



# US HYPERSONICS INDUSTRY TEAM

**BEYOND MACH 3**

## White Paper on High-Speed Weapons (HSW) and High-Speed Strike / ISR (HSS/ISR)

The US Hypersonics Industry Team (HIT) is a non-contractual industry consortium, funded by annual membership dues, and led entirely by industry representatives. The current members of the HIT are: Aerojet, Astrox, Boeing, Lockheed Martin, McKinney Associates, Pratt & Whitney Rocketdyne, Universal Technology Corporation, and the University of Maryland.

### What are HIT's Goals?

The HIT's views high-speed / hypersonic technology development and system acquisition achieving two goals. First, preserving and enhancing U.S. national capability for assured, prompt global access in the face of adversaries' strategies of access denial, while also preserving and enhancing freedom of action for U.S. military forces. Second, maintaining U.S. national assets and industrial base consisting of (1) the current highly-trained, highly-educated aerospace workforce, (2) our significant comparative advantage in information technology, computational tools and simulations, (3) our test facilities and ranges, and (4) our capability to produce advanced flight prototype vehicles.

### Why Hypersonics?

The HIT believes there are three areas in which hypersonic systems offer unique, "game-changing" capabilities vital to US national security and aerospace dominance. First, in the near-term (<10 years), High-Speed Time-Critical Strike (HSTCS) weapons, envisioned as performing two classes of missions: (1) flying short distances (several hundred nautical miles) too fast for adversaries to defend against, and (2) flying longer distances (500-2000 nautical miles) fast enough to be effective, launched from U.S. platforms at safe "stand-off" ranges. Second, in the mid-term (10-20 years), reusable High-Speed Intelligence, Surveillance, Reconnaissance/Strike (HSISR/S) vehicles, seen as Mach 5+ successors to the Mach 3+ SR-71. HSISR/S vehicles will provide responsive, un-warned, highly-survivable ISR/strike capability. Finally, in the long-term (>20 years), HSTCS and HSISR/S technologies and systems will lead to hypersonic air-breathing space access that is routine and responsive.

### Why Hypersonics Now?

As demonstrated in 2010 and 2011 by the US Air Force's X-51 and DARPA's HTV-2 test flights, relevant technologies are rapidly maturing. Leading the way are enabling vehicle technologies: propulsion, aerodynamics, materials, and thermal management. But equally important are non-hypersonic technologies such as advanced data/decision fusion and wideband communications which have direct military uses in "compressing the kill chain" – greatly shortening mission time to the point where reducing flight time by flying at hypersonic speeds will significantly affect mission time. And the potential applications for hypersonics are real. HSTCS weapons will counter "The Three Tyrannies" of Distance + Time + Defenses, changing the conduct of warfare by increasing tempo and the flexibility of existing forces, and offering the promise of requiring fewer strike assets and less time to complete campaigns. HSISR/S systems combine decisive multi-mission capabilities with access to otherwise denied territory to promptly kill difficult targets.

### What Threats Drive Need for Hypersonics?

Current and near-term advanced Integrated Air Defense Systems (IADS) are double-threats to deny access to U.S. forces and also deny freedom of action for those forces. Near-term competitors and potential adversaries are vigorously working hypersonic technologies and systems right now. Leading the way is Russia with the S-300 and S-400 families of IADS, with ranges of up to 250 nautical miles and 8,000 fps maximum velocity [Source: *Janes, Air Power Australia, Almaz-Antey*, etc]. Another immediate threat is China, with 3 S-300-derived IADS: HQ-10 (S-300PMU-1), HQ-15 (S-300PMU-2), HQ-18 (S-300V), all manufactured under Russian license. China's new J-20 aircraft may be intended to for long-range interdiction and strike - a stealthy FB-111 – conforming to China's strategy of blunting US forces at long range from mainland China. India is also active with the Mach 2.5+ BrahMos missiles fielded in 2007 (joint venture with Russia), the Mach 2.8+ Akash missile fielded in 2009, and the HSTDV. Iran has contracts with Russia to receive S-300/SA-20 IADS. And all these countries also pose "Gray Threats" to sell to highest bidders.

### What HIT Recommends to U.S. Government

The HIT is concerned that the U.S. may be in "catch-up" mode, making accelerated programs an urgent priority. Therefore, the HIT recommends that in 2011 the U.S. set course for operational high-speed weapons by 2019: Pre-Milestone B S&T activity, development planning and AoA by Services, and endorsements by Air Force ROC and Navy FMOC. Also in 2011 the U.S. should set course for a Reusable High-Speed Flight Research Vehicle flying by 2019: Increased funding for critical configuration, propulsion, and materials technologies and AFROC/NFMOC endorsement, with a 3-4 year program leading to CDR and a 5-year EMD program.

For further information contact HIT Executive Director Leon McKinney  
314-514-1352 (ofc) / 314-495-4732 (cell) / [leonmck@mckinneyassociates.com](mailto:leonmck@mckinneyassociates.com)