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Lunar Lander (video game series)

Lunar Lander is the name of several [video games](#) built on the same concept. In all variations of the game, the player controls a spaceship as it falls towards the surface of the [Moon](#) or other [astronomical bodies](#), and must maneuver the ship's thrusters so as to land safely before exhausting the available fuel. In many versions of the game, the player must adjust the ship's orientation, as well as its horizontal and vertical velocities. The initial version of the game was a text-based game named *Lunar*, or alternately the *Lunar Landing Game*, written in the [FOCAL](#) programming language for the [Digital Equipment Corporation](#) (DEC) [PDP-8 minicomputer](#) by Jim Storer while a high school student in the fall of 1969. Two other versions were written soon after by other programmers in [BASIC](#). *Lunar* was converted to [BASIC](#) by [David H. Ahl](#), who included all three versions in his 1973 [101 BASIC Computer Games](#); by the end of the decade, the type of game was collectively known as a "lunar lander" game.

In 1973, DEC commissioned the creation of a real-time, graphical version of *Lunar Lander*, which was intended to showcase the capabilities of their new [DEC GT40](#) graphics terminals. The game, which was written by Jack Burness and named *Moonlander*, was distributed with DEC computers and displayed at trade shows. An [arcade game](#) version of the game concept was released as [Lunar Lander](#) in 1979 by Atari, which featured a fuel-for-money system allowing the player to purchase more fuel to continue their current game. Other versions of the graphical game were released for various systems, including *Jupiter Lander* for the [Commodore 64](#), *Retrofire* for [Atari 8-bit computers](#), and *Apollo 11* for the [ZX Spectrum](#). Critics have claimed that the text-based version of the game was the most popular computer game of its time, and so many versions of the graphical game exist that in 1981 [Electronic Games](#) claimed: "sometimes it seems as though every company capable of copying a cassette is trying to sell a game on this theme."

<i>Lunar Lander</i>	
	
Screenshot of the 1979 arcade version of <i>Lunar Lander</i>	
Genres	Space flight simulation
Platforms	Minicomputers, Personal computers, Arcade game
Platform of origin	PDP-8
Year of inception	1969

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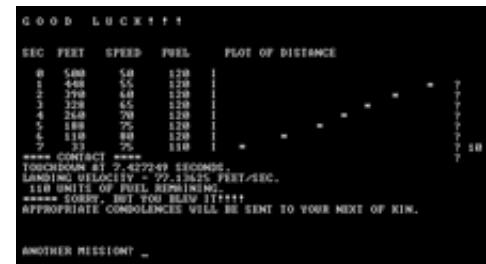
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Text games

The original *Lunar Lander* game was a 1969 text-based game called *Lunar*, or alternately the *Lunar Landing Game*.^{[1][2]} It was originally written in the FOCAL programming language for the Digital Equipment Corporation (DEC) PDP-8 minicomputer by Jim Storer while a student at Lexington High School in the fall of 1969.^{[3][4]} Storer submitted the game to the DEC users' newsletter, which distributed the source code to readers.^[3] Other versions of the concept were written soon after: a version called *Rocket* was written in BASIC by Eric Peters at DEC, and a third version, *LEM*, was written by William Labaree II in BASIC, among others.^[1]

All three text-based games require the player to control a rocket attempting to land on the moon by entering instructions to the rocket in a turn-based system in response to the textual summary of its current position and velocity relative to the ground.^[1] In the original *Lunar*, players controlled only the amount of vertical thrust to apply, based on their current vertical velocity and remaining fuel, with each round representing one second of travel time. *Rocket* added a simple text-based graphical display of the distance from the ground in each round, while *LEM* added horizontal velocity and the ability to apply thrust at an angle.^[3] In 1970 and 1971, DEC employee and editor of the newsletter David H. Ahl converted two early mainframe games, *Lunar* and *Hamurabi*, from the FOCAL language to BASIC, partially as a demonstration of the language on the DEC PDP-8 minicomputer. Their popularity led him to start printing BASIC games in the DEC newsletter, both his own and reader submissions.^{[5][6]}

In 1973, Ahl released the book 101 BASIC Computer Games, which contained the source code of computer games written in BASIC. The games included were written by both Ahl and others and included both games original to the language and games ported from other languages such as FOCAL. 101 BASIC Computer Games was a landmark title in computer games programming and was a best-selling title with more than 10,000 copies sold. Its second edition in 1978, titled BASIC Computer Games, was the first million-selling computer book. As such, the BASIC ports of mainframe computer games included in the book were often more long-lived than their original versions or other mainframe computer games.^[5] Included in the book were all three versions of *Lunar Lander*, under the names ROCKET (Storer version), ROCKT1 (Peters version), and ROCKT2 (Labaree version).^[1] Ahl and Steve North then converted all three versions to Microsoft BASIC and published them in Creative Computing magazine and the Best of Creative Computing collection in 1976;^[6] they were reprinted in the 1978 edition of BASIC Computer Games as *Lunar*, *LEM*, and *Rocket* as the most popular of the existing versions of the game.^[1] With the advent of home computers in 1977, the game concept soon moved to those systems as well, with *Moon Lander* (1977) for the MK14 computer kit, which displayed the lander's speed, height, and fuel consumption on an eight-character calculator-style display, as an early example.^[7] While Ahl did not list a common name



A full game of *Rocket*, one of the early versions of the game type. The player has only spent fuel at the last moment, and as a result has crashed into the moon.

for the three similar titles in his book, the style of game was collectively seen as its own subgenre, with *InfoWorld* referring to *LEM* in February 1979 as "a lunar lander" and *Antic* terming the set of text-based games as "Lunar Landers" in 1986.^{[8][9]}

Graphical games

In 1973, DEC commissioned the creation of a real-time, graphical version of *Lunar Lander*, which was intended to showcase the capabilities of their new *DEC GT40* graphics terminals, when connected to their *PDP-10* or *PDP-11* minicomputers. The game was written by Jack Burness, a DEC consultant, and named *Moonlander*; it was distributed with DEC computers and displayed at trade shows.^{[2][3]} Unlike the previous turn-based, textual games, *Moonlander* is a real-time graphical game. The goal remains to correctly land a lunar module on the surface of the *moon* using the game's *telemetry* data. If the player miscalculates the module's landing, the module will either fly off into space or crash into the moon's surface. The game is controlled with a *light pen*, and the output display was a *vector graphics* system; the light pen allowed adjusting the throttle value and the angle of the lunar lander.^[2] Burness has said that he does not recall playing the original *Lunar*, but that by 1973 there were numerous versions of the game which he had played. He based the calculations of the fuel consumption for maneuvering the rocket on the actual *lunar lander* specifications, which he obtained from the *Massachusetts Institute of Technology*, which co-designed the lander. The entire game was written in ten days.^[3]



DEC GT40 graphics terminal running *Moonlander*

In August 1979, *Atari* produced an *arcade game* version of the concept called *Lunar Lander*. This version featured monochrome *vector graphics* and allowed the player to rotate the ship right or left and fire thrusters controlled with a proportional throttle control system using a joystick with a spring. Like *Moonlander*, both a graphical display of a repeating mountainous surface as well as a text readout of the ship's speed, altitude, and remaining fuel are displayed. Once a game begins, it only ends when a player runs out of fuel, rather than due to a time limit; players can insert quarters to add fuel to their current game. Bonus points are awarded for landing on difficult parts of the map.^[10] The game features four levels of difficulty in controlling the ship.^[3] *Lunar Lander* was Atari's first vector graphics game and the first multiple-perspective video game; when the lander got close to the surface, the view changed to a close-up view of the lander.^{[10][11]} The vector engine was inspired by *Space Wars* (1978) and created by Rick Moncrief and Howard Delman, who developed *Lunar Lander* alongside Rich Moore. The idea for the game came from Delman, who had seen a graphical version of the game, likely *Moonlander*, a few years prior.^[3] At least one other arcade game based on the *Lunar Lander* concept was developed around the same time, *Lunar Rescue* by *Taito*.^[11]

Additional graphical versions of *Lunar Lander* have been produced for several other systems. Although some, such as a version by Stoneware for the *Apple II*, were named *Lunar Lander*,^[12] many were not; regardless, the name of the type of game continued to be "lunar landers".^{[9][13]} Bill Budge developed *Tranquility Base* for the *Apple II* in 1980, *HAL Laboratory* developed *Jupiter Lander*, a raster version of the game, in 1982 for the *Commodore VIC-20* and *Commodore*

64, and IBM released *Rocket Lander* for the IBM Personal Computer in 1982.^{[3][14]} Ahoy! magazine published a Commodore BASIC type-in program version of the game for the Commodore 64 in April 1984.^[15] Tom Hudson wrote *Retrofire*, a more elaborate version of the lander concept for Atari 8-bit computers in 1983; it uses an 3D isometric view, so there are three velocities to control (along the X, Y, and Z axes).^[16] Other games include *Apollo 11* (1983) for the ZX Spectrum,^[17] *Marslander* (1983) for the Acorn Electron and BBC Micro,^[18] and versions of *Lunar Lander* for the Commodore PET and TRS-80. George Moromisato developed *Lander* for Windows 3.1x in 1990, Nintendo released a version of *Lunar Lander* for the Game Boy that same year, and Psygnosis released a 3D, commercial version for Microsoft Windows in 1999 titled *Lander*. Other modern versions and remakes have been made for iOS, Android, mobile phones, and browsers.^[3]

Reception

In the 1978 edition of *BASIC Computer Games*, David Ahl described the text-based version of *Lunar Lander* as "by far and away the single most popular computer game" of the time.^[3] *Moonlander* was similarly popular among users of DEC graphics terminals.^[3] The *Lunar Lander* arcade game proved popular and commercially successful, selling approximately 4,700 cabinets. Its popularity was soon overtaken by Atari's *Asteroids* (1979), however, and Atari ceased production on *Lunar Lander* in favor of shipping *Asteroids* games in *Lunar Lander* cabinets; 300 *Asteroids* games were released with *Lunar Lander* artwork on the side.^{[3][10]}

Computer Gaming World described *Lunar Lander* in 1982 as one of the first fun programs entry level programmers start with and continually improve upon as they improve their skills.^[19] By 1973, there were numerous versions of the text-based game, and so many versions of the graphical game existed by 1981 that Electronic Games, in a review of a version by Scott Adams for Atari 8-bit computers and the TRS-80, claimed it was "yet another entry in a field as crowded as the category of *Space Invaders* imitators. Sometimes it seems as though every company capable of copying a cassette is trying to sell a game on this theme."^{[20][3]} According to the authors of *Grand Thieves & Tomb Raiders*, *Moon Lander* for the MK14 (1977) was one of the first three commercial games in Britain for home computers.^[7] The game type even spawned at least one meta-game; *Antic*, in March 1986, named *Lunar Lander Construction Set* as its game of the month, a BASIC game for Atari 8-bit computers in which the player can construct their own version of the graphical *Lunar Lander*.^[9] In *Science Fiction Video Games* (2014), while discussing the games' lack of science fiction concepts like aliens or unrealistic physics, author Neal Roger Tringham described the series as "one of the few video games to be based on to be based on a real space program, as opposed to the many games inspired by fictional forms of space exploration".^[2]

See also

- Gravitar (1982), an arcade game from Atari based on similar concepts
- Space Taxi (1984), a more fanciful spin on thrust-controlled landings

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External links

- [Text game source code](http://atariarchives.org/basicgames/showpage.php?page=106) (<http://atariarchives.org/basicgames/showpage.php?page=106>) in *BASIC Computer Games* (1978)
- [Official online version](http://games.atari.com/arcade.php?game=lunarlander) (<http://games.atari.com/arcade.php?game=lunarlander>) of Atari's *Lunar Lander* arcade game
- [Lunar Lander](http://www.arcade-museum.com/game_detail.php?game_id=8465) (http://www.arcade-museum.com/game_detail.php?game_id=8465) at the [Killer List of Videogames](#)
- [Source code](http://www.brouhaha.com/~eric/retrocomputing/dec/gt40/software/moonlander/gtlem.mac) (<http://www.brouhaha.com/~eric/retrocomputing/dec/gt40/software/moonlander/gtlem.mac>) (in [MACRO-11](#)) of *GT40 Moonlander*, February 1973, and port (<http://www.brouhaha.com/~eric/retrocomputing/dec/gt40/software/moonlander/rtlem.mac>) to [RT-11](#) by Al Kossow, January 1980.

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