

# High-G Environment



S&T Campaign: Sciences for Lethality & Protection  
 Creating a High-G Environment in the Laboratory

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## Research Objective

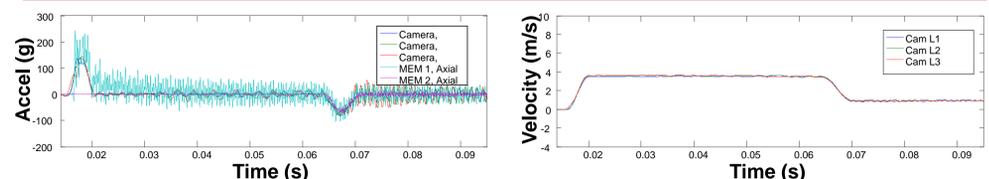
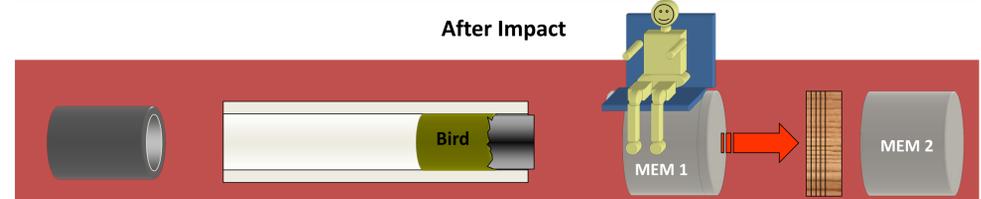
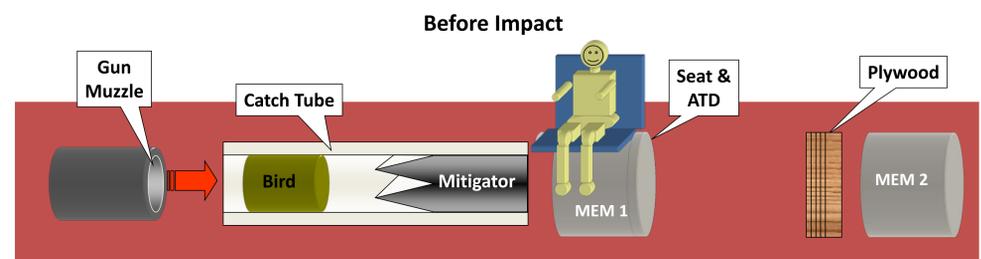
- Provide enabling technology for the repeatable, and controlled simulation capability of high-g events in a laboratory environment as a research tool, and low cost alternative to ballistics experiments

## ARL Facilities and Capabilities Available to Support Collaborative Research

- 7" Diameter, 300' Airgun
- 4" Diameter, 70' Airgun
- 3" diameter, 70' Airgun
- Pulse shaping materials and methods
- Explicit FE Modeling Capability of Impact Events
- Onboard recorder instrumentation
- Acceleration levels achievable



7" Airgun System



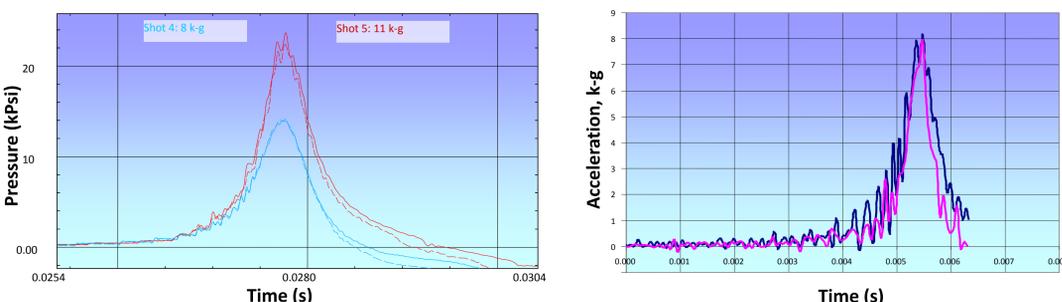
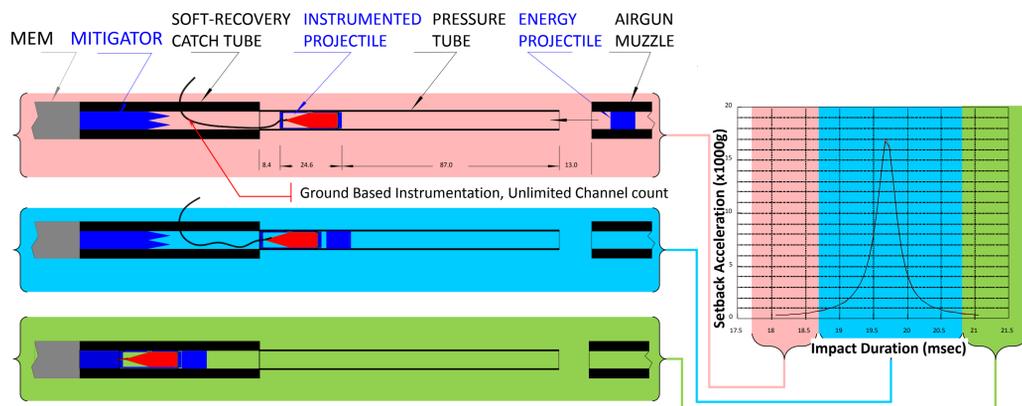
System Adaptable and Capable of Driving Large Structures

## Challenges

- Instrumentation is limited due to loads and ability to transmit signals from flying article under test
- Current simulation technology utilizes materials that have significant statistical variation
- Total energy available to drive event is limited to non-explosive capabilities

## Complementary Expertise, Facilities and Capabilities Sought in Collaboration

- High-g instrumentation and associated recording and transmission methodology
- Novel methods for the stochastic modeling of transient impact events
- Advanced methods to control and program acceleration and time curves
- Innovative research approaches to high-g simulation



ARL Air Mitigation Technique



- ARL's Airguns**
- Up to 7" diameter test articles
  - Up to 100 lb projectile
  - Up to 200 k-g
  - Up to 2000 ft/s