OERLIKON CONTRAVES

Air Bursting Munition ABM Medium Calibre Applications

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Abstract

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20

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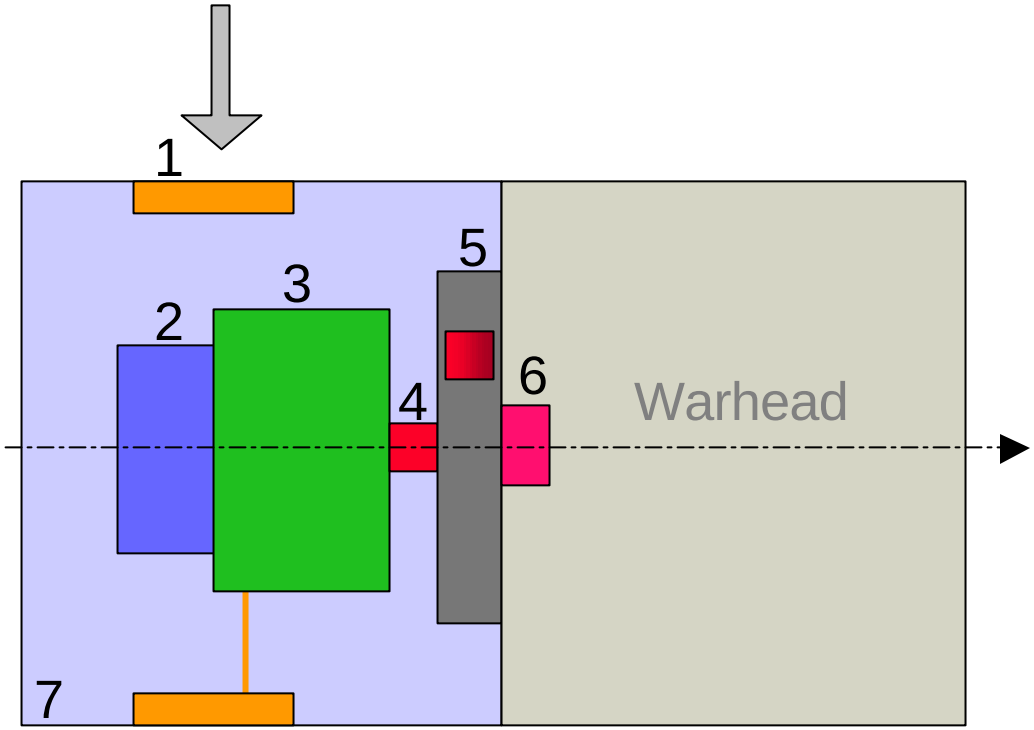
ABM Fuze Components



Contactless Programming at Gun Muzzle

Fuze Components:

1 Receiving Coil

2 Setback Generator

3 Electronic Timer Module

4 Squib

5 Safe & Arm

6 Booster, Ejection Charge

7 Base-Fuze Housing

ABM Programming System
With On-Line Compensation of MV-Variation

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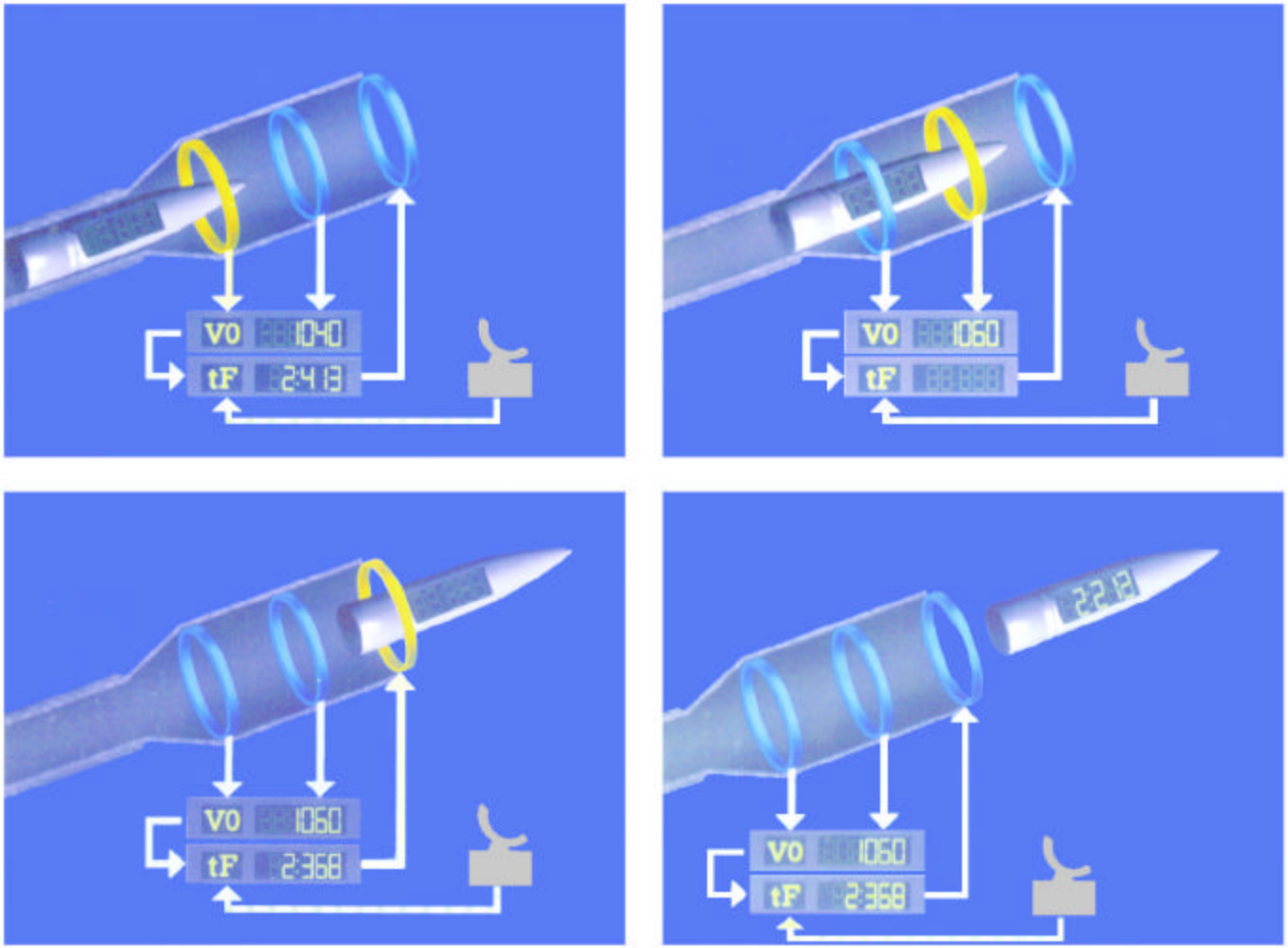

ABM KETF
Subprojectile Payload Delivery

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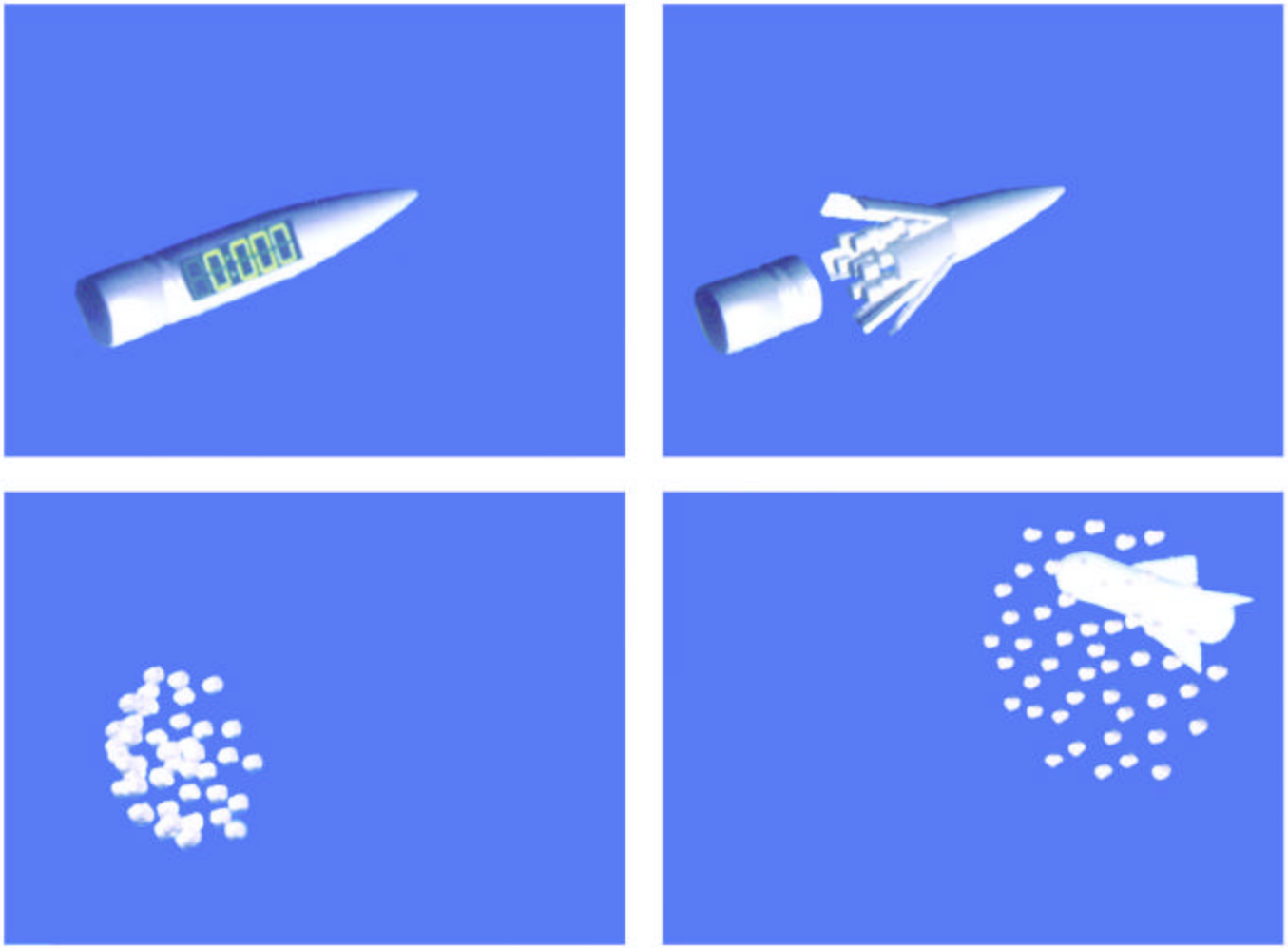

Fuze Challenge!
Programmable Payload Delivery

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Precise Time Space Payload Delivery up to 5000 rd/min!

10th Rd:
300 m

1st Rd:
1200 m

„String of Pearls“ at 550 Rd/min of 35mm Ahead-HETF Ammunition

Fuze Programming without & with Compensation of Muzzle Velocity Variation

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7 Rd Burst 35mm Ahead-HETF Ammunition at 1600 m Range

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ABM Family of Oerlikon Contraves

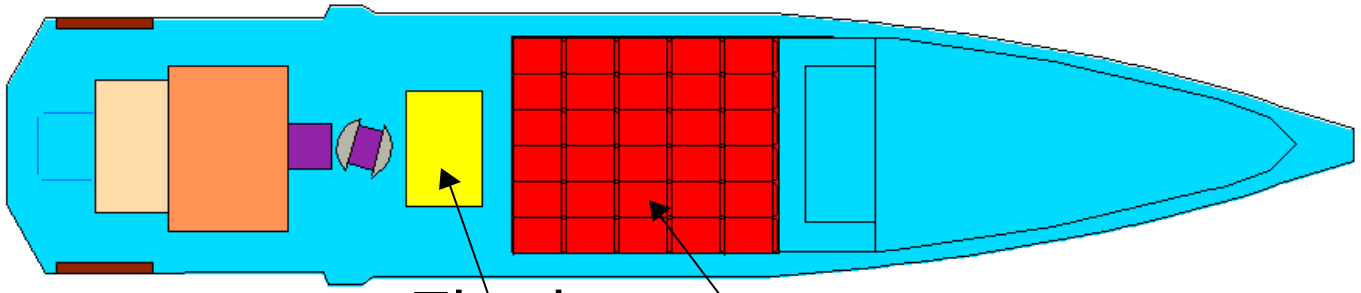
35mm x 228
Ahead
NATO Qual.

30mm x 173
selected for
AAAV - FCT

40mm x 53
selected in
Sweden for
evaluation

Other studies on
following calibers:
25mm x 137
27mm x 145
up to 140 mm

One ABM Fuze System (Ahead) - Two Different Warhead Systems



30mm x 173

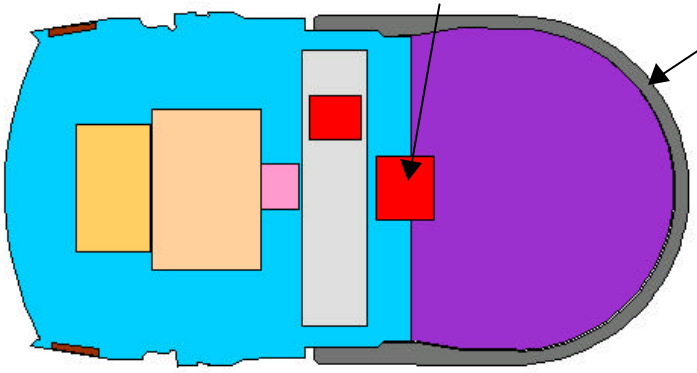
(35mm x 228)

Ejection Charge

Subprojectile Warhead
(KETF: Kinetic Energy Time Fuze)

Programmable Base Fuze

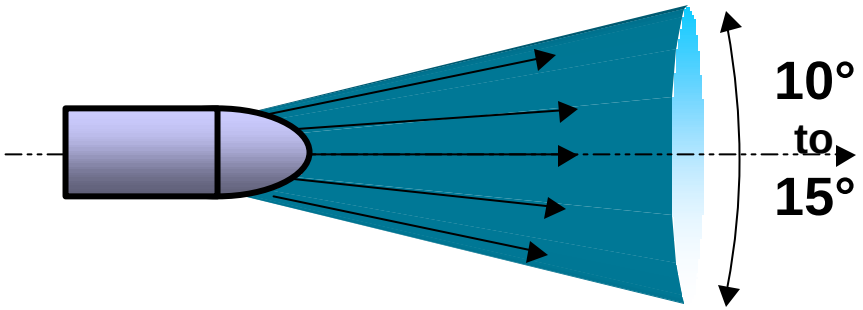
Booster

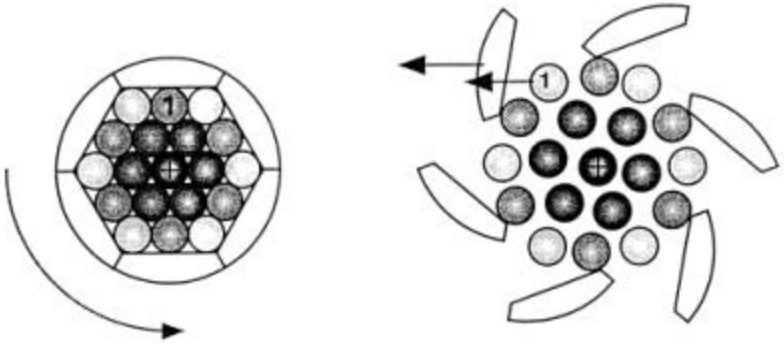


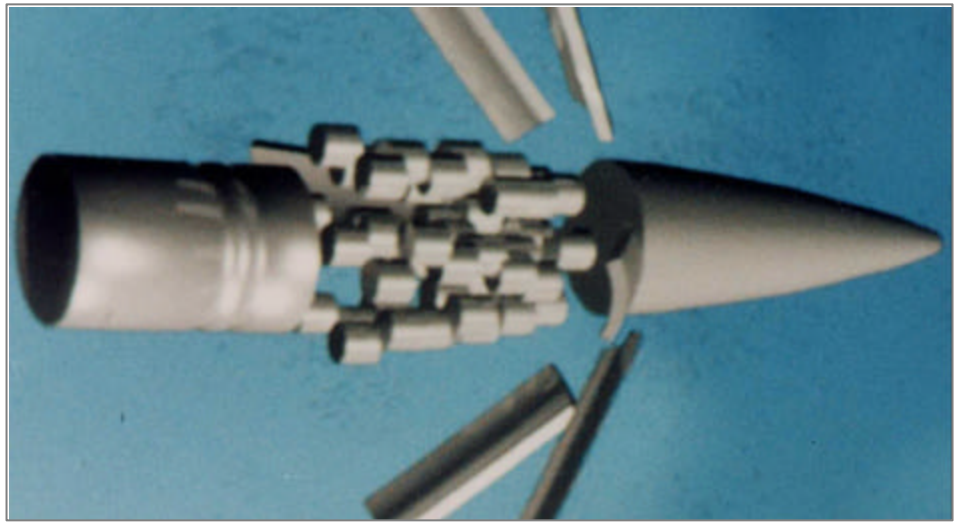
Blast Fragmentation Warhead
(HETF: High Explosive Time Fuze)

40mm x 53

ABM KETF
Subprojectile Payload Ejection



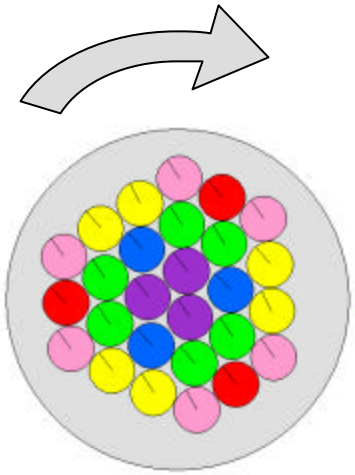


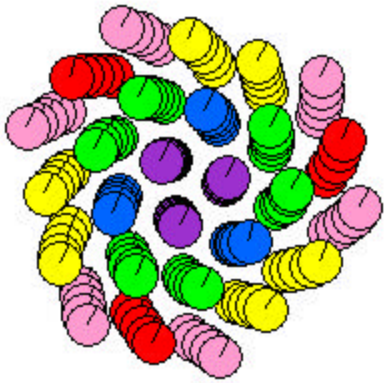


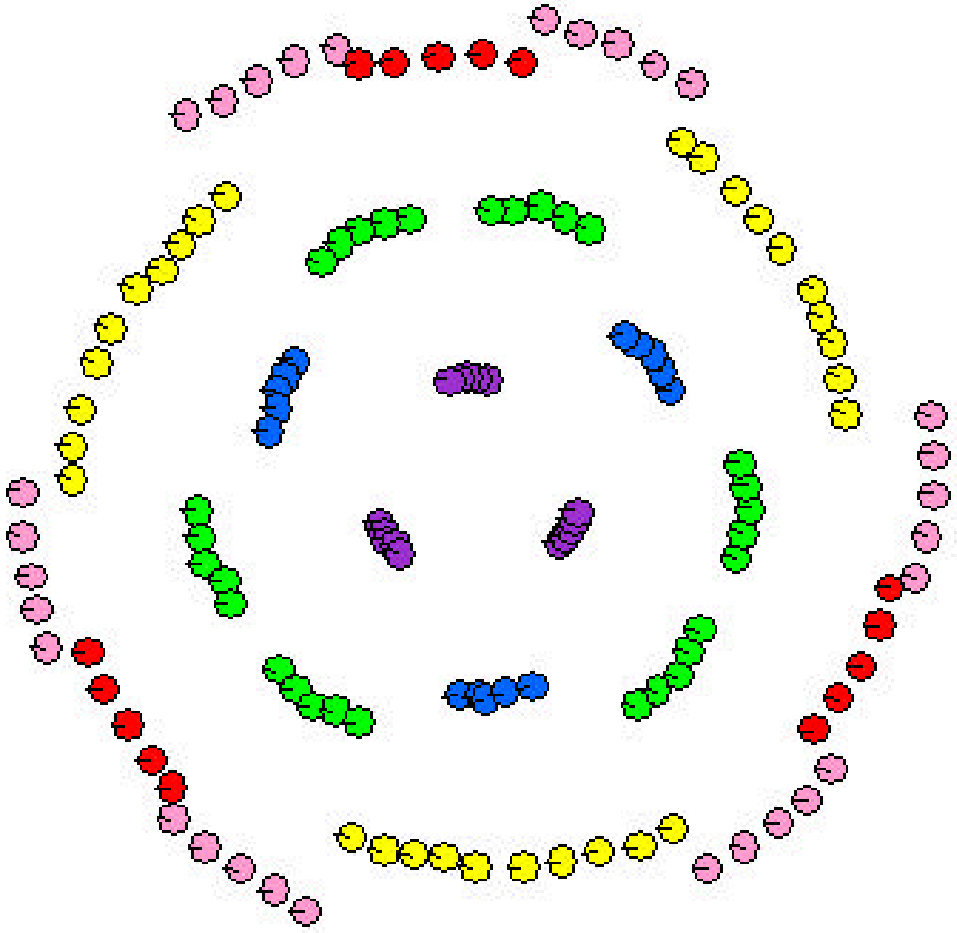
ABM KETF 30mm x 173
Payload Ejection Dynamics

135 Subprojectiles at 1.5 g each

5 Layers at 27 Subprojectiles







Time: 0 µs 100 µs 500 µs

ABM KETF 30mm x 173 against ATGW-Bunker at 1 Km Range

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Results: Numerous Full Perforations/100% Damage (Demo: Dec.1999)

ABM (KETF & HETF) 35mm x 228 against ATGW-Bunker

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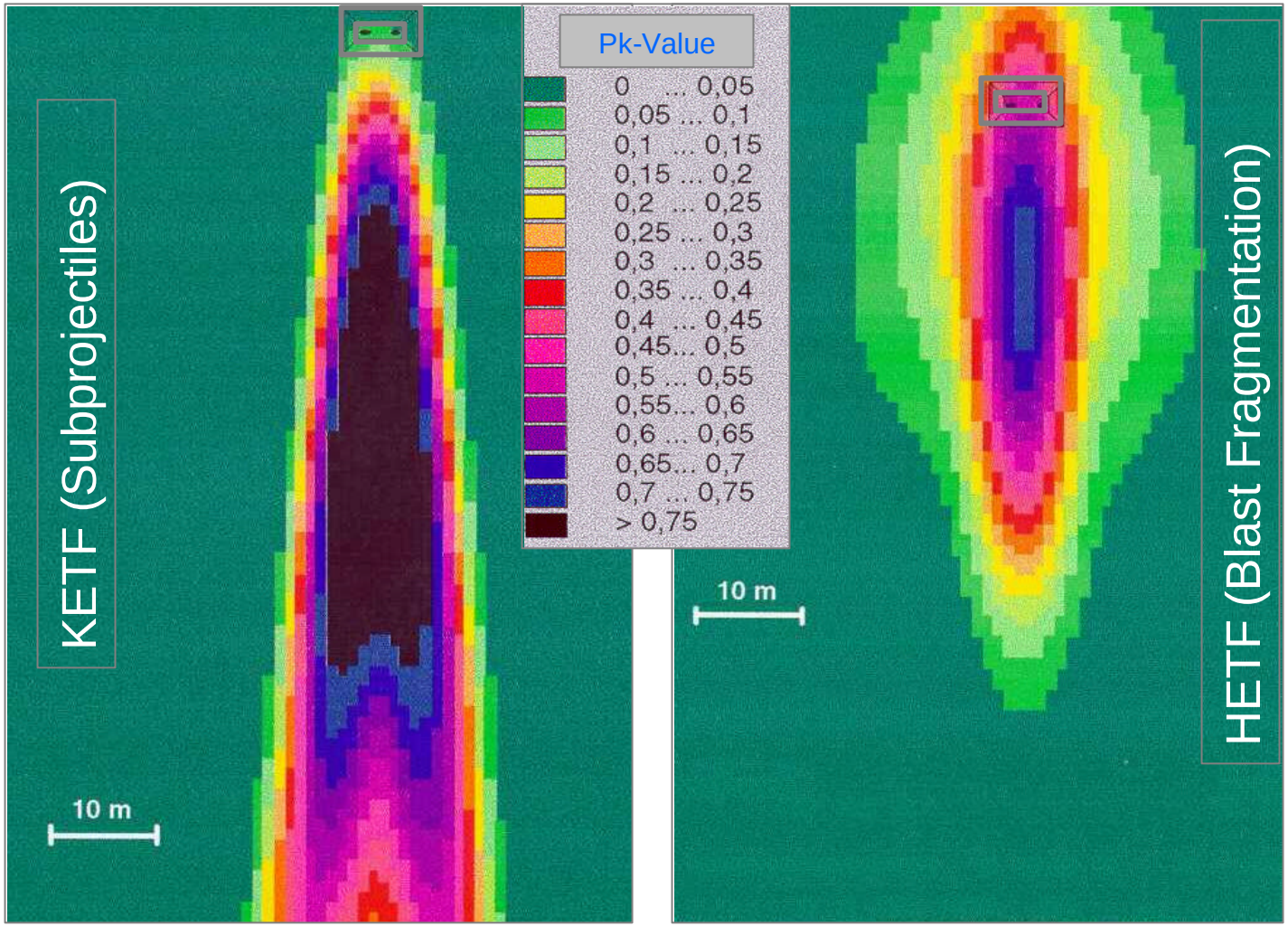
Lethality of a

3 Rd Burst against an ATGW Bunker at 1500 m



ABM KETF 30mm x 173 against Urban Target (Unprogrammed Fuze)

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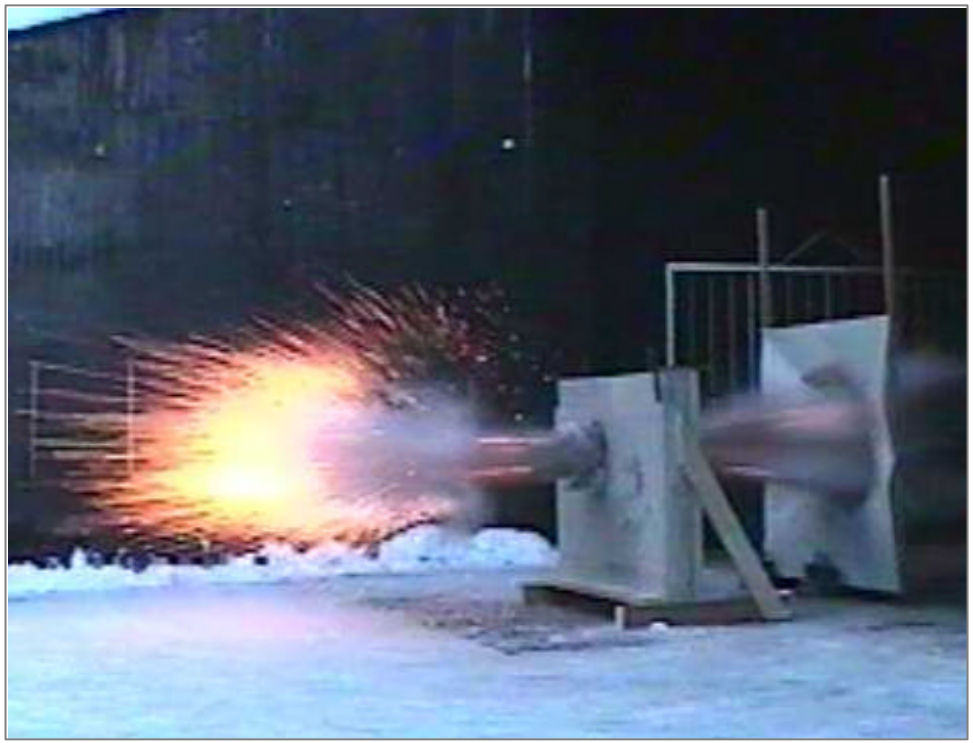
Target: 20 cm Concrete Wall with double Steel-Structure Reinforced
Results: Target Fully Penetrated



ABM KETF 35mm x 228 Ahead Simulated Lethality > 2 km Range

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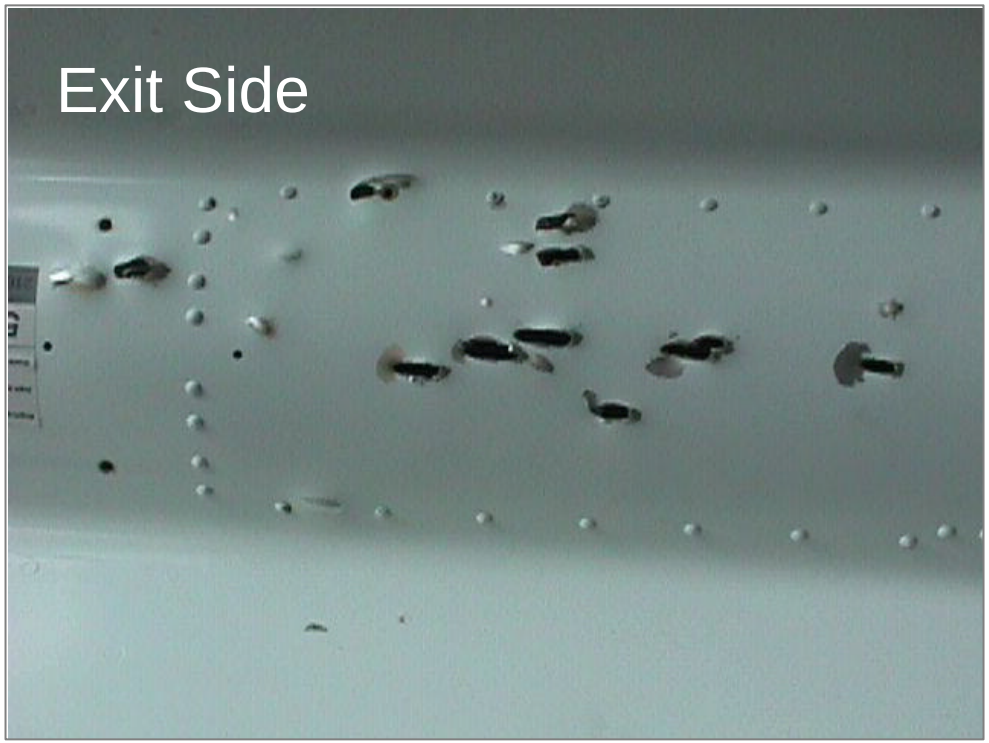
Target: Maverick Missile



Subprojectile Graze Angle Impact < 10°

ABM HETF Basic Concept for 40mm x 53 Automatic Grenade Launcher AGL

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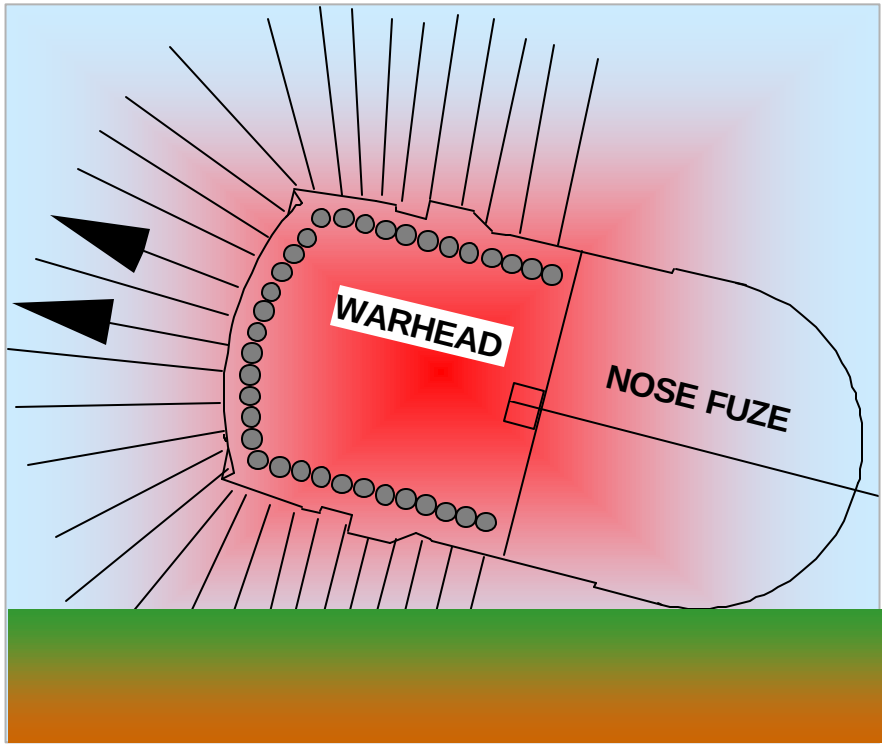
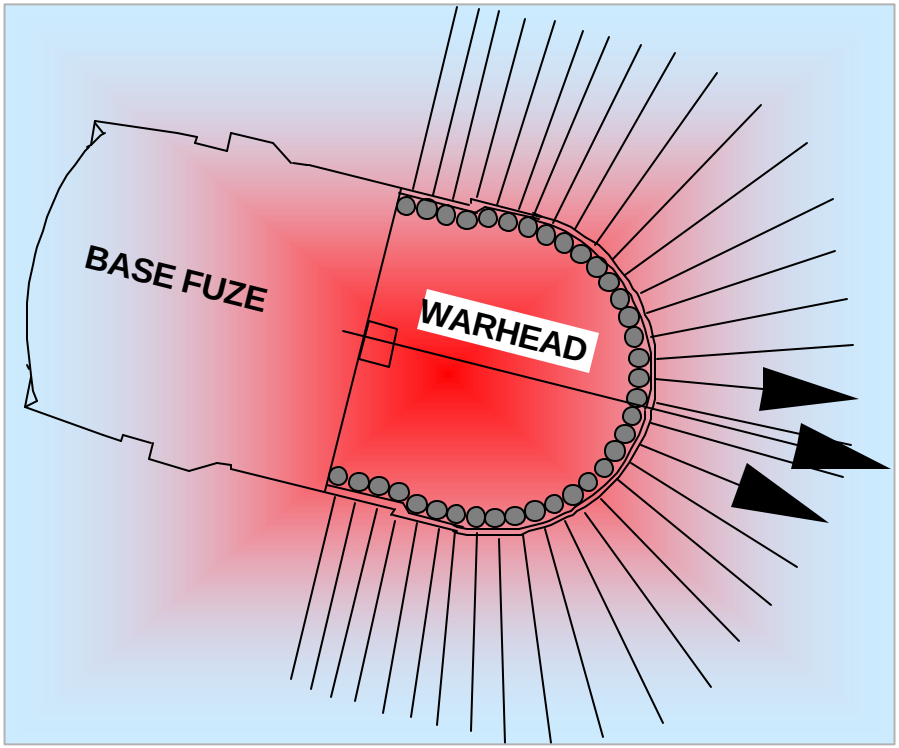


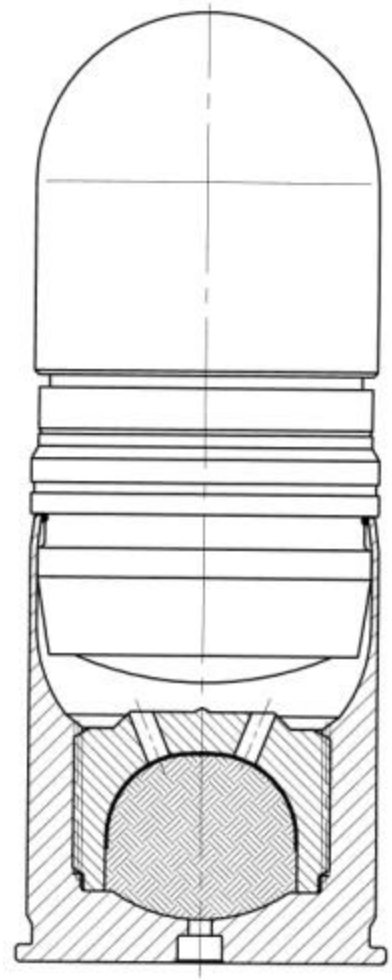
Conventional HE Round
(PD-Fuze)



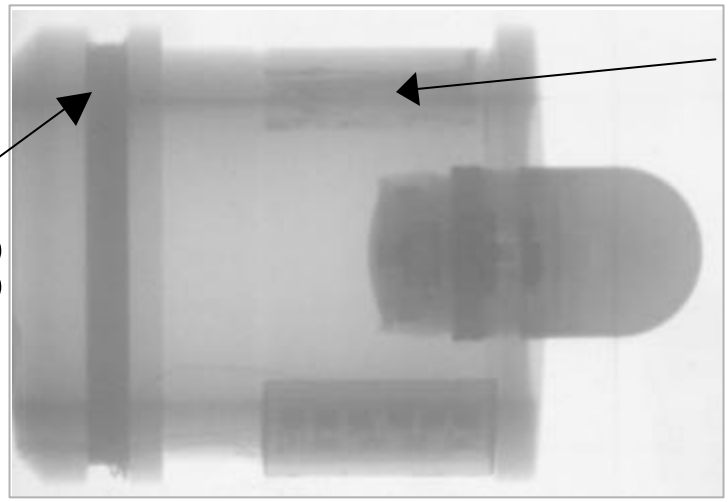
Optimum for
Air Burst Munition

ABM HETF 40mm x 53 for AGL
Round Parameters

• Round Length	max. 112 mm	
• Round Volume	approx. 130 cm^3	
• Round Mass	350 g	
• Projectile Mass	245 g	
• High Explosive Mass	> 35 g	
• Muzzle Velocity	245 m/s	
• Time of Flight	500 m	2.3 s
	1000 m	5.3 s
	1500 m	9.3 s
	2000 m	15.3 s



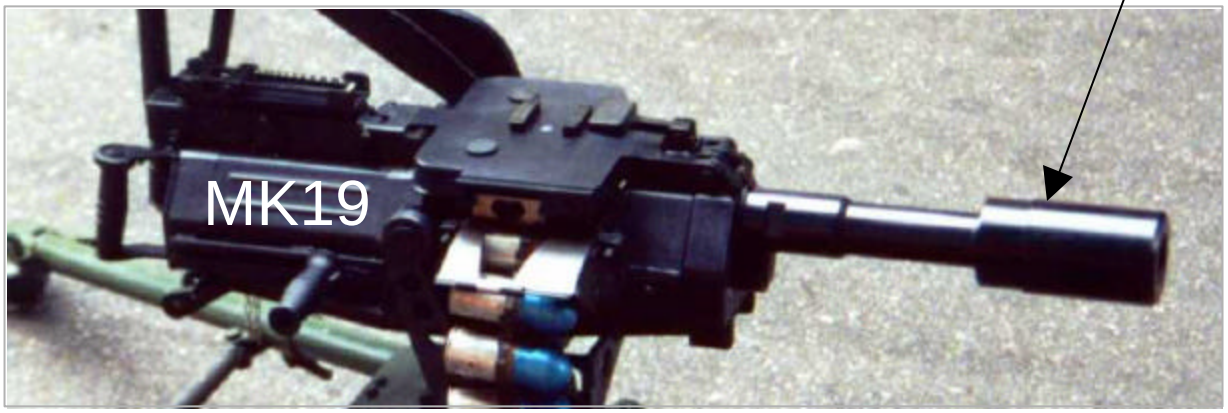
ABM HETF 40 mm x 53
Muzzle Programming Device

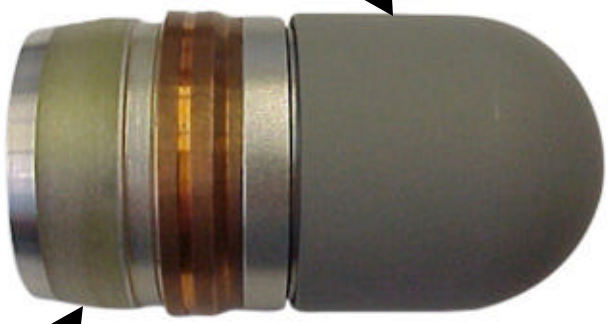


Ammunition Programming Phase in Muzzle Programming Device

(X-Ray Picture)

Ammunition Programmer & Projectile





Receiving Coil

ABM HETF 40 mm x 53 Firing Trials

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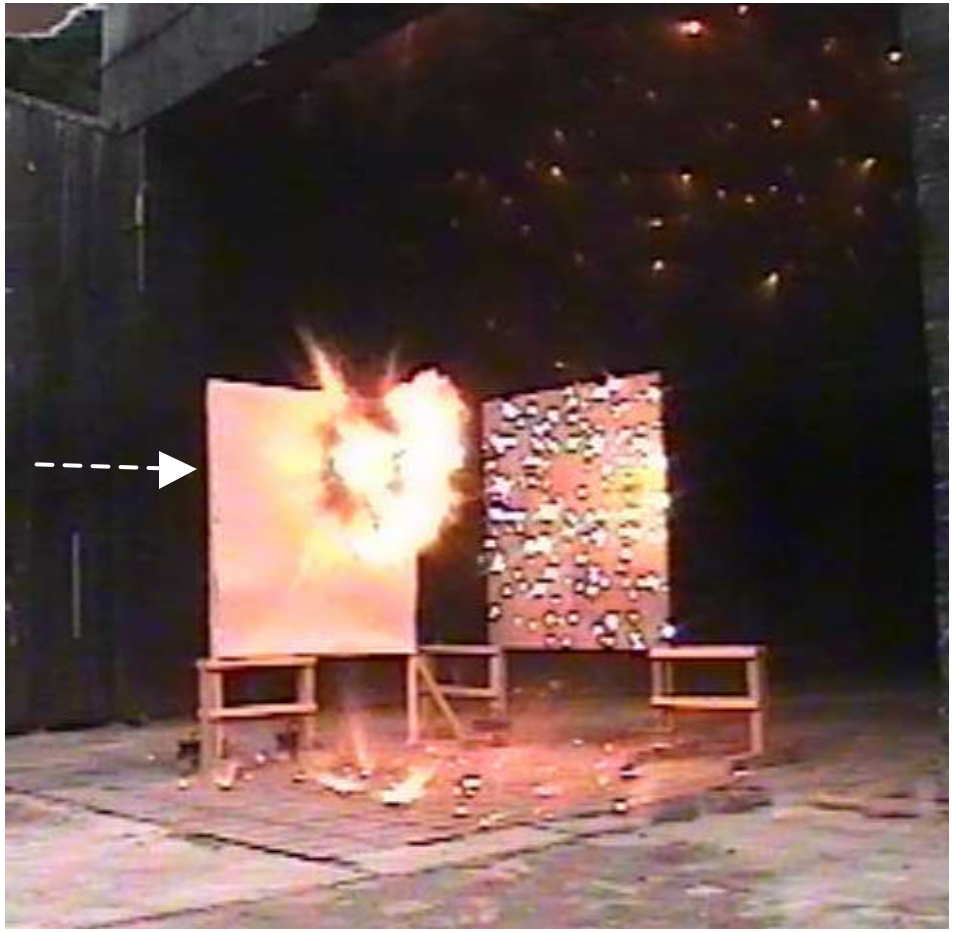

Range 200 m

Range 1000 m

ABM Fuze (Ahead): Main Features

1 Total modularity of components: easy manufacturing, testing & assembly

2 Autonomous power supply (no battery, no storage problems)

3 Allows rapid new fuze developments (recently: 30 mm x 173 & 40 mm x 53)

4 Fuze running time temperature compensated

5 Each bit programmed with double pulse

6 Completeness check on programmed message

7 Reliable component functions at very high g launch (> 100‘000 g)

8 Absolutely ECM safe

9 Applicable to all calibers 25 mm upwards, rifled or smooth bore

10 High calculated system reliability (> 97%) confirmed by years of experience

ABM System (Ahead): Main Advantages

1. Smart technology simple and safe in use
2. No rate of fire limitation due to fuze programming
3. Inductive fuze programming at muzzle (not in the gun)
4. On-line compensation for muzzle velocity variation
5. Easy system upgrade: no weapon modification
6. Absolute gun unload safety
7. Insensitive to mud, humidity & other environmental factors
8. Firing through bushes (impact sensor switched off)
9. If no fuze programming required, self-destruct automatically on
10. Lethality level of each round adjustable

