

Joint Armaments Conference

Dallas, Texas

May 17-20 2010

JOINT FAMILY OF WEAPONS

- **35MM Revolver Cannon
&
AHEAD Air Bursting Ammo**
- **Mission Area:
SUW/SHORAD/MOUTS/Force
Protection**

- Fully developed NDI end items.
- NATO qualified.

The Millennium GDM-008 Naval Gun System



Operational Capability:

- Scalable Lethality capability in one weapon
- Operational range 300M to 5 KM
- Unmanned/Modular/No thru deck penetration
- Rapid Reload 252 Ready Service Rounds on Mount

Skyshield 35 Short Range Air Defence Weapon System



Operational Capability:

- Area- and point-defence against air threats, including low RCS & C-RAM
- Continuous full hemisphere surveillance >20 km
- Short reaction time Automatic (TEWA),

SkyRanger



Operational Capability: Defeat Ground Targets - Air Defence Counter Mortar (RAM) - Infantry Flank Protection - Urban Warfare - Scalable Lethality

Ahead Air Burst Munition - One Round for all Missions



Summary of Advantages - Part 1

- Multi mission = C-RAM/ SHORAD/ Camp protection/Force Protection/Counter Swarm/
- Light weight + Modular design = Air Transportable
- Mature technology - NDI
- Open Architecture
- No auxiliary systems = lower maintenance
- Linkless feed system = Reload 250 rds ~ 9 min
- Optimized health monitoring = <MTBR
- Off-board diagnostics = reduced manning
- On-mount local reference system
- Low power requirement < 2KVa
- Network Enabled

Summary of Advantages Part 2

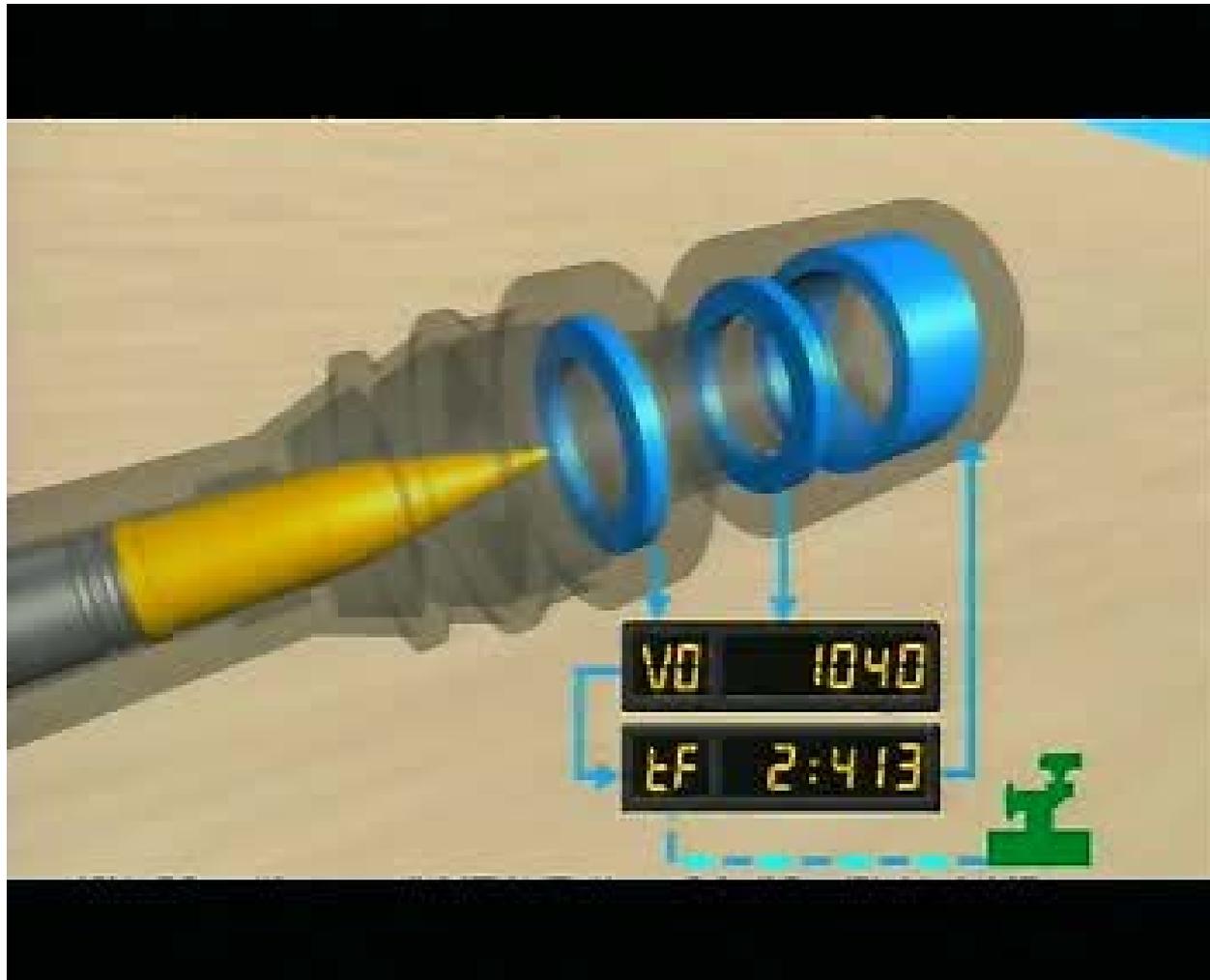
- Engage all air & ground targets +85 to -15
- Self contained casualty power
- 250 rounds on mount = 10 - 20 engagements
- Selectable Rate of Fire 1000 RPM/200 RPM/single shot
- Fully stabilized
- Unmanned Gun System
- No hot gun issues
- Common parts & fasteners = less spares
- Minimum tool set - one 5mm & one 8mm wrench
- One round for all missions
- Safe ammo - no H.E.
- Lowest TOC

Summary of Advantages Part 3

Naval version specific

- Light weight 3.6t to 5.2t depending on configuration
 - Minimum Structure to install
 - No auxiliary systems = lower maintenance
 - Modular design = 30 min swap out
 - On-mount local reference system = easy cross decking
- “Personality” card in the on-mount GCM = easy cross decking

AHEAD Lethality Mechanism



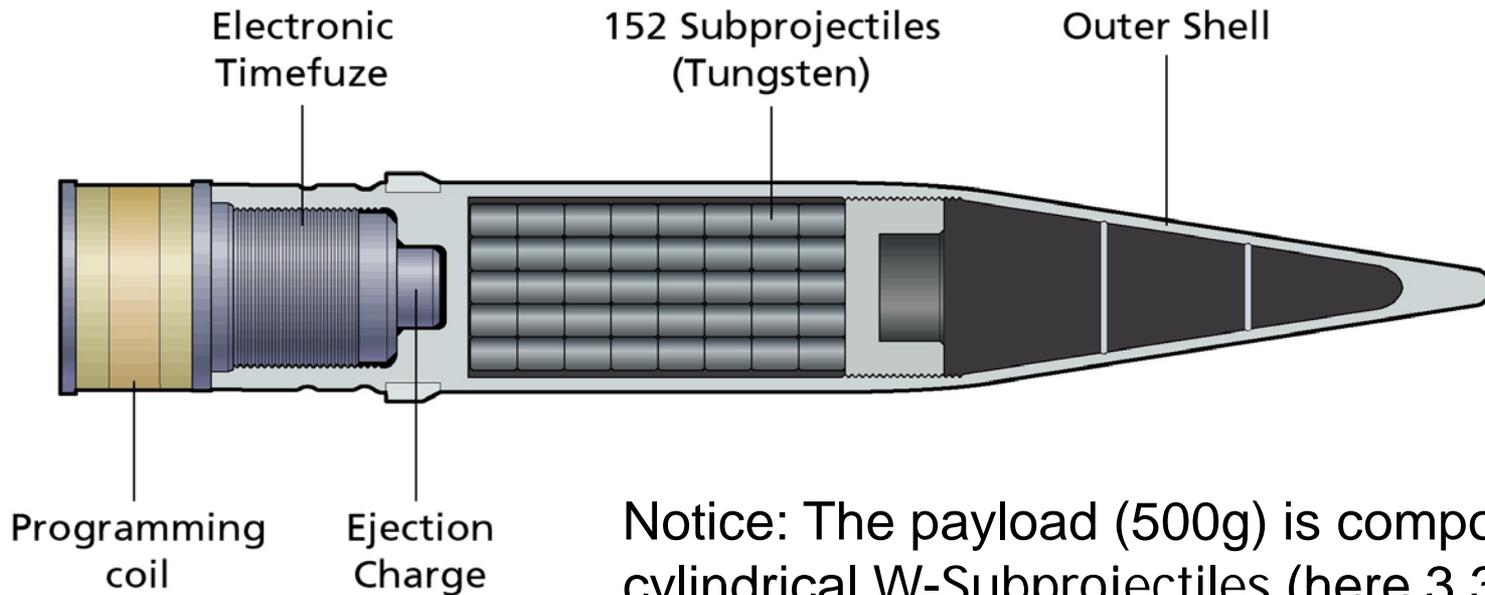
Selectable Firing Rates

Single Shot - 200spm - 1000spm



35mm Air Burst Munition

Kinetic Energy Time Fuze (ABM-KETF)



Notice: The payload (500g) is composed of cylindrical W-Subprojectiles (here 3.3 g each). For engagements other than AA (e.g. G-to-G) the mass of the subprojectiles can be reduced accordingly (e.g. 1 to 1.5 g)

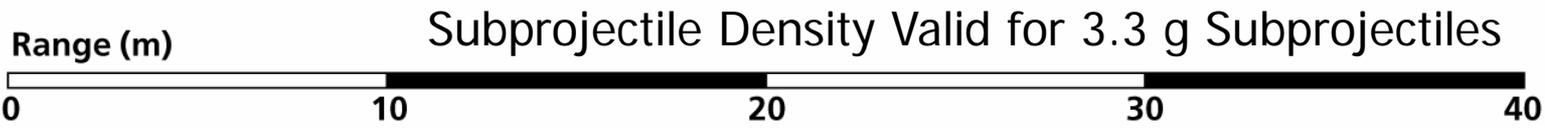
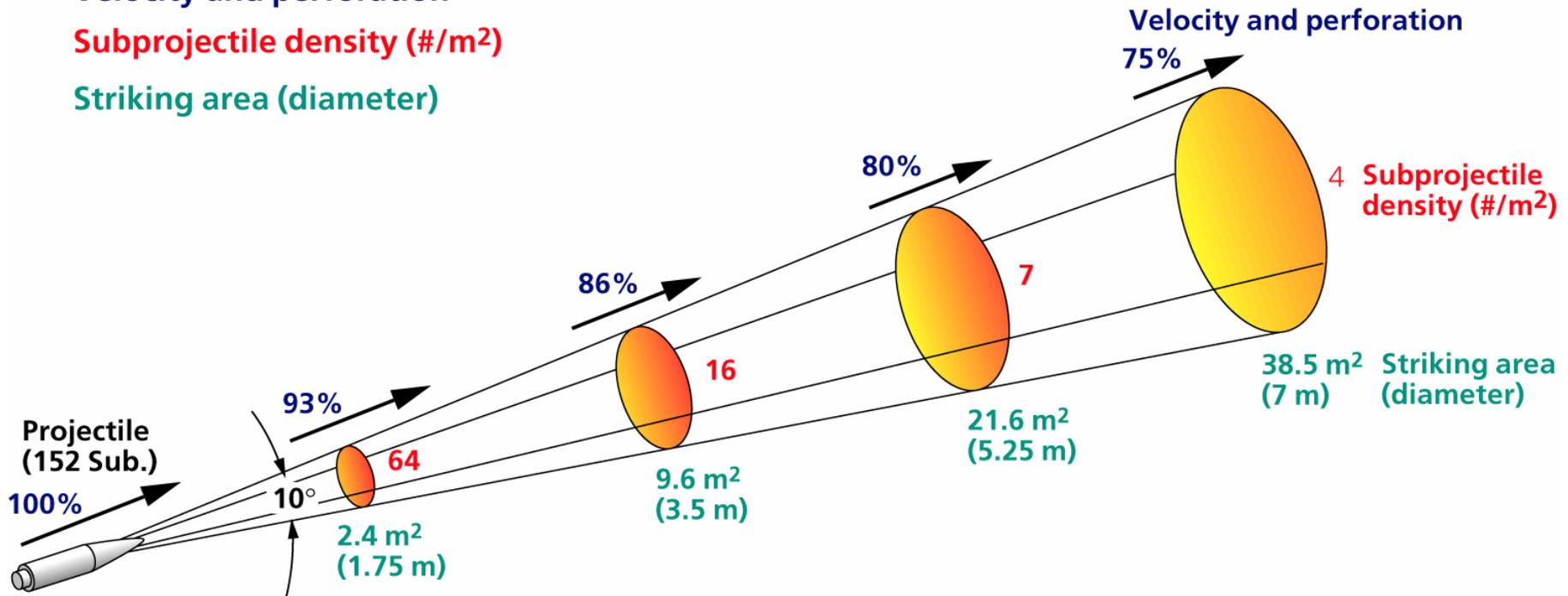
AHEAD 35 mm ABM

Subprojectile Dynamic Parameters

Velocity and perforation

Subprojectile density (#/m²)

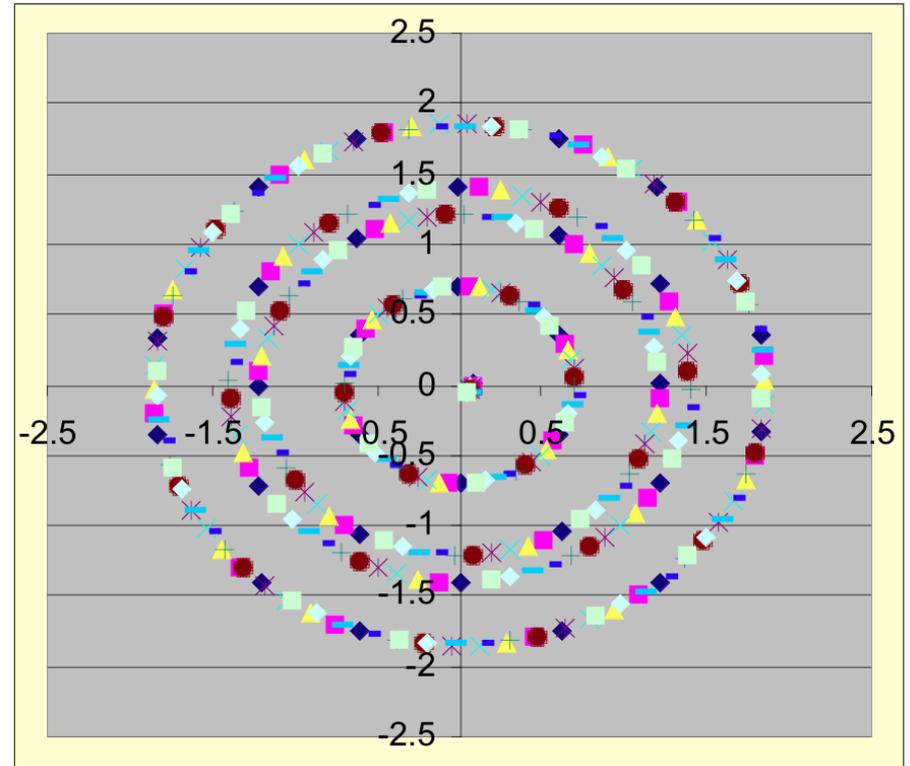
Striking area (diameter)



Payload Foot-Print



35 mm ABM (Ahead):
152 subprojectiles of 3.3 g



35 mm ABM:
341 subprojectiles of 1.5 g

On-line Compensation of Muzzle Velocity Variation

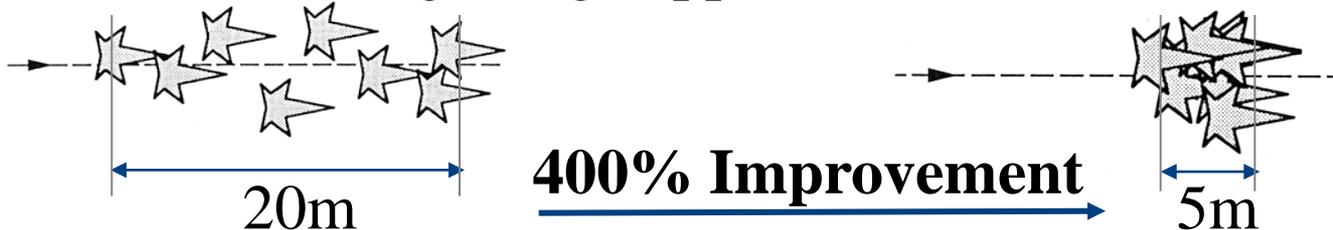
Fixed Time Programming



On-Line ΔV_0 - Compensation



Firing Range approx. 1600m

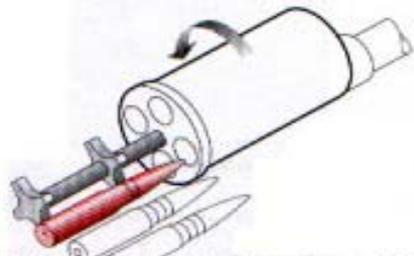


Muzzle Velocity Correction

Ahead

muzzle velocity uncompensated

Four Chamber Revolver Cannon



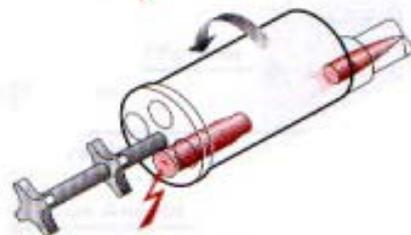
Cartridge moving to chamber position



Cartridge half in chamber



Cartridge fully in chamber



Chamber and cartridge in line with barrel - firing position



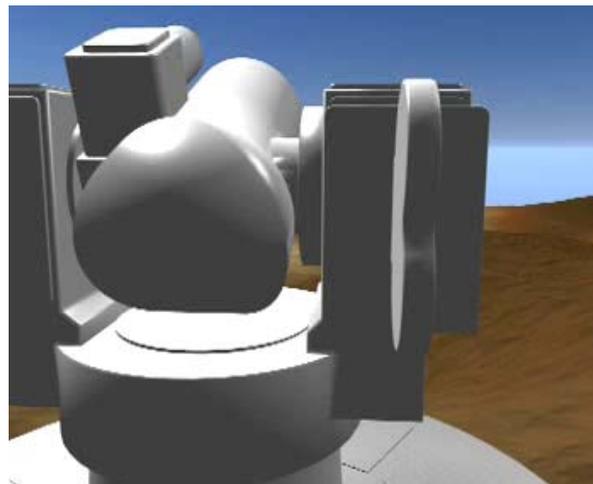
Ejection of cartridge case

Sample Target Sets

1. Boghammer



2. UAV 12' wingspan



3. Periscope



4. 2" Armor Plate

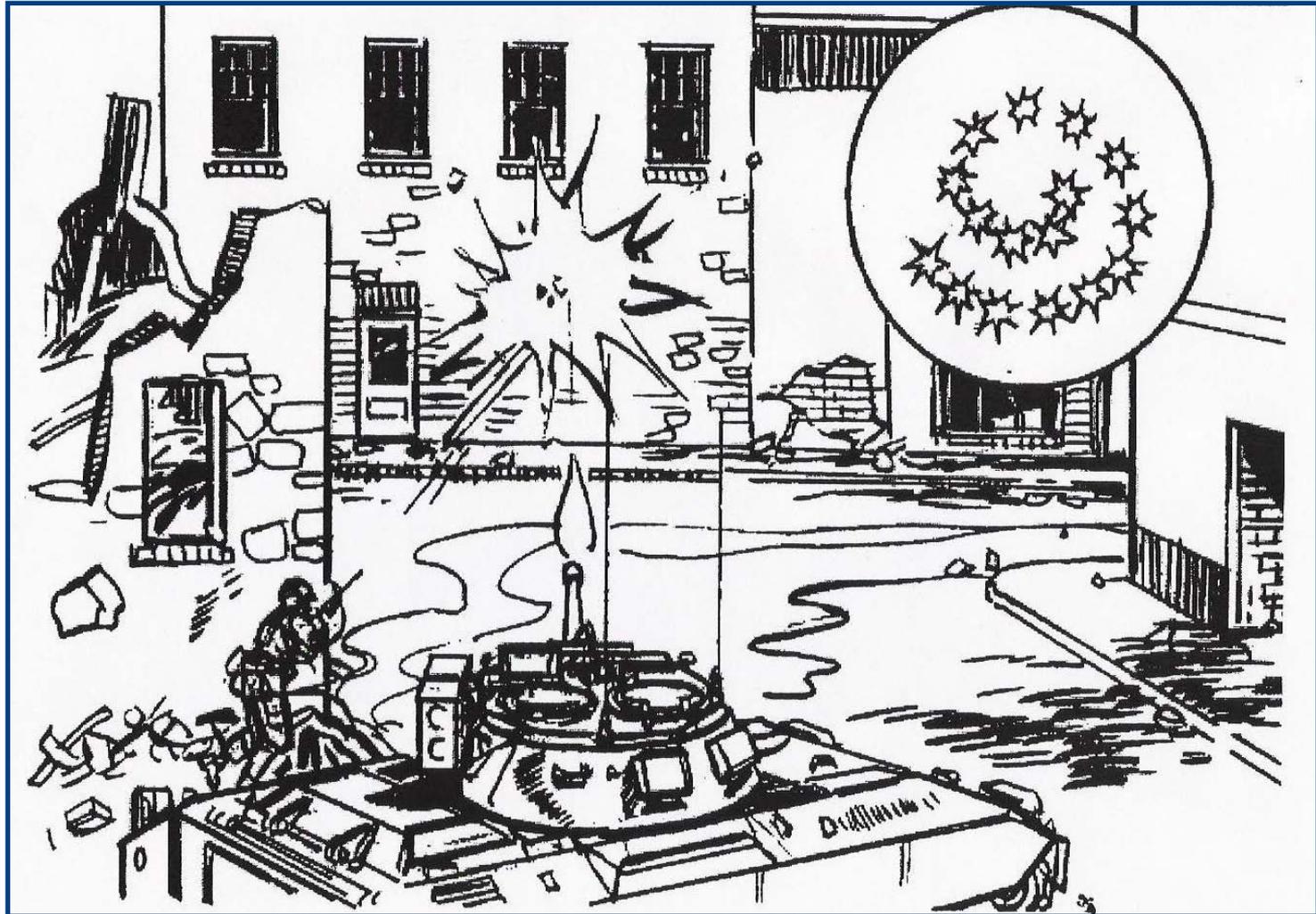


Helicopter Target (UH-1, Static)

- 2 Shots
- Range: 1500 m
- Entry Side
- Ref.: APG/Oct. 98



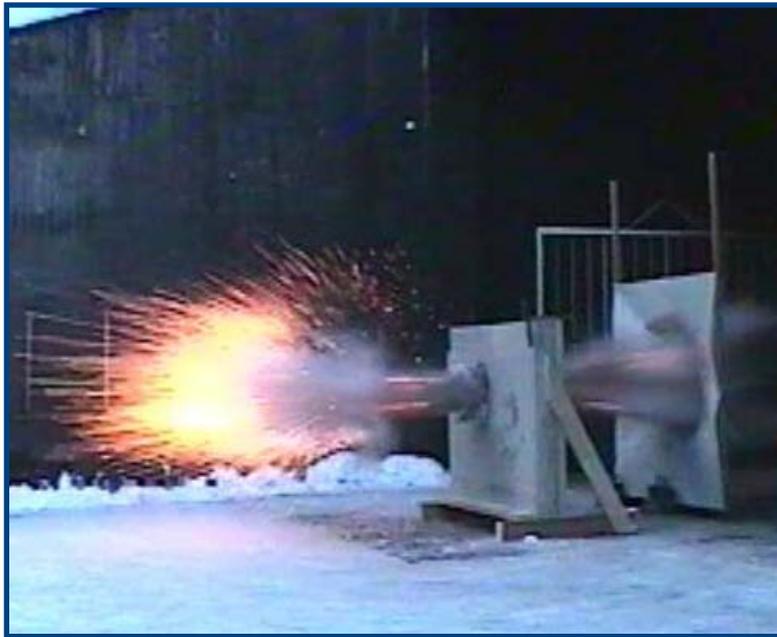
U.S. Army Breaching Technique



Breaching Fire

8" Concrete Wall

Double Steel-Structure Reinforced



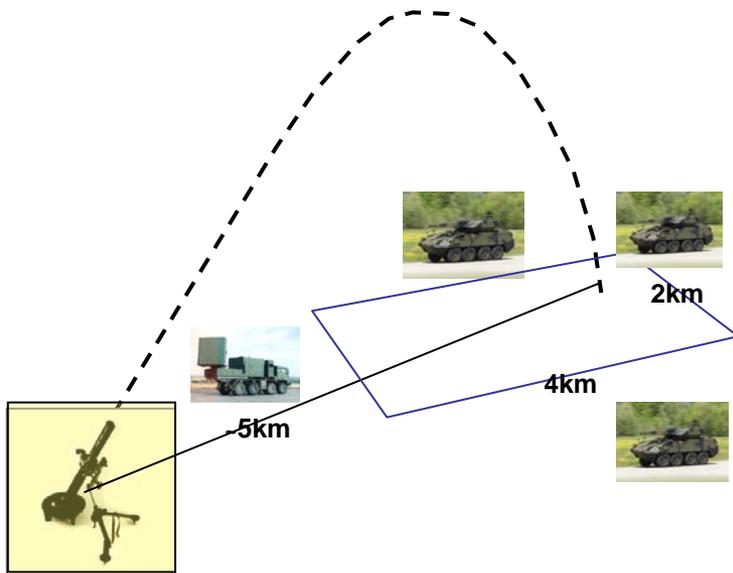
Video: M1 15962BA

Neutralizes Heavy Armor



Base Defence – Counter Mortar

Demonstrated 12.2004



Effective Against ATW Positions

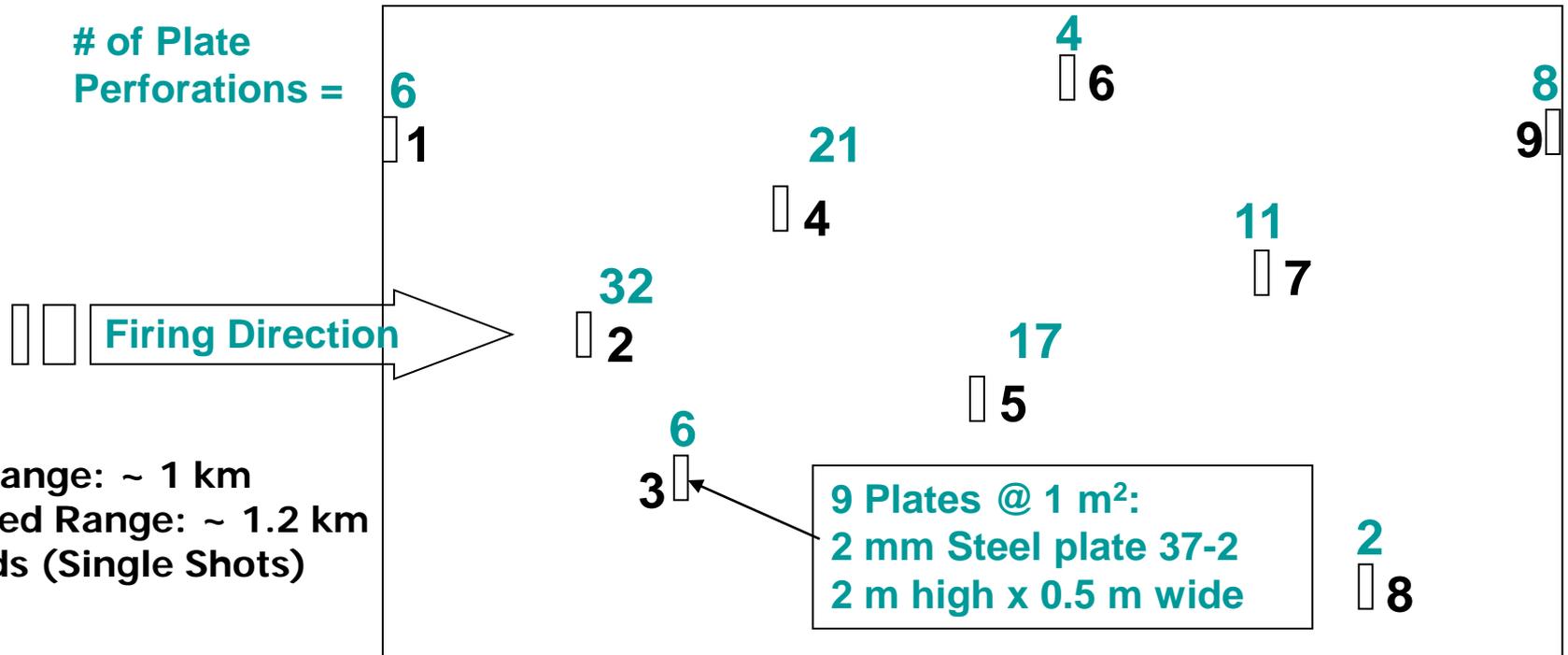


Dismounted Troops

4 Rds @ 135 Subprojectiles = 540 SP

Total: 107 Plate Perforations (~ 20%)

of Plate Perforations =

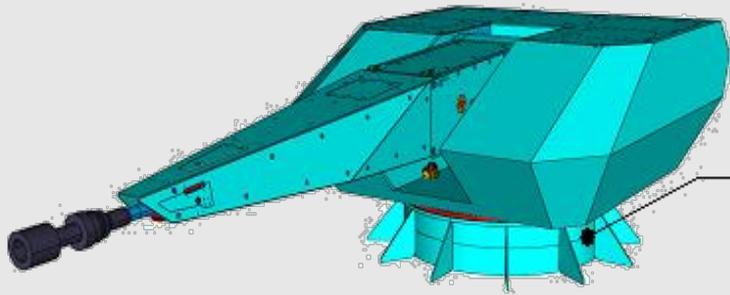


Firing Range: ~ 1 km
Simulated Range: ~ 1.2 km
4 Rounds (Single Shots)

Target Area: 10 (width) x 30 (depth) m

The target area is 27 m higher than the gun muzzle

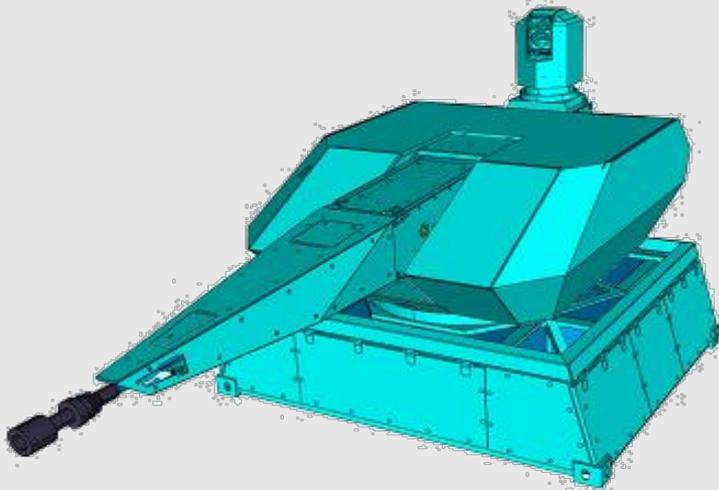
Naval Version Modular Options



Fixed installation 4.2 tons



Modular (ISO) Installation 5.3 tons



Modular Install w/ Optional EO/IR FCS



Skyranger – Turret Version

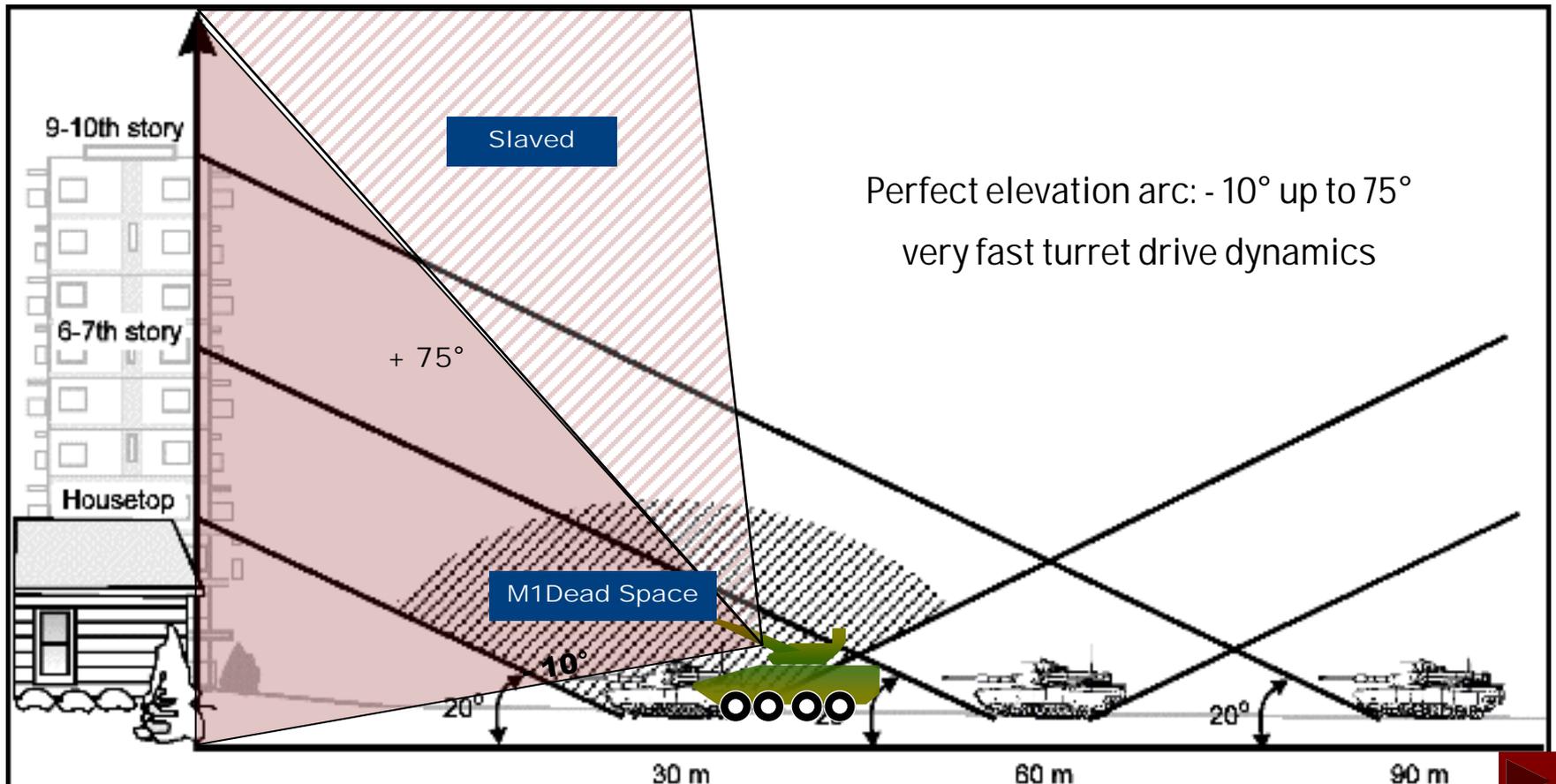


- Compatible with: Piranha III/IV, Stryker,etc
- Design Basis for Millennium Gun
- On Mount EOD
- Capable of Netcentric Operation
- Capable of Independent Operation

Turreted Gun Version

Advantages

STRYKER elevation +15, Depression -5
M1/M1 A2 elevation +20, Depression -10
BFV elevation +60, Depression -10

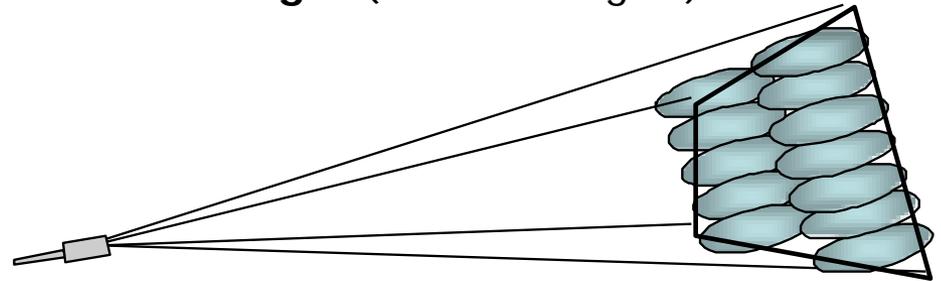


Ground Operation Modes

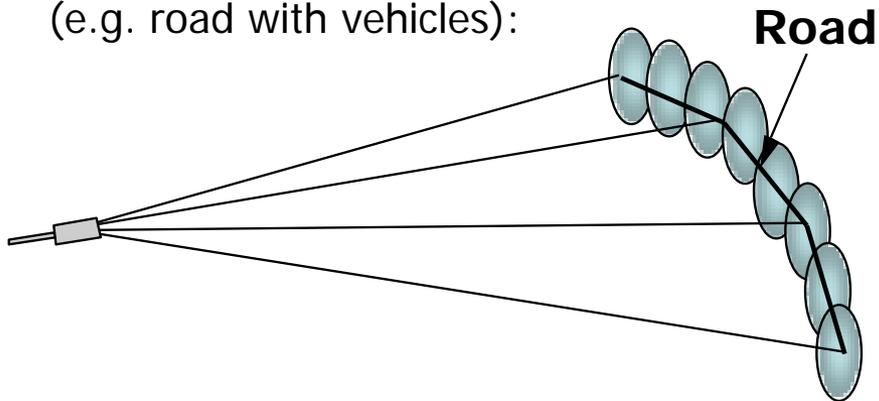
Point Target (incl. ATGW-Bunker, Prone & Covered Troops, MBT, Helicopter):



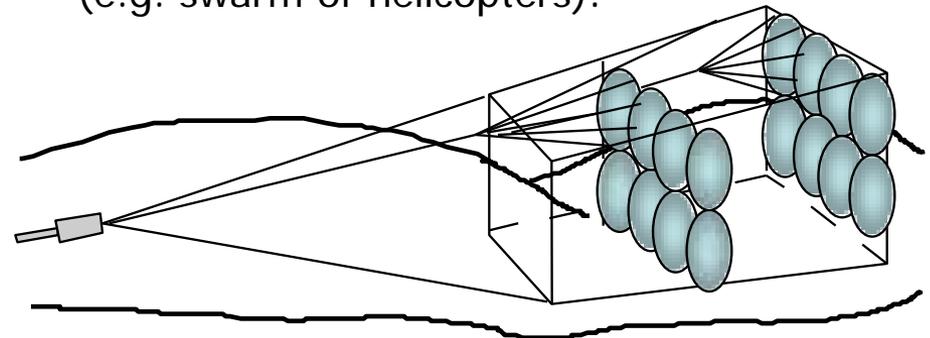
Area Target (Diffused Targets):



Linear Target
(e.g. road with vehicles):



Pre-Determined Air Space
(e.g. swarm of helicopters):



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Questions?

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