



ABOVE THE CLOUDS



PRESS GUIDE

JANUARY 2022



*“ABOVE THE CROWDS,
ABOVE THE CLOUDS
WHERE THE SOUNDS
ARE ORIGINAL
INFINITE SKILLS
CREATE MIRACLES”*

—ABOVE THE CLOUDS, GANG STARR



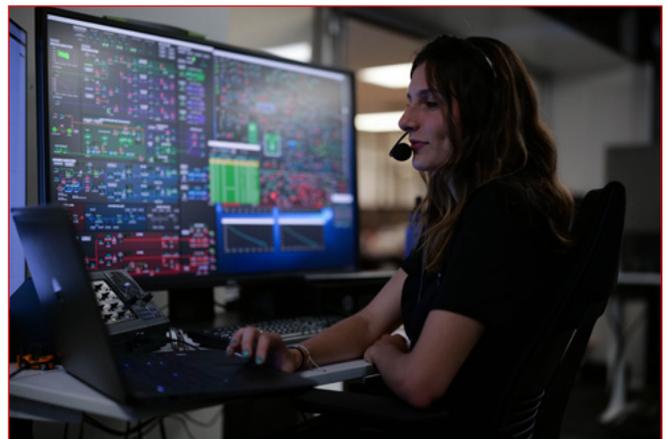
The curvature of the Earth as seen from a camera onboard LauncherOne's upper stage during Virgin Orbit's *Tubular Bells: Part One* mission. June 2021.



Filled with cryogenic propellants and pressurized to flight-like levels, LauncherOne undergoes a cryo load test on the taxiway at Mojave Air and Space Port. May 2021.



LauncherOne undergoes final integration at Virgin Orbit's manufacturing HQ in Long Beach, CA. March 2021.



Launch Engineer Stephanie Ollom monitors data in the Mission Control Center during *Tubular Bells: Part One* launch. June 2021.



Chief Test Pilot Kelly Latimer and RAF Test Pilot Mathew "Stanny" Stannard conduct a flight test with Virgin Orbit's carrier aircraft Cosmic Girl in June 2021.



Senior Launch Engineer Jason Panzarino (left) and Lead Launch Engineer Bryce Schaefer (right) inside Cosmic Girl during the *Tubular Bells: Part One* mission. June 2021.

MISSION OVERVIEW

Coming off flawless back-to-back launches, the Virgin Orbit team takes the next important step in providing routine commercial flights to orbit with *Above the Clouds*.

Virgin Orbit and Virgin Orbit's subsidiary, VOX Space, are becoming known as providers of the world's most affordable and responsive launch capability: the mobile, highly flexible LauncherOne system. Virgin Orbit's air-launched platform can take off from any runway long enough to handle a Boeing 747, a major departure from traditional fixed infrastructure sites. Our system was designed for mass production, and our fully operational factory was built to produce as many as 20 rockets per year.

Our June mission, *Tubular Bells: Part One*, sounded this new era, and now our happy *Tubular Bells* customers have become our first repeat clients. We're working with some old friends but headed to some new places.

We invite you to turn your attention skyward, to a mission we have dubbed *Above the Clouds*.

- **The U.S. Department of Defense**, which is launching several Research and Development (R&D) satellites from multiple government agencies that are experiments in space-based communications and in-space navigation, as well as a university payload sponsored by NASA. This launch, also known as STP-VP27B, was awarded to

Virgin Orbit through our subsidiary VOX Space by the DoD's Defense Innovation Unit (DIU) as part of the DoD Space Test Program's (STP) Rapid Agile Launch (RALI) Initiative. DIU is an organization working to accelerate the adoption of commercial technology into the U.S. military to strengthen national security.

- Polish company **SatRevolution**, which is launching two nanosatellites: STORK-3 and SteamSat-2. STORK-3 joins the STORK-4 and STORK-5 Marta satellites placed in orbit on our June 2021 mission as part of SatRevolution's Earth-observation capabilities, with a focus on serving customers in the agricultural sector to take medium-resolution photos. SteamSat-2 is a technology demonstrated for SteamJet Space System (UK)'s innovative water-fueled thrusters for in-space propulsion.
- **Spire Global**, a satellite imaging provider, will launch Adler-1, which was developed in partnership with the Austrian Space Forum (OeWF) and Findus Venture GmbH. Adler-1 is part of a growing movement to address the issue of dangerous space debris and improve sustainability in Low Earth Orbit. The 30x10x10 cm satellite will study the space debris environment in Low Earth Orbit to complement the space debris models by obtaining in-situ data. Spire Global was a late addition to the Above the Clouds manifest, taking advantage of Virgin Orbit's industry-leading responsive capabilities.



BEHIND THE NAME ABOVE THE CLOUDS

The mission name *Above the Clouds* pays homage to hip hop sensation Gang Starr's album, *Moment of Truth*. Released on March 31, 1998, by Virgin Records in collaboration with Noo Trybe Records, *Moment of Truth* is widely regarded as one of the greatest hip hop albums of all time. The song titled *Above the Clouds*, featuring Inspectah Deck of Wu-Tang Clan, appears as the fifth track – and Virgin Orbit's favorite. We are especially inspired by the chorus:

*Above the crowds, above the clouds
Where the sounds are original
Infinite skills create miracles*

We're certainly a little biased. Starting our launches from *above the clouds* lets us avoid the crowds at traditional spaceports, while also giving us a significant performance advantage over ground-launched systems. That means we can do more to help our customers and partners use their infinite skills to create miracles, using space technology

to make life better right here on planet Earth. We are emboldened by the original, creative work and innovative tenacity our collaborators, customers, and colleagues demonstrate every day to advance the industry.



MISSION EMBLEM

MISSION OVERVIEW

For *Above the Clouds* LauncherOne will carry a total of seven satellites to Low Earth Orbit, for three customers: the U.S. Department of Defense, Polish company SatRevolution, and Spire Global.

MISSION NUMBER

This is our fourth mission with LauncherOne. The wings are a reference to our successful three launches to date and connect to the United States' national symbol of the eagle. This launch is carrying two repeat happy customers, who are continuing to soar.

CLOUDS

The clouds in the design refer to the mission namesake, and double as the destination to which we are heading – *Above the Clouds*.



SETTING

As our launch site for this mission is the Mojave Air and Space Port in California, the backdrop includes features of the local landscape: Joshua trees, mountains, and an iconic desert sun.

SYMBOLS

The outline surrounding the emblem represents our signature brand color, and the laurel leaves on the bottom left are our good luck symbol. The sun star that appears in the bottom right is hip hop artist Gang Starr's logo, giving credit to the artist who inspired this mission's name. The color palette for the emblem is guided by its album's cover: *Moment of Truth*. Released in 1998 by Virgin Records in collaboration with Noo Trybe Records, it is regarded as one of the greatest hip hop albums of all time – and the soundtrack for our fourth mission.

LAUNCH DETAILS

TIMING

With all systems go, our team is proceeding through the final routine items on the pre-flight checklist. We're coordinating with our stakeholders to identify the final preferred targets for launch, aiming to head *Above the Clouds* January 2022.

We will only proceed with the mission if all conditions for launch are nominal. If for some reason the launch is delayed, we have backup windows extending through January.

LAUNCH SITE

Mojave Air and Space Port
Mojave, California USA

TARGET ORBIT

500 km circular orbit at 45 degrees inclination

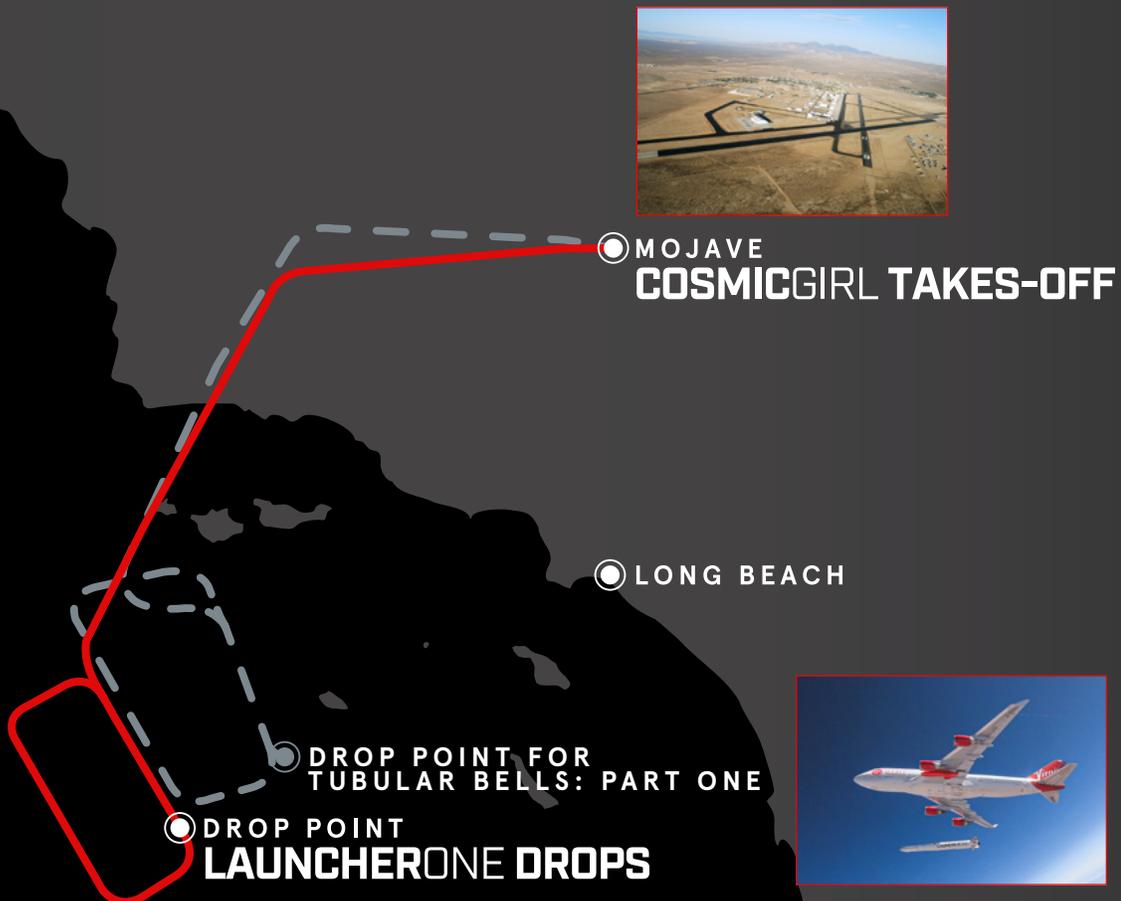
KEEPING UP WITH THE ACTION

This orbital test flight will be publicly livestreamed on our website, virginorbit.com. We'll also live-tweet real-time updates: [@virginorbit](https://twitter.com/virginorbit).

We will be documenting the entire day via our in-house media team. To access high-quality B-roll and photos captured on flight day, please reach out to press@virginorbit.com.

After the launch, track our continued progress by [subscribing](#) to our newsletter, and following us across our social channels: [Facebook](#), [Twitter](#), [LinkedIn](#) and [Instagram](#).

FLIGHT MAP



OUR PEOPLE

WHO YOU GONNA CALL?

For more information or to set up media interviews, please reach out to the contacts below or submit an email to our press inbox (press@virginorbit.com).

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KEY PERSONNEL



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Serial Entrepreneur



DAN HART
Virgin Orbit President and CEO



BRIG. GENERAL MARK BAIRD
VOX Space President



TYLER GRINNELL
Vice President of Launch

ABOUT US

VIRGIN ORBIT

Virgin Orbit (Nasdaq: VORB) operates one of the most flexible and responsive space launch systems ever built. Founded by Sir Richard Branson in 2017, the company began commercial service in 2021, and has already delivered commercial, civil, national security, and international satellites into orbit. Virgin Orbit's LauncherOne rockets are designed and manufactured in Long Beach, California, and are air-launched from a modified 747-400 carrier aircraft that allows Virgin Orbit to operate from locations all over the world in order to best serve each customer's needs. Learn more at virginorbit.com and visit us on [LinkedIn](#), on Twitter [@virginorbit](#), and on Instagram [@virgin.orbit](#).

VOX SPACE

VOX Space is a US-incorporated, wholly-owned subsidiary of Virgin Orbit that provides the national security community of the USA and allied nations with responsive, dedicated, and affordable launch services for small satellites bound for Low Earth Orbit. Headquartered in El Segundo, California, VOX Space can provide study, analysis, integration, and launch services using Virgin Orbit's LauncherOne, while ensuring customers' critical information is protected.



THE LAUNCHERONE ROCKET

LAUNCHERONE

- **70 FT** in length
- **57,000 LBM** is the typical takeoff weight of a LauncherOne rocket, including the satellites
- **8,000 MPH** is the typical maximum speed of LauncherOne's first stage
- **17,500 MPH** is the typical maximum speed of LauncherOne's second stage
- **99+%** is manufactured in the USA
- **75%** of atmosphere that LauncherOne has cleared at the point of release
- **5 SEC** is the time between release of LauncherOne and ignition of NewtonThree



NEWTONTHREE

- **3 MIN** run time
- **75,000 LBF** vacuum-equivalent thrust



NEWTONFOUR

- **6 MIN** run time
- Completed in **2 BURNS** to allow circularization of the desired orbit
- **5,000 LBF** of thrust

PAYLOAD

- **650-1,100 LBM** is the typical mass of satellites we deliver to orbit on each flight
- **310-745 MI** is the typical altitude at which we deploy our customers' satellites



TERMS TO KNOW

- **Cosmic Girl:** Virgin Orbit's 747-400 carrier aircraft, procured from the fleet of Virgin Atlantic
- **Ground support equipment (GSE):** The set of mobile trailers Virgin Orbit uses for ground operations before takeoff, including propellant loading
- **Hammerhead:** The staging area on the runway where Virgin Orbit sets up our mobile ground support equipment
- **Low Earth Orbit (LEO):** The region between 400 and 1,000 miles above Earth
- **LOX:** Liquid oxygen, which we use as the oxidizer for LauncherOne
- **Payload:** What is being sent into orbit, generally a satellite
- **Pylon:** The structural mechanism that hooks LauncherOne to Cosmic Girl's wing
- **Rapid Agile Launch Initiative (RALI):** The Space Test Program (STP) Rapid Agile Launch Initiative (RALI) is a project initiated in response to Congressional guidance to procure prototype commercial small launch capabilities rapidly. By using the Other Transaction Authority (OTA) competitive process, STP was able to award contracts for small launch services to non-traditional companies. The intent of RALI is to provide prototype commercial small launch services capable of taking research and development payloads into Low Earth Orbit (LEO).
- **RP-1:** Rocket Propellant-1 – a highly refined form of kerosene which we use as the fuel for LauncherOne
- **Small satellites:** Satellites of low mass and size, usually less than 1,100 lb





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