

HMTE HIGH MACH TURBINE ENGINE

COMPACT EXPENDABLE / LIMITED LIFE SUPERSONIC PROPULSION

FAST FACTS

High-Mach turbine engines (HMTE) expand munition design and employment trade space with several key benefits over traditional high-speed propulsion approaches:

- Increased fuel efficiency, for greater range and payload capacity
- Continuous electrical power generation capability, for less reliance on bulky batteries
- Wide operating range, for diverse applications and flexible mission planning

WHY IS IT IMPORTANT?

High Mach Turbine Engines are compact and enable robust high-speed operations over long distances.

Air-delivered, high-speed weapon systems must incorporate and balance material selection, aerodynamics, structures, flight controls, fuel, batteries, mission payloads, etc. – all within in a highly constrained package size and cost. Conventional high-speed weapons are propelled by a rocket engine for the launch/acceleration phase flight and/or for supersonic cruise. Rocket-propelled weapons have lower specific impulse than HMTEs and the rocket motor integration impacts weapon system cost, size, weight and employment flexibility.

HMTE's higher propulsive efficacy and smaller size alleviates some subsystem packaging challenges in volumetrically constrained applications. These attributes enable weapon systems with greater range and greater payload flexibility for a given weapon system size.

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HOW DOES IT WORK?

High Mach Turbine Engines work by employing advanced aerodynamic design and high temperature materials to enable optimized cycle performance across a wide speed range.

HMTEs employ compact combustors and tailored thermal management approaches to enable high thermal efficacy and high thrust output for short-life applications.

Technology and manufacturing advancements enable HMTEs to be affordably produced in a compact form factor that is suitable for volumetrically constrained munitions and unmanned air-vehicles.



Artist Rendering of an HMTE turbojet

ADDITIONAL FACTS

- HMTE turbomachinery enables electrical power generation during all flight modes
- HMTE throttleability permits vehicle to have a wide operational flight envelope
- HMTEs offer improved efficiency in multiple speed regimes
- Advanced manufacturing techniques allow HMTEs to be delivered affordably and at high production rates



Artist Rendering of an HMTE powered munition