## **VIRTUAL BOY WORKS**

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©2018-2021 Jeremy Parish Published by Limited Run Games With support by Retronauts and all Video Works patrons Printed by Millennium Print Group CE box illustration: Bill Mudron

gameboyworks.com patreon.com/gamespite

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Based on the YouTube video series Virtual Boy Works.

Games provided for photography by **Chris Kohler**, from his personal collection.









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# VIRTUAL BOY



Developer: Nintendo R&D1 Manufacturer: Nintendo Release: July 1995 [JP] Aug. 1995 [U.S.] VUE-USA t would be redundant to say Nintendo's Game Boy had grown long in the tooth by 1995. The system had *arrived* feeling long in the tooth six years earlier. Running on tech that was a decade old by the time of its debut, and saddled with an almost comically poor LCD screen, the Game Boy felt indescribably underpowered compared to Atari's contemporary portable competitor, the Lynx. The subsequent arrival of the impressive Game Gear and TurboExpress did Nintendo's handheld no favors.

The genius of Game Boy came in the way Nintendo parlayed its apparent weaknesses into selling points. It ran on a dated chip set? Sure, but that tech was well-documented and familiar to developers, who were able to squeeze maximum performance from the system. And because the system's processor had been around for so long, it was available for manufacturers to source for cheap—and it had been refined to become incredibly energy efficient. Likewise, the murky LCD screen was cheap and sipped battery juice.

Game Boy, in a word, kind of sucked, but the tradeoff was that it was cheap, battery-friendly, and easy to develop for. The system outlasted the vastly more powerful Lynx... the vastly more powerful Game Gear... the vastly more powerful TurboExpress... and thanks to

its vast library of hits, it also wiped the floor with direct competitors like the Mega Duck and Gamate. Still, by 1995, Game Boy's star was on the wane. The system's release schedule had dropped off precipitously—1995 would see barely a third as many new Game Boy titles as appeared in 1992.

Game Boy remained gaming's handheld market leader, but only by default. No one seemed especially interested in launching a serious new competitor into that space, perhaps because all eyes were on the new 32-bit CD-ROM console war at the time. Whatever the case, Nintendo could tell the writing was on the wall for Game Boy. The time had come for a successor—and who better to lead the charge than the father of portable gaming himself, Gunpei Yokoi?

At the time, Yokoi was preparing to retire from Nintendo after more than three incredibly fruitful decades with the company. His career there had begun as a humble assembly line worker in the '60s and ultimately led him to become the architect of some of the corporation's greatest hits: Light gun toys, novelty amusements, remote control cars, game devices based on LCD watch tech, and of course the Game Boy. It seemed fitting for Yokoi's swan song for his Nintendo tenure to be a final entry in the Game & Watch/Game Boy lineage. Ever fascinated with the potential of gadgetry to create new forms of play, Yokoi seized upon a LED-based personal 3D screen concept called Private Eye as the basis of Game Boy's successor.

Private Eye wasn't a virtual reality system; the limitations of game and computer tech in the '90s made the idea of an affordable consumer-level VR rig prohibitively expensive. Its creators originally envisioned it as such, but the available processors simply lacked the horsepower to keep up with head-tracking and resulted in severe nausea. Still, it served as a sort of halfway step between traditional game visuals and the dream of Johnny Mnemonic and Lawnmower Man. It was a self-contained system capable of delivering stereoscopic 3D visuals in a far more convincing fashion than the gimmicky Magic Eye posters that were so ubiquitous in the '90s.

Developed by a Cambridge-based company called Reflection, Private Eye seemed a perfect match for Yokoi's visionary approach to tech. It would be an affordable way to deliver an interesting new concept in video games, opening the door to new forms of gaming at a price most consumers could stomach. It would also

bring to the table a materially different gaming experience than Game Boy had offered. Single-screen 3D didn't exist at the time, and Nintendo obviously couldn't ship a portable system that required players to carry special glasses with them everywhere. Rather than being a handheld device, the Game Boy's 3D follow-up would instead be head-mounted. The console would use a dual display, with two small screens, one dedicated to each eye.

This concept translated into a complex setup, but the principle behind it was sound. Players would wear a headset that projected slightly different images for each eye, and the disparity between the two images would result in a sort of parallax effect: Objects occupying the same space on each lens would read as foreground elements. On the other hand, objects appearing in different locations on the screens would read as elements in the background; the greater the distance between an object's position on the two screens, the further into the distance it would appear to be. In short, the viewer's brain would reconcile the disparity between the two images projected by Virtual Boy by combining them into a single, three-dimensional composite.

The Private Eye took an unusual approach to creating its 3D graphics. Rather than operating with the liquid-crystal displays most portable systems had used to date, or trying to cram tiny Vectrex-style CRTs into its portable unit, it instead "painted" visuals on the viewer's eye by reflecting a light-emitting diode array at the viewer off a rapidly spinning mirror. The luminous LEDs addressed one of the Game Boy's fundamental shortcomings, a lack of screen lighting.

Unfortunately, it also introduced new challenges and limitations. The Game Boy had used a monochromatic grey screen for reasons of cost management, but it could have incorporated a backlit color LCD as the Lynx and Game Gear did. The Private Eye tech Nintendo hoped to adopt, on the other hand, was effectively limited to monochromatic red-on-black. This amounted to a matter of simple logistics. At the time, only one color of LEDs was widely available on the market: Red. Though blue, white, and green LEDs would enter the mainstream within a few years, they weren't available in the volume at the prices Nintendo needed for a mass-market product. Nevertheless, these restrictions still lined up with Yokoi's vision. Whereas competitors like Sega had passed on the Private Eye tech due to its monochromatic limitations—it would have made a poor follow-up to the full-color Game Gear—it would make for a logical successor to Game Boy's four-shade monochrome. Thus: The Virtual Boy.

Indeed, Virtual Boy's raw video feed amounts, in essence, to a souped-up version of Game Boy. The system delivers graphics in monochromatic four-tone greyscale. Removed from the console's luminous, mirror-based display, Virtual Boy's graphics reveal it as a high-resolution Game Boy capable of pushing far more, and far larger, sprites, as well as rendering multiple background layers. The Virtual Boy only gains its trademark red tones in the final step of the graphical rendering process, where grey sprites are projected via red LEDs onto the internal mirrors, which splash them across the player's retinas.

If anything, Virtual Boy's visuals underplayed the system's real capabilities. It

#### THE VIRTUAL BOY TIMELINE

**1985:** Engineer Allen Becker conceives the Scanned Linear Array imaging system, in which a single column of LEDs is reflected by an oscillating mirror to create a compact, personal, portable video system.

**1986:** Becker completes his first prototype with the backing of tech luminaries like Nicholas Negroponte and establishes a company, Reflection Technology Inc., to sell the concept.

**Fall 1988:** The SLA is miniaturized into a working prototype called the Private Eye, which receives massive accolades from press and technologists alike at the Fall COMDEX trade show.

**1990:** Reflection converts a Private Eye prototype for use in video gaming, creating a stereoscopic imaging system that hints at virtual reality applications.

1991: Having failed to garner interest from giants like Sega, Mattel, and Hasbro, Reflections' Steve Lipsey meets with Nintendo at their Kyoto offices and catches the attention of the company's most respected and tenured gadget and hardware creator, Game & Watch/Game Boy designer Gunpei Yokoi.

1991: Sega designer Tetsuya Mizuguchi experiments with augmented reality tech applications for the Game Gear handheld. It never comes to fruition; nor do similar ventures from Atari and other game companies. However, the writing is on the wall: 3D and virtual reality would be part of gaming's future.

1992: Around this time, Yokoi postpones his planned retirement to lead Nintendo's R&D1 division through development on the VR32 project, a wearable VR headset based on the Private Eye tech.

**1992-1994:** Technological, cultural, and corporate realities shape the evolution of VR32. It becomes a tabletop personal viewer rather than a head-mounted device. High-level directives mandate that its launch content focus away from traditional Nintendo properties in order to prevent undermining the appeal of the upcoming Nintendo 64 console and key titles like *Super Mario 64*.

**Nov. 1994:** VR32, now Virtual Boy, makes its public debut at Spaceworld, Nintendo's annual trade show. The Dec. 1994 issue of *Nintendo Power* ships, offering a first look at the system for American fans.

**Jan. 1995:** Virtual Boy makes its first playable U.S. appearance at the Winter Consumer Electronics Show. While it generates some positive buzz, the overall reception seems muted.

**July 1995:** Japanese launch. Titles available on day one include *Mario's Tennis*, *Galactic Pinball*, *Teleroboxer*, *Panic Bomber*, and *Red Alarm*.

Aug. 1996: U.S. launch, with hardware priced at \$179. Day-one titles include *Mario's Tennis, Galactic Pinball, Teleroboxer*, and *Red Alarm*. In Japan, *Golf, Virtual Pro Yakyuu '95, Vertical Force*, and *V-Tetris* debut.

Sept. 1996: Japan sees Mario Clash, Space Squash, and Jack Bros. In the U.S., Virtual League Baseball ships.

Oct. 1995: In the U.S., the hardware's price is reduced to \$159. Japanese releases include *Virtual Fishing* and *Innsmouth no Yakata*. In the U.S., *Mario Clash* and *Jack Bros.* make their debut.

Nov. 1995: No Japanese releases. In the U.S., Golf and Virtual Boy Wario Land arrive.

**Dec. 1995:** The Virtual Boy is officially discontinued in Japan, with *Virtual Lab, Virtual Boy Wario Land, SD Gundam: Dimension Force, Space Invaders Virtual Collection*, and *Virtual Bowling* being hustled out the door as quickly as possible. The U.S. receives *Panic Bomber* and *Vertical Force* for the holidays, and *Waterworld* ships exclusively in the U.S.

**Feb. 1996:** *Nester's Funky Bowling* hits the U.S. In Japan, *Pokémon* debuts for Game Boy, giving Nintendo's business a critical lifeline to recover from the Virtual Boy's poor performance.

March 1996: The final licensed Virtual Boy release, 3-D Tetris, hits U.S. retail.

May 1996: The system's price is reduced to \$99 in the U.S., with further cuts to come.

June 1996: Nintendo 64 launches in Japan.

July 1996: Gunpei Yokoi's final Nintendo project, Game Boy Pocket, debuts. It reinvigorates Game Boy.

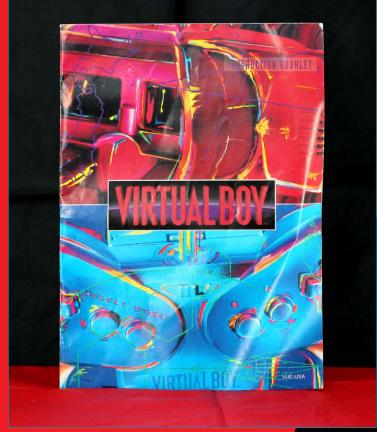
Aug. 1996: Virtual Boy officially discontinued in the U.S. Yokoi formally resigns from Nintendo.

Sept. 1996: Nintendo 64 launches in the U.S.

Oct. 1997: Yokoi is unexpectedly killed in a highway accident.

March 1999: Yokoi's final creation, the WonderSwan handheld, debuts exclusively in Japan.





Why grey? Virtual Boy is famous for its red-on-black graphics, created by light reflected from an array of mirrors. In person, Virtual Boy visuals are crisp, bold, luminous... and decidedly not the monochromatic grey seen in the screenshots throughout this book. So why the discrepancy? Consumer video capture compression algorithms primarily discard information from the red color channel. It's imperceptible to the human eye in live footage that displays the full color spectrum, but it's disastrous for images that feature only red. To maintain image quality, I had to capture footage in greyscale rather than in red. Why not colorize the images for print? Unfortunately, print is a subtractive process—color dyes work by absorbing all colors of light beside the one you see—which mean colorizing images for print makes them look darker. Yet Virtual Boy graphics become brighter the redder they appear. So, I've instead opted to depict screenshoots the way the internal imaging system feeds them into the LED array. What you see here isn't a faithful recreation of the Virtual Boy's visuals, but it's an accurate depiction of the internal video feed:

Games the way their creators designed them.

had the raw horsepower to generate far more impressive graphics than souped-up Game Boy sprites. The console ran on a 32-bit NEC chip that, rumor has it, was sourced from the processors left over once NEC's impressive but unpopular

PC-FX console/tower hybrid failed. Virtual Boy had the underlying power to create visuals with immense detail and rich color depth. However, the experience was constrained by the limitations imposed by the display's LED array. Also, unlike any other console before it, Virtual Boy output two similar but distinct video signals all at once.

This boiled down to a weird compromise of a system. Virtual Boy boasted 3D visuals, yet the hardware wasn't quite powerful enough to render proper 3D polygons at a respectable framerate. Virtual Boy launched well after Sega's Saturn and Sony's PlayStation, so players had

already sorted out their opinions of what "virtual" and "3D" should mean. Virtual Boy wasn't it. It didn't help that, according to a 2015 Fast Company profile by Benj Edwards, Virtual Boy suffered a proverbial death by a thousand papercuts during the course of its development.

Head-tracking didn't work, so the promise of a "virtual" experience rang false. Meanwhile, according to Yokoi collaborator Takefumi Makino,

the notion of sticking a computer processor directly in front of players' faces made some people at Nintendo nervous about the potential dangers of electromagnetic radiation. To play it safe, the manufacturer shielded the system's chip with a

VIRTUAL BOY

**PRESENTED** 

**A STRANGE** 

COMPROMISE:

3D VISUALS

ON HARDWARE

LACKING THE

POWER TO RENDER

CONVINCING

**POLYGONS** 

metal plate, which curtailed the risk of cancer but also added considerable weight to the head-mounted device—enough that it would no longer really work as a head-mounted device, making Virtual Boy bulky enough that it needed to rest on a table stand to be usable.

So: It couldn't do true 3D, it wasn't actual virtual reality, and it wasn't a genuine portable system. Oh, and the LED screen tech tended to cause headaches with extended play. Nintendo ultimately recommended players take breaks every 15 to 30 minutes to avoid eyestrain, and encouraged parents not to let young children use the system

at all lest it permanently damage their still indevelopment eyesight.

Reactions to Virtual Boy mutated from "intrigued" to "wary" over the course of its prelaunch hype cycle. The press naturally wanted to be excited by this new Game Boy follow-up, but as more news (and eventually hands-on demos) emerged, it was hard for anyone to see Virtual Boy as a potential hit. Even Nintendo could stumble.

In fairness, all the old guard console makers found themselves fumbling in the mid '90s. Sega frittered away the strength and goodwill generated by its Genesis console with the powerful but cumbersome (and overpriced) Sega CD, the disastrous 32X, and the baffling U.S. Saturn launch. Atari disintegrated itself with the Jaguar and its CD add-on. Even newcomer platforms like 3DO and CDi had melted down by 1995. Perhaps inevitably, then, Nintendo joined the ranks of the fallen: The launch date of Project Reality (aka Ultra 64, aka Nintendo 64) slipped to mid-1996, giving upstart PlayStation a healthy lead in the home console race. Then Virtual Boy debuted and promptly made things even worse.

It was a short-lived disaster. Virtual Boy didn't even survive long enough to make its way into Europe. The system shipped in July 1995 in Japan and a month later in the U.S. By the end of December that same year, the Japanese business had drawn to a close with the quiet release of Athena's Virtual Bowling. Three months later, the final American title—3-D Tetris—hit stores. And that was it. The Virtual Boy was gone, with consoles eventually marked down to \$20 (10% of their original retail price) to clear them out of stores, right alongside unwanted Sega 32X units. Games still in development at the time of the console's demise were unceremoniously canceled regardless of their completeness or worthiness. Some have been salvaged and unofficially released in various states of completion, but many of Virtual Boy's most enticing future titles were lost forever.

Thus Virtual Boy picked up a miserable reputation during its lifetime, and the stigma of its failure has continued to linger over the system to

this day, nearly 25 years later. But is that really fair?

Well, yes and no. Virtual Boy, as a system, was a shambles: Complicated, expensive, cumbersome, poorly supported, painful to use. Its focus and design shifted so much in development that it no longer resembled an actual Game Boy successor. Ironically, this ultimately worked out to Nintendo's advantage. The success of *Pokémon* and the Game Boy Pocket system the following year allowed the company to quietly pretend like the Virtual Boy never happened. That may have worked out well for Nintendo, but it's hard to see it as a win for players.

But there's light even in Virtual Boy's darkness. The system itself may have been a dud, yet the prolific designers in Nintendo's R&D1 division supported it with some great games. Third-party support turned out reasonably well given the short life of the system, too. Ultimately, a good half of the Virtual Boy's library clocks in somewhere between "quite solid" to "genuinely excellent." The rest is mundane to awful, but a 50% success rate is unusually high. There's something to be said for a quick, merciful death.

Hidden within the Virtual Boy's tiny lineup are some overlooked classics as well as a couple of of famous greats. The console fared surprisingly well when it came to rendering timeworn concepts and genres; its one traditional platformer, Wario Land, is a masterpiece. Its top-down shooter, Vertical Force, is flawed but interesting. Its puzzle games—especially Panic Bomber and V-Tetris—are fine examples of the form, and the latter contains a mode that plays unlike any other interpretation of Tetris. Even its mundane titles, like Golf and Galactic Pinball, turned out well. And it gave us the very first Mario

sports title, which blossomed into a franchise in its own right.

Meanwhile, there's something to be said for Virtual Boy's forays into more cutting-edge titles, too. Its 3D visualization was a neat novelty, but the system's controller—which included two D-pads—predicted the dual-analog future of console interfaces and resulted in a handful of games that feel a few years ahead of their time in hindsight. Star Fox-alike Red Alarm isn't great, but its behind-the-ship aerial combat uses the right D-pad to tweak camera angles in a way that you only saw in PC games like Descent in 1995. Meanwhile, weirdo Shin Megami Tensei spin-off Jack Bros. presaged the indie twin-stick shooter genre a decade early... despite the lack of control sticks.

There's a lot of great stuff to be found on Virtual Boy if you take the time to investigate. In fairness, though, the process of investigation has grown increasingly difficult over time. Nintendo didn't exactly make a ton of these things. Virtual Boy didn't even sell a million units worldwide, which makes it by far the scarcest post-Famicom Nintendo system. Likewise, many of its games were released in vanishingly small quantities. There are fewer English-language copies of Jack Bros. in the world than there are gamers who discovered the Shin Megami Tensei series years later and want to explore the full franchise. And for true collector's sticker shock, there's always the four insanely rare third-party Japan-only releases from December 1995.

It also doesn't help that what systems do exist could stand to be made of sterner stuff; the display has a tendency to fail as it ages thanks to an engineering decision to tack down critical cables with a glue that brittles and breaks with age.

And, again, Nintendo has been all too willing to wipe Virtual Boy out of its own history. Aside from occasional cheeky references in games like *Animal Crossing* and *Tomodachi Life*, you'd almost never know the thing existed. There's never been a Virtual Boy Virtual Console or any sort of compilation of games, despite the fact that the 3DS was practically born to play host to such a thing. Not a single Virtual Boy release has been remade for another system, either. In hindsight, the platform feels like a sort of video game Galapagos: Small, self-contained, cut off from the rest of the medium, it's full of evolutionary dead-ends and strange one-offs that feel completely unknown to the larger world.

Virtual Boy's library deserves better. But, on the other hand, its poor visibility means there's a lot of pleasure to be found in making your way through the console's library. For every disastrous *Virtual League Baseball* or *Virtual Lab* to be found on the console, there's also an excellent *Jack Bros.* or *Virtual Bowling*. Even if Nintendo never finds room in its collective corporate heart to repatriate Virtual Boy into the annals of its self-curated history, the system and its games are out there, simply begging to be explored by curious gamers eager to see what happens when gaming's most enduring company stumbles over its good intentions.

As for Gunpei Yokoi, he did retire from Nintendo after Virtual Boy—but not until he had delivered the marvelous Game Boy Pocket as a final statement before venturing off to create a proper next-generation Game Boy in the form of Bandai's WonderSwan. It's not a happy ending, since Yokoi's life was cut short in a traffic accident the following year, but neither it is wholly a tragic finale, either. V



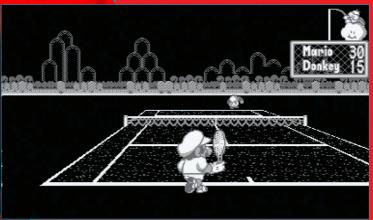




### **MARIO'S TENNIS**

### DOUBLES VISION





Developer: Nintendo / TOSE
Publisher: Nintendo
Genre: Sports
Release: July 1995 [JP] Aug. 1995 [U.S.]
VUE-VMTJ

irtual Boy came fourth among Nintendo's consoles, chronologically speaking, following in the wake of the NES, Game Boy, and Super NES. Like every one of the Nintendo systems that preceded it, Virtual Boy's debut was marked by the presence of the company's two American launch-window constants.

First, you had tennis. Nintendo's first stab at the sport, simply called "Tennis," had showed up at the NES's U.S. launch [see NES Works Vol. I]. (A modified two-player version of that NES cart appeared in arcades as the very first Vs. Unisystem release a year and a half before the NES launch, meaning it technically preceded the system it had been created for.) In 1989, a portable variant on the NES game showed up at Game Boy's U.S. launch. And, finally, Nintendo licensed Tonkin House's Super Tennis as a first-party release for the Super NES's launch window.

As the second Nintendo console constant, of course, you have Mario. A faithful (if truncated) rendition of *Donkey Kong* served as Famicom's killer app in 1983; *Super Mario Bros.* ushered the NES into the U.S.; *Super Mario Land* introduced gamers to the Game Boy; and *Super Mario World* shipped with the Super NES.

Tennis and Mario: The two reliable tentpoles of a new Nintendo

console. Fittingly, then, Nintendo decided to simply combine the two for Virtual Boy. Not only was the console's American packin title an adaptation of tennis, it's also a Mario game: *Mario's Tennis*.

This pack-in title may not seem remarkable in the here-and-now, when more then half a dozen tennis games featuring Mario exist, but the idea had novelty value back in 1995. This Virtual Boy release marked the first time the Mario gang had appeared in a tennis title as a Super Mario Kart-style selectable character pantheon. Now, Mario was no stranger to sports by this point in his career; he had worked as line judge in the NES and Game Boy titles, golfed like the duffer he is back at the NES launch, and even refereed for Mike Tyson in *Punch-Out!!*. Even so, prior to Mario's Tennis, he had only actively gotten his white-gloved hands dirty in the gentleman's sports of golf (in Golf and NES Open Tournament Golf) and racing (in both Mario Kart and the Japan-only 3D Hot

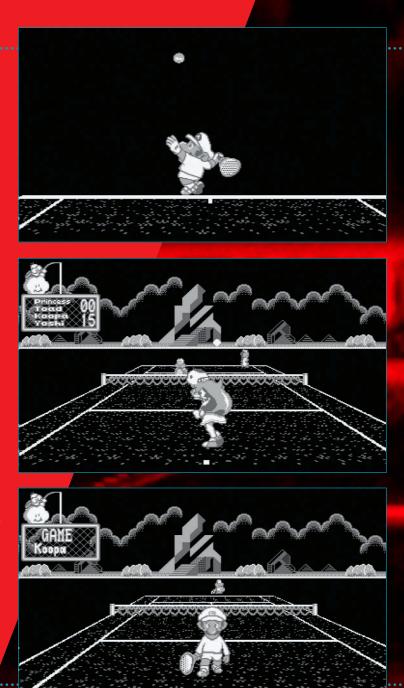
Rally for Famicom Disk System). Here, he hits the courts with seven friends and rivals for both singles and doubles matches. Nintendo appears to have liked the results. In addition to shipping as the pack-in title for the American Virtual Boy, Mario's Tennis kicked off an ongoing franchise of Mario-centric tennis titles.

Mario's Tennis made perfect sense as a pack-in for Virtual Boy. Besides featuring the company's best-selling mascot character, it also presented players with a concise mission statement for the platform itself. After all, tennis is arguably the single oldest video game genre in existence. Physicist William Higginbotham created Tennis for Two way back in 1958, an amusement that barely constituted a game and ran on a primitive oscilloscope. A decade and a half later, Atari's Pong would become the world's first commercial video game hit: A primitive adaptation of table tennis that ended up dominating gaming throughout most of the '70s. Even Nintendo got its start in video gaming by selling standalone *Pong* clones.

Tennis provides a sort of calibration exercise for a new system. How does this gaming platform compare to what's come before? What's special about it? A new platform's take on this most venerable video game genre speaks volumes to its capabilities and purpose. And here we have Virtual Boy's take. It absolutely plays up the central hook of this daring little mess of a system. Thanks to

the console's power and 3D visualization features. Mario's Tennis allows Nintendo's designers to realize a dream they had been pursuing since the original NES Tennis: A down in-the-action, court-height visual perspective. Nintendo's tennis sims consistently presented their courts with a skewed point of view staged in a way to make the forecourt appear larger than the backcourt to create a sense of depth, but they were limited by the boundaries of their consoles. Mario's Tennis is the first time we've seen the camera drop down to put players into the thick of the action, with the active character front-and-center on the screen at all times. The perspective here allows players to run far enough forward and laterally to cause entire portions of the court to shift out of view, making for-by far-the smoothest and most immersive tennis game anyone had seen on a Nintendo system to this point.

The in-court free movement is a lot more convincing than Super NES's Mode 7 effects. It helps that the Virtual Boy's self-contained screens allowed the system to enjoy a widescreen resolution unique among game systems at the time—its aspect ratio is about 40% wider than standard television-based consoles of the time—which gives you more lateral visual information here and allows the action to zoom in close to the characters. It also helps that, despite boasting graphics that look like blood-soaked Game Boy visuals, Virtual Boy was a considerably more









powerful system than Game Boy—or even, for that matter, the Super NES. Sporting a 32-bit RISC chip, Virtual Boy could display two simultaneous widescreen stereo images. Because that processor was mostly pushing monochrome bitmap sprites rather than polygons, it could do a lot with those humble elements. Consider these huge, detailed character sprites. They're probably the most impressive sprites yet seen on a Nintendo system to this point, and they move freely around a tennis court that scales and skews fluidly in all directions.

Meanwhile, the fact that you can run into and out of the court while hitting a ball that moves into and out of the screen as other character scale up and down based on your distance from them neatly showcases not only the Virtual Boy's hardware power, but also its 3D effects. There's a genuinely convincing sense of immersion here as you run around the court and the ball volleys back and forth over the net—an effect enhanced by the excellent sprite work. Indeed, this game is much harder to play without the 3D effect. In 2D, the ball sprite always appears a little larger than it should read, and its location along the Z-axis can be hard to judge. But viewed on the Virtual Boy's twin integrated screens, the illusion works perfectly.

The whizzy visuals go a long way toward making up for the fact that, as a tennis game, *Mario's Tennis* actually feels pretty flat. (Figuratively speaking.) For starters, it takes a significant step

backward from Game Boy Tennis and Super *Tennis* in that it only supports play for a single person. Virtual Boy was physically designed to be used by a single person to the exclusion of all else, but as with Game Boy Nintendo built a link cable port into the device, but the cable never shipped. Mario's Tennis can only be played solo. If you select doubles mode, you simply play with three other A.I.-controlled participants. Impressively, determined Nintendo fans have created their own ersatz link cable and patched Mario's Tennis to add multiplayer. Out of the box, however, Mario's Tennis took players back in time more than a decade to NES Tennis's solo play. Multiplayer support had been a huge selling point for Game Boy Tennis in particular, so already we see a glimpse of the design and business choices that would haunt Virtual Boy for its brief lifetime.

As always, the experience in a solo sports game is regulated entirely by the quality of the artificial intelligence. In that regard, *Mario's Tennis* is all over the place. On easy mode, you can breeze through the entire game by drawing your opponent to the left side of the screen then slicing right. Meanwhile, normal and hard difficulty offer no quarter. And no in-between: It's either brain-dead or murderous.

There are some other fine differences between difficulty levels—for example, characters' bodies can obscure the ball on-screen on "hard." For the most part, though, "hard" simply means the A.I. is

violently aggressive, rarely misses the ball, and reads your own inputs more quickly to the point of unfairness.

Mario's Tennis may make use of Virtual Boy's fancy graphical capabilities, but it does little to take advantage of the system's strange and complicated controller, which contains two face buttons, two shoulder buttons, and two D-pads. Everything you can do is executed on one D-pad and the face buttons—there are no dives or dashes with the shoulder buttons, for example. There are also no special moves or power smashes available as there would be in future Mario-themed tennis titles. As such, the only differentiators between characters are their stats: Speed, racquet size, and strength.

In that respect, the seven characters here seem to have carried over their general traits from Super Mario Kart. Mario sits in as the unexciting all-rounder, Yoshi is crazy fast but clumsy with its racquet, and Donkey Kong Jr. is slow but powerful. The remainder of the seven characters are mostly what you'd expect: Mario, Luigi, Princess "Toadstool" (not yet "Peach" in English localizations—that change would take effect a year later in Super Mario 64), Toad, and a lone Koopa Troopa. Bowser is conspicuous in his absence; presumably he was too busy planning his upcoming Super Mario 64 schemes to participate in this diversion.

All the characters look great here and have been animated with huge, lively sprites. They each have their own expressive

reactions to the outcome of a game, from Peach's grin of delight at winning to Luigi's hangdog expression to whiffing a play.

The Virtual Boy was notorious for causing headaches during extended play sessions, but the design of Mario's Tennis doesn't really reflect the "helicopter-mom" approach Nintendo adopted to minimize play time. A "quick" game with options set for a speedy match takes a good 15 minutes, and a full-format match can take as much as an hour—not really ideal for those who aren't fans of eyestrain. Meanwhile, the Tournament mode, in which you work your way through a tree of competitors to jockey for the top slot, can theoretically take a lot longer, though it's weirdly unforgiving. If you lose a match, there's no continue or retry option; it's simply game over.

On the whole, Mario's Tennis really kind of feels like the holistic Virtual Boy experience in a nutshell. It's visually a delight, with an effective use of 3D depth and boasting some gorgeous sprites. But in terms of actual gameplay, it feels anemic and poorly considered. It lacks features present in the primitive Tennis for Game Boy, including the crucial multiplayer options that make sports games worth playing in the first place. There's no denying it looks great, though, and it set the stage for a legacy of genuinely great Mariothemed sports titles that would appear in the years to follow. So while this may not be an essential work, it's an interesting one all the same.

