CATCH ME IF YOU CAN

PRESS KIT | NET NOV 04 UTC

Rocket Lab USA, Inc.
rocketlabusa.com

ROCKETLAB

LAUNCH INFORMATION

LAUNCH WINDOW

Rocket Lab is targeting no earlier than Nov 4 UTC / Nov 5 NZDT for the launch.

DAILY LAUNCH OPPORTUNITY

Target Launch Time:

Time Zone	Window Open
NZDT (Nov 05)	06:15-07:30
UTC (Nov 04	17:15-18:30
ET (Nov 04)	13:15-14:30
MT (Nov 04)	11:15-12:30
PT (Nov 04)	10:15-11:30
CET (Nov 04)	18:15-19:30

The launch timing for this mission remains the same each day, and lasts one hour fifteen minutes.

RECOVERY MISSION

Electron Stage-1 Booster to be captured by recovery helicopter.

LAUNCH SITE

LC-1 B

Mahia, New Zealand

ORBIT

585km

Sun Synchronous

SATELLITES

1

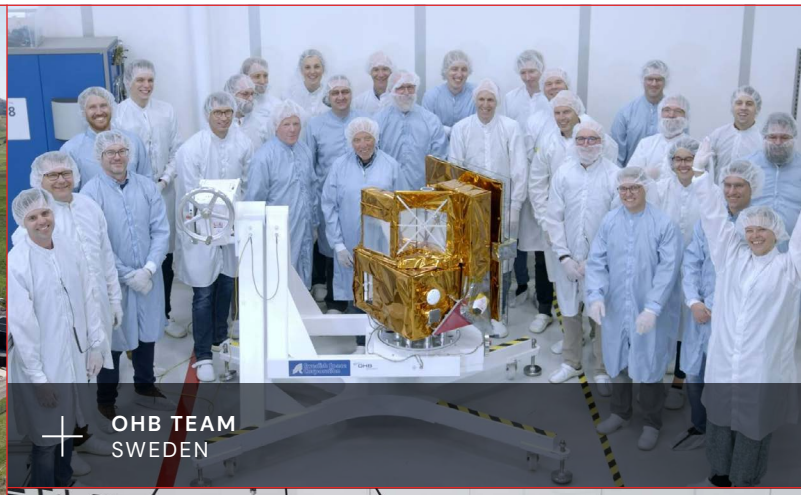
MISSION TYPE

Recovery

MISSION OVERVIEW

About 'Catch Me If You Can'

LAUNCH COMPLEX 1
MAHIA, NEW ZEALAND



OHB TEAM
SWEDEN

PAYLOAD INTEGRATION
MAHIA, NEW ZEALAND

Launching from Pad B at Rocket Lab Launch Complex 1 on New Zealand's Mahia Peninsula, the "Catch Me If You Can" mission will be Rocket Lab's 32nd Electron launch overall and second reusability mission of 2022.

Electron will carry a science research satellite by space systems provider OHB Sweden for the Swedish National Space Agency (SNSA). The Mesospheric Airglow/Aerosol Tomography and Spectroscopy (MATS) satellite is the basis for the SNSA's science mission to investigate atmospheric waves and better understand how the upper layer of Earth's atmosphere interacts with wind and weather patterns closer to the ground. MATS was originally due to fly on a Russian launch service before the mission was manifested on Rocket Lab's Electron.

The Swedish National Space Agency, SNSA, is a central governmental agency under the Ministry of Education and Research. SNSA is responsible for national and international activities relating to space and remote sensing, primarily research and development.
The mission's science partner is the Department of Meteorology at Stockholm University (MISU).

MATS
Mesospheric Airglow/Aerosol Tomography & Spectroscopy

Rymdstyrelsen
Swedish National Space Agency

LAUNCH, CATCH, LAUNCH AGAIN

Making Electron the world's first reusable small rocket

In an effort to increase launch opportunities and reduce manufacturing costs, Rocket Lab is evolving Electron into the world's first and only reusable and operational small rocket.

Using a modified Sikorsky S-92 large helicopter, Rocket Lab will attempt to capture the Electron rocket's first stage mid-air as it returns from space after launch.

The Electron booster will release a parachute to slow down its descent over the ocean, before the helicopter attempts to catch and secure it by the parachute line. From there, the stage will be transported back to Rocket Lab's production complex in New Zealand where it will be assessed for possible re-flight.

HERE'S HOW WE'LL DO IT

'CATCH ME IF YOU CAN' MISSION PROFILE

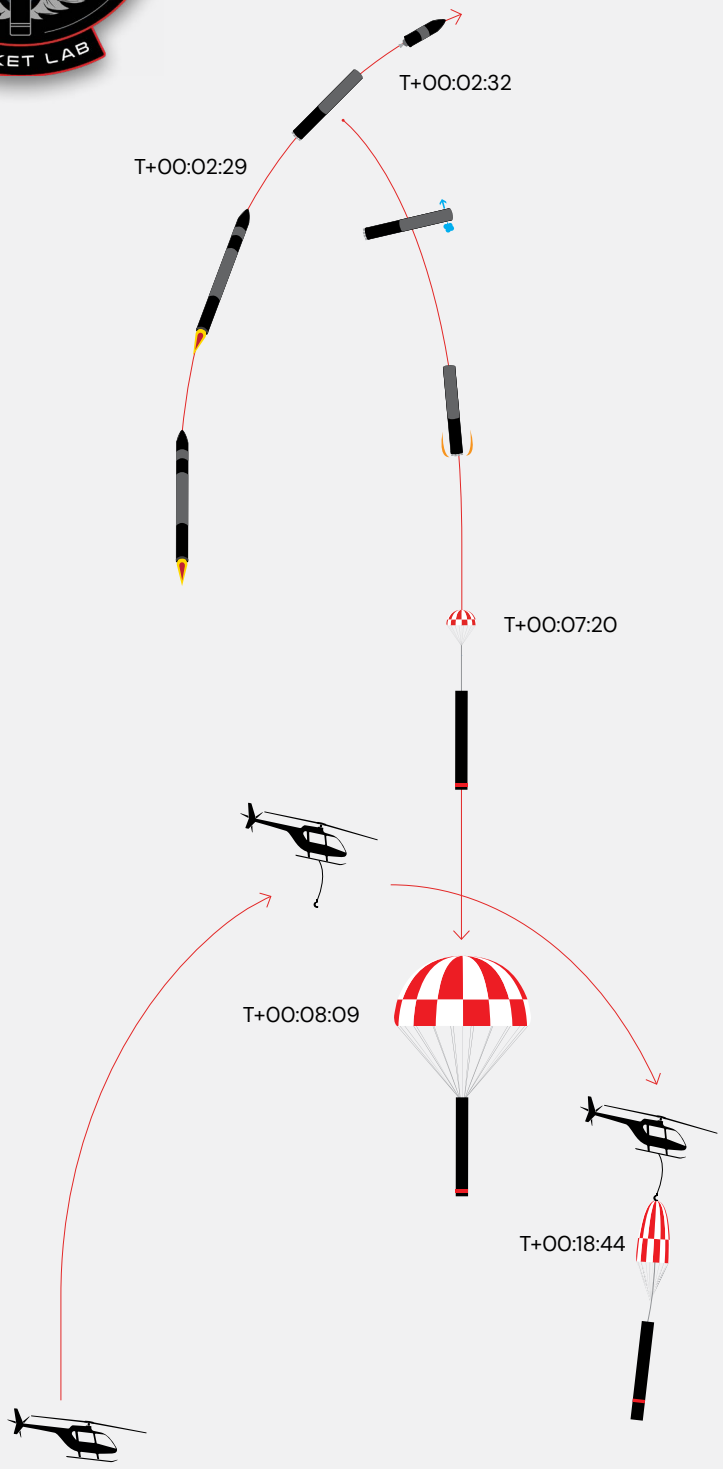
Shortly before lift-off, the customized Sikorsky S-92 recovery helicopter will deploy to the capture zone at sea, approximately 160 nautical miles off New Zealand's Banks Peninsula.

Once launched, Electron's first and second stages will separate at approximately **T+2:32** minutes into the mission. The MATS payload will continue to orbit onboard the rocket's second stage while Electron's first stage descends back to Earth. At this point in the mission, Electron's return is expected to reach speeds of up to 8,300km (5,150 miles) per hour and temperatures of up to 2,400 degrees C (4,352 F).

At approximately **T+7:20** minutes after lift-off, Electron's first parachute will deploy followed shortly after by the rocket's main parachute. The double deployment of parachutes helps to slow the returning first stage to 0.4% of its top speed during descent: from 8,300km per hour to just 36km per hour.

As Electron enters the capture zone, Rocket Lab's recovery helicopter will match the rocket's speed and descent from above, attempt to secure the trailing parachute engagement line to the helicopter via a hook at the end of a long line.

Once captured and secured, Electron will be transported back to land and to Rocket Lab's Auckland Production Complex. There, technicians will receive and prepare the stage for inspection to assess its suitability for re-use.



ROCKET LAB'S BIRD IN THE SKY

950 KM	306 KM/H	20.8 M	5.47 M
Range	Top Speed	(68 ft 6 in) Length	(17 ft 11 in) Height
7,070 KG	12,837 KG	2	1,879 KW
Weight	Max Takeoff Weight	Turboshaft Engines	Engine Power (each)

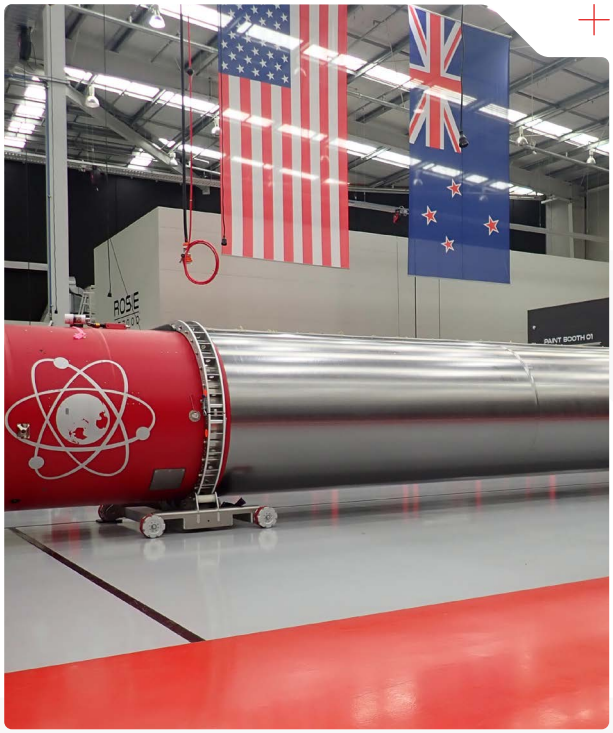
The Sikorsky S-92 is an American-made twin-engine helicopter built by Sikorsky Aircraft in Connecticut.

Primarily used in the oil and gas industry for personnel transport, the Sikorsky S-92 has accumulated more than two million flight hours across its global fleet. The Sikorsky S-92 has also completed more than 91,000 search and rescue missions, as well as coastal and border control, emergency response, disaster relief, and Head of State and airline missions – and now, Electron rocket catching over the South Pacific Ocean.

The helicopter flies with a crew of three: a pilot, a co-pilot, and rocket spotter. Capable of lifting up to 5,000 kg, the Sikorsky S-92 was logical helicopter choice to be able to catch and hold the 1,000 kg Electron rocket booster on its way back down to Earth. In order to complete its rocket-catching mission, the Sikorsky S-92 has also been modified to include extended range fuel tanks for open ocean flights; a capture hook on a long-line to catch the parachute line attached to Electron's booster; additional cargo; pilot assists for recovery operations, including a bubble window to better see the returning rocket and displays with position and direction information for the intercept; and other minor modifications.

THE ROAD TO REUSABILITY

We've successfully achieved some major mission milestones on the path to evolving Electron into the world's first reusable small orbital launch vehicle.



Initial Hardware Updates

To reuse Electron, first we need it back in good condition. The booster returns to Earth under extreme heat and at high speeds and to help it survive this gruelling descent, we introduced several new features to Electron for our first guided, full telemetry return on our 10th Electron launch in 2019.

Reusability changes included guidance and navigation hardware, S-band telemetry and on-board flight computer systems, and a reaction control system to maneuver the first stage correctly to better protect its Rutherford engines and survive the journey back to Earth.

Mid-Air Recovery Tests

Once we knew it was possible to bring Electron back, we took it over the ocean with a helicopter as one of our many mid-air capture tests.

These tests involved dropping an Electron simulator with a parachute from a helicopter, before a second helicopter swooped in and caught it mid-air at around 5,000 ft, using a specially-designed hook to snag the parachute's drogue line and bring it back to land while the simulator was suspended to the helicopter below.

Completing these tests firmed up our recovery team's helicopter operations in preparation for the real thing. Next was bringing back an Electron booster to the production complex to better understand its condition after launch and what our team would be dealing with.

THE ROAD TO REUSABILITY

Recovered Stages

Return to Sender and Running Out of Toes Missions: November 2020 and May 2021

Across two commercial missions – Return To Sender and Running Out Of Toes – we packed the parachute on Electron and monitored its descent under parachute to the ocean after launch. Guiding the Electron booster's return with parachutes for controlled water landings allowed our team to retrieve them from the ocean – without parachutes, there would be nothing to collect. Twice in six months our recovery ship returned Electron boosters from the ocean and back to our production complex, where our engineers studied their condition and how they fared in preparation for bringing one back by helicopter instead.

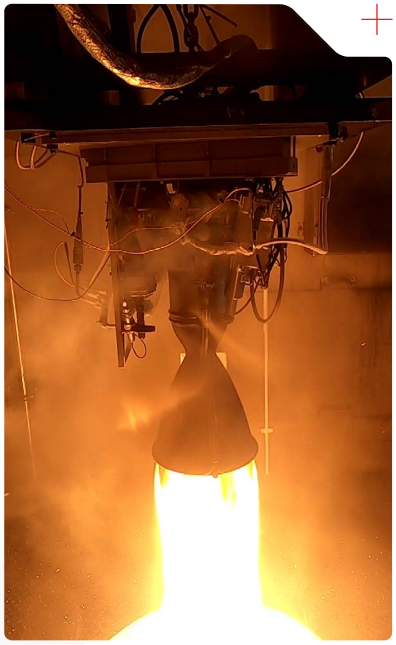
Bringing in the Sikorsky Helicopter

The helicopter for the job is a customized Sikorsky S-92, a large twin-engine helicopter big enough to fly the distance to the capture zone and strong enough to transport a rocket underneath it.

In May 2022, we used it to make a mid-air capture of Electron with a helicopter for the first time.

After launching to space, Electron's first stage returned to Earth under a parachute. At 6,500 ft, our Sikorsky shadowed the stage's descent and used a hook on a long line to catch it by the parachute line – a highly complex operation that demands extreme precision.

Successfully demonstrating on the very first attempt that we can do what we set out to do, helicopter operations are here to stay for future Electron recovery attempts.

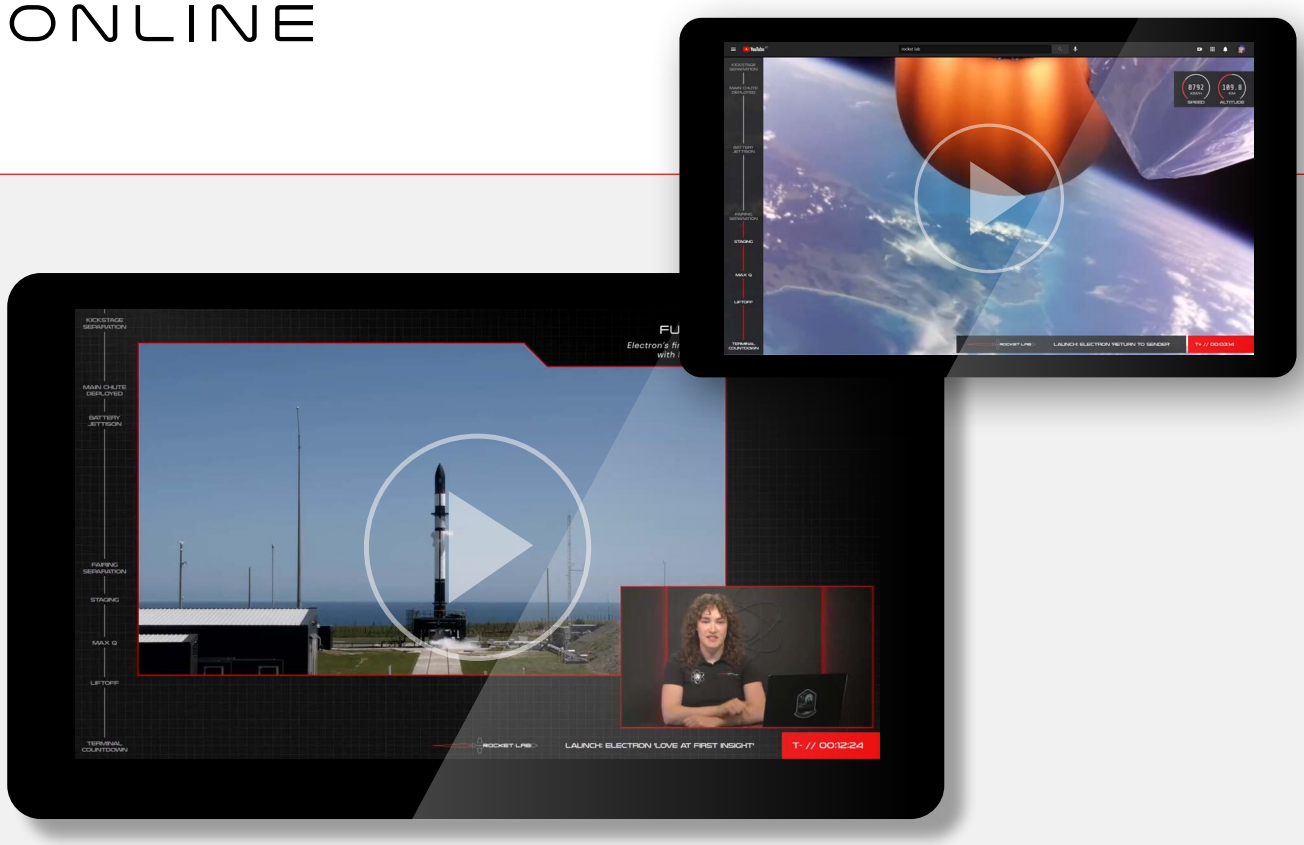


Engine Relight

Speaking of reusability, we proved our Rutherford engines are up to the task when we successfully fired up a reused engine from the There And Back Again recovery mission in 2022. The refurbished engine passed all of the same rigorous acceptance tests we perform for every launch engine, including 200 seconds of engine fire and multiple restarts. Data shows the engine produced full thrust of 21kNs within 1000 milliseconds of ignition and performed to the same standard of a newly-built Rutherford engine.

Being able to refly Electron without too much rework is the aim of the game. If we can achieve high level performance with engine parts recovered from the ocean, imagine what we can do with returned dry engines.

VIEWING A LAUNCH ONLINE



LIVE STREAM LINKS

The livestream is viewable at:

rocketlabusa.com/live-stream

Webcast will be live approx. T-20 minutes

LAUNCH FOOTAGE & IMAGES

Images and footage of "Catch Me If You Can" launch will be available shortly after a successful mission at:

www.flickr.com/photos/rocketlab

UPDATES

For information on launch day visit:

rocketlabusa.com/next-mission

FOLLOW ROCKET LAB:

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facebook.com/RocketLabUSA

VIEWING A LAUNCH IN PERSON

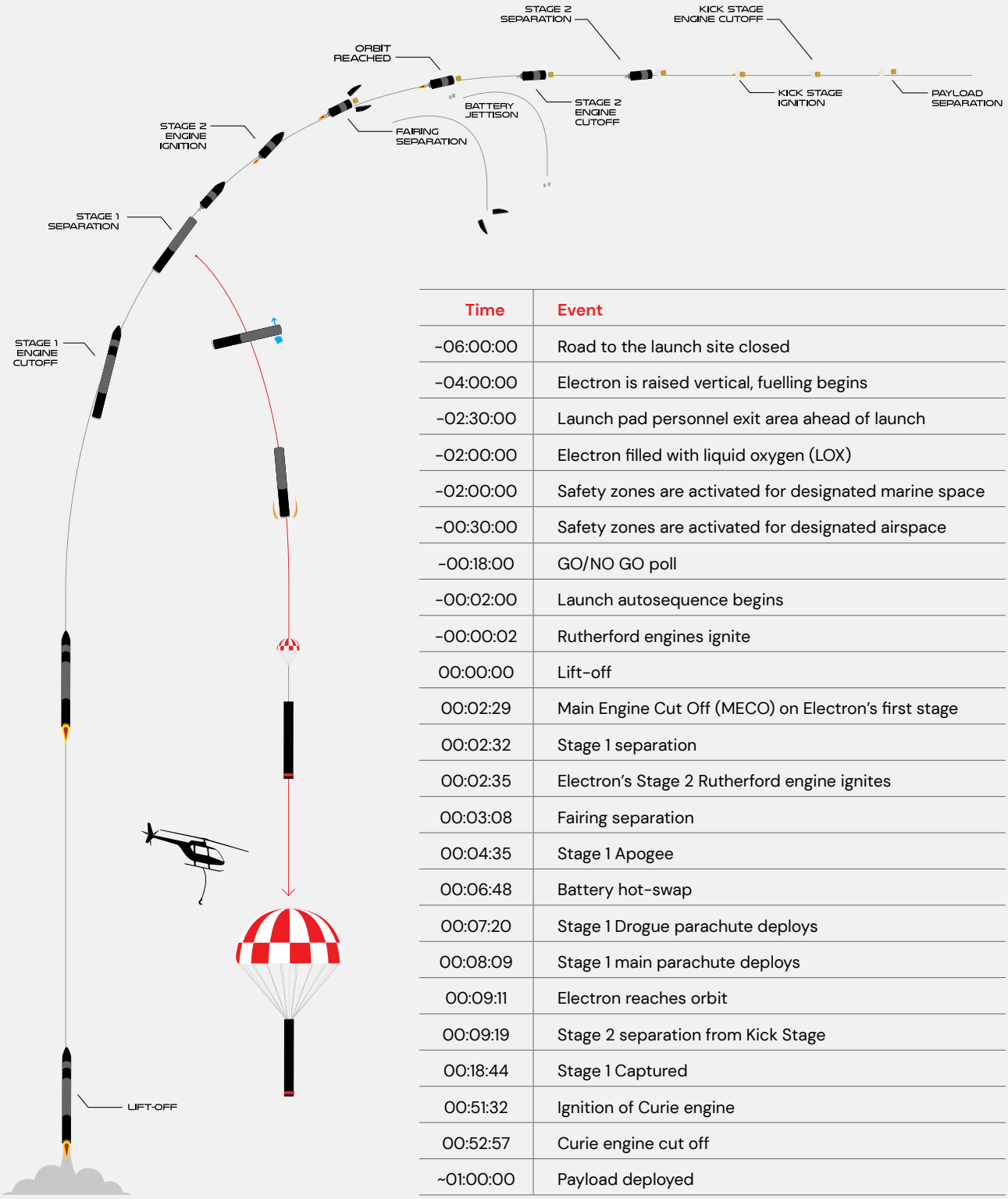
Location

Wairoa District Council has allocated a rocket launch viewing area for the public near Nuhaka, accessible via Blucks Pit Road. Scrubs and postponements are likely during launch windows, so visitors to the Blucks Pit viewing site should anticipate multiple postponements, sometimes across several days.

More information visit

www.visitwairoa.co.nz/welcome-to-wairoa/space-coast-new-zealand

TIMELINE OF LAUNCH EVENTS



Time	Event
-06:00:00	Road to the launch site closed
-04:00:00	Electron is raised vertical, fuelling begins
-02:30:00	Launch pad personnel exit area ahead of launch
-02:00:00	Electron filled with liquid oxygen (LOX)
-02:00:00	Safety zones are activated for designated marine space
-00:30:00	Safety zones are activated for designated airspace
-00:18:00	GO/NO GO poll
-00:02:00	Launch autosequence begins
-00:00:02	Rutherford engines ignite
00:00:00	Lift-off
00:02:29	Main Engine Cut Off (MECO) on Electron's first stage
00:02:32	Stage 1 separation
00:02:35	Electron's Stage 2 Rutherford engine ignites
00:03:08	Fairing separation
00:04:35	Stage 1 Apogee
00:06:48	Battery hot-swap
00:07:20	Stage 1 Drogue parachute deploys
00:08:09	Stage 1 main parachute deploys
00:09:11	Electron reaches orbit
00:09:19	Stage 2 separation from Kick Stage
00:18:44	Stage 1 Captured
00:51:32	Ignition of Curie engine
00:52:57	Curie engine cut off
~01:00:00	Payload deployed

ELECTRON LAUNCH VEHICLE

OVERALL

LENGTH
18m

DIAMETER (MAX)
1.2m

STAGES
2 + Kick Stage

VEHICLE MASS (LIFT-OFF)
13,000kg

MATERIAL/STRUCTURE
Carbon Fiber Composite/Monocoque

PROPELLANT
LOX/Kerosene

PAYLOAD

NOMINAL PAYLOAD
320kg / 440lbm To 500km

FAIRING DIAMETER
1.2m

FAIRING HEIGHT
2.5m

FAIRING SEP SYSTEM
Pneumatic Unlocking, Springs

STAGE 2

PROPULSION
1x Rutherford Vacuum Engine

THRUST
5800 LBF Vacuum

ISP
343 Sec

INTERSTAGE

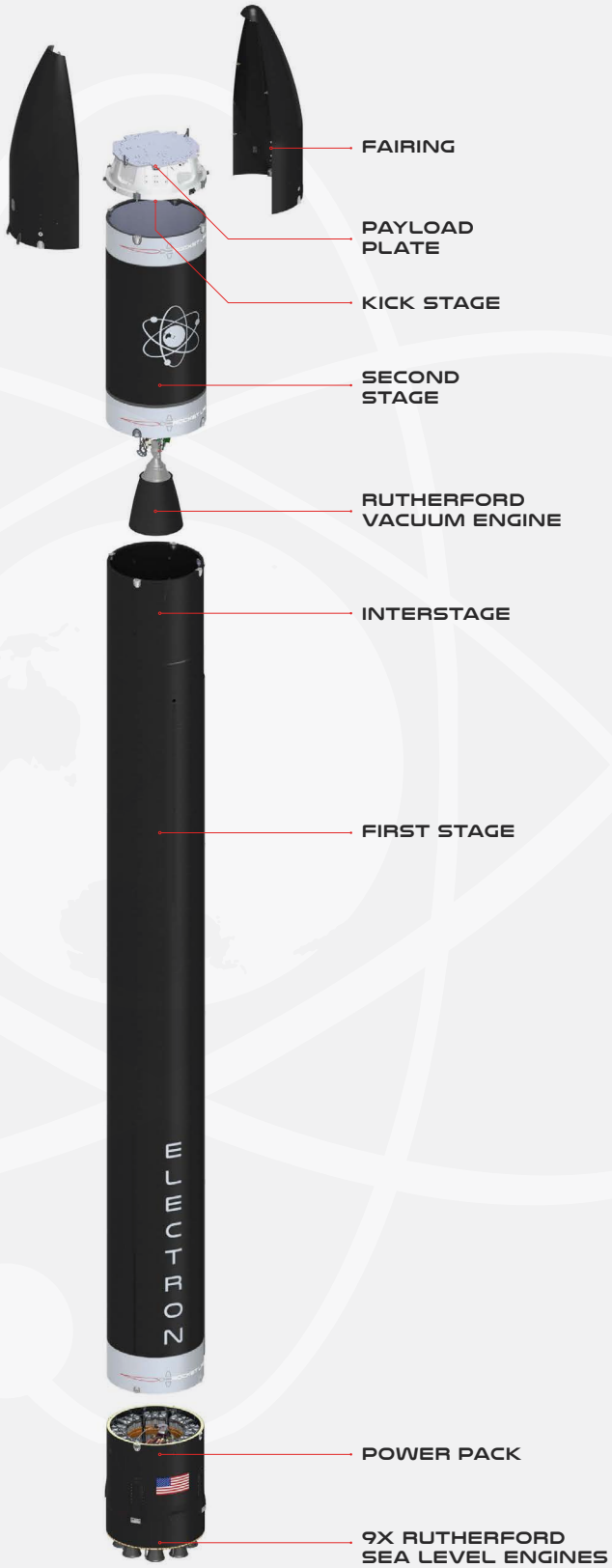
SEPARATION SYSTEM
Pneumatic Pusher

STAGE 1

PROPULSION
9x Rutherford Sea Level Engines

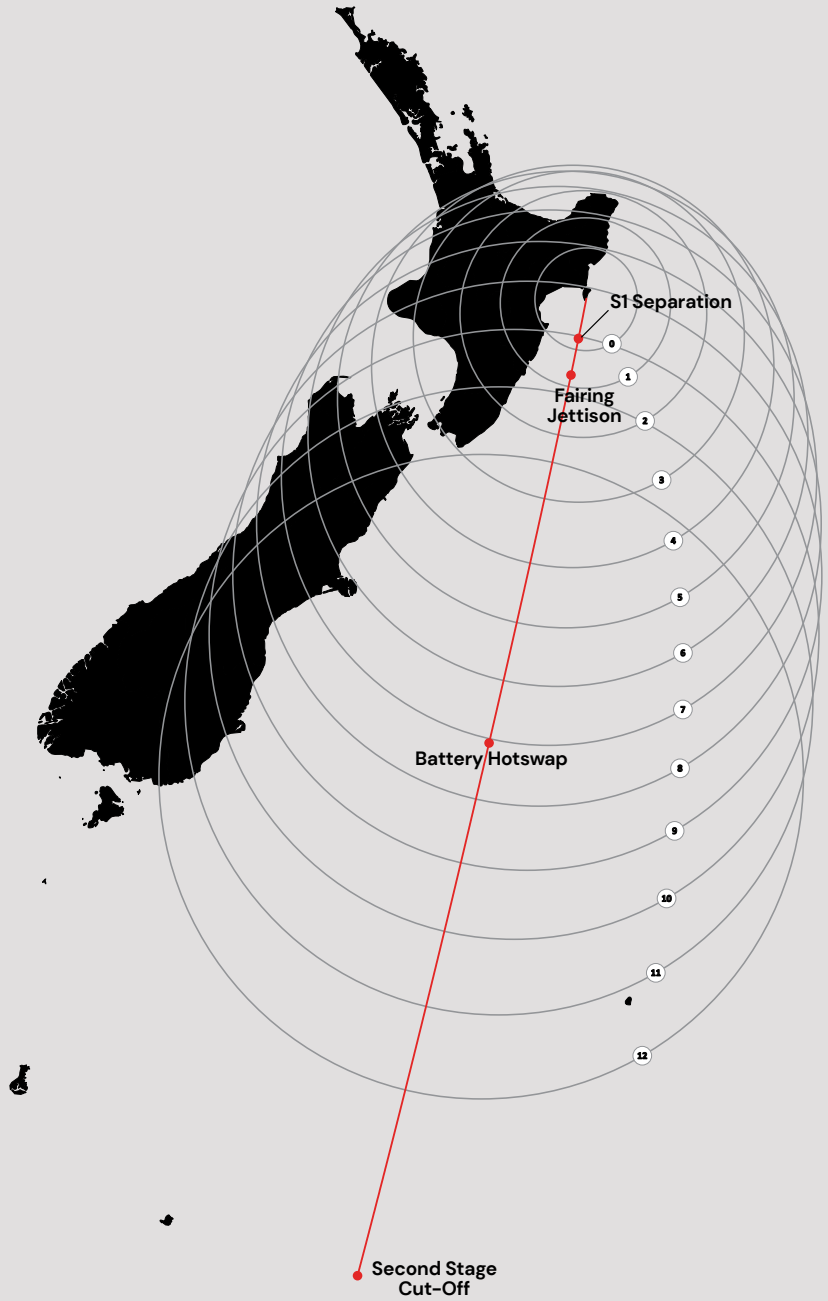
THRUST
5600 LBF Sea Level (Per Engine)

ISP
311 Sec



LAUNCH VISIBILITY MAP

When and where to spot the launch



Note:
Numbers apply to the centre of the circle.

Marker	Mission Time
1	T+ 01:00
2	T+ 01:30
3	T+ 02:00
4	T+ 02:30
5	T+ 03:00
6	T+ 03:30
7	T+ 04:00
8	T+ 04:30
9	T+ 05:00
10	T+ 05:30
11	T+ 06:00
12	T+ 06:30

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