THE **HELIPLANE**

SKYWORKS

SKYWORKS

Right technology, right time

Heliplane Overview

- Vertical Takeoff and Landing (VTOL) and hover capability of a helicopter combined with high speed cruise capability of a fixed-wing airplane
- Efficient high speed cruise at speeds 2-3x of today's helicopters
- Reduced complexity and cost

Heliplane

SET TO DISRUPT
THE VTOL MARKETPLACE

Speed	**400 MPH**
Payload	**1,000 LBS**
Range	**1,000 MI**

Key Elements

High Lift/Drag Ratio ~10
(efficient cruise)

Reaction Drive
(no antitorque or cross-shafting required)

Rotor Essential for Hover, VTOL
and Low Speed Flight

Twin Turbofans for
Forward Propulsion

Wing Carries Majority of Lift during Cruise
Flight

Mechanically Simple
and Robust

Heliplane

KEY ELEMENTS

- Williams International FJ44 Turbofan Engines
- Low Cost Rapid Development
- Reaction Drive – tip jets (no transmission or anti-torque required)
- Rotor: essential for hover, low speed flight, and low speed maneuverability.
- As airspeed increases, lift is steadily transferred from the rotor to the fixed wing.
- Highly Efficient Fixed Wing: most effective lifting surface at 400 mph – majority of lift
- Turbofan Propulsion: much more efficient than main rotor thrust for high speed cruise

CABABILITIES

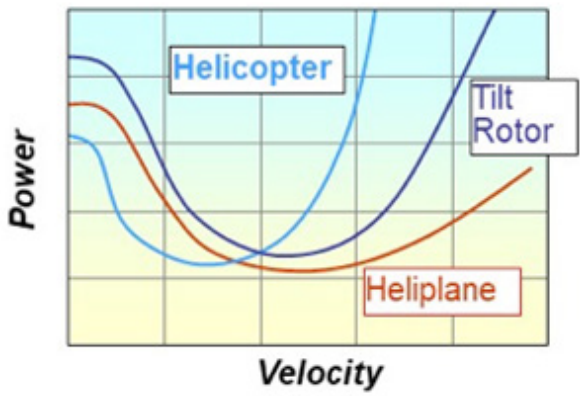
- **Unmatched VTOL flight regime**
  - 400 mph cruise
  - 35k ft service ceiling
  - 4,000 fpm rate of climb
  - Hover off-of-ground effect at high altitude at max gross weight.
- **Mechanically simple/robust**
  - Unlike all tilt-rotor aircraft, no conversion mechanism or interconnecting shafting
  - No transmission
  - No tail rotor and associated shafting and gear boxes

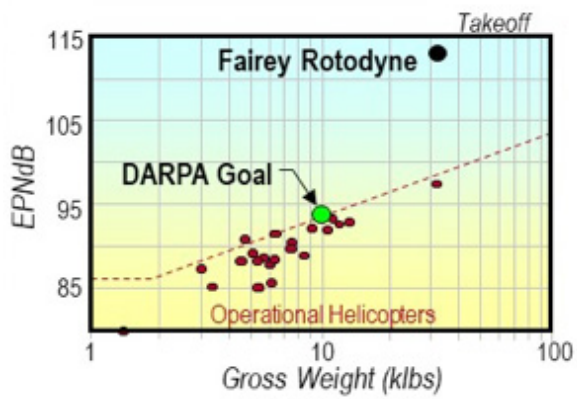
Heliplane Leveraged 50 Years of Technology

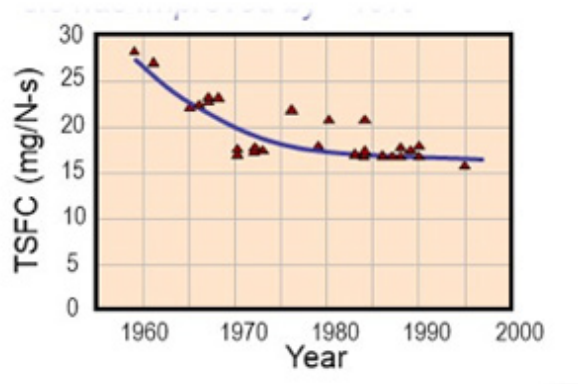
LIGHTWEIGHT STRUCTURES

COMPUTATIONAL ANALYSIS

DIGITAL FLIGHT CONTROL





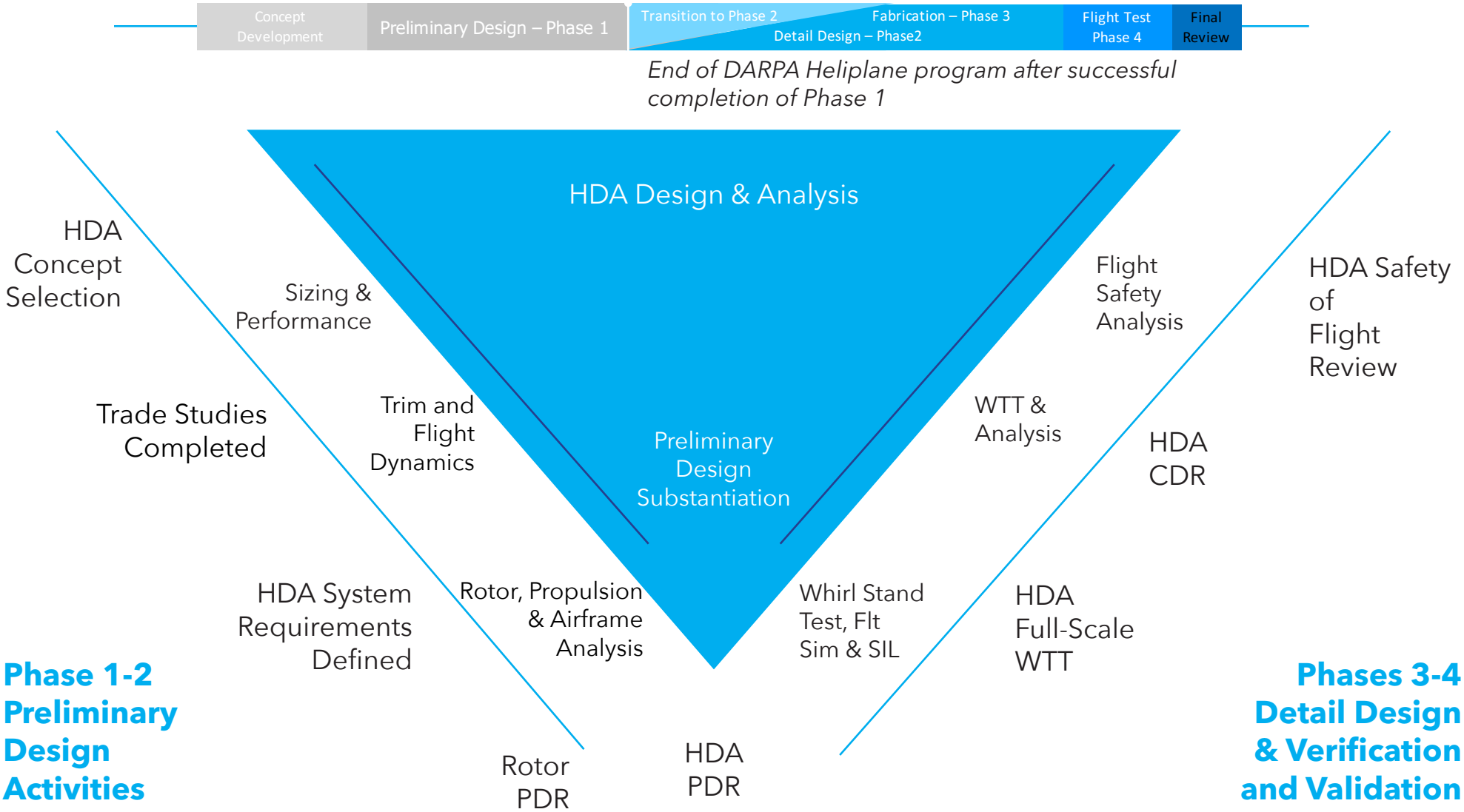


ROTOR SYSTEM

NOISE SUPPRESSION

ENGINES

Heliplane Demonstrator Aircraft Vee Systems Engineering Diagram



Heliplane Summary

- The DARPA Heliplane was designed to combine the key attributes of a helicopter and a fixed wing aircraft: VTOL and hover capability of a helicopter combined with high speed and efficient cruise capability of a fixed wing airplane
    - "…with the potential for the lack of complexity to result in the much lower lifecycle cost that has been demonstrated by gyroplanes"
- Heliplane successfully completed the extensive DARPA Preliminary Design Review (PDR), meeting all technical and programmatic requirements
- The underlying gyrodyne technologies are applicable to a range of platform configurations - from ISR UAVs to armed recon/escort, and transport manned or unmanned systems.

Paradigm Shift

Significantly Increased Performance and Greatly Reduced Complexity

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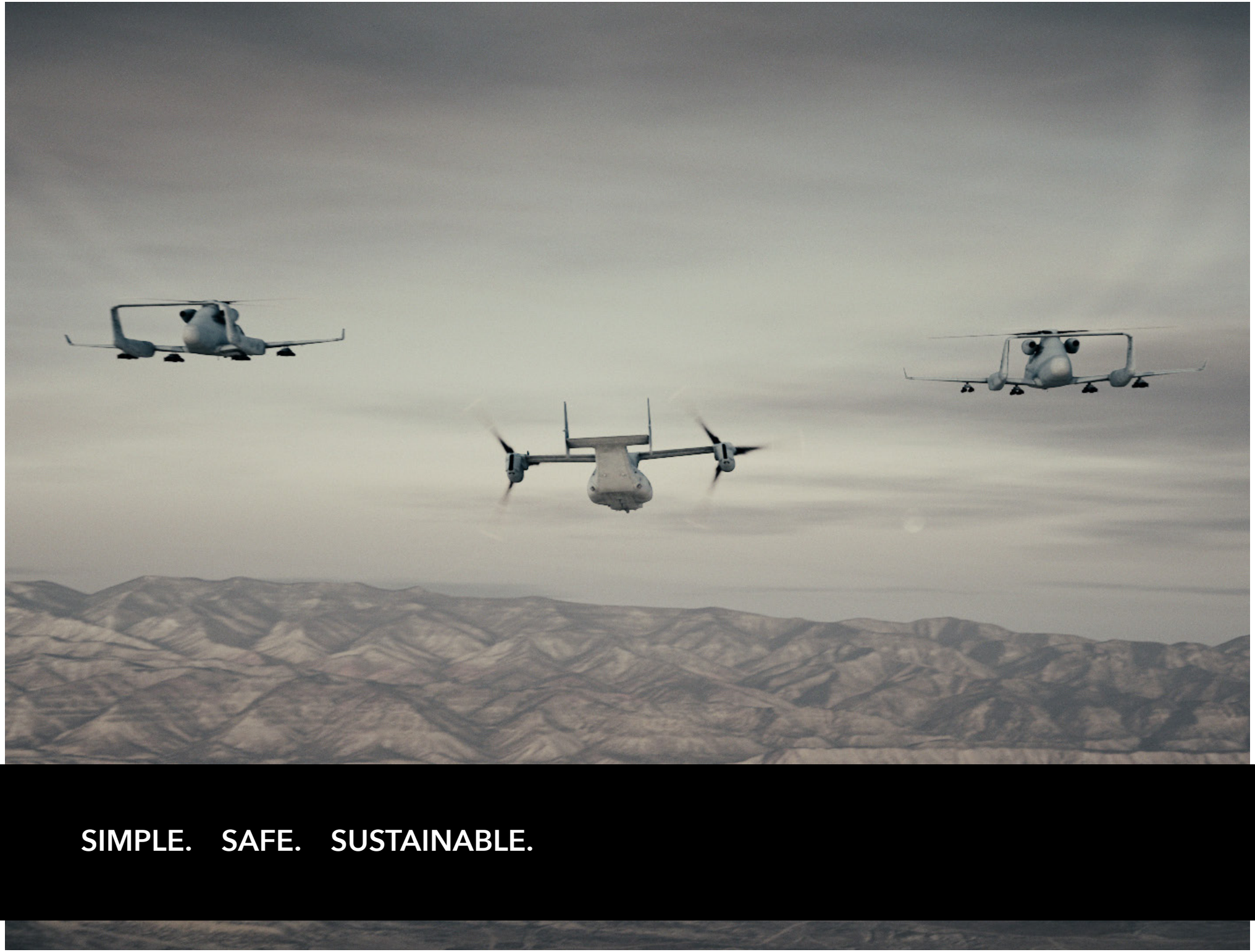

SIMPLE. SAFE. SUSTAINABLE.