

BIODYNAMICS

Horizontal Impulse Accelerator (HIA)

The HIA is a test device that uses a sled pushed by a ram along a track to simulate impact events up to 150 G's. Seating systems can be mounted to test impact in the X, Y, and Z axes. The facility can simulate both high-intensity short pulses and long-duration impacts. This facility is approved for ATDS, human, and post-mortem subjects.



Testing Applications: Front and Side Vehicle Impacts, Drogue-Phase Ejection, Helmet Head and Neck Injury, Medical Device and Medical Evac Equipment Testing, Forward and Lateral Structural Impacts.

Vertical Deceleration Tower (VDT)

The VDT is a test device used for simulating vertical impact events such as ejection, hard landing scenarios, or crashes. The impact g-level can be customized by altering the drop height and changing a plunger fixed to the carriage. This facility is approved for ATDS, humans, and post-mortem subjects.



Testing Applications: Catapult-Phase Ejection, Neck and Lumbar Spine Injury Testing, Medical Device Drop Testing, Vertical Structural Impacts.

Specialized Tests: Parachute Opening Shock and Dynamic Fall Arrest.



Contact Us on how we can provide test support for your products

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BIODYNAMICS TEST CENTER



A premier Air Force CRADA accelerating innovation in impact, escape systems, and vibration research to enhance safety and survivability.

Cooperative Research & Development Agreement
(USAF Research Lab 711th HPW Biodynamics & DCS Corporation)

About DCS

Founded in 1977, DCS is an employee-owned company providing engineering, testing, and technical support services to the Department of Defense. DCS has been performing Biodynamics research since 2012, offering impact, vibration, and escape systems testing to the Air Force as well as private companies through our Cooperative Research & Development Agreement.



How does our Cooperative Research and Development Agreement (CRADA) Work?

The CRADA between DCS Corporation and the 711th Human Performance Wing / Human Effectiveness Directorate enables third-party customers access to highly specialized human-rated facilities and test equipment detailed in this brochure. These facilities are located at Wright-Patterson Air Force Base near Dayton, Ohio. In addition, DCS works together external partner facilities for testing windblast and full-scale escape systems. DCS has decades of expertise operating and conducting research within these facilities and abroad. DCS looks forward to handling every aspect of your testing requirements.

VIBRATION

Six Degree of Freedom (SIXMODE) Vibration Facility

The SIXMODE facility features a 36 square-foot platform capable of replaying vibration profiles from ground vehicles, aircraft, and spacecraft, allowing long-term human and device exposures in a controlled environment.



Testing Applications:

Medical Device and Air Evac, Vibration Mitigation Devices, Damping Seat Systems, Personal Protective Gear.

Vertical Impact Device (VID)

The VID is a rail-guided platform that replicates high-g, short-duration vertical impact events up to 1600 G. A seismic base and various dampening materials are used to program the pulse duration. Rated for ATDs, humans, post-mortem subjects.



Testing Applications: Simulated Underbody Blast and Shock Impulses, Rotor Wing Crash, and High-Energy Impact Events.

Vertical Impulse Accelerator (VIA)

A compact, vertically oriented version of the HIA, this system rapidly accelerates a platform upward to simulate shock and impact events for small payload testing. Devices can be placed in a single or multi-axis configuration. This facility is approved for ATD injury and device durability testing.



Testing Applications:

Component impact durability, device structural stability, aircrew seat impact testing.

Manikin and Equipment Rental

Data Acquisition Systems: Various systems made by DTS.

High-Speed Cameras: Phantom C210 and C321 cameras.

Sensors: Load Cells, Linear Accelerometers, Angular Rate Sensors, and 6DX Blocks.

Aircrew Flight Equipment: Flight Suits, Pilot-Worn Equipment, Helmets, Boots, Gloves.

Manikins: LOIS, LARD, Automotive 5th 50th and 95th, Aerospace 5th 50th and 95th, FAA 50th, Roller Coaster Ballast, Model T Parachute Dummy, and GARD.



Mass Properties

- Weight, center of gravity, principal moments of inertia equipment.
- Can measure objects weighing less than a pound to more than 1 ton.
- Data serves as required input for accurate dynamics models.
- **Testing Applications:** Helmets, HMD's, NVG's, chem-bio, oxygen systems.
- Seating systems (automotive and aircraft).



Scanning and Model Development

- Pre-test scanning services, reverse engineering, component digitization, meshing of CAD into dynamic models using LS-DYNA.
- Anthropometry measurement.
- FARO Arm, Hexagon Romer Arm Scanner, Artec Leo Handheld Scanner, Humanetics Vitus 3D Body Scanner.

External Testing

- Offer on-site data acquisition support for full escape systems and ejection testing, in-flight maneuver testing, in-flight ballistic parachute shock, and windblast testing.
 - State-of-the-art sensors, load cells, and in-dummy data acquisition systems.

In-House Fixtures and Fabrication

- Ability to model and build custom fixtures for our facilities.
- Turret fixture for 360-degree rotation and 180-degree pitch of test article.
- Flatbed fixture for stretcher, air-evac, and medical device testing.
- Ejection seats for a variety of fighter and bomber aircraft.
 - Variety of ACES II seats, in addition to F-35 US16E, and T-38 seats.



Calibration Services

- Single axis and triaxial linear accelerometers.
- Angular rate and angular accelerometers.
- 6DX linear accelerometer - angular rate packages.
- Single axis and triaxial load cells.
 - Belt load cells, triaxial load cells, and strainert load cells.
- Manikin Load Cells
 - 1716 Upper Neck Load Cell
 - 1914 Lumbar Load Cell
- Pressure sensors up to 25 PSI.

