

= Sega CD =

The Sega CD , released as the Mega @-@ CD (Japanese : ??CD , Hepburn : Mega @-@ Sh? D?) in most regions outside North America and Brazil , is a CD @-@ ROM accessory for the Sega Genesis video game console designed and produced by Sega as part of the fourth generation of video game consoles . The add @-@ on was released on December 12 , 1991 in Japan , October 15 , 1992 in North America , and 1993 in Europe . The Sega CD lets the user play CD @-@ based games and adds extra hardware functionality , such as a faster central processing unit and graphic enhancements . It can also play audio CDs and CD + G discs .

Seeking to create an add @-@ on device for the Genesis , Sega developed the unit to read compact discs as its storage medium . The main benefit of CD technology was greater storage capacity , which allowed for games to be nearly 320 times larger than their Genesis cartridge counterparts . This benefit manifested in the form of full motion video (FMV) games like the controversial Night Trap , which became a focus of the 1993 Congressional hearings on issues of video game violence and ratings . Sega Enterprises partnered with JVC to design the add @-@ on and refused to consult with Sega of America until the project was completed . Sega of America assembled parts from various " dummy " units to obtain a working prototype . While the add @-@ on became known for several well @-@ received games such as Sonic the Hedgehog CD and Lunar : Eternal Blue , its game library contained a large number of Genesis ports and FMV titles . The Sega CD was redesigned a number of times , including once by Sega and several times by licensed third @-@ party developers .

2 @.@ 24 million Sega CD units were sold by March 1996 , after which the system was officially discontinued as Sega shifted its focus to the Sega Saturn . Retrospective reception to the add @-@ on is mixed , praising the Sega CD for its individual offerings and additions to the Genesis ' functions , but offering criticism to the game library for its depth issues , high price of the unit , and how the add @-@ on was supported by Sega .

= = History = =

= = = Background = = =

Released in 1988 , the Genesis (known as the Mega Drive in Europe and Japan) was Sega 's entry into the fourth generation of video game consoles .

= = = Development = = =

By the early 1990s , compact discs were making significant headway as a storage medium for music and video games . NEC had been the first to use compact disc technology in a video game console with their PC Engine CD @-@ ROM ² System add @-@ on in October 1988 in Japan (launched in North America as the TurboGrafx @-@ CD the following year) , which sold 80 @,@ 000 units in six months . That same year , Nintendo announced a partnership with Sony to develop its own CD @-@ ROM peripheral for the Super NES . Commodore International released their CD @-@ based CDTV multimedia system centered in early 1991 , while long @-@ in @-@ waiting CD @-@ i from Philips finally arrived towards the end of that year .

Shortly after the release of the Genesis , Sega 's Consumer Products Research and Development Labs led by manager Tomio Takami were tasked with creating a CD @-@ ROM add @-@ on for the system , which became the Sega CD . The Sega CD was originally intended to equal the capabilities of the TurboGrafx @-@ CD , but with twice as much random @-@ access memory (RAM) , and sell for about JP ¥ 20 @,@ 000 (or US \$ 150) . In addition to relatively short loading times , Takami 's team planned for the device to feature hardware scaling and rotation similar to that found in Sega 's arcade games , which required the use of a dedicated digital signal processor (DSP) . However , two changes made later in development contributed to the final unit 's higher than expected price .

Because the Genesis ' Motorola 68000 CPU was too slow to handle the Sega CD 's new graphical capabilities , an additional 68000 CPU was incorporated into the add @-@ on . In addition , upon hearing rumors that NEC planned a memory upgrade to the TurboGrafx @-@ CD , which would bring its available RAM from 0 @. @ 5 Mbit to between 2 and 4 Mbit , Sega decided to increase the Sega CD 's available RAM from 1 Mbit to 6 Mbit . This proved to be one of the greatest technical challenges during development since the Genesis ' access speed was initially too slow to run programs effectively . The cost of the device was now estimated at \$ 370 , but market research convinced Sega executives that consumers would be willing to pay more for a state @-@ of @-@ the @-@ art machine . Sega partnered with JVC , which had been working with Warner New Media to develop a CD player under the CD + G standard , to develop the Sega CD .

Up until the middle of 1991 , Sega of America had been kept largely uninformed of the details of the project , without a functioning unit to test (although Sega of America was provided with preliminary technical documents earlier in the year) . According to former Sega of America executive producer Michael Latham , " When you work at a multinational company , there are things that go well and there are things that don 't . They didn 't want to send us working Sega CD units . They wanted to send us dummies and not send us the working CD units until the last minute because they were concerned about what we would do with it and if it would leak out . It was very frustrating . " Even though they were not provided a functioning unit , Latham and Sega of America vice president of licensing Shinobu Toyoda put together a functioning Sega CD by acquiring a ROM for the system and installing it in a dummy unit . Further frustrating the Sega of America staff was the construction of the add @-@ on . " The Mega @-@ CD was designed with a cheap , consumer @-@ grade audio CD drive , not a CD @-@ ROM , " stated Scot Bayless , former Sega of America senior producer . " Quite late in the run @-@ up to launch , the quality assurance teams started running into severe problems with many of the units ? and when I say severe , I mean units literally bursting into flames . We worked around the clock , trying to catch the failure in @-@ progress , and after about a week we finally realized what was happening , " citing the need of game titles to utilize more time seeking data than the CD drive was designed to provide .

= = = Launch = = =

Sega announced the release of the Mega @-@ CD in Japan for late 1991 , and North America (as the Sega CD) in 1992 . It was unveiled to the public for the first time at the 1991 Tokyo Toy Show , to positive reception from critics . The Mega @-@ CD would go on to be released in Japan on December 12 , 1991 , initially retailing at JP ¥ 49 @, @ 800 . Though the unit sold quickly , the small install base of the Mega Drive in Japan meant that sales declined rapidly after launch . Within its first year in Japan , the Mega @-@ CD only sold 100 @, @ 000 units . Third @-@ party development of games for the new system suffered because Sega took a long amount of time to release software development kits . Other factors impacting sales included the high launch price of the Mega @-@ CD in Japan and only two titles being available at launch .

On October 15 , 1992 , the Sega CD was released in North America , with a retail price of US \$ 299 . Advertising for the add @-@ on included one of Sega 's slogans , " Welcome to the Next Level " . Though only 50 @, @ 000 units were available at launch due to production issues , the add @-@ on sold over 200 @, @ 000 units by the end of 1992 . As part of Sega 's sales , Blockbuster LLC purchased Sega CD units for rental in their stores . The Mega @-@ CD was launched in Europe in the spring of 1993 , at a price of GB £ 270 . Only 70 @, @ 000 units were initially available in the United Kingdom , but 60 @, @ 000 units were sold by August 1993 . Emphasized by Sega of America , the benefits of the Sega CD 's additional storage space allowed for a large amount of full motion video (FMV) games to be published for the add @-@ on , with Digital Pictures becoming an important partner for Sega . After the initial competition between Sega and Nintendo to develop a CD @-@ based add @-@ on , Nintendo eventually canceled the development process of its own competing peripheral after having partnered with Sony and then with Philips to develop one .

Sega would go on to release the add @-@ on 's second model , the Sega CD 2 (Mega @-@ CD 2) , on April 23 , 1993 in Japan at a price of JP ¥ 29 @, @ 800 , It was released in North America

several months later at the reduced retail price of US \$ 229 , with one of the system 's best @-@ selling games , Sewer Shark , as a pack @-@ in . Designed to bring down the manufacturing costs of the Sega CD , the newer model is smaller and does not contain the motorized disc tray used in the initial model . A limited number of games were also later developed that utilized both the Sega CD and the Sega 32X add @-@ ons , the latter of which was released in November 1994 .

= = = Night Trap controversy = = =

On December 9 , 1993 , the United States Congress began to hold hearings on video game violence and the marketing of violent video games to children . One of the games at the center of this controversy was the Sega CD 's Night Trap , a full @-@ motion video adventure game by Digital Pictures . Night Trap had been brought to the attention of United States Senator Joe Lieberman , who said of the game , " I looked at that game , too , and there was a classic . It ends with this attack scene on this woman in lingerie , in her bathroom . I know that the creator of the game said it was all meant to be a satire of Dracula ; but nonetheless , I thought it sent out the wrong message . " Lieberman 's research later went on to conclude that the average video game player at the time was between seven and twelve years old , and that video game publishers were marketing violence to children . Similar issues were brought up in the United Kingdom , with former Sega of Europe development director Mike Brogan noting that " Night Trap got Sega an awful lot of publicity Questions were even raised in the UK Parliament about its suitability . This came at a time when Sega was capitalizing on its image as an edgy company with attitude , and this only served to reinforce that image . " Although experiencing increased sales as a result of the hearings , Sega decided to recall Night Trap and re @-@ release it with revisions in 1994 . After the close of these hearings , video game manufacturers came together in 1994 to establish the rating system called for by Lieberman , eventually materializing in the form of the Entertainment Software Rating Board .

= = = Decline = = =

As time passed , the releases of new CD @-@ based consoles such as the 3DO Interactive Multiplayer rendered the Sega CD technically obsolete , reducing public interest in the add @-@ on . In late 1993 , less than a year after the system 's launches in North America and Europe , the gaming media reported that Sega of Japan was no longer accepting in @-@ house development proposals for the Mega CD . In early 1995 , Sega shifted its focus to the Sega Saturn and discontinued all advertising for Genesis hardware , including the Sega CD . The add @-@ on itself was officially no longer supported in 1996 . 2 @-@ 24 million Sega CD units were sold worldwide , including 400 @-@ 000 in Japan .

= = Technical specifications = =

The Sega CD can only be used in conjunction with a Genesis system , attaching through an expansion slot on the side of the main console . Though the Sega CD is an add @-@ on , it does require its own separate power supply . In addition to playing its own library of games in CD @-@ ROM format , the Sega CD can also play compact discs , karaoke CD + G discs , and can also be used in conjunction with the Sega 32X to play 32 @-@ bit games that utilize both add @-@ ons . The second model , also known as the Sega CD 2 , also includes a steel joining plate to be screwed into the bottom of the Genesis , as well as an extension spacer to work with the original model of the Genesis .

The main CPU of the Sega CD is a 12.5MHz 16 @-@ bit Motorola 68000 processor , which runs 5 MHz faster than the Genesis processor . It contains 1 Mbit of boot ROM , allocated for the CD game BIOS , CD player software , and compatibility with CD + G discs . 6 Mbit of RAM are allocated to data for programs , pictures , and sounds ; 512 Kbit to PCM waveform memory ; 128 Kbit to CD @-@ ROM data cache memory ; and an additional 64 Kbit are allocated as backup memory . Additional backup memory in the form of a 1 Mbit Backup RAM Cartridge was also available as a

separate purchase , released near the end of the system 's life . Audio is able to be supplied through the Ricoh RF5C164 , and two RCA pin jacks allow the Sega CD to output stereophonic sound separate from the Genesis . Combining stereo sound from a Genesis to either version of the Sega CD requires a cable between the Genesis 's headphone jack and an input jack on the back of the CD unit . This is not required for the second model of the Genesis .

Though the Sega CD offers a faster processor , its main purpose is to expand the size of the games . Whereas ROM cartridges of the day typically contained 8 to 16 megabits of data , a CD @-@ ROM disc can hold more than 640 megabytes of data , or more than 320 times the storage of a Genesis cartridge . This allows the Sega CD to run games containing full motion video .

= = Variations = =

The Sega CD received several variations during its lifetime , of which Sega constructed three . The original model utilized a front @-@ loading motorized disc tray and sat underneath the Genesis . Sega later released the second model of the Sega CD , which was redesigned to sit next to the Genesis console and featured a top @-@ loading disc tray in place of the motorized tray of the original model . In addition to the add @-@ on models , Sega also released the Genesis CDX (Multi @-@ Mega in Europe) . This console was a combination of the Genesis and Sega CD into one unit , and initially retailed at US \$ 399 . Unique to this model was its additional functionality as a portable compact disc player .

Three additional system models were created by other electronics companies . Working with Sega Enterprises , JVC released the Wondermega on April 1 , 1992 , in Japan , at an initial retail price of ¥ 82 @,@ 800 (or US \$ 620) . The system was later redesigned by JVC and released as the X 'Eye in North America in September 1994 . Designed by JVC to be a Genesis and Sega CD combination with high quality audio , the Wondermega 's high price kept it out of the hands of average consumers . Likewise was the case with the Pioneer LaserActive , which was also an add @-@ on that required an attachment developed by Sega , known as the Mega @-@ LD pack , in order to play Genesis and Sega CD games . Though the LaserActive , developed by Pioneer Corporation , was lined up to compete with the 3DO Interactive Multiplayer , the combined system and Mega @-@ LD pack retailed at nearly \$ 1600 , becoming a very expensive option for Sega CD players . Aiwa also released the CSD @-@ GM1 , a combination Genesis / Sega CD unit built into a boombox .

= = Game library = =

The Sega CD supports a library of over 200 games created both by Sega and an array of third @-@ party publishers . Included in this library are six games which , while receiving individual Sega CD releases , also received separate versions that utilized both the Sega CD and Sega 32X add @-@ ons . Among the titles released for the add @-@ on were a number of FMV games , including Sewer Shark and Fahrenheit . Well @-@ regarded titles include Sonic the Hedgehog CD , Lunar : Eternal Blue and Lunar : The Silver Star , Popful Mail , and Snatcher , as well as the controversial Night Trap . Although Sega created Streets of Rage for the Genesis to compete against the SNES port of the arcade hit Final Fight , the Sega CD received an enhanced version of the latter game that has been praised for its greater faithfulness to the arcade original . Eternal Champions : Challenge from the Dark Side was noted for its impressive use of the system 's hardware as well as its violent content . In particular , Sonic the Hedgehog CD has garnered critical acclaim for its excellent graphics and new time travel elements , which improved upon the traditional Sonic formula . The Sega CD also received enhanced ports of games from the Genesis , such as Batman Returns and Ecco the Dolphin .

Given the large number of FMV games and Genesis ports , the Sega CD 's game library has been criticized for its lack of depth . Full motion video quality was substandard on the Sega CD due to poor video compression software and the system 's limited color palette , and the concept never caught on with the public . According to Digital Pictures founder Tom Zito , " Sega CD could only put

up 32 colors at a time , so you had this horrible grainy look to the images , " though the system was able to put up 64 colors at one time . Likewise , most Genesis ports for the Sega CD featured additional full motion video sequences , extra levels , and enhanced audio , but were otherwise identical to their Genesis release . The video quality in these sequences has also been criticized as comparable to an old VHS tape .

= = Reception and legacy = =

Near the time of its release , the Sega CD was awarded Best New Peripheral of 1992 by Electronic Gaming Monthly . Four separate reviews scored the add @-@ on 8 , 9 , 8 , and 8 out of 10 ; reviewers cited its upgrades to the Genesis as well as its high @-@ quality and expanding library of games . Later reception in 1995 by Electronic Gaming Monthly showed a more mixed response to the peripheral , with four reviewers scoring it 5 out of 10 , citing its game library issues and substandard video quality . GamePro also criticized the weak games library and substandard video quality , noting that many of the games were simple ports of cartridge games with minimal enhancements and commenting that " The Sega CD could have been an upgrade , but it 's essentially a big memory device with CD sound . " They gave it a " thumbs sideways " and recommended that Genesis fans buy an SNES before even considering a Sega CD . Likewise , in a special Game Machine Cross Review in May 1995 , Famicom Ts?shin scored the Japanese Mega @-@ CD 2 a 17 out of 40 .

Retrospective reception of the Sega CD is mixed , praising certain titles in its game library but criticizing its low value for money and limitations on the benefits it provides to the Genesis . GamePro listed the Sega CD as the 7th @-@ worst selling video game console of all time , with reviewer Blake Snow noting that " The problem was threefold : the device was expensive at \$ 299 , it arrived late in the 16 @-@ bit life cycle , and it didn 't do much (if anything) to enhance the gameplay experience . " Snow went on to note , however , that the Sega CD did have in its library " the greatest Sonic game of all time " in Sonic the Hedgehog CD . IGN 's Levi Buchanan criticized Sega 's implementation of CD technology for the Genesis , noting , " What good is the extra storage space if there is nothing inventive to be done with it ? No new gameplay concepts emerged from the SEGA CD ? it just offered more of the same . In fact , with few exceptions like Sonic CD , it often offered some of the 16 @-@ bit generation 's worst games , like Demolition Man . " Jeremy Parish of USgamer pointed out that " Sega was hardly the only company to muddy its waters with a CD add @-@ on in the early ' 90s " and highlighted some " gems " for the system , but cautioned " the benefits offered by the Sega CD had to be balanced against the fact that the add @-@ on more than doubled the price (and complexity) of the [Genesis] . " Writing for Retro Gamer , Damien McFerran cited various reasons for the Sega CD 's limited sales , including the add @-@ on 's high price , lack of significant enhancement to the Genesis console , and lack of ability to function without a console attached . Retro Gamer writer Aaron Birch , however , defended the Sega CD and wrote that " the single biggest cause of the Mega @-@ CD 's failure was the console itself . When the system came out , CD @-@ ROM technology was still in its infancy and companies had yet to get to grips with the possibilities it offered ... quite simply , the Mega @-@ CD was a console ahead of its time . "

The poor support for the Sega CD has often been criticized as the first link in the devaluation of the Sega brand . Writing for IGN , Buchanan described an outside perspective on Sega 's decision to release the Sega CD with its poor library and console support , stating , " [T] he SEGA CD instead looked like a strange , desperate move ? something designed to nab some ink but without any real , thought @-@ out strategy . Genesis owners that invested in the add @-@ on were sorely disappointed , which undoubtedly helped sour the non @-@ diehards on the brand . " In reviewing for GamePro , Snow commented that " [the] Sega CD marked the first of several Sega systems that saw very poor support ; something that devalued the once @-@ popular Sega brand in the eyes of consumers , and something that would ultimately lead to the company 's demise as a hardware maker . "

Former Sega of America senior producer Scot Bayless attributes the unsuccessful market to a lack

of direction from Sega with the add @-@ on . According to Bayless , " It was a fundamental paradigm shift with almost no thought given to consequences . I honestly don 't think anyone at Sega asked the most important question : ' Why ? ' There 's a rule I developed during my time as an engineer in the military aviation business : never fall in love with your tech . I think that 's where the Mega @-@ CD went off the rails . The whole company fell in love with the idea without ever really asking how it would affect the games you made . " Sega of America producer Michael Latham offers a contrasting view of support for the add @-@ on , however , stating " I loved the Sega CD . I always thought the platform was under @-@ appreciated and that it was hurt by an over @-@ concentration of trying to make Hollywood interactive film games versus using its storage and extended abilities to make just plain great video games . " Former Sega of Europe president Nick Alexander commented on the Mega CD , saying " The Mega CD was interesting but probably misconceived and was seen very much as the interim product it was . I am afraid I cannot recall the sales numbers , but it was not a success . "