Virtuix bundled four Omni "treadmills", which appealed mostly to hobbyists and indie arcade owners, wrapped a well-designed customer and operator experience around it, and created a true VR esports attraction. The Omni requires a player to walk and "run" to move around the environment. The competitive, active nature of the attraction makes it unlike anything else in the market. It's a very physical manifestation of an immersive VR experience.

Virtuix runs weekly and monthly leaderboard tournaments with a \$100K annual prize pool. Each week the top three players split \$700, and 10 monthly winners vie for a piece of \$4700. You can check out the leaderboards at <https://arena.virtuix.com/leaderboards>

Omni Arena offers eight games in total with four being team-based esports titles. These encourage groups to practice together, driving repeat visitation. Virtuix rotates the competition to different games each week and month to keep things interesting for players.

Omni offers players their gameplay video after they're done, which drives email registrations for 70% of players. This is a marketing goldmine for operators. I know a few operators charging as much as \$18 per play, and locations that have embraced all the capabilities of the Omni Arena have seen payback in a year.



**FOOTPRINT** 375 sq ft

**PLAYERS** 4



**Disclosure:** I worked with Virtuix, the developer of Omni Arena, leading up to and through its initial launch at IAAPA in 2018. I currently have no financial relationship with the company or incentive to promote this product.

## VAR BOX from VAR LIVE

BOOTH 4072 / 4271

VAR BOX is a virtual reality esports platform masquerading as a VR arcade game. The company has been running its platform in 10 countries in Asia since 2018 and has over 100K registered players there. VAR BOX won the AMOA Innovator Award at Amusement Expo in March and is a finalist for the Brass Ring Awards at IAAPA this year.

VAR BOX is a compact VR arcade cabinet with four games. Two are casual play: Blockade is a zombie hoard game and Jurassic: New Era is an adventure-based dinosaur shooter. The other two are competitive esports games. Double Tap is a speed and accuracy challenge where players go head-to-head for speed and accuracy. Overkill, a 4-on-4 esports arena shooter, is one of my all-time favorite VR games. Most people I've seen play it say the same thing.

VAR BOX is running esports tournaments offering a \$100,000 annual prize pool. Player performance is tracked on the VAR BOX mobile app, which also features achievements, missions, and skins. The brains behind VAR BOX is Steve Ngu, who created Darts Live, which became the world's largest online-connected location-based darts system.

VAR BOX is a new product, with only a few locations scattered around the US. The prototype units shipped to the States used the Oculus CV1 headset, which is not fit for purpose in a western FEC. The company has recently upgraded to the Pico Neo 3 headset which is one of two headsets I have recommended in the past.

**FOOTPRINT** 10 sq ft

**PLAYERS** 1



**Disclosure:** VAR LIVE, the developer of VAR BOX, approached me in the summer of 2021 and asked for my help bringing the product to the US market. I was initially skeptical, but after researching and ultimately playing the games, I agreed. I continue to advise VAR LIVE on distribution, and marketing strategy, as well as tournament development, and have a financial incentive tied to their sales.

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# Build Community and Recurring Revenue with VR Esports

Esports is exploding. It's expected to grow past \$2 billion in annual revenue by the end of 2022, from only \$500 million in 2016. Professional sports see the future: the NBA, FIFA, Formula 1, and the Dallas Cowboys owner Jerry Jones and Mavericks owner Mark Cuban have invested in teams and leagues. Big brands see the value in esports communities. Luxury brand Mercedes-Benz recently signed on as the global sponsor for DOTA 2, one of the most hardcore esports tours.

But the business models surrounding location-based esports have been sketchy. Investors have built esports arenas, but they haven't found a way to fill them consistently enough to warrant the investment yet. Esports arcades have popped up but getting players to pay for something they can do as well at home for free is a challenge. These businesses rely on food and beverage sales because they're essentially in a low-margin PC rental business.

VR offers the promise of a profitable business model around esports. Since less than 10% of households own a VR headset, the only way for most people to experience VR is at an arcade. And there are now some VR esports games exclusively available to arcades.

But challenges still exist. VR is priced at a premium. Serious players need to hone their skills which requires practice. Omni Arena, one of the early entrants into location-based VR esports published that it has dozens of teams that have played hundreds of games at more than \$10 each. But that still represents a tiny fraction of their total player base.

VAR BOX, a new entrant to the market, offers short intense games that last only 2-4 minutes each on more affordable hardware. Operators are encouraged to charge only \$2-3 a game, which means it's more affordable for players to build their skills.

Both VAR BOX and Omni Arena offer more than \$100K in prizes each year. Players vie for position on the leaderboards with cash paid for the top scores each week or month. Smart operators also run local tournaments, offering smaller prizes to their players so every location has winners every month. Bringing those players in to collect prizes and celebrate together begins the community. As the community builds, live tournaments build excitement, adding spectators to the community.

Once the community hits critical mass, some locations are using subscription models. Players pay a monthly fee of up to \$100 for unlimited play during off-peak times. A few locations in Asia, the birthplace of esports, have 10 teams of four players each paying US\$100 a month. That's \$4000 a month in recurring revenue on a \$60K investment not including casual play revenue.

Esports is all about building community. I have partnered with TrainerTainment to build an esports training program for FECs. We help locations engage staff, recruit teams of players, train community managers, and build their esports communities for recurring revenue. For more information, contact us via this [link](#).



**VR offers the promise of a profitable business model around esports.**

# Worth Checking Out

The following section represents what I consider the best of the rest. These products are all solid and plenty of operators love them. They just are not my personal number one in their category.

## VR Esports Arena from Phenomena

BOOTH 5609

Before I get any further, I need to qualify this product because, despite its name, it is not currently an esports product based on my definition of esports. But that doesn't mean it doesn't deserve recognition or your consideration.



Phenomena was the first to package the VIVE Focus 3 into a compact, turnkey, free-roam VR arena. I believe their use of the term esports is aspirational, and they may develop the features necessary to support that name. I hope they do because the intersection of esports and VR makes sense for FECs.

Phenomena's VR Arena is well-designed for operators. It's easy to set up and can be run with one attendant. Based on the VIVE Focus 3, it's built on a reliable tech stack. It is currently available with three games.

The game most locations run is called Versus. They describe it as VR laser tag. It's a player-vs-player free-for-all where people walk around the space, hiding behind virtual walls and shooting each other. Each player has two controllers, one for the gun and one is a small shield. It's a very simple game and easy to learn.

Phenomena also offer a game called Enter the Duat which is a co-op archery adventure set in Ancient Egypt. And they just released a new game called Space Dance Harmony. It's a multiplayer music rhythm game in the spirit of Microsoft's Let's Dance on XBOX, where players mimic the moves of a virtual dance instructor. The success of music games depends greatly on the available catalog, and I don't have any info on that yet.

The company reports they will also be previewing their new player app that gives operators rankings, leaderboards, and streaming capabilities. Phenomena, like all the players building esports games, is working to help drive repeat traffic back into FECs.

**FOOTPRINT** 400 sq ft – 640 sq ft

**PLAYERS** 4 – 8



## VR Agent from Sega

BOOTH 1010

Sega's first entry into VR is a product developed by 3MindWave, an arcade game developer in Hong Kong. They're the company behind Sega's driver ATV Slam, so they have experience making games for our industry. VR Agent is a rail shooter brought to VR. Think Time Crisis. The innovation of VR Agent is they integrated a gun into the headset. At first glance, I couldn't see how that would work for the player. But once I played it, I realized its genius. Expect to see companies copying this feature because it just works.

Since players always look where they are shooting (unless they're John Wick), having the gun integrated with the headset makes sense. And it eliminates several problems with unattended VR arcade cabinets. First, it makes it easy to onboard people. Players don't have to juggle the gun and the headset. It also reduces the number of cables which eliminates tangling, which can be a point of failure.

The game features shooting realistic human characters, but there's a family friendly setting that replaces the human targets with androids. Regardless, it's not as intense or violent as most of the zombie shooters out there. It's also among the first VR games to offer a continuation feature, which lets players continue to swipe their way deeper into the game. VR Agent is worth checking out.

**FOOTPRINT** 91.5 sq ft

**PLAYERS** 2





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## Storm from Triotech

BOOTH 5818/5424

Storm is a VR motion simulator. It sits firmly behind VR Rabbids: The Big Ride and King Kong of Skull Island in the race for VR ride market share. Press reports suggest there are about 200 units out there, compared to over 1000 for VR Rabbids.

Storm took the original Rabbids concept and added hand tracking to gamify the experience, (a feature that the other two quickly copied). For purists though, it isn't really a "video game" but more like grabbing the brass ring on the carousel. It added a level of spectacle for people watching, however, which according to operators increased revenue.

Triotech launched Storm in 2019 and plans to unveil its first software update at IAAPA.



**FOOTPRINT** 50 sq ft

**PLAYERS** 2



## Creative Works

BOOTH 4072/4271

Creative Works entered the VR market with a bang, launching Hologate to record-breaking sales at IAAPA Orlando in 2017. Since then, they've evolved into a multi-line distributor of VR products. While they no longer exclusively promote Hologate, they've added multiple other exclusive product lines to their growing catalog.

### SPONGEBOB SQUAREPANTS VR: DYNAMIC DUO

Hold on to your crabby patties! SpongeBob VR is a full-motion, interactive VR simulator from MajorMega, the team that created Hyperdeck.

It's a 2-player co-op experience. The driver plays Patrick, and the other is SpongeBob, who shoots crabby patties.



It's a fun, whimsical adventure for kids of all ages. It's a big piece for a 2-player game, but the motion and curb appeal is dramatic. It's worth a look.

**FOOTPRINT** 56 sq ft

**PLAYERS** 2



### FOOTBALL FRENZY

In a collaboration of VRstudios, VRsenal, and Creative Works, Football Frenzy is getting some real buzz leading to the show. It's been on test and early reports are positive.



The first game from this partnership yielded Hoops Madness (getting a software update I am told), which ran into the reality that there are already a lot of basketball games in arcades. Football is the most popular sport in America, and there are just not a lot of football games.

Football Frenzy will be offered in the new VRsenal Monolith cabinet that VRstudios is calling the Fury Solo. And it's available exclusively from Creative Works. It's great to see this industry's collaborations, where companies focus on their core competencies, partnering up to bring better products to market for operators.

**FOOTPRINT** 7.5 sq ft

**PLAYERS** 1



### HYPERDECK

Hyperdeck is a high-end 4-player hyper-reality attraction from MajorMega, distributed exclusively in partnership with Creative Works.

It offers buttery smooth motion, wind and heat effects, and a unique haptic controller. It has two games with a third coming to IAAPA this year. It recently added the capability for people in the queue to interact with the players to increase excitement and reduce perceived wait times. Hyperdeck is best for tourist locations or high-end FECs.



**FOOTPRINT** 360 sq ft

**PLAYERS** 4



**LIMITLESS VR**

Creative Works, which is the largest design and build firm of laser tag arenas, introduced Limitless VR at the 2021 IAAPA Expo in Orlando. It was designed to be placed into a laser tag arena, giving operators two attractions in a single space. Creative Works scans the existing arena using photogrammetry, then maps the virtual environment onto the existing walls and barriers. Players don Focus 3 headsets, and suddenly, they're playing a VR version of laser tag.



This year, they are introducing a new format to break Limitless out of the box and create a stand-alone, open air free-ram attraction. The new format comes in 8-player and 16-player sizes, creating a true high-capacity free-ram product. And they are using tracking technology that lets them place props in the playing area, so it's more like a true arena and less of an empty space. If it works, and I expect it will, this will be the laser shot heard around the world.

It's early days for this tech, but this is one of the most exciting developments in the VR space. For operators who are early adopters and want to be at the forefront of the next big thing, Limitless is one to watch.

**FOOTPRINT** 800 sq ft or 2400 sq ft

**PLAYERS** 8 or 16



**Arkadia from Inowize**

**BOOTH 3473**

Arkadia from Inowize is probably the closest competitor to Hologate in the tethered, multiplayer VR arena segment of the market. But that's like being the second largest brewery in the world behind AB Inbev (makers of Budweiser and almost every other beer you might drink).

Arkadia has two unique benefits you want to consider. First, it can handle six players at a time, which increases the capacity by 50% over other products in this category, letting you handle larger groups of friends and families.

They also let two games run simultaneously. So, if you have a group of two players, the attendant can start that game, and then run another group of up to four immediately without

waiting for the first group to play. This amps up the throughput. In a time with labor constraints, these two factors set Arkadia apart.

Inowize has quietly built its library up to seven games, with an eighth coming at IAAPA. Most of their games are player-vs-player. For my opinion on that, see the sidebar *Cut the Crap: Competitive Socialization*.



**FOOTPRINT** 225 – 285 sq ft

**PLAYERS** 4 – 6



**ParadropVR Pod from Frontgrid**

**BOOTH 1060**

Frontgrid is back with a follow-up to its original ParadropVR paragliding simulator. Dubbed The Pod, it's smaller, prettier, and provides a lower cost than the original. It's also designed to be unattended with a touchscreen payment kiosk. The ParadropVR Pod offers solo or multiplayer experiences so up to four players can fly with their friends.

The competitive elements let people track their improvement whilst participating in a global online league. I recently rode a prototype of the new ParadropVR Pod at Adventure Parc Snowdonia in Wales. It required an element of skill to navigate through the courses.





## PARADROP VR

paradropVR

Created by FRONTGRID

Matt Wells is a badass. A former British army paratrooper, mountain climber, expedition leader, and entrepreneur with a passion for helping people experience adventure. After his career jumping out of perfectly good airplanes for the military, he founded a youth expedition company leading over 40,000 people on more than 3000 adventures.

So what does a badass like Matt do for an encore? How about starting the first paragliding simulator company using virtual reality, so millions of people can experience what only a handful can do in real life? What it feels like to fly on the wind.

Frontgrid is Matt's vehicle to deliver these experiences. His first version of ParadropVR was a modest success. It was big, a spectacle, and expensive, finding its way into mostly high-profile tourist venues like the Dubai Mall, Resorts World Genting, and iFly Indoor Skydiving in England. Matt knew if the masses were to experience what it's like to paraglide, he needed a more accessible solution suitable for a wider range of venues.

Matt and his team went back to the drawing board to create something smaller, less expensive, and easier to operate. The result is the ParadropVR Pod.

You might not know that paragliding is both a recreation and a competitive sport. Every year, pilots gather for the Paragliding World Cup (PWC), a global competition that visits five or six different locations worldwide. Flyers navigate a course with specific turn points and a finish line. Whoever finishes the fastest, or flies the farthest if nobody finishes, is the winner.

### ParadropVR takes this competition to the masses. No need to spend thousands of dollars learning to paraglide.

Now anyone can swipe their card and take to the skies thanks to the magic of virtual reality and a unique simulator system. Players choose their course from a growing selection, sit in the harness, grab the control lines, and take to the skies.

To foster this spirit of competition, ParadropVR created the Parasphere League, an online leaderboard showing the top 10 scores from around the world. The mobile-optimised website provides persistent profiles so players can build points and skills over time. Matt envisions ParadropVR as part of the nascent but growing location-based VR esports movement. To that end, there are a series of avatars that players can adopt, which show up in-game, and online.

The Valley Drop puts flyers in a lush river valley, Cave Drop makes them explore different caverns, and Alpine Drop elevates them to the top of the world around snowy mountains. There's also a Fly Snowdon series where flyers can explore Snowdonia National Park in Wales. And the newly released Neon Nights series offers three night-flights with bright colors that will captivate anyone's imagination. ParadropVR is an extreme VR simulator in a compact package, that is accessible to almost any family entertainment center. It's sure to thrill people of all ages and become a real centerpiece in an arcade.

I had more fun when I was offered the chance to "fly" over a digital recreation of Snowdonia National Park. It was a blissful experience and enhanced my perspective of the terrain of the area.

ParadropVR is a spectacle to watch, and the new one is smaller and easier to install and run than the original. For locations looking for something dramatic, or adventure parks that want to use VR to create exciting experiences in a compact space, it's one to watch.

**FOOTPRINT** 56 sq ft – 224 sq ft

**PLAYERS** 1 – 4



## Rilix Coaster

BOOTH 838

Rilix is a company that's making a name for itself with an inexpensive VR simulator ride. Think Typhoon meets VR. (Which makes me wonder why Triotech didn't make Typhoon VR instead of something like LAI's Rabbids. They would have killed it.) Rilix has a large library of fantasy coasters and is promoting a forthcoming SpongeBob coaster.

Rilix is priced well below the other products in this category. The cost savings come because there's no motion base. They use butt-kickers in the seat to create vibration, and as wind creates a sense of speed I'm less prone to motion sickness on the Rilix simulator than on the real motion rides.

If you're looking for a low-cost, reliable VR coaster, Rilix Coaster is worth checking out.

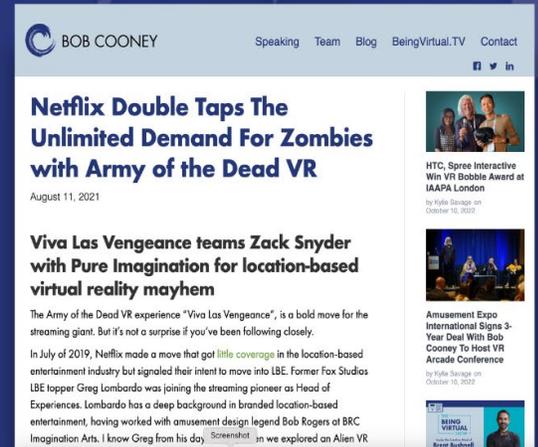
**FOOTPRINT** 24 sq ft

**PLAYERS** 2



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## OPINION PIECE

# Cut the Crap: VR Laser Tag

As the founder of Laser Storm in 1989, I know a thing or two about laser tag. While I am not an expert on the state-of-the-art of laser tag hardware, I know a fair bit about laser tag arena design and game mechanics.

I'm not a fan of this new wave of compact, free-roam, player-vs-player (PvP) VR games. Replicating laser tag with VR in a small space doesn't make sense. How many laser tag arenas have you seen that were less than 1000 square feet? There's a reason for that.

Developers have taken the approach of copying laser tag without using the advantages that VR offers. Things like making the space feel bigger than it is with elevators, moving platforms, and teleportation. Or using weapon variation, power-ups, and other things found in consumer PvP games.

VEX has come close with their VEX Arena games. But at last report they were still using Antilatency's tracking system, which is obsolete and of questionable reliability. The best version of VR laser tag I've played was a game called Polygon from Neurogaming in Russia. It was a 1000 square foot play space that felt like a 3-story 5000 square foot arena.

That was in 2017, and nobody has come close to that since. Unfortunately, Polygon was tied to an expensive optical tracking system and didn't make financial sense.

**Laser tag is still the most popular anchor attraction in the FEC world.**



Laser tag is still the most popular anchor attraction in the FEC world. The capacity and throughput of laser tag is still beyond any VR attraction. But with the HTC VIVE Focus 3 and their LBSS system enabling arenas as big as 10,000 square feet, I believe it's only a matter of time before VR headsets replace laser tag vests and guns. We are already seeing a ratio of one VR player per 100 square feet in these compact arenas, so we know we can scale capacity to 30 players in a 3000 square foot space.

Creative Works, the leading laser tag arena builder, has been increasing its catalog of VR products since helping launch Hologate in 2017. Last year, they showcased an early prototype of a Focus 3 laser tag hybrid system called Limitless VR. They're using photogrammetry to map virtual environments over existing physical barrier walls in an arena. This is a great first step, despite the occlusion challenges of tracking 30 players in an environment with lots of walls. Operators are not ready to throw away their arenas and embrace VR laser tag so Limitless VR offers the opportunity to run VR games in addition to laser tag, for now.

This year I expect to see Limitless VR as a new standalone option to replace laser tag. Creative Works has been working on getting 18 players in a 2400 square foot space. Look for it at the IAAPA show.

The financial advantage of virtual reality over laser tag is considerable. Arenas can be re-themed at the push of a button. One arena design can scale over hundreds or thousands of locations. And with platforms like Unreal Engine, these environments can be photorealistic.

The cost of a turnkey laser tag arena can easily be over \$300K, while 30 VIVE Focus 3 headsets cost only \$45K. And imagine a world with no cables.

This cost delta makes the shift inevitable. My guess is that 2023 will be the year we see the transition begin, and within five years, I predict the end of laser tag as we know it.

Long live VR laser tag.

# Too New to Review

These products are all worth checking out at IAAPA if you have time. They're brand new, and I could not review them yet. I will supplement this guide after the show once I've given them a go.

## Vertigo Games/SpringboardVR

BOOTH 4086

Vertigo Games is the biggest player in the VR arcade space you might never have heard of. They're part of the Embracer Group, a global conglomerate of entrepreneurial businesses in the gaming and entertainment industry. Their launch title for the LBE market, Arizona Sunshine, has been the top-played VR arcade game since mid-2018. In 2021 they acquired SpringboardVR, the most popular software for managing multiple room-scale VR stations in arcades. They've been quietly building capability and presence in the VR arcade market and are primed to become a significant force in the industry.

They will be showcasing their hit titles in a free-roam space streaming via Wi-Fi 6E on the VIVE Focus 3. Check out the new After The Fall, which looks amazing. It's a cinematic, post-apocalypse zombie thriller with some of the best graphics we've seen on VR.

**FOOTPRINT** 400 sq ft

**PLAYERS** 4



## Tower Tag Battlezone from Hologate

BOOTH 2883/3083

Tower Tag is a team-based competitive VR game that's been around since 2017. When it launched it was a groundbreaking combination of VR, laser tag, and esports. Over the years Tower Tag has been operated in VR arcades and bundled with systems like Hologate, Spree Arena and even dedicated, retail storefronts. Now Hologate is building a Tower Tag turnkey solution launching at IAAPA.

Tower Tag 'Battlezone' is a modular system ranging from 120 square feet for two players up to 450 square feet for 8 players. It mixes the feeling of free-roam in a compact space. Combined with Hologate's forthcoming Esports platform is another entry into the growing VR esports category.

**FOOTPRINT** 120 – 450 sq ft

**PLAYERS** 2 – 8



## QBIX from Inowize

BOOTH 3473

While it's not VR, I must mention the newest product, QBIX from Inowize. It's an unattended 6-player immersive attraction in a compact 13x13-foot space. Players pay and select their game at a kiosk, then enter the space with controllers tracked by VIVE Lighthouse trackers. There, 270° of three-dimensional interactive scenes are projected on the walls. From this perspective, they're trying to recreate the immersion of VR without the headsets.

Since the human peripheral vision is 220°, the immersion will probably be decent. Players must shoot targets that appear on the screen. Each player will have a different color crosshair, so they know where they are aiming. It's like Triotech's XD theater but players stand and may move freely.

Inowize integrates environmental haptics into the experiences. A motion floor and wind add to the immersion. They are launching one game at IAAPA and will add another soon. Considering the challenges the industry has faced with headset reliability and cable supply chain, I expect this product will capture the attention of operators looking for something different, but less bleeding edge.

I love the concept, but as this is a brand-new product, the proof will be in the playing.

**FOOTPRINT** 169 sq ft

**PLAYERS** 6



**NEW**  
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# Other Products at IAAPA

## Vex Solutions/Amusement Products

BOOTH 4869

VEX will be at IAAPA this year with their third different distributor. Their products have been handed off from Shaffer Distributing to Amusement Products, the company that used to distribute Arkadia for Inowize. VEX offers two products. The VEX Arena, which is a compact free-roam arcade, and the VEX Adventure, which is like a mashup of The VOID and Hologate.

**FOOTPRINT** 169 sq ft

**PLAYERS** 6



## Birdly from Somniacs

BOOTH 806

Birdly is a product that amazed people when it first showed up on the scene in 2017. In the early days of VR, it sustained a high-ticket price point, but the experience hasn't evolved much. It's a single-player system that requires an attendant, so the economics have always been sketchy. It's done well at VR-centric locations like Two Bit Circus in Los Angeles.

**FOOTPRINT** 81 sq ft

**PLAYERS** 1



## Talon Simulations

BOOTH 2989

Talon is a talented company that specializes in motion simulation. Their claim to fame was their involvement in the Dave and Buster's simulator project. They launched a driving and flight simulator in 2019 called the Vortex, that's been installed at some FECs and VR arcades. It comes bundled with 30 experiences including the Asseto Corsa driving simulator and the NoLimits 2 roller coaster sim.

**FOOTPRINT** 28 sq ft

**PLAYERS** 1



## DOF Robotics

BOOTH 2686/2286

These guys are showing up at IAAPA with extreme simulators that look amazing. The Hurricane is a 4-seat, 6 DOF simulator with 360° rotation.

They also have a Monster Jam Grave Digger, which is a full-size replica of the famous monster truck on a 6 DOF simulator base

In my experience, unfortunately, their content doesn't match up with their hardware. This is a shame because their hardware is amazing and relatively affordable.

**FOOTPRINT** 375 sq ft

**PLAYERS** 6



## VR Bumper Cars from Eurogames and I.E. Park

BOOTH 3829/2669

Eurogames is the leading manufacturer of battery-powered bumper cars in Europe. I.E. Park holds the same position in electric floor pickup bumper cars. Both companies are partnered with Spree Interactive to develop VR bumper cars, under license from VR Coaster. This is an emerging market segment and I expect as the technology and gameplay get figured out and throughput increases, we will see great products emerge.

**FOOTPRINT** 1000 sq ft & 330-1000 sq ft

**PLAYERS** 4 & 20



## Megaverse from Exploring Digital

BOOTH 258

Exploring Digital is a subsidiary of Exploring, Inc, one of the leading design firms in the amusement industry. They've worked on LBE installations ranging from Great Wolf Lodge to Harry Potter. Megaverse is their first attempt at building a turnkey virtual reality attraction. They're combining the VIVE Focus 3 with environmental haptics.

Exploring Digital owns a virtual production facility, and if they figure out how to build interactive content and games, could become a player in the market.

**FOOTPRINT** 600 sq ft

**PLAYERS** 6



## Animalive

BOOTH 4288

I wanted to call out a company called Animalive. They specialize in animated avatars for theme parks and FECs.

One operator can control live, animated avatars on video screens across a location's network. Imagine a birthday child talking to a live, animated character and being led in a rousing rendition of Happy Birthday by a dinosaur, an alien, or your branded mascot. The technology to do this is improving and more accessible every year. Companies that embrace this customized interactive group experience will instantly distance themselves from their competition, and create memorable, and sharable, guest experiences.

**FOOTPRINT** N/A

**PLAYERS** Unlimited

## Boxblaster

BOOTH 1886

Boxblaster is exhibiting its compact, 4-player VR arena. They'll be showcasing two new games added to their library in 2022. A family-friendly game called Hamster Invasion, and a competitive sci-fi shooter, Sling Battle. One of the unique features of Boxblaster is their ability to customize the colors of the attraction to meet the brand requirements of any location.

**FOOTPRINT** 225 sq ft

**PLAYERS** 4



# Seen in the Wild

Some new games have not been officially announced but have been seen on location tests. Some of this information comes from updates by **Arcade Heroes**. No guarantee they will be on the IAAPA show floor.

## **MotoGP VR Raw Thrills**

BOOTH 615

Raw Thrills is taking a second shot at virtual reality after their successful King Kong of Skull Island. MotoGP would be the second motorcycle racing simulator after the UNIS Technology MotoGP was released in 2019. Motorcycle racing games lend themselves well to VR, as looking back over the shoulder is a core racing mechanic.

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## **LAI Games Asphalt 9 VR**

BOOTH 831

Another big factory looking at launching their second VR piece is LAI Games, maker of VR Rabbids: The Big Ride. Asphalt 9 VR is a follow-up to the arcade version of Asphalt 9 Legends, a wildly popular mobile game. The VR version has been spotted in Asia and confirmed for a 2023 release by LAI.

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## **Sailor's Quest VR Booth**

BOOTH 1306

UNIS Technology makes up the trifecta of arcade factories working on their second VR. It's a 2-player, seated shooter. Guns are mounted on turrets and the game sits on a motion base. It offers wind and vibration. From the photos I have seen, it looks fantastic. Word is that UNIS is moving to the HP Reverb headset and offering an upgrade to the same for their Ultra Moto VR games.

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## **Hologate: X**

BOOTH 2883/3083

Hologate X is a hyper-reality experience for next-generation cinematic adventures. It's a 20x20 foot arena for four players featuring THX surround sound, wind and heat effects, and full-body haptics. Hologate X features the VIVE Focus 3 with wireless streaming for PCVR quality with no wires or backpacks. Hologate is offering a launch title called Sigvried: Escape Valhalla.



# Hitting the Bullseye

Most of the products recommended in this guide would work for larger family entertainment centers. But when I work with manufacturers, I preach product/market fit. I look for a market niche where their solution solves a unique problem in a specific market. In this section are the products that have nailed their market fit for specific types of businesses.

## By Location Type

### VR Arcades

#### FOR THE DIY BUSINESS OWNER

Hero Zone .....	BOOTH 3486	Pg 28
Springboard .....	BOOTH 4086	Pg 42
VR Esports Arena .....	BOOTH 5609	Pg 35

### Trampolines

#### HEALTHY | ACTIVE | FITNESS | FUN

Spree Arena .....	BOOTH 3888/3889	Pg 26
ValoArena .....	BOOTH 4879	Pg 26
Virtuix Omni .....	BOOTH 1828	Pg 31
VRsenal A: Synth Riders .....	BOOTH 427	Pg 24
Limitless VR .....	BOOTH 4072/4271	Pg 38

## Adventure Parks

### EXTREME | THRILLING | ACTIVE

Ballast	BOOTH 847	Pg 29
Birdly	BOOTH 806	Pg 44
Hyperdeck	BOOTH 4072 / 4271	Pg 37
Kong	BOOTH 615	Pg 23
Paradrop VR	BOOTH 1060	Pg 38
Rabbids	BOOTH 831	Pg 21
Storm	BOOTH 5818/5424	Pg 37

## Karting Centers

### TEENS AND ADULTS | COMPETITIVE

Arkadia	BOOTH 3473	Pg 38
Football Frenzy	BOOTH 4072/4271	Pg 37
Hero Zone	BOOTH 3486	Pg 28
Hologate — Tower Tag	BOOTH 2883/3083	Pg 29
Limitless VR	BOOTH 4072/4271	Pg 38
VAR BOX	BOOTH 202	Pg 32
Virtuix Omni	BOOTH 1828	Pg 31
VR Esports Arena	BOOTH 5609	Pg 35

## Movie Theaters

### SIMPLE TO OPERATE | MAJOR IP

Hologate: Ghostbusters VR Academy	BOOTH 2883/3083	Pg 29
Kong	BOOTH 615	Pg 23
Rabbids	BOOTH 831	Pg 21

SpongeBob	BOOTH 4072/4271	Pg 37
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VRsenal B: Zombieland	BOOTH 427	Pg 23
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## Bowling Centers

### ACTIVE | COMPETITIVE

Arkadia	BOOTH 3473	Pg 38
Football Frenzy	BOOTH 4072/4271	Pg 37
Hero Zone	BOOTH 3486	Pg 28
Hologate — Tower Tag	BOOTH 2883/3083	Pg 44
Limitless VR	BOOTH 4072/4271	Pg 38

ValoArena	BOOTH 4879	Pg 26
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VAR BOX	BOOTH 202	Pg 32
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Virtuix Omni	BOOTH 1828	Pg 31
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VR Esports Arena	BOOTH 5609	Pg 35
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VRsenal A: Synth Riders	BOOTH 427	Pg 24
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## Waterparks and Resorts

### WET | WILD | EXTREME

Ballast	BOOTH 847	Pg 29
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Bumper Cars	BOOTH 3829/2669	Pg 44
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DOF Robotics	BOOTH 2686/2286	Pg 44
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Hologate Blitz	BOOTH 2883/3083	Pg 29
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Hologate: Ghostbusters VR Academy	BOOTH 2883/3083	Pg 29
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Hyperdeck	BOOTH 4072/4271	Pg 37
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Kong	BOOTH 615	Pg 23
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# VR for Trampoline and Adventure Parks

It was only in 2004 that the first indoor trampoline park opened under the SkyZone banner. Since then, over 600 parks have opened in the United States alone.

As the market matured, parks evolved from pure trampolining into more varied active entertainment centers. Adding ropes courses, zip lines, ninja courses, and parkour elements meant a rebrand from "trampoline park" was in order. Urban Air, one of the fastest-growing franchises in America, is now calling itself an Adventure Park. Even the association rebranded as the International Adventure and Trampoline Park Association this year.

While Valo Motion had early success in this market with their augmented and mixed reality attractions, it's only in the last couple of years we have seen virtual reality headsets show up in trampoline and adventure parks.

The first large-scale deployment of VR in an adventure park was probably Hologate, which was installed in dozens of Urban Air locations. More recently Urban Air has been rolling out their VR Portal, a custom version of the Spree Arena free-roam system. Ranging from 600–1000 square feet, it allows up to 10 players to run, jump, and play together in fun, casual games. Spree has perfected the design of multiplayer, social VR games for kids.

Trampoline and adventure parks focus on active, healthy, and even thrilling entertainment. While Spree is getting a foothold in the market for the core, younger crowd, some other implementations of VR appeal to the more extreme customers.

ParadropVR from Frontgrid offers the opportunity to safely experience the thrill of paragliding. Using a custom control system, riders sit in a harness and use hand controls to steer, rise and drop. ParadropVR features three environments to fly in, including natural and fantasy landscapes. Like paragliding, ParadropVR offers competitive experiences, with an app coming that will let flyers track their stats and scores.

JUMP from Limitless Flight offers the most extreme VR experience yet. It's a virtual wingsuit flying experience. Flyers don a real wingsuit, with the "parachute" pack hiding a mounting connection to a massive hydraulic harness system. Flyers "jump" out of a simulated airplane. The combination of wind turbines and the harness put them in a flying position that's as close to wingsuiting as you can get without risking your life.

JUMP is still in prototype mode, but if you're interested, I can make an intro to the founders.

On the tamer end of the spectrum is VRsenal's Synth Riders. It's a VR music rhythm game where players must use their arms and legs to duck, sway, and "ride" waves of light in sync with the music. VR games have proven to be excellent modes of exercise, with the Virtual Reality Fitness Institute even ranking VR games based on their equivalent to traditional exercise. They rate Synth Riders as equivalent to an elliptical machine. I can validate that as my Apple Watch showed my heart rate up to 150 beats per minute after a 3-minute round at the recent IATP Expo.

Virtuix Omni Arena is another active VR platform that gets your heart pumping. Using their proprietary VR treadmill system, the Omni Arena pits four players in competitive esports games. It's the closest you can get to running in VR.

Trampoline and adventure parks have plenty of options to utilize virtual reality now. While it will be at least a few more years before we have headsets that could be implemented on trampolines, for operators willing to explore the technology, IAAPA will have plenty on offer for them.

**Trampoline and adventure parks focus on active, healthy and even thrilling entertainment.**



Paradrop VR	BOOTH 1060	Pg 38
Rabbids	BOOTH 831	Pg 21
SpongeBob	BOOTH 4072/4271	Pg 37
Storm	BOOTH 5818/5424	Pg 37

## Shopping Malls

### HIGH THROUGHPUT | CASUAL | IMPULSE PURCHASE

Birdly	BOOTH 806	Pg 44
Bumper Cars	BOOTH 3829/2669	Pg 44
Spree Arena	BOOTH 3888/3889	Pg 26
Rilix	BOOTH 838	Pg 39

# By Product Categories

## Compact Free-roam

Hero Zone	BOOTH 3486	Pg 28
Spree Arena	BOOTH 3888/3889	Pg 26
Springboard	BOOTH 4086	Pg 42
ValoArena	BOOTH 4879	Pg 26
Vex	BOOTH 4869	Pg 44
VR Esports Arena	BOOTH 5609	Pg 35

## Arcade Cabinets

Football Frenzy	BOOTH 4072/4271	Pg 37
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VAR BOX	BOOTH 202	Pg 32
VRsenal A: Synth Riders	BOOTH 427	Pg 24
VRsenal B: Zombieland	BOOTH 427	Pg 23
VR Agent	BOOTH 1010	Pg 35

## Simulators

Birdly	BOOTH 806	Pg 44
DOF Robotics	BOOTH 2686/2286	Pg 44
Hologate Blitz	BOOTH 2883/3083	Pg 29
Hyperdeck	BOOTH 4072/4271	Pg 37
Kong	BOOTH 615	Pg 23
Paradrop VR	BOOTH 1060	Pg 38
Rabbids	BOOTH 831	Pg 21
Rilix	BOOTH 838	Pg 39
SpongeBob	BOOTH 4072/4271	Pg 37
Storm	BOOTH 5818/5424	Pg 37
Talon	BOOTH 2989	Pg 44
<b>Esports</b>		
Hologate Tower Tag	BOOTH 2883/3083	Pg 42
Limitless VR	BOOTH 4072/4271	Pg 38
VAR BOX	BOOTH 202	Pg 32
Virtuix Omni	BOOTH 1828	Pg 31
VR Esports Arena	BOOTH 5609	Pg 35



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