

= Asteroids (video game) =

Asteroids is an arcade space shooter released in November 1979 by Atari , Inc. and designed by Lyle Rains , Ed Logg , and Dominic Walsh . The player controls a spaceship in an asteroid field which is periodically traversed by flying saucers . The object of the game is to shoot and destroy asteroids and saucers while not colliding with either or being hit by the saucers ' counter @-@ fire . The game becomes harder as the number of asteroids increases .

Asteroids was one of the first major hits of the golden age of arcade games . The game sold over 70 @,@ 000 arcade cabinets and proved both popular with players and influential with developers . It has since been ported to multiple platforms . Asteroids was widely imitated and directly influenced Defender , Gravitar , and many other video games .

Asteroids was conceived during a meeting between Logg and Rains and used hardware developed by Howard Delman previously used for Lunar Lander . Based on an unfinished game titled Cosmos and inspired by Spacewar ! and Computer Space , both early shoot ' em up video games , Asteroids ' physics model and control scheme were derived by Logg from these earlier games and refined through trial and error . The game is rendered on a vector display in a two @-@ dimensional view that wraps around in both screen axes .

= = Gameplay = =

The objective of Asteroids is to destroy asteroids and saucers . The player controls a triangular ship that can rotate left and right , fire shots straight forward , and thrust forward . Once the ship begins moving in a direction , it will continue in that direction for a time without player intervention unless the player applies thrust in a different direction . The ship eventually comes to a stop when not thrusting . The player can also send the ship into hyperspace , causing it to disappear and reappear in a random location on the screen , at the risk of self @-@ destructing or appearing on top of an asteroid .

Each level starts with a few large asteroids drifting in various directions on the screen . Objects wrap around screen edges ? for instance , an asteroid that drifts off the top edge of the screen reappears at the bottom and continues moving in the same direction . As the player shoots asteroids , they break into smaller asteroids that move faster and are more difficult to hit . Smaller asteroids are also worth more points . Two flying saucers appear periodically on the screen ; the " big saucer " shoots randomly and poorly , while the " small saucer " fires frequently at the ship . After reaching a score of 40 @,@ 000 , only the small saucer appears . As the player 's score increases , the angle range of the shots from the small saucer diminishes until the saucer fires extremely accurately . Once the screen has been cleared of all asteroids and flying saucers , a new set of large asteroids appears , thus starting the next level . The game gets harder as the number of asteroids increases until after the score reaches a range between 40 @,@ 000 and 60 @,@ 000 . The player starts with 3 lives after a coin is inserted and gains an extra life every 10 @,@ 000 points . When the player loses all his lives , the game ends .

Asteroids contains several bugs . The game slows down as the player gains 50 @-@ 100 lives , due to a programming error in that there is no limit for the permitted number of lives . The player can " lose " the game after more than 250 lives are collected .

= = Development and design = =

Asteroids was conceived by Lyle Rains and programmed by Ed Logg with collaborations from other Atari staff . Logg was impressed with the Atari 2600 (then known as " Atari Video Computer System ") and joined Atari 's coin @-@ op division and worked on Dirt Bike , which was never released due to an unsuccessful field test . He developed Super Breakout after hearing that Nolan Bushnell , founder of Atari , wanted Breakout updated . Paul Mancuso joined the development team as Asteroids ' technician and engineer Howard Delman contributed to the hardware . During a meeting in April 1979 , Rains discussed Planet Grab , a multiplayer arcade game later renamed to Cosmos .

Logg did not know the name of the game, thinking Computer Space as "the inspiration for the two @-@ dimensional approach." The unfinished game featured a giant, indestructible asteroid, so Rains asked Logg: "Well, why don't we have a game where you shoot the rocks and blow them up?" In response, Logg described a similar concept where the player selectively shoots at rocks that break into smaller pieces. Both agreed on the concept.

Asteroids was implemented on hardware developed by Delman and is a vector game, in which the graphics are composed of lines drawn on a vector monitor. Rains initially wanted the game done in raster graphics, but Logg, experienced in vector graphics, suggested an XY monitor because the high image quality would permit precise aiming. The hardware is chiefly a MOS 6502 executing the game program, and QuadraScan, a high @-@ resolution vector graphics processor developed by Atari and referred to as an "XY display system" and the "Digital Vector Generator (DVG)".

The original design concepts for QuadraScan came out of Cyan Engineering, Atari's off @-@ campus research lab in Grass Valley, California, in 1978. Cyan gave it to Delman, who finished the design and first used it for Lunar Lander. Logg received Delman's modified board with five buttons, 13 sound effects, and additional RAM, and used it to develop Asteroids. The size of the board was 4 by 4 inches, and it was "linked up" to a monitor.

Logg modeled the player's ship, the five @-@ button control scheme, and the game physics after Spacewar!, which he had played as a student at the University of California, Berkeley, but made several changes to improve playability. The ship was programmed into the hardware and rendered by the monitor, and was configured to move with thrust and inertia. The hyperspace button was not placed near Logg's right thumb, which he was dissatisfied with, as he had a problem "tak[ing] his hand off the thrust button." Drawings of asteroids in various shapes were incorporated into the game. Logg copied the idea of a high score table with initials from Exidy's Star Fire.

The two saucers were formulated to be different from each other. A steadily decreasing timer that shortens intervals between saucer attacks was employed to keep the player from not shooting asteroids and saucers. The minimalist soundtrack features a "heartbeat" sound effect, which quickens as the game progresses. The game did not have a sound chip, so Delman created a hardware circuit for 13 sound effects by hand which was wired onto the board.

A prototype of Asteroids was well received by several Atari staff and engineers, who would "wander between labs, passing comment and stopping to play as they went." Logg was often asked when he would be leaving by employees eager to play the prototype, so he created a second prototype specifically for staff to play. Atari went to Sacramento, California for testing, setting up prototypes of the game in local arcades to measure its potential success. The company also observed veteran players and younger players during focus group sessions at Atari itself. A group of old players familiar with Spacewar! struggled to maintain grip on the thrust button and requested a joystick, whereas younger players accustomed to Space Invaders noted they get no break in the game. Logg and other Atari engineers observed proceedings and documented comments in four pages.

= = Reception and legacy = =

Asteroids was immediately successful upon release. It displaced Space Invaders by popularity in the United States and became Atari's best selling arcade game of all time, with over 70 @,@ 000 units sold. Atari earned an estimated \$ 150 million in sales from the game, and arcade operators earned a further \$ 500 million from coin drops. Atari had been in the process of manufacturing another vector game, Lunar Lander, but demand for Asteroids was so high "that several hundred Asteroids games were shipped in Lunar Lander cabinets." Asteroids was so popular that some video arcade operators had to install large boxes to hold the number of coins spent by players.

The saucer in the original game design was supposed to take a shot as soon as it appeared. This action was altered so there would be a delay before the saucer shoots, leading to "lurking" from players. Lurking is a strategy in which the player uses thrust to keep the ship in motion, leaves 1 or 2 asteroids undamaged, and hunts for saucers, allowing the player to pick off as many 1 @,@ 000 @-@ point UFOs as possible and play indefinitely on a single credit. Since the saucer could only

shoot directly at the player 's position on the screen , the player could " hide " at the opposite end of the screen and shoot across the screen boundary , while remaining relatively safe . Complaints from operators losing revenue due to lurking led to the creation of an EPROM restricting such chances . Usage of the names of Saturday Night Live characters " Mr. Bill " and " Sluggo " to refer to the saucers in an Esquire article about the game led to Logg receiving a cease and desist letter from a lawyer with the " Mr. Bill Trademark . "

Asteroids received positive reviews from video game critics and has been regarded as Logg 's magnum opus . Brett Alan Weiss , writing for Allgame , likened the monochrome vector graphics to minimalism and viewed its sound effects as memorable . Weiss found its overall design to be near @-@ perfect and cites the intensity and controls as elements that make the game addicting . He admitted the game is easily understandable and " holds up extremely well over time . " William Cassidy , writing for GameSpy 's " Classic Gaming " , noticed its innovations , including being one of the first video games to track initials and allow players to enter their initials for appearing in the top 10 high scores , and commented , " the vector graphics fit the futuristic outer space theme very well . " Asteroids was ranked fourth on Retro Gamer 's list of " Top 25 Arcade Games " ; the Retro Gamer staff cited its simplicity and the lack of a proper ending as allowances of revisiting the game . Entertainment Weekly named Asteroids one of the top ten games for the Atari 2600 in 2013 . It was added to the Museum of Modern Art 's collection of video games . By contrast , in March 1983 the Atari 8 @-@ bit port won sixth place in Softline 's Dog of the Year awards " for badness in computer games " , Atari division , based on reader submissions .

The gameplay in Asteroids was imitated by many games that followed , mostly " Asteroid clones " . By December 1981 BYTE observed that " If imitation is the sincerest form of flattery , then [Atari 's Asteroids has] a lot to be proud of ... Its popularity has inspired numerous imitations " , including eight for personal computers . The Mattel Intellivision title Astrosmash was conceived as Avalanche ! after Meteor ! did not take up the cartridge 's entire ROM space . Meteor ! , an Asteroids clone , was cancelled to avoid a lawsuit and Avalanche ! was released as Astrosmash . The resultant game borrows elements from Asteroids and Space Invaders , both which also influenced Defender and Gravitar , two popular and often cloned arcade games. Quality Software 's Asteroids in Space (1980) , another Asteroids clone , was one of the best selling games for the Apple II and was voted one of the most popular software titles of 1978 @-@ 80 by Softalk magazine . Others include Acornsoft 's Meteors , Moons of Jupiter for the Commodore VIC @-@ 20 , and MineStorm for the Vectrex .

= = Arcade sequels = =

Released in 1981 , Asteroids Deluxe is the first sequel to Asteroids . Dave Shepperd edited the code and made enhancements to the game without Logg 's involvement . The onscreen objects were tinted blue , and hyperspace was replaced by a shield that depleted if used . The asteroids rotate , and the added killer satellite enemy breaks apart into three smaller ships when hit that home in on the player 's position . The arcade machine 's monitor displays vector graphics overlaying a holographic backdrop . The game is much harder than the original and does not allow saucers to be hunted ? a common strategy for Asteroids high scores .

It was followed by Owen Rubin 's Space Duel in 1982 , featuring colorful geometric shapes and co @-@ op multiplayer gameplay .

In 1987 's Blasteroids , Ed Rotberg added " power @-@ ups , ship morphing , branching levels , bosses , and the ability to dock your ships in multiplayer for added firepower . " Blasteroids uses raster graphics instead of vectors .

= = Ports = =

Asteroids has been ported to multiple platforms , including much of Atari 's hardware (Atari 2600 and 8 @-@ bit computers in 1981 , Atari 7800 in 1987 , Atari Lynx in 1994) and many other platforms . Released in 1981 , the 2600 port was the first game to use bank switching , a technique developed by Carl Nielsen 's group of engineers that increased available ROM space from 4 KB to 8

KB . Brad Stewart , the programmer tasked to work on the port , used bank switching to complete the game . A port for the Atari 5200 , identical to the Atari 8 @-@ bit computer version , was in development in 1982 , but was not published .

The Atari 7800 version was a launch title and features co @-@ operative play . The asteroids receive colorful textures , and the " heartbeat " sound effect remains intact . The game was included as part of the Atari Lynx title Super Asteroids & Missile Command , and featured in the original Microsoft Arcade compilation in 1993 , the latter with four other Atari video games : Missile Command , Tempest , Centipede , and Battlezone .

Activision made an enhanced version of Asteroids for PlayStation , Nintendo 64 , Microsoft Windows , and the Game Boy Color in 1998 . Doug Perry , writing for entertainment and video game journalism website IGN , praised the high @-@ end graphics ? with realistic space object models , backgrounds , and special effects ? for making Asteroids " a pleasure to look at " while being a homage to the original arcade version . The Atari Flashback series of dedicated video game consoles have included both the 2600 the arcade versions of Asteroids .

Published by Crave Entertainment on December 14 , 1999 , Asteroids Hyper 64 is the Nintendo 64 port of Asteroids . The game 's graphics were upgraded to 3D , with both the ship and asteroids receiving polygon models along static backgrounds , and it was supplemented with weapons and a multiplayer mode . IGN writer Matt Casamassina was pleased that the gameplay was faithful to the original but felt the minor additions and constant " repetition " was not enough to make the port " warrant a \$ 50 purchase . " He was disappointed about the lack of music and found the sound effects to be of poor quality .

In 2001 , Infogrames released Atari Anniversary Edition for the Sega Dreamcast , PlayStation , and PC compatibles . Developed by Digital Eclipse , it included emulated versions of Asteroids and other old Atari games . Jeff Gerstmann of GameSpot criticized the Dreamcast version for its limitations , such as the presentation of vector graphics on a low resolution television set , which obscures the copyright text in Asteroids . The arcade and Atari 2600 versions of Asteroids , along with Asteroids Deluxe , were included in Atari Anthology for both Xbox and PlayStation 2 .

Released on November 28 , 2007 , the Xbox Live Arcade port of Asteroids has revamped HD graphics along with an added intense " throttle monkey " mode . Both Asteroids in its arcade and 2600 versions and Asteroids Deluxe were ported to Microsoft 's Game Room download service in 2010 . Glu Mobile released a mobile phone port of the game with supplementary features as well as the original arcade version .

Asteroids was included on Atari Greatest Hits Volume 1 for the Nintendo DS . Craig Harris , writing for IGN , noted that the Nintendo DS 's small screen can not properly display details of games with vector graphics .

= = Highest score = =

On November 13 , 1982 , 15 @-@ year @-@ old Scott Safran of Cherry Hill , New Jersey , set a world record of 41 @,@ 336 @,@ 440 points on the arcade game Asteroids , beating the 40 @,@ 101 @,@ 910 point score set by Leo Daniels of Carolina Beach on February 6 , 1982 . In 1998 , to congratulate Safran on his accomplishment , the Twin Galaxies Intergalactic Scoreboard searched for him for four years until 2002 , when it was discovered that he had died in an accident in 1989 . In a ceremony in Philadelphia on April 27 , 2002 , Walter Day of Twin Galaxies presented an award to the surviving members of Safran 's family , commemorating the Asteroid Champion 's achievement . On April 6 , 2010 , John McAllister broke Safran 's record with a high score of 41 @,@ 338 @,@ 740 in a 58 @-@ hour Internet livestream .

= = Film adaptation = =

In 2009 , Universal Studios obtained the rights to adapt Asteroids into a film , with Matthew Lopez as the scriptwriter and Lorenzo di Bonaventura as the producer . Universal will create the story from scratch , as done with Battleship , a film based on the Hasbro board game of the same name .

