

# DSX Shock & Vibration Application Highlight

## DSX-6650 Ballistic Shock System

### Overview of Application & Test

Survivability testing of armored vehicles and their components.

Armored vehicles like tanks, trucks, planes and ships must be designed and built to survive the impact of enemy projectiles and be able to fight back.....to take



and deliver shocking impacts from a variety of projectiles.

### Equipment Benefits & Highlights

- Meets ballistic and gunfire shock specifications for armored vehicles
- Combines the force of multiple machines into one vibration system
- Cost effective alternative to independent testing services...saves money in the long run
- Capable of replicating required shock performance specifications in the horizontal and vertical axes
- High capacity, lightweight linear bearing slidable for handling large overturning moments (with high centers of gravity) up

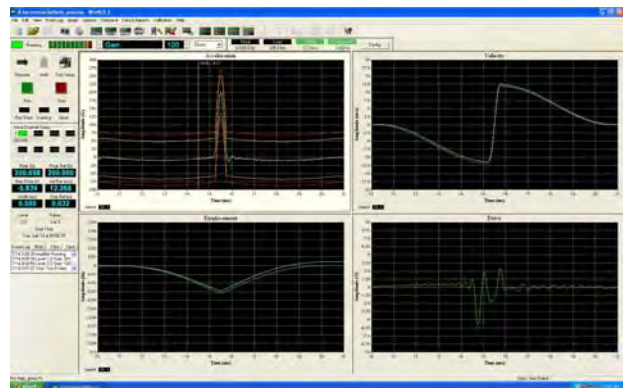
to 100,000 inch-pounds

- Capable of achieving new, higher sweep rate levels up to 5 octaves/minute
- Adjustable pre & post pulse offsets comply with many Mil-Std specifications
- Improved consistency and efficiency



### Shock Spec Performance:

#### Ballistic Shock Pulse

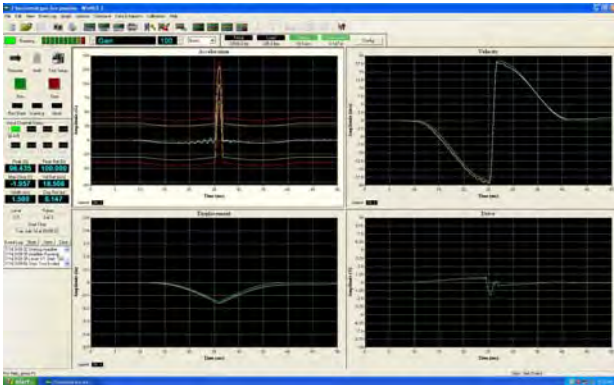


- 200G acceleration
- 0.5 mSec duration
- Half sine with 5% pre & post pulse
- 50 pound payload
- Horizontal & vertical axes
- Positive & negative shock pulse

Ballistic shock is a high-level shock that generally results from the impact of projectiles or ordnance on armored combat vehicles. Armored combat vehicles must survive the shocks resulting from large caliber non-perforating projectile impacts, mine blasts, and overhead artillery attacks, while retaining their combat mission capabilities.

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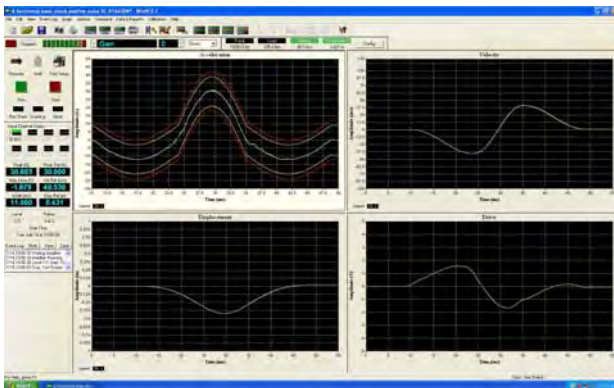
## Gunfire Shock



- 100 G acceleration
- 1.5 mSec duration
- Half sine with 5% pre & post pulse
- 50 pound payload
- Horizontal & vertical axes
- Positive & negative shock pulse

Gunfire shock tests are performed to provide confidence that material can structurally and functionally withstand the relatively infrequent, short duration transient high rate repetitive shock input encountered in operational environments during the firing of guns.

## Shock with high overturning moment



- 30 G acceleration
- 11 mSec duration
- Half sine with 40% pre & post pulse
- 359 pound payload
- 45,600 in-lb overturning moment
- Horizontal & vertical axes
- Positive & negative shock pulse

The nature of high center of gravity and high overturning moments required of this shock test forced us to develop a lightweight and sturdy linear bearing assembly for horizontal axis vibration testing. These bearings keep the plate riding smoothly and restrained to move efficiently in only one axis. We have taken some brave and innovative steps in the development of this linear guide bearing table and expect it will have application in cases where large products must be tested in the horizontal (x and y) axes.

## Testimonial

One company that manufactures military electronic & electromechanical products such as fluid level sensors and separators and high & low current switching devices has gained a great deal of knowledge and confidence in Thermotron's vibration test equipment for these harsh and demanding environments. We were the only shaker company willing to take on the challenge of designing a vibration system to meet their needs. All of the other competitors declined to bid on the project.

Through this experience, we have gained the confidence that our Ballistic Shock System stands up to the test; meeting and exceeding the demanding specifications and expectations of this customer and their application.

It provides further proof that we are capable of customizing our shaker product offering to meet out of the ordinary shock & vibration requirements.

## Going Forward

We would like to seek out and serve additional market needs with this customized vibration solution. Contractors required to perform these demanding shock & vibration levels can be found amongst the supplier base serving manufacturers of Abrams Tanks, Bradley Fighting Vehicles, Mine Resistant Ambush Protected (MRAP) Vehicles and Joint Light Tactical Vehicles (JLTV). Suppliers to

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vehicle manufacturers like BAE, General Dynamics, OshKosh Corporation and NAVISTAR with familiar names like:

- DRS
- Honeywell
- CTS Corp.
- Alliantech Systems
- Rockwell Collins
- Raytheon
- Curtiss Wright
- L3 Communications
- FLIR Systems
- ICX Technologies
- Lockheed Martin
- Miltope
- Northrop Grumman
- SAIC
- ITT/EDO



The beauty here is that we already know many of these companies. We need to get deeper into their core and find out how they are getting their ballistic and gunfire shock vibration testing done. Infiltrate and radiate.

