Reliance 21 – DoD Communities of Interest

Air Platforms

Scope/Thrust Areas

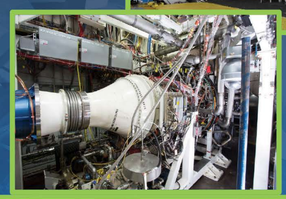
The Air Platforms COI is a forum for developing and coordinating S&T air platforms initiatives. Current Sub-Areas and Thrusts:

- **Fixed Wing Vehicle:** Develop vehicle technologies that significantly increase range and capability.
- **Rotary Wing Vehicle:** Develop vehicle concepts/technologies that significantly increase speed, range and lifting capability.
- **Aircraft Propulsion, Power, and Thermal:** Develop efficient, intelligent, reliable, maintainable, affordable aircraft propulsion, power and thermal management systems.
- **High-Speed/Hypersonic:** Manage aerodynamic heating, design for shape-change caused aerodynamics effects, and maintain combustion in scramjet supersonic flow.

Impact on Capability Needs

Army's Joint Multi-Role Technology Demonstration program:

- JMR-TD goal: develop, expand, and demonstrate new vertical lift technology capabilities.
- Bell's Air Vehicle Technology Demonstrator achieved first flight 18 Dec 2017 in Amarillo, Texas.
- Lockheed Martin – Sikorsky demonstrator is scheduled to fly in 2018.



AFRL partnered with General Electric and Pratt & Whitney

- Successfully tested a new high efficiency core and adaptive fan demonstrator in 2017.
- Tests validated adaptability, aerodynamic performance, operability and structural designs.

Success Stories

Flight demonstrations were accomplished using a highly modified TigerShark UAV.

- Incorporated CLAS technology on 70+ installed antennas.
- Demonstrated beam steering to a single ground location.
- Enhanced ability to provide narrowly directed communications.

NASA Armstrong flew AFRL-funded GOLauncher1 inert test article Dec 2017.

- Test gathered aerodynamic, flight dynamics, and structural data for Gulfstream-III carriage.
- Testing validated maneuver up to 30° flight path angle at Mach 0.7.

Engagement Opportunities for Industry

- American Helicopter Society Annual Forum (14-17 May 2018)
- AIAA Science & Technology Forum & Exposition (7-11 Jan 2019)
- Air Vehicle Technology Symposium (10-12 Sept 2019)
- Turbine Engine Technology Symposium (10-13 Sept 2018)
- Various Industry IR&D reviews

Defense Innovation Marketplace
(http://www.defenseinnovationmarketplace.mil/coi.html)

Focus Going Forward

Fixed Wing Vehicle

- Mature adaptive, lightweight, multifunctional structures
- Develop advanced aerodynamic control

Rotary Wing Vehicle:

- Reduce maintenance. Goal: zero unplanned maintenance
- Perform multi-disciplinary design and optimization

Aircraft Propulsion, Power, and Thermal

- Integrate aircraft architectures and controls
- Improve power density and distribution
- Investigate alternative concept propulsion

High-Speed/Hypersonic

- Scramjet performance
- Develop/demonstrate aero-propulsion integration
- Combined loads/structural lifting
- Shock/boundary layer interaction