Turning Ideas

Into Reality

AMGD

ADVANCED MODULAR GUN DEMONSTRATOR

Using Today's Technology for Tomorrow's Weapon Systems

Presented by
Applied Ordnance Technology, Inc.

40th NDIA GARM Conference
New Orleans, LA
April 2005

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Solutions Through Applied Technology

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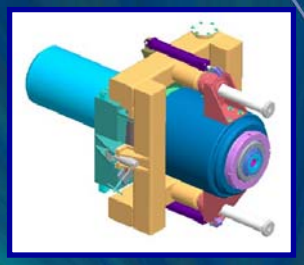
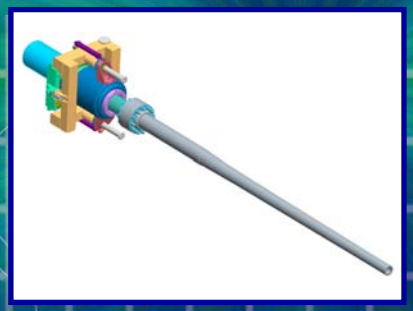
PROGRAM OVERVIEW

- Modular
- Large Caliber
- High Performance
- Hypervelocity



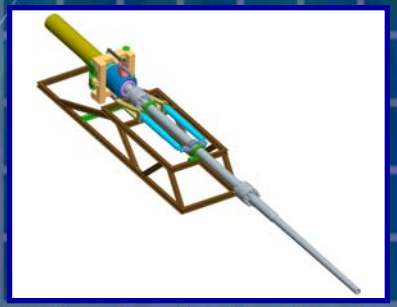
Available Now!

Demonstrated:
- Operating Pressures Up to 100KSI
- 25 shots; 100% Success
- Seal Cartridge Performance
- Chamber / Barrel Connection
- Simultaneous Ignition of Modular Prop Charge
- Chamber Sized for 110-cal. System
- System Can be Upgraded to 200-cal. System



Available FY06.

Upcoming:
- Use Existing Parts
- Test Shots at 100KSI
- Add a Barrel Segment
- Fire Instrumented Projectile



Available FY07.

Near Future:
- Use Existing Parts
- Custom Stand
- Test Shots at 100KSI
- Add Additional Barrel Segment
- Use Larger Volume Chamber
- Launch Instrumented Projectile at High Speeds
- Use Advanced Gun Propellants

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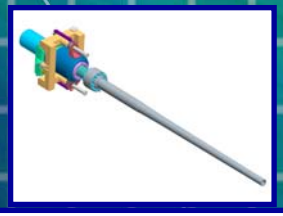
PROGRAM OBJECTIVES

The program objective is to provide the DoD community with a large caliber, high energy, high pressure, high velocity TEST GUN for advancing gun, projectile, propulsion and ammunition technology.

- Hypervelocity Research Platform (Large Caliber)
- Advanced Projectiles
- Advanced Gun Propellants
- Advanced Propulsion & Ignition Systems
- Wear & Erosion Mitigation
- Gun Instrumentation & Safety Systems
- Barrel Coatings/Liners
- Lightweight Barrel Materials

DST Fixture Available for Use!



BJT Fixture Available Oct 2005

OUTLINE

AMGD Test Fixture

- GUN DESIGN
- TEST DETAILS
- PROPELLING CHARGE
- INSTRUMENTED PROJECTILE
- AMGD PROGRAM PLAN
- PROGRAM OBJECTIVE

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GUN DESIGN

AOT designed a large-caliber high energy, high-pressure, large-volume, chemical gun system.

- **High Energy, High Velocity, High Pressure**
- **Separable Chamber**
- **Multiple, Large Volume Chambers**
- **Disposable Seal Cartridge**
- **Segmented, Smoothbore Barrel**
- **Patent 6,571,676**

Test Fixture

Separable Chamber

Seal Cartridge

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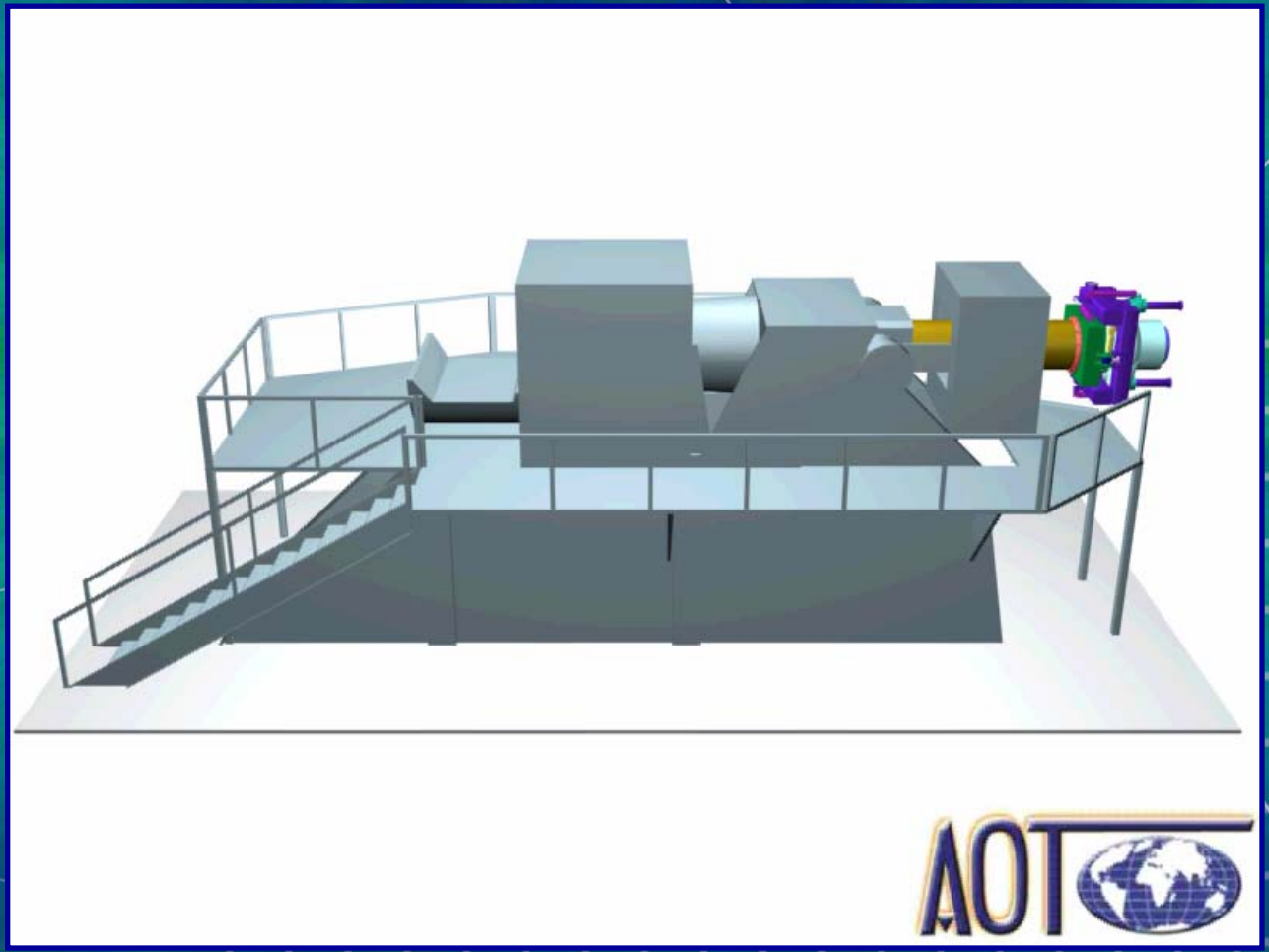
ADVANCED Power Technology

NAVSEA WARFARE CENTERS INDIAN HEAD

NAVSEA WARFARE CENTERS DAHLGREN

DST SIMULATION



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NAVSEA WARFARE CENTERS INDIAN HEAD

NAVSEA WARFARE CENTERS DAHLGREN

DST Fixture

Objectives:

- Seal Cartridge Performance
- Chamber Pressures Up to 100 KSI
- Chamber / Barrel Connection
- Simultaneous Ignition of Modular Prop Charge

Fixture Features:

- Full-scale 5-in. Gun Parts
- Nozzle/Throttle to Simulate P-t Curve
- Automated Chamber / Barrel Connection

Sequence of Pictures Showing Fixture Opening

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DST RESULTS

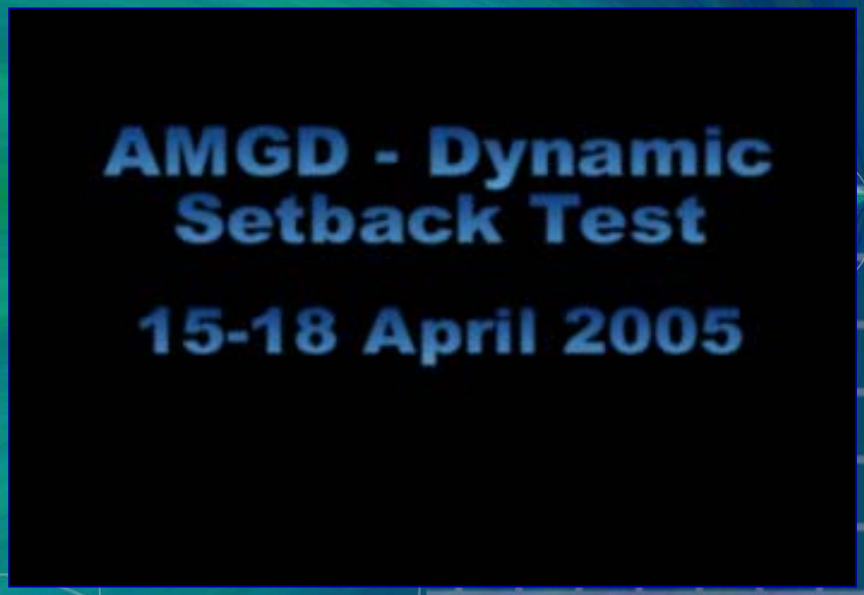
- Test Performed at NSWC-DD
- Conducted 25 Shots
- Pressures Ranging from 40-100KSI
- Seal Cartridge Performance Exceptional
- Successfully Demonstrated Chamber/Barrel Coupling
- Modular Prop Charge Performance Repeatable

Chamber w/ Seal

Coupler

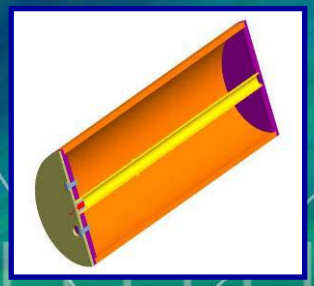
Fired Seal Cartridge

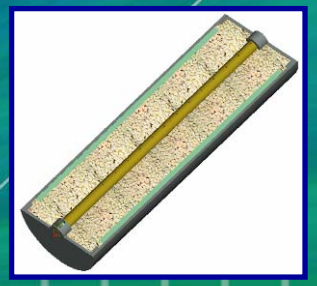
SETBACK TEST FIRING



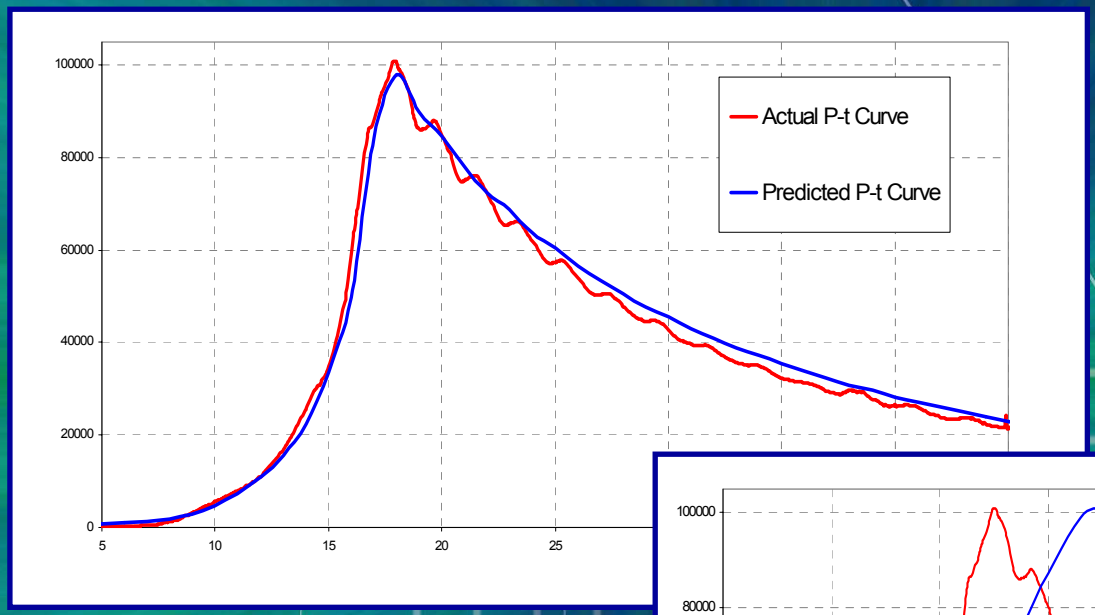
PROPELLING CHARGE

- Modular Prop Charge
- Simultaneous Module Ignition
- Consumable Case



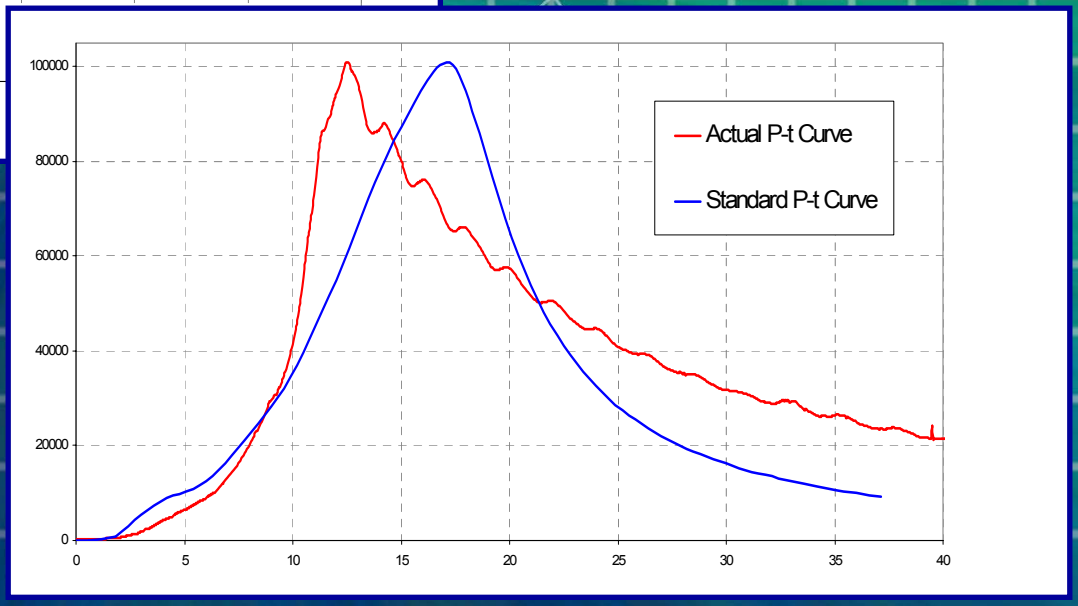


PROPELLING CHARGE



DST Test Results – April 2005
Prop Charge Performance

DST P-t Curve
vs.
Standard P-t Curve



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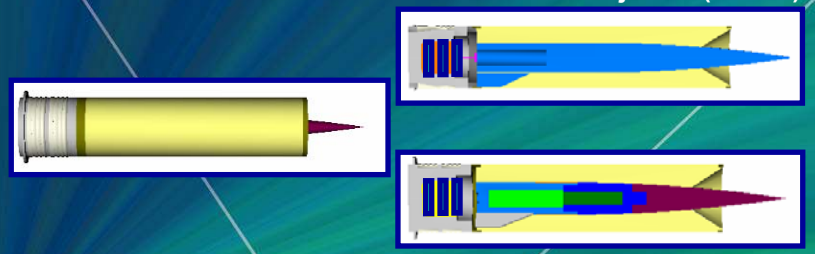
INSTRUMENTED PROJECTILE

Instrumented Pusher Assembly (IPA)

Instrumented Monolithic Pusher Test Projectile (IMPTP)



Instrumented Long Range Test Projectile (ILRTP)

- Capture Interior and Exterior Ballistics Data
- Leverage Army Instrumentation Expertise
- Utilize Existing, Gun-proven Sensors and TM Solutions
- Embed Instrumentation in Modular Fashion
- Conduct Hypervelocity Research for Large Caliber Projectiles

State-of-the-Art + Timely + Robust + Low Cost = Low Program Risk!

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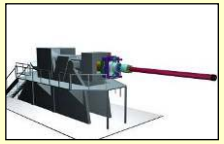
AMGD PROGRAM PLAN

Test Name	Test Gun Configuration	Projectile	Propellant	Status
Proof-of-Concept	Army Test Asset 	None	M30A1	Completed
Setback Test	5-in., 50L chamber 	None	NACO	Completed
Barrel Joint Test	5-in./70-cal., 50L chamber 	IPA 	Advanced Gun Propellants	FY06 Q1
Propellant Characterization Test	5-in./110-cal., 50L or 100L chamber 	IMPTP 	Advanced Gun Propellants	FY06 Q4
155mm Long Range Testing	155mm/200-cal. 	ILRTP 	Advanced Gun Propellants	FY09 Q2

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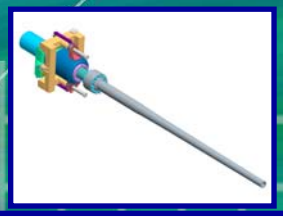
AMGD USES

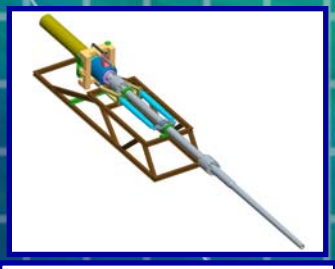
Test Platform To:

- Validate Modeling & Simulation
- Develop Hypervelocity Projectile
- Conduct High Velocity Penetration Effects
- Advance Gun Propellants
- Evaluate Instrumentation High-G Survivability
- Evaluate Precision Guided Munitions
- Study Barrel Life
- Test Wear & Erosion Mitigation
- Advance Gun Barrel Technology

DST Fixture Available for Use!



BJT Fixture October 2005!



XLR Fixture July 2006!

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