



AIR FORCE RESEARCH LABORATORY

Air Superiority (AS)

Capability Area

The Air Superiority Capability Area is focused on developing and maturing technologies for advanced weapons that would enable the joint warfighter to achieve and maintain air superiority across the full range of military operations in current and future threat environments.



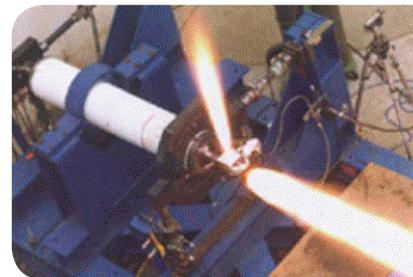
The Air Superiority mission encompasses Offensive Counter-Air (OCA) and Defensive Counter Air (DCA). OCA is defined as “Offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible.” OCA includes attack operations, sweep, escort, and suppression/destruction of enemy air defense (SEAD/DEAD).



DCA is defined as “Defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace.” DCA comprises both active and passive measures including both ballistic missile defense and air breathing threat defense, and encompasses point defense, area defense, and high value airborne asset defense.

While specific next generation air superiority weapons concepts are in the early planning stages, technology development is being pursued that goes beyond upgrading legacy weapons. An overarching emphasis for advanced air superiority weapons is significant size and weight reduction to increase internal carriage capacity. These reductions, in addition to significantly lowering costs, must be achieved without compromising performance (i.e. range, kinematics, and high probability of weapon effectiveness) in what will certainly be a very challenging environment, due to anticipated advances in adversary airborne and surface-based defenses. Next generation air superiority weapons, while being developed primarily for future platforms such as highly advanced next generation fighters, would also enhance the survivability and capability of current generation fighters, such as the F-22A and F-35 Joint Strike Fighter.

The Air Superiority Capability Area is pursuing a number of technologies that may be incorporated into new weapons systems. Recent technology development efforts include: advanced adaptable warhead technology to defeat smaller, highly-agile air targets, and selected ground-based air defense targets; Guidance Integrated Fuzing (GIF) to provide improved target detection and characterization; Hybrid AeroFin / Reaction Jet Control (RJC) technology to improve missile airframe agility; and advanced propulsion technology focusing on improved energy management to increase range. The integration of the advanced propulsion and guidance and control system technologies would expand missile operational envelope, enabling full-spherical, minimum-time intercept capability against extremely agile air targets both within and beyond visual range. These combined technologies would provide the warfighter with the capability to rapidly destroy or neutralize air targets and ground-based air defenses at greater distances from the launch aircraft, enhancing survival and mission effectiveness.



For More Information:

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