Aerodynamic decelerators

The space and military communities undertook several important aerodecelerator research and technology development programs in 2006. This year also saw the first significant operational deployment of a guided airdrop system to a combat theater—a scenario that will rapidly expand in the near future as the research funding spent over the past several years bears fruit.

Ballistic systems

A series of MC-4 pilot parachute hesitation incidents at the Military Freefall (MFF) Schoolhouse, Yuma Proving Grounds, warranted an investigation by the Natick Soldier Center PM-CIE MFF team. Training video footage showed the MC-4 hesitation resulted from the parachute getting caught in the turbulent airflow circulating directly in the wake of the freefall parachutist, causing an increased risk of bridge entanglement. The MFF environment was simulated on the ground using the Vertical Wind Tunnel Facility at Ft. Bragg, N.C. Tests using fully geared MFF-qualified parachutists attempted to reproduce pilot parachute hesitation inside the wind tunnel. Ongoing test results will drive improvements for the current MC-4 pilot parachute system and will influence the selection of a replacement system, to begin in FY07.

The development of two new personnel parachutes continued this year. The Irvin/Parafliite-developed T-11 Advanced Tactical Parachute System (ATPS) is the next generation of nonsteerable personnel parachutes designed for the Army. ATPS-T-11 includes a redesigned reserve package and integrated harness system suitable for the fifth-percentile female to the 95th-percentile male soldier. Developmental testing for ATPS was completed at Yuma, Ariz., in June. Operational testing will begin at Ft. Bragg, N.C., in early 2007. The program is on track to begin the replacement of 53,000 T-10 systems by the end of FY08. The Army also recently awarded Irvin Aerospace a volume production contract to manufacture the MC-6 system for replacement of the MC-1B/C/D. The MC-6, developed through the Special Operations Forces Tactical Assault Parachute System program, features the latest in advanced design for steerable troop parachutes.

Drop testing and performance estimation continues on the low-cost airdelivery system, a one-time-use, stand-alone airdrop system consisting of a modular suite of low-cost airdrop items including parachutes, containers, and platforms configured for low-velocity impact velocity of 28.5 ft/sec), high-velocity (impact velocity of 90 ft/sec), and free-drop (without guidance unit and no use of a parachute) airdelivery of cargo.

Pioneer Aerolabs. These three components, developed for joint guided airdrop system Force Sustainment Systems, Research Development Delivery platform and Engineering Command, Natick, Mass., will be used for humanitarian relief and bundle system. Add to the development of 3,000 lb and 10,000 lb airdrop system, which is believed to be on the MicroFly, 0.12 lb, and Drag systems; each utilize a high-velocity system (90 ft/sec), and free-drop (without guidance unit and no use of a parachute) airdelivery of cargo.

Guided airdrop systems

The Dept. of Defense continues to team on an expanding set of Joint Precision Airdrop System (JPADS) programs. Numerous systems of 3,000 lb or lower capacity have already been deployed to current areas of operations under joint fielding initiatives, including the first use of a JPADS system in a combat zone. The formal program record for JPADS-XL (500-2,000 lb capacity) systems is expected to begin soon. Requirements have stabilized with a threshold deployment altitude of 24,500 ft MSL (mean sea level) and an accuracy objective of 50 m.

The JPADS Advanced Concept Technology Demonstration (ACTD) conducted its first Joint Military Utility Assessment (JMA) in June, executing numerous 10,000-lb Screamer airdrops with wireless linkage to the Joint Mission Planner (JMP). The JPADS-XL continues to support ongoing theater airdrop operations. Several 2,000-lb and 10,000-lb systems have been demonstrated with the JPADS-MP at altitudes up to 25,000 ft MSL with a variety of drop sets, and many of these systems are now or about to be in use in current operations. The JPADS is planning one more JMA this year and another in 2007 before the JPADS program of NATO prioritized FOC Operations Forces Against Terrorists (POFTAT) Airdrop system. The JPADS has been established as a precision airdrop and interoperability. A JPADS Demonstration (JPAF) with a USAF C-17 fleet over 30 days conducting over 30 NATO-sponsored Operations Development contracts and airdrop systems. The development of an JPADS system has begun an active program on the MicroFly, 0.12 lb, and Drag systems, each utilizing a high-velocity system (90 ft/sec), and free-drop (without guidance unit and no use of a parachute) airdelivery of cargo.

Space systems

Space arena, the year-long return of the Stardust spacecraft successfully achieved several significant rendezvous with the comet wild 2 to successfully collect samples. After a journey of 7 years and 2.9 billion