



MK-II AURORA

ROCKET-POWERED AIRCRAFT



ABOUT - Dawn Aerospace is a space transportation company with operations in New Zealand, the Netherlands, and the United States.

Since its founding in 2017, Dawn Aerospace has established itself as a proven supplier of innovative satellite propulsion systems and its rocket-powered aircraft. Dawn's unique propulsion technology has already powered dozens of satellites in orbit and over 50 flight tests of the Mk-II Aurora.



**Boost Glide to
Mach 3.5**

**100 km
Altitude**

**Certified Unmanned
Operations**

Version 1.1 - This brochure outlines the current vision and initial specifications for the Mk-II rocket-powered aircraft, developed by Dawn Aerospace. Please note that as development, testing, and feedback shape our project, the Mk-II's features, specifications, and capabilities may change. Dawn Aerospace does not have an obligation to notify of such changes. Be aware that some images may showcase our technology demonstrator or prior vehicle iterations and designs, not the final Mk-II, reflecting our commitment to innovation as our design progresses. This brochure is provided without warranties.

For the most up-to-date information, modifications, and enhancements to the Mk-II, we encourage referencing the final proposal documentation and direct communication with our team. Your support and interest are invaluable as we advance aerospace technology together.

DAWN MK-II AURORA

A SUBORBITAL AIRCRAFT

The Mk-II is a reusable, rocket-powered, suborbital aircraft that brings the performance of an expendable rocket to the versatility, reliability, and same-day reusability of an aircraft platform.

The Mk-II enables unparalleled high-frequency access to high-speed and high-altitude flight, far beyond the limitations of the atmosphere, and previously only seen on government programs of the 1960's, such as the X-15.

With this capability, the Mk-II is set to become an indispensable platform for research, defense, education, emergency response and much more.



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A VANTAGE POINT BEYOND THE ATMOSPHERE

The Mk-II has a total delta V performance of 2900 m/s, delivered as required to meet a variety of mission needs and flight profiles:

- Boost-glide to the upper atmosphere and edge of space, 100 km altitude, or target specific atmospheric layers
- Maintaining specific Mach number or dynamic pressure profiles
- Specific gravity profiles such as Moon or Mars gravity
- High-speed and low-altitude passes to simulate missile trajectories

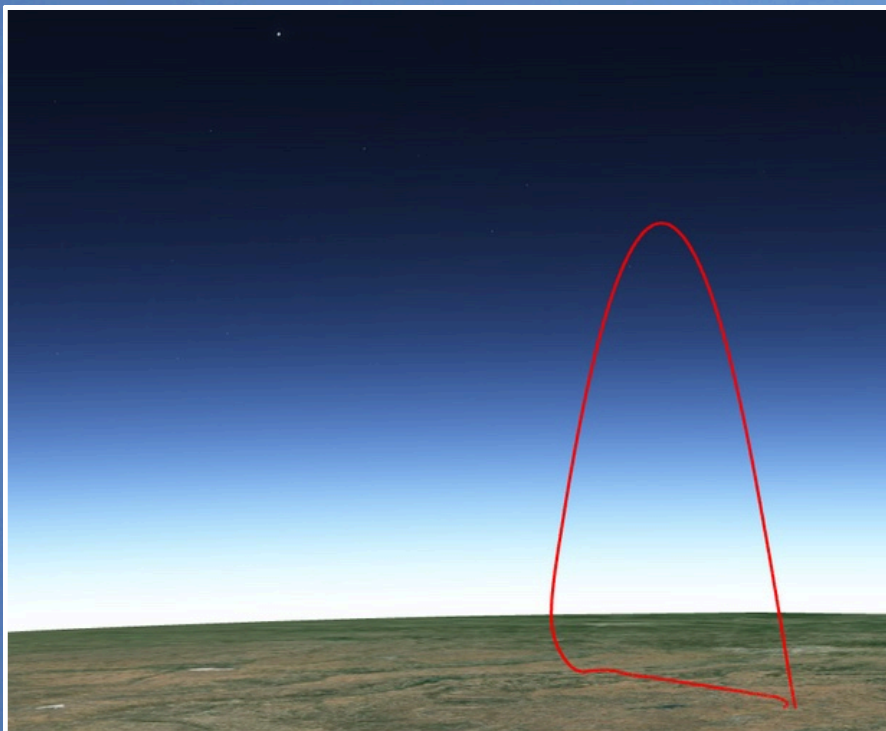
Trajectory - Customizable

Maximum altitude - Up to 100 km (330,000 ft)

Maximum speed - Up to Mach 3.5

Maximum range - 300 km (185 miles)

Microgravity duration - Up to 3.5 minutes



FLY TO SPACE TWICE IN ONE DAY

Features

- Rapidly reusable - within 3 hours
- Remotely-piloted with autonomous capability
- Fully self-contained operations
- Operable from a 1000 m runway
- Redundant elevons and communications link

Characteristics

- **Length** - 4.8 m
- **Wingspan** - 2.4 m
- **MTOW** - 400 kg
- **Powerplant** - Liquid bi-propellant engine
- **Construction** - Carbon fiber primary structure

Dedicated Payload Bay

- Realtime data downlink
- Instrument access to external environment
- Optical window
- Payload deployment possible
- Accessible within 15 minutes of landing



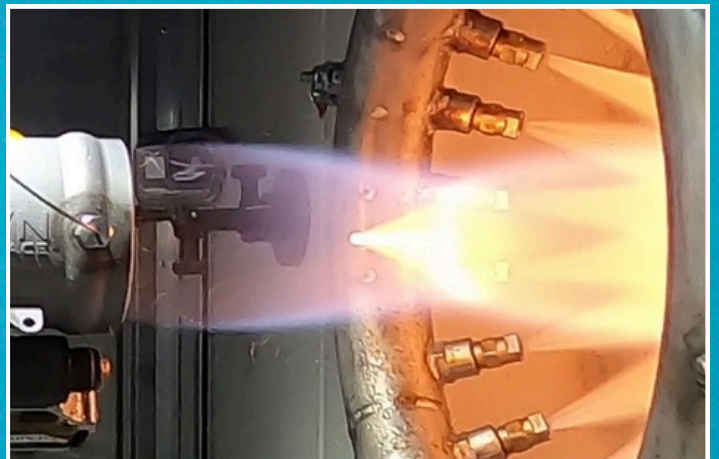
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PERFORMANCE AT ANY ALTITUDE

To fly beyond the limitations of the atmosphere, the Mk-II is equipped with a bi-propellant rocket engine and a reaction control system.

Operational flexibility, ideal for responsive operations, is obtained through the use of storable propellants; hydrogen peroxide and kerosene.

Precise pilot control and flight profile customization is enabled by throttling capability from 30 - 100% of maximum thrust.



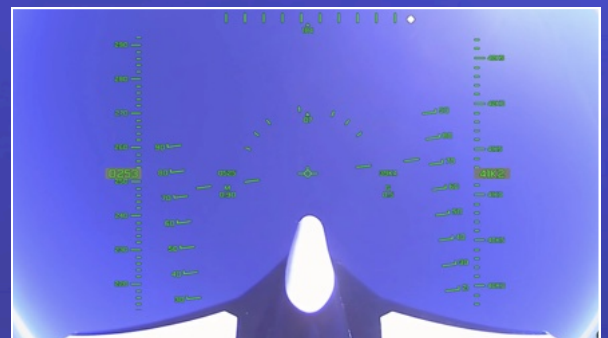
SAFETY AND RELIABILITY

The Mk-II is designed to meet international regulatory standards. It can be certified as an experimental or operational aircraft.

The Mk-II possesses breakthrough capabilities for an uncrewed aerial vehicle including operating beyond visual line of sight in integrated airspace.

High reliability by design.

- Dual redundant communications via S-Band, VHF, SATCOM (optional)
- Dual redundant video feeds
- Redundant control surfaces



RAPID RESPONSE - A UAS FROM THE ULTIMATE HIGH GROUND

The Mk-II offers a new vantage point for precise reconnaissance, which is complementary to existing UAS and satellite systems.

From “go” command to a 100 km apogee in less than five minutes, the Mk-II is effective in even the most time-sensitive situations.

Pseudo Satellite Capabilities

The Mk-II brings together elements of both Space-based and UAS assets as a tactical 'pseudo satellite'.

- More responsive to user needs and less predictable than space-based systems
- Able to achieve higher standoff than traditional UAS and see 5x further over the horizon

Multi-mission Adaptability

Unlike satellites, the Mk-II is payload reconfigurable and upgradeable according to situational needs.

- Earth observation and remote sensing
- Signal intelligence
- Persistent communications

The Mk-II can adapt at the speed of relevance.

Tactically Deployable

- Self-contained and containerized, including ground support equipment
- Can be operational at any 1000 m runway within 12 hours of arrival



HIGH ALTITUDE RESEARCH UNLOCKED

Frequent and reliable access to space underpins our ability to understand and develop the technology to harness it.

The Mk-II Aurora unlocks unprecedented low-cost and high-frequency space access to supercharge research into this critically important domain.

Operating from a regional spaceport, the Mk-II can be utilized by local research centers and universities to develop new insights into a broad range of key science and technology areas, or as an educational tool itself.

Bring insights to your program faster, unlock unique science, and attract space users with a world first capability.

Technology Development

Test and tune space hardware quickly in the most relevant environment - Space!

- Imagers and other sensors
- Communications - radios and antennas
- Guidance and navigation hardware and techniques
- Thermal protection systems

Science

- **Atmospherics:** Understand the impact of our upper atmosphere on Earth and space weather, as well as long term climate science
- **Climate monitoring:** Tracking and managing Earth's ecosystems using hyperspectral and IR remote sensing imagers
- **Biotech and material science:** Explore microgravity and the powerful science it can unlock



DEVELOPMENT

The Mk-II Aurora is built with performance, safety and reliability in mind.

Since first flight in August 2021, Dawn has conducted 50 flights in various configurations.

We fly early and often, harnessing the rapid reusability features of the vehicle in development. Every flight, we expand the envelope in a controlled manner to push the limits of what is possible.

In March 2023 we demonstrated three flights in three days under rocket power from Glentanner Aerodrome in the South Island of New Zealand.

In 2024, the Mk-II is scheduled to fly supersonic within an operating license altitude limit of 80,000 ft.

In 2025, the Mk-II will complete development by demonstrating the full performance spec of flying to space - 100 km altitude - twice in one day. The program will enter commercial production shortly thereafter.

2021

First Flight

53

Flights conducted to date





DAWN AEROSPACE

We are 130 professionals who transform bleeding-edge performance into operational reality.

Our unique propulsion technology has already powered dozens of satellites in orbit with hundreds more in production.

- 7 years experience in delivering excellence in space technology
- Proven in-market delivery of propulsion systems for satellites as well as rocket powered aircraft
- Vertically integrated: In-house design, certification, CNC machining, composites, cleanrooms, AIT, engine testing and flight test capabilities
- Engaging with European and New Zealand governments and regulators
- Engaging with spaceports worldwide
- Supported by the New Zealand Government through the Airspace Integration Trials Program and Catalyst Fund
- Supported by the European Space Agency through numerous technology development programs - FLPP, ARTES, ATLAS




Fly high. Fly fast. Fly safe.



dawnaerospace.com | @dawnaerospace
sales@dawnaerospace.com

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 VIEW FLIGHT TEST