



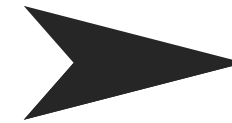
Laboratory of Mechanics and Defense Applications
Hellenic Military Academy



High performance missile targets

Project PROMETHEUS

PRESENTATION OF
RESEARCH PROPOSAL



Lieutenant of the Engineers' Corps
Eleftherios Karampasis



01

INTRODUCTION



INTRODUCTION

Our Laboratory

The Lab of Mechanics and Defence Applications (L.A.M.D.A.) of Hellenic Military Academy specializes in the fields of applied and theoretical mechanics, UAV's, Aeronautics and Composite Materials and Additive Manufacturing.

Our Academic Partner

The Lab of Fluid Mechanics and Turbo-machinery (L.F.M.T.) of Aristotle University of Thessaloniki Mechanical Engineering Department specializes in fixed-wing UAV design and testing as well as pioneering research in the field as well as in the field of high-power rockets.

Our Idea

The design and development of a high-performance missile-target for the assessment of anti-air and anti-ballistic defense systems.





02

EXISTING PROBLEM AND SOLUTION

Existing Problem

Currently utilized aerial targets which are used for the assessment of the anti-ballistic systems generally travel with subsonic speeds.

Modern aerial threats have generally speeds that **exceed the speed of sound**, while existing target vehicles have **top speed of 0.75 Mach**.

Thus, the necessity occurs for **higher velocity** targets for more **realistic threat representation**.

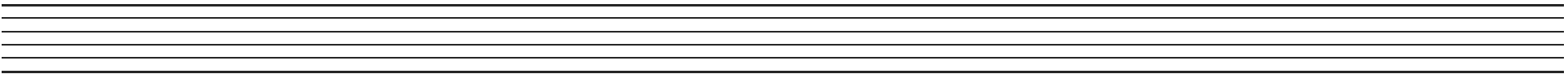
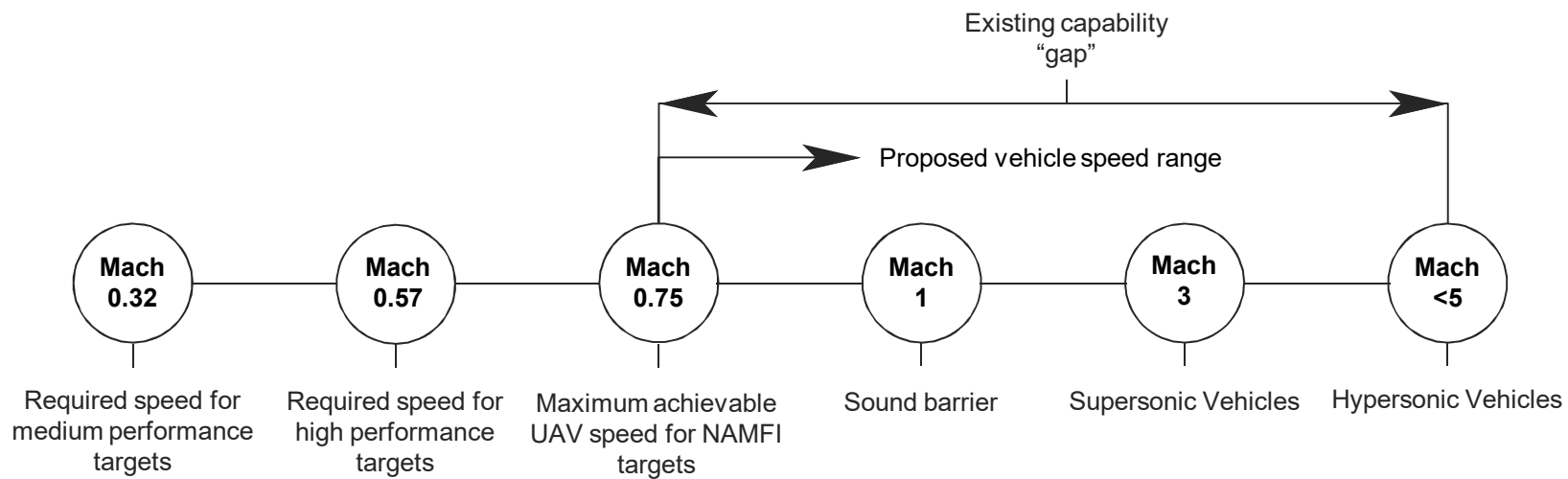
Proposed Solution

Design and development of a fully functional missile target with the aim to cover velocities in the range of **1-2 Mach**.

This system will also have the ability to conduct aerial **maneuvers** and **alter its trajectory**, mid-flight, for the **better representation** of modern missile threats.



Technological Gap





03

PROJECT OBJECTIVES

Project Objectives



Prototype Design



Acquisition of Know-How



Requirements Adjustments



Partnership Creation

Key Objectives

>1.1 Mach

Lower end missile-target speed

>10 km

Target vehicle range

Active Guidance

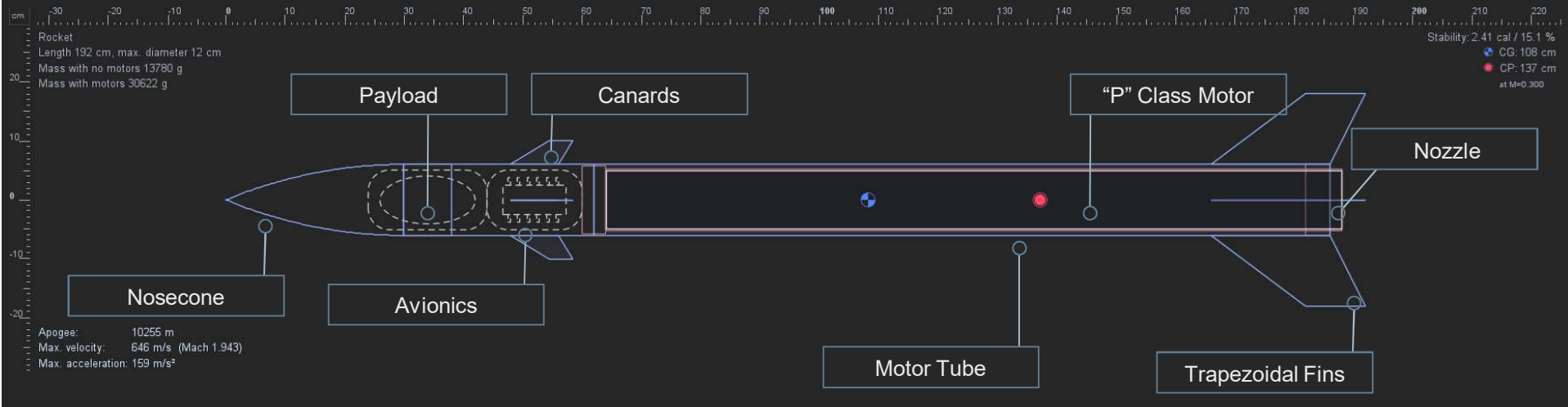
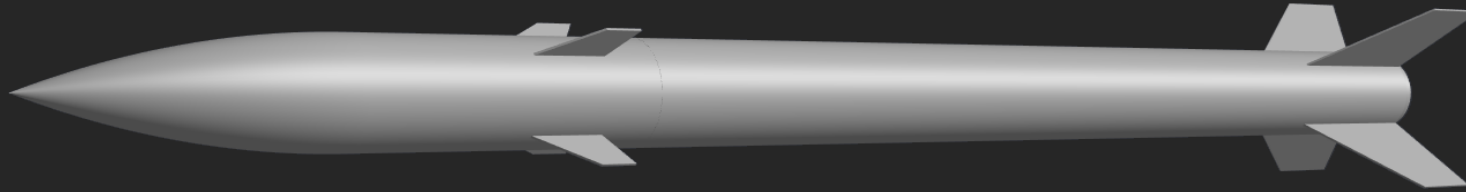
Mid flight trajectory changes



04

SYSTEM ARCHITECTURE

System Architecture





05

APPLIED TECHNOLOGY



Established Experience

Aristotle Space and Aeronautics Team (ASAT) is a well established academic entity.

ASAT was founded in 2018 under the auspices of LFMT, linking young engineers with applied research and specializes in high-power rocket design and testing.

Some of the team's distinctions:

- 1st successful high power rocket launch from Greece
- 1st successful relaunch of the same recovered vehicle
- 3rd place EUROCC 2023 (3/25)
- 7th place EUROCC 2022 (7/27)
- 13rd place Spaceport America Cup 2022 (13/154)

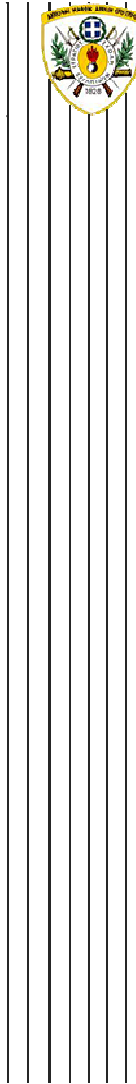




EUROC 2023 flight at 3km (3rd Place)



EUROC 2022 flight at 3km (7th Place)

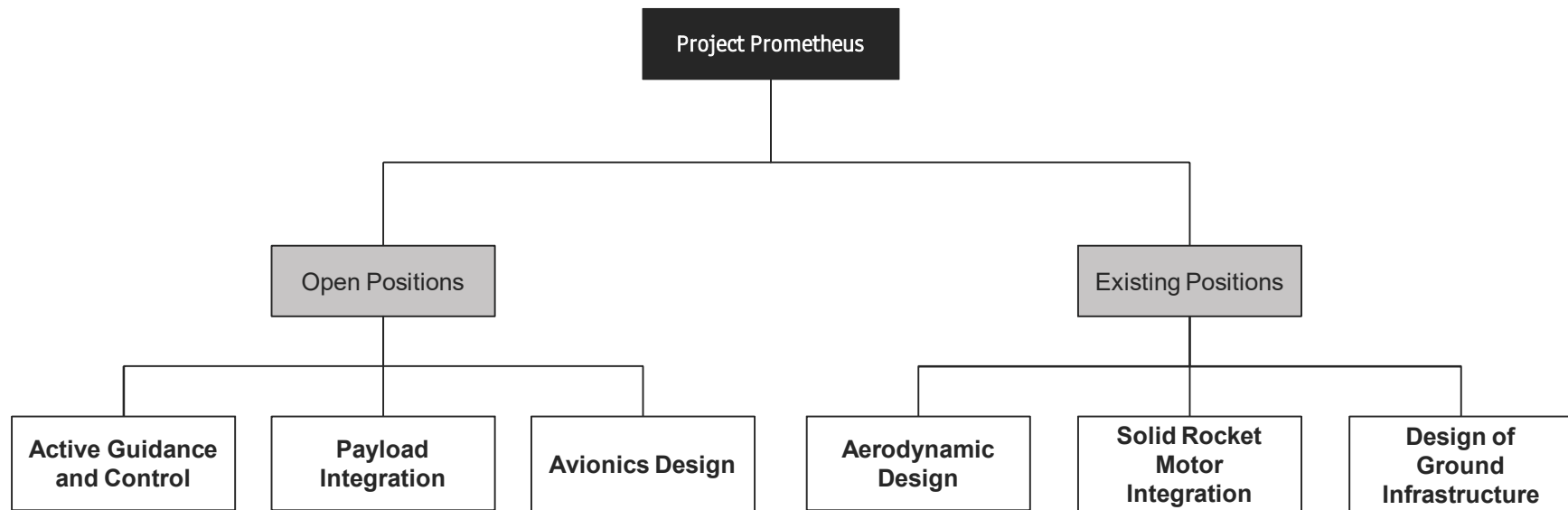




06

PROJECT ORGANIZATION AND EXISTING EXPERTISE

Discipline-Focused Organization



Existing Expertise

01

Aerodynamics

02

**Computer Aided
Design (CAD)**

03

Materials Science

04

Flight Performance

05

**Computational Fluid
Dynamics (CFD)**

06

**Finite Elements
Analysis (FEA)**



07

RESEARCH OPPORTUNITY

Benefits of cooperation



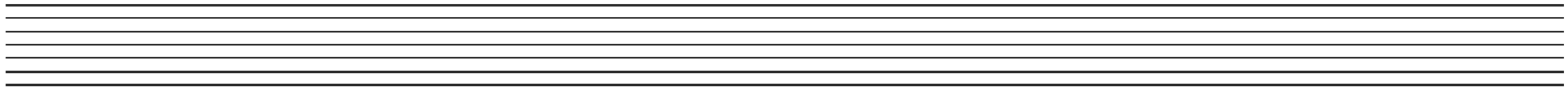
Research Work



Case-Specific Study



EDF Focused Project





08

**OPEN CALL FOR
COOPERATION**



Open Call for Cooperation

We invite experts, researchers, and officers from the fellow Military Academies and other organizations to join our team and contribute insights related to the following technical disciplines:

- Aerodynamics
- High Power Engines
- Guidance - Navigation - Control (GNC)
- Telecommunication
- Automatic Control



To explore potential partnerships and express your interest, contact us to our emails.

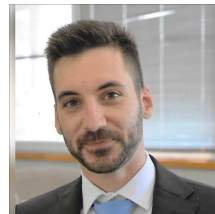




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**THANK YOU FOR
YOUR
ATTENTION!**

