

Life in the age of the Atari 8-bit computers

Vol. A "Video Games & Consoles"



* 6 *

Early Handheld Video Game Consoles

Wikipedia articles curated by Laurent Delsarte
Downloaded from <https://www.atari800xl.eu>

Foreword

Talking with some very young colleagues at the office made me fully realise just how difficult it is to describe what the world of video games and personal computers was like in the early 1980s.

Their impression of it is distorted by series such as "Stranger Things" and other recent films set in the 80s. It simply doesn't match what I experienced as a child born in 1971, a teenager in France during the 80s.

How can I explain to them that, at the time, all of this was so new, so exciting? Of course, everyone – parents included – quickly understood what video game consoles were for. But trying to explain that you wanted a computer – that we called a "microcomputer" – which was far more expensive than a video game console, was quite another matter. Why? What for?

First of all, to play video games – that was the obvious honest answer, and there was no point denying it, even for those who swore otherwise. But you could do so much more with it, especially learning to program the machine, which seemed incredibly promising for the future. The name "Atari" was practically synonymous with "video game" back then. So, if you wanted to ask for an Atari computer, you needed solid arguments to justify it. And why an Atari rather than something else? There were so many options!

We didn't have access to many sources of information back then. Apart from a few magazines, there wasn't much at all. Spending time in a computer or video game shop was genuinely entertaining, even if you didn't buy anything. And an hour or so in an arcade was like stepping into a whole new world – with no direct view of the outside, constantly stimulated by those flashy colours and sounds coming from all around. The games were absolutely stunning – especially visually. They were far superior to their microcomputer versions, which were released only months, or even years, later.

Today's generation can feel anxious when they're disconnected, without a network, cut off from their tribe. But that was completely normal in the 80s. The Internet did exist, but it wasn't available to the general public – only to the military and universities. In fact, ordinary people had never even heard of the Internet, and websites hadn't been invented yet. We were only just beginning to imagine connecting via a modem – painfully slow – to a local BBS (Bulletin Board System). In the US, other services like CompuServe, PLATO, The Source and so on were available, but not in France. That said, at the same time, we did have the Minitel.

To try to begin sketching out as accurately as possible the contours of these technological revolutions of the 1970s and 1980s, I've selected a collection of Wikipedia articles, grouped by theme. Of course, this isn't exhaustive. Of course, this selection reflects a certain perspective on certain topics, and some choices had to be made. But the approach is entirely honest. You won't be fascinated by every single article, but I'm certain that, like me, you'll make some wonderful discoveries. I plan to compile these articles into about twenty themed books. Happy reading, happy exploring.

Handheld game console

A **handheld game console**, or simply **handheld console**, is a small, portable self-contained video game console with a built-in screen, game controls and speakers.^[1] Handheld game consoles are smaller than home video game consoles and contain the console, screen, speakers, and controls in one unit, allowing players to carry them and play them at any time or place.^{[2][3]}

In 1976, Mattel introduced the first handheld electronic game with the release of *Auto Race*.^[4] Later, several companies—including Coleco and Milton Bradley—made their own single-game, lightweight table-top or handheld electronic game devices.^[5] The first commercially successful handheld console was Merlin from 1978, which sold more than 5 million units.^[6] The first handheld game console with interchangeable cartridges is the Milton Bradley Microvision in 1979.^[7]

Nintendo is credited with popularizing the handheld console concept with the release of the Game Boy in 1989^[3] and continues to dominate the handheld console market.^{[8][9]} The first internet-enabled handheld console and the first with a touchscreen was the Game.com released by Tiger Electronics in 1997.^[10] The Nintendo DS, released in 2004, introduced touchscreen controls and wireless online gaming to a wider audience, becoming the best-selling handheld console with over 150 million units sold worldwide.^[11]

History

Timeline

This table describes handheld games consoles by generation, with over 1 million sales. No handheld achieved this prior to the fourth generation of game consoles. This list does not include dedicated consoles, such as LCD games and the Tamagotchi.



Nintendo DS Lite (2006), the best-selling handheld console and the third best-selling console overall

Manufacturer	Generation						
	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	
<u>Asus</u>						ROG Xbox Ally ^[a]	
<u>Atari</u>	<u>Atari Lynx (+II)</u> (≈3 million)						
<u>Bandai</u>		<u>WonderSwan</u> (1.55 million)	<u>WonderSwan Color^[b]</u> (1.95 million)				
<u>NEC</u>	<u>TurboExpress</u> (1.5 million)						
<u>Nintendo</u>	<u>Game Boy^[c]</u> (>64.4 million)	<u>Game Boy Color</u> (<49.3 million)	<u>Game Boy Advance^[d]</u> (81.5 million)	<u>DS^[e]</u> (154.02 million)	<u>3DS^[f]</u> (76 million)	<u>Switch^[g]</u> (155.37 million)	<u>Switch 2</u> (10.36 million)
<u>Nokia</u>			<u>N-Gage (+QD)</u> (3 million)				
<u>Sega</u>	<u>Game Gear</u> (10.6 million)	<u>Nomad</u> (≈1 million)					
<u>SNK</u>		<u>Neo Geo Pocket</u> (<2 million ^[h])	<u>Neo Geo Pocket Color</u>		<u>Neo Geo X</u>		
<u>Sony</u>				<u>PlayStation Portable^[i]</u> (81.09 million)	<u>PlayStation Vita</u> (16.21 million)		
<u>Valve</u>						<u>Steam Deck</u> (3.7 million) ^[13]	

Origins

The origins of handheld game consoles are found in handheld and tabletop electronic game devices of the 1970s and early 1980s. These electronic devices are capable of playing only a single game,^[3] they fit in the palm of the hand or on a tabletop, and they may make use of a variety of video displays such as LED, VFD, or LCD.^[14] In 1978, handheld electronic games were described by *Popular Electronics* magazine as "nonvideo electronic games" and "non-TV games" as distinct from devices that required use of a television screen.^[15] Handheld electronic games, in turn, find their origins in the synthesis of previous handheld and tabletop electro-mechanical devices such as Waco's Electronic Tic-Tac-Toe (1972)^[14] Cragstan's *Periscope-Firing Range* (1951),^[16] and the emerging optoelectronic-display-driven calculator market of the early 1970s.^{[17][18]} This synthesis happened in 1976, when "Mattel began work on a line of calculator-sized sports games that became the world's first handheld electronic games. The project began when Michael Katz, Mattel's new product category marketing director, told the engineers in the electronics group to design a game the size of a calculator, using LED (light-emitting diode) technology."^[19]

our big success was something that I conceptualized—the first handheld game. I asked the design group to see if they could come up with a game that was electronic that was the same size as a calculator.

—Michael Katz, former marketing director, Mattel Toys.^[19]

The result was the 1976 release of *Auto Race*.^[20] Followed by *Football* later in 1977,^{[21][22]} the two games were so successful that according to Katz, "these simple electronic handheld games turned into a '\$400 million category.'"^[14] Mattel would later win the honor of being recognized by the industry for innovation in handheld game device displays.^[23] Soon, other manufacturers including Coleco, Parker Brothers, Milton Bradley, Entex, and Bandai^[5] began following up with their own tabletop and handheld electronic games.



Game & Watch Ball

In 1979 the LCD-based Microvision, designed by Smith Engineering and distributed by Milton-Bradley,^[24] became the first handheld game console and the first to use interchangeable game cartridges.^[7] The Microvision game *Cosmic Hunter* (1981) also introduced the concept of a directional pad on handheld gaming devices,^[25] and is operated by using the thumb to manipulate the on-screen character in any of four directions.^[26]

In 1979, Gunpei Yokoi, traveling on a bullet train, saw a bored businessman playing with an LCD calculator by pressing the buttons. Yokoi then thought of an idea for a watch that doubled as a miniature game machine for killing time.^[27] Starting in 1980, Nintendo began to release a series of electronic games designed by Yokoi called the Game & Watch games.^[28] Taking advantage of the technology used in the credit-card-sized calculators that had appeared on the market, Yokoi designed the series of LCD-based games to include a digital time display in the corner of the screen.^[29] For later, more complicated Game & Watch games, Yokoi invented a cross shaped directional pad or "D-pad" for control of on-screen characters.^[30] Yokoi also included his directional pad on the NES controllers, and the cross-shaped thumb controller soon became standard on game console controllers and ubiquitous across the video game industry since.^{[31][32]} When Yokoi began designing Nintendo's first handheld game console, he came up with a device that married the elements of his Game & Watch devices and the Famicom console,^[33] including both items' D-pad controller. The result was the Nintendo Game Boy.

In 1982, the Bandai LCD Solarpower was the first solar-powered gaming device. Some of its games, such as the horror-themed game *Terror House*, features two LCD panels, one stacked on the other, for an early 3D effect.^[34] In 1983, Takara Tomy's Tomytronic 3D simulates 3D by having two LCD panels that were lit by external light through a window on top of the device, making it the first dedicated home video 3D hardware.^[35]

Beginnings

The late 1980s and early 1990s saw the beginnings of the modern-day handheld game console industry, after the demise of the Microvision. As backlit LCD game consoles with color graphics consume a lot of power, they were not battery-friendly like the non-backlit original Game Boy whose monochrome graphics allowed longer battery life. By this point, rechargeable battery technology had not yet matured and so the more advanced game consoles of the time such as the Game Gear and Lynx did not have nearly as much success as the Game Boy.

Even though third-party rechargeable batteries were available for the battery-hungry alternatives to the Game Boy, these batteries employed a nickel-cadmium process and had to be completely discharged before being recharged to ensure maximum efficiency; lead-acid batteries could be used

with automobile circuit limiters (cigarette lighter plug devices); but the batteries had mediocre portability. The later NiMH batteries, which do not share this requirement for maximum efficiency, were not released until the late 1990s, years after the Game Gear, Atari Lynx, and original Game Boy had been discontinued. During the time when technologically superior handhelds had strict technical limitations, batteries had a very low mAh rating since batteries with heavy power density were not yet available.

Modern game systems such as the Nintendo DS and PlayStation Portable have rechargeable Lithium-Ion batteries with proprietary shapes. Other seventh-generation consoles, such as the GP2X, use standard alkaline batteries. Because the mAh rating of alkaline batteries has increased since the 1990s, the power needed for handhelds like the GP2X may be supplied by relatively few batteries.

Game Boy

Nintendo released the Game Boy on April 21, 1989 (September 1990 for the UK). The design team headed by Gunpei Yokoi had also been responsible for the Game & Watch system, as well as the Nintendo Entertainment System games Metroid and Kid Icarus. The Game Boy came under scrutiny by Nintendo president Hiroshi Yamauchi, saying that the monochrome screen was too small, and the processing power was inadequate. The design team had felt that low initial cost and battery economy were more important concerns, and when compared to the Microvision, the Game Boy was a huge leap forward.

Yokoi recognized that the Game Boy needed a killer app—at least one game that would define the console, and persuade customers to buy it. In June 1988, Minoru Arakawa, then-CEO of Nintendo of America saw a demonstration of the game Tetris at a trade show. Nintendo purchased the rights for the game, and packaged it with the Game Boy system as a launch title. It was almost an immediate hit. By the end of the year more than a million units were sold in the US.^[36] As of March 31, 2005, the Game Boy and Game Boy Color combined to sell over 118 million units worldwide.^{[37][38]}



The original Game Boy

Atari Lynx



In 1987, Epyx created the Handy Game; a device that would become the Atari Lynx in 1989. It was the first color handheld console ever made, as well as the first with a backlit screen. It also featured networking support with up to 17 other players, and advanced hardware that allowed the zooming and scaling of sprites. The Lynx could also be

turned upside down to accommodate left-handed players. However, all of these features came at a high price point, which drove consumers to seek cheaper alternatives. The Lynx was also unwieldy, consumed batteries quickly, and lacked the third-party support enjoyed by its competitors. Due to its high price, short battery life, production shortages, a dearth of compelling games, and Nintendo's aggressive marketing campaign, and despite a redesign in 1991, the Lynx became a

commercial failure. Despite this, companies like Telegames helped to keep the system alive long past its commercial relevance, and when new owner Hasbro released the rights to develop for the public domain, independent developers like Songbird have managed to release new commercial games for the system every year until 2004's *Winter Games*.

TurboExpress

The TurboExpress was a portable version of the TurboGrafx, released in 1990 for \$249.99. Its Japanese equivalent was the PC Engine GT.

It was the most advanced handheld of its time and could play all the TurboGrafx-16's games (which are on a small, credit-card sized media called HuCards). It had a 66 mm (2.6 in.) screen, the same as the original Game Boy, but in a much higher resolution, and could display 64 sprites at once: 16 per scanline, in 512 colors (although the hardware could only handle 481 simultaneous colors). It had 8 kilobytes of RAM. The Turbo ran on the HuC6820 CPU at 1.79 or 7.16 MHz.



TurboExpress handheld

The optional "TurboVision" TV tuner included an RCA audio/video input allowing users to use TurboExpress as a video monitor. The "TurboLink" allowed two-player play. *Falcon*, a flight simulator, included a "head-to-head" dogfight mode that could only be accessed via TurboLink. However, very few TG-16 games offered co-op play modes especially designed with the TurboExpress in mind.

Bitcorp Gamate



Gamate and game cards

The Bitcorp Gamate was one of the first handheld game systems created in response to the Nintendo Game Boy. It was released in Asia in 1990 and distributed worldwide by 1991.

Like the Game Gear, it was horizontal in orientation and like the Game Boy, required 4 AA batteries. Unlike many later Game Boy clones, its internal components were professionally assembled (no "glop-top" chips). Unfortunately the system's fatal flaw was its screen. Even by the standards of the day, its screen was rather difficult to use, suffering from similar ghosting problems that were common complaints with the first generation Game Boys. Likely because of this fact, sales were quite poor, and Bitcorp closed by 1992. However, new games continued to be published for the Asian market, possibly as late as 1994.

The total number of games released for the system remains unknown.

Gamate games were designed for stereo sound, but the console was only equipped with a mono speaker.

Game Gear

The Game Gear was the first color handheld console produced by Sega. Released in Japan in 1990 and in North America and Europe in 1991, it was based on the Master System, which gave Sega the ability to quickly create Game Gear games from its large library of games for the Master System. While never reaching the level of success enjoyed by Nintendo, the Game Gear proved to be a fairly durable competitor, lasting longer than any other Game Boy rivals.



Game Gear

While the Game Gear was most frequently seen in black or navy blue, it was also released in a variety of additional colors: red, light blue, yellow, violet, and transparent. All of these variations were released in small quantities and frequently only in the Asian market.

Following Sega's success with the Game Gear they began development on a successor during the early 1990s which was intended to feature a touchscreen interface, many years before the Nintendo DS. However, such a technology was very expensive at the time, and the handheld itself was estimated to have cost around \$289 were it to be released. Sega eventually chose to shelve the idea and instead release the Genesis Nomad, a handheld version of the Genesis, as the successor.^[39]

Watara Supervision



The Watara Supervision with tilting screen

The Watara SuperVision was released in 1992 in an attempt to compete with the Nintendo Game Boy. The first model was designed very much like a Game Boy, but was grey in color and had a slightly larger screen. The second model was made with a hinge across the center and could be bent slightly to provide greater comfort for the user. While the system did enjoy a modest degree of success, it never impacted the sales of Nintendo or Sega. The SuperVision was redesigned a final time as "The Magnum". Released in limited quantities it was roughly equivalent to the Game Boy Pocket. It was available in three colors: yellow, green and grey. Watara designed many of the games themselves, but did receive some third party support, most notably from Sachen.

A TV adapter was available in both PAL and NTSC formats that could transfer the Supervision's black-and-white palette to 4 colors, similar in some regards to the Super Game Boy from Nintendo.

Hartung Game Master

The Hartung Game Master was an obscure handheld released at an unknown point in the early 1990s. Its graphics fidelity was much lower than most of its contemporaries, displaying just 64x64 pixels. It was available in black, white, and purple, and was frequently rebranded by its distributors, such as Delplay, Videojet and Systema.

The exact number of games released is not known, but was likely around 20. The system most frequently turns up in Europe and Australia.

Late 1990s

By this time, the lack of significant development in Nintendo's product line began allowing more advanced systems such as the Neo Geo Pocket Color and the WonderSwan Color to be developed.

Sega Nomad

The Nomad was released in October 1995 in North America only.^{[40][41]} The release was six years into the market span of the Genesis, with an existing library of more than 500 Genesis games. According to former Sega of America research and development head Joe Miller, the Nomad was not intended to be the Game Gear's replacement; he believed that there was little planning from Sega of Japan for the new handheld.^[42] Sega was supporting five different consoles: Saturn, Genesis, Game Gear, Pico, and the Master System, as well as the Sega CD and 32X add-ons. In Japan, the Mega Drive had never been successful and the Saturn was more successful than Sony's PlayStation, so Sega Enterprises CEO Hayao Nakayama decided to focus on the Saturn.^[43] By 1999, the Nomad was being sold at less than a third of its original price.^[44]



Sega Nomad

Game Boy Pocket



The 1st release Game Boy Pocket

The Game Boy Pocket was a redesigned version of the original Game Boy having the same features. It was released in 1996. Notably, this variation was smaller and lighter. It came in seven different colors: red, yellow, green, blue, pink, black, silver and transparent. It was powered by two AAA batteries, which provided approximately 10 hours of gameplay.^[45] The screen was changed to a true black-and-white display, rather than the "pea soup" monochromatic display of the original Game Boy.^[46] Although, like its predecessor, the Game Boy Pocket had no backlight to allow play in a darkened area, it did notably improve visibility and pixel response-time (mostly eliminating ghosting).^[47]

The first model of the Game Boy Pocket did not have an LED to show battery levels, but the feature was added due to public demand. The Game Boy Pocket was not a new software platform and played the same software as the original Game Boy model.^[48]

Game.com

The Game.com was a handheld game console released by Tiger Electronics in September 1997. It featured many new ideas for handheld consoles and was aimed at an older target audience, sporting PDA-style features and functions such as a touch screen and stylus.



Game.com

Game Boy Color



The Game Boy Color was the first handheld by Nintendo featuring Colors.

The Game Boy Color (also referred to as GBC or CGB) was Nintendo's successor to the Game Boy and was released on October 21, 1998, in Japan and in November of the same year in the United States. It featured a color screen, and was slightly bigger than the Game Boy Pocket. The processor was twice as fast as a Game Boy's and had twice as much memory. It also had an infrared communications port for wireless linking which did not appear in later versions of the Game Boy, such as the Game Boy Advance.

The Game Boy Color was a response to pressure from game developers for a new system, as they felt that the Game Boy, even in its latest incarnation (the Game Boy Pocket) was insufficient. The resulting product was backward-compatible, a first for a handheld console system, and this leveraged the large library of games and the existing user base of the predecessor system. This became a major feature of the Game Boy line since it allowed each new launch to begin with a significantly larger

library than any of its competitors. As of March 31, 2005, the Game Boy and Game Boy Color combined to sell 118.69 million units worldwide.^{[37][38]}

The console was capable of displaying up to 56 different colors simultaneously on screen from its palette of 32,768, and could add basic four-color shading to games that had been developed for the original Game Boy. It could also give the sprites and backgrounds separate colors, for a total of more than four colors.

Neo Geo Pocket Color

The Neo Geo Pocket Color (or NGPC) was released in 1999 in Japan, and later that year in the United States and Europe. It was a 16-bit color handheld game console designed by SNK, the maker of the Neo Geo home console and arcade machine.^[49] It came after SNK's original Neo Geo Pocket monochrome handheld, which debuted in 1998 in Japan.

In 2000, following SNK's purchase by Japanese Pachinko manufacturer Aruze, the Neo Geo Pocket Color was dropped from both the US and European markets, purportedly due to commercial failure.^[50]

The system seemed well on its way to being a success in the U.S. It was more successful than any Game Boy competitor since Sega's Game Gear, but was hurt by several factors, such as SNK's infamous lack of communication with third-party developers, and anticipation of the Game Boy Advance.^[51] The decision to ship U.S. games in cardboard boxes in a cost-cutting move rather than hard plastic cases that Japanese and European releases were shipped in may have also hurt US sales.^[52]



Neo Geo Pocket Color

Wonderswan

The WonderSwan was a handheld game console designed by Bandai. It was released on March 4, 1998, in Japan.

Early 2000s

The 2000s saw a major leap in innovation, particularly in the second half with the release of the DS and PSP.

Wonderswan Color



The WonderSwan Color

The WonderSwan Color was a handheld game console designed by Bandai. It was released on December 9, 2000, in Japan,^[53] Although the WonderSwan Color was slightly larger and heavier (7 mm and 2 g) compared to the original WonderSwan, the color version featured 512 KB^[54] of RAM and a larger color LCD screen. In addition, the WonderSwan Color was compatible with the original WonderSwan library of games.

Prior to WonderSwan's release, Nintendo had virtually a monopoly in the Japanese video game handheld market. After the release of the WonderSwan Color, Bandai took approximately 8% of the market share in Japan partly due to its low price of 6800 yen (approximately US\$65).^[54] Another reason for the WonderSwan's success in Japan was the fact that Bandai managed to get a deal with Square to port over the original Famicom *Final Fantasy* games with improved graphics and controls.^[54] However, with the popularity of the Game Boy Advance and the reconciliation between Square and Nintendo, the WonderSwan Color and its successor, the SwanCrystal quickly lost its competitive advantage.

Game Boy Advance

In 2001, Nintendo released the Game Boy Advance (GBA or AGB), which added two shoulder buttons, a larger screen, and more computing power than the Game Boy Color.

The design was revised two years later when the Game Boy Advance SP (GBA SP), a more compact version, was released. The SP featured a "clamshell" design (folding open and closed, like a laptop computer), as well as a frontlit color display and rechargeable battery. Despite the smaller form factor, the screen remained the same size as that of the original. In 2005, the Game Boy Micro was released. This revision sacrificed screen size and backwards compatibility with previous Game Boys for a dramatic reduction in total size and a brighter backlit screen. A new SP model with a backlit screen was released in some regions around the same time.



The Game Boy Advance was a major upgrade to the Game Boy line.

Along with the GameCube, the GBA also introduced the concept of "connectivity": using a handheld system as a console controller. A handful of games used this feature, most notably Animal Crossing, Pac-Man Vs., Final Fantasy Crystal Chronicles, The Legend of Zelda: Four Swords Adventures, The Legend of Zelda: The Wind Waker, Metroid Prime, and Sonic Adventure 2: Battle.

As of December 31, 2007, the GBA, GBA SP, and the Game Boy Micro combined sold 80.72 million units worldwide.^[55]

Game Park 32



GP32

The original GP32 was released in 2001 by the South Korean company Game Park a few months after the launch of the Game Boy Advance. It featured a 32-bit CPU, 133 MHz processor, MP3 and Divx player, and e-book reader. SmartMedia cards were used for storage, and could hold up to 128mb of anything downloaded through a USB cable from a PC. The GP32 was redesigned in 2003. A front-lit screen was added and the new version was called GP32 FLU (Front Light Unit). In summer 2004, another redesign, the GP32 BLU, was made, and added a backlit screen. This version of the handheld was planned for release outside South Korea; in Europe, and it was released

for example in Spain (VirginPlay was the distributor). While not a commercial success on the same level as mainstream handhelds (only 30,000 units were sold), it ended up being used mainly as a platform for user-made applications and emulators of other systems, being popular with developers and more technically adept users.^[56]

N-Gage

Nokia released the N-Gage in 2003. It was designed as a combination MP3 player, cellphone, PDA, radio, and gaming device. The system received much criticism alleging defects in its physical design and layout, including its vertically oriented screen and requirement of removing the battery



N-Gage QD

to change game cartridges. The most well known of these was "sidetalking", or the act of placing the phone speaker and receiver on an edge of the device instead of one of the flat sides, causing the user to appear as if they are



N-Gage

speaking into a taco.

The N-Gage QD was later released to address the design flaws of the original. However, certain features available in the original N-Gage, including MP3 playback, FM radio reception, and USB connectivity were removed.

Second generation of N-Gage launched on April 3, 2008^[57] in the form of a service for selected Nokia Smartphones.

Tapwave Zodiac

In 2003, Tapwave released the Zodiac. It was designed to be a PDA-handheld game console hybrid. It supported photos, movies, music, Internet, and documents. The Zodiac used a special version Palm OS 5, 5.2T, that supported the special gaming buttons and graphics chip. Two versions were available, Zodiac 1 and 2, differing in memory and looks. The Zodiac line ended in July 2005 when Tapwave declared bankruptcy.

Mid 2000s

Nintendo DS

The Nintendo DS was released in November 2004. Among its new features were the incorporation of two screens, a touchscreen, wireless connectivity, and a microphone port. As with the Game Boy Advance SP, the DS features a clamshell design, with the two screens aligned vertically on either side of the hinge.

The DS's lower screen is touch sensitive, designed to be pressed with a stylus, a user's finger or a special "thumb pad" (a small plastic pad attached to the console's wrist strap, which can be affixed to the thumb to simulate an analog stick). More traditional controls include four face buttons, two shoulder buttons, a D-pad, and "Start" and "Select" buttons. The console also features online capabilities via the Nintendo Wi-Fi Connection and ad-hoc



The Nintendo DS has two screens (the lower of which is a touchscreen), a microphone and Wi-Fi connectivity.

wireless networking for multiplayer games with up to sixteen players. It is backwards-compatible with all Game Boy Advance games, but like the Game Boy Micro, it is not compatible with games designed for the Game Boy or Game Boy Color.

In January 2006, Nintendo revealed an updated version of the DS: the Nintendo DS Lite (released on March 2, 2006, in Japan) with an updated, smaller form factor (42% smaller and 21% lighter than the original Nintendo DS), a cleaner design, longer battery life, and brighter, higher-quality displays, with adjustable brightness. It is also able to connect wirelessly with Nintendo's Wii console.

On October 2, 2008, Nintendo announced the Nintendo DSi, with larger, 3.25-inch screens and two integrated cameras. It has an SD card storage slot in place of the Game Boy Advance slot, plus internal flash memory for storing downloaded games. It was released on November 1, 2008, in Japan, April 2, 2009, in Australia, April 3, 2009, in Europe, and April 5, 2009, in North America. On October 29, 2009, Nintendo announced a larger version of the DSi, called the DSi XL, which was released on November 21, 2009, in Japan, March 5, 2010, in Europe, March 28, 2010, in North America, and April 15, 2010, in Australia.

As of December 31, 2009, the Nintendo DS, Nintendo DS Lite, and Nintendo DSi combined have sold 125.13 million units worldwide.^[58]

Game King



The GameKing 2

The GameKing is a handheld game console released by the Chinese company TimeTop in 2004. The first model while original in design owes a large debt to Nintendo's Game Boy Advance. The second model, the GameKing 2, is believed to be inspired by Sony's PSP.^[59] This model also was upgraded with a backlit screen, with a distracting background transparency (which can be removed by opening up the console). A color model, the GameKing 3 apparently exists, but was only made for a brief time and

was difficult to purchase outside of Asia.

As many of the games have an "old school" simplicity, the device has developed a small cult following. The Gameking's speaker is quite loud and the cartridges' sophisticated looping soundtracks (sampled from other sources) are seemingly at odds with its primitive graphics.

TimeTop made at least one additional device sometimes labeled as "GameKing", but while it seems to possess more advanced graphics, is essentially an emulator that plays a handful of multi-carts (like the GB Station Light II). Outside of Asia (especially China) however the Gameking remains relatively unheard of due to the enduring popularity of Japanese handhelds such as those manufactured by Nintendo and Sony.

PlayStation Portable

The PlayStation Portable (officially abbreviated PSP)^[60] is a handheld game console manufactured and marketed by Sony Computer Entertainment.^[61] Development of the console was first announced during E3 2003,^[62] and it was unveiled on May 11, 2004, at a Sony press conference

before E3 2004.^[63] The system was released in Japan on December 12, 2004,^[64] in North America on March 24, 2005,^[65] and in the PAL region on September 1, 2005.^[66]

The PlayStation Portable is the first handheld video game console to use an optical disc format, Universal Media Disc (UMD), for distribution of its games. UMD Video discs with movies and television shows were also released. The PSP utilized the Sony/SanDisk Memory Stick Pro Duo format as its primary storage medium.^{[67][68]} Other

distinguishing features of the console include its large viewing screen,^[69] multi-media capabilities,^[70] and connectivity with the PlayStation 3, other PSPs, and the Internet.^{[71][72]}



PlayStation Portable

Gizmondo



The Gizmondo

Tiger's Gizmondo came out in the UK during March 2005 and it was released in the U.S. during October 2005. It is designed to play music, movies, and games, have a camera for taking and storing photos, and have GPS functions. It also has Internet capabilities. It has a phone for sending text and multimedia messages. Email was promised at launch, but was never released before Gizmondo, and ultimately Tiger Telematics', downfall in early 2006. Users obtained a second service pack, unreleased, hoping to find such functionality. However, Service Pack B did not activate the e-mail functionality.

GP2X Series

The GP2X is an open-source, Linux-based handheld video game console and media player created by GamePark Holdings of South Korea, designed for homebrew developers as well as commercial developers. It is commonly used to run emulators for game consoles such as Neo-Geo, Genesis, Master System, Game Gear, Amstrad CPC, Commodore 64, Nintendo Entertainment System, TurboGrafx-16, MAME and others.

A new version called the "F200" was released October 30, 2007, and features a touchscreen, among other changes. Followed by GP2X Wiz (2009) and GP2X Caanoo (2010).



The Game Park Holdings GP2X F-100

Late 2000s

Dingoo



The Dingoo A320

The Dingoo A320 is a micro-sized gaming handheld that resembles the Game Boy Micro and is open to game development. It also supports music, radio, emulators (8 bit and 16 bit) and video playing capabilities with its own interface much like the PSP. There is also an onboard radio and recording program. It is currently available in two colors – white and black. Other similar products from the same manufacturer are the Dingoo A330 (also known as Geimi), Dingoo A360, Dingoo A380, and Dingoo A320E.

PSP Go

The PSP Go is a version of the PlayStation Portable handheld game console manufactured by Sony. It was released on October 1, 2009, in American and European territories, and on November 1 in Japan. It was revealed prior to E3 2009 through Sony's Qore VOD service. Although its design is significantly different from other PSPs, it is not intended to replace the PSP 3000, which Sony continued to manufacture, sell, and support. On April 20, 2011, the manufacturer announced that the PSP Go would be discontinued so that they may concentrate on the PlayStation Vita. Sony later said that only the European and Japanese versions were being cut, and that the console would still be available in the US. Unlike previous PSP models, the PSP Go does not feature a UMD drive, but



PSP Go

instead has 16 GB of internal flash memory to store games, video, pictures, and other media. This can be extended by up to 32 GB with the use of a Memory Stick Micro (M2) flash card. Also unlike previous PSP models, the PSP Go's rechargeable battery is not removable or replaceable by the user. The unit is 43% lighter and 56% smaller than the original PSP-1000, and 16% lighter and 35% smaller than the PSP-3000. It has a 3.8" 480 × 272 LCD (compared to the larger 4.3" 480 × 272 pixel LCD on previous PSP models). The screen slides up to reveal the main controls. The overall shape and sliding mechanism are similar to that of Sony's mylo COM-2 internet device.

Pandora

The Pandora is a handheld game console/UMPC/PDA hybrid designed to take advantage of existing open source software and to be a target for home-brew development. It runs a full distribution of Linux, and in functionality is like a small PC with gaming controls. It is developed by OpenPandora, which is made up of former distributors and community members of the GP32 and GP2X handhelds.

OpenPandora began taking pre-orders for one batch of 4000 devices in November 2008 and after manufacturing delays, began shipping to customers on May 21, 2010.^{[73][74]}



Pandora

FC-16 Go

The FC-16 Go is a portable Super NES hardware clone manufactured by Yobo Gameware in 2009. It features a 3.5-inch display, two wireless controllers, and CRT cables that allow cartridges to be played on a television screen. Unlike other Super NES clone consoles, it has region tabs that only allow NTSC North American cartridges to be played. Later revisions feature stereo sound output, larger shoulder buttons, and a slightly re-arranged button, power, and A/V output layout.

2010s

Nintendo 3DS

The **Nintendo 3DS** is the successor to Nintendo's DS handheld. The autostereoscopic device is able to project stereoscopic three-dimensional effects without requirement of active shutter or passive polarized glasses, which are required by most current 3D televisions to display the 3D effect. The 3DS was released in Japan on February 26, 2011; in Europe on March 25, 2011; in North America on March 27, 2011, and in Australia on March 31, 2011. The system features backward compatibility with Nintendo DS series software, including Nintendo DSi software except those that require the Game Boy Advance slot. It also features an online service called the Nintendo eShop, launched on June 6, 2011, in North America and June 7, 2011, in Europe and Japan, which allows owners to download games, demos, applications and information on upcoming film and game releases. On November 24, 2011, a limited edition *Legend of Zelda 25th Anniversary 3DS* was released that contained a unique Cosmo Black unit decorated with gold Legend of Zelda related imagery, along with a copy of *The Legend of Zelda: Ocarina of Time 3D*.







The original cyan Nintendo 3DS

There are also other models including the Nintendo 2DS and the New Nintendo 3DS, the latter with a larger (XL/LL) variant, like the original Nintendo 3DS, as well as the New Nintendo 2DS XL.

Xperia Play



Xperia PLAY

The Sony Ericsson Xperia PLAY is a handheld game console smartphone produced by Sony Ericsson under the Xperia smartphone brand. The device runs Android 2.3 Gingerbread, and is the first to be part of the PlayStation Certified program which means that it can play PlayStation Suite games. The device is a horizontally sliding phone with its original form resembling the Xperia X10 while the slider below resembles the slider of the PSP Go. The slider features a D-pad on the left side, a set of standard PlayStation buttons (, ,  and ) on the right, a long rectangular touchpad in the middle, start and select buttons on the bottom right corner, a menu button on the bottom left corner, and two shoulder buttons (L and R) on the back of the device. It is powered by a 1 GHz Qualcomm

Snapdragon processor, a Qualcomm Adreno 205 GPU, and features a display measuring 4.0 inches (100 mm) (854 × 480), an 8-megapixel camera, 512 MB RAM, 8 GB internal storage, and a micro-USB connector. It supports microSD cards, versus the Memory Stick variants used in PSP consoles. The device was revealed officially for the first time in a Super Bowl ad on Sunday, February 6, 2011. On February 13, 2011, at Mobile World Congress (MWC) 2011, it was announced that the device would be shipping globally in March 2011, with a launch lineup of around 50 software titles.

PlayStation Vita

The **PlayStation Vita** is the successor to Sony's PlayStation Portable (PSP) Handheld series. It was released in Japan on December 17, 2011, and in Europe, Australia, North, and South America on February 22, 2012.

The handheld includes two analog sticks, a 5-inch (130 mm) OLED/LCD multi-touch capacitive touchscreen, and supports Bluetooth, Wi-Fi and optional 3G. Internally, the PS Vita features a 4 core ARM Cortex-A9 MPCore processor and a 4 core SGX543MP4+ graphics processing unit, as well as LiveArea software as its main user interface, which succeeds the XrossMediaBar.



PlayStation Vita

The device is fully backwards-compatible with PlayStation Portable games digitally released on the PlayStation Network via the PlayStation Store. However, PSone Classics and PS2 titles were not compatible at the time of the primary public release in Japan. The Vita's dual analog sticks will be supported on selected PSP games. The graphics for PSP releases will be up-scaled, with a smoothing filter to reduce pixelation.

On September 20, 2018, Sony announced at Tokyo Game Show 2018 that the Vita would be discontinued in 2019, ending its hardware production.^[75] Production of Vita hardware officially ended on March 1, 2019.^[76]

Nvidia Shield



Nvidia Shield Portable

Project Shield is a handheld system developed by Nvidia announced at CES 2013. It runs on Android 4.2 and uses Nvidia Tegra 4 SoC. The hardware includes a 5-inches multitouch screen with support for HD graphics (720p). The console allows for the streaming of games running on a compatible desktop PC, or laptop.

Nvidia Shield Portable has received mixed reception from critics. Generally, reviewers praised the performance of the device, but criticized the cost and lack of worthwhile games. Engadget's review noted the system's "extremely impressive PC gaming", but also that due to its high price, the device was "a hard sell as a portable game console", especially when compared to similar handhelds on the market.^[77] CNET's Eric Franklin states in his review of the

device that "The Nvidia Shield is an extremely well made device, with performance that pretty much obliterates any mobile product before it; but like most new console launches, there is currently a lack of available games worth your time."^[78] Eurogamer's comprehensive review of the device provides a detailed account of the device and its features; concluded by saying: "In the here and now, the first-gen Shield Portable is a gloriously niche, luxury product - the most powerful Android system on the market by a clear stretch and possessing a unique link to PC gaming that's seriously impressive in beta form, and can only get better."^[79]

Nintendo Switch

The **Nintendo Switch** is a hybrid console that can either be used in a handheld form, or inserted into a docking station attached to a television to play on a bigger screen. The Switch features two detachable wireless controllers, called Joy-Con, which can be used individually or attached to a grip to provide a traditional gamepad form. A handheld-only revision named Nintendo Switch Lite was released on September 20, 2019.



The Nintendo Switch in portable mode

The Switch Lite had sold about 1.95 million units worldwide by September 30, 2019, only 10 days after its launch.^[80]

2020s

Evercade

Evercade is a handheld game console developed and manufactured by UK company Blaze Entertainment. It focuses on retrogaming with ROM cartridges that each contain a number of emulated games. Development began in 2018, and the console was released in May 2020, after a few delays. Upon its launch, the console offered 10 game cartridges with a combined total of 122 games.

Arc System Works, Atari, Data East, Interplay Entertainment, Bandai Namco Entertainment and Piko Interactive have released emulated versions of their games for the Evercade. Pre-existing homebrew games have also been re-released for the console by Mega Cat Studios. The Evercade is capable of playing games released for the Atari 2600, the Atari 7800, the Atari Lynx, the NES, the Super NES, and the Genesis/Mega Drive.

Analogue Pocket

The **Analogue Pocket** is a FPGA-based handheld game console designed and manufactured by Analogue,^[81] It is designed to play games designed for handhelds of the fourth, fifth and sixth generation of video game consoles. The console features a design reminiscent of the Game Boy, with additional buttons for the supported platforms. It features a 3.5" 1600x1440 LTPS LCD screen, an SD card port, and a link cable port compatible with Game Boy link cables. The Analogue Pocket uses an Altera Cyclone V processor, and is compatible with the original Game Boy, Game Boy Color and Game Boy Advance cartridges out of the box. With cartridge adapters (sold separately) the Analogue Pocket can play Game Gear, Neo Geo Pocket, Neo Geo Pocket Color and Atari Lynx game cartridges. The Analogue Pocket includes an additional FPGA, allowing 3rd party FPGA development. The Analogue Pocket was released in December 2021.

Steam Deck

The Steam Deck is a handheld computer device, developed by Valve, which runs SteamOS 3.0, a tailored distro of Arch Linux and includes support for Proton, a compatibility layer that allows most Microsoft Windows games to be played on the Linux-based operating system. This device and other similar ones generally are not referred to as "consoles" but more commonly as handheld style gaming computers due to effectively being IBM PC-compatible like contemporary desktop and laptop gaming PCs.^[82] In terms of hardware, the Deck includes a custom AMD APU based on their Zen 2 and RDNA 2 architectures, with the CPU running a four-core/eight-thread unit and the GPU running on eight compute units with a total estimated performance of 1.6 TFLOPS.^[83] Both the CPU and GPU use variable timing frequencies, with the CPU running between 2.4 and 3.5 GHz and the GPU between 1.0 and 1.6 GHz based on current processor needs.^{[84][85]} Valve stated that the CPU has comparable performance to Ryzen 3000 desktop computer processors and the GPU performance to the Radeon RX 6000 series.^[86] The Deck includes 16 GB of LPDDR5 RAM in a quad channel configuration.^{[85][87]}



Steam Deck

Valve revealed the Steam Deck on July 15, 2021, with pre-orders being made option the next day. The Deck was expected to ship in December 2021 to the US, Canada, the EU and the UK but was delayed to February 2022, with other regions to follow in 2022.^[88] Pre-orders were limited to those with Steam accounts opened before June 2021 to prevent resellers from controlling access to the device.^[88] Pre-order reservations were on July 16, 2021, through the Steam storefront briefly crashed the servers due to the demand. While initial shipments are still planned by February 2022, Valve has reported to new purchasers that wider availability will be later, with the 64 GB model and 256 GB NVMe model due in Q2 2022, and the 512 GB NVMe model by Q3 2022.^[89] Steam Deck was released on February 25, 2022.^[90]

Nintendo Switch 2

The **Nintendo Switch 2** is the direct successor of the Nintendo Switch, which was released on June 5, 2025. Like its predecessor, Switch 2 is a hybrid console: Either be used in a handheld form, or inserted into a docking station attached to a television to play on a bigger screen.



The Nintendo Switch 2 in portable mode

ROG Xbox Ally

The ROG Xbox Ally is a handheld gaming computer and handheld game console co-developed by Asus and Microsoft, and manufactured by Asus as part of the Republic of Gamers (ROG) and Xbox brands. A successor to the Asus ROG Ally, it was released on October 16, 2025.



ROG Xbox Ally X

See also

- [List of handheld game consoles](#)
- [Video game console emulator](#)
- [Handheld electronic game](#)
- [Handheld television](#)
- [Video games and Linux](#)
- [Cloud gaming](#)
- [Mobile game](#)

References

- Co-developed with [Microsoft](#)^[12]
 - including the SwanCrystal model
 - including the Pocket and Light models
 - including the SP and Micro models
 - including the Lite, DSi and XL models
 - including the XL, 2DS, New 3DS, New 3DS XL, and New 2DS XL models
 - including the Lite and OLED models
 - 2 million units were sold across all SNK handhelds combined, a model by model breakdown is not available.
 - Including the Go and Street models
- D 4.1 - Standards and technology monitoring report [revised version]* (https://web.archive.org/web/20110714081415/http://www.mg-bl.com/fileadmin/downloads/deliverables/D4.1_Standards_and_technology_monitoring_report_revised_version_V1.7.pdf) . University of Maribor. [Sixth Framework Programme \(European Community\)](#). April 24, 2007. p. 20.

2. Li, Frederick W. B. *Computer Games* (<http://www.dur.ac.uk/frederick.li/paper/game.v2.pdf>). Archived (<https://web.archive.org/web/20100714083111/http://www.dur.ac.uk/frederick.li/paper/game.v2.pdf>) July 14, 2010, at the [Wayback Machine](http://www.waybackmachine.org/). Durham University. Retrieved December 19, 2008. p. 4.
3. Steinbock, Dan; Johnny L. Wilson (January 28, 2007). *The Mobile Revolution* (<https://books.google.com/books?id=cUQ1y4iNrGcC&q=popularizing+the+handheld+console+concept+nintendo&pg=PA150>). Kogan Page. p. 150. ISBN 978-0-7494-4850-9.
4. Loguidice, Bill; Matt Barton (August 15, 2008). "A History of Gaming Platforms: Mattel Intellivision" (<https://www.gamedeveloper.com/game-platforms/a-history-of-gaming-platforms-mattel-intellivision>). *Gamasutra*. Retrieved December 27, 2008.
5. Demaria, Rusel; Johnny L. Wilson (2002). *High Score! The Illustrated History of Video games* (<https://books.google.com/books?id=HJNvZLvPCEQC&q=High+Score!+The+Illustrated+History+of+Video+games>). McGraw-Hill. pp. 31–32. ISBN 978-0-07-222428-3.
6. "Merlin, the Electronic Wizard - Game Console - Computing History" (<http://www.computinghistory.org.uk/det/16957/Merlin-the-Electronic-Wizard/>). *www.computinghistory.org.uk*. Retrieved July 7, 2020.
7. East, Tom (November 11, 2009). "History Of Nintendo: Game Boy" (<https://web.archive.org/web/20141110045319/http://www.officialnintendomagazine.co.uk/13153/features/history-of-nintendo-game-boy/>). *Official Nintendo Magazine*. Archived from the original (<http://www.officialnintendomagazine.co.uk/13153/features/history-of-nintendo-game-boy/>) on November 10, 2014. Retrieved December 29, 2013.
8. Patsuris, Penelope (June 7, 2004). "Sony PSP Vs. Nintendo DS" (https://www.forbes.com/2004/06/07/cx_pp_0607mondaymatchup.html). *Forbes*.
9. Hutsko, Joe (March 25, 2000). "88 Million and Counting; Nintendo Remains King of the Handheld Game Players" (<https://www.nytimes.com/2000/03/25/business/88-million-and-counting-nintendo-remains-king-of-the-handheld-game-players.html?pagewanted=all>). *The New York Times*. Retrieved January 12, 2009.
10. "30 Years of Handheld Game Systems" (https://www.pcworld.com/article/183679/evolution_of_portable_gaming.html). *PCWorld*. December 6, 2009. Retrieved July 7, 2020.
11. McFerran, Damien (May 19, 2017). "Retrospective: The Awkward Birth of the DS, Nintendo's Most Successful System" (https://www.nintendolife.com/news/2017/05/retrospective_the_awkward_birth_of_the_ds_nintendos_most_successful_system). *Nintendo Life*. Retrieved August 14, 2021.
12. Khullar, Kunal (June 9, 2025). "Asus partners with Microsoft launch first Xbox gaming handhelds, the ROG Xbox Ally and Ally X" (<https://www.tomshardware.com/video-games/xbox/asus-partners-with-microsoft-launch-first-xbox-gaming-handhelds-the-rog-xbox-ally-and-ally-x>). *Tom's Hardware*. Retrieved January 11, 2026.
13. Hollister, Sean (February 25, 2025). "Three years later, the Steam Deck has dominated handheld PC gaming" (<https://www.theverge.com/pc-gaming/618709/steam-deck-3-year-anniversary-handheld-gaming-shipments-idc>). *The Verge*.
14. Demaria, Rusel; Johnny L. Wilson (2002). *High Score! The Illustrated History of Video games* (<https://books.google.com/books?id=HJNvZLvPCEQC&q=High+Score!+The+Illustrated+History+of+Video+games>). McGraw-Hill. p. 30. ISBN 978-0-07-222428-3.
15. Jensen, Kris (January 1978). "New 1978 Electronic Games" (https://web.archive.org/web/20110628172513/http://www.handheldmuseum.com/BooksMagazines/Mag-PE_0178/PE0178_2.htm). *Popular Electronics*: 33–43. Archived from the original (http://www.handheldmuseum.com/BooksMagazines/Mag-PE_0178/PE0178_2.htm) on June 28, 2011. Retrieved July 17, 2016.
16. Morgan, Rik (August 5, 2008). "Cragstan Periscope-Firing Range" (<http://www.handheldmuseum.com/Misc/CragstanPeriscope.htm>). Handheld Museum. Retrieved December 27, 2008.
17. "Optoelectronics Arrives" (<https://web.archive.org/web/20101022172145/http://www.time.com/time/magazine/article/0,9171,903443,00.html>). *Time*. Vol. 99, no. 14. April 3, 1972. Archived from the original (<http://www.time.com/time/magazine/article/0,9171,903443,00.html>) on October 22, 2010.

18. Morgan, Rik (August 5, 2008). "Interview with Howard Cohen" (<http://www.handheldmuseum.com/Mattel/Trivia.htm>). Handheld Museum. Retrieved October 1, 2009.
19. Kent, Steven (2001). *The Ultimate History of Video Games* (<https://books.google.com/books?id=C2MH05ogU9oC&q=%22The+Ultimate+History+of+Video+Games%22>). Prima Publishing. p. 200. ISBN 978-0-7615-3643-7.
20. Parish, Jeremy (March 28, 2005). "PSPredecessors" (<https://web.archive.org/web/20160721193503/http://www.1up.com/features/pspredecessors>). 1up. Archived from the original (<http://www.1up.com/features/pspredecessors>) on July 21, 2016. Retrieved January 10, 2008.
21. "Mattel's Football (I) (1977, LED, 9 Volt, Model# 2024)" (<http://www.handheldmuseum.com/Mattel/FB.htm>). *handheldmuseum.com*. Retrieved July 16, 2016.
22. "Mattel Electronics Football" (<https://web.archive.org/web/20200710014145/http://www.retroland.com/mattel-electronics-football/>). *Retroland*. Archived from the original (<http://www.retroland.com/mattel-electronics-football/>) on July 10, 2020. Retrieved July 16, 2016.
23. "Winners of 59th Technology & Engineering Emmy Awards Announced by National Television Academy at Consumer Electronics Show" (https://web.archive.org/web/20160721193614/http://www.emmyonline.org/mediacenter/_pdf/tech_2k7_winners.pdf) (PDF). *National Television Academy of Television Arts and Sciences*. January 8, 2008. Archived from the original (http://www.emmyonline.org/mediacenter/_pdf/tech_2k7_winners.pdf) (PDF) on July 21, 2016. Retrieved July 16, 2016.
24. Herman, Leonard (2001). *Phoenix: The Rise and Fall Of Video Games* (<https://books.google.com/books?id=JHOAAAACAAJ&q=%22Phoenix%22+video+games>). Rolenta Press. p. 42. ISBN 0-9643848-5-X.
25. Silvester, Niko. "Sony's PlayStation Portable and Milton Bradley's Microvision - The PSP and the History of Handheld Video Gaming, Part 2" (<https://web.archive.org/web/20200806162245/https://www.lifewire.com/retro-collector-beginnings-4040018>). *about.com*. Archived from the original (<http://psp.about.com/od/hardwarefirmware/a/psphistorymicrovision.htm>) on August 6, 2020. Retrieved July 16, 2016.
26. Morgan, Rik (August 5, 2008). "CosmiHunter" (<https://web.archive.org/web/20110628172547/http://www.handheldmuseum.com/MB/MVCosmicHunter.htm>). Handheld Museum. Archived from the original (<http://www.handheldmuseum.com/MB/MVCosmicHunter.htm>) on June 28, 2011. Retrieved June 25, 2009.
27. Crigger, Lara (March 3, 2007). "The Escapist: Searching for Gunpei Yokoi" (https://web.archive.org/web/20140213213725/http://www.escapistmagazine.com/articles/view/issues/issue_87/490-Searching-for-Gunpei-Yokoi). *Escapistmagazine.com*. Archived from the original (http://www.escapistmagazine.com/articles/view/issues/issue_87/490-Searching-for-Gunpei-Yokoi) on February 13, 2014. Retrieved July 17, 2016.
28. Pollack, Andrew (October 9, 1997). "Gunpei Yokoi, Chief Designer Of Game Boy, Is Dead at 56" ([https://www.nytimes.com/1997/10/09/business/gunpei-yokoi-chief-designer-of-game-boy-is-dead-at-56.html?n=Top%2FReference%2FTimes%20Topics%2FSubjects%2FD%2FDeaths%20\(Obituaries\)](https://www.nytimes.com/1997/10/09/business/gunpei-yokoi-chief-designer-of-game-boy-is-dead-at-56.html?n=Top%2FReference%2FTimes%20Topics%2FSubjects%2FD%2FDeaths%20(Obituaries))). *The New York Times*.
29. Sheff, David (1999). *Game Over: Press Start to Continue* (<https://books.google.com/books?id=0dK2AAAIAAJ&q=Game+Over:+Press+Start+to+Continue>). GamePress. p. 28. ISBN 978-0-9669617-0-6.
30. Buchanan, Levi (September 8, 2008). "From Janitor to Superstar Gunpei Yokoi, inventor of the Game Boy, would have been 67 this week" (<http://retro.ign.com/articles/908/908569p1.html>). *IGN*. Retrieved December 28, 2008.
31. Pfau, Jeffrey (2008). "The Game Controller: From the Beginning" (https://www.brown.edu/Departments/Joukowsky_Institute/courses/13things/7643.html). *13 Things*. Joukowsky Institute for Archaeology and the Ancient World. Brown University. Retrieved July 16, 2016.
32. Natapov, D.; MacKenzie, I. S. (2010). "The trackball controller: Improving the analog stick" (<http://www.yorku.ca/mack/FuturePlay2010-1.pdf>) (PDF). *Proceedings of the 2010 Conference on FuturePlay*. New York: ACM: 175–182. Archived (<https://web.archive.org/web/20160411142350/http://www.yorku.ca/mack/FuturePlay2010-1.pdf>) (PDF) from the original on April 11, 2016.

33. Sheff, David (1999). *Game Over: Press Start to Continue* (<https://books.google.com/books?id=0dK2AAAAIAAJ&q=Game+Over:+Press+Start+to+Continue>). GamePress. p. 294. ISBN 978-0-9669617-0-6.
34. "The top ten retro gaming secrets" (<https://web.archive.org/web/20120123220944/http://www.pcpco.co.uk/features/361591/the-top-ten-retro-gaming-secrets/3>). *PC Pro*. Archived from the original (<http://www.pcpco.co.uk/features/361591/the-top-ten-retro-gaming-secrets/3>) on January 23, 2012. Retrieved January 26, 2011.
35. "The top ten retro gaming secrets" (<https://web.archive.org/web/20120115123926/http://www.pcpco.co.uk/features/361591/the-top-ten-retro-gaming-secrets>). *PC Pro*. Archived from the original (<http://www.pcpco.co.uk/features/361591/the-top-ten-retro-gaming-secrets>) on January 15, 2012. Retrieved January 26, 2011.
36. "Game Boy — Nintendo dominates the portable market" (<https://web.archive.org/web/20110123202930/http://firstarkansasnews.net/2011/01/game-boy-nintendo-dominates-the-portable-market/>). First Arkansas News. January 22, 2011. Archived from the original on January 23, 2011. Retrieved April 28, 2011.
37. "05 Annual Report" (<https://web.archive.org/web/20051215033905/https://www.nintendo.com/corp/report/NintendoAnnualReport2005.pdf>) (PDF). Nintendo Co., Ltd. March 31, 2006. p. 65. Archived from the original (<https://www.nintendo.com/corp/report/NintendoAnnualReport2005.pdf>) (PDF) on December 15, 2005. Retrieved March 22, 2008.
38. "Game Boy" (https://web.archive.org/web/20070509094404/http://images.businessweek.com/s/06/10/game_consoles/source/7.htm). *A Brief History of Game Console Warfare*. BusinessWeek. Archived from the original on May 9, 2007. Retrieved March 22, 2008.
39. Fahs, Travis (April 21, 2009). "IGN Presents the History of SEGA" (<http://retro.ign.com/articles/974/974695p7.html>). *IGN*. p. 7. Retrieved April 27, 2011.
40. Snow, Blake (July 30, 2007). "The 10 Worst-Selling Handhelds of All Time" (<https://web.archive.org/web/20071012194600/http://gamepro.com/gamepro/domestic/games/features/125748.shtml>). *GamePro*. Archived from the original (<http://www.gamepro.com/gamepro/domestic/games/features/125748.shtml>) on October 12, 2007. Retrieved January 17, 2008.
41. Marriott, Scott Alan. "Sega Genesis Nomad - Overview" (<https://web.archive.org/web/20141114094423/http://www.allgame.com/platform.php?id=17671>). Allgame. Archived from the original (<http://www.allgame.com/platform.php?id=17671>) on November 14, 2014. Retrieved October 18, 2013.
42. Horowitz, Ken (February 7, 2013). "Interview: Joe Miller" (<http://www.sega-16.com/2013/02/interview-joe-miller/>). Sega-16. Retrieved November 17, 2013.
43. Kent, Steven L. (2001). *The Ultimate History of Video Games: The Story Behind the Craze that Touched our Lives and Changed the World*. Roseville, California: Prima Publishing. pp. 508, 531. ISBN 0-7615-3643-4.
44. *Retro Gamer* staff. "Retrospection: Sega Nomad". *Retro Gamer* (69). Imagine Publishing: 46–53.
45. "The Incredible Shrinking Game Boy Pocket". *Electronic Gaming Monthly*. No. 84. Ziff Davis. July 1996. p. 16.
46. "Game Boy Relunched". *Next Generation*. No. 20. Imagine Media. August 1996. p. 26.
47. "Pocket Cool". *Electronic Gaming Monthly*. No. 89. Ziff Davis. December 1996. p. 204.
48. "Show Notes". *GamePro*. No. 95. IDG. August 1996. p. 16.
49. "A Sign Of The Times: Game Over For SNK" (<https://uk.ign.com/articles/2001/11/03/a-sign-of-the-times-game-over-for-snk>). IGN UK. November 2, 2001.
50. Parish, Jeremy (October 28, 2014). "Neo Geo Pocket Color: The portable that changed everything" (<https://web.archive.org/web/20150209032237/http://www.usgamer.net/articles/neo-geo-pocket-color-the-portable-that-changed-everything>). *usgamer.net*. Archived from the original (<http://www.usgamer.net/articles/neo-geo-pocket-color-the-portable-that-changed-everything>) on February 9, 2015. Retrieved February 28, 2017.
51. "Neo Geo Pocket Color 101, A beginner's guide" (<http://www.racketboy.com/retro/snkneo-geo/neo-geo-pocket-color-101-beginners-guide>). *racketboy.com*. January 4, 2012.

52. "The end of an era: a cruel look at what we missed: Part 2" (http://archive.kontek.net/sngp.classicgaming.gamespy.com/editorials/end_of_an_era_part2.htm). *gamespy.com*. June 2000.
53. "Bandai announces release of WonderSwan color" (https://web.archive.org/web/20140320215243/http://www.promoduck.com/PressRelease/html/press_con10a048.htm). August 30, 2000. Archived from the original (http://www.promoduck.com/PressRelease/html/press_con10a048.htm) on March 20, 2014. Retrieved April 28, 2011.
54. "WonderSwan Color Revealed" (<http://gameboy.ign.com/articles/084/084272p1.html>). *ign.com*. August 30, 2000. Retrieved April 28, 2011.
55. "Consolidated Financial Highlights" (<https://www.nintendo.co.jp/ir/pdf/2008/080124e.pdf#page=8>) (PDF). Nintendo. January 24, 2008. p. 8. Archived (<https://web.archive.org/web/20080216091256/https://www.nintendo.co.jp/ir/pdf/2008/080124e.pdf>) (PDF) from the original on February 16, 2008. Retrieved March 22, 2008.
56. GP2X Q&A, With Craig Rothwell (<http://www.gamespot.com/news/6159783.html>). *Clockerz*. Retrieved March 24, 2008.
57. "A New Day for N-Gage" (<https://web.archive.org/web/20090412015450/http://www.n-gage.com/ngi/ngage/web/g0/en/community/articles.Detail.general-anewdayforgage.1.html>). Nokia. Archived from the original (<http://www.n-gage.com/ngi/ngage/web/g0/en/community/articles.Detail.general-anewdayforgage.1.html>) on April 12, 2009. Retrieved April 3, 2008.
58. "Consolidated Financial Highlights" (<https://www.nintendo.co.jp/ir/pdf/2009/090507e.pdf#page=22>) (PDF). Nintendo. May 7, 2009. p. 22. Archived (<https://web.archive.org/web/20110629122850/https://www.nintendo.co.jp/ir/pdf/2009/090507e.pdf>) (PDF) from the original on June 29, 2011. Retrieved May 7, 2009.
59. Gameking 2 Portable Game Machine (<https://gizmodo.com/101781/gameking-2-portable-game-machine>) Archived (<https://web.archive.org/web/20180621070243/https://gizmodo.com/101781/gameking-2-portable-game-machine>) June 21, 2018, at the [Wayback Machine](#). Gizmodo.com (April 30, 2005). Retrieved on 2013-08-23.
60. "PSP - About" (<https://web.archive.org/web/20080213151309/http://www.us.playstation.com/psp/about/>). Sony Computer Entertainment. Archived from the original (<http://www.us.playstation.com/PSP/Features>) on February 13, 2008. Retrieved March 12, 2008.
61. "PSP Technical Specifications" (<https://web.archive.org/web/20080213151309/http://www.us.playstation.com/psp/about/specs>). "Sony Computer Entertainment. Archived from the original (<http://www.us.playstation.com/psp/about/specs>) on February 13, 2008. Retrieved March 12, 2008.
62. "E3 2003: Sony Goes Handheld!" (<http://ps2.ign.com/articles/402/402220p1.html>). *IGN*. May 13, 2003. Retrieved March 12, 2008.
63. Miller II, Stanley A. (May 11, 2004). "Sony aims to take on rivals" (<https://web.archive.org/web/20211028234432/https://news.google.com/newspapers?id=BTcqAAAIBAJ&pg=2031,1889081&dq=sony+aims+to+take+on+rivals&hl=en>). *Milwaukee Journal Sentinel*. Archived from the original (<https://news.google.com/newspapers?id=BTcqAAAIBAJ&pg=2031,1889081&dq=sony+aims+to+take+on+rivals&hl=en>) on October 28, 2021. Retrieved March 12, 2008.
64. "PSP Japanese launch impressions" (<https://web.archive.org/web/20160721193505/http://www.1up.com/news/psp-japanese-launch-impressions>). 1UP. December 11, 2004. Archived from the original (<http://www.1up.com/news/psp-japanese-launch-impressions>) on July 21, 2016. Retrieved March 12, 2008.
65. Thorsen, Tor (March 24, 2005). "The US PSP Launch" (<http://www.gamespot.com/news/612109/spot-on-the-us-bsp-launch>). *GameSpot*. Retrieved March 12, 2008.
66. "Sony PSP launches across Europe" (http://news.bbc.co.uk/cbbcnews/hi/newsid_4200000/newsid_4202900/4202934.stm). The BBC. September 1, 2005. Retrieved March 12, 2008.
67. "E3 2003: PSP Press Release" (<https://web.archive.org/web/20080323190851/http://www.gamedaily.com/games/playstation-portable/psp/game-news/e3-2003-psp-press-release/4356/3143/>). *gamedaily.com*. December 31, 2003. Archived from the original (<http://www.gamedaily.com/games/playstation-portable/psp/game-news/e3-2003-psp-press-release/4356/3143/>) on March 23, 2008. Retrieved March 12, 2008.

68. "Support - PSP - Movies" (<https://web.archive.org/web/20080315222243/http://www.us.playstation.com/Support/PSP/Movies/default.html>). "Sony Computer Entertainment. Archived from the original (<http://www.us.playstation.com/Support/PSP/Movies/default.html>) on March 15, 2008. Retrieved March 12, 2008.
69. Roper, Chris (March 28, 2005). "Sony PSP vs. Nintendo DS" (<http://gear.ign.com/articles/599/599454p1.html>). *IGN*. Retrieved March 12, 2008.
70. "PSP - About - Multimedia" (<https://web.archive.org/web/20080214222111/http://www.us.playstation.com/PSP/About/Multimedia>). Sony Computer Entertainment. Archived from the original (<http://www.us.playstation.com/PSP/About/Multimedia>) on February 14, 2008. Retrieved March 12, 2008.
71. "User's Guide - Remote Play" (<http://manuals.playstation.net/document/en/ps3/current/remotelay/remotelay.html>). Sony Computer Entertainment. Retrieved March 12, 2008.
72. "Support - PSP - Connecting to the Internet" (<https://web.archive.org/web/20080315144612/http://www.us.playstation.com/Support/PSP/ConnectingToInternet/default.html>). Sony Computer Entertainment. Archived from the original (<http://www.us.playstation.com/Support/PSP/ConnectingToInternet/default.html>) on March 15, 2008. Retrieved March 12, 2008.
73. "Official Blog: It finally happened!" (https://web.archive.org/web/20120301134532/http://www.open-pandora.org/index.php?option=com_content&view=article&id=177). OpenPandora. May 22, 2010. Archived from the original on March 1, 2012. Retrieved May 22, 2010.
74. First shipping emails hit inboxes (<https://web.archive.org/web/20120307234935/http://pandorapress.net/2010/05/21/first-shipping-emails-hit-inboxes/>). *Pandora Press*. May 21, 2010.
75. "PS Vita production to end in 2019 in Japan - Gematsu" (<https://gematsu.com/2018/09/ps-vita-production-to-end-in-2019-in-japan>). *Gematsu*. September 20, 2018. Retrieved March 10, 2019.
76. "PS Vita production ended in Japan" (<https://gematsu.com/2019/03/ps-vita-production-ended-in-japan>). March 2019.
77. Gilbert, Ben (July 31, 2013). "NVIDIA Shield review" (<https://www.engadget.com/2013/07/31/nvidia-shield-review/>). *Engadget*. Retrieved July 31, 2013.
78. Franklin, Eric. "Nvidia Shield Review" (https://reviews.cnet.com/consoles/nvidia-shield/4505-10109_7-35566996.html). *Reviews.cnet.com*. Retrieved August 2, 2013.
79. Leadbetter, Richard (August 11, 2013). "Nvidia Shield review" (<http://www.eurogamer.net/article/s/digitalfoundry-nvidia-shield-review>). *Eurogamer.net*. Retrieved August 12, 2013.
80. "Consolidated Financial Highlights - Q2 FY2020" (<https://www.nintendo.co.jp/ir/pdf/2019/191031e.pdf>) (PDF). Nintendo. October 31, 2019. Archived (<https://web.archive.org/web/20191031072855/https://www.nintendo.co.jp/ir/pdf/2019/191031e.pdf>) (PDF) from the original on October 31, 2019. Retrieved October 31, 2019.
81. "Analogue homepage" (<https://www.analogue.co>). Analogue, Inc.
82. "Valve Steam Deck Review" (<https://www.pcmag.com/reviews/valve-steam-deck>). *PCMag*. April 6, 2023. Retrieved November 5, 2024.
83. "Steam Deck :: Tech Specs" (<https://www.steamdeck.com/en/tech>). *Steam Deck*.
84. Moore, Bo (July 15, 2021). "Steam Deck: The First Hands-On With Valve's Handheld Gaming PC" (<https://www.ign.com/articles/steam-deck-hands-on-impressions-details-valve-handheld-gaming-pc>). *IGN*. Retrieved July 15, 2021.
85. Phillips, Tom (July 15, 2021). "Valve announces Steam Deck, a £349 handheld PC" (<https://www.eurogamer.net/articles/2021-07-15-valve-announces-steam-deck-a-gbp349-handheld-pc>). *Eurogamer*. Retrieved July 15, 2021.
86. Weatherbed, Jess (July 23, 2021). "Valve claims the Steam Deck can handle any game you throw at it, including AAAs" (<https://www.techradar.com/news/valve-claims-the-steam-deck-can-handle-any-game-you-throw-at-it-including-aas>). *TechRadar*. Retrieved July 23, 2021.
87. Loeffler, John (July 21, 2021). "Steam Deck gets a spec update, and it's good news for gamers" (<https://www.techradar.com/news/steam-deck-gets-a-spec-update-and-its-good-news-for-gamers>). *TechRadar*. Retrieved July 22, 2021.

88. Peters, Jay (July 15, 2021). "Valve's gaming handheld is called the Steam Deck and it's shipping in December" (<https://www.theverge.com/2021/7/15/22578783/valve-steam-deck-gaming-handheld-pc>). *The Verge*. Retrieved July 15, 2021.
 89. Yin-Poole, Wesley (July 17, 2021). "Steam Deck expected order availability now Q1 2022 (64GB) and Q2 2022 (256GB/512GB)" (<https://www.eurogamer.net/articles/2021-07-17-steam-deck-expected-order-availability-now-q1-2022-64gb-or-q2-2022-256gb-512gb>). *Eurogamer*. Retrieved July 17, 2021.
 90. Larabel, Michael (February 25, 2022). "For Linux Enthusiasts Especially, The Steam Deck Is An Incredible & Fun Device" (<https://www.phoronix.com/scan.php?page=article&item=steam-deck-steam-os-linux>). *Phoronix*. Retrieved February 27, 2022.
-

Retrieved from "https://en.wikipedia.org/w/index.php?title=Handheld_game_console&oldid=1345605998"

Touch Me (arcade game)

Touch Me is an arcade game first released by Atari Inc. in 1974, and later as a handheld game in 1978.^[1] It can be described as a *Simon Says*-like game that involves touching a series of buttons that light up and produce sounds. The player must observe a sequence of blinking electric lights and repeat the sequence back in the same order that it occurred. Each time this is completed, the game will produce another sequence with an additional button added. This process is repeated and a digital score window displays the total number of sound sequences a player correctly repeats. The game continues until the maximum sequence of buttons is reached, or the user makes a mistake.

History

Touch Me was first released as an arcade game in 1974 by Atari. The arcade version was housed in a short arcade cabinet and had four large circular buttons of the same color. The player was allowed to make three mistakes before the game ended. The arcade game found itself competing for attention in arcades with the latest pinball machines and video games of the day; it was not very successful.

In 1977, Ralph Baer saw potential in the "Simon Says" concept behind the *Touch Me* game. He copied Atari's game, adding colored buttons and musical sound effects, and created the *Simon* handheld game, which became a major success.

Seeing this, Atari sought to capitalize on the success of *Simon* and released their own handheld version of *Touch Me* in 1978.

An emulated handheld version of *Touch Me* was included in the 2022 compilation *Atari 50*.^[2]

References

- "Touch-Me" (https://www.arcade-museum.com/game_detail.php?game_id=12694). Arcade Museum. Retrieved 13 December 2022.
- Machkovech, Sam (September 12, 2022). "The 103 classic games that did, and didn't, make the Atari 50 anniversary cut" ([https://arstechnica.com/gaming/2022/09/the-103-classic-games-t-hat-did-and-didnt-make-the-atari-50-anniversary-cut/](https://arstechnica.com/gaming/2022/09/the-103-classic-games-that-did-and-didnt-make-the-atari-50-anniversary-cut/)). *Ars Technica*. Retrieved December 18, 2022.

Touch Me



Handheld version of *Touch Me*

Publisher	Atari Inc.
Platforms	Arcade, handheld console
Release	1974

External links

- [Touch Me at Coin-Op Museum \(http://www.arcade-museum.com/game_detail.php?letter=T&game_id=12694\)](http://www.arcade-museum.com/game_detail.php?letter=T&game_id=12694)
 - [Original Touch Me arcade flyer \(http://www.atarimuseum.com/videogames/arcade/fullsize/touchme.html\)](http://www.atarimuseum.com/videogames/arcade/fullsize/touchme.html)
 - [Info on the Touch Me handheld \(http://www.atarihq.com/museum/miscatari/touchme.html\)](http://www.atarihq.com/museum/miscatari/touchme.html)
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Retrieved from "[https://en.wikipedia.org/w/index.php?title=Touch_Me_\(arcade_game\)&oldid=1295526396](https://en.wikipedia.org/w/index.php?title=Touch_Me_(arcade_game)&oldid=1295526396)"

Atari Cosmos

The **Atari Cosmos** was an unreleased product by Atari, Inc. for the handheld/tabletop electronic game system market that uses holography to improve the display. It is similar to other small electronic games of the era that used a simple LED-based display, but superimposes a two-layer holographic image over the LEDs for effect. Two small lights illuminate one or both of the holographic images depending on the game state. The system was never released, and is now a coveted collector's item.^[3]

Atari Cosmos

Developer	<u>Atari, Inc.</u>
Type	<u>Handheld/tabletop electronic game</u>
Released	Unreleased (1978–1981) ^{[1][2]}
Media	<u>Cartridge</u>
CPU	<u>COPS444L</u>

History

The Cosmos was created by Atari, Inc. engineers Allan Alcorn, Harry Jenkins and Roger Hector.^[4] Work on the Cosmos began in 1978. Atari, Inc. purchased most of the rights to holographic items so that they could make this system. The Cosmos was to have nine released games, but all of the game logic for those games was included in the Cosmos itself – the cartridges only contained the holographic images and a notch to identify which game was included. This technically made the Cosmos a dedicated console, but Atari, Inc. did not publicize this fact.

In advertisements made for the system before its cancellation, Atari Inc. claimed that the holographic images were life-like and 3D. While this may have been true, the images did not influence the actual gameplay at all. There were only two images to a game, though they did enhance each game's appearance. The system was intended to be powered by an AC adapter rather than batteries. The Cosmos would have supported up to two players.

In 1981, the Cosmos was exhibited at the 1981 New York Toy Fair. Reviewers were extremely critical of the system, but Atari, Inc. stood by it and managed to obtain 8,000 pre-orders at the show alone.^[5] Engineering logs indicate that a 250-unit run was to be made, but it is unclear if they were all produced. In interviews by Curt Vendel with Al Alcorn and Steve Providence, management removed all of the parts and components from the "Holooptics Lab"; they are speculated to have been destroyed. Shortly thereafter, Ray Kassar directed Al Alcorn to close down the Holooptics labs and remove all of the holographic photography equipment and associated machinery.

Games

- Asteroids
- Basketball
- Dodge 'Em
- Football
- Outlaw

- Road Runner
- Sea Battle
- Space Invaders
- Superman

Specifications

- CPU: National Semiconductor COPS444L
- Graphic modes: Holographic backgrounds and programmable LEDs
- Lighting: 2 dual non-reflective incandescent lights for "A" and "B" Holoptic scenes
- Power supply: 10.5 V AC, 750 mA

References

1. 12.5 Advertisement for the Atari Cosmos game system, 1981 (https://books.google.com/books?id=iPfU_powAgAC&dq=atari+cosmos&pg=PA382), Page 382, By Sean F. Johnston, *Holographic Visions: A History of New Science*
2. Hot Lines and Holograms (<https://books.google.com/books?id=jT4EAAAAMBAJ&dq=%22atari+cosmos%22+1981+show&pg=PT23>), By Jean Yates, Page 29, 2 Mar 1981, InfoWorld, *Atari's "Cosmos" hand-held game uses game cartridges similar to those of the ... and game products at the Consumer Electronics Show, Atari maintains its image ... Shack, Apple, Commodore and other computers a run for the money in 1981.*
3. Buy An Original Atari "Cosmos" Hologram (<https://www.wired.com/2007/06/buy-an-original-2/>), By Chris Kohler, 2007-06-21 WIRED, *Dan Kramer, an ex-Atari employee (he created the trackball controller for the 5200!), is auctioning off some seriously rare pieces of Atari memorabilia: holograms that were going to be used for the never-released Atari Cosmos handheld system, which was going to project LCD games over swappable holographic backgrounds. This would have been included with an Asteroids game...*
4. Atari Cosmos (<http://www.oocities.org/siliconvalley/vista/3015/cosmos.html>), Planet Irata, *In 1978, Atari engineer Lyle Raines began working on an outer space game for a holographic game system Atari was developing called Cosmos.... Atari announced the system in May of 1981, and said the unit would retail for \$100, with eight cartridges...*
5. Page 180 (<https://books.google.com/books?id=tLWICgAAQBAJ&dq=atari+cosmos&pg=PA180>), By Sean Johnston, *Holograms: A Cultural History, Atari, the electronic game manufacturer, trialled a hand-held electronic toy in 1981*

External links

- Atari Cosmos Podcast at the Retroist (<https://web.archive.org/web/20160503102123/http://www.retroist.com/2010/04/02/retroist-podcast-episode-051-atari-cosmos/>)

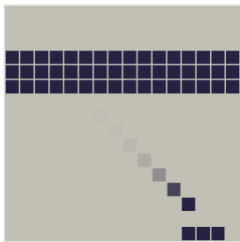
Retrieved from "https://en.wikipedia.org/w/index.php?title=Atari_Cosmos&oldid=1336062023"

Microvision

The **Microvision** (aka **Milton Bradley Microvision** or **MB Microvision**) is the first handheld game console that used interchangeable cartridges^{[1][2]} and in that sense is reprogrammable.^[3] It was released by the Milton Bradley Company in November 1979^[4] for a retail price of \$49.99,^{[5][6]} equivalent to \$221.00 in 2025.

The Microvision was designed by Jay Smith, the engineer who later designed the Vectrex video game console.^[2] The Microvision's combination of portability and a cartridge-based system led to moderate success, with Smith Engineering grossing \$15 million in the first year of the system's release. However, its small game library, its small screen, and a lack of support from established home video game companies led to its discontinuation in 1981.^[7] According to Satoru Okada, the former head of Nintendo's R&D1 Department, the Microvision inspired the Game Boy, the follow-up to Game & Watch, after Nintendo designed around Microvision's limitations.^[8]

Production



Screenshot of Block Buster, which came packaged with the Microvision

Unlike most later consoles, the Microvision did not contain an onboard processor (CPU). Instead, each game included its own processor contained within the removable cartridge.^{[9][10][11]} This meant that the console itself effectively consisted of the controls, LCD panel and LCD controller.^{[9][11]}

The processors for the first Microvision cartridges were made with both Intel 8021 (cross-licensed by Signetics) and Texas Instruments TMS1100 processors. Due to purchasing issues, Milton Bradley switched to using TMS1100 processors exclusively, including reprogramming the games that were originally programmed for the 8021 processor. The TMS1100 was a more primitive device, but offered more memory and lower power consumption than the 8021. First-revision Microvisions needed two batteries due to the 8021's higher power consumption, but later units (designed for the TMS1100) only had one active battery holder. Even though the battery compartment was designed to allow the two 9-volt batteries to be inserted with proper polarity of positive and negative terminals, when a battery was forcefully improperly oriented, while the other battery was properly oriented, the two batteries would be shorted and overheat. The solution was to remove terminals for one of the batteries to prevent this hazard. Due to the high cost of changing production molds, Milton Bradley did not eliminate the second battery compartment, but instead removed its terminals and called it a spare battery holder.

Problems

Microvision units and cartridges are now somewhat rare.^{[12][13]} Those that are still in existence are susceptible to three main problems: "screen rot," ESD damage, and keypad destruction.

Microvision

MICROVISION



A Microvision with *Block Buster* cartridge inserted

Also known as	Milton Bradley Microvision MB Microvision
Manufacturer	Milton Bradley Company
Type	Handheld game console
Generation	Second generation
Released	November 1979
Introductory price	US\$49.99 (equivalent to about \$222 in 2025)
Discontinued	1981
Media	ROM cartridges
CPU	Intel 8021/TI TMS1100 (on cartridge) clocked at 100 kHz
Memory	64 bytes RAM, 2K ROM
Display	16 × 16 pixels resolution
Power	1 × 9V battery (TMS1100 processors), 2 × 9V battery (Intel 8021 processors)

Screen rot

The manufacturing process used to create the Microvision's LCD was primitive by modern standards. Poor sealing and impurities introduced during manufacture have resulted in the condition known as *screen rot*. The liquid crystal spontaneously leaks and permanently darkens, resulting in a game unit that still plays but is unable to properly draw the screen. While extreme heat, which can instantly destroy the screen, can be avoided, there is nothing that can be done to prevent screen rot in most Microvision systems.^[3]

ESD damage

A major design problem on early units involves the fact that the microprocessor (which is inside the top of each cartridge) lacks ESD protection and is directly connected to the copper pins which normally connect the cartridge to the Microvision unit. If the user opens the protective sliding door that covers the pins, the processor can be exposed to any electric charge the user has built up. If the user has built up a substantial charge, the discharge can jump around the door's edge or pass through the door itself (dielectric breakdown). The low-voltage integrated circuit inside the cartridge is extremely ESD sensitive, and can be destroyed by an event of only a few dozen volts which cannot even be felt by the person, delivering a fatal shock to the game unit. This phenomenon was described in detail by John Elder Robison (a former Milton Bradley engineer) in his book *Look Me in the Eye*; according to Robison, up to 60% of units were returned as defective during the 1979 holiday season, causing significant panic among Milton Bradley staff and prompting extensive modifications to both later Microvision units (which were his own design) and Microvision factories to better dispel stray static charges.^[14]

Keypad destruction

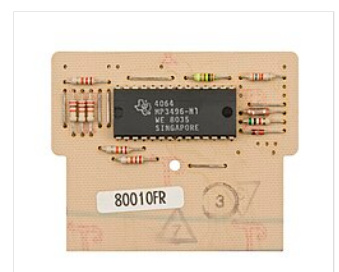
The Microvision unit had a twelve-button keypad, with the switches buried under a thick layer of flexible plastic. To align the user's fingers with the hidden buttons, the cartridges had cutouts in their bottom (over the keypad). As different games required different button functions, the cutouts were covered with a thin printed piece of plastic, which identified the buttons' functions in that game. The problem with this design is that pressing on the buttons stretched the printed plastic, resulting in the thin material stretching and eventually tearing. Having long fingernails exacerbated the condition. Many of the initial games were programmed to give feedback of the keypress when the key was released instead of when the key was pressed. As a result, users may press on the keypad harder because they are not being provided with any feedback that the key has been pressed. This resulted from a keypad used for prototyping being different from the production keypad; the prototyping keypad had tactile feedback upon key pressing that the production units lacked.

Technical specifications

- CPU: Intel 8021/TI TMS1100 (on cartridge)
- Screen type and resolution: 16 × 16 pixel LCD^{[2][6]}
- Register width: 4 bit (TMS1100), 8 bit (8021)
- Processor speed: 100 kHz
- RAM (integrated into CPU): 64 bytes
- ROM: 2K (TMS1100), 1K (8021)
- Cartridge ROM: 2K (TMS 1100), 1K (8021) masked (integrated into CPU; each game's CPU was different)
- Video Display Processor: LCD Custom Driver (made by Hughes)
- Sound: Piezo beeper
- Input: Twelve button keypad, one paddle
- Power requirements: One or two 9 volt batteries on earlier Microvision consoles, one 9 volt battery on later Microvision consoles
- Power Dissipation: 110 mW (TMS 1100), 1 W (8021)



The uncovered LCD screen of a Microvision, showing screen damage










































































The PCB of a Sea Duel game cartridge, showing the TI3496 processor from the TMS1100 family





















Games

While the game cartridge plastic cases were beige colored in the USA, in Europe they came in a variety of different colors, and the games were numbered on the Box. The age range in Europe for the console and its games was from 8 to 80 years old or 8 to Adult.

There were **12** titles known to have been released.

Background shading and an asterisk indicates cancelled games.

#	US title	Overseas titles	Game number (EU)	Release date	Microprocessor/s ^[15]	PCB Revision(s)
1	 <i>Block Buster</i> 4952	 <i>Block Buster</i>  <i>Block Buster</i>  <i>Block Buster</i>  <i>Block Buster</i>  <i>Casse Brique</i>	 1  1  1  1  1	November 1979	<i>TI MP3450A</i>	4952 REV A 4952-56 REV A 4952-79 REV B
2	 <i>Bowling</i> 4972	 <i>Bowling</i>  <i>Bowling</i>  <i>Bowling</i>  <i>Bowling</i>  <i>Bowling</i>	 2  2  2  2  2	November 1979	<i>TI MP3475NLL</i>	4952 REV A
3	 <i>Connect Four</i> 4971	 <i>Connect 4</i>  <i>4</i>  <i>Gewinnt</i>  <i>Vier</i>  <i>Op'n Rij</i>  <i>Forza 4</i>  <i>Puissance 4</i>	 5  5  5  5  5	November 1979	Signetics Intel 8021 <i>TI MP3481NLL</i>	4971 REV C 4952 REV -
4	 <i>Pinball</i> 4974	 <i>Pinball</i>  <i>Pinball</i>  <i>Flipper</i>  <i>Flipper</i>  <i>Flipper</i>	 4  4  4  4  4	November 1979	<i>TI MP3455NLL</i>	4952 REV A
5	 <i>Mindbuster</i> 4976	N/A	N/A	1979	<i>TI MP3457NLL</i>	4952 REV A
6	 <i>Star Trek: Phaser Strike</i> (later just <i>Phaser Strike</i>) 4973	 <i>Shooting Star</i>  <i>Shooting Star</i>  <i>Shooting Star</i>  <i>Shooting Star</i>  <i>Shooting Star</i>  <i>Shooting Star</i>	 3  3  3  3  3	1979	<i>TI MP3454NLL</i>	4952 REV A
7	 <i>Vegas Slots</i> 4975	N/A	N/A	1979	<i>TI MP3474-NLL</i>	4952-56 REV -
8	 <i>Baseball</i> 4974	N/A	N/A	1980	<i>TI MP3479-N1NLL</i>	4952-56 REV -
9	 <i>Sea Duel</i> 4064	 <i>Sea Duel</i>  <i>See-Duell</i>  <i>Duel</i>  <i>Duello</i>  <i>Sul Mare</i>  <i>Bataille Navale (Battleship)</i>	 6  6  6  6  6	1980	<i>TI MP3496-N1</i>	4952-56 REV -

#	US title	Overseas titles	Game number (EU)	Release date	Microprocessor/s ^[15]	PCB Revision(s)
10	 <i>Alien Raiders</i> 4176	 <i>Space Blitz</i>  <i>Blitz</i>  <i>Blitz</i>  <i>Blitz</i>  <i>Blitz</i>	 7  7  7  7  7	1981	TI M34009-N1	4952-79 REV B
11	 <i>Cosmic Hunter</i> 4177	N/A	N/A	1981	TI M34007-N1	4952-79 REV B
12	N/A	 <i>Super Block Buster</i>  <i>Super Blockbuster</i> 611497800  <i>Super Block Buster</i>  <i>Super Casse Brique (Super Brick Breaker)</i> 611497801	 8  8  8  8	1982	TI M34047-N2LL	7924952D02 Rev B
13	<i>Barrage*</i>	?	?	Unreleased (supposed to be released in 1982)	?	

Reviews

- 1980 Games 100 in *Games*^[16]
- 1981 Games 100 (<https://archive.org/details/games-26-1981-november/page/50/mode/2up>) in *Games*

See also

- *Mattel Auto Race*
- *Vectrex*

References

- Sfetcu, Nicolae (2014-05-04). *Game Preview* (<https://books.google.com/books?id=J1aAAwAAQBAJ>). Nicolae Sfetcu.
- "Cribsheet No. 15: Milton Bradley's Microvision". *Next Generation*. No. 40. Imagine Media. April 1998. p. 25.
- Vinciguerra, Robert (November 25, 2007). "Milton Bradley Microvision: The World's First Handheld Game Console" (<https://web.archive.org/web/20130125081809/http://www.revrob.com/sci-a-tech-topmenu-52/86-milton-bradley-Microvision-the-worlds-first-handheld-game-console>). The Rev. Rob Times. Archived from the original (<http://www.revrob.com/sci-a-tech-topmenu-52/86-milton-bradley-Microvision-the-worlds-first-handheld-game-console>) on January 25, 2013. Retrieved 26 December 2013.
- www.lookingtodraw.com, MICHAEL J. BARNES, ILTD DESIGN SERVICES. "PC Timeline. The Freeman PC Museum... Largest Collection of Vintage Computers On The Web" (<http://www.thepcmuseum.net/timeline.php>). Retrieved 22 January 2017.
- "Milton Bradley Microvision – Pop Culture Maven" (<https://www.popculturemaven.com/games/milton-bradley-microvision/>). 2014-02-19. Retrieved 2020-07-21.
- "Microvision by Milton Bradley – The Video Game Kraken" (<http://videogamekraken.com/microvision>). Retrieved 2020-08-06.
- Donald Melanson, March 3, 2006, *A Brief History of Handheld Video Games* (<https://www.engadget.com/2006-03-03-a-brief-history-of-handheld-video-games.html>) Engadget

8. Barder, Ollie (December 31, 2016). "New Interview With Satoru Okada Delves Into The Hidden History Behind Nintendo's Gaming Handhelds" (<https://www.forbes.com/sites/olliebarder/2016/12/31/new-interview-with-satoru-okada-delves-into-the-hidden-history-behind-nintendos-gaming-handhelds/>). *Forbes.com*. Retrieved 22 January 2017.
9. "Milton Bradley Microvision (U.S.)" (<https://web.archive.org/web/20180821212220/http://www.handheldmuseum.com/MB/uVUS.htm>). *Handheld Museum*. Archived from the original (<http://www.handheldmuseum.com/MB/uVUS.htm>) on 2018-08-21. Retrieved 2018-12-02. "the console itself is nothing more than controls, LCD panel and a controller chip for the LCD panel. Each cartridge contains the microprocessor, which happens to have a small amount of ROM space on it that MB loaded the game code onto."
10. "MB Microvision Handheld Games Console" (<https://web.archive.org/web/20170710171115/https://www.simplyeighties.com/mb-microvision-game-console.php>). *Simply Eighties*. Archived from the original (<https://www.simplyeighties.com/mb-microvision-game-console.php#.XAQiaTFBqUk>) on 2017-07-10. Retrieved 2018-12-02. "In fact, it was the cartridge itself that contained the CPU, and just to confuse everyone two different ones were used."
11. "Milton Bradley Microvision (1979 – 1981)" (<https://web.archive.org/web/20181121012836/https://obsoletemedia.org/milton-bradley-microvision/>). *Museum of Obsolete Media*. 27 September 2013. Archived from the original (<https://obsoletemedia.org/milton-bradley-microvision/>) on 2018-11-21. Retrieved 2018-12-07. "The main unit was little more than a housing for the display, batteries, switches and controller, while the brains of each game was a combined microprocessor/memory chip inside the clip-on cartridge."
12. Brown, Jason (2022-01-14). "12 Best Microvision Games Of 2022" (<https://retrododo.com/best-microvision-games/>). *RetroDodo*. Retrieved 2022-02-13.
13. Lester, John "Gamester81" (2013-04-28). "History of Consoles-Microvision (1979)" (<https://gamester81.com/history-of-consoles-microvision-1979/>). *Gamester81.com*. Retrieved 2022-02-13.
14. Robinson, John Elder (25 September 2007). "Chapter 21: Being Young Executives" (<https://archive.org/details/look-meineyemyl00robi/page/197>). *Look Me in the Eye*. Three Rivers Press. pp. 197-203 (<https://archive.org/details/look-meineyemyl00robi/page/197>). ISBN 978-0-307-39598-6.
15. "Dan B's Atari Microvision Tech Page" (<https://atarihq.com/danb/MicrovisionCarts.shtml>).
16. "GAMES Magazine #20" (<https://archive.org/details/games-20-1980-november/page/52/mode/2up>). November 1980.

Retrieved from "<https://en.wikipedia.org/w/index.php?title=Microvision&oldid=1347137824>"

Game & Watch

Game & Watch^[a] is a series of handheld electronic games developed by Nintendo. Designed by Gunpei Yokoi, the first game, *Ball* was released in 1980 and the original production run of the devices continued until 1991. The name Game & Watch reflects their dual functionality: a single game paired with a digital clock on a segmented liquid-crystal display (LCD) screen. The Game & Watch series proved a monumental success, selling a total of 43.4 million units globally, marking Nintendo's first major worldwide success with electronic games.

History

The Game & Watch was the brainchild of designer Gunpei Yokoi, the head of Nintendo Research & Development 1 (R&D1), who was inspired during a trip on a Shinkansen high-speed train, where he noticed a bored businessman idly pressing buttons on a credit-card-sized pocket calculator.^[3] This sparked the idea of a compact, discreet toy for adults to pass the time on public transport. At the time, Nintendo was struggling financially, and R&D1 consisted of just Yokoi and his assistant, Satoru Okada. The two looked at other handheld electronic games, including *Mattel Auto Race*, the Microvision, and *Simon*, but found these too large and reliant on low-resolution vacuum fluorescent or LED displays that rendered abstract graphics.^{[4][5]} This led to the idea of using a segmented liquid-crystal display (LCD), like those in calculators, to create a smaller device with sharper, clearer graphics, though limited to a single game.^{[6][7]}

This experience would inspire Yokoi's design philosophy of "lateral thinking with withered technology",^[b] which emphasized creative uses of mature, cost-effective technology. This principle would continue to be embraced by Nintendo in the following decades.^[8] At the time, fierce competition

Game & Watch



Ball, the first Game & Watch device

Also known as	<u>Tricotronic</u> (West Germany, Austria) <u>Time-Out</u> (North America)
Developer	<u>Nintendo R&D1</u>
Manufacturer	<u>Nintendo</u>
Type	<u>Handheld electronic games</u>
Generation	<u>Second</u>
Released	28 April 1980
Introductory price	¥5,800 (equivalent to ¥8,595 in 2024) ^[1]
Discontinued	1991
Units sold	43.4 million ^[1]
CPU	<u>Sharp SM5xx</u>
Memory	260 B <u>RAM</u>
Storage	1,792 B <u>ROM</u>
Display	<u>Segmented liquid-crystal display</u>
Best-selling game	<i><u>Donkey Kong</u></i> (8 million) ^[2]
Successor	<u>Game Boy</u>
Made in	Japan

in the calculator market between Sharp and Casio had created a surplus of LCDs and semiconductors, creating an opportunity to repurpose these components for gaming.^{[7][8]}

Yokoi pitched the idea to Nintendo president Hiroshi Yamauchi while driving him to a business meeting after the company chauffeur called in sick. Yamauchi's meeting happened to be with Sharp's CEO, and the two leaders discussed the concept. Within a week, Yokoi was invited to a meeting between Nintendo and Sharp, where approval was given to develop a calculator-sized gaming device.^[3]

Yamauchi, however, assigned the project to Nintendo Research & Development 2 (R&D2), which was established in 1978 to focus on electronic projects like the Color TV-Game, while R&D1 was to continue to focus on creating physical toys and games. R&D2 rejected the idea, claiming it was too difficult to implement. Undeterred, Yokoi and Okada continued developing the concept on their own. Yokoi created a mock-up of the first game, Ball, and demonstrated it to Okada by shining light through cut-out paper shapes. Okada then built a working prototype, buying a TK-80 computer, teaching himself to program for the Intel 8080, and designing the necessary electronics.^[4]

When they presented the prototype to employees at Sharp, they also dismissed the project, saying it wasn't feasible to scale it down to calculator size. Yokoi and Okada left the prototype with Sharp, asking them to play with it for a while, which convinced Sharp employees of the game's potential and led them to develop a compatible display.^[4] The final device was powered by a 4-bit CPU from Sharp's SM5xx family, paired with 1,792 bytes of ROM, 65 bytes of RAM across four banks for data storage, and an LCD screen driver circuit.^{[9][10]}

The Game & Watch name reflected its dual functionality: it combined a single game with a digital clock.^{[11][12]} The first game, Ball, had modest initial sales but enough success for Yamauchi to greenlight three more games: Flagman, Vermin, and Fire.^[4] This eventually led to dozens of titles over the next decade.^[13]

In North America, the games were initially launched through Mego Corporation as the **Time-Out** series which included Ball (renamed Toss-Up), Flagman, Vermin (renamed Exterminator), and Fire (retitled Fireman Fireman). This partnership ended within a year, and Nintendo of America began distributing the series under their original titles.^[14]

Starting in 1981, Game & Watch devices incorporated an alarm function, enhancing their practicality as a watch.^[15] By mid-1982, limitations of single-screen LCDs led to the creation of the Multi Screen Series, which effectively doubled the gameplay area. Oil Panic launched the series. Shortly thereafter, Nintendo's highly successful Donkey Kong arcade game was adapted for the Multi Screen format, requiring an alternative to the traditional joystick, which was impractical for handheld gaming. This challenge led to the invention of the now-iconic D-pad, a flat, four-way directional control that allowed for precise movement with minimal space requirements.^{[13][16][17]} The D-pad design was later honored with a Technology & Engineering



Donkey Kong, showing its revolutionary D-pad and multi-screen clamshell design

Emmy Award in 2008.^{[18][19]} The clamshell design of the Multi Screen Series would later inspire the Game Boy Advance SP, Nintendo DS, and Nintendo 3DS.^[20]

The Game & Watch series was a monumental success. Yokoi had initially aimed to sell 100,000 units, but Nintendo ultimately sold 43.4 million units worldwide—12.87 million in Japan and 30.53 million overseas.^[21] The device also significantly improved Nintendo's financial standing. Before its release in 1980, the company reportedly had debts of 7 to 8 billion yen. By 1981, however, largely due to the Game & Watch's success, Nintendo had paid off its debts and put about 4 billion yen in the bank.^[5] It marked the company's first major worldwide success with a Nintendo video game product.^[22]

Series

Over the initial eleven year life span of the *Game & Watch* line, 60 different games were produced for sale.^[23] These games came in eleven different series, each with a different form-factor:^[8]



Chef, a Game & Watch Wide Screen series device

- Silver (1980) – the first version of the Game & Watch
- Gold (1981) – added alarm clock function, static color backgrounds, and a built-in wire loop stand
- Wide Screen (1981–1982) – introduced a 30% larger LCD panel in a slightly wider form factor
- Vertical Multi Screen (1982–1989) – two LCD panels in a vertical folding clamshell unit
- Horizontal Multi Screen (1983) – two LCD panels in a right-to-left opening clamshell unit
- New Wide Screen (1982–1991) – an updated version of the Wide Screen series; used colorful metal faceplates for each game
- Tabletop (1983) – made to compete with Coleco; these actually do not use VFD (Vacuum Fluorescent Display) screens but regular LCD screens like all other Game & Watch games. Ambient light transmitted through the translucent top illuminates an integrated mirror which bounces the light onto the back of the display. The polarizer film is flipped front to back, creating a full blackened LCD screen in power-off mode, when LCD segments are turned on these will become transparent holes, allowing light passing through them from the mirror on the back. The colors come from a colored overlay which make the holes appear colored.
- Panorama (1983–1984) - similar design to the Tabletop units, but folded into a compact size via an articulated hinge
- Super Color (1984) – used a long portrait-oriented LCD panel with color overlays to color the display elements
- Micro Vs. System (1984) – used a wide horizontal LCD panel; allowed 2-player games via two external wired control pads
- Crystal Screen (1986) – used a unique large see-through LCD panel with no reflective background; all three games were later re-released as New Wide Screen titles

Titles included characters from other Nintendo franchises including *The Legend of Zelda* and *Mario Bros.* Nintendo also licensed third-party characters including Mickey Mouse.

Among the 60 games was one "prize" game, a version of *Super Mario Bros.* that came in a yellow plastic case modeled after the Disk-kun character Nintendo used to advertise their Famicom Disk System.^{[24][25]} These games were never sold, but instead given away to 10,000 winners of Nintendo's *F-1 Grand Prix* tournament.^{[24][23]}

The Game & Watch series sold 14 million units worldwide during its first year of release by 1981.^[26] The Game & Watch version of *Donkey Kong* released in 1982 sold 8 million units.^[2] *Mario the Juggler* was the last LCD installment in the *Game & Watch* series released in 1991 and is a tribute to the first game, *Ball*.^{[27][8]}

In 2021, the last Game and Watch was released, being *Game and Watch: The Legend of Zelda*.

Game A and Game B

Most of the titles have a "GAME A" and a "GAME B" button. Game B is generally a faster, more difficult version of Game A, although exceptions do exist:

- In *Squish*, Game B is radically different from Game A—the player must touch aliens to eliminate them as opposed to avoiding moving walls.^[28]
- In *Flagman*, Game B is a mode where the player has to press the right button within a certain amount of time, not memorize patterns.
- In *Judge*, *Boxing*, *Donkey Kong 3*, and *Donkey Kong Hockey*, Game B is a two-player version of Game A.^[29]
- In *Climber*,^[30] *Balloon Fight*,^[31] and *Super Mario Bros.*,^{[32][25]} there is no Game B button.

In most cases, both Game A and Game B would increase in speed and/or difficulty as the player progressed, with Game B starting at the level that Game A would reach at 200 points.

Legacy, ports and remakes

The Game & Watch series helped to popularize handheld video games, inspiring imitators like Tiger Electronics, Micro Games of America, Konami and Elektronika, which released the IM-02 series in the Soviet Union.^[33]

Nintendo also used the core technology from the Game & Watch line for the Bassmate Computer, a handheld databank intended for bass fishing. The Bassmate was released in 1984 by Telko under various brand names, with Nintendo acting as the original design manufacturer.^[34]

After this initial model, Telko and its partners expanded the concept into several related fishing computers—including the Bassmate II, WalleyeMate, and Troutmate—all of which were produced without Nintendo's involvement. These later units reused the same basic hardware and software platform created for the original Bassmate but were engineered and manufactured entirely by third-party companies. Each model targeted a different fishing niche—bass, walleye, or trout—and, like the first Bassmate, was sold under multiple brand names such as Telko, KMV, and Probe 2000.^[35]

Nintendo revived the series between 1995 and 2002 with the *Game & Watch Gallery* series for Game Boy, Game Boy Color and Game Boy Advance featuring original ports and modernized Mario-themed versions. Starting in 1998, smaller LCD versions of ten Game & Watch titles were re-released as the Nintendo Mini Classics. In 2001, Nintendo bundled *Manhole-e* with the Nintendo e-Reader, though a planned line of e-Reader Game & Watch cards never materialized.^[36]



Elektronika IM-02 (Well, Just You Wait!), a clone of the Game & Watch from the Soviet Union

From 2006 to 2010, Nintendo produced the *Game & Watch Collection* series for the Nintendo DS, initially exclusive to Club Nintendo. Between 2009 and 2010, nine Game & Watch titles were released on DSiWare.^{[37][38]} In the DS game, *Cooking Guide: Can't Decide What to Eat?*, the player can unlock the game *Chef*.^[39]

To celebrate Game & Watch's 30th anniversary in 2010, Nintendo re-released *Ball* as a Club Nintendo reward, adding a mute switch.^[40] It was available to members in Japan,^[41] North America,^[42] and Europe.^[43] The Game & Watch legacy was also acknowledged in the 2012 game *Nintendo Land* for Wii U, with a mini-game called *Octopus Dance* based on the classic *Octopus* title.^[44]

In 2020, Nintendo released *Game & Watch: Super Mario Bros.* to commemorate the 35th anniversary of the *Super Mario* series and the 40th anniversary of the Game & Watch line.^[45] This limited-edition handheld included the full NES versions of *Super Mario Bros.* and *Super Mario Bros.: The Lost Levels*, and *Ball* now starring Mario.^[46] The following year, Nintendo launched *Game & Watch: The Legend of Zelda* to celebrate that franchise's 35th anniversary.^[47] It included *The Legend of Zelda*, *Zelda II: The Adventure of Link*, *The Legend of Zelda: Link's Awakening*, and *Vermin* now starring Link.^[48] Unlike the classic Game & Watch devices, these modern versions are far more technically advanced with a backlit full-color LCD screen, a rechargeable battery that charges via USB-C,^[49] and powered by an Cortex-M7 processor with over a megabyte of RAM and flash memory.^{[50][51]}

Mr. Game & Watch

Mr. Game & Watch represents the brand in Nintendo's *Super Smash Bros.* series, debuting in *Melee* (2001) as a two-dimensional, stick-figure-styled fighter with moves based on classic Game & Watch games. He also appears in *Game & Watch Gallery 4* and makes cameos in *Donkey Kong Country Returns* and *Rhythm Heaven Fever*. In 2015, Nintendo released a Mr. Game & Watch Amiibo,^[52] which unlocks a personal CPU fighter in *Super Smash Bros.* and a cosmetic option in *Super Mario Maker*.^{[53][54]} His moveset in the *Super Smash Bros.* series utilizes techniques taken from various Game & Watch games.^[55] He was featured as one of the greatest video game icons by *Retro Gamer* staff, describing him as an early mascot in gaming while also someone who never earned the level of celebrity that Nintendo's biggest characters did. They felt that his simple design made him work well on the LCD format, and allowed him to slot into different roles.^[56] The character makes a cameo appearance in *The Super Mario Galaxy Movie* (2026), where Luigi paints him into existence to help the protagonists defeat the villains.^[57]



Fishing Computer Models of the Bassmate, Bassmate II and WalleyeMate



Nintendo Mini Classics



Game & Watch: Super Mario Bros.

See also



[1980s portal](#)



[Video games portal](#)

- [History of Nintendo](#)

Notes

- a. [Japanese](#): ゲーム&ウオッチ, [Hepburn](#): *Gēmu & Uotchi*
- b. [Japanese](#): 枯れた技術の水平思考, [Hepburn](#): *Kareta Gijutsu no Suihei Shikō*

References

1. "社長が訊く「ゲーム&ウオッチ」" (https://www.nintendo.co.jp/n10/interview/game_and_watc h/vol1/index4.html) [The president asks about "Game & Watch"]. *Nintendo* (in Japanese). Retrieved 5 January 2025.
2. Epstein, David (27 June 2019). "Chapter 9: Lateral Thinking with Withered Technology" (<https://books.google.com/books?id=oEGCDwAAQBAJ&pg=PT196>). *Range: Why Generalists Triumph in a Specialized World*. Pan Macmillan. p. 196. ISBN 978-1-5098-4351-0. "The Donkey Kong Game & Watch was released in 1982 and alone sold eight million units."
3. Alt, Matt (12 November 2020). "How Gunpei Yokoi Reinvented Nintendo" (<https://www.vice.co m/en/article/how-gunpei-yokoi-reinvented-nintendo/>). *Vice*. Archived (<https://web.archive.org/w eb/20201113062629/https://www.vice.com/en/article/pkdbx7/how-gunpei-yokoi-reinvented-nint endo>) from the original on 13 November 2020. Retrieved 12 November 2020.
4. Kurokawa, Fumio (28 March 2022). "元任天堂・岡田 智氏の独立独歩 前編 "技術的に不可能"を 覆したゲーム&ウオッチ 「ビデオゲームの語り部たち」：第27部" (<https://www.4gamer.net/ga mes/999/G999905/20220303097/>) [Former Nintendo employee Satoshi Okada's independent journey Part 1: Game & Watch overturns "technical impossibility"]. *4Gamer.net* (in Japanese). Retrieved 21 March 2025.
5. Yokoi, Gunpei (November 1996). "ゲームボーイを開発した伝説の技術者・横井軍平「私はな ぜ任天堂を辞めたか」" (<https://bunshun.jp/articles/-/6659>) [Gunpei Yokoi, the legendary engineer who developed the Game Boy: "Why I left Nintendo"]. *Bungeishunjū* (in Japanese). Retrieved 20 March 2025.
6. "Satoru Okada talks Game & Watch, Game Boy and Nintendo DS development" (<https://web.ar chive.org/web/20170101232208/http://www.japanesenintendo.com/post/155107688449>). *Retro Gamer*. No. 163. 2016. Archived from the original on 1 January 2017. Retrieved 1 January 2017.
7. Parish, Jeremy (31 March 2011). "The Troubled Past and Challenging Future of Nintendo 3DS: What the 3DS owes to Virtual Boy (and how it's different)" (<https://web.archive.org/web/201207 11185404/http://www.1up.com/features/nintendo-3ds-past-present-future>). *1up.com*. Archived from the original (<http://www.1up.com/features/nintendo-3ds-past-present-future>) on 11 July 2012.
8. McFarren, Damien (2016). *Videogames Hardware Handbook*. Vol. 1 (2nd ed.). Bournemouth: Imagine Publishing. pp. 157–163. ISBN 978-1-78546-239-9.

9. "Sharp SM" (https://en.wikichip.org/wiki/sharp_corporation/sm). *WikiChip*. Archived (https://web.archive.org/web/20221201111835/https://en.wikichip.org/wiki/sharp_corporation/sm) from the original on 1 December 2022. Retrieved 5 January 2025.
10. "MAME emulator source code" (https://github.com/mamedev/mame/blob/master/src/mame/handheld/hh_sm510.cpp). *GitHub*. Archived (https://web.archive.org/web/20230525065814/https://github.com/mamedev/mame/blob/master/src/mame/handheld/hh_sm510.cpp) from the original on 25 May 2023. Retrieved 25 May 2023.
11. "Game & Watch (Franchise)" (<https://www.giantbomb.com/game-watch/3025-1183/>). *Giant Bomb*. Archived (<https://web.archive.org/web/20210127221433/https://www.giantbomb.com/game-watch/3025-1183/>) from the original on 27 January 2021. Retrieved 15 June 2020.
12. "Digital game + digital clock = Game & Watch!" (<https://recollectionsofplay.wordpress.com/2013/05/15/why-game-and-watch-when-you-could-game-watch/>). *Recollections of Play*. 16 May 2013. Archived (<https://web.archive.org/web/20200615190339/https://recollectionsofplay.wordpress.com/2013/05/15/why-game-and-watch-when-you-could-game-watch/>) from the original on 15 June 2020. Retrieved 15 June 2020.
13. "Feature: The History of the Nintendo Game & Watch" (http://www.nintendolife.com/news/2010/02/feature_the_history_of_the_nintendo_game_and_watch). *Nintendo Life*. 24 February 2010. Retrieved 26 January 2019.
14. Salvador, Phil (13 June 2024). "Is This the First Nintendo Commercial?" (<https://gamehistory.org/mego-time-out-commercial/>). *Video Game History Foundation*. Archived (<https://web.archive.org/web/20240627061609/https://gamehistory.org/mego-time-out-commercial/>) from the original on 27 June 2024. Retrieved 2 July 2024.
15. "Feature: The History of the Nintendo Game & Watch" (https://www.nintendolife.com/news/2010/02/feature_the_history_of_the_nintendo_game_and_watch). *Nintendo Life*. 24 February 2010. Archived (https://web.archive.org/web/20200615190339/https://www.nintendolife.com/news/2010/02/feature_the_history_of_the_nintendo_game_and_watch) from the original on 15 June 2020. Retrieved 15 June 2020.
16. McFerran, Damien (2016). "Game Boy". *Videogames Hardware Handbook Vol 1. (2nd RE)*. pp. 157–163.
17. Goodall, Reece (13 June 2020). "Concept to Console: Game & Watch" (<https://theboar.org/2020/06/concept-to-console-game-and-watch-nintendo-smash-bros/>). *TheBoar.org*. Archived (<https://web.archive.org/web/20210301095838/https://theboar.org/2020/06/concept-to-console-game-and-watch-nintendo-smash-bros/>) from the original on 1 March 2021. Retrieved 26 October 2020.
18. "Nintendo Wins Emmy For DS And Wii Engineering | Technology | Sky News" (<http://news.sky.com/skynews/Home/Sky-News-Archive/Article/20080641299976>). *Sky News*. 9 January 2008. Retrieved 30 August 2010.
19. Magrino, Tom (8 January 2008). "CES '08: Nintendo wins second Emmy - News at GameSpot" (<http://www.gamespot.com/articles/ces-08-nintendo-wins-second-emmy/1100-6184421/>). *GameSpot*. Retrieved 28 April 2016.
20. "Feature: How Nintendo's Game & Watch Took "Withered Technology" And Turned It Into A Million-Seller" (https://www.nintendolife.com/news/2020/09/feature_how_nintendos_game_and_watch_took_withered_technology_and_turned_it_into_a_million-seller). *Nintendo Life*. 8 September 2020. Archived (https://web.archive.org/web/20201017092404/https://www.nintendolife.com/news/2020/09/feature_how_nintendos_game_and_watch_took_withered_technology_and_turned_it_into_a_million-seller) from the original on 17 October 2020. Retrieved 24 October 2020.
21. "Iwata Asks: Game & Watch: 4. Absorbed in Development" (<https://web.archive.org/web/20110518183353/http://iwataasks.nintendo.com/interviews/#/clubn/game-and-watch-ball-reward/0/3>). Nintendo of America. Archived from the original (<http://iwataasks.nintendo.com/interviews/#/clubn/game-and-watch-ball-reward/0/3>) on 18 May 2011. Retrieved 23 June 2013.
22. "Wii.com – Iwata Asks: Super Mario Bros. 25th Anniversary" (https://web.archive.org/web/20111231005824/http://us.wii.com/iwata_asks/mario25th/vol2_page1.jsp). Us.wii.com. Archived from the original (http://us.wii.com/iwata_asks/mario25th/vol2_page1.jsp) on 31 December 2011. Retrieved 23 March 2011.

23. "Super Mario Bros. YM-901" (<http://www.gameandwatch.ch/en/faqs/super-mario-bros-ym-901.html>). 2 January 2009. Archived (<https://web.archive.org/web/20110309015902/http://www.gameandwatch.ch/en/faqs/super-mario-bros-ym-901.html>) from the original on 9 March 2011. Retrieved 1 July 2009.
24. "ファミコン必勝本 No. 037(1987年 12月 18日号)" (<https://archive.org/details/no.-037-1987-12-18/%E3%83%95%E3%82%A1%E3%83%9F%E3%82%B3%E3%83%B3%E5%BF%85%E5%8B%9D%E6%9C%ACNo.037%281987%E5%B9%B412%E6%9C%8818%E6%97%A5%E5%8F%B7%29/page/n10/mode/1up>). 18 December 1987.
25. "Nintendo Super Mario Bros Promo" (<http://www.handheldmuseum.com/Nintendo/SMBPromo.htm>). Archived (<https://web.archive.org/web/20210115233757/https://www.handheldmuseum.com/Nintendo/SMBPromo.htm>) from the original on 15 January 2021. Retrieved 1 July 2009.
26. "昔(1970年代) のテレビゲームは何台売れた?" (https://www.ne.jp/asahi/cvs/odyssey/hyperlink/setframe_dataroom_numbers1.html) [How many old (1970s) video games sold?]. *Classic Videogame Station Odyssey* (in Japanese). Archived (https://web.archive.org/web/20140109231757/http://www.ne.jp/asahi/cvs/odyssey/hyperlink/setframe_dataroom_numbers1.html) from the original on 9 January 2014. Retrieved 16 April 2021.
27. "Obscure Pixels – Nintendo Game&Watch" (<https://web.archive.org/web/20181130000851/http://homepages.ihug.co.nz/~pinwhiz/g%26w.htm>). Archived from the original (<http://homepages.ihug.co.nz/~pinwhiz/g&w.htm>) on 30 November 2018. Retrieved 11 July 2009.
28. "gw / squish" (<https://web.archive.org/web/20090625012323/http://www.gameandwatch.com/screen/multiscreen/squish/index.html>). Archived from the original (<http://www.gameandwatch.com/screen/multiscreen/squish/index.html>) on 25 June 2009. Retrieved 11 July 2009.
29. van Spanje, Martin. "#026: Judge – a Nintendo Game & Watch collection" (https://web.archive.org/web/20090715005513/http://p-edge.nl/parachuter/game_watch_games/026_judge). Archived from the original (http://p-edge.nl/parachuter/game_watch_games/026_judge) on 15 July 2009. Retrieved 11 July 2009.
30. "gw / climber" (<https://web.archive.org/web/20091007051623/http://www.gameandwatch.com/screen/crystal/climber/index.html>). Archived from the original (<http://www.gameandwatch.com/screen/crystal/climber/index.html>) on 7 October 2009. Retrieved 11 July 2009.
31. "gw / balloon fight" (<https://web.archive.org/web/20091007171858/http://www.gameandwatch.com/screen/crystal/balloonfight/index.html>). Archived from the original (<http://www.gameandwatch.com/screen/crystal/balloonfight/index.html>) on 7 October 2009. Retrieved 11 July 2009.
32. "gw / super mario bros" (<https://web.archive.org/web/20090908063728/http://www.gameandwatch.com/screen/crystal/supermario/index.html>). Archived from the original (<http://www.gameandwatch.com/screen/crystal/supermario/index.html>) on 8 September 2009. Retrieved 11 July 2009.
33. Richter, Darmon (3 May 2023). "How A Nintendo Game & Watch Bootleg Enraptured A Generation Of Russian Kids" (<https://www.timeextension.com/features/how-a-nintendo-game-and-watch-bootleg-enraptured-a-generation-of-russian-kids>). *Time Extension*. Hookshot Media. Archived (<https://web.archive.org/web/20230503140647/https://www.timeextension.com/features/how-a-nintendo-game-and-watch-bootleg-enraptured-a-generation-of-russian-kids>) from the original on 3 May 2023. Retrieved 3 May 2023.
34. "Bassmate Computer – a new member on the Game & Watch family tree" (<http://blog.beforemario.com/2013/06/bassmate-computer-new-member-on-game.html>). *Before Mario*. Retrieved 7 December 2025.
35. "How the Bassmate Computer came to be" (<http://blog.beforemario.com/2013/06/how-bassmate-computer-came-to-be.html>). *Before Mario*. Retrieved 7 December 2025.
36. "Game & Watch Collection: Manhole Release Information for e-Reader" (<http://www.gamefaqs.com/ereader/915448-game-and-watch-collection-manhole/data>). *GameFAQs*. Archived (<https://web.archive.org/web/20131227124459/http://www.gamefaqs.com/ereader/915448-game-and-watch-collection-manhole/data>) from the original on 27 December 2013. Retrieved 6 July 2013.

37. "Game & Watch: Mario's Cement Factory Release Information for DS" (<http://www.gamefaqs.com/ds/961347-game-and-watch-marios-cement-factory/data>). GameFAQs. 22 March 2010. Archived (<https://web.archive.org/web/20160918100125/http://www.gamefaqs.com/ds/961347-game-and-watch-marios-cement-factory/data>) from the original on 18 September 2016. Retrieved 6 July 2013.
38. "GAME&WATCH" (https://www.nintendo.co.jp/ds/dsiware/game_and_watch/index.html). Nintendo.co.jp. 10 July 2009. Archived (https://web.archive.org/web/20171124055820/https://www.nintendo.co.jp/ds/dsiware/game_and_watch/index.html) from the original on 24 November 2017. Retrieved 11 July 2009.
39. "Personal Trainer: Cooking – Cheats" (<https://gamefaqs.gamespot.com/ds/946314-personal-trainer-cooking/cheats+%26cd%3D1%26hl%3Den%26ct%3Dclnk%26gl%3Dus>). Archived (<https://web.archive.org/web/20201028212101/https://gamefaqs.gamespot.com/ds/946314-personal-trainer-cooking/cheats+%26cd%3D1%26hl%3Den%26ct%3Dclnk%26gl%3Dus>) from the original on 28 October 2020. Retrieved 25 October 2020.
40. "Game & Watch" (<http://iwataasks.nintendo.com/interviews/#/clubn/game-and-watch-ball-reward/0/4>). *Iwata Asks*. Nintendo. Archived (<https://web.archive.org/web/20160304001700/http://iwataasks.nintendo.com/interviews/#/clubn/game-and-watch-ball-reward/0/4>) from the original on 4 March 2016. Retrieved 1 November 2014.
41. McWhertor, Michael (18 November 2009). "Club Nintendo Offers Members Actual Game & Watch Prize" (<https://kotaku.com/club-nintendo-offers-members-actual-game--watch-prize-5407784>). *Kotaku*. Archived (<https://web.archive.org/web/20141102101420/http://kotaku.com/5407784/club-nintendo-offers-members-actual-game--watch-prize>) from the original on 2 November 2014. Retrieved 2 November 2014.
42. Winterhalter, Ryan (11 February 2011). "Club Nintendo offering Game & Watch replica" (<http://www.gamesradar.com/club-nintendo-offering-game-watch-replica/>). *GamesRadar+*. Future. Archived (<https://web.archive.org/web/20141222024809/http://www.gamesradar.com/club-nintendo-offering-game-watch-replica/>) from the original on 22 December 2014. Retrieved 2 November 2014.
43. Newton, James (28 November 2011). "Game & Watch Gifts Added to European Club Nintendo" (http://www.nintendolife.com/news/2011/11/game_and_watch_gifts_added_to_european_club_nintendo). *Nintendo Life*. Archived (https://web.archive.org/web/20200628140652/http://www.nintendolife.com/news/2011/11/game_and_watch_gifts_added_to_european_club_nintendo) from the original on 28 June 2020. Retrieved 2 November 2014.
44. Hanson, Ben (7 November 2012). "F-Zero, Yoshi, And Octopus Dance Gameplay Videos In Nintendo Land" (<https://www.gameinformer.com/b/features/archive/2012/11/07/f-zero-yoshi-and-octopus-dance-gameplay-videos-in-nintendo-land.aspx>). *Game Informer*. Archived (<https://web.archive.org/web/20121108100730/http://www.gameinformer.com/b/features/archive/2012/11/07/f-zero-yoshi-and-octopus-dance-gameplay-videos-in-nintendo-land.aspx>) from the original on 8 November 2012.
45. Rao, Anjali (February 15, 2007). Sigeru Miyamao Talk Asia interview (<http://www.cnn.com/2007/WORLD/asiapcf/02/14/miyamoto.script/index.html>) Archived (<https://web.archive.org/web/20090401060304/http://www.cnn.com/2007/WORLD/asiapcf/02/14/miyamoto.script/index.html>) April 1, 2009, at the *Wayback Machine*. CNN. Retrieved February 28, 2009
46. "The official home of the Game & Watch: Super Mario Bros. system" (<https://gameandwatch.nintendo.com/>). *gameandwatch.nintendo.com*. Archived (<https://web.archive.org/web/20201025144039/https://gameandwatch.nintendo.com/>) from the original on 25 October 2020. Retrieved 24 October 2020.
47. [1] (<https://web.archive.org/web/20211113021921/https://www.nintendo.com/products/detail/game-and-watch-the-legend-of-zelda/>)
48. McFerran, Damien (15 June 2021). "There's A Zelda Game & Watch Coming This Christmas" (https://www.nintendolife.com/news/2021/06/theres_a_zelda_game_and_watch_coming_this_christmas). Nintendo Life. Archived (https://web.archive.org/web/20210615165721/https://www.nintendolife.com/news/2021/06/theres_a_zelda_game_and_watch_coming_this_christmas) from the original on 15 June 2021. Retrieved 16 June 2021.

49. Burton, Jared (16 October 2020). "'80s and '90s kids might remember the Game & Watch handheld systems—now Nintendo's bringing 'em back, Mario-style" (<https://ourcommunitynow.com/gaming/80s-kids-rejoice-nintendo-releases-the-game-and-watch-handheld>). *Our Community Now*. Archived (<https://web.archive.org/web/20201021080750/https://ourcommunitynow.com/gaming/80s-kids-rejoice-nintendo-releases-the-game-and-watch-handheld>) from the original on 21 October 2020. Retrieved 24 October 2020.
50. McFerran, Damien (12 November 2020). "Hacker Tears Apart Super Mario Game & Watch To Find Out What's Inside" (https://www.nintendolife.com/news/2020/11/hacker_tears_apart_super_mario_game_and_watch_to_find_out_whats_inside). *Nintendo Life*. Gamer Network. Archived (https://web.archive.org/web/20201112201547/https://www.nintendolife.com/news/2020/11/hacker_tears_apart_super_mario_game_and_watch_to_find_out_whats_inside) from the original on 12 November 2020. Retrieved 13 November 2020.
51. "STM32H7B0VB ARM Cortex-M7 Microcontroller" (<https://www.st.com/en/microcontrollers-microprocessors/stm32h7b0vb.html>). *STMicroelectronics*. Archived (<https://web.archive.org/web/20201117210017/https://www.st.com/en/microcontrollers-microprocessors/stm32h7b0vb.html>) from the original on 17 November 2020.
52. "Street Fighter® Icon Ryu Joins the Roster of Super Smash Bros. for Nintendo 3DS / Wii U" (<https://www.businesswire.com/news/home/20150614005067/en/Street-Fighter%C2%AE-Icon-Ryu-Joins-the-Roster-of-Super-Smash-Bros.-for-Nintendo-3DS-Wii-U>). *Business Wire*. 14 June 2015. Archived (<https://web.archive.org/web/20201027043518/https://www.businesswire.com/news/home/20150614005067/en/Street-Fighter%C2%AE-Icon-Ryu-Joins-the-Roster-of-Super-Smash-Bros.-for-Nintendo-3DS-Wii-U>) from the original on 27 October 2020. Retrieved 25 October 2020.
53. Sahdev, Ishaan (14 June 2015). "Ryu, Roy, Duck Hunt, And Mewtwo Amiibo Figurines Announced" (<https://www.siliconera.com/r-o-b-duck-hunt-mr-game-watch-and-falco-amiibo-figurines-announced/>). *Siliconera*. Archived (<https://web.archive.org/web/20210224210400/https://www.siliconera.com/r-o-b-duck-hunt-mr-game-watch-and-falco-amiibo-figurines-announced/>) from the original on 24 February 2021. Retrieved 25 October 2020.
54. "Mr. Game and Watch – Nintendo Amiibo Wiki Guide" (https://www.ign.com/wikis/nintendo-amiibo-figurines/Mr_Game_%26_Watch#Games_that_support_the_Mr_Game_%26_Watch_amiibo). *IGN*. 29 September 2015. Archived (https://web.archive.org/web/20201026231800/https://www.ign.com/wikis/nintendo-amiibo-figurines/Mr_Game_%26_Watch#Games_that_support_the_Mr_Game_%26_Watch_amiibo) from the original on 26 October 2020. Retrieved 25 October 2020.
55. Green, Jake (21 January 2020). "Mr Game & Watch Super Smash Bros Ultimate Guide – Unlock, Moves, Changes, Mr Game & Watch Alternate Costumes, Final Smash" (<https://www.usgamer.net/articles/10-12-2018-super-smash-bros-ultimate-characters-moves-type-every-character-on-the-super-smash-bros-ultimate-roster/super-smash-bros-ultimate-watch+&cd=24&hl=en&ct=clnk&gl=us>). *US Gamer*.
56. "Retro Gamer Special Edition - Greatest Gaming Icons 2nd Edition 2020". *Retro Gamer*. 2020. p. 30, 31.
57. Caballero, David (1 April 2026). "Best cameos and biggest MIAs in *The Super Mario Galaxy Movie*" (<https://www.gamereactor.eu/best-cameos-and-biggest-mias-in-the-super-mario-galaxy-movie-1700733/>). *Gamereactor*. Retrieved 1 April 2026.

External links

- [GAME&WATCH \(https://www.nintendo.co.jp/ds/dsiware/game_and_watch/index.html\)](https://www.nintendo.co.jp/ds/dsiware/game_and_watch/index.html) at Nintendo official website (Japanese)
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Retrieved from "https://en.wikipedia.org/w/index.php?title=Game_%26_Watch&oldid=1346661503"

Game Boy

The **Game Boy**^[a] is a handheld game console developed and marketed by Nintendo. It was released in Japan on April 21, 1989, in North America on July 31, 1989, and in Europe on September 28, 1990. Nintendo's first handheld to use ROM cartridges, it succeeded the Game & Watch line of handheld electronic games and competed with Sega's Game Gear, Atari's Lynx, and NEC's TurboExpress in the fourth generation of video game consoles.

Nintendo Research & Development 1, under Gunpei Yokoi and Satoru Okada, designed the Game Boy. To expand on the single-game Game & Watch, Nintendo adopted a dot-matrix display and interchangeable game cartridges. They prioritized affordability, battery life, and durability over the faster processors and color graphics of its competitors; following Yokoi's philosophy of using mature, low-cost technology, the Game Boy has a monochromatic display and an 8-bit processor. It retains the Game & Watch D-pad and the Game Link Cable, developed by Okada, enables multiplayer connectivity and data transfer.

In North America and Europe, the Game Boy was backed by a large marketing campaign and bundled with Tetris, which increased its appeal beyond traditional video game audiences. Although its monochromatic display and technical limitations drew criticism, the Game Boy's low price, long battery life, and extensive game library drove strong sales worldwide. The success of Nintendo's *Pokémon* series helped maintain its popularity late into the 1990s. Nintendo released multiple redesigns, including the smaller Game Boy Pocket (1996) and the Japan-exclusive, backlit Game Boy Light (1998).

Nintendo continued to support the Game Boy following the 1998 release of the Game Boy Color (GBC). The Game Boy is forward compatible with many GBC games, while the GBC and its 2001 successor, the Game Boy Advance, are backward

Game Boy

GAME BOY



The original gray Game Boy

Also known as	DMG-01 KR: Mini Comboy
Developer	<u>Nintendo R&D1</u>
Manufacturer	<u>Nintendo</u>
Product family	<u>Game Boy</u> ^[1]
Type	<u>Handheld game console</u>
Generation	<u>Fourth</u>
Released	April 21, 1989
Introductory price	¥12,500 (equivalent to ¥15,594 in 2024) US\$89.99 (equivalent to \$234 in 2025) £69.99 (equivalent to £173 in 2025) ^[4]
Discontinued	<u>WW</u> : March 31, 2003
Units sold	118.69 million (including all variants and <u>Game Boy Color</u>) ^[5]
Media	<u>Game Boy Game Pak</u>

compatible with Game Boy games. The Game Boy and GBC sold an estimated 118.69 million combined. They were the bestselling console at the time of their discontinuation in 2003, and remain the fourth-bestselling console as of 2025. Journalists credit the Game Boy with establishing handheld gaming as a mass-market category and for introducing video games to a generation of players.

History and development

Background

The Game Boy was designed by Nintendo Research & Development 1 (R&D1), the team behind the *Mario Bros.* and *Donkey Kong* arcade games and the successful *Game & Watch* series of handhelds, which had helped stabilize Nintendo financially.^{[7][8][9]} By 1983, while *Game & Watch* remained popular internationally, sales in Japan had begun to decline, pressuring R&D1 to innovate. At the same time, they faced competition from Nintendo Research & Development 2 (R&D2), an in-house rival created by Nintendo president Hiroshi Yamauchi. That same year, R&D2 had launched the *Family Computer*, intensifying the pressure on R&D1. Looking to improve *Game & Watch*, R&D1 researched new screens from supplier Sharp, including dot-matrix displays that could support multiple games—unlike *Game & Watch*, which used pre-printed segmented LCDs, limiting each device to a single game.^[10]

Start of development

On June 10, 1987, division director Gunpei Yokoi informed R&D1 that Yamauchi wanted a successor to *Game & Watch* priced under ¥10,000 (equivalent to ¥12,840 in 2024).^[10] From the very first meeting, the team knew they wanted to use a dot-matrix display and codenamed the project *Dot Matrix Game* (DMG), a name later reflected in the Game Boy's official model number: DMG-01.^[11]

Within R&D1, Yokoi championed "lateral thinking with withered technology",^[b] a design philosophy which eschewed cutting-edge technology in favor of finding innovative uses of mature technologies, which tended to be more affordable and reliable.^[7] This led to early clashes between Yokoi and his assistant director Satoru Okada. Yokoi envisioned a simple toy, akin to an advanced *Game & Watch*, while Okada pushed for a more powerful system with interchangeable cartridges—essentially a portable NES.^[8] Some within R&D1 believed Yokoi resisted the idea simply to avoid links to the NES, developed by their rivals at R&D2. Eventually, in a heated meeting, Yokoi relented, approving Okada's vision and giving him full responsibility for the project.^{[10][8]}

System on a chip	Original: <u>Nintendo DMG-CPU</u> (<u>Sharp LR35902</u>) Pocket/Light: <u>Nintendo CPU MGB</u>
CPU	<u>Sharp SM83 @ 4.2 MHz</u>
Memory	8 KB <u>RAM</u> , 8 KB <u>Video RAM</u>
Display	Original: <u>STN LCD</u> Pocket/Light: <u>FSTN LCD</u> 160 × 144 px
Power	Original: 4 × <u>AA batteries</u> (Up to 30 hours) Pocket: 2 × <u>AAA batteries</u> (Up to 10 hours) Light: 2 × <u>AA batteries</u> (Up to 12 hours w/ backlight on, 20 w/ backlight off)
Best-selling game	<u><i>Pokémon Red, Blue, and Yellow</i></u> (46 million)
Predecessor	<u>Game & Watch</u> <u>Computer Mah-jong</u> <u>Yakuman</u>
Successor	<u>Game Boy Color</u> ^[6]

Choosing the hardware

Initially, R&D1 considered using a Ricoh CPU, similar to the NES, for potential compatibility.^[12] However, R&D2—then building the Super Nintendo Entertainment System (SNES)—blocked this, claiming it would strain Ricoh's resources. R&D1 suspected this was simply an attempt to hinder their project. Ultimately, they opted for a Sharp CPU. A key side effect of this choice was the CPU's built-in communication feature.^[8] In the early 1980s, Okada had worked on an earlier Nintendo project called Computer Mah-jong Yakuman that featured multiplayer gaming over a cable connection between two devices. He saw an opportunity to implement a similar feature.^{[13][14]} Despite skepticism from his team that the feature would be too difficult to use, he personally developed the Game Link Cable technology,^[12] which later enabled Pokémon's "battle" and "trade" game mechanics.^[13] The Game Boy also retained a key innovation from Game & Watch: the D-pad. Yokoi had designed it as a compact alternative to joysticks, making it ideal for handheld devices. Its use on the NES controller also helped ease the transition for players.

Early in development, R&D1 evaluated dot-matrix displays from Sharp but found them unsuitable due to severe ghosting. Seeking alternatives, they approached Citizen, Epson, Hosiden, Matsushita, and Seiko. Most declined, but Citizen, already producing LCDs for portable TVs, was eager to collaborate. The team was impressed by Citizen's chip-on-glass technology, which integrated the screen controller into the display, reducing cost and production time. They offered Nintendo a monochrome screen for ¥1,300 or a color version for ¥3,900. However, following Yokoi's philosophy, the team rejected color due to higher power consumption and cost, opting for a simple grayscale screen without a backlight.^[15] This decision proved wise, as competing color handhelds would suffer from poor battery life, giving the Game Boy a significant advantage.^[7]

However, Sharp was still an important partner, so Nintendo asked if they could match Citizen on technology and price. Sharp responded with vague answers on their screen technologies and quoted a price of ¥2,500 to ¥3,000 per screen. In response, Citizen lowered its price to ¥1,000. With Yamauchi's approval, R&D1 finalized a deal with Citizen on September 1, 1987. However, as Citizen's representatives left Nintendo's offices, they saw Sharp's team arriving for a meeting with Yamauchi. Without explanation, Yamauchi canceled the Citizen deal and awarded the contract to Sharp. To soften the blow, R&D1 fabricated a story, telling Citizen they were interested in buying color screens the next year, even drafting fake project documents. Citizen later supplied color screens for Sega's Game Gear, which had a design closely resembling Nintendo's fake project. Citizen never admitted to sharing the design.^[10]

Near cancellation

The R&D1 team soon discovered that Sharp was unprepared to make the screens they needed, leading to months of delays. Early prototypes with low-quality twisted nematic (TN) screens sparked internal skepticism, with some employees mockingly referring to the project as *DameGame* (with *dame* (だめ) meaning "hopeless" in Japanese).^{[16][17]} In the summer of 1988, R&D1 presented a prototype to Yamauchi, who immediately canceled the project, citing the poor visibility of the display. Team members argued that minor screen adjustments or a slightly higher budget could resolve the issue, but Yamauchi refused, leading them to suspect other teams had already convinced him the device would be a commercial failure. Furthermore, with the NES still thriving and the SNES on the horizon, a Game & Watch successor was no longer seen as essential.^[10]

Most of R&D1, including Okada, was reassigned. However, Yokoi remained committed to the project. Defying Yamauchi's decision, he continued refining the display. During discussions with a Sharp director involved in Game & Watch, the team learned of a super-twisted nematic (STN) display secretly in development. While it had a green tint and slightly lower contrast, it dramatically improved the viewing angle. Yokoi devised a plan. In a meeting with a Sharp board member, he pressed them about new technologies, leading them to reveal the STN display. R&D1 secured a prototype and installed it in a Game Boy.^[10]

Three months after canceling the project, Yamauchi was shown the STN prototype. Though still unimpressed by the screen, he approved the console for sale, perhaps influenced by delays in SNES development, which was now two years away from launch.^[10]

Using the STN display significantly increased production costs. To mitigate expenses, the team reduced the screen's size, though it was too late in development to shrink the console's overall dimensions.^{[13][18]} The target price of ¥10,000 was ultimately not met due to the cost of the display, and the Game Boy would retail for ¥12,500 (equivalent to ¥15,594 in 2024).^[19] To enhance the perceived value of the product, Yamauchi decided to include headphones and four AA batteries in the box, which cost Nintendo very little but made the Game Boy appear like a better deal.^[10]

Launch and success

On January 17, 1989, Nintendo officially announced the Game Boy. It launched in Japan on April 21, selling out its initial production run of 300,000 units within the first two weeks.^[20] By August, sales had reached 720,000 consoles and 1.9 million games across just four launch titles.^[10] The Game Boy debuted in North America on July 31, 1989,^[20] at a retail price of US\$89.99 (equivalent to \$234 in 2025),^[21] and backed by a US\$20 million marketing campaign (equivalent to \$52 million in 2025) aimed at making it the must-have, hard-to-find holiday toy.^{[22][23]} On its release day, 40,000 units were sold, and within just a few weeks, sales reached one million.^{[20][24]}



Original gray Game Boy

Learning from one of the NES launch's shortcomings, Okada pushed to offer third-party developers a development manual and development kit, built by Intelligent Systems, to encourage software creation for the Game Boy.^{[8][13]} Meanwhile, R&D1 developed *Super Mario Land* as the console's flagship title,^[20] but another game captured the attention of Okada and Yokoi—*Tetris*. While a team within R&D1 was porting the Soviet-made puzzle game to the NES, they recognized its potential for a handheld platform.^[10] Although the Game Boy version of Tetris would not be ready for the console's Japanese debut, it was completed in time for its North American launch in July 1989. Henk Rogers, who had acquired the rights to *Tetris*, convinced Nintendo of America president Minoru Arakawa to make it the pack-in game with the Game Boy instead of *Super Mario Land*, arguing that while Mario primarily appealed to young boys, *Tetris* would appeal to everyone.^[23] As a result, *Tetris* was bundled with the Game Boy in every region except Japan.^[7]

Hardware

The Game Boy uses a custom system on a chip (SoC), to house most of the components, named the *DMG-CPU* by Nintendo and the *LR35902* by its manufacturer, the Sharp Corporation.^{[25]:11}

Within the DMG-CPU, the main processor is a *Sharp SM83*,^{[25]:15} a hybrid of the Intel 8080 and Zilog Z80 processors. It combines the seven 8-bit registers of the 8080 (omitting the alternate registers of the Z80) with the programming syntax and additional bit manipulation instructions of the Z80. The SM83 also includes new instructions optimized for operations specific to the Game Boy's hardware arrangement.^{[7][26][27]} It operates at a clock rate of 4.194304 MHz.^{[25]:12}

The DMG-CPU also incorporates the Picture Processing Unit, essentially a basic GPU, that renders visuals using an 8 KB bank of Video RAM located on the motherboard.^{[28]:11} The display is a 2.5-inch (diagonal) reflective super-twisted nematic (STN) monochrome liquid-crystal display (LCD), measuring 47 millimeters (1.9 in) wide by 43 millimeters (1.7 in) high with a resolution of 160 pixels wide by 144 pixels high in a 10:9 aspect ratio.^[29] The screen displays four shades of grey/green.^{[28]:16}

Additionally, the SoC includes a 256 byte "bootstrap" ROM^[30] which is used to start up the device, 127 bytes of High RAM that can be accessed faster (similar to a CPU cache), and the *Audio Processing Unit*, a programmable sound generator with four channels: a pulse wave generation channel with frequency and volume variation, a second pulse wave generation channel with only volume variation, a wave channel that can reproduce any waveform recorded in RAM, and a white noise channel with volume variation.^{[28]:79[31]} The motherboard also contains an 8 KB "work RAM" chip providing storage for general operations.^{[28]:16}

The Game Boy's physical controls include a D-pad (directional pad), four action buttons (labeled 'A', 'B', 'SELECT', 'START'), a sliding power switch with a cartridge lock to prevent accidental removal, along with volume and contrast dials on either side of the device.^[32]

The original Game Boy was powered internally by four AA batteries.^[33] For extended use, an optional AC adapter or rechargeable battery pack can be connected via a coaxial power connector on the left side.^[34] The right side also has a Game Link Cable^[c] port for connecting to up to four Game Boy devices for multiplayer games or data transfer.^[36] For sound output, the Game Boy includes a single monaural speaker and a 3.5 mm headphone jack that offered stereo sound.^[37]

Revisions

The Game Boy remained a strong seller throughout the 1990s, driven by popular releases like *Pokémon*, which kept demand high. Around 1992, Game Boy sold around 10 million^[38] copies. However, its continued success presented a challenge for Nintendo: while the hardware was aging,



The original Game Boy motherboard (annotated version)

the company was reluctant to replace it due to its strong sales.

At a press conference in San Francisco on March 14, 1994, Peter Main, Nintendo's vice president of marketing, answered queries about when Nintendo was coming out with a color handheld system by stating that sales of the Game Boy were strong enough that it had decided to hold off on developing a successor handheld for the near future.^[39] Instead, Nintendo would introduce several updates over the following years to extend the system's relevance.^[7]



Clear "Play It Loud!" edition

Play It Loud!

The first update to the Game Boy's hardware design came on March 20, 1995, nearly six years after the console was first released, when Nintendo introduced various colored cases as part of the "Play It Loud!" campaign,^[40] known in Japan as Game Boy Bros.^{[d][41]} This revision was purely cosmetic, with consoles available in red, yellow, green, blue, black, white, and transparent; with screens featuring a bezel in a darker shade of gray compared to the original model.

Game Boy Pocket

A major revision to the Game Boy came in 1996 with the introduction of the Game Boy Pocket, a slimmed-down unit that required just two smaller AAA batteries, albeit at the expense of providing just 10 hours of gameplay.^[42] The other major change was that the screen was changed to a much-improved film compensated super-twisted nematic (FSTN) LCD with a larger viewable area. The screen's visibility and pixel response-time had been improved, mostly eliminating ghosting.^[43] Additionally, the film compensation layer produced a true black-and-white display, rather than the green hues of the original Game Boy.^[44] The Pocket also has a smaller Game Link Cable port, which requires an adapter to link with the original Game Boy. This smaller port design would be used on all subsequent Game Boy models.^[45] Internally, the Game Boy Pocket had a new SoC, the CPU MGB, which moved the Video RAM from the motherboard to the SoC.^{[46][47]}



The Game Boy Pocket launched in Japan on July 20, 1996, and in North America on September 2, 1996, for US\$69.99 (equivalent to \$144 in 2025).^[48] The Game Boy Pocket helped to revitalize hardware sales and its release was ultimately well-timed as it coincided with the massively successful launch of *Pokémon* in Japan, which further fueled Game Boy sales.^[7] Reviewers praised the device's compact size and improved display,^{[43][49]} though some critics dismissed it as a minor upgrade with the *Los Angeles Times* remarking that Nintendo was, "repacking the same old black-and-white stuff and selling it as new".^[50] The device also faced criticism for its relatively short 10-hour battery life and the absence of a power LED, which had been used in previous models to indicate battery strength.^{[51][52]}

In early 1997, a revision was released featuring the return of the power LED, a broader range of case colors (red, green, yellow, black, gold metal, clear, and blue, in addition to the launch silver), and a price drop to US\$54.95 (equivalent to \$110 in 2025).^[51] By mid-1998, just before the launch of the Game Boy Color, the price had dropped further to US\$49.95 (equivalent to \$99 in 2025).^[53]

Game Boy Light

The Game Boy Light, released exclusively in Japan on April 14, 1998, retained all of the Pocket's improvements, including a more compact design and clearer FSTN LCD screen, while introducing several enhancements of its own. The most notable addition was an electroluminescent backlight, enabling gameplay in low-light conditions for the first time without external accessories. The backlight emitted a blue-green glow, similar to the illumination used in digital wristwatches at the time. To address the criticism of the Pocket's battery life, the Game Boy Light used two AA batteries with greater capacity, offering approximately 12 hours of gameplay with the backlight on and up to 20 hours with it off. These upgrades resulted in a slightly larger and heavier form factor compared to the Game Boy Pocket, though it remained significantly smaller and lighter than the original Game Boy. The Game Boy Light was available in gold and silver color variants and launched at a retail price of ¥6,800 (equivalent to ¥7,502 in 2024).^{[52][54]}



Technical specifications

	Game Boy ^{[29][55]}	Game Boy Pocket ^[55]	Game Boy Light
Height	148 mm (5 ⁷ / ₈ in)	127.6 mm (5 in)	135 mm (5 ³ / ₈ in)
Width	90 mm (3 ¹ / ₂ in)	77.6 mm (3 in)	80 mm (3 ¹ / ₈ in)
Depth	32 mm (1 ¹ / ₄ in)	25.3 mm (1 in)	27 mm (1 ¹ / ₈ in)
Weight	220 g (7.8 oz)	125 g (4.4 oz)	138 g (4.9 oz)
Display	2.5-inch reflective super-twisted nematic (STN) liquid-crystal display (LCD)	2.5-inch reflective film compensated STN (FSTN) LCD	2.5-inch FSTN LCD with electroluminescent backlight
Screen size (playable)^[56]	45.5 × 41.5 mm (1 ³ / ₄ × 1 ⁵ / ₈ in)	47.5 × 42.5 mm (1 ⁷ / ₈ × 1 ⁵ / ₈ in)	47 × 42 mm (1 ⁷ / ₈ × 1 ⁵ / ₈ in)
Resolution	160 (w) × 144 (h) pixels (10:9 aspect ratio)		
Refresh rate	59.727500569606 Hz ^[57]		
Color support	2-bit, four shades of green: 0x0 0x1 0x2 0x3	2-bit, four shades of grey: 0x0 0x1 0x2 0x3	
System on a chip (SoC)	Nintendo DMG-CPU (Sharp LR35902)	Nintendo CPU MGB	
CPU	Sharp SM83 (custom Intel 8080/Zilog Z80 hybrid, 8-bit) @ 4.194304 MHz		
Memory	On SoC: 256 B ROM, 127 B High RAM, 128 B Audio RAM, 1.12KB object attribute RAM Internal: 8 KB RAM, 8 KB Video RAM	On SoC: 256 B ROM, 127 B High RAM, 8 KB Video RAM, 128 B Audio RAM, 1.12KB object attribute RAM Internal: 8 KB RAM	
	External: (in the game cartridge) up to 1 MB ROM, up to 128 KB RAM		
Power	Consumption: 70–80 mA Internal: 4 × AA batteries External: 0.7 W at 6 V DC from 3.5 mm × 1.35 mm coaxial connector	Consumption: 80–90 mA Internal: 2 × AAA batteries External: 0.7 W at 3 V DC from 2.35 mm × 0.75 mm coaxial connector	Internal: 2 × AA batteries External: 0.6 W at 3 V DC from 2.35 mm × 0.75 mm coaxial connector
Battery life	Up to 30 hours	Up to 10 hours	Up to 20 hours (backlight off) Up to 12 hours (backlight on)
Sound	Channels: 2 pulse wave, 1 wave, 1 noise Outputs: Built-in mono speaker, stereo 3.5mm headphone jack		
I/O	Game Link Cable (8 kbit/s between up to 4 devices) ^{[28]:28} Game Boy Game Pak slot		
Controls	4-way D-pad Four action buttons (A, B, Start, Select) Volume potentiometer Contrast potentiometer Power switch		

Games

More than 1,000 games were released for the Game Boy, excluding cancelled and unlicensed games.^[58] Additionally, more than 300 games developed for the Game Boy Color were backward compatible with the monochrome Game Boy models.^{[59][60]}

Games are stored on cartridges called the Game Boy Game Pak, using read-only memory (ROM) chips. Initially, due to the limitations of the 8-bit architecture of the device, ROM size was limited to 32 KB. However, Nintendo overcame this limitation with a Memory Bank Controller (MBC) inside the cartridge. This chip sits between the processor and the ROM chips. The CPU can only access 32 KB at a time, but the MBC can switch between several banks of 32 KB ROM. Using this technology, Nintendo created Game Boy games that used up to 1 megabyte of ROM. Game Paks could also provide additional functionality to the Game Boy system. Some cartridges included up to 128 KB of RAM to increase performance, which could also be battery-backed to save progress when the handheld was off, real-time clock chips could keep track of time even when the device was off and Rumble Pak cartridges added vibration feedback to enhance gameplay.^{[28]:299[46][61]}



The standard gray Game Boy Game Pak

The top-selling franchise for the Game Boy were *Pokémon Red, Blue, and Yellow*, the first installments of the *Pokémon* video game series, which sold more than 46 million copies.^{[62][63]} The best-selling single game was *Tetris*, with more than 35 million copies shipped, it was a pack-in game included with the purchase of many original Game Boy devices.^{[64][65]}

Beyond the platform's official titles, as of 2025, an active online community continues to create new games for the Game Boy and Game Boy Color through tools like GB Studio, a free and user-friendly game-building engine that simplifies the process compared to manual coding.^[66]

Launch titles

When the Game Boy launched in Japan in April 1989, it featured four launch titles: *Alleyway* (a *Breakout* clone), *Baseball* (a port of the NES game), *Super Mario Land* (an adaptation of the *Mario* franchise for the handheld format) and *Yakuman* (a Japanese mahjong game).^[67] When the console debuted in North America, two additional launch titles were added: *Tetris* and *Tennis* (another NES port), while *Yakuman* never saw a wide international release.^{[68][69]}

Reception

Critical reception

Though it was less technically advanced than the Game Gear, Atari Lynx, NEC TurboExpress and other competitors, notably by not supporting color, the Game Boy's lower price along with longer battery life made it a success.^{[70][71]}

The console received mixed reviews from critics. In a 1997 year-end review, a team of four *Electronic Gaming Monthly* editors gave the Game Boy scores of 7.5, 7.0, 8.0, and 2.0. The reviewer who contributed the 2.0 panned the system due to its monochrome display and motion blur, while his three co-reviewers praised its long battery life and strong games library, as well as the sleek, conveniently sized design of the new Game Boy Pocket model.^[72]

Sales

The Game Boy launched in Japan on April 21, 1989, with an initial shipment of 300,000 units, which sold out within two weeks.^[20] In the United States, 40,000 units were sold on its release day, July 31, 1989, and sales reached one million within weeks.^{[20][24]} By 1995, Nintendo of America reported that 46% of Game Boy players were female, a higher proportion than for the Nintendo Entertainment System (29%) and Super Nintendo Entertainment System (14%).^[73]

Before the introduction of the Game Boy Color, over 59.89 million units of the various monochrome Game Boy models had been sold worldwide as of 30 September 1997.^[74] Nintendo subsequently reported only combined sales figures for the Game Boy and Game Boy Color. By the time of the system's discontinuation in 2003, the monochrome Game Boy models and the Game Boy Color had sold a combined total of 118.69 million units globally: 32.47 million in Japan, 44.06 million in the Americas, and 42.16 million in other regions.^[75]

At the time of its discontinuation, the Game Boy line was the best-selling game console of all time. It was later surpassed by the Nintendo DS, PlayStation 2, and Nintendo Switch, making it the fourth-best-selling console as of 2025.^[76]

By 1997, the Game Boy and Game Boy Pocket had sold over 64 million units worldwide. Combined lifetime sales of the Game Boy and Game Boy Color models reached approximately 118.69 million units worldwide by the time of discontinuation.

Cultural legacy

Beyond its commercial success, the Game Boy has had a lasting cultural impact. It helped popularize handheld gaming through an affordable, durable design that brought video games into daily life. The system is frequently cited in retrospectives as a gateway to gaming for a generation of players.^[77]

Smithsonian Magazine describes the Game Boy as a permanent fixture of American cultural history, citing its economic significance and enduring appeal.^[78] Reflections in *The Guardian* characterize it as "a portal to other magical worlds",^[77] with players recalling formative gaming experiences.^[79]

An original 1989 Game Boy is on display at the Smithsonian's National Museum of American History as part of the "American Enterprise" exhibition, alongside early mobile devices.^[78] It is also featured in the Nintendo Museum in Kyoto, Japan.^[80] In 2009, the Game Boy was inducted into the U.S. National Toy Hall of Fame.^[81]



One common criticism of the original Game Boy was its lack of a backlight, prompting third-party accessories to make play possible in low-light conditions.

The Game Boy has become a staple within the chiptune scene as hardware for composing music through homebrew music trackers such as Little Sound DJ and Nanoloop.^{[82][83][84][85][86][87]}

Lego created a set based on the Game Boy in partnership with Nintendo. The set came out October 2025.^[88]

Notes

1. Japanese: ゲームボーイ, Hepburn: *Gēmu Bōi*
2. Japanese: 枯れた技術の水平思考, Hepburn: *Kareta Gijutsu no Suihei Shikō*
3. The Game Link Cable port was also called the Video Link cable and extension connector in early Owner's Manuals.^[35]
4. Japanese: ゲームボーイブラザーズ, Hepburn: *Gēmu Bōi Burazāzu*

References

1. Ishihara; Morimoto. "Pokémon HeartGold Version & Pokémon SoulSilver Version" (<https://iwataasks.nintendo.com/interviews/ds/pokemon/0/0/>). *Iwata Asks* (Interview: Transcript). Interviewed by Satoru Iwata. Nintendo. Retrieved September 25, 2022.
2. White, Dave (July 1989). "Gameboy Club". *Nintendo Power*. No. 7. p. 84.
3. "retrodiary: 1 April – 28 April". *Retro Gamer*. No. 88. Bournemouth. April 2011. p. 17. ISSN 1742-3155 (<https://search.worldcat.org/issn/1742-3155>). OCLC 489477015 (<https://search.worldcat.org/oclc/489477015>).
4. Nintendo Game Boy Original - UK TV Commercial (1990) (<https://www.youtube.com/watch?v=JR25jqWNxO0&t=22s>) on YouTube
5. "Consolidated Sales Transition by Region" (https://web.archive.org/web/20160427084600/http://www.nintendo.co.jp/ir/library/historical_data/pdf/consolidated_sales_e1603.pdf) (PDF). Nintendo. April 26, 2016. Archived from the original (https://www.nintendo.co.jp/ir/library/historical_data/pdf/consolidated_sales_e1603.pdf) (PDF) on April 27, 2016. Retrieved October 23, 2016.
6. Umezu; Sugino. "Nintendo 3DS (Volume 3 – Nintendo 3DS Hardware Concept)" (<https://web.archive.org/web/20150725233103/http://iwataasks.nintendo.com/interviews/#/3ds/how-nintendo-3ds-made/1/0>). *Iwata Asks* (Interview: Transcript). Interviewed by Satoru Iwata. Nintendo. Archived from the original (<http://iwataasks.nintendo.com/interviews/#/3ds/how-nintendo-3ds-made/1/0>) on July 25, 2015. Retrieved January 1, 2026.
7. McFerran, Damien (2016). *Videogames Hardware Handbook* (https://archive.org/details/Videogames_Hardware_Handbook_Vol_1_2nd_RE_2016_UK). Vol. 1 (2nd ed.). Bournemouth. pp. 157–163. ISBN 978-1-78546-239-9.
8. "Satoru Okada talks Game & Watch, Game Boy and Nintendo DS development" (<https://web.archive.org/web/20170101232208/http://www.japanesenintendo.com/post/155107688449>). *Issue 163. Retro Gamer Magazine*. 2016. Archived from the original on January 1, 2017. Retrieved January 1, 2017.
9. Yokoi, Gunpei (November 1996). "ゲームボーイを開発した伝説の技術者・横井軍平「私はなぜ任天堂を辞めたか」" (<https://bunshun.jp/articles/-/6659>) [Gunpei Yokoi, the legendary engineer who developed the Game Boy: "Why I left Nintendo"]. *Bungeishunju* (in Japanese). Retrieved March 20, 2025.
10. Gorges, Florent (2024). *The History of Nintendo Vol.4: 1989–1999 The Incredible History of the Game Boy*. Omaké books. ISBN 9798338221631.

11. Lane, Gavin (May 6, 2020). "Nintendo Console Codenames and Product Codes" (https://web.archive.org/web/20200917061039/https://www.nintendolife.com/news/2020/05/feature_nintendo_console_codenames_and_product_codes). *Nintendo Life*. Archived from the original (https://www.nintendolife.com/news/2020/05/feature_nintendo_console_codenames_and_product_codes) on September 17, 2020. Retrieved May 25, 2024.
12. Kurokawa, Fumio (2022). "Satoru Okada – 2022 Retrospective Interview" (<https://shmuplations.com/okada2022/>). *4gamer.net*. Retrieved April 8, 2024.
13. Kurokawa, Fumio (July 15, 2022). "ゲームボーイの生みの親・岡田 智氏が任天堂での開発者時代を語った「黒川塾 八十八 (88)」 聴講レポート" (<https://www.4gamer.net/games/999/G999905/20220720007/>) [Attendance report on "Kurokawa Juku 88" where Game Boy creator Satoshi Okada talks about his time as a developer at Nintendo]. *4Gamer.net* (in Japanese). Archived (<https://web.archive.org/web/20230331032353/https://www.4gamer.net/games/999/G999905/20220720007/>) from the original on March 31, 2023. Retrieved March 1, 2024.
14. Voskuil, Erik (March 19, 2011). "Mah-jong Yakuman". *Before Mario: the fantastic toys from the video game giant's early days* (<http://blog.beforemario.com/2011/03/nintendo-computer-mah-jong-yakuman-1983.html>). Omaké books (published November 20, 2014). ISBN 978-2-919603-10-7. Archived (<https://web.archive.org/web/20240509192145/http://blog.beforemario.com/2011/03/nintendo-computer-mah-jong-yakuman-1983.html>) from the original on May 9, 2024. Retrieved May 26, 2024.
15. Ryan, Jeff (2011). *Super Mario: How Nintendo Conquered America*. New York: Portfolio Penguin. pp. 102–105. ISBN 978-1-59184-405-1.
16. Audureau, William (March 18, 2015). "NX, Ultra 64, Revolution... Petite histoire de Nintendo à travers ses noms de code" (http://www.lemonde.fr/pixels/article/2015/03/18/nx-ultra-64-revolution-petite-histoire-de-nintendo-a-travers-ses-noms-de-code_4595183_4408996.html). *Le Monde.fr* (in French). ISSN 1950-6244 (<https://search.worldcat.org/issn/1950-6244>). Archived (https://web.archive.org/web/20160817105050/http://www.lemonde.fr/pixels/article/2015/03/18/nx-ultra-64-revolution-petite-histoire-de-nintendo-a-travers-ses-noms-de-code_4595183_4408996.html) from the original on August 17, 2016. Retrieved June 19, 2016.
17. "駄目" (<https://en.wiktionary.org/wiki/%E9%A7%84%E7%9B%AE>). *Wiktionary*. Archived (<https://web.archive.org/web/20210515182011/https://en.wiktionary.org/wiki/%E9%A7%84%E7%9B%AE>) from the original on May 15, 2021. Retrieved February 13, 2021.
18. Kurokawa, Fumio (March 29, 2022). "元任天堂・岡田 智氏の独立独歩 後編 ひたすらに意志を貫いたゲームボーイ & ゲームボーイアドバンス開発 「ビデオゲームの語り部たち」：第28部" (<https://www.4gamer.net/games/999/G999905/20220316093/>) [Former Nintendo employee Satoshi Okada's independent career, Part 2: The development of the Game Boy and Game Boy Advance with single-minded determination]. *4Gamer.net* (in Japanese). Archived (<https://web.archive.org/web/20230521131129/https://www.4gamer.net/games/999/G999905/20220316093/>) from the original on May 21, 2023. Retrieved March 2, 2024.
19. Edwards, Benj (April 21, 2019). "Happy 30th B-Day, Game Boy: Here are six reasons why you're #1" (<https://arstechnica.com/gaming/2019/04/game-boy-20th-anniversary/>). *Ars Technica*. Archived (<https://web.archive.org/web/20240504014255/https://arstechnica.com/gaming/2019/04/game-boy-20th-anniversary/>) from the original on May 4, 2024. Retrieved May 26, 2024.
20. Fahs, Travis (July 27, 2009). "IGN Presents the History of Game Boy" (<http://www.ign.com/articles/2009/07/27/ign-presents-the-history-of-game-boy>). *IGN*. p. 2. Archived (<https://web.archive.org/web/20230219134710/https://www.ign.com/articles/2009/07/27/ign-presents-the-history-of-game-boy>) from the original on February 19, 2023. Retrieved October 2, 2013.
21. Moriarty, Colin (October 15, 2013). "The Real Cost of Gaming: Inflation, Time, and Purchasing Power" (<https://www.ign.com/articles/2013/10/15/the-real-cost-of-gaming-inflation-time-and-purchasing-power>). *IGN*. Archived (<https://web.archive.org/web/20200915010832/https://www.ign.com/articles/2013/10/15/the-real-cost-of-gaming-inflation-time-and-purchasing-power>) from the original on September 15, 2020. Retrieved August 28, 2020.

22. Shiver Jr., Jube (November 29, 1989). "Toys: It's serious business as Nintendo's Game Boy goes head to head with Atari's Lynx" (<https://www.latimes.com/archives/la-xpm-1989-11-20-fi-193-story.html>). *Los Angeles Times*. Archived (<https://web.archive.org/web/20211214142448/https://www.latimes.com/archives/la-xpm-1989-11-20-fi-193-story.html>) from the original on December 14, 2021. Retrieved December 14, 2021.
23. Moss, Richard (April 19, 2019). "How Nintendo introduced the Game Boy, Tetris, and Pokémon to the West" (<https://www.polygon.com/2019/4/19/18295061/game-boy-history-timeline-tetris-pokemon-nintendo>). *Polygon*. Retrieved March 20, 2025.
24. Kent, Steve L. (2001). *The Ultimate History of Video Games* (1 ed.). Roseville, Calif.: Prima Publishing. p. 416. ISBN 978-0-7615-3643-7. "According to an article in *Time* magazine, the one million Game Boys sent to the United States in 1989 met only half the demand for the product. That allotment sold out in a matter of weeks and its black and white (except for Konami/Factor 5 games and *SeaQuest DSV*), was shown in color like the Game Gear version."
25. Javanainen, Joonas (February 22, 2025). "Game Boy: Complete Technical Reference" (<https://gekkio.fi/files/gb-docs/gbctr.pdf>) (PDF). *gekkio.fi* (160 ed.). Retrieved March 5, 2025.
26. "The Nintendo Game Boy, Part 1: The Intel 8080 and the Zilog Z80" (<https://realboyemulator.wordpress.com/2013/01/01/the-nintendo-game-boy-1/>). RealBoy Emulator Blog. January 2, 2013. Archived (<https://web.archive.org/web/20220510190547/https://realboyemulator.wordpress.com/2013/01/01/the-nintendo-game-boy-1/>) from the original on May 10, 2022. Retrieved August 29, 2017.
27. "CPU Comparison with Z80" (https://gbdev.io/pandocs/CPU_Comparison_with_Z80). *Pan Docs*. Archived (https://web.archive.org/web/20240429215020/https://gbdev.io/pandocs/CPU_Comparison_with_Z80) from the original on April 29, 2024. Retrieved April 29, 2024.
28. *Game Boy Programming Manual* (<https://archive.org/details/GameBoyProgManVer1.1>). Nintendo. December 3, 1999. Retrieved November 21, 2024 – via Internet Archive.
29. "GameBoy User Manual" (<https://www.flickr.com/photos/30348074@N00/5439992398/in/set-72157626034398554/>). Nintendo of America. 1989. p. 12. Archived (<https://web.archive.org/web/20110629131839/http://www.flickr.com/photos/30348074@N00/5439992398/in/set-72157626034398554/>) from the original on June 29, 2011. Retrieved February 12, 2011.
30. "Cherryroms :: View topic - "Manually" extracting a ROM" (<https://web.archive.org/web/20060507053755/http://forums.cherryroms.com/viewtopic.php?t=3848&start=75>). May 7, 2006. Archived from the original (<http://forums.cherryroms.com/viewtopic.php?t=3848&start=75>) on May 7, 2006. Retrieved January 27, 2025.
31. "Game Boy Advance Service Manual" (https://drive.google.com/file/d/1IpKe2BRdcZLUURvhrvxnlEMZf3MEI6tc/view?usp=embed_facebook) (2nd ed.). Nintendo. p. 3. Retrieved May 27, 2024.
32. "Game Boy Owner's Manual" (<https://www.flickr.com/photos/30348074@N00/5439387075/in/album-72157626034398554/>). Nintendo of America. 1989. p. 3. Retrieved May 26, 2024.
33. "Game Boy Owner's Manual" (<https://www.flickr.com/photos/30348074@N00/5439992276/in/album-72157626034398554/>). Nintendo of America. 1989. p. 6. Retrieved May 26, 2024. "Remove the cover on the back of the GAME BOY and insert the four AA batteries (supplied) as shown in the illustration."
34. "Nintendo Game Boy (DMG-001)" (<https://web.archive.org/web/20080211181421/http://www.videgame.net/NINTENDO/GB.html>). *Vidgame.net*. 2006. Archived from the original (<http://www.videgame.net/NINTENDO/GB.html>) on February 11, 2008. Retrieved August 22, 2006.
35. "Game Boy Owner's Manual" (<https://www.flickr.com/photos/30348074@N00/5439992312/in/album-72157626034398554/>). Nintendo of America. 1989. p. 8. Retrieved May 26, 2024.
36. Masuyama, Meguro (2002). "Pokémon as Japanese Culture?". In Lucien King (ed.). *Game On*. New York, NY: Universe Publishing. p. 39. ISBN 0-7893-0778-2. "Pokémon allowed more than metaphorical communication; it made use of a system that created actual communication — a network game."

37. "Game Boy Owner's Manual" (<https://www.flickr.com/photos/30348074@N00/5439387125/in/album-72157626034398554/>). Nintendo of America. 1989. p. 5. Retrieved May 26, 2024. "(10) Headphone jack (PHONES) — Connect the stereo headphones that come with the GAME BOY to enjoy the impressive sounds of games without disturbing others around you. (11) Speaker — A small built-in external speaker. It will turn on automatically if the headphones are not plugged into the headphones jack."
38. Rothstein, Edward (December 8, 1997). "TECHNOLOGY: CONNECTIONS; Nintendo's Game Boy lives as nostalgia for simpler computer games catches on" (<https://www.nytimes.com/1997/12/08/business/technology-connections-nintendo-s-game-boy-lives-nostalgia-for-simpler-computer.html>). *The New York Times*. ISSN 0362-4331 (<https://search.worldcat.org/issn/0362-4331>). Retrieved March 28, 2026.
39. "Cart Queries". *GamePro*. No. 71. August 1994. p. 14.
40. "Color it loud with hot new Game Boys; Game Boy reflects players own style with five exciting new colors" (<http://www.thefreelibrary.com/Color+it+loud+with+hot+new+Game+Boys%3B+Game+Boy+reflects+players+own...-a016001521>). Archived (<https://web.archive.org/web/20131102052451/http://www.thefreelibrary.com/Color+it+loud+with+hot+new+Game+Boys%3B+Game+Boy+reflects+players+own...-a016001521>) from the original on November 2, 2013. Retrieved November 3, 2009.
41. Oxford, David (February 14, 2019). "Boy, Oh Game Boy: Play It Loud!" (<https://www.oldschoolgamermagazine.com/boy-oh-game-boy-play-it-loud/>). *Old School Gamer Magazine*. Archived (<https://web.archive.org/web/20231028231030/https://www.oldschoolgamermagazine.com/boy-oh-game-boy-play-it-loud/>) from the original on October 28, 2023. Retrieved October 28, 2023.
42. "The Incredible Shrinking Game Boy Pocket". *Electronic Gaming Monthly*. No. 84. Ziff Davis. July 1996. p. 16.
43. "Pocket Cool". *Electronic Gaming Monthly*. No. 89. Ziff Davis. December 1996. p. 204.
44. "Game Boy Relaunched". *Next Generation*. No. 20. August 1996. p. 26.
45. "Link Cable Adapter" (<https://www.nintendo.com/en-gb/Support/Game-Boy-Pocket-Color/Accessories/Link-cable-adapter/Link-cable-adapter-619614.html>). *Nintendo of Europe*. Archived (<https://web.archive.org/web/20240511035518/https://www.nintendo.com/en-gb/Support/Game-Boy-Pocket-Color/Accessories/Link-cable-adapter/Link-cable-adapter-619614.html>) from the original on May 11, 2024. Retrieved May 11, 2024.
46. Copetti, Rodrigo (February 21, 2019). "Game Boy / Color Architecture – A Practical Analysis" (<https://www.copetti.org/writings/consoles/game-boy/>). Archived (<https://web.archive.org/web/20240413195021/https://www.copetti.org/writings/consoles/game-boy/>) from the original on April 13, 2024. Retrieved April 29, 2024.
47. Javanainen, Joonas (July 18, 2023). "MGB-xCPU schematic" (<https://github.com/Gekkiio/gb-schematics/blob/main/MGB-xCPU/schematic/MGB-xCPU.pdf>) (PDF). *GitHub*. Retrieved May 22, 2024.
48. "1998 Sears Christmas Book, Page 161 – Christmas Catalogs & Holiday Wishbooks" (<https://christmas.musetechanical.com/ShowCatalogPage/1998-Sears-Christmas-Book/161>). *christmas.musetechanical.com*. Archived (<https://web.archive.org/web/20200731214935/https://christmas.musetechanical.com/ShowCatalogPage/1998-Sears-Christmas-Book/161>) from the original on July 31, 2020. Retrieved December 1, 2019.
49. Cameron, Mike (September 19, 1996). "A game that's small enough to score where it counts" (<https://infoweb.newsbank.com/apps/news/document-view?p=AWNB&docref=news/10B30EFFA5830318>). *Hamilton Spectator*. p. 11. Retrieved May 22, 2024 – via NewsBank.
50. Curtiss, Aaron (May 30, 1996). "The Expo Challenge: Dodging the Pretenders" (<https://www.latimes.com/archives/la-xpm-1996-05-30-ca-10272-story.html>). *Los Angeles Times*. Retrieved May 22, 2024.
51. "Tidbits...". *Electronic Gaming Monthly*. No. 94. Ziff Davis. May 1997. p. 19.
52. "Game Boy Lights Up". *Electronic Gaming Monthly*. No. 105. Ziff Davis. April 1998. p. 26.
53. "Nintendo unchallenged as big Boy in town" (<https://infoweb.newsbank.com/apps/news/document-view?p=AWNB&docref=news/0EB77359B6744FE3>). *USA Today*. July 29, 1998. p. 4D. Retrieved May 22, 2024 – via NewsBank.

54. [ゲームボーイライト](https://www.nintendo.co.jp/n02/dmg/hardware/light/index.html) (<https://www.nintendo.co.jp/n02/dmg/hardware/light/index.html>) (in Japanese). Nintendo. Archived (<https://web.archive.org/web/19980530125425/http://www.nintendo.co.jp/n02/dmg/hardware/light/index.html>) from the original on May 30, 1998. Retrieved November 3, 2009.
55. "Technical data" (<https://www.nintendo.co.uk/Support/Game-Boy-Pocket-Color/Product-information/Technical-data/Technical-data-619585.html>). *Nintendo of Europe GmbH*. Archived (<https://web.archive.org/web/20230207100304/https://www.nintendo.co.uk/Support/Game-Boy-Pocket-Color/Product-information/Technical-data/Technical-data-619585.html>) from the original on February 7, 2023. Retrieved February 4, 2018.
56. "Game Boy Versions" (<https://www.retrorgb.com/gbversions.html>). *RetroRGB*. June 14, 2018. Archived (<https://web.archive.org/web/20240506190310/https://www.retrorgb.com/gbversions.html>) from the original on May 6, 2024. Retrieved May 6, 2024.
57. "TASVideos / Platform Framerates" (<https://tasvideos.org/PlatformFramerates.html>). *tasvideos.org*. Archived (<https://web.archive.org/web/20200229184750/http://tasvideos.org/PlatformFramerates.html>) from the original on February 29, 2020. Retrieved February 29, 2020.
58. "Game Boy (original) Games" (https://web.archive.org/web/20160402190758/http://www.nintendo.com/consumer/downloads/dmg_games.pdf) (PDF). Nintendo of America. Archived from the original (http://www.nintendo.com/consumer/downloads/dmg_games.pdf) (PDF) on April 2, 2016. Retrieved April 13, 2023.
59. "Game Boy Color Games" (https://web.archive.org/web/20040610021821/http://www.nintendo.com:80/consumer/downloads/cgb_games.pdf) (PDF). Nintendo of America. Archived from the original (http://www.nintendo.com/consumer/downloads/cgb_games.pdf) (PDF) on June 10, 2004. Retrieved April 13, 2023.
60. "Game List – Released Titles" (<http://www.gameboy.com:80/gamelist.html>). *GameBoy.com*. Nintendo of America. January 19, 2001. Archived (<https://web.archive.org/web/20010119180900/http://www.gameboy.com/gamelist.html>) from the original on January 19, 2001. Retrieved August 20, 2018.
61. Byers, Brendan. "Exploring the Gameboy Memory Bank Controller" (<https://b13rg.github.io/Gameboy-MBC-Analysis/>). *Brendan's Website*. Archived (<https://web.archive.org/web/20240429225226/https://b13rg.github.io/Gameboy-MBC-Analysis/>) from the original on April 29, 2024. Retrieved April 29, 2024.
62. "'Pokken Tournament' and Pokemon's \$1.5 Billion Brand" (http://www.huffingtonpost.com/gobankingratebuls/pokken-tournament-and-pok_b_9501260.html). *The Huffington Post*. AOL. March 19, 2017. Archived (https://web.archive.org/web/20200218180223/https://www.huffpost.com/entry/pokken-tournament-and-pok_b_9501260) from the original on February 18, 2020. Retrieved April 25, 2017.
63. Clement, Jessica (May 2024). "All-time best-selling Pokémon games 2024" (<https://www.statista.com/statistics/1072224/pokemon-unit-sales-worldwide/>). *Statista*. Retrieved May 21, 2024.
64. Saltzman, Marc (June 12, 2009). "'Tetris' by the numbers" (<http://content.usatoday.com/communities/gamehunters/post/2009/06/68024593/1>). *USA Today*. Retrieved May 21, 2024.
65. Takahashi, Dean (June 1, 2009). "After 25 years, Tetris has sold 125 million copies" (<https://venturebeat.com/entrepreneur/after-25-years-tetris-has-sold-125-million-copies/>). *VentureBeat*. Archived (<https://web.archive.org/web/20230621144138/https://venturebeat.com/entrepreneur/after-25-years-tetris-has-sold-125-million-copies/>) from the original on June 21, 2023. Retrieved June 21, 2023.
66. McGlynn, Anthony (May 2, 2021). "Why are game-makers creating new Game Boy games in 2021?" (<https://arstechnica.com/gaming/2021/05/meet-the-developers-making-og-game-boy-games-in-2021/>). *Ars Technica*. Retrieved March 24, 2025.
67. Swanson, Drew (January 5, 2023). "Remembering the Game Boy's Launch Titles" (<https://game-rant.com/game-boy-launch-title-retrospective-tetris-super-mario-land/>). *Game Rant*. Retrieved May 21, 2024.
68. Duncan, Andrew (April 21, 2019). "Game Boy Launch Titles" (<https://www.gamegrin.com/articles/game-boy-launch-titles/>). *GameGrin*. Retrieved May 21, 2024.

69. "Yakuman for Game Boy (1989) – MobyGames" (<http://www.mobygames.com/game/gameboy/yakuman>). Archived (<https://web.archive.org/web/20160630040755/http://www.mobygames.com/game/gameboy/yakuman>) from the original on June 30, 2016. Retrieved December 30, 2016.
70. "AtariAge – Lynx History" (<http://www.atariage.com/Lynx/history.html>). AtariAge. Archived (<https://web.archive.org/web/20161201065331/http://www.atariage.com/Lynx/history.html>) from the original on December 1, 2016. Retrieved November 22, 2016. "Eventually the Lynx was squeezed out of the picture and the handheld market was dominated by the Nintendo GameBoy with the Sega Game Gear a distant second."
71. Maher, Jimmy (December 22, 2016). "A Time of Endings, Part 2: Epyx" (<http://www.filfre.net/2016/12/a-time-of-endings-part-2-epyx/>). *The Digital Antiquarian*. Archived (<https://web.archive.org/web/20161223132701/http://www.filfre.net/2016/12/a-time-of-endings-part-2-epyx/>) from the original on December 23, 2016. Retrieved December 23, 2016.
72. "EGM's Special Report: Which System Is Best?". *Electronic Gaming Monthly 1998 Video Game Buyer's Guide*. Ziff Davis. March 1998. p. 58.
73. "Makers Of Games Focus On Girls" (<https://news.google.com/newspapers?id=AUNWAAAIBA&pg=1966,3565771>). *The Gainesville Sun*. January 15, 1995. p. 15. Archived (<https://web.archive.org/web/20170325000543/https://news.google.com/newspapers?id=AUNWAAAIBA&pg=1966,3565771>) from the original on March 25, 2017. Retrieved March 18, 2012.
74. "年末といったらこれ 最新出荷台数調査!". *Weekly Famitsu* (in Japanese). Vol. 379, no. 471. December 26, 1997. p. 8.
75. "A Brief History of Game Console Warfare: Game Boy" (https://web.archive.org/web/20070509094404/http://images.businessweek.com/ss/06/10/game_consoles/source/7.htm). *BusinessWeek*. McGraw-Hill. Archived from the original (http://images.businessweek.com/ss/06/10/game_consoles/source/7.htm) on May 9, 2007. Retrieved July 30, 2008.
76. "Lifetime sales of video game consoles worldwide as of February 2024" (<https://www.statista.com/statistics/1101872/unit-sales-video-game-consoles/>). *Statista*. March 2024.
77. MacDonald, Keza (April 21, 2024). "The Game Boy at 35: a portal to other magical worlds" (<https://www.theguardian.com/games/2024/apr/21/the-game-boy-at-35-a-portal-to-other-magical-worlds>). *The Guardian*. ISSN 0261-3077 (<https://search.worldcat.org/issn/0261-3077>). Retrieved April 13, 2025.
78. Kindy, David (July 29, 2019). "Thirty Years Ago, Game Boy Changed the Way America Played Video Games" (<https://www.smithsonianmag.com/innovation/thirty-years-ago-game-boy-changed-way-america-played-video-games-180972743/>). *Smithsonian*. Retrieved April 13, 2025.
79. MacDonald, Keza (April 24, 2024). "Pushing Buttons: readers' memories of the game-changing Game Boy at 35" (<https://www.theguardian.com/games/2024/apr/24/pushing-buttons-game-boy-35-years-old-readers-memories-nintendo>). *The Guardian*. ISSN 0261-3077 (<https://search.worldcat.org/issn/0261-3077>). Retrieved April 13, 2025.
80. MacDonald, Keza (September 25, 2024). "Pushing Buttons: At Nintendo's new museum in Japan, I found a nostalgia-laced trip down memory lane – not a history lesson" (<https://www.theguardian.com/games/2024/sep/25/pushing-buttons-nintendo-museum-kyoto>). *The Guardian*. ISSN 0261-3077 (<https://search.worldcat.org/issn/0261-3077>). Retrieved April 13, 2025.
81. "*Ball, Game Boy, Big Wheel enter toy hall of fame*" (<https://web.archive.org/web/20110717232724/http://www.rbj.net/article.asp?aID=181826>). *Rochester Business Journal*. Archived from the original (<http://www.rbj.net/article.asp?aID=181826>) on July 17, 2011. Retrieved November 5, 2009.
82. Carnes, Aaron (December 12, 2016). "LA's Chiptune Scene Is More Than Just Nerds with Game Boys" (<https://www.vice.com/en/article/las-chiptune-scene-is-more-than-just-nerds-with-game-boys>). *Vice*. Retrieved May 17, 2025.
83. "Boston Bitdown fest celebrates music from vintage video games" (<https://www.wbur.org/news/2025/03/05/chiptune-boston-bitdown-video-game-music>). *WBUR*. March 5, 2025. Retrieved May 17, 2025.

84. Rose, Janus (May 30, 2011). "Well This Is Cool: The Inner Workings Of A Gameboy Chip-Tune Virtuoso" (<https://www.vice.com/en/article/well-this-is-cool-the-chip-tune-game-boy-virtuoso>). *Vice*. Retrieved May 17, 2025.
85. "Quit Wasting Time on Phone Games and Write Chiptunes Instead" (<https://www.popularmechanics.com/technology/apps/a23888/how-to-make-chiptunes-smartphone>). *popularmechanics.com*. November 15, 2016. Retrieved May 17, 2025. "Of all the different music apps you can find on iOS and Android, one called Nanoloop caught my eye. The descendent of a chiptune program created for real Game Boys, Nanoloop's iOS and Android versions require no special hardware, and have all kinds of additional features."
86. Rosenthal, Emerson (April 21, 2014). "On Its 25th Birthday, Game Boy Is Alive And Well In The Art World" (<https://www.vice.com/en/article/on-its-25th-birthday-game-boy-is-alive-and-well>). *Vice*. Retrieved February 6, 2026. "Shanshui Records' owner and operator is a chiptune guru named Sulumu. Best-known for making 8-bit tones into electro techno, by running hacked Game Boy cartridges into a computer, the producer takes the 25-year young technology and radically transforms it into something new."
87. Hardy, Julia (July 9, 2015). "Can Anyone Make Chiptune Music?" (<https://www.vice.com/en/article/it-sounds-so-basic-but-can-anyone-make-chiptune-music-658>). *Vice*. Retrieved February 6, 2026. "If you're making chiptune, you need more than just some retro hardware—you need to be able to hack the shit out of it, courtesy of some handy software."
88. "Take a trip down memory lane and celebrate a gaming icon with the LEGO Game Boy model building set" (https://www.nintendo.com/us/whatsnew/take-a-trip-down-memory-lane-and-celebrate-a-gaming-icon-with-the-lego-game-boy-model-building-set/?srsltid=AfmBOoprlXMs5bYwmkb_EpK-6i94DfPNEj0F6TIsvYnyO_EtqFDPBDC). *nintendo.com*. Nintendo. July 23, 2025. Retrieved September 7, 2025.

Nintendo IR — Hardware & Software Sales Units (Game Boy: 118.69 million units) (https://www.nintendo.co.jp/ir/en/finance/hard_soft/index.html) PBS NewsHour – “Nintendo’s Game Boy turns 25” (noting combined Game Boy + Game Boy Color sales over 118 million) (<https://www.pbs.org/newshour/arts/nintendos-game-boy-turns-25>)

External links

- [Official website \(https://web.archive.org/web/20110128120244/http://www.gameboy.com/\)](https://web.archive.org/web/20110128120244/http://www.gameboy.com/) archived at the [Wayback Machine](#)
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Retrieved from "https://en.wikipedia.org/w/index.php?title=Game_Boy&oldid=1345891145"

Game Gear

The **Game Gear**^[a] is a handheld game console developed and marketed by Sega. It was released in Japan on October 6, 1990, in North America and Europe in April 1991, and in Australia in 1992. The Game Gear was Sega's first handheld console and competed with Nintendo's Game Boy, Atari's Lynx, and NEC's TurboExpress in the fourth generation of video game consoles.

Sega rushed the 8-bit Game Gear to market to compete with the Game Boy. It shares much of its hardware with the Master System, and can play Master System games with an adapter. Its hardware is superior to the Game Boy's, with a full-color backlit screen and a Z80 CPU. However, it resulted in a much shorter battery life, running for three to five hours on six AA batteries. Sega based the landscape design on the Sega Genesis controller and sought to repeat the Genesis's success by positioning the Game Gear as a more mature and attractive alternative to the Game Boy.

The Game Gear received praise for its hardware, but criticism for its short battery life, large size, and weak support from Sega. Its game library—which includes many ports of Master System games—and price point gave it an edge over the Atari Lynx and TurboExpress, but it was unable to effectively compete with the Game Boy. Sega canceled plans for a 16-bit successor and reduced Game Gear support to prioritize its home consoles. It sold around 14 million units in its lifetime.^[5] Majesco Entertainment rereleased the Game Gear as a budget system between 2000 and 2002, under license from Sega.

History

Developed as codename "Project Mercury",^[6] the Game Gear was launched in Japan on October 6, 1990,^[7] in North America and Europe in 1991, and in Australia in 1992.^[6] Originally retailing at ¥19,800

Game Gear



Manufacturer	<u>Sega</u>
Type	<u>Handheld video game console</u>
Generation	<u>Fourth</u>
Released	<u>JP</u> : October 6, 1990 <u>NA/EU</u> : April 1991 ^[1] <u>AU</u> : 1992
Introductory price	¥19,800 (equivalent to ¥24,000 in 2024) US\$149.99 (equivalent to \$350 in 2025) ^[2] £99.99 (equivalent to £230 in 2025)
Discontinued	<u>WW</u> : April 30, 1997 (Sega) <u>NA</u> : 2002 (<u>Majesco Entertainment</u>) ^[3]
Units sold	Around 14 million
Media	<u>ROM cartridge</u>
CPU	<u>Zilog Z80</u> @ 3.5 MHz
Memory	8 KB <u>RAM</u> , 16 KB <u>VRAM</u>
Display	3.2 in (81 mm) backlit <u>LCD</u> , 160 × 144 px
Graphics	4,096-color palette, 32 colors on-screen
Sound	<u>SN76489</u> Mono speaker Headphone jack

in Japan,^[7] US\$149.99 (equivalent to \$400 in 2025) in North America, and £99.99 in the United Kingdom,^[6] the Game Gear was developed to compete with the Game Boy, which Nintendo had released in 1989.^[8] The decision to make a handheld console was made by Sega's CEO Hayao Nakayama and the name was chosen by newly appointed Sega of America CEO Michael Katz. Both Sega's chairman Isao Okawa and cofounder David Rosen approved of

the name. The console had been designed as a portable version of the Master System, with more powerful features than the Game Boy, including a full-color screen instead of monochromatic.^[9] According to former Sega console hardware research and development head Hideki Sato, Sega saw the Game Boy's black and white screen as "a challenge to make our own color handheld system".^[10]

To improve upon the design of its competition, Sega modeled the Game Gear with a similar shape to a Genesis controller, intending the curved surfaces and greater length to be more comfortable to hold than the Game Boy.^[11] The console's mass was carefully considered from the beginning of the development, aiming for a total mass between that of the Game Boy and the Atari Lynx, another full-color screen competing product.^[10] Game Gear can use the Master Gear adaptor to play games from the similar Master System.^[12] The original Game Gear pack-in game was *Columns*, which is similar to *Tetris* which was bundled with the Game Boy at launch.^[8]

With a late start into the handheld console market, Sega rushed to get the Game Gear into stores quickly,^[13] having lagged behind Nintendo in sales without a handheld on the market.^[11] To simplify development, Sega based the Game Gear hardware on the Master System, with a much larger 4,096 color palette compared to the Master System's 64 colors.^[6] Part of the intention was easy conversion of Master System games. The Game Gear's stronger hardware impacted its battery life, running for three to five hours on six AA batteries, falling short of the Game Boy, which could run for more than 30 hours on four AA batteries.^[11] Its quick launch in Japan sold 40,000 units in its first two days, 90,000 within a month, and more than 600,000 back orders. According to Sega of America marketing director Robert Botch, "there is clearly a need for a quality portable system that provides features other systems have failed to deliver. This means easy-to-view, full-color graphics and exciting quality games that appeal to all ages."^[6]

Release and marketing

Before the Game Gear's launch in 1990, the 16-bit Genesis had been successfully marketed as a "more mature" option for players, and this was repeated against the Game Boy. Sega's marketing in Japan did not take this approach, instead opting for advertisements with Japanese women featuring the handheld, but Sega's worldwide advertising prominently positioned the Game Gear as the "cooler" alternative to the Game Boy.^[11]

Power	6 × AA batteries (3 to 5 hours)
Dimensions	210 × 113 × 38 mm (8.3 × 4.4 × 1.5 in)
Best-selling game	<i>Sonic the Hedgehog 2</i> (400,000) ^[4]
Successor	Genesis Nomad



Game Gear displaying the Sega trademark in color

In North America, marketing for the Game Gear included side-by-side comparisons against the Game Boy which likened Game Boy players to the obese and uneducated. Most of these advertisements feature the "Sega Scream" with a person yelling the name. One Sega advertisement in early 1994, which contained a dog looking between the two consoles, features the quote, "If you were color blind and had an IQ of less than 12, then you wouldn't mind which portable you had."^[11] Such advertising drew criticism from Nintendo, who sought to have protests organized against Sega for insulting disabled people. Sega of America president Tom Kalinske responded that Nintendo "should spend more time improving their products and marketing rather than working on behind-the-scenes coercive activities". Ultimately, this debate would have little impact on sales for the Game Gear.^[13]

Europe and Australia were the last regions to receive the Game Gear. Due to delays, some importers paid up to £200 per system. Upon launch in Europe, video game distributor Virgin Mastertronic unveiled the price as £99.99, positioning it as being more expensive than the Game Boy, but less expensive than the also full-color Atari Lynx.^[6] Marketing in the United Kingdom included the slogan, "To be this good takes Sega", and advertisements with a biker.^[11] In the United Kingdom, the Game Gear had a 16% share of the handheld market in January 1992, increasing to 40% by December 1992.^[14]

Decline

Sega reduced support for the Game Gear in favor of home consoles. The successful Genesis yielded two major peripherals, the Sega CD and the 32X. The 32-bit Saturn console was launched in 1994.^[6] Though selling 10.62 million units by March 1996 (including 1.78 million in Japan),^[15] the Game Gear was never able to match the success of its main rival, the Game Boy, with ten times the sales.^[9] Sales of the Game Gear were further hurt by Nintendo's release of the smaller Game Boy Pocket, running on two AAA batteries.^[11]

Plans for a 16-bit fifth generation direct successor to the Game Gear were canceled, leaving only the Genesis Nomad, a portable version of the Genesis.^[16] Moreover, the Nomad was intended to supplement the Game Gear rather than replace it; in press coverage leading up to the Nomad's release, Sega representatives said the company was not discontinuing the Game Gear in favor of the Nomad, and that "we believe the two can co-exist".^[17] Though the Nomad had been released in 1995, Sega did not officially end support for the Game Gear until 1996 in Japan, and 1997 worldwide.^[11]

Though the system was originally discontinued in 1997, third-party publisher Majesco Entertainment released a version of the Game Gear at US\$30 (equivalent to \$60 in 2025), with \$15 games in 2000 under license from Sega. New games were released, such as a port of Super Battletank. This machine is compatible with all previous Game Gear games,^[9] but incompatible with the TV Tuner and some Master System adaptors.^[6] The system and its re-released games were sold throughout 2000 and 2001 but were discontinued the following year.^{[3][18][19][20]} Over ten years later, on March 2, 2011, Nintendo announced that its 3DS Virtual Console service on the Nintendo eShop would feature Game Gear games.^[21]

Technical specifications

Much of the Game Gear's internal hardware is derived from the Master System, as the handheld was designed to be compatible with that system's library of games. It shares the same Zilog Z80 CPU,^[22] an 8-bit processor clocked at 3.5 MHz, and the Texas Instruments SN76489 sound chip, a programmable sound generator. The chip generated stereo sound, audible using headphones as the device only included a single monaural speaker. The system also contains 8 KB of RAM and 16 KB of video RAM.



Game Gear motherboard

The Game Gear measures 210 millimeters (8.3 in) wide, 113 mm (4.4 in) high, 38 mm (1.5 in) deep,^[22] and was designed to be played horizontally.^[9] At the center of the device is a color liquid-crystal display that measures 3.2 inches (81 mm) diagonally and is able to display up to 32 simultaneous colors from a total palette of 4,096,^[8] with a frame rate of about 60 Hz^[b] with 160 × 144 non-square pixels.^{[6][7]} The screen is backlit for low light using a small cold cathode fluorescent lamp tube.

The Game Gear is powered by six AA batteries which provide an approximate battery life of 3 to 5 hours. This was a source of significant criticism from reviewers.^[11] In response, Sega released two types of external rechargeable battery packs, intended to lengthen play time and reduce consumer cost.^{[8][24]}

Available accessories included a TV Tuner with a whip antenna for the cartridge slot, to become a handheld television. Released at £74.99 (equivalent to US\$130), the add-on was expensive but unique for collectors and contributed to the system's popularity.^[6] The Super Wide Gear magnifies the screen. The Car Gear adapter plugs into cigarette lighters to power the system while traveling, and the Gear to Gear Cable (VS Cable in Japan) establishes a data connection between two Game Gear systems using the same multiplayer game.^[8] Master Gear enables the Game Gear to play Master System games.^[25]



A Game Gear with TV Tuner

Game Gear model variations include several colors, including a blue "sports" variation in North America bundled with World Series Baseball '95 or The Lion King.^[6] A white version was bundled with a TV tuner. Other versions include a red Coca-Cola theme bundled with Coca-Cola Kid, and the Kids Gear Japan-only variation for children.^[7]

Game library

Over 300 total Game Gear games were released,^[7] with six titles available at launch. Prices for game cartridges initially ranged from \$24.99 to \$29.99 in the United States. The casings are molded black plastic with a rounded front to aid in removal.^[8] Games include *Sonic the Hedgehog*, *The GG Shinobi*, *Space Harrier*,^[9] and *Land of Illusion Starring Mickey Mouse*, which was considered the best game for the system by GamesRadar+.^[26] Later games included entries in franchises that had originated on the successful 16-bit Genesis.^[7] Much of the Game Gear's library consists of Master System ports. Because of the landscape orientation of the Game Gear's screen and the similarities to Master System hardware, it was easy for developers to port Master System games to the Game Gear.^[6]



A standard Game Gear cartridge

Because of Nintendo's control over the console video game market, few third-party developers were available to create games for Sega's systems. This contributed to the many ports from Master System. Likewise, because of this, much of the Game Gear library is unique among handhelds, pulling sales away from the Atari Lynx and NEC TurboExpress and helping to establish the Game Gear's market position.^{[6][13]} However, the Game Boy's library includes over 1000 individual games.^[11] Several Game Gear games were released years later on the Nintendo 3DS's Virtual Console service on the Nintendo eShop.^{[27][28]} The emulator for the Virtual Console releases was handled by M2.^[29]

Game Gear Micro

On June 3, 2020, as part of the company's 60th anniversary, Sega revealed the Game Gear Micro^[c] dedicated console. The Micro was released in Japan on October 6, 2020, through Japanese storefronts in four different versions, varying in color and the game selection, with each containing four separate Game Gear games. Each unit otherwise is the same size, measuring 80 mm × 43 mm × 20 mm (3.15 in × 1.69 in × 0.79 in) with a 29 mm (1.1 in) display, and is powered by 2 AAA batteries or through a separate USB charger. Each unit also includes a headphone jack. A magnifying accessory modeled after the original system's Big Window accessory was included with preorders.^{[30][31]} A special version of the device (published by M2 and licensed by Sega) was being shipped with a limited edition of *Aleste Collection* in December 2020. This version includes a newly developed Game Gear title *G.G. Aleste 3* as well as four other *Aleste* titles.^[32]

Reception

Game Gear surpassed the Atari Lynx and NEC TurboExpress, but lagged far behind the Game Boy in the handheld marketplace. Retrospective reception to the Game Gear is mixed. In 2008, GamePro listed the Game Gear as 10th on its list of the "10 Worst-Selling Handhelds of All Time" and criticized aspects of the implementation of its technology, but also stated that the Game Gear could be considered a commercial success at nearly 11 million units sold. According to *GamePro* reviewer Blake Snow, "Unlike the Game Boy, the Game Gear rocked the landscape holding position, making it less cramped for human beings with two hands to hold. And even though the Game Gear could be considered a success, its bulky frame, relative high price, constant

consumption of AA batteries, and a lack of appealing games ultimately kept Sega from releasing a true successor."^[33] In speaking with *Famitsu DC* for its November 1998 issue, Sato stated that the Game Gear achieved "a respectable chunk of market share" since overall "about 14 million systems" were sold, but that "Nintendo's Game Boy was such a runaway success, and had gobbled up so much of the market, that our success was still seen as a failure, which I think is a shame."^[10]

GamesRadar+ offered some praise for the system and its library, stating: "With its 8-bit processor and bright color screen, it was basically the Sega Master System in your hands. How many batteries did we suck dry playing Sonic, Madden and Road Rash on the bus or in the car, or in the dark when we were supposed to be sleeping? You couldn't do that on a Game Boy!"^[26] By contrast, *IGN* reviewer Levi Buchanan opined that the Game Gear's biggest fault was its game library when compared to the Game Boy, stating: "the software was completely lacking compared to its chief rival, which was bathed in quality games. It didn't matter that the Game Gear was more powerful. The color screen did not reverse any fortunes. Content and innovation beat out technology, a formula that Nintendo is using right now with the continued ascendance of the DS and Wii." Buchanan praised some of the library: "Some of those Master System tweaks were very good games, and fun is resilient against time."^[9] *Retro Gamer* praised Sega's accomplishment in surviving against the competition of Nintendo in the handheld console market with the Game Gear, noting that "for all the handhelds that have gone up against the might of Nintendo and ultimately lost out, Sega's Game Gear managed to last the longest, only outdone in sales by the Sony PSP. For its fans, it will remain a piece of classic gaming hardware whose legacy lives on forever."^[6]

See also



- [Watara Supervision](#)
- [Gamate](#)

Notes

- [Japanese](#): ゲームギア, [Hepburn](#): *Gēmu Gia*
- The exact frame rate was 59.922751013551 Hz^[23]
- ゲームギアミクロ, *Gēmu gia mikuro*

References

- "The Next Generation 1996 Lexicon A to Z: Game Gear". *Next Generation*. No. 15. [Imagine Media](#). March 1996. p. 34.
- "The Real Cost of Gaming: Inflation, Time, and Purchasing Power" (<https://www.ign.com/article/s/2013/10/15/the-real-cost-of-gaming-inflation-time-and-purchasing-power>). October 15, 2013. Retrieved August 28, 2020.

3. "Game Gear - Hardware" (<https://www.smspower.org/Hardware/GameGear>). *SMS Power*. Retrieved April 13, 2024.
4. *Guinness World Records 2016 Gamer's Edition*. Jim Pattison Group. 2015. p. 149. ISBN 978-1910561096.
5. shmuplations (December 28, 2021). "The History of Sega Console Hardware - shmuplations.com" (<https://shmuplations.com/segahistory/>). Retrieved February 19, 2026.
6. Wild, Kim (2009). "Retroinspection: Sega Game Gear" (https://archive.org/stream/retro_gamer/RetroGamer_041#page/n75/mode/2up). *Retro Gamer* (41). Imagine Publishing Ltd.: 78–85.
7. Forster, Winnie (2005). *The Encyclopedia of Game Machines: Consoles, Handhelds, and Home Computers 1972-2005*. Variant Press. p. 139. ISBN 3-0001-5359-4.
8. Beuscher, David. "Sega Game Gear - Overview" (<https://web.archive.org/web/20141114094408/http://www.allgame.com/platform.php?id=25>). AllGame. Archived from the original (<http://www.allgame.com/platform.php?id=25>) on November 14, 2014. Retrieved July 8, 2013.
9. Buchanan, Levi (October 9, 2008). "Remember Game Gear?" (<http://uk.retro.ign.com/articles/918/918381p1.html>). *IGN*. Archived (<https://web.archive.org/web/20180623173244/http://www.ign.com/articles/2008/10/09/remember-game-gear>) from the original on June 23, 2018. Retrieved March 29, 2009.
10.
 - Sato, Hideki (February 15, 2002). "セガ・コンシューマー・ヒストリー (Sega Consumer History)". *Interview: The Witness of History* (https://retrocdn.net/index.php?title=File:Sega_Consumer_History_JP_EnterBrain_Book.pdf&page=23). Famitsu DC (in Japanese). Enterbrain. pp. 22–25. ISBN 978-4-75770789-4.
 - Translation (<http://shmuplations.com/segahistory/>) by Shmuplations, Archived (<https://web.archive.org/web/20200814114513/http://shmuplations.com/segahistory/>) August 14, 2020, at the [Wayback Machine](#)
11. Kapa, Damien (2005). "Sega Game Gear" (https://archive.org/stream/retro_gamer/RetroGamer_017#page/n25/mode/2up). *Retro Gamer*. No. 17. Live Publishing. pp. 26–35 – via Internet Archive.
12. "Gear Up Master System Games" (https://retrocdn.net/images/0/07/GamePro_US_068.pdf) (PDF). *GamePro*. No. 68. IDG. March 1995. p. 136. Archived (https://web.archive.org/web/20200113193151/https://retrocdn.net/images/0/07/GamePro_US_068.pdf) (PDF) from the original on January 13, 2020.
13. Wesley, David; Barczak, Gloria (2010). *Innovation and Marketing in the Video Game Industry: Avoiding the Performance Trap*. Gower Publishing, Ltd. ISBN 978-0-5660-9167-4.
14. "Geared For Success" (https://retrocdn.net/images/9/98/SegaForce_UK_16.pdf#page=17) (PDF). *Sega Force*. No. 16 (April 1993). March 4, 1993. p. 17. Archived (https://web.archive.org/web/20160329203427/https://retrocdn.net/images/9/98/SegaForce_UK_16.pdf) (PDF) from the original on March 29, 2016.
15. "Weekly Famitsu Express" (<https://imgur.com/hXXa6DE>). *Famitsu*. Vol. 11, no. 392. June 21, 1996. Retrieved August 2, 2019. See lines 8 and 20 for units sold in Japan and other regions, respectively.
16. Fahs, Travis (April 21, 2009). "IGN Presents The History of SEGA" (<http://uk.retro.ign.com/articles/974/974695p7.html>). *IGN*. Archived (<https://web.archive.org/web/20180623173515/http://www.ign.com/articles/2009/04/21/ign-presents-the-history-of-sega?page=7>) from the original on June 23, 2018. Retrieved July 8, 2013.
17. Ramshaw, Mark James (November 1995). "Generator" (<https://archive.org/details/nextgen-issue-011/page/n31/mode/2up>). *Next Generation* (11). Imagine Media: 31.
18. *GamePro (US) Issue 152 - May 2001* (https://retrocdn.net/images/c/cc/GamePro_US_152.pdf) (PDF) (Issue 152 - May 2001 ed.). *GamePro (US)*. May 2001. p. 26. Retrieved April 13, 2024.
19. "Amazon.com - April 05, 2001 - Archive.org Capture" (<https://web.archive.org/web/20010405023936/http://www.amazon.com/exec/obidos/tg/browse/-/409566/funlife>). *Amazon*. Archived from the original on April 5, 2001. Retrieved April 13, 2024.

20. "IGN.com Sonic Advance Article - Dec 2001" (<https://www.ign.com/articles/2001/12/14/sonic-the-hedgehog-advance>). *IGN.com*. IGN. December 14, 2001. Retrieved April 13, 2024.
21. Newton, James (March 3, 2011). "Sega Names First Game Gear Games for 3DS Virtual Console" (http://3ds.nintendolife.com/news/2011/03/sega_names_first_game_gear_games_for_3ds_virtual_console). *Nintendo Life*. Archived (https://web.archive.org/web/20180623175854/http://www.nintendolife.com/news/2011/03/sega_names_first_game_gear_games_for_3ds_virtual_console) from the original on June 23, 2018. Retrieved July 8, 2013.
22. ゲームギア 取扱説明書 [*Game Gear Instruction Manual*] (in Japanese). Sega Enterprises Ltd. 1990. p. 18.
23. "TASVideos / Platform Framerates" (<https://tasvideos.org/PlatformFramerates.html>). *tasvideos.org*. Retrieved March 4, 2020.
24. "GamePro Labs" (https://archive.org/details/GamePro_Issue_057_April_1994/page/n89/mode/2up). *GamePro*. No. 57. IDG. April 1994. pp. 104–106.
25. "GameSpot Presents: The History of Video Game Compatibility" (https://web.archive.org/web/20041031213027/http://www.gamespot.com/gamespot/features/video/compat/p3_02.html). *GameSpot*. Archived from the original (http://www.gamespot.com/gamespot/features/video/compat/p3_02.html) on October 31, 2004. Retrieved August 6, 2008.
26. GamesRadar Staff (June 23, 2012). "Best Sega Game Gear games of All Time" (<http://www.gamesradar.com/best-game-gear-games-all-time>). Retrieved July 8, 2013.
27. Whitehead, Thomas (March 6, 2012). "Game Gear Hits North American eShop on 15th March" (http://www.nintendolife.com/news/2012/03/game_gear_hits_north_american_eshop_on_15th_march). *Nintendo Life*. Gamer Network. Archived (https://web.archive.org/web/20151222125618/http://www.nintendolife.com/news/2012/03/game_gear_hits_north_american_eshop_on_15th_march) from the original on December 22, 2015. Retrieved December 11, 2015.
28. Drake, Audrey (May 17, 2013). "3DS eShop: Zelda Sale and Tons of GameGear Games" (<http://www.ign.com/articles/2013/05/17/3ds-eshop-zelda-sale-and-tons-of-gamegear-games>). *IGN*. Ziff Davis. Archived (<https://web.archive.org/web/20151224112808/http://www.ign.com/articles/2013/05/17/3ds-eshop-zelda-sale-and-tons-of-gamegear-games>) from the original on December 24, 2015. Retrieved December 11, 2015.
29. Fletcher, JC (March 14, 2012). "Game Gear emulation outclasses the other 3DS Virtual Console games" (<https://www.engadget.com/2012/03/14/game-gear-emulation-outclasses-the-other-3ds-virtual-console-gam/>). *Engadget*. AOL. Archived (<https://web.archive.org/web/20151222080311/http://www.engadget.com/2012/03/14/game-gear-emulation-outclasses-the-other-3ds-virtual-console-gam/>) from the original on December 22, 2015. Retrieved December 11, 2015.
30. Plunkett, Luke (June 2, 2020). "Sega Is Releasing A Game Gear Micro" (<https://kotaku.com/sega-is-releasing-a-game-gear-micro-1843869286>). *Kotaku*. Retrieved June 2, 2020.
31. Byford, Sam (June 3, 2020). "Sega's Game Gear Micro is four \$50 consoles with four games each" (<https://www.theverge.com/2020/6/3/21278895/sega-game-gear-micro-games-list-price-magnifying-glass>). *The Verge*. Retrieved June 3, 2020.
32. Romano, Sal (September 16, 2020). "Aleste Collection announced for PS4, Switch" (<https://www.gematsu.com/2020/09/aleste-collection-announced-for-ps4-switch>). *Gematsu*. Retrieved September 20, 2020.
33. Snow, Blake (July 30, 2007). "The 10 Worst-Selling Handhelds of All Time" (<https://web.archive.org/web/20080918035922/http://www.gamepro.com/article/features/125748/the-10-worst-selling-handhelds-of-all-time/>). *GamePro.com*. Archived from the original (<http://www.gamepro.com/article/features/125748/the-10-worst-selling-handhelds-of-all-time/>) on September 18, 2008. Retrieved January 17, 2008.

External links

- [Game Gear Micro official website \(https://60th.sega.com/ggmicro/\)](https://60th.sega.com/ggmicro/) (Japanese)

Retrieved from "https://en.wikipedia.org/w/index.php?title=Game_Gear&oldid=1341783261"

TurboExpress

The **TurboExpress** is an 8-bit handheld game console by NEC Home Electronics, released in late 1990 in Japan and the United States, branded as the **PC Engine GT** in Japan and **TurboExpress Handheld Entertainment System** in the U.S. It is essentially a portable version of the TurboGrafx-16 home console that came out one to three years earlier. Its launch price in Japan was ¥44,800 and US\$249.99 (equivalent to \$620 in 2025) in the U.S.

The TurboExpress was technically advanced for the time, able to play all the TurboGrafx-16's HuCard games, featuring a backlit, active-matrix color LCD screen, and optional TV tuner.^[3]

The TurboExpress primarily competed with Nintendo's Game Boy, Sega's Game Gear, and the Atari Lynx. With 1.5 million units sold, far behind its two main competitors, NEC failed to gain significant sales or market share in the handheld market.^[4]

History

The TurboExpress's codename was *Game Tank*. A working prototype was revealed in the April 1990 issue of VG&CE.^[5] It was eventually released in December 1990 in both Japan and the U.S. Its price in the U.S. was briefly raised to \$299.99 in March 1991 due to higher costs of the display,^[6] before dropping back to its launch price of \$249.99, and lowering the price again to \$199.99 in 1992.

Regardless of its technical advantages upon its release, the TurboExpress was not widely recognized or adopted by consumers.^[7] In addition to NEC's marketing issues, the handheld was initially released for \$249.99, significantly higher than popular competitors. Because of this price tag, it was labeled as the "Rolls-Royce of handheld systems".^[8] On the other hand, the ability to run the same software as its console counterpart meant that additional portable

TurboExpress/PC Engine GT

TurboExpress

Handheld Entertainment System

PC Engine

GT



TurboExpress handheld

Also known as	<u>HES-EXP-01</u>
Manufacturer	<u>NEC Home Electronics</u>
Type	<u>Handheld game console</u>
Generation	<u>Fourth</u>
Released	<u>JP</u> : December 1, 1990 ^[1] <u>NA</u> : December 1990
Introductory price	\$249.99, ¥44,800
Discontinued	<u>NA</u> : 1994 ^[2]
Units sold	1.5 million units
Media	<u>HuCard</u>
CPU	<u>HuC6280</u> @ 7.16 MHz or 1.79 MHz
Memory	8 KB <u>RAM</u> 64 KB <u>VRAM</u>

system specific software did not have to be purchased if already owning the console, resulting in a (oftentimes substantial) cost savings.

Hardware



The PC Engine GT

Display	2.6 in. TFT active matrix backlit LCD, 336×221 pixels, 512 color palette, 481 colors on-screen
Graphics	2x <u>HuC6270A</u> VDC
Sound	<u>HuC6280</u> , 6-channel wavetable synthesis and PCM playback, monophonic speaker, 3.5mm stereo output jack
Connectivity	TurboLink
Power	6 <u>AA</u> batteries or 6 volt <u>AC</u> adapter
Related	<u>TurboGrafx-16</u>

The screen is sized 66 mm (2.6 in.), the same as the original Game Boy. It can display 64 sprites at once, 16 per scanline, in up to 481 colors from a palette of 512. It has 8 kilobytes of RAM, and it runs a HuC6280 CPU at 1.79 or 7.16 MHz, same as TurboGrafx-16.

The TurboExpress had a backlit display. Handheld market leader Nintendo did not have a backlit handheld until the release of the Game Boy Light in 1998. Its keypad layout is

similar to that of the original Game Boy, with the unique addition of two "turbo switches" that engage two levels of high-speed controller button re-triggering to assist the player.

Due to a problem with faulty capacitors (an industry-wide issue in the early 1990s), sound failure is a frequent problem with the TurboExpress, sometimes even in new systems.^[9] The screen used in the TurboExpress was another source for problems, though it was state of the art when it was released. The LCD technology used was still fairly new and the rate of pixel failure was very high. Brand-new TurboExpress systems often had several bad pixels. Text is also difficult or impossible to read in certain circumstances, as many times fonts were written to be seen on a television screen, not on a small LCD screen. As a result, certain RPGs and adventure games can be difficult to play on the unit.

The TurboExpress plays the same game cartridges as the TurboGrafx-16 home console.^[10] Some TurboGrafx-16 HuCards save game data to the internal memory of the TurboGrafx-CD unit, TurboDuo, or TurboBooster Plus (a peripheral for the core TG-16 console). The TurboExpress lacks this internal memory and, as a result, is not capable of saving in this manner. Most games provide a password save mechanism as an alternative.

The battery life is about three hours for 6 AA batteries. This is also a problem for other color and backlit or sidelit handhelds of the time, such as the Game Gear at 5–6 hours, the Sega Nomad at 2–3 hours, and the Atari Lynx at more than 4 hours. Nintendo's Game Boy had a 12- to 40-hour lifespan on 4 AA batteries.

Specifications

- CPU: HuC6280
- CPU speed: 7.16 MHz or 1.79 MHz (switchable in software)
- Resolution: 400x270 pixels
- Color palette: 512 colors; 9-bit RGB
- Max simultaneous colors: 481 on screen
- Max sprites: 64
- Audio: 6-voice wavetable synthesis

TurboLink

The TurboLink allows two-player play. *Falcon*, a flight simulator, includes "head-to-head" dogfight and cooperative modes that can only be accessed via TurboLink.^[11] This technology was also used for *Bomberman '93* Com-Link multiplayer. Although it was released after the TurboExpress launch, very few TG-16 games offer co-op play modes especially designed with the TurboExpress in mind.



The TurboLink cable

TurboVision

TurboVision is a TV tuner adapter for the TurboExpress converting the TurboExpress into a handheld television.^[10]

The accessory was available at launch for US\$100 (equivalent to \$250 in 2025).^[12] It allowed a player to either watch television, or go back to playing games with the flip of a switch; in other words, one may use the TurboExpress as a video monitor. It includes an RCA audio/video input for external composite video signals. Due to the widespread adoption of digital television and the HDTV standard, however, the adapter will no longer function as a television in most places due to the lack of any HDTV digital processing circuitry (the tuner can only process an analog signal for television). Due to this limitation, the TV tuner adapter is now relegated to a collectible for most people, although its RCA audio/video input function will still be operational (albeit limited with its low screen resolution).



The TurboVision TV tuner

Reception

Computer Gaming World favorably compared TurboExpress to the Game Boy, but stated that the NEC handheld "gobbles power like crazy ... almost forcing players to immediately purchase an AC adapter". The magazine nonetheless praised its compatibility with TurboGrafx games, and concluded, "to see this machine in action is to fall in love with it".^[13]

Entertainment Weekly praised the new 16 bit computer architecture of the system and the graphics of the games, but warned that the small screen is a downgrade for those used to playing the games on a big screen.^[10]

See also

- TurboGrafx-16
- TurboGrafx-16 Mini, a home video game console with a TurboExpress display option.

References

1. "PC-Engine" (<https://web.archive.org/web/20180623210846/http://www.pc-engine.co.uk/?section=systems>). 23 June 2018. Archived from the original (<http://www.pc-engine.co.uk/?section=systems>) on 2018-06-23. Retrieved 29 December 2018.
2. "TurboGrafx-16 TurboExpress - Overview - allgame" (<https://web.archive.org/web/20141114094414/http://www.allgame.com/platform.php?id=17673>). 14 November 2014. Archived from the original (<http://www.allgame.com/platform.php?id=17673>) on 2014-11-14. Retrieved 29 December 2018.
3. Lachel, Cyril (February 22, 2012). "The TurboExpress Has won the War" (<http://www.defunctgames.com/history/21/the-turboexpress-has-won-the-war>). *Defunct Games*. Archived (<https://web.archive.org/web/20180623193643/http://www.defunctgames.com/history/21/the-turboexpress-has-won-the-war>) from the original on June 23, 2018.
4. Snow, Blake (July 30, 2007). "The 10 Worst-Selling Handhelds of All Time" (<https://web.archive.org/web/20071012194600/http://gamepro.com/gamepro/domestic/games/features/125748.shtml>). *GamePro*. Archived from the original (<http://www.gamepro.com/gamepro/domestic/games/features/125748.shtml>) on October 12, 2007. Retrieved January 17, 2008.
5. "Game Tank" (http://archives.tg-16.com/VGCE/VGCE_1990_04_024.jpg). *TurboPlay*. April 1990. p. 24. Archived (https://web.archive.org/web/20180623194636/http://archives.tg-16.com/VGCE/VGCE_1990_04_024.jpg) from the original on June 23, 2018.
6. "TurboExpress release" (<http://archives.tg-16.com/TURBOPLAY/TP-05-11.jpg>). TurboPlay. March 1991. Archived (<https://web.archive.org/web/20180623205845/http://archives.tg-16.com/TURBOPLAY/TP-05-11.jpg>) from the original on June 23, 2018 – via tg-16.com.
7. Marriott, Scott Alan. "TurboGrafx-16 TurboExpress" (<https://web.archive.org/web/20090406021702/http://www.allgame.com/platform.php?id=17673>). AllGame. Archived from the original (<http://www.allgame.com/cg/agg.dll?p=agg&sql=5:17673>) on April 6, 2009.
8. "Most Expensive Handheld Video Game System" (<https://web.archive.org/web/20130119143432/http://most-expensive.net/handheld-video-game-system>). The Most Expensive Journal. October 14, 2006. Archived from the original (<http://most-expensive.net/handheld-video-game-system>) on January 19, 2013.
9. "{title}" (<http://www.pcenginefx.com/forums/index.php?topic=702.0>). Archived (<https://web.archive.org/web/20080408105248/http://www.pcenginefx.com/forums/index.php?topic=702.0>) from the original on 2008-04-08. Retrieved 2008-01-17.
10. "1991 Gadget guide" (<https://ew.com/article/1991/03/15/1991-gadget-guide/>). *EW.com*. Archived (<https://web.archive.org/web/20151001084323/http://www.ew.com/article/1991/03/15/1991-gadget-guide>) from the original on 2015-10-01. Retrieved 2018-09-10.
11. "Review Crew: Falcon" (https://archive.org/details/Electronic_Gaming_Monthly_036). *Electronic Gaming Monthly*. No. 36. Sendai Publishing. July 1992. p. 24. Archived (https://web.archive.org/web/20180729080951/https://archive.org/details/Electronic_Gaming_Monthly_036) from the original on 2018-07-29. Retrieved 2018-03-03.

12. "PlayBoy Collection" (http://archives.tg-16.com/PLAYBOY/Playboy_1991_04.pdf) (PDF). *Playboy*. April 1991. Archived (https://web.archive.org/web/20170105223547/http://archives.tg-16.com/PLAYBOY/Playboy_1991_04.pdf) (PDF) from the original on January 5, 2017 – via tg-16.com.
13. Adams, Roe R. III (January 1991). "Firing Up the TurboExpress / NEC's Hot New Hand-Held System" (<http://www.cgwmuseum.org/galleries/index.php?year=1991&pub=2&id=78>). *Computer Gaming World*. p. 64. Archived (<https://web.archive.org/web/20180623205300/http://www.cgwmuseum.org/galleries/index.php?year=1991&pub=2&id=78>) from the original on June 23, 2018. Retrieved 17 November 2013.

Other sources

- *The Electronic Gaming Monthly 1991 Video Game Buyers Guide*.
-

Retrieved from "<https://en.wikipedia.org/w/index.php?title=TurboExpress&oldid=1342424060>"

Atari Lynx

The **Atari Lynx** is a fourth-generation handheld game console released by Atari Corporation in September 1989 in North America and 1990 in Europe and Japan. It was the first handheld game console with a color liquid-crystal display. Powered by a 4 MHz 65C02 8-bit CPU and a custom 16-bit blitter, the Lynx was more advanced than Nintendo's monochrome Game Boy, released five months earlier. It also competed with Sega's Game Gear and NEC's TurboExpress, released the following year.

The system was developed at Epyx by two former designers of the Amiga personal computers. The project was called the **Handy Game** or simply **Handy**. In 1991, Atari replaced the Lynx with a smaller model internally referred to as the Lynx II. Atari published a total of 73 games for the Lynx before it was discontinued in 1995.

History

The Lynx system was originally developed by Epyx as the Handy Game. In 1986, two former Amiga designers, RJ Mical and Dave Needle, had been asked by a former manager at Amiga, Dave Morse, to design a portable gaming system.^{[3][4]} Morse now worked at Epyx, a game software company with a recent string of hit games. Morse's son had asked him if he could make a portable gaming system, prompting a meeting with Mical and Needle to discuss the idea. Morse convinced Mical and Needle and they were hired by Epyx to be a part of the design team.^[3] Planning and design of the console began in 1986 and was completed in 1987.^[5] Epyx first showed the Handy system at the Winter Consumer Electronics Show (CES) in January 1989.^[3] Facing financial difficulties, Epyx sought partners. Nintendo, Sega, and other companies declined, but Atari and Epyx eventually agreed that Atari would handle production and marketing, and Epyx would handle software development. Epyx declared bankruptcy by the end of the year, so Atari essentially owned the entire project. Both Atari and others had to purchase Amigas from Atari arch-rival Commodore in order to develop Lynx software.^[6]

Atari Lynx



Atari Lynx I

Developer	<u>Epyx</u>
Manufacturer	<u>Atari Corporation</u>
Type	<u>Handheld game console</u>
Generation	<u>Fourth</u>
Released	September 1, 1989
Lifespan	1989–1995
Introductory price	US\$179.99 (equivalent to \$470 in 2025) ^[1]
Discontinued	1995
Units sold	2 million ^[2]
Media	<u>ROM cartridge</u>
CPU	"Mikey" (<u>VLSI VL65NC02</u> 8-bit CPU + Sound processor + LCD driver)
Memory	64 KB RAM
Display	Backlit 3.5" color LCD; 160 × 102 standard resolution (16,320 addressable pixels)
Graphics	"Suzy" (16-bit custom CMOS)
Sound	4 channels, 8-bit DAC or PSG sound
Best-selling game	<u>RoadBlasters</u>

The Handy was designed to run games from the cartridge format, and the game data must be copied from ROM to RAM before it can be used. Thus, less RAM is then available and each game's initial loading is slow.^[7] There are trace remnants of a cassette tape interface physically capable of being programmed to read a tape. Lynx developers have noted that "there is still reference of the tape and some hardware addresses"^[8] and an updated vintage Epyx manual describes the bare existence of what could be utilized for tape support.^{[9]:ch.2,8} A 2009 retrospective interview with Mical clarifies that there is no truth to some early reports claiming that games were loaded from tape, and elaborates, "We did think about hard disk a little."^[10]

The networking system was originally developed to run over infrared links and codenamed RedEye.^[11] This was changed to a cable-based networking system before the final release as the infrared beam was too easily interrupted when players walked through the beam, according to Peter Engelbrite. Engelbrite developed the first recordable eight-player co-op game, and the only eight-player game for the Lynx, Todd's Adventures in Slime World.^[11]

Atari changed the internal speaker and removed the thumb stick on the control pad. At Summer 1989 CES, Atari's press demonstration included the "Portable Color Entertainment System", which was changed to "Lynx" when distributed to resellers, initially retailing in the US at US\$179.95 (equivalent to about \$470 in 2025).^[7]

Its launch was successful. Atari reported that it had sold 90% of the 50,000 units shipped in the launch month in the U.S. with a limited launch in New York.^[12] US sales in 1990 were approximately 500,000 units according to the Associated Press.^[13] In late 1991, it was reported that Atari sales estimates were about 800,000, which Atari claimed was within its expected projections.^[14] Lifetime sales by 1995 amount to fewer than 7 million units when combined with the Game Gear.^[15] In comparison, 16 million Game Boy units were sold by 1995^[15] because of its superior durability, pricing, battery life, and game library, notably the pack-in hit Tetris.^[6]

As with the console units, the game cartridge design evolved over the first year of the console's release. The first generation of cartridges are flat, and designed to be stackable for ease of storage. However, this design proved to be very difficult to remove from the console and was replaced by a second design. This style, called "tabbed" or "ridged", adds two small tabs on the underside to aid in removal. The original flat style cartridges can be stacked on top of the newer cartridges, but the newer cartridges can not be easily stacked on each other, nor were they stored easily. Thus a third style, the "curved lip" style was produced, and all official and third-party cartridges during the console's lifespan were released (or re-released) using this style.^[16]

In May 1991, Sega launched its Game Gear portable gaming handheld with a color screen.^[17] In comparison to the Lynx it had shorter battery life (3–4 hours as opposed to 4-5 for the Lynx), but it is slightly smaller, has significantly more games, and cost \$30 less than the Lynx at launch.

Retailers such as Game and Toys "R" Us continued to sell the Lynx well into the mid-1990s on the back of the Atari Jaguar launch, helped by magazines such as *Ultimate Future Games* which continued to cover the Lynx alongside the new generation of 32-bit and 64-bit consoles.

Lynx II

In July 1991, Atari introduced a new version of the Lynx, internally called the "Lynx II", with a new marketing campaign, new packaging, slightly improved hardware, better battery life, and a sleeker look. It has rubber hand grips and a clearer backlit color screen with a power save option (which

turns off the backlighting). The monaural headphone jack of the original Lynx was replaced with one wired for stereo. The Lynx II was available without any accessories, dropping the price to \$99 (equivalent to \$240 in 2025).

Decline

In 1993, Atari started shifting its focus away from the Lynx in order to prepare for the launch of the Jaguar.^[17] A few games were released during that time, including *Battlezone 2000*. Support for the Lynx was formally discontinued in 1995. After the commercial failure of the Jaguar, Atari ceased all game development and hardware manufacturing by early 1996^[18] and merged with JTS, Inc. on July 30 of that year.^{[19][20]}



The Lynx II, smaller and lighter than the original

Features

The Atari Lynx has a backlit color LCD display, switchable right- and left-handed (upside down) configuration, and the ability to network with other units via Comlynx cable. The maximum stable connection allowed is eight players.^[11] Each Lynx needs a copy of the game, and one cable can connect two machines. The cables can be connected into a chain.^[11]

The Lynx was cited as the "first gaming console with hardware support for zooming and distortion of sprites". With a 4096 color palette and integrated maths and graphics co-processors (including a sprite engine unit), its color graphics display was said to be the key defining feature in the system's competition against Nintendo's monochromatic Game Boy. The fast pseudo-3D graphics features were made possible on a minimal hardware system by co-designer Dave Needle having "invented the technique for planar expansion/shrinking capability" and using stretched triangles instead of full polygons.^[10]

The leading-edge display was the most expensive component, so the color choice was one of economy. If the low-cost glass and drivers would have supported a million colors, I would have done it.

Dave Needle, Lynx co-designer^[10]

Technical specifications

- Mikey (8-bit VLSI custom CMOS chip running at 16 MHz)^[21]
 - On Lynx I a VLSI 8-bit VL65NC02 processor (based on the MOS 6502) running at up to 4 MHz (3.6 MHz average).^[3] In the stereo version of Lynx II a 65C02 with all instructions.
 - Sound engine
 - 4 channel sound
 - 8-bit DAC for each channel (4 channels × 8-bits/channel = 32 bits commonly quoted) these four sound channels can also switch in analogue sound mode to generate PSG sound. PSG sound is created by setting the taps of



The motherboard of an Atari Lynx II. The larger chip is the "Mikey" and the smaller is called "Suzy".

a LFSR to produce various pulse waves or pseudo-random noise.

- Video DMA driver for liquid-crystal display
 - Custom built and designed by Jay Miner and Dave Morse^[22]
 - 160×102 pixels resolution
 - 4,096 color (12-bit) palette
 - 16 simultaneous colors (4 bits) from palette per scanline
 - Variable frame rate (up to 75 frames/second)
- Eight system timers (two reserved for LCD timing, one for UART)
- Interrupt controller
- UART (for Comlynx) (fixed format 8E1, up to 62500 Bd / TurboMode 1,000,000Bd)
- 512 bytes of bootstrap and game-card loading ROM
- Suzy (16-bit VLSI custom CMOS chip running at 16 MHz)
 - Unlimited number of blitter "sprites" with collision detection
 - Hardware sprite scaling, distortion, and tilting effects
 - Hardware decoding of compressed sprite data
 - Hardware clipping and multi-directional scrolling
 - Math engine
 - Hardware 16-bit × 16-bit → 32-bit multiply with optional accumulation; 32-bit ÷ 16-bit → 16-bit divide
 - Parallel processing of CPU
- RAM: 64 KB 120ns DRAM
- Cartridges: 128, 256, 512 KB and (with bank-switching) 1 MB
- Ports:
 - Headphone port (3.5 mm stereo; wired for mono on the original Lynx)
 - ComLynx (multiple unit communications, serial)
- LCD Screen: 3.5" diagonal
- Battery holder (six AA) 4–5 hours (Lynx I) 5–6 hours (Lynx II)



The backlight from an Atari Lynx II. The CCFL tube has high power consumption.

Legacy

Telegames released several games in the late 1990s, including a port of *Raiden* and a platformer called *Fat Bobby* in 1997,^[23] and an action sports game called *Hyperdrome* in 1999.

On March 13, 1998, nearly three years after the Lynx's discontinuation, JTS Corporation sold all of the Atari assets to Hasbro Interactive for \$5 million.^[24] On May 14, 1999, Hasbro, which held on to those properties until selling Hasbro Interactive to Infogrames in 2001,^[25] released into the public domain all rights to the Jaguar,^[26] opening up the platform for anyone to publish software on without Hasbro's interference. Internet theories say that the Lynx's rights may have been released to the public at the same time as the Jaguar,^[27] but this is clearly disputed. Nevertheless, since discontinuation, the Lynx, like the Jaguar, has continued to receive support from a grassroots community^[17] which would go on to produce many successful homebrew games such as *T-Tris* (the first Lynx game with a save-game feature),^[28] *Alpine Games*,^[29] and *Zaku*.^[30]

In 2008, Atari was honored at the 59th Annual Technology & Engineering Emmy Awards for pioneering the development of handheld games with the Lynx.^[31]

In 2022, the compilation *Atari 50* released with a handful of popular Lynx titles, marking the first time that classic Lynx software would be officially rereleased by Atari.^[32] A collection of Lynx games have also been released as standalone titles outside of the *Atari 50* compilation as well on other platforms such as Steam and the Evercade.^{[33][34][35]}

See also

- List of Atari Lynx games
- History of Atari

References

1. "Toys R Us weekly ad" (<https://news.google.com/newspapers?nid=373&dat=19901205&id=ek1OAAAIBAJ&pg=2470,1037511>). *The Catoosa County News*. December 5, 1990. Retrieved June 17, 2014.
2. Bossom, Andy (July 6, 2017). *Video Games: An Introduction to the Industry*. Bloomsbury. p. 28. ISBN 978-1-4742-5542-4. OCLC 992448568 (<https://search.worldcat.org/oclc/992448568>).
3. Jermaine, John (November 1989). "Lynx, an interview with the men behind the machine" (<http://web.archive.org/web/20140916114505/http://ataritimes.com/index.php?ArticleIDX=370>). *Electronic Gaming Monthly*. United States: Sendai Publications. Archived from the original (<http://ataritimes.com/index.php?ArticleIDX=370>) on September 16, 2014. Retrieved June 17, 2014.
4. Jacobs, Steven. "Third Time's a Charm (They Hope)" (http://archive.wired.com/wired/archive/2.01/3do_pr.html). *Wired*. United States: Conde Nast. Retrieved June 17, 2014.
5. Latimer, Peter (July 2005). "Atari Lynx" (https://archive.org/stream/retro_gamer/RetroGamer_018#page/n21/mode/2up). *Retro Gamer*. No. 4. pp. 24–31. ISSN 1742-3155 (<https://search.worldcat.org/issn/1742-3155>).
6. Maher, Jimmy (December 22, 2016). "A Time of Endings, Part 2: Epyx" (<http://www.filfre.net/2016/12/a-time-of-endings-part-2-epyx/>). *The Digital Antiquarian*.
7. Latimer, Peter (July 2005). "Atari Lynx" (https://archive.org/stream/retro_gamer/RetroGamer_018#page/n21/mode/2up). *Retro Gamer*. Vol. 2, no. 6. pp. 24–31. ISSN 1742-3155 (<https://search.worldcat.org/issn/1742-3155>).
8. "Atari Lynx programming tutorial series" (<http://atarilynxdeveloper.wordpress.com/>). *Diary of an Atari Lynx developer*. Retrieved June 18, 2014.
9. "Lynx Hardware Overview" (<http://www.monlynx.de/lynx/lynxdoc.html>). Epyx. 1987. Retrieved June 18, 2014.
10. "Retrospection: Atari Lynx" (https://web.archive.org/web/20130205052828/http://www.nowgamer.com/features/894712/retrospection_atari_lynx.html). NOW Gamer. January 22, 2009. Archived from the original (http://www.nowgamer.com/features/894712/retrospection_atari_lynx.html) on February 5, 2013. Retrieved June 18, 2014.
11. "Todd's Adventures in Slime World". *Retro Gamer Magazine*. No. 164. p. 74.
12. "New games make big splash" (<https://news.google.com/newspapers?nid=1908&dat=19900603&id=yugfAAAAIBAJ&pg=2239,4378537>). *The Nevada Daily Mail*. Vernon County, Missouri. Associated Press. June 3, 1990. Retrieved June 17, 2014.
13. Catalina Ortiz (January 4, 1991). "Sega Woos Game Boy, Lynx Users With 32-Color, Hand-Held Video System" (<https://apnews.com/a1288531efff2f9504f70dbcd9f8b6cc>) (Press release). Associated Press. Retrieved November 7, 2013.

14. "Raze Magazine" (<https://archive.org/details/raze-magazine-11>). *Raze Magazine*. No. 11. September 1991. p. 6.
15. Steven Kent (January 5, 1995). "Virtual Fun - Nintendo Adds A New Dimension To Games" (<https://archive.seattletimes.com/archive/19950105/2097913/virtual-fun>). *Seattle Times*. Retrieved November 7, 2013.
16. Atari Lynx (http://www.atariage.com/system_labels.php?SystemID=LYNX) cartridge style illustrations at AtariAge.com.
17. "Atari Lynx History" (<https://atariage.com/Lynx/index.php>). *Atari Age*. Retrieved October 11, 2020.
18. "The Life and Death of Atari". *GamePro*. No. 92. IDG. May 1996. p. 20.
19. "Atari and JT Storage Reorganisation Plan" (<https://web.archive.org/web/20061209123854/http://contracts.onecle.com/atari/jt.mer.1996.04.08.shtml>). One Cle. Archived from the original (<http://contracts.onecle.com/atari/jt.mer.1996.04.08.shtml>) on December 9, 2006. Retrieved November 25, 2006.
20. "Video Game Timeline". *Electronic Gaming Monthly*. No. 102. Ziff Davis. January 1998. p. 137.
21. "Atari Lynx FAQ" (<https://atariage.com/Lynx/faq/index.html>). *AtariAge*. atariage.com. Retrieved October 24, 2014.
22. "Nintendo's island state of a stand at the Consumer Electronics Show in Chicago couldn't stop Atari stealing the limelight with their amazing hand-held video game machine" (https://archive.org/stream/ace-magazine-23/ACE_Issue_23_1989_Aug#page/n25). *ACE Magazine*. August 1989. p. 26. Retrieved August 11, 2018 – via archive.org.
23. "News Bits" (https://archive.org/details/GamePro_Issue_105_Volume_09_Number_06_1997-06_IDG_Publishing_US/page/n21/mode/2up). *GamePro*. No. 105. IDG. June 1997. p. 20.
24. Johnston, Chris (April 28, 2000). "Atari goes to Hasbro" (<https://www.gamespot.com/articles/atari-goes-to-hasbro/1100-2462915/>). *GameSpot*.
25. "Infogrames to Acquire Hasbro Interactive" (<https://web.archive.org/web/20011119190727/http://pc.ign.com/news/28701.html>). *IGN*. December 6, 2000. Archived from the original (<http://pc.ign.com/news/28701.html>) on November 19, 2001. Retrieved September 30, 2019.
26. "Hasbro Releases Jaguar Publishing Rights" (<http://www.atariage.com/Jaguar/archives/HasbroRights.html>). Hasbro Interactive. Retrieved May 14, 2008. "Beverly, MA (May 14, 1999) – Leading entertainment software publisher, Hasbro Interactive announced today it has released all rights that it may have to the vintage Atari hardware platform, the Jaguar."
27. "Retro Isle - Atari Lynx" (<http://www.retroisle.com/atari/lynx/general.php>). *www.retroisle.com*. Retrieved September 9, 2018.
28. "LYNX: T-Tris" (https://atariage.com/software_page.php?SoftwareID=2404).
29. Duranik. "Duranik" (<https://web.archive.org/web/20150213085905/http://www.duranik.com/>). Archived from the original (<http://www.duranik.com/>) on February 13, 2015. Retrieved February 13, 2015.
30. Cobb, Brandon. "Zaku - www.zaku-lynx.com" (<https://web.archive.org/web/20170515010348/http://www.zaku-lynx.com/>). Archived from the original (<http://www.zaku-lynx.com/>) on May 15, 2017. Retrieved February 13, 2015.
31. "CES '08: Nintendo wins second Emmy" (<http://www.gamespot.com/news/6184421.html>). *GameSpot*. January 8, 2008. Retrieved May 9, 2014.
32. "Atari 50: the Anniversary Celebration" (<https://atari.com/products/atari-50th-the-anniversary-celebration>). *Atari*. Retrieved January 23, 2024.
33. "The Lynx Collection on Steam" (https://store.steampowered.com/bundle/29505/The_Lynx_Collection/). *store.steampowered.com*. Retrieved May 25, 2025.
34. "Atari Lynx Games: Collection 2" (<https://web.archive.org/web/20240705194456/https://evercade.co.uk/cartridges/atari-lynx-collection-2-cartridge/>). *Evercade*. Archived from the original (<https://evercade.co.uk/cartridges/atari-lynx-collection-2-cartridge/>) on July 5, 2024. Retrieved May 25, 2025.

35. "Atari Lynx Games: Collection 1" (<https://web.archive.org/web/20240705194324/https://evercade.co.uk/cartridges/atari-lynx-collection-1-cartridge/>). *Evercade*. Archived from the original (<https://evercade.co.uk/cartridges/atari-lynx-collection-1-cartridge/>) on July 5, 2024. Retrieved May 25, 2025.

External links

- [AtariAge – Comprehensive Lynx Database and information \(https://www.atariage.com/software_search.php?SystemID=LYNX\)](https://www.atariage.com/software_search.php?SystemID=LYNX)
 - [Guide to Atari Lynx games at Retro Video Gamer \(http://www.retrovideogamer.co.uk/index.php?page=atarilynx\)](http://www.retrovideogamer.co.uk/index.php?page=atarilynx)
 - [Too Powerful for Its Own Good, Atari's Lynx Remains a Favorite 25 Years Later \(http://www.usgamer.net/articles/too-good-for-its-day-ataris-lynx-remains-a-fan-favorite-25-years-later\)](http://www.usgamer.net/articles/too-good-for-its-day-ataris-lynx-remains-a-fan-favorite-25-years-later)
 - [Atari Lynx review, 1990 \(http://st-news.com/issues/st-news-volume-5-issue-1/reviews/the-atari-lynx/\)](http://st-news.com/issues/st-news-volume-5-issue-1/reviews/the-atari-lynx/)
 - [Atari Lynx Hardware Documentation \(https://www.monlynx.de/lynx/lynxdoc.html\)](https://www.monlynx.de/lynx/lynxdoc.html)
 - [Atari Lynx Development Wiki \(https://atarilynxdev.net/doku.php/start\)](https://atarilynxdev.net/doku.php/start)
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Game Boy Color

The **Game Boy Color**^[a] (abbreviated as **GBC**) is an 8-bit handheld game console developed by Nintendo. It was released in Japan on October 21, 1998, and in international markets the following month. Compared with the original Game Boy, the Game Boy Color features a color TFT screen instead of monochrome, a CPU running at up to twice the speed, and four times as much memory. It is backward compatible with games developed for its predecessor. The Game Boy Color was released during the fifth generation of video game consoles and competed with the WonderSwan and Neo Geo Pocket, and Genesis Nomad.

The handheld is slightly thicker, taller and has a smaller screen than its immediate predecessor, the Game Boy Pocket, but is significantly smaller than the original Game Boy. As with its predecessors, the Game Boy Color has a custom 8-bit processor made by Sharp. The American English spelling of the system's name, *Game Boy Color*, remains consistent throughout the world.

The Game Boy Color received positive reviews upon release, and was praised for its backwards compatibility with games from its predecessor. It had a relatively brief lifespan, being succeeded by the Game Boy Advance after less than three years on the market. The Game Boy and the Game Boy Color combined have sold 118.69 million units worldwide, making them the fourth best-selling system of all time. Its best-selling games are *Pokémon Gold* and *Silver* (1999), which shipped 23 million units worldwide.

History

The original Game Boy was first introduced in 1989. The device was a monochrome handheld, and one of its competitors, the Atari Lynx, featured a color screen. While the Lynx's color display was visually impressive, it was criticized for its bulky size and

Game Boy Color

GAME BOY™
COLOR



Game Boy Color with Atomic Purple case

Developer	<u>Nintendo Research & Engineering</u>
Manufacturer	<u>Nintendo</u>
Product family	<u>Game Boy</u>
Type	<u>Handheld game console</u>
Generation	<u>Fifth</u>
Released	October 21, 1998
Introductory price	US\$79.95 (equivalent to \$160 in 2025)
Discontinued	March 31, 2003
Units sold	118.69 million (including all Game Boy variants)
Media	<u>Game Boy Color Game Pak</u> <u>Game Boy Game Pak</u>
System on a chip	<u>Nintendo CPU CGB</u>
CPU	<u>Sharp SM83 @ 4.2 / 8.4 MHz</u>

poor battery life. The Game Boy, in contrast, offered superior portability and longevity, propelling it to immense popularity.^{[2][3]} Publicly, Nintendo pledged to develop a color Game Boy, but only when technology limitations could be addressed.^[4]

Internally, a team led by Satoru Okada, who played a key role in the original Game Boy's design, was experimenting with color displays. Their early-1990s prototype, codenamed "Project Atlantis," featured a color screen and a powerful 32-bit processor from Sharp. However, the team was not satisfied with the outcome and shelved further development.^{[5][6]}

Despite the lack of color, consumer interest in the Game Boy remained strong. In 1996, Nintendo released the slimmer Game Boy Pocket, and the launch of the Pokémon series that same year further boosted sales.^[4] However, developers were losing interest in creating new games for the aging platform.^[7]

Additional market pressure for Nintendo came in October 1997 when news broke about Bandai's new handheld, the WonderSwan. The project was led by Gunpei Yokoi, the engineer who led the development of the Game & Watch series and the original Game Boy. Yokoi had left Nintendo in 1996 following the commercial failure of his final project at the company, the Virtual Boy. His departure caused a stir, with investors dumping Nintendo stock, forcing a temporary halt on trading at the Tokyo Stock Exchange. Yokoi was killed in a roadside accident in 1997 before the WonderSwan's release.^[8]

Faced with mounting pressure, Okada revisited Project Atlantis. Prioritizing quickly bringing a device to market over processing power, he dropped the 32-bit chip in favor of a faster version of the existing Game Boy's 8-bit processor that would allow for a sooner launch and maintain compatibility with the existing library of Game Boy games.^[6]

The Game Boy Color was announced in March 1998 and released in Japan that October.^[9] It received an international rollout throughout November (amid the busy Christmas holiday shopping season), reaching North America on the 18th, Europe on the 23rd, and Australasia on the 27th. Launching at a price of US\$79.95 (equivalent to \$160 in 2025),^[10] the Game Boy Color ultimately outsold the WonderSwan, which went on sale in March 1999.^[11]

The Game Boy Color had a relatively short lifespan, being on the market for only two and a half years before being succeeded by the Game Boy Advance in 2001. The successor finally brought the 32-bit processing power envisioned in Project Atlantis. Despite the new system, the Game Boy Color remained in production, serving as a budget-friendly alternative.^[4] The last units were reportedly sold by March 2003.^[12]

Memory	32 KB <u>RAM</u> , 16 KB <u>Video RAM</u>
Display	Reflective <u>TFT LCD</u> 160 × 144 <u>px</u> , 44 × 40 mm (1.7 × 1.6 in)
Connectivity	<u>Infrared</u>
Online services	<u>JP: Mobile System GB</u>
Best-selling game	<u>Pokémon Gold and Silver</u> (23 million)
Backward compatibility	<u>Game Boy</u>
Predecessor	<u>Game Boy</u> ^[1]
Successor	<u>Game Boy Advance</u> ^[1]

Hardware

The Game Boy Color uses a custom system-on-a-chip (SoC) that integrates the CPU and other major components into a single package, designated the CPU CGB by Nintendo and manufactured by the Sharp Corporation. While the CPU CGB was a new design for the Game Boy Color, the technology was largely an evolution of the ten-year-old DMG-CPU SoC used in the original Game Boy.^[13]

Within the CPU CGB, the main processor is the same *Sharp SM83* that powered the original Game Boy.^[14] Derived from two other 8-bit processors: the Intel 8080 and the Zilog Z80, the SM83 features the seven 8-bit registers of the 8080—lacking the alternate registers of the Z80—but uses the Z80's programming syntax and additional bit manipulation instructions, along with new instructions optimized for operations specific to the hardware design.^{[15][16]}

While in the original Game Boy, the SM83 operated at a clock rate of 4.194304 megahertz (MHz), games can command the processor in the Game Boy Color to operate in "dual-speed mode," doubling its frequency to 8.388608 MHz. This allowed developers to achieve twice the processing power when creating games exclusively for the Game Boy Color, while maintaining backward compatibility with existing games.^{[17]:12}

The CPU CGB incorporates the *Picture Processing Unit*, a basic GPU that renders visuals using 16 kilobytes (KB) of Video RAM, twice as much as that of the original Game Boy.^{[17]:16} Games developed specifically for the Game Boy Color could fully utilize this additional memory, enabling enhanced effects and displaying up to 56 colors simultaneously from a palette of 32,768 colors.^{[17]:49} Programmers subsequently developed the "high color mode" technique, which involved rapidly switching color palettes to display over 2,000 colors at once. This feature was used in games such as *The Fish Files*, *The New Addams Family* and *Alone in the Dark: The New Nightmare*.^{[18][19]} When a Game Pak compatible with the original Game Boy is inserted, the additional video RAM is disabled.^{[17]:49}

The screen is a 2.3-inch (diagonal) thin-film transistor (TFT) color liquid-crystal display (LCD), measuring 44 millimeters (1.7 in) wide by 40 millimeters (1.6 in) high. The screen aspect ratio and resolution remain identical to the original Game Boy at 160 pixels wide by 144 pixels high in a 10:9 format. Like the original Game Boy and Game Boy Pocket before it and the Game Boy Advance after it, the screen is passively reflective, with a surface behind it that reflects ambient light back through the liquid crystal elements toward the viewer. Because there is no backlight, the device can be hard to use in dark environments.^{[20][21]}

Additionally, the SoC contains a 2 KB "bootstrap" ROM which is used to start up the device,^[22] 127 B of high RAM that can be accessed faster (similar to a CPU cache), and the *Audio Processing Unit*, a programmable sound generator with four channels: a pulse wave generation channel with



The Game Boy Color motherboard (annotated version)

frequency and volume variation, a second pulse wave generation channel with only volume variation, a wave channel that can reproduce a waveform, and a white noise channel with volume variation.^{[17]:79}^[23] The motherboard of the Game Boy Color contains a 32 KB "work" RAM chip, four times more than the original Game Boy.^{[17]:16}

The Game Boy Color features a D-pad (directional pad), four action buttons ('A', 'B', 'START', and 'SELECT'), and a sliding on-off switch on the right side of the device. Volume is adjusted by a potentiometer dial on the left side of the device. The left side also has a Game Link Cable port for connecting up to four Game Boy devices for multiplayer games or data transfer.^[24] The port used on the Game Boy Color is of a smaller design first introduced on the Game Boy Pocket and requires an adapter to link with the original Game Boy.^[25] The Game Boy Color also included a "high-speed" mode that allowed data to be transmitted up to 64 times faster over the Game Link Cable than on the original Game Boy.^{[17]:28} The Game Boy Color included an infrared communications port for wireless data transfer, but it was only supported by a small number of games and consequently was not included on the later Game Boy Advance line.^[23]

Technical specifications

Height	133.5 mm (5¼ in)
Width	78 mm (3⅛ in)
Depth	27.4 mm (1⅛ in)
Weight	138 g (4.9 oz)
Display	2.3-inch (diagonal) reflective <u>thin-film transistor</u> (TFT) color <u>liquid-crystal display</u> (LCD)
Screen size (playable)	43 mm × 39 mm (1¾ in × 1½ in) ^[26]
Resolution	160 (w) × 144 (h) pixels (10:9 aspect ratio)
Graphics	Maximum <u>sprites</u> : 40 total, 10 per line, 4 colors each (one transparent) Sprite size: 8 × 8 or 8 × 16 Tiles drawn: 512 (360~399 visible, others off-screen as a scrolling buffer)
Frame rate	59.727500569606 Hz ^[27]
Color support	32,768 colors, up to 56 simultaneously
System on a chip (SoC)	Nintendo CPU CGB
CPU	Sharp SM83 (custom <u>Intel 8080/Zilog Z80</u> hybrid, <u>8-bit</u>) @ 4.194304 or 8.388608 MHz
Memory	On SoC: 2 KB ROM, 127 B High RAM, 16 KB <u>Video RAM</u> , 128 B Audio RAM, 1.12KB object attribute RAM Internal: 32 KB <u>RAM</u> External: (in the game cartridge) up to 8 MB ROM, up to 128 KB RAM
Power	Consumption: 70–80 mA Internal: 2 × AA batteries ^[28] External: 0.6 W at 3 V DC from 2.35 mm × 0.75 mm <u>coaxial connector</u>
Battery life	Up to 10 hours ^[29]
Sound	Channels: 2 pulse wave, 1 wave, 1 noise Outputs: Built-in <u>mono</u> speaker, stereo <u>3.5mm headphone jack</u>
I/O	<u>Game Link Cable</u> (up to 512 <u>kbit/s</u> , between up to 4 devices) ^{[17]:28} <u>Game Boy Game Pak slot</u> <u>Infrared</u> (up to 9.5 <u>kbit/s</u> , ^{[17]:45} usable at distances less than 2 m (6 ft 7 in) and within 45°)
Controls	<u>Eight-way control pad</u> Four action buttons (A, B, START, SELECT) <u>Volume potentiometer</u> Power switch
References: ^{[30][31][17]:16}	

Model colors

Nintendo had seen success selling colored variations of the Play It Loud! Game Boy and the Game Boy Pocket, so the company released the Color in several case variations.^[4]

The logo for Game Boy Color spells out the word "COLOR" in the five original colors in which the unit was manufactured: Berry (C), Grape (O), Kiwi (L), Dandelion (O), and Teal (R). Another color released at the same time was "Atomic Purple", made of a translucent purple plastic. Other colors

were sold as limited editions or in specific countries.^[32]

Games

The Game Boy Color launched with an extensive game library, thanks to its ability to play original Game Boy titles. At launch, it featured three exclusive games: *Pocket Bomberman*, *Tetris DX* and *Wario Land II*.^[33] Over time, the system amassed more than 900 titles, in addition to the original Game Boy's catalog of over 1,000 games. In a promotional list of 296 Game Boy Color games, 100 were compatible with the original Game Boy.^[34]

Nintendo prohibited simple "colorized" re-releases of monochrome Game Boy titles, requiring developers to implement meaningful gameplay enhancements. These additions included new levels, characters, items, or mechanics that leveraged the system's color capabilities. To ensure these enhancements were significant, Nintendo mandated that they be easily recognizable to players familiar with the monochrome version.^{[17]:6} Many of these enhanced versions, often called "Deluxe" or "DX", became some of the Game Boy Color's most popular titles, including *Tetris DX* and *The Legend of Zelda: Link's Awakening DX*.

The Game Boy Color's improved display and enhanced processing power also enabled more faithful ports of NES games, in contrast to the heavily modified versions created for the original Game Boy due to its monochrome display limitations. One of the most notable examples is *Super Mario Bros. Deluxe*, which showcased the Game Boy Color's ability to deliver an authentic port of the NES classic.^[35]

Tetris for the original Game Boy is the best-selling game compatible with Game Boy Color,^{[36][37]} *Pokémon Gold* and *Silver* are the best-selling games developed primarily for it, and *Pokémon Crystal* was the best-selling Game Boy Color exclusive title.^{[38][39]}

The last Game Boy Color game ever released is the Japanese exclusive *Doraemon no Study Boy: Kanji Yomikaki Master*, on July 18, 2003. The last game released in North America is *Harry Potter and the Chamber of Secrets* on November 15, 2002,^[40] while Europe's was *Hamtaro: Ham-Hams Unite!* released on January 10, 2003.^[4]

Beyond the platform's official titles, as of 2025, an active online community continues to create new titles for the Game Boy and Game Boy Color through tools like GB Studio, a free and user-friendly game-building engine that simplifies the process compared to manual coding.^[41] GB Studio has been used by professional game studios like *Krool Toys*, who created the promotional title *Grimace's Birthday* for *McDonald's* in 2023.^[42]

Cartridges

Games are stored on cartridges called *Game Boy Game Paks*, using *read-only memory* (ROM) chips. Due to the limitations of the 8-bit architecture of the device, the maximum ROM size the processor could access at any time was 32 KB. Nintendo overcame this limitation with a *Memory Bank Controller* (MBC) in the cartridge. This chip sits between the processor and the ROM and

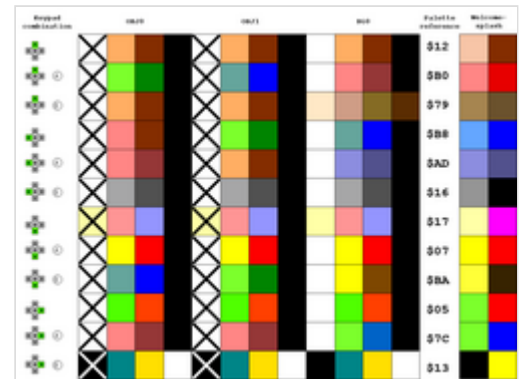


can switch between banks of 32 KB ROM. Using this technology, Nintendo created Game Boy Color games up to 8 megabytes in size. Game Paks can also provide additional functionality to the Game Boy system. Some cartridges include up to 128 KB of RAM to increase performance, which can be battery-backed to save progress when the handheld is off, real-time clock chips can keep track of time even when the device is off, and Rumble Pak cartridges added vibration feedback to enhance gameplay.^{[43][17]:299}



The Game Boy Color has backward compatibility with all original Game Boy games. Three main Game Pak cartridge types for the handheld were released:

- Original Game Boy Game Pak (gray case): The classic Game Boy cartridges. The Game Boy Color applies a limited color palette (often dark green) using four to ten colors to enhance games originally intended to be presented in four shades of gray.^[44] The Game Boy Color's "bootstrap" ROM was programmed with default color palettes for more than 90 titles, mainly first-party releases and popular games from other publishers.^[45] For games without a default, users can choose from 12 different palettes, including one which replicates the original Game Boy's grayscale experience, by pressing down a combination of buttons at startup.
- Color enhanced Game Boy Game Pak (black case): These cartridges can use the full-color capabilities of the console (56 colors simultaneously out of a palette of 32,768) while remaining compatible with the original Game Boy where they are presented in four shades of gray. This compatibility comes at the expense of not being able to utilize the Game Boy Color's increased processing speed and memory.^[4]
- Game Boy Color Game Pak (clear case): Designed specifically for the Game Boy Color, these cartridges feature the full-color range (56 colors simultaneously out of a palette of 32,768) and benefit from the increased processing speed and memory of the Game Boy Color.^[4] Because of this reliance on newer hardware, these games are incompatible with the older monochrome Game Boy models.^[46]



Samples of the color palettes and the key combinations to select them on an original Game Pak

Accessories

Nintendo released several add-ons for the Game Boy Color, including:

- Game Boy Camera:** A cartridge-based digital camera that captures low-resolution black-and-white images and includes built-in minigames where players use their faces as avatars.^[29]
- Game Boy Printer:** A thermal printer that produces hard copies of Game Boy Camera images and supports printing content from games such as *Super Mario Bros. Deluxe*, *Donkey Kong Country*, and *Pokémon* versions *Yellow*, *Gold*, *Silver*, and *Crystal*. Connects via a Game Link Cable.
- Game Link Cable:** Enables multiplayer gaming and data transfers between Game Boy systems, notably used in the *Pokémon* series
- Mobile Adapter GB:** Connects the console to a mobile phone, utilizing its cellular network for online interactions via the Mobile System GB service, most notably for *Pokémon Crystal*.

Limited game support and high costs led to low adoption. The service ended on December 18, 2002, and it was never released outside Japan due to wireless incompatibilities.

Reception

Sales

The Game Boy and Game Boy Color were both commercially successful, selling 118.69 million units worldwide: 32.47 million in Japan, 44.06 million in the Americas, and 42.16 million in all other regions.^{[12][47]} At the time of its discontinuation in 2003, the combined sales of all Game Boy variants made it the best-selling game console of all time. In later years, its sales were surpassed by the Nintendo DS, PlayStation 2 and Nintendo Switch, making it the fourth-best-selling console the second-best-selling handheld of all time, as of 2024. Sales of the device were in part driven by the success of *Pokémon Gold and Silver* and *Pokémon Crystal*, with combined sales of 29.5 million units, making them one of the best selling-video games of all time.^{[48][49]}

Sales of the Game Boy Color were strong at launch. Nintendo of America reported a sale of one million units from launch to December 1998,^[50] and two million by July 1999.^[51] Retail chains in the United States reported unexpectedly high demand for the console, with executives of FuncoLand reporting "very pleasant and unpredicted" sales and Electronics Boutique stating "the entire Game Boy Color line just exploded, including accessories" upon release.^[52] Faced with high worldwide demand and competitive retail pricing, retailers such as CompUSA sold out of Game Boy Color stock in the weeks before the 1998 Christmas season.^[50]

Critical reception

Reception of the Game Boy Color was positive, with critics praising the addition of color and improved clarity of the display.

Affiliated publications such as *Total Games* praised the handheld for its "bright, colorful picture that can be viewed in direct light", backward compatibility features preserving the "vast catalogue of original Game Boy games", and improved technical performance.^[20] *Computer and Video Games* praised the Game Boy Color for making the Game Boy library of games "look better than ever – everything is crystal clear, bright and in [color]".^[53] Writing for *GameSpot*, Chris Johnston stated that the display was "crystal clear" and free of motion blur, stating that *Tetris DX* was the "killer app" of the launch titles on the platform.^[54]

Milder reviews included those by *Arcade*, who said that while that the colors were "very impressive" they were "not as eyeball-popping as you might have hoped for [...] it's mostly seaweed greens, rusty browns, timid yellows and the like". They concluded that "nothing about [the Game Boy Color] is very radical" but said the device was "Game Boy as it always should have been".^[55] Reviewers pointed out other drawbacks including that the system was still using an 8-bit architecture when competitors had moved onto 16-bit handheld systems and that the non-backlit screen required that the user be in a well lit area.^{[56][21]}

Legacy

Commentary on the legacy of the Game Boy Color has been shaped by the perception that the handheld was as an incremental and transitional upgrade of the Game Boy rather than a completely new device.^{[57][58]} Author Jeff Ryan noted the Game Boy Color had a reputation as a "legacy machine" that found success mostly due to its backward compatibility, as "few wanted to lose all the *Dr. Mario* and *Pokémon* cartridges they had amassed over the years."^[59] Quoted in *Retro Gamer*, Blitz Games Studios developer Bob Pape acknowledged that although "backwards compatibility more or less defined (the) Game Boy Color", the handheld "ticked all the right boxes with regards to size, battery life, reliability and most importantly backwards compatibility".^[58]

Positive assessments of the legacy of the Game Boy Color have focused on the merits of its game library, particularly for its third-party and import titles. Travis Fahs of *IGN* noted while "the Game Boy Color's life was relatively brief", it "built up a small library of excellent games", including *Wario Land 3* and *Pokémon Gold and Silver*, and a "unique" and "previously unheard of" line of successful third-party games, including *Dragon Warrior Monsters*, *Metal Gear Solid* and *Yu-Gi-Oh! Dark Duel Stories*.^[57] Ashley Day of *Retro Gamer* noted that the handheld had an "overlooked" status, stating "the Game Boy Color (has) an unfair reputation as the one Nintendo handheld with few worthwhile titles, but this simply isn't the case...returning to the Game Boy Color now reveals a wealth of great games that you never knew existed, especially those available on import."^[60]

See also

- [List of Game Boy accessories](#)

Notes

- a. Japanese: ゲームボーイカラー

References

- Umezu; Sugino; Konno. "Nintendo 3DS (Volume 2 – Nintendo 3DS Hardware Concept)" (<http://web.archive.org/web/20120329190132/http://iwataasks.nintendo.com/interviews/#/3ds/how-nintendo-3ds-made/1/0>). *Iwata Asks* (Interview: Transcript). Interviewed by Satoru Iwata. Nintendo. Archived from the original (<http://iwataasks.nintendo.com/interviews/#/3ds/how-nintendo-3ds-made/1/0>) on March 29, 2012. Retrieved March 7, 2011.
- McFarren, Damien (2016). *Videogames Hardware Handbook*. Vol. 1 (2nd ed.). Bournemouth: Imagine Publishing. pp. 157–163. ISBN 978-1-78546-239-9.
- Ryan, Jeff (2011). *Super Mario: How Nintendo Conquered America*. New York: Portfolio Penguin. pp. 102–105. ISBN 978-1-59184-405-1.
- Day, Ashley (2016). *Videogames Hardware Handbook*. Vol. 1 (2nd ed.). Bournemouth: Imagine Publishing. pp. 236–239. ISBN 978-1-78546-239-9.
- "Satoru Okada – Interview" (https://web.archive.org/web/20000529053545/https://www.nintendo.co.jp/nom/9902/b_box/staff/index.html). *Nintendo*. Archived from the original (https://www.nintendo.co.jp/nom/9902/b_box/staff/index.html) on May 29, 2000. Retrieved January 15, 2019.
- Kurokawa, Fumio (2022). "Satoru Okada – 2022 Retrospective Interview" (<https://shmuplations.com/okada2022/>). *4gamer.net*. Retrieved April 8, 2024.

7. "Nintendo's Next Generation Handheld". *Next Generation*. No. 41. Imagine Media. May 1998. p. 22.
8. McFerran, Damien (2016). *Videogames Hardware Handbook* (2nd ed.). Bournemouth: Imagine Publishing. p. 235. ISBN 978-1-78546-239-9.
9. "Game Boy Color hardware" (<https://www.nintendo.co.jp/n02/dmg/hardware/color/>). *Nintendo*. Archived (<https://web.archive.org/web/20220525051241/https://www.nintendo.co.jp/n02/dmg/hardware/color/>) from the original on May 25, 2022. Retrieved July 24, 2016.
10. "Introducing Game Boy Color". *Nintendo Power*. Nintendo. November 1998. p. 85.
11. "Fun in the Palm of Your Hand" (http://docs.newsbank.com/openurl?ctx_ver=z39.88-2004&rft_id=info:sid/iw.newsbank.com:AWNB:ORLB&rft_val_format=info:ofi/fmt:kev:mtx:ctx&rft_dat=0EB4F474A0E83D50&svc_dat=InfoWeb:aggregated5&req_dat=0ECC86DE7A4704AD). *The Orlando Sentinel*. Associated Press. October 9, 1998. Retrieved May 24, 2014 – via Newsbank.
12. "Consolidated Sales Transition by Region" (https://web.archive.org/web/20161011145332/https://www.nintendo.co.jp/ir/library/historical_data/pdf/consolidated_sales_e1603.pdf) (PDF). Nintendo. April 26, 2016. Archived from the original (https://www.nintendo.co.jp/ir/library/historical_data/pdf/consolidated_sales_e1603.pdf) (PDF) on October 11, 2016. Retrieved October 23, 2016.
13. Copetti, Rodrigo (February 21, 2019). *Game Boy / Color Architecture - A Practical Analysis* (<https://www.copetti.org/writings/consoles/game-boy/>). ASIN B0B7KD7XZF (<https://www.amazon.com/dp/B0B7KD7XZF>).
14. Javanainen, Joonas (April 23, 2024). "Game Boy: Complete Technical Reference" (<https://gekkio.fi/files/gb-docs/gbctr.pdf>) (PDF). *gekkio.fi*.
15. "The Nintendo Game Boy, Part 1: The Intel 8080 and the Zilog Z80" (<https://realboyemulator.wordpress.com/2013/01/01/the-nintendo-game-boy-1/>). RealBoy. January 2, 2013. Archived (<https://web.archive.org/web/20220510190547/https://realboyemulator.wordpress.com/2013/01/01/the-nintendo-game-boy-1/>) from the original on May 10, 2022. Retrieved August 29, 2017.
16. "CPU Comparison with Z80" (https://gbdev.io/pandocs/CPU_Comparison_with_Z80). *Pan Docs*. Retrieved April 29, 2024.
17. *Game Boy Programming Manual* (<https://archive.org/details/GameBoyProgManVer1.1>). Nintendo. December 3, 1999. Retrieved November 21, 2024 – via Internet Archive.
18. "First Alone in the Dark Screenshots for Game Boy Color" (<http://www.ign.com/articles/2000/08/05/first-alone-in-the-dark-screenshots-for-game-boy-color>). *IGN*. August 4, 2000. Archived (<https://web.archive.org/web/20150403134639/http://www.ign.com/articles/2000/08/05/first-alone-in-the-dark-screenshots-for-game-boy-color>) from the original on April 3, 2015. Retrieved March 24, 2015.
19. "Graphic Adventures on Game Boy Color" (<https://www.ign.com/articles/2001/10/19/graphic-adventures-on-game-boy-color>). *IGN*. October 19, 2001. Retrieved September 19, 2024.
20. "Introducing The Game Boy Color" (https://archive.org/details/Total_Game_Boy_Issue_01/page/n3/mode/2up?q=%22game+boy+color%22). *Total Games Guide to Game Boy Color*. Bournemouth: Paragon Publishing. 1998. pp. 6–9.
21. Pavlacka, Adam (November 16, 1998). "Game Boy Now Offers Play in Color" (<https://infoweb.newsbank.com/apps/news/document-view?p=AWNB&docref=news/0EB1EEF4B4749A56>). *The Beacon News (Aurora, IL)*. p. C1. Retrieved May 22, 2024 – via NewsBank.
22. GameBoy Development Wiki (November 12, 2009). "Gameboy Bootstrap ROM" (http://gbdev.gg8.se/wiki/index.php?title=Gameboy_Bootstrap_ROM&oldid=192). Archived (https://web.archive.org/web/20100818180456/http://gbdev.gg8.se/wiki/index.php?title=Gameboy_Bootstrap_ROM&oldid=192) from the original on August 18, 2010. Retrieved October 24, 2010.
23. "Game Boy Advance Service Manual" (https://drive.google.com/file/d/1IpKe2BRdcZLUURvhrvxnlEMZf3MEI6tc/view?usp=embed_facebook) (2nd ed.). Nintendo. p. 3. Retrieved May 27, 2024.

24. Masuyama, Meguro (2002). "Pokémon as Japanese Culture?". In Lucien King (ed.). *Game On*. New York, NY: Universe Publishing. p. 39. ISBN 0-7893-0778-2. "Pokémon allowed more than metaphorical communication; it made use of a system that created actual communication — a network game."
25. "Link Cable Adapter" (<https://www.nintendo.com/en-gb/Support/Game-Boy-Pocket-Color/Accessories/Link-cable-adapter/Link-cable-adapter-619614.html>). *Nintendo of Europe*. Retrieved May 11, 2024.
26. "Game Boy Versions" (<https://www.retrorgb.com/gbversions.html>). *RetroRGB*. Retrieved May 6, 2024.
27. "Platform Framerates" (<https://tasvideos.org/PlatformFramerates.html>). *TASVideos*. Archived (<https://web.archive.org/web/20200229184750/http://tasvideos.org/PlatformFramerates.html>) from the original on February 29, 2020. Retrieved February 29, 2020.
28. "Adding Color to Game Boy". *Electronic Gaming Monthly*. No. 106. Ziff Davis. May 1998. p. 26.
29. "Nintendo Adds Color". *Electronic Gaming Monthly*. No. 107. Ziff Davis. June 1998. p. 26.
30. "Nintendo Game Boy Color Console Information – Console Database" (<https://web.archive.org/web/20110702131325/http://www.consoledatabase.com/consoleinfo/nintendogameboycolor/>). ConsoleDatabase.com. Archived from the original (<http://www.consoledatabase.com/consoleinfo/nintendogameboycolor/>) on July 2, 2011. Retrieved February 19, 2011.
31. "Technical data" (<https://www.nintendo.co.uk/Support/Game-Boy-Pocket-Color/Product-information/Technical-data/Technical-data-619585.html>). *Nintendo of Europe GmbH*. Archived (<https://web.archive.org/web/20230207100304/https://www.nintendo.co.uk/Support/Game-Boy-Pocket-Color/Product-information/Technical-data/Technical-data-619585.html>) from the original on February 7, 2023. Retrieved May 24, 2017.
32. "Game Boy Color" (https://web.archive.org/web/20011214000944/http://www.nintendo.com/systems/gbc/gbc_overview.jsp). *Nintendo*. Archived from the original (http://www.nintendo.com/systems/gbc/gbc_overview.jsp) on December 14, 2001. Retrieved May 2, 2024.
33. Duncan, Andrew (April 21, 2019). "Game Boy Launch Titles" (<https://www.gamegrin.com/article/s/game-boy-launch-titles/>). *GameGrin*. Retrieved May 21, 2024.
34. "Game List – Released Titles" (<https://web.archive.org/web/20010119180900/http://www.gameboy.com/gamelist.html>). *GameBoy.com*. Nintendo of America. January 19, 2001. Archived from the original (<http://www.gameboy.com:80/gamelist.html>) on January 19, 2001. Retrieved August 20, 2018.
35. Davis, Cameron (January 28, 2000). "Super Mario DX Review" (<https://www.gamespot.com/reviews/super-mario-dx-review/1900-2536190/>). *GameSpot*. Archived (<https://web.archive.org/web/20240118181620/https://www.gamespot.com/reviews/super-mario-dx-review/1900-2536190/>) from the original on January 18, 2024. Retrieved March 18, 2024.
36. Saltzman, Marc (June 12, 2009). "'Tetris' by the numbers" (<http://content.usatoday.com/communities/gamehunters/post/2009/06/68024593/1>). *USA Today*. Retrieved May 21, 2024.
37. Takahashi, Dean (June 1, 2009). "After 25 years, Tetris has sold 125 million copies" (<https://venturebeat.com/entrepreneur/after-25-years-tetris-has-sold-125-million-copies/>). *VentureBeat*. Archived (<https://web.archive.org/web/20230621144138/https://venturebeat.com/entrepreneur/after-25-years-tetris-has-sold-125-million-copies/>) from the original on June 21, 2023. Retrieved June 21, 2023.
38. "'Pokken Tournament' and Pokemon's \$1.5 Billion Brand" (http://www.huffingtonpost.com/gobankingratebuls/pokken-tournament-and-pok_b_9501260.html). *The Huffington Post*. AOL. March 19, 2017. Archived (https://web.archive.org/web/20200218180223/https://www.huffpost.com/entry/pokken-tournament-and-pok_b_9501260) from the original on February 18, 2020. Retrieved April 25, 2017.
39. Clement, Jessica (May 2024). "All-time best-selling Pokémon games 2024" (<https://www.statista.com/statistics/1072224/pokemon-unit-sales-worldwide/>). *Statista*. Retrieved May 21, 2024.
40. Buday, John (January 9, 2023). "The Last Game Boy Color Game Released In North America Was Tied To A Blockbuster Film" (<https://www.svg.com/1160776/the-last-game-boy-color-game-released-in-north-america-was-tied-to-a-blockbuster-film/>). *SVG*. Retrieved May 27, 2024.

41. McGlynn, Anthony (May 2, 2021). "Why are game-makers creating new Game Boy games in 2021?" (<https://arstechnica.com/gaming/2021/05/meet-the-developers-making-og-game-boy-games-in-2021/>). *Ars Technica*. Retrieved March 24, 2025.
42. Liszewski, Andrew (June 13, 2023). "McDonald's Serves Up a Brand New Game Boy Color Game in the Year 2023" (<https://gizmodo.com/mcdonald-nintendo-game-boy-color-game-grimace-birthday-1850534966>). *Gizmodo*. Retrieved June 10, 2025.
43. Byers, Brendan. "Exploring the Gameboy Memory Bank Controller" (<https://b13rg.github.io/Gameboy-MBC-Analysis/>). *Brendan's Website*. Retrieved April 29, 2024.
44. "Changing the Color Palette on Game Boy Advance Systems" (<https://www.nintendo.com/consumer/systems/gameboyadvance/colorchange.jsp>). *Customer Service*. Nintendo. Archived (<https://web.archive.org/web/20090113001631/http://www.nintendo.com/consumer/systems/gameboyadvance/colorchange.jsp>) from the original on January 13, 2009. Retrieved January 4, 2009.
45. Carroll, Martyn (2023). *The Handheld Gaming Collection* (1 ed.). Bath, UK: Future Publishing. p. 83.
46. "Game Pak Troubleshooting – All Game Boy Systems" (http://www.nintendo.com/consumer/systems/gameboy/trouble_game.jsp). Nintendo of America. Archived (https://web.archive.org/web/20170928055842/http://www.nintendo.com/consumer/systems/gameboy/trouble_game.jsp) from the original on September 28, 2017. Retrieved September 27, 2017.
47. "A Brief History of Game Console Warfare: Game Boy" (https://web.archive.org/web/20070509094404/http://images.businessweek.com/ss/06/10/game_consoles/source/7.htm). *BusinessWeek*. McGraw-Hill. Archived from the original (http://images.businessweek.com/ss/06/10/game_consoles/source/7.htm) on May 9, 2007. Retrieved March 28, 2008.
48. "Japan Platinum Game Chart" (<https://web.archive.org/web/20071213230402/http://www.the-magicbox.com/topten2.htm>). The Magic Box. Archived from the original (<http://www.the-magicbox.com/topten2.htm>) on December 13, 2007. Retrieved September 27, 2007.
49. "US Platinum Videogame Chart" (<https://web.archive.org/web/20070421003854/http://www.the-magicbox.com/Chart-USPlatinum.shtml>). The Magic Box. Archived from the original (<http://www.the-magicbox.com/Chart-USPlatinum.shtml>) on April 21, 2007. Retrieved September 27, 2007.
50. "Game Boy Color Sales Exceed 1 Million During Holidays" (<https://archive.org/details/gaming-intelligence-february-1999>). *Gaming Intelligence*. February 1999. p. 4.
51. Dunne, Alex (July 1999). "Industry Watch" (https://archive.org/details/GDM_July_1999). *Game Developer Magazine*. p. 10.
52. Trainman, Steve (May 12, 1999). "Retailers Coming to E3 with High Expectations" (<https://archive.org/details/game-week-may-12-1999>). *Game Week*. Vol. 5, no. 17.
53. "Portable Colour Gaming Is Here!" (https://archive.org/details/Computer_and_Video_Games_Issue_205_1998-12_EMAP/Images_GB/page/n7/mode/2up?q=%22game+boy+color%22). *Computer and Video Games*. No. 205. December 1998.
54. Johnston, Chris (1998). "Hands On: Game Boy Color" (<https://www.gamespot.com/articles/hands-on-game-boy-color/1100-2465339/>). *GameSpot*. Archived (<https://web.archive.org/web/20190607230501/https://www.gamespot.com/articles/hands-on-game-boy-color/1100-2465339/>) from the original on June 7, 2019. Retrieved November 13, 2022.
55. "The Color Purple" (https://archive.org/details/Arcade_Issue_01_1998-12_Future_Publishing_GB/page/n61). *Arcade*. No. 1. December 1998. pp. 60–61.
56. Kapalka, Jeff (December 20, 1998). "A Gamer's Wish List" (<https://infoweb.newsbank.com/apps/news/document-view?p=AWNB&docref=news/0EEC8F80A6BD337E>). *Syracuse Herald American*. p. 16. Retrieved May 22, 2024 – via NewsBank.
57. Fahs, Travis (July 27, 2009). "IGN Presents the History of Game Boy" (<https://www.ign.com/articles/2009/07/27/ign-presents-the-history-of-game-boy>). *IGN*. Archived (<https://web.archive.org/web/20100528083411/http://retro.ign.com/articles/100/1007864p3.html>) from the original on May 28, 2010. Retrieved August 6, 2022.
58. Carroll, Martyn (December 2018). "Game Boy Color". *Retro Gamer*. No. 187. pp. 50–55.
59. Ryan, Jeff (September 25, 2012). *Super Mario: How Nintendo Conquered America*. Penguin Random House. p. 208. ISBN 978-1-59184-563-8.

60. Day, Ashley (May 2006). "Game Boy Color". *Retro Gamer*. No. 24. pp. 41–43.

External links

- Official website (<https://web.archive.org/web/20001012024759/http://gameboy.com/>) at the [Wayback Machine](#) (archived October 12, 2000)
 - Game Boy Color (Nintendo.com) (https://web.archive.org/web/20011214000944/http://www.nintendo.com/systems/gbc/gbc_overview.jsp) at the [Wayback Machine](#) (archived December 14, 2001)
 - List of Game Boy Color games (https://web.archive.org/web/20040212061705/http://www.nintendo.com/doc/cgb_games.pdf) at the [Wayback Machine](#) (archived February 12, 2004)
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