

= Laika =

Laika (Russian : ????? ; c . 1954 ? November 3 , 1957) was a Soviet space dog who became one of the first animals in space , and the first animal to orbit the Earth . Laika , a stray dog from the streets of Moscow , was selected to be the occupant of the Soviet spacecraft Sputnik 2 that was launched into outer space on November 3 , 1957 .

Little was known about the impact of spaceflight on living creatures at the time of Laika 's mission , and the technology to de @-@ orbit had not yet been developed , and therefore Laika 's survival was not expected . Some scientists believed humans would be unable to survive the launch or the conditions of outer space , so engineers viewed flights by animals as a necessary precursor to human missions . The experiment aimed to prove that a living passenger could survive being launched into orbit and endure micro @-@ gravity , paving the way for human spaceflight and providing scientists with some of the first data on how living organisms react to spaceflight environments .

Laika died within hours from overheating , possibly caused by a failure of the central R @-@ 7 sustainer to separate from the payload . The true cause and time of her death were not made public until 2002 ; instead , it was widely reported that she died when her oxygen ran out on day six or , as the Soviet government initially claimed , she was euthanised prior to oxygen depletion .

On April 11 , 2008 , Russian officials unveiled a monument to Laika . A small monument in her honour was built near the military research facility in Moscow that prepared Laika 's flight to space . It features a dog standing on top of a rocket . She also appears on the Monument to the Conquerors of Space in Moscow .

= = Sputnik 2 = =

After the success of Sputnik 1 in October 1957 , Nikita Khrushchev , the Soviet leader , wanted a spacecraft launched on November 7 , 1957 , the 40th anniversary of the Bolshevik Revolution . Construction had already started on a more sophisticated satellite , but it would not be ready until December ; this satellite would later become Sputnik 3 .

Meeting the November deadline meant building a new craft . Khrushchev specifically wanted his engineers to deliver a " space spectacular " , a mission that would repeat the triumph of Sputnik 1 , stunning the world with Soviet prowess . Planners settled on an orbital flight with a dog . Soviet rocket engineers had long intended a canine orbit before attempting human spaceflight ; since 1951 , they had lofted 12 dogs into sub @-@ orbital space on ballistic flights , working gradually toward an orbital mission set for some time in 1958 . To satisfy Khrushchev 's demands , they expedited the orbital canine flight for the November launch .

According to Russian sources , the official decision to launch Sputnik 2 was made on October 10 or 12 , leaving less than four weeks to design and build the spacecraft . Sputnik 2 , therefore , was something of a rush job , with most elements of the spacecraft being constructed from rough sketches . Aside from the primary mission of sending a living passenger into space , Sputnik 2 also contained instrumentation for measuring solar radiation and cosmic rays .

The craft was equipped with a life @-@ support system consisting of an oxygen generator and devices to avoid oxygen poisoning and to absorb carbon dioxide . A fan , designed to activate whenever the cabin temperature exceeded 15 ° C (59 ° F) , was added to keep the dog cool . Enough food (in a gelatinous form) was provided for a seven @-@ day flight , and the dog was fitted with a bag to collect waste . A harness was designed to be fitted to the dog , and there were chains to restrict her movements to standing , sitting , or lying down ; there was no room to turn around in the cabin . An electrocardiogram monitored heart rate and further instrumentation tracked respiration rate , maximum arterial pressure , and the dog 's movements .

= = Training = =

Laika was found as a stray wandering the streets of Moscow . Soviet scientists chose to use

Moscow strays since they assumed that such animals had already learned to endure conditions of extreme cold and hunger . This specimen was an eleven @-@ pound mongrel female , approximately three years old . Another account reported that she weighed about 6 kg (13 lb) . Soviet personnel gave her several names and nicknames , among them Kudryavka (Russian for Little Curly) , Zhuchka (Little Bug) , and Limonchik (Little Lemon) . Laika , the Russian name for several breeds of dogs similar to the husky , was the name popularized around the world . The American press dubbed her Mutt-nik (mutt + suffix -nik) as a pun on Sputnik , or referred to her as Curly . Her true pedigree is unknown , although it is generally accepted that she was part husky or other Nordic breed , and possibly part terrier . NASA refers to Laika as a " part @-@ Samoyed terrier . " A Russian magazine described her temperament as phlegmatic , saying that she did not quarrel with other dogs . Vladimir Yazdovsky , who led the program of test dogs used on rockets , in a later publication wrote that ? Laika was quiet and charming ? .

The Soviet Union and United States had previously sent animals only on sub @-@ orbital flights . Three dogs were trained for the Sputnik 2 flight : Albina , Mushka , and Laika . Soviet space @-@ life scientists Vladimir Yazdovsky and Oleg Gazenko trained the dogs .

To adapt the dogs to the confines of the tiny cabin of Sputnik 2 , they were kept in progressively smaller cages for periods of up to 20 days . The extensive close confinement caused them to stop urinating or defecating , made them restless , and caused their general condition to deteriorate . Laxatives did not improve their condition , and the researchers found that only long periods of training proved effective . The dogs were placed in centrifuges that simulated the acceleration of a rocket launch and were placed in machines that simulated the noises of the spacecraft . This caused their pulses to double and their blood pressure to increase by 30 ? 65 torr . The dogs were trained to eat a special high @-@ nutrition gel that would be their food in space .

Before the launch , one of the scientists took Laika home to play with his children . In a book chronicling the story of Soviet space medicine , Dr. Vladimir Yazdovsky wrote , " Laika was quiet and charming ... I wanted to do something nice for her : She had so little time left to live . "

= = Preflight preparations = =

Vladimir Yazdovsky made the final selection of dogs and their designated roles . Laika was to be the " flight dog " ? a sacrifice to science on a one @-@ way mission to space . Albina , who had already flown twice on a high @-@ altitude test rocket , was to act as Laika 's backup . The third dog Mushka was a " control dog " ? she was to stay on the ground and be used to test instrumentation and life support .

Before leaving for the Baikonur Cosmodrome , Yazdovsky and Gazenko conducted surgery on the dogs - they routed the cables from the transmitters to the sensors that would measure breathing , pulse , and blood pressure .

Because the existing airstrip at Turatam near the cosmodrome was small , the dogs and crew had to be first flown aboard a Tu @-@ 104 plane to Tashkent . From there , a smaller and lighter Il @-@ 14 plane took them to Turatam . Training of dogs continued upon arrival ; one after another they were placed in the capsules to get familiar with the feeding system .

According to a NASA document , Laika was placed in the capsule of the satellite on October 31 , 1957 ? three days before the start of the mission . At that time of year the temperatures at the launch site were extremely cold , and a hose connected to a heater was used to keep her container warm . Two assistants were assigned to keep a constant watch on Laika before launch . Just prior to liftoff on November 3 , 1957 from Baikonur Cosmodrome , Laika 's fur was sponged in a weak alcohol solution and carefully groomed , while iodine was painted onto the areas where sensors would be placed to monitor her bodily functions .

One of the technicians preparing the capsule before final liftoff states that " after placing Laika in the container and before closing the hatch , we kissed her nose and wished her bon voyage , knowing that she would not survive the flight . "

= = Voyage = =

The exact time of the liftoff varies from source to source and is mentioned as 05 : 30 : 42 Moscow Time or 07 : 22 Moscow Time . At peak acceleration Laika 's respiration increased to between three and four times the pre @-@ launch rate . The sensors showed her heart rate was 103 beats / min before launch and increased to 240 beats / min during the early acceleration . After reaching orbit , Sputnik 2 's nose cone was jettisoned successfully ; however the " Block A " core did not separate as planned , preventing the thermal control system from operating correctly . Some of the thermal insulation tore loose , raising the cabin temperature to 40 ° C (104 ° F) . After three hours of weightlessness , Laika 's pulse rate had settled back to 102 beats / min , three times longer than it had taken during earlier ground tests , an indication of the stress she was under . The early telemetry indicated that Laika was agitated but eating her food . After approximately five to seven hours into the flight , no further signs of life were received from the spacecraft .

The Soviet scientists had planned to euthanize Laika with a poisoned serving of food . For many years , the Soviet Union gave conflicting statements that she had died either from asphyxia , when the batteries failed , or that she had been euthanized . Many rumors circulated about the exact manner of her death . In 1999 , several Russian sources reported that Laika had died when the cabin overheated on the fourth orbit . In October 2002 , Dimitri Malashenkov , one of the scientists behind the Sputnik 2 mission , revealed that Laika had died by the fourth circuit of flight from overheating . According to a paper he presented to the World Space Congress in Houston , Texas , " It turned out that it was practically impossible to create a reliable temperature control system in such limited time constraints . "

Over five months later , after 2 @,@ 570 orbits , Sputnik 2 ? including Laika 's remains ? disintegrated during re @-@ entry on April 14 , 1958 .

= = Ethics of animal testing = =

Due to the overshadowing issue of the Soviet vs. U.S. Space Race , the ethical issues raised by this experiment went largely unaddressed for some time . As newspaper clippings from 1957 show , the press was initially focused on reporting the political perspective , while the health and retrieval ? or lack thereof ? of Laika only became an issue later .

Sputnik 2 was not designed to be retrievable , and Laika had always been intended to die . The mission sparked a debate across the globe on the mistreatment of animals and animal testing in general to advance science . In the United Kingdom , the National Canine Defence League called on all dog owners to observe a minute 's silence , while the Royal Society for the Prevention of Cruelty to Animals (RSPCA) received protests even before Radio Moscow had finished announcing the launch . Animal rights groups at the time called on members of the public to protest at Soviet embassies . Others demonstrated outside the United Nations in New York ; nevertheless , laboratory researchers in the U.S. offered some support for the Soviets , at least before the news of Laika 's death .

In the Soviet Union , there was less controversy . Neither the media , books in the following years , nor the public openly questioned the decision to send a dog into space . It was not until 1998 , after the collapse of the Soviet regime , that Oleg Gazenko , one of the scientists responsible for sending Laika into space , expressed regret for allowing her to die :

Work with animals is a source of suffering to all of us . We treat them like babies who cannot speak . The more time passes , the more I 'm sorry about it . We shouldn 't have done it ... We did not learn enough from this mission to justify the death of the dog .

In other Warsaw Pact countries , open criticism of the Soviet space program was difficult because of political censorship ; however , there were notable cases of criticism in Polish scientific circles . A Polish scientific periodical , " Kto , Kiedy , Dlaczego " , published in 1958 , discussed the mission of Sputnik 2 . In the periodical 's section dedicated to astronautics , Krzysztof Boru? described the Sputnik 2 mission as " regrettable " and criticized not bringing Laika back to Earth alive as " undoubtedly a great loss for science " .

= = Legacy = =

Laika is memorialized in the form of a statue and plaque at Star City , Russia , the Russian Cosmonaut training facility . Created in 1997 , Laika is positioned behind the cosmonauts with her ears erect . The Monument to the Conquerors of Space , constructed in 1964 , also includes Laika . On April 11 , 2008 at the military research facility where staff had been responsible for readying Laika for the flight , officials unveiled a monument of her poised on top of a space rocket .

Future space missions carrying dogs would be designed to be recovered . Four other dogs died in Soviet space missions : Bars and Lisichka were killed when their R @-@ 7 rocket exploded shortly after launch on July 28 , 1960 ; Pchylka and Mushka died when Korabl @-@ Sputnik 3 was purposely destroyed with an explosive charge to prevent foreign powers from inspecting the capsule after a wayward atmospheric reentry trajectory on December 1 , 1960 .