

46ESS-13: Thrust Vectoring and V/STOL Systems for Aircraft

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Thrust vectoring is the ability of an Aircraft or other vehicle to direct the thrust from its engine(s) in a direction other than parallel to the vehicle's longitudinal axis. The technique was originally envisaged to provide vertical thrust for incorporating Vertical and/or Short Take Off and Landing (V/STOL) capability in Aircraft. Subsequently, attempts to develop Thrust Vectoring Nozzles (TVNs) for Combat Aircraft has increased in the last two decades, as it can provide modern Military Aircrafts with many advantages regarding performance and survivability. The primary advantage of TVNs is improved Aircraft manoeuvrability at high angles of attack or low speeds where the conventional aerodynamic control surfaces lose all effectiveness. Single Axis TVNs (2D) provide only Aircraft pitch control whereas Multi-Axis TVNs (3D) provide both pitch and yaw control to the Aircraft. The key challenge is to develop Multi-Axis TVNs that can operate efficiently at all flight conditions and should satisfy design constraint of low cost, low weight and minimum impact on Radar Cross-section Signature.