

NDIA Joint Armaments Conference

Qualification of .50 Caliber Reduced Range Ammunition by U.S. Navy and Marine Corps

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Small Arms Ammunition and Testing JXNN
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What is Reduced Range ammunition?

- **Maximum range 3500 meters.**
- **Compare to M33 6500 meters.**
- **MK 322 Mod 0 Ball**
- **MK 321 Mod 0 Tracer**

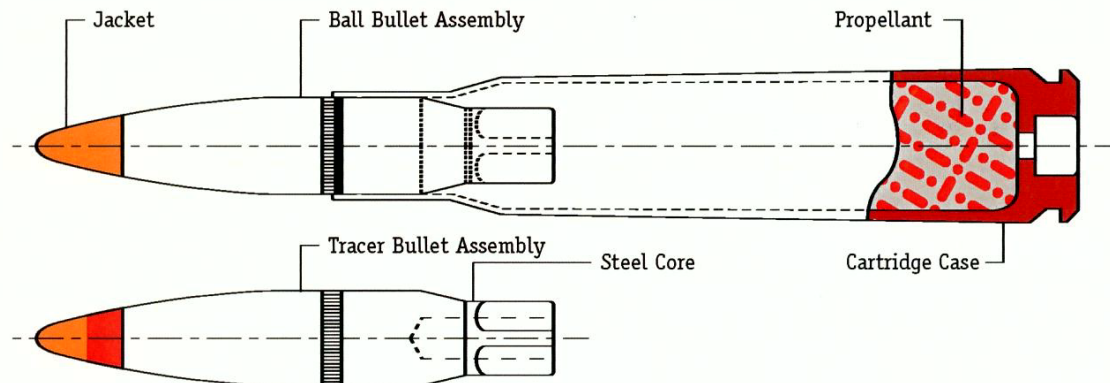


Performance

- **Fired from unmodified M2HB machine guns.**
- **Matches M33 trajectory at 800 meters within 1-meter.**

Cartridge Design

- Design is based on performance requirements.
- General Dynamics design was selected in competitive procurement.



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.50 Caliber Reduced Range



Ball and Tracer **General Dynamics Ordnance Tactical Systems**

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Cartridge Design

- **Fins at base of bullets.**
- **Fins increase drag / air resistance.**
 - Reduced bullet spin and gyroscopic instability.
 - Turbulence at base of bullet.
- **Drag reduces bullet velocity and range.**

.50 Caliber Reduced Range

	MK 322 Ball	M33 Ball
Cartridge Length	5.45 inches	5.45 inches
Case	Brass	Brass
Primer Mix	FA-958	FA-956
Propellant	WC860 247 grains	WC860 235 grains
Bullet	Brass Jacket and Steel Core. Lead Free.	Brass Jacket and Steel Core.
Bullet Base	Fins	Boat-tail
Bullet Length	2.7 inches	2.3 inches
Bullet Weight	700 grains	661 grains
Bullet Tip Color	Orange	Brass
Velocity at 24m	885 mps nominal	885 9 mps
Maximum Range	3500 meters	6500 meters

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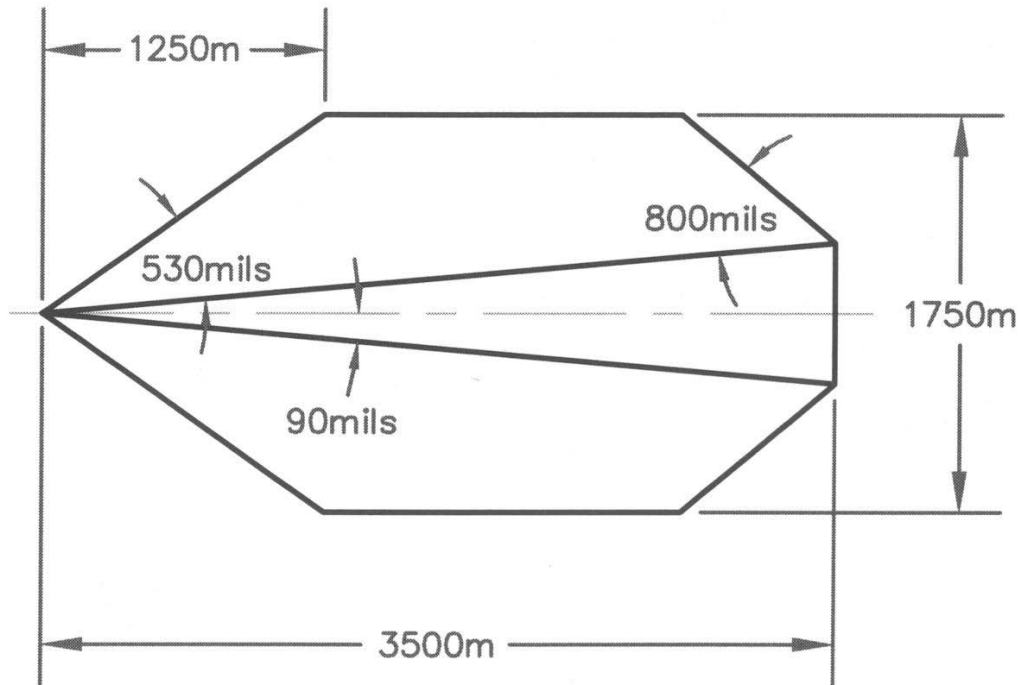


Mission Requirements

- **Navy**
 - Training
 - Crew Served Weapons Courses
 - M2HB training on 7.62mm ranges
- **Marine Corps**
 - Training
 - Operational

.50 Caliber Reduced Range

NATO Surface Danger Zone



.50 Caliber Reduced Range

Configurations	DODIC / NSN	Packaging
Ball MK 322 Mod 0	AB63 1305-01-582-5872	Bulk packaged. 120 rounds in M2A1 Can.
Tracer MK 321 Mod 0	AB62 1305-01-582-3646	
4 Ball MK 322 Mod 0 to 1 Tracer MK 321 Mod 0	AB64 1305-01-582-5890	Linked Belts. 100-round belt in M2A1 Can.
Ball MK 322 Mod 0	AB65 1305-01-582-5969	

NSNs are inactive until completion of safety reviews.

Qualification Tests, Evaluations, Certifications

Life Cycle Safety Series

28-Day Temperature and Humidity	MIL-STD-2105
Loose Cargo Vibration	MIL-STD-331C Test B1.5.2
Shipboard Vibration	MIL-STD-810G Method 514.6
4-Day Temperature and Humidity	MIL-STD-2105
12-Meter Drop	MIL-STD-2105

Handling and Shock

1.5-Meter Drop	MIL-STD-331C Test A4.1
Transportation Handling	MIL-STD-331C Test A5
Shipboard Shock	MIL-S-901D Grade A

Qualification Tests, Evaluations, Certifications

Adverse Environments

High Temperature	MIL-STD-810G Method 501.5 Procedure I
Low Temperature	MIL-STD-810G Method 502.5 Procedure I
Temperature Shock	MIL-STD-810G Method 503.5 Procedure I-C
Humidity	MIL-STD-810G Method 507.5 Procedure II
Salt Fog	MIL-STD-810G Method 509.5
Waterproofness	Immersion for 24 hours

Health Hazards

Toxic Fumes	OSHA Standards
Waste Characterization	CFR Title 40 Part 261 Subpart C
Impulse Noise	MIL-STD-1474

Qualification Tests, Evaluations, Certifications

Function and Ballistics Tests

Pressure and Velocity

Dispersion and Match

Function and Casualty

Cyclic Rate of Fire

Trace Visibility

Cartridge Performance Specifications

HS/JXNN/C09/1630

HS/JXNN/C09/1631

Certifications

Electrostatic Discharge

NAVSEAINST 8020.19

Hazard Classification

NAVSEAINST 8020.8

Surface Danger Zone

AR 385-63

Demil Disposal

NAVSUPLOCAMMOINST 8027.1A

Program Milestone Schedule

	2010	2011	2012	2013
Request for Proposals (RFP)	Feb			
IDIQ Contract Award to GD-OTS		Sept		
Initial WSESRB Safety Review		Sept		
LAT Tests DO 0001			Apr	
Safety & Environmental Tests			Sept	
Packaging Handling Storage and Transportation (PHST) Certification				Jan
Electrostatic Discharge Certification				Jan
Shipboard Shock Qualification				Feb
Final Hazard Classification				June
Final WSESRB Safety Review and Initial Operational Capability (IOC)				June

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.50 Caliber Reduced Range



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