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HOUSE ARMED SERVICES COMMITTEE  
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UNITED STATES HOUSE OF REPRESENTATIVES

PRESENTATION TO THE  
HOUSE ARMED SERVICES COMMITTEE  
SUBCOMMITTEE ON STRATEGIC FORCES  
UNITED STATES HOUSE OF REPRESENTATIVES

HEARING DATE/TIME: March 10, 2023, at 9:00am

SUBJECT: Department of the Air Force Hypersonics Programs

STATEMENT OF:

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Military Deputy  
Assistant Secretary of the Air Force  
(Acquisition, Technology & Logistics)

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## **INTRODUCTION**

Chairman Lamborn, Ranking Member Moulton, and distinguished members of the subcommittee, thank you for the opportunity to provide testimony on the Department of the Air Force hypersonic programs. Extensive war-gaming and analysis demonstrate that the limited capability, capacity, and upgradability of our munitions inventory creates risk for our forces; therefore, the Air Force is investing in munitions production and development, both hypersonic and non-hypersonic, to address this risk. Several countries, in particular China and Russia, are developing and testing their own hypersonic weapons and have claimed to have fielded operational capabilities.

### ***AIR FORCE HYPERSONIC PROGRAMS***

The Department of the Air Force is developing and fielding air-launched, long-range, hypersonic strike weapons. Hypersonics is an attribute being pursued for advanced munitions to rapidly overcome the tyranny of distance in the Pacific and enable the U.S. to hold high value, time-sensitive targets at risk in contested environments from standoff distances. When integrated with the broader munitions portfolio, their cost and complexity make hypersonic weapons a high-end, low volume capability, yet, in concert with a wider weapon force mixture, are key to providing a war-winning force. The Air Force's hypersonic portfolio consists of three major thrusts: boost-glide missiles; air-breathing cruise missiles; and the foundational science and technology (S&T) hypersonics portfolio.

### ***ARRW (AGM-183A)***

The Air-Launched Rapid Response (ARRW) program is a hypersonic boost glide weapon that provides a long range, conventional air-to-surface, precision guided prompt strike capability from standoff ranges in contested environments. It consists of a Solid-Rocket Motor (SRM) booster, a protective shroud, and a glider containing a fragmenting warhead. The Air Force is developing ARRW using the Middle Tier Acquisition (MTA) rapid prototyping authority.

With the FY23 funds authorized and appropriated by the Congress, the Air Force is continuing work to complete the ARRW rapid prototyping program, which includes completing the All-Up Round (AUR) Test Flights (ATFs) series. The Air Force intends to collect valuable

data, build capacity and capability, allow hypersonics programs to leverage and build upon each other, and project the overall technology forward. ARRW successfully completed the Booster Test Flight (BTF) series in July 2022 and ATF-1 in December of 2022. ATF-1 denotes the Department of the Air Force's first successful test of an end-to-end operationally representative air-launched hypersonic weapon. ATF-2 is scheduled for 2QFY23, and the Air Force is planning for two additional ATFs prior to program completion.

### ***HACM***

The Hypersonic Attack Cruise Missile (HACM) is an air launched, air breathing weapon that can be integrated on current and future fighters, as well as provide expanded capacity on bombers. As a self-powered cruise missile, HACM provides complementary trajectories to boost glide, imposing additional cost on our strategic competitors by increasing complexity, while simultaneously supporting integrated deterrence with a key ally, Australia. The Air Force awarded the HACM contract in FY22 and is developing the weapon using the MTA rapid prototyping authority.

HACM leveraged and significantly expands the Office of the Under Secretary of Defense, Research and Engineering funded Southern Cross Integrated Flight Research Experiment, a bilateral U.S. / Australian hypersonic air breathing, cruise missile prototyping effort. The concept is a derivative of the joint Air Force / Defense Advanced Research Projects Agency (DARPA) Hypersonic Air-breathing Weapon Concept (HAWC) that demonstrated event-based learning, multiple successful flight tests, and risk reduction activities, matured preliminary designs and accelerated development. War-gaming and analysis indicates HACM provides significantly improved operational capability over current weapon inventories when integrated on current and advanced platforms.

The FY23 funds authorized and appropriated by the Congress have set the stage to enable the Air Force to: 1) mature HACM to critical design, 2) continue model-based engineering activities, 3) mature the digital ecosystem to complete critical design analysis, 4) design verification testing, 5) execute initial qualification testing, 6) procure initial flight test hardware, 7) build aircraft integration assets, and 8) mature Weapon Open Systems Architecture (WOSA) compliance evaluations enabling the flight test program to begin in FY25.

## ***S&T***

The Air Force Research Laboratory (AFRL) has made many enduring contributions to the field of hypersonics, including aerodynamics and aerothermodynamics; airbreathing propulsion; solid and liquid rocket propulsion; high temperature materials, weapon effects, structures, and manufacturing; guidance and control; and ordnance systems. The High Speed Strike Weapon (HSSW) Technology Maturation (TechMat) portfolio is a complementary Air Force Research Laboratory effort that matures air-launched hypersonic weapons by developing long-lead, critical technologies in synchronization with the OSD Hypersonics S&T Roadmap. HSSW TechMat was completed in 2022 and transitioned over 30 technologies to the Joint Air Force / DARPA HAWC and Tactical Boost Glide (TBG) programs, and the Air Force ARRW and HACM programs.

Utilizing FY23 funds authorized and appropriated by the Congress, HSSW TechMat II is kicking off to facilitate development and transition of technologies to enable next-generation systems with significantly increased capability and military utility. AFRL Technology Development efforts continue to work toward expendable hypersonic multi-mission intelligence, surveillance, and reconnaissance (ISR) and strike capabilities for larger, longer range multi-mission hypersonic platforms. These technologies are also a key part of the OSD roadmap for future reusable hypersonic platform technologies.

## **CLOSING**

Thank you again for the opportunity to testify. We look forward to working with this subcommittee to ensure the Department of the Air Force maintains the military advantage to secure our vital national interests and support our allies and partners.