



**STRAIGHT
UP**



PRESS GUIDE

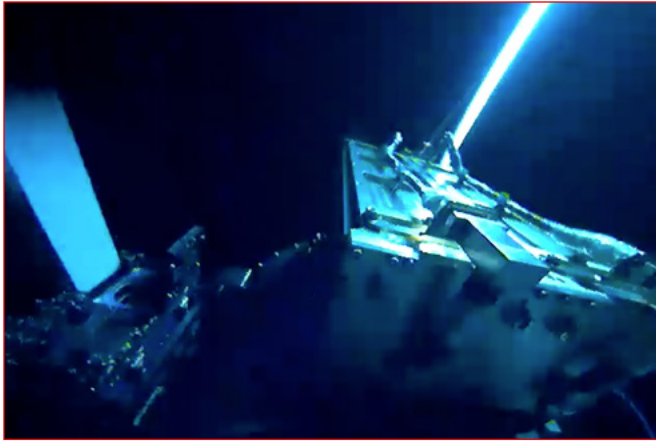
JUNE 2022

“STRAIGHT UP NOW
TELL ME, DO YOU REALLY
WANT TO LOVE ME
FOREVER...”

—“STRAIGHT UP,” PAULA ABDUL



Virgin Orbit's Cosmic Girl and LauncherOne rocket in mid-air during the company's *Above the Clouds* mission in January 2022.



The curvature of the Earth as seen from a camera onboard LauncherOne's upper stage during Virgin Orbit's *Above the Clouds* mission. January 2022.



Virgin Orbit's LauncherOne rocket ignites in mid-air during the company's *Above the Clouds* mission in January 2022.



Virgin Orbit's carrier aircraft Cosmic Girl flies along the racetrack towards its drop point during the *Above the Clouds* mission on January 2022.



Launch Engineers Sara Barnes (left) and Bryce Schaefer (right) inside Cosmic Girl during the *Above the Clouds* mission on January 2022.



Pilot in Command Eric Bippert and Second in Command Pilot Mathew "Stanny" Stannard make pre-flight preparations on Virgin Orbit's carrier aircraft Cosmic Girl in January 2022.



LauncherOne is mated to the wing of Cosmic Girl at Mojave Air and Space Port. November 2021.

MISSION OVERVIEW

Building on its record of successfully executed launches, Virgin Orbit has entered flight preparation mode for its forthcoming mission, *Straight Up*. The mission will support the United States Space Force and the U.S. Department of Defense's Space Test Program. Originally built at our state-of-the-art rocket factory in Long Beach, California, the rocket has arrived at the Mojave Air and Space Port, completed a full launch rehearsal, and has been mated to Cosmic Girl, the customized 747 aircraft that serves as our flying and fully reusable launch pad. Cosmic Girl also conveniently houses our mobile Mission Control Center onboard.

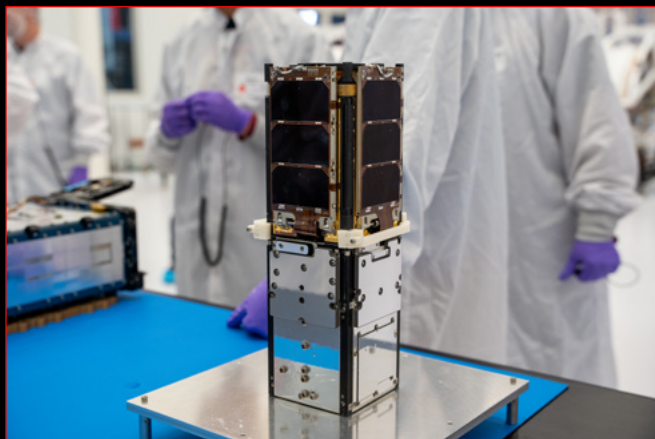
On the *Straight Up* mission, the U.S. Space Force will launch seven (7) satellites provided by multiple government agencies that will conduct experiments in space-based communications, in-space navigation, and climate change. This mission, also known as STPS28A, was awarded to Virgin Orbit through our subsidiary Virgin Orbit National Systems by the U.S. Space Force Rocket Systems Launch Program (RSLP) as part of the Orbital Systems Program 4 (OSP-4)

Indefinite Delivery Indefinite Quantity (IDIQ) program. The objective of the OSP-4 program is to provide flexible small launch capability using commercially designed launch systems designed to meet a variety of mission and Space Vehicle (SV) requirements.

U.S. Space Force has procured this launch for the Rocket Systems Launch Program (RSLP), with payloads provided by the DoD Space Test Program (STP).

The experiments on this mission will attempt to demonstrate novel modular satellite bus, space domain awareness, adaptive radio frequency technologies, and explore climate change. STP-S28A was awarded to Virgin Orbit National Systems in April 2020 by the United States Space Force as a three (3) launch mission. The *Straight Up* launch will support the first of these launches, the STP-S28A mission.

The target orbit is 500km above the Earth's surface at 45 degrees inclination – an orbit that no other launch system has reached from the West Coast.



BEHIND THE NAME *STRAIGHT UP*

The launch name, *Straight Up*, pays homage to American singer Paula Abdul's breakthrough hit "Straight Up," from her debut studio album *Forever Your Girl*. Released through Virgin Records on June 21, 1988, it was the most successful debut album ever at the time of its release. The iconic dance-pop tune propelled Abdul to mega stardom and remains as fresh and relevant as ever. In addition to being the name of a song we love, *Straight Up* is also one of the key values of Virgin Orbit and of the global Virgin Family.



MISSION EMBLEM

MISSION OVERVIEW

With *Straight Up*, LauncherOne will carry seven payloads to an orbit that no other launch system has reached from the West Coast, supporting the United States Space Force and the U.S. Department of Defense.

MISSION NUMBER

Straight Up will be the company's fifth mission with LauncherOne. The number 5 on this launch emblem has been placed in a heart as an homage to Paula Abdul's *Forever Your Girl* album cover artwork.



ICONS

The fence image used in the emblem references Abdul's iconic video for the *Straight Up*. The memorable video for the song was shot in black and white, hence the coloration of the emblem. We also included the company's hallmark, Virgin-red accents. A Joshua Tree appearing on the emblem pays tribute to the company's Mojave Desert launch site whereas the seven (7) stars in the sky represent the number of satellites the mission will carry. And Leaves of Laurel are Virgin Orbit's good luck symbol!

LAUNCH DETAILS

TIMING

We anticipate *Straight Up* will launch no earlier than June 29. As always, we will only proceed with the mission if all conditions for launch are agreeable. If, for some reason, the launch is delayed, we have backup launch dates planned.

LAUNCH SITE

Virgin Orbit's fully mobile LauncherOne system will conduct the flight from a bare concrete pad at the Mojave Air and Space Port in California.

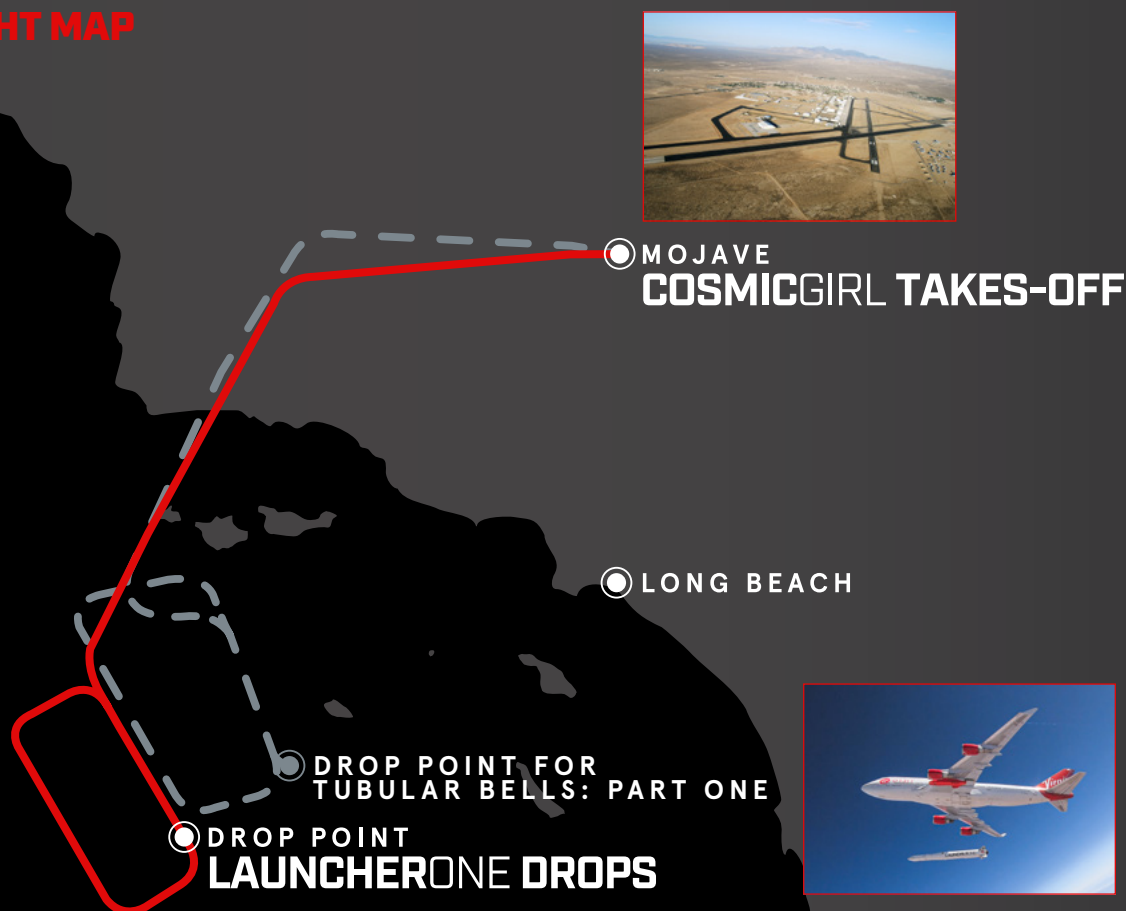
TARGET ORBIT

Payloads will be inserted at an altitude of 500km above the Earth's surface at 45 degrees inclination. This will be only the second time in history that such an orbit has been reached from the West Coast of the Americas – with the first such occasion being our *Above the Clouds* mission in January 2022.

KEEPING UP WITH THE ACTION

More information will be shared in the news over the coming weeks, with real-time updates to be provided via social media and a public livestream. This orbital test flight will be livestreamed on youtube.com/virginorbit and we will Tweet real-time updates on our Twitter account: [@virginorbit](https://twitter.com/virginorbit). After the launch, keep up with continued progress by subscribing to our newsletter and following our social channels.

FLIGHT MAP



OUR PEOPLE

WHO YOU GONNA CALL?

For more information or to set up media interviews,
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KEY PERSONNEL



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DAN HART

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Virgin Orbit National Systems
President



TONY GINGISS

Virgin Orbit
Chief Operating Officer



KIRK PYSHER

Vice President
Safety & Mission Assurance



TYLER GRINNELL

Vice President of Launch



OMAR R HERNANDEZ

Virgin Orbit National Systems
STP-S28A Mission Manager



ERIC BIPPERT

Pilot in Command



MATHEW "STANNY" STANNARD

Second in Command Pilot



BRYCE SCHAEFER

Launch Director



SARAH BARNES

Launch Engineer



DAYLE ALEXANDER

Launch Engineer

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](#).

VIRGIN ORBIT NATIONAL SYSTEMS

Virgin Orbit National Systems is a US-incorporated, wholly-owned subsidiary of Virgin Orbit, LLC. It 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, Virgin Orbit National Systems can provide study, analysis, integration, and launch services using Virgin Orbit's LauncherOne, while ensuring our customer's critical information is protected.



PAYLOADS

- **Compact Solar Total Irradiance Monitor** with VACNT ESR detector head, embedded processor, silicon ion-etched precision apertures, to enable maturation of the new ESTO-funded technology into a fully qualified, 6U CubeSat system and demonstrate science performance validated against existing TSIS-1 TIM TSI capabilities.
- **GPX2** is a technology demonstration mission that will provide a novel testbed for Commercial-Off-the-Shelf (COTS) differential global positioning systems (dGPS) to enable future on-orbit assembly, docking, and formation-flying small satellite missions. While on-orbit, GPX2 will assess the capability of multi-frequency COTS dGPS receivers.
- **Gunsmoke-L** will produce two tactical space support vehicles (TSSVs), which will aid in all phases of joint force operations.
- **Modular ISR (MISR) Satellite** program is intended to demonstrate a robust, responsive, multi-mission CubeSat capability to satisfy a varied set of requirements. The MISR-B CubeSats are the second in the series of missions to demonstrate various capabilities and mission effectiveness.
- **NACHOS-2** will allow scientists to detect, map, and quantify Earth's dilute gases more easily, which is critical for learning about everything from volcanology to climate change. The 3U NACHOS-2 CubeSat is the second in the series. Coordinated NACHOS-1 and NACHOS-2 operations will help researchers determine whether constellations of CubeSats could gather and process high-resolution imaging data as efficiently as larger, single-platform satellites.
- **Recurve** pushes CubeSat technology forward by demonstrating adaptive radio frequency (RF) capability from a Low Earth Orbit (LEO) platform. The demonstration evaluates mesh network behavior across multiple nodes in multi-platform to prove that diverse nodes can cooperate efficiently to route data wherever the warfighter is located.
- **Slingshot 1** is a program developed by The Aerospace Corporation to use a commercial 12U CubeSat as a demonstration platform for new technologies resulting from internal research and development. A key component of Slingshot 1 is the use of modular technologies to speed up system development thus allowing for faster innovation.



THE LAUNCHERONE ROCKET

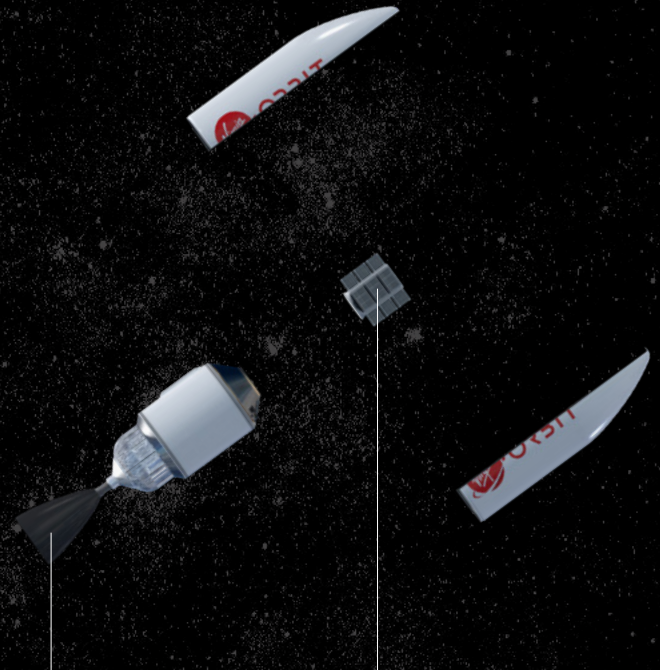
LAUNCHERONE

- **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

- **LEO:** Low Earth Orbit is the region between 400 and 1,000 miles above Earth.
- **RSLP:** The Rocket Systems Launch Program is responsible for providing suborbital launch capability for various governmental organizations, including the DoD , NASA, and the Intelligence Community (IC).
- **OSP-4:** A 9-yr Indefinite Delivery Indefinite Quantity (IDIQ) program with the objective to provide flexible small launch capability using commercially-designed launch systems to meet a variety of mission and Space Vehicle (SV) requirements.
- **STP:** The Space Test Program, chartered by the Office of the Secretary of Defense, provides access to space for the DoD-wide space Research and Development teams.
- **STP-S28A:** Code for the *Straight Up* launch.





ORBIT

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