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 bridle 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/Paraflite-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 parachute 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 aerial delivery 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 (im-

The Screamer 10,000-lb airdrop system deploys two G-11 recovery parachutes.

pact velocity of 28.5 ft/sec), high-velocity (im- pact velocity of 90 ft/sec), and free-drop (with- out use of a parachute) aerial delivery of cargo loads. These three components, developed by Force Sustainment Systems, Research Develop- ment and Engineering Command, Natick, Mass., will be used for humanitarian relief efforts and resupply missions. The items are designed to be disposable, so they are light, simple in design, and 55-80% cheaper than the parachutes and containers in current use.

Guided airdrop systems

The Dept. of Defense continues to team on an expanding set of Joint Precision Airdrop Systems (JPADS) programs. Numerous systems of 2,000 lb or lower capacity have already been deployed to current areas of operations under rapid fielding initiatives, including the first use of a JPADS system in a combat zone. The formal program of record for JPADS-XL (500-2,200-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 (JMUA) in June, executing numerous 10,000-lb Screamer system airdrops with wireless linkage to the JPADS Mission Planner (MP). The JPADS-MP 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 offsets, and many of these systems are now or will soon be in use in current operations. The ACTD is planning one more JMUA this year and a final

in 2007 before the
l JPADS program o
NATO prioritized
ial Operations Force
nse Against Terroris
Precision Airdrop
p has been establish
precision airdrop
interoperability. A
ity Demonstration (
e with a USAF C-1
conducting over
n NATO-specified o
Development contin
d airdrop systems.
nued development o
,000-lb and 10,000-l
has begun an acce
am on the MicroFly
0-2,200 lb), and Dra
latforms; each utilize
guidance unit an
S-MP. Pioneer Aeros
guided airdrop sys
ed delivery platform
tions: a 500-lb (A-7 b
2bundle) system. Add
ms have shown signif
ties in both domestic
PACD06) demonstra
Natick Soldier Center
dates for the 30,0
nology Objective. Pio
a NASA X-38 parafoil
n, while ParaFlite mo
oil developed unde
had successful subsc
e conducting the fu
0-lb payloads using
y. The first test drop
0,000-lb canopy at 2
r October, and the r
000 lb is slated for
guidance unit for the
produced by Wam
tion, and control flig
ped by Draper Labor
the JPADS 10,000-lb

Space syst

space arena, the year
l return of the Stard
n achieved several si
ing a rendezvous wi
e distinction of bein
object to successfully
nerte. After a journe
years and 2.9 billior

by **Sean George**