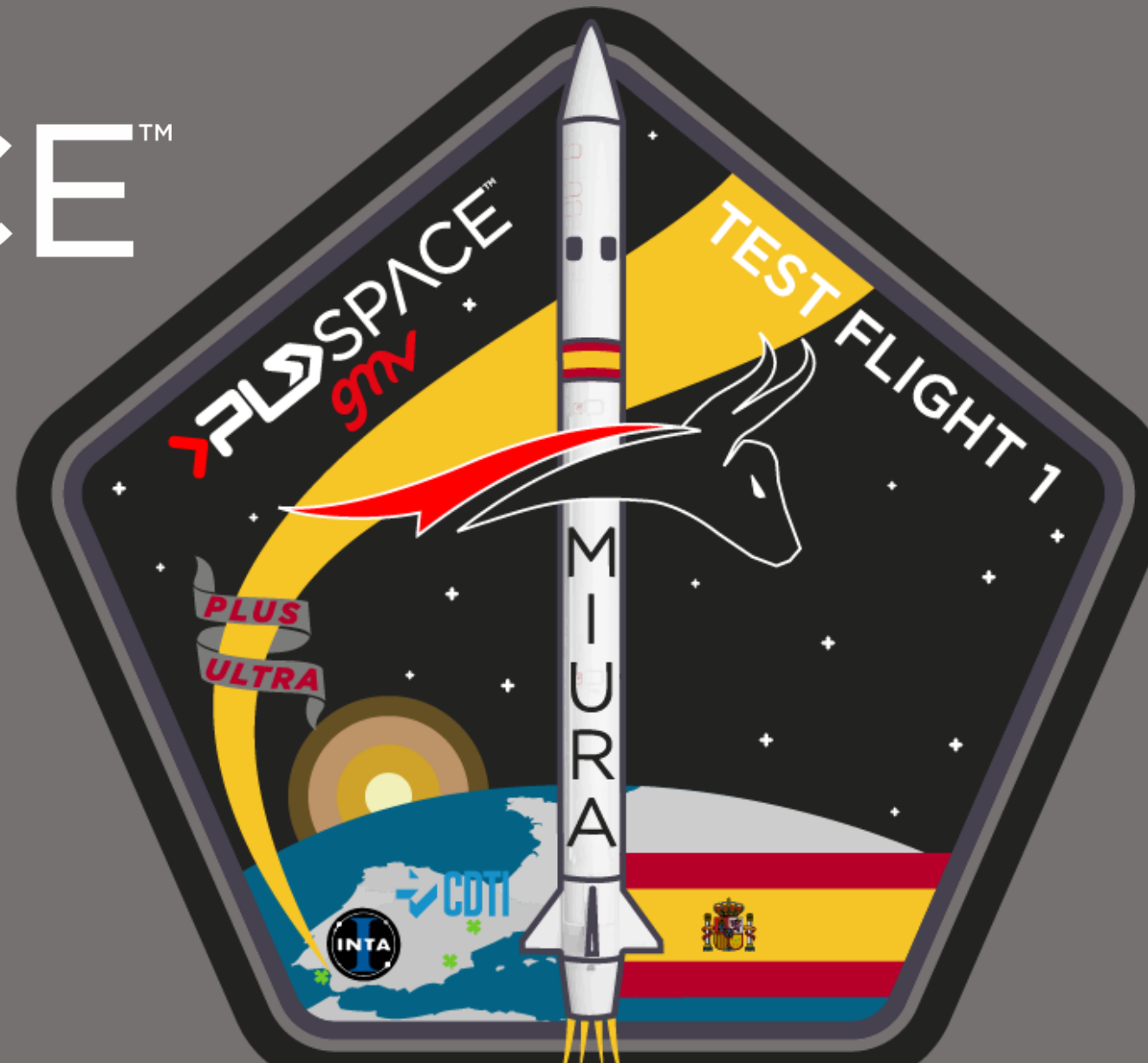


FLDSPACE™

MIURA 1 TEST FLIGHT 1 MISSION

Overview description





> Primary Objective:

- Conduct a test launch of the MIURA 1 launch vehicle reaching an apogee of 130 km with a payload of up to 100 kg onboard.
- Reenter the MIURA 1 after apogee.
- Recover the MIURA 1 launch vehicle after splashdown for inspection and eventually, reuse.

> Secondary Objective:

- Assess the payload environment during flight.

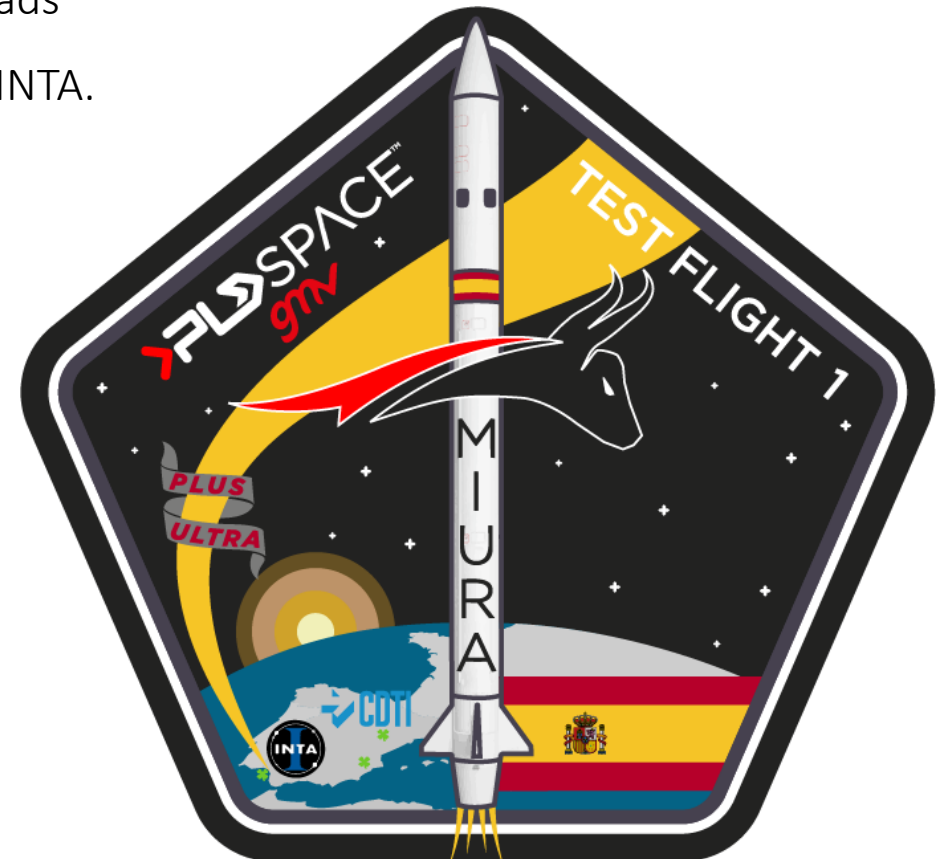
> Mission Definition:

- Define and implement a MIURA 1 test launch to be representative of the commercial service that PLD Space will offer for microgravity research and technology demonstration , including:
 1. Launch Vehicle configuration.
 2. Payload configuration and interfaces.
 3. Suborbital trajectory parameters.
 4. Launch Vehicle integration.
 5. Ground Operations, Launch Operations and Recovery Operations.
- To Execute the Flight Qualification of MIURA 1 (Space Mission) under the frame of EC-SME Phase 2 “ARION” project.

MIURA 1 TESTFLIGHT-1 MISSION DESCRIPTION



- **Launch Vehicle:** MIURA 1 – MSN1
- **Payload:** 5 different payloads, from 2 customers + PLD/GMV payloads
- **Launch site:** Centro de Experimentación “El Arenosillo” (CEDEA) – INTA.
- **Launch range:** CEDEA
- **Launch date:** From end of Q3 to mid Q4 , 2019
- **Target apogee:** 130 km , azimuth 200°
- **End of mission:** T+700 s



MIURA 1 LAUNCH VEHICLE



Together ahead. **RUAG**



Vehicle general parameters:

- > # Stages: 1
- > Length: 12.7
- > Diameter: 0.7 m
- > Gross liftoff mass: 2560 kg.
- > Payload mass: 100 kg.

PLD Space has designed, integrated, tested and will launch MIURA 1 Launch Vehicle. However we have relied on a group of key hardware providers for specific parts of the vehicle, including:

- > **GMV:** Avionics subsystem development.
- > **RUAG Space:** Payload fairing provider (FlexLine® based).
- > **Airborne Systems:** Parachutes provider.

MIURA 1 LAUNCH VEHICLE



Avionics:

- > Modular Avionics subsystem developed jointly with GMV.
- > MIURA 1 Launch Vehicle is actively guided.

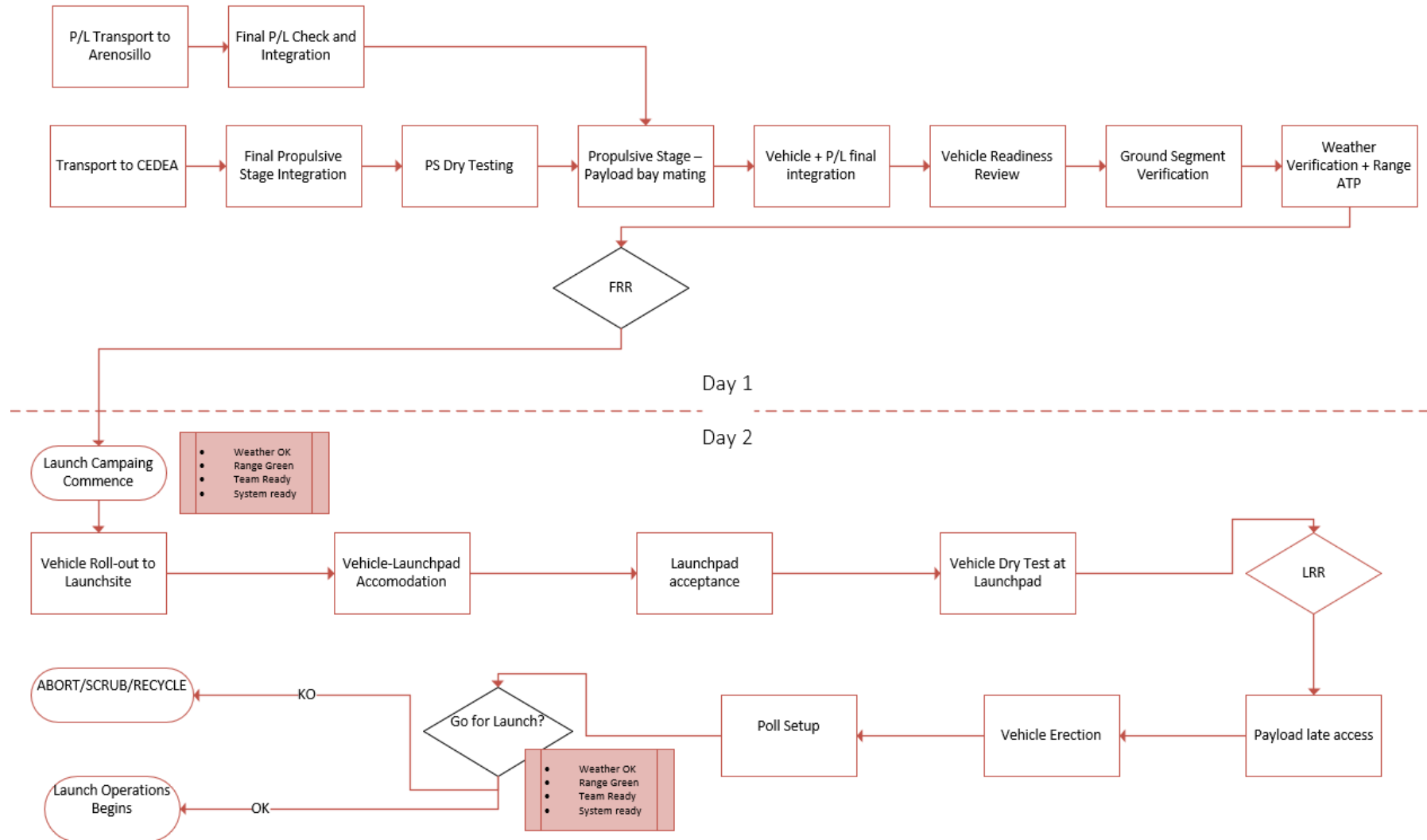
Structures:

- > All aluminium Aerospace-grade alloy structures, except engine covering and fairing.
- > Engine cover and fairing made of CFRP monocoque.

Propulsion:

- > 1 x TEPREL-B engine, developed by PLD Space.
- > 30 kN at Sea Level with TVC control.
- > Liquid Oxygen / Kerosene.
- > Pressure fed.
- > Roll control using Cold Gas thrusters.

MIURA 1 LAUNCH VEHICLE LAUNCH COUNTDOWN TIMELINE



MIURA 1 LAUNCH VEHICLE LAUNCH COUNTDOWN TIMELINE

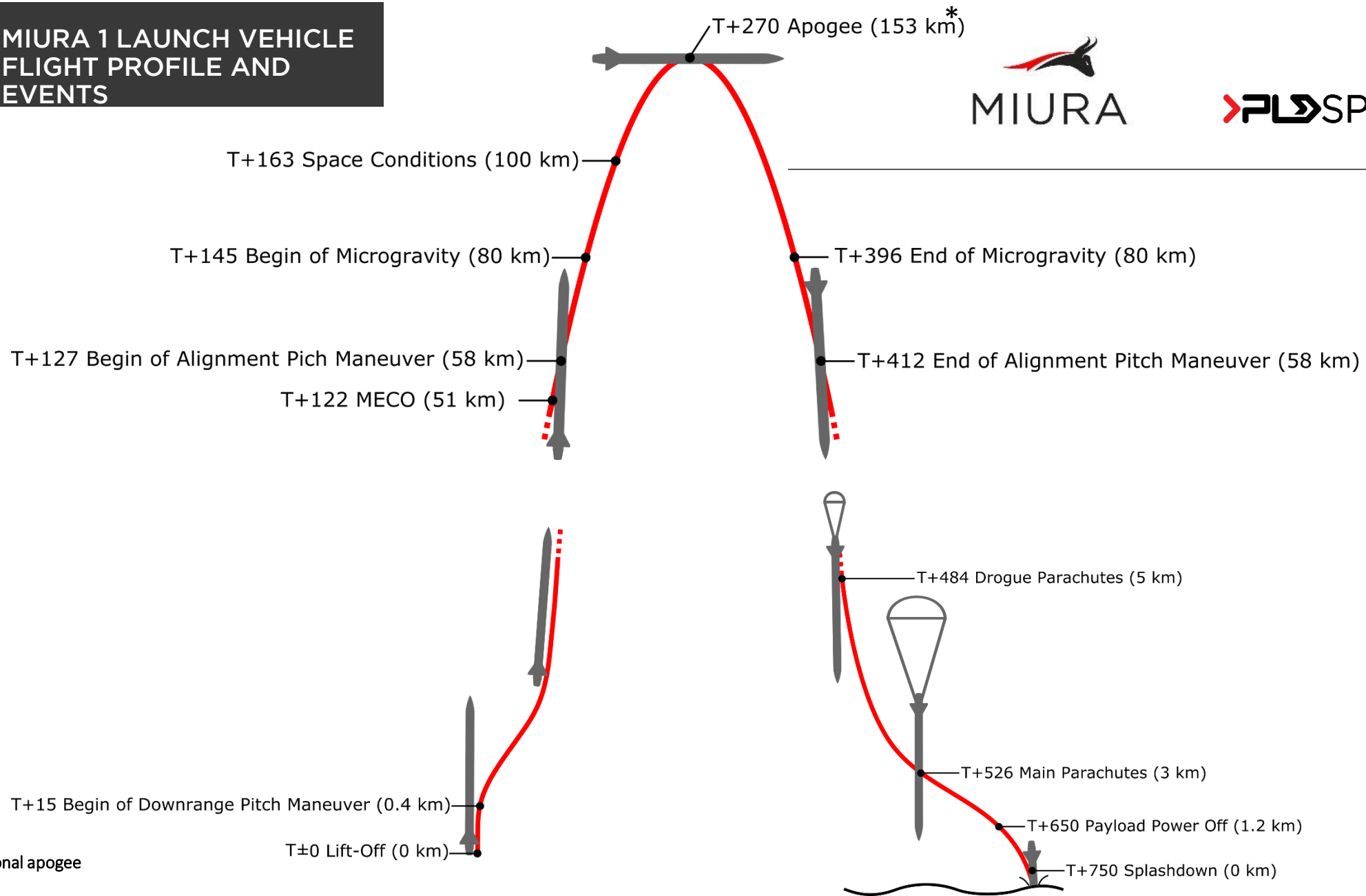


LAUNCH OPERATIONS. MAIN EVENTS

- > **T- 5 hours HOLD 3**
 - RF Tests and FTS pre-flight tests
 - Range clearance
 - Arm motion verification
 - Strongback motion verification
 - Helium loading
- > **T-2 hours - HOLD 2**
 - Mid RF and FTS checks
 - Range clearance
 - Weather clearance
- > **T-90 min - Propellant Loading**
- > **T-10 min - Terminal count (T-10 min) (Helium + Kerosene loaded, LOX under chill-in)**
 - Clamp open and Strongback retraction
- > **T-5 min - Late FTS Checks**
- > **T-1 min - Holding - HOLD 1**
- > **T-1 min - Counting – Auto-sequence commence**
 - T-55 s – Vehicle switch to internal power
 - T-50 s – FTS switch to internal power
 - T-45 s – Stage Pressure up
 - T-15 s - Stage at flight pressure
 - T-13 s - Umbilical release
 - T-10 s – Vehicle Switch to Internal guidance
 - T-10 s - Engine start-up sequence
- > **T0 - IGNITION**
- > **T+2 s - Engine healthy auto-verification**
- > **T+3 s - Lift-off**
- > **T+6 s - Pad clearance**



MIURA 1 LAUNCH VEHICLE FLIGHT PROFILE AND EVENTS



*Operational apogee



MIURA 1

The European Suborbital Rocket