



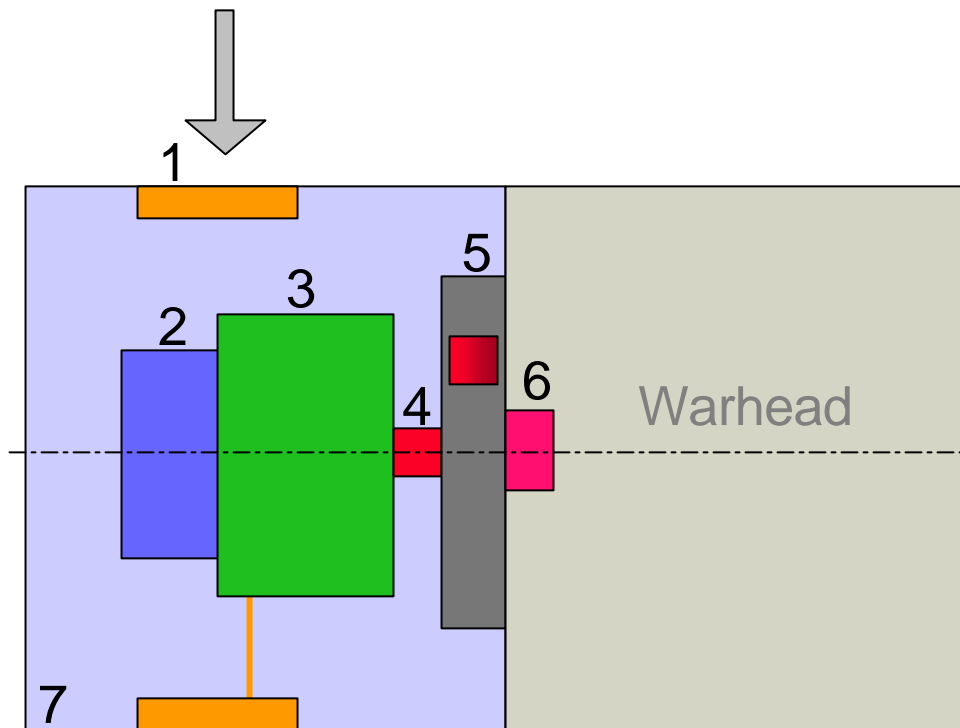
# **Air Bursting Munition ABM Medium Calibre Applications**

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<b>Number of Pages</b> 20		

# ABM Fuze Components



↑ Contactless  
Programming  
at Gun Muzzle

Fuze Components:

1 Receiving Coil

2 Setback Generator

3 Electronic Timer  
Module

4 Squib

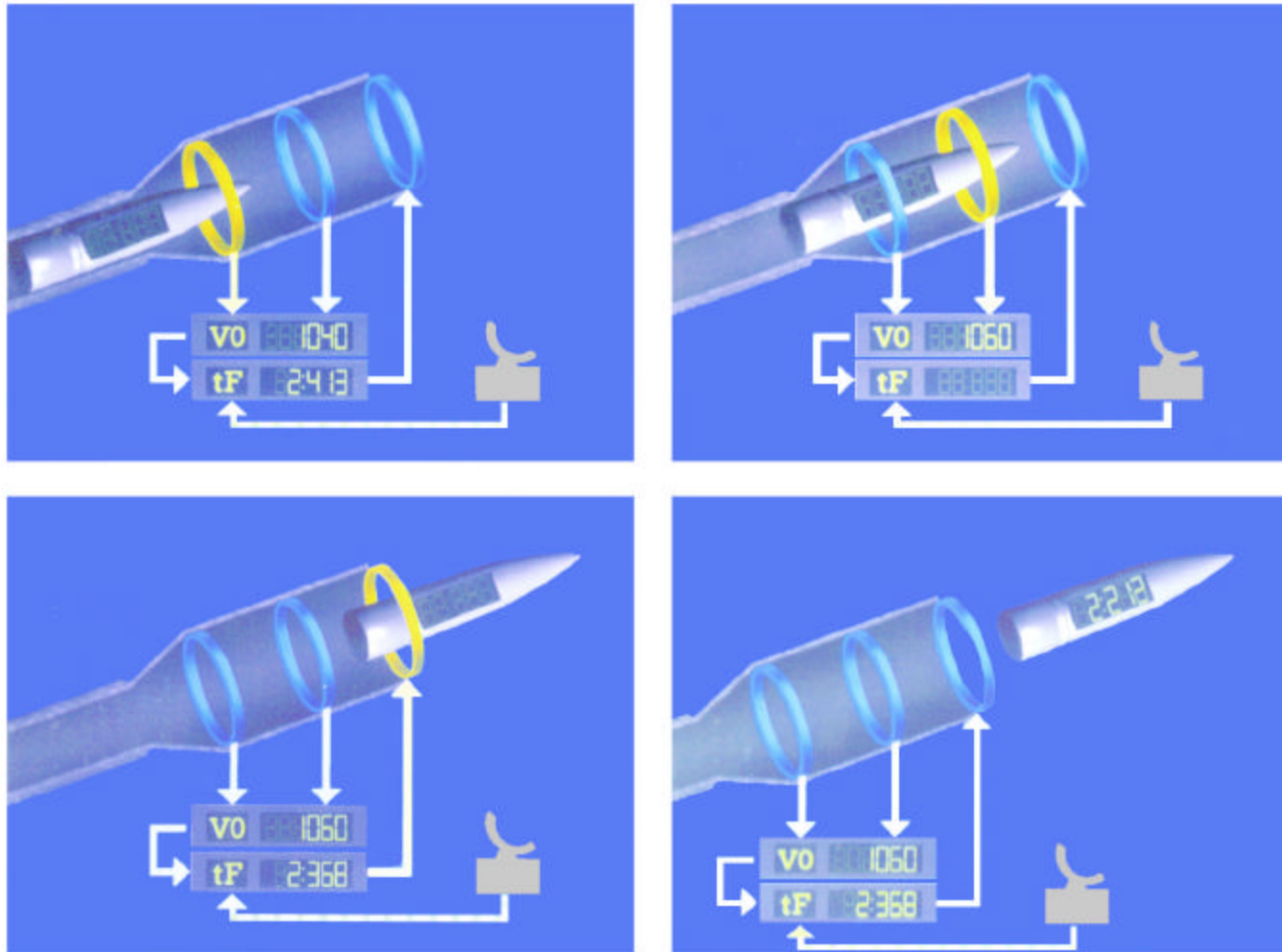
5 Safe & Arm

6 Booster, Ejection Charge

7 Base-Fuze Housing

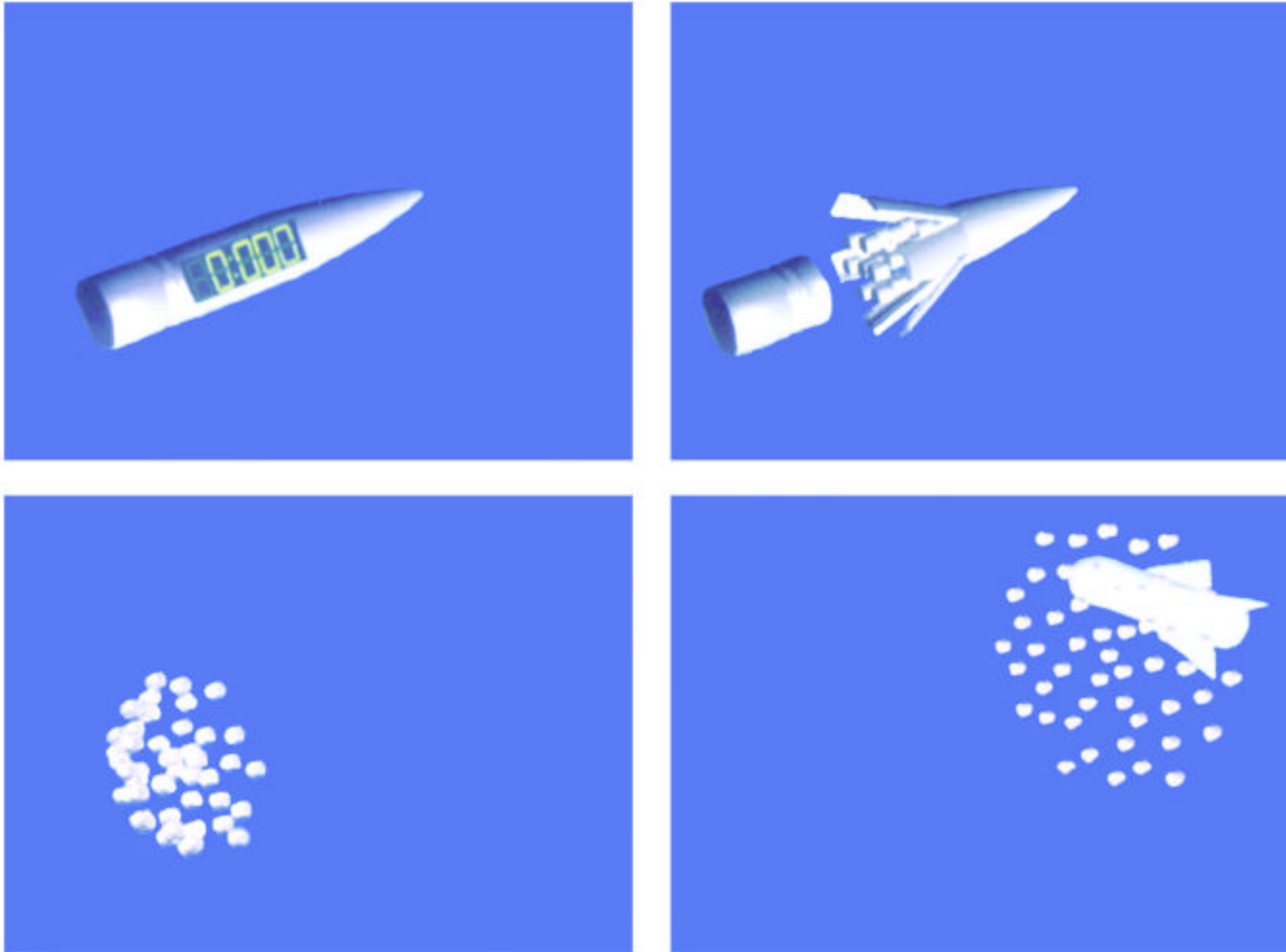


# ABM Programming System With On-Line Compensation of MV-Variation



# ABM KETF

## Subprojectile Payload Delivery



# Fuze Challenge!

## Programmable Payload Delivery

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

10 Rds between 1200 m & 300 m  
every 100 m!



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



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

# 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

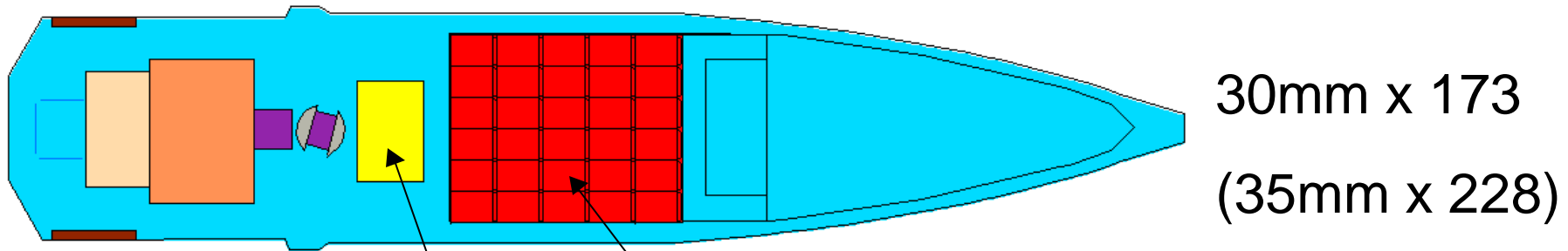


Other studies on  
following calibers:  
25mm x 137  
27mm x 145  
up to 140 mm





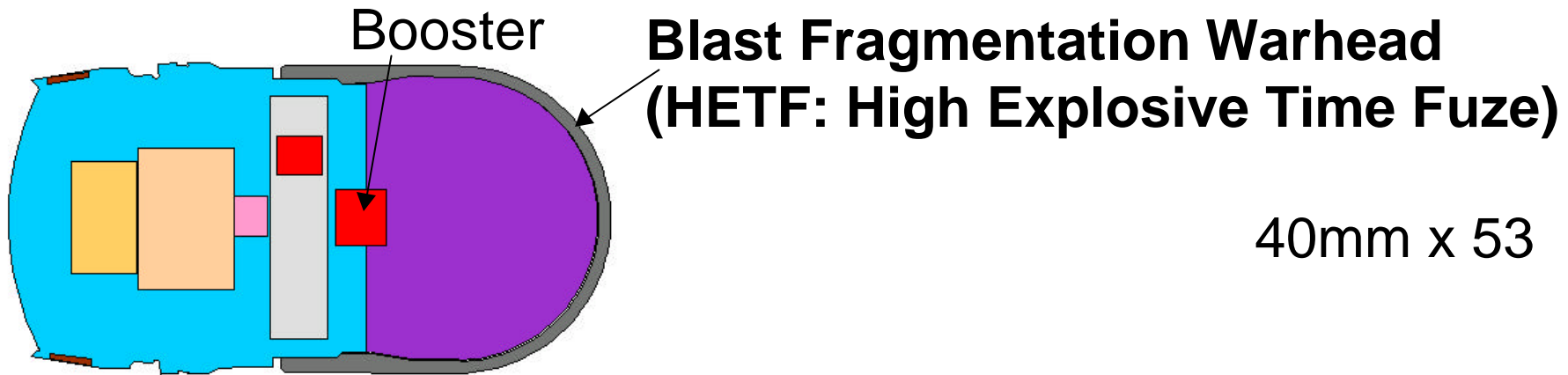
# One ABM Fuze System (Ahead) - Two Different Warhead Systems



Ejection Charge

**Subprojectile Warhead  
(KETF: Kinetic Energy Time Fuze)**

Programmable  
Base Fuze



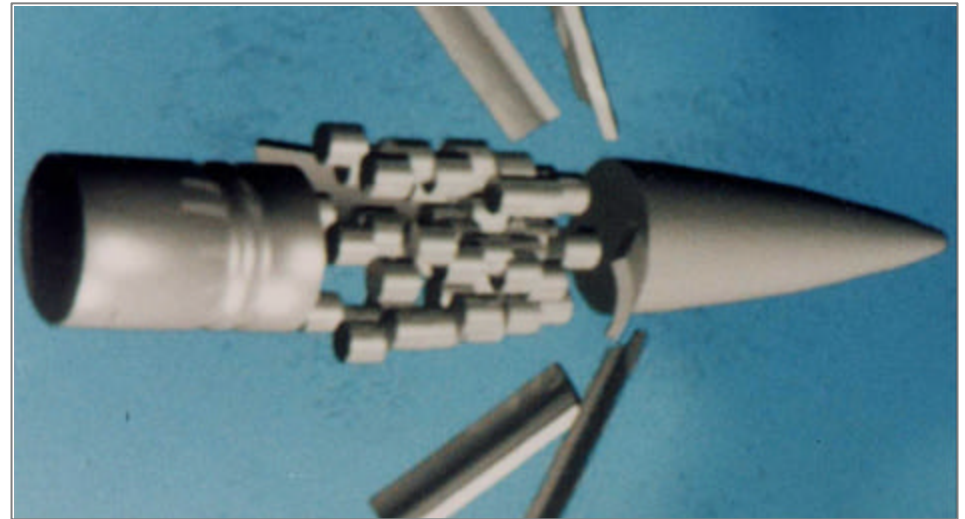
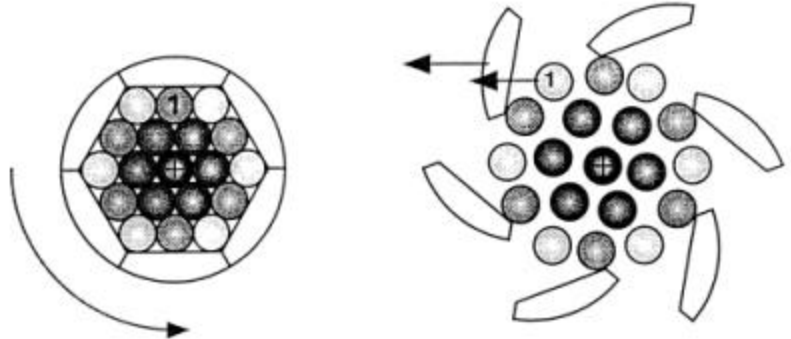
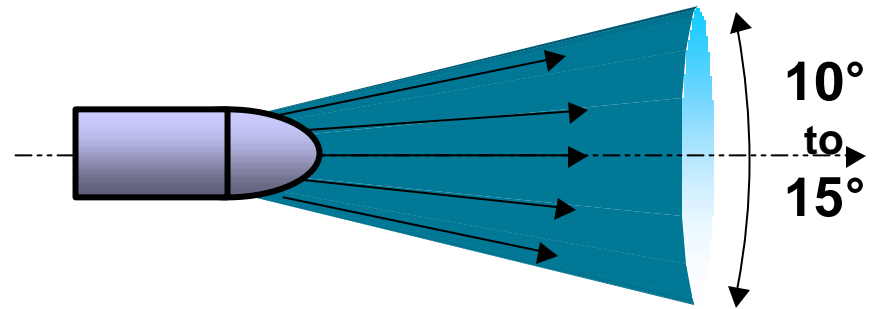
Booster

**Blast Fragmentation Warhead  
(HETF: High Explosive Time Fuze)**

40mm x 53

# ABM KETF

## Subprojectile Payload Ejection

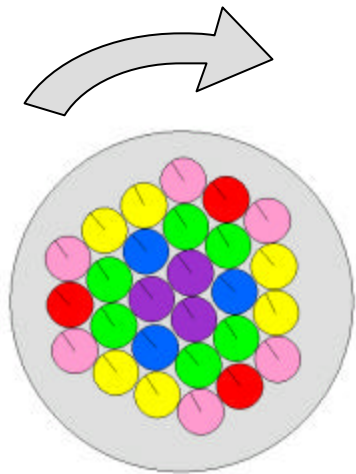


# ABM KETF 30mm x 173

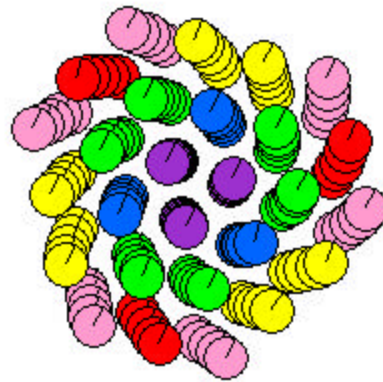
## Payload Ejection Dynamics

135 Subprojectiles at 1.5 g each

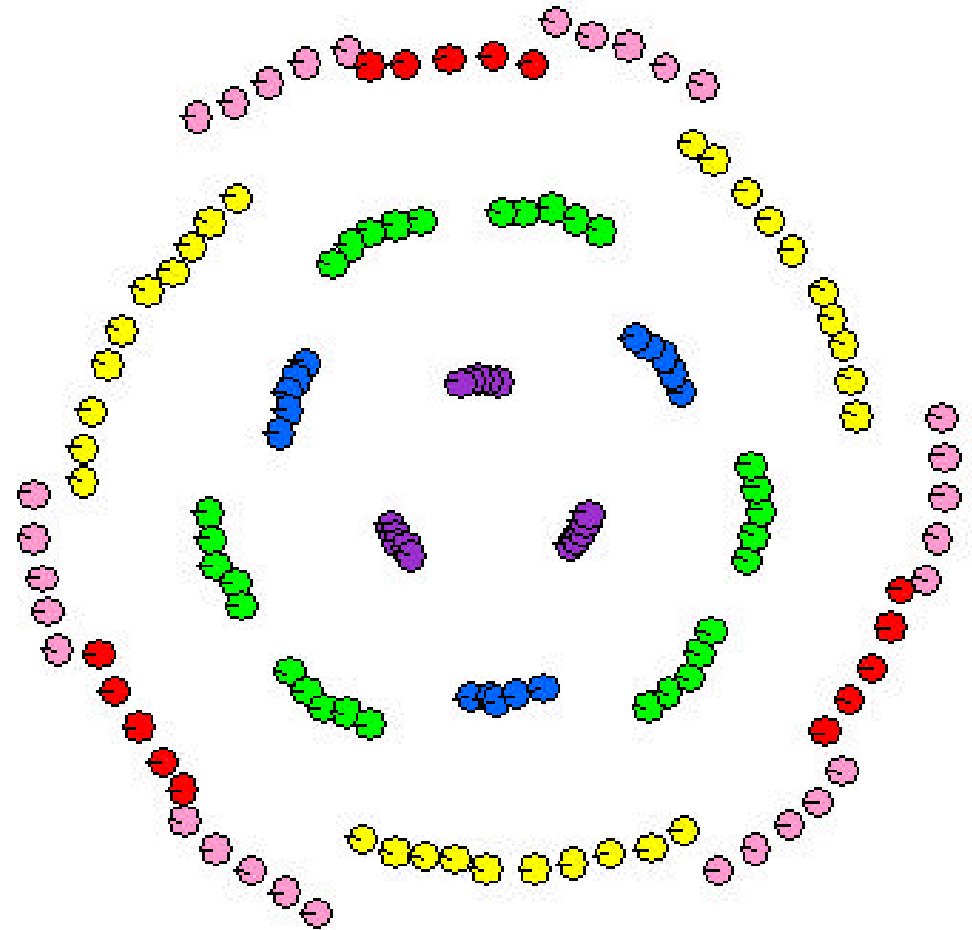
5 Layers at 27 Subprojectiles



Time: 0  $\mu\text{s}$



100  $\mu\text{s}$



500  $\mu\text{s}$

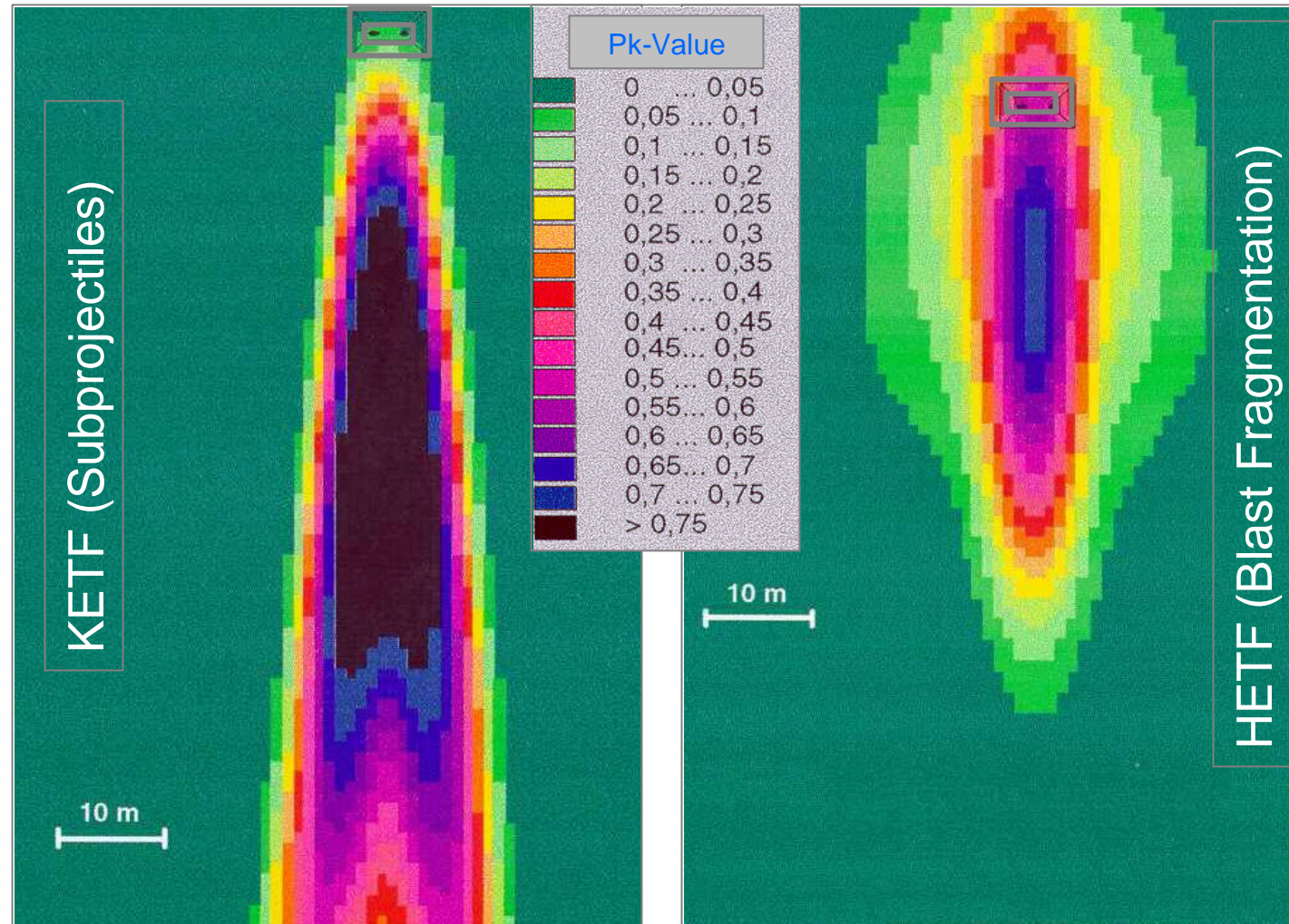
# ABM KETF 30mm x 173 against ATGW-Bunker at 1 Km Range

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



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

Lethality of a  
3 Rd Burst  
against an  
ATGW Bunker  
at 1500 m



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

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



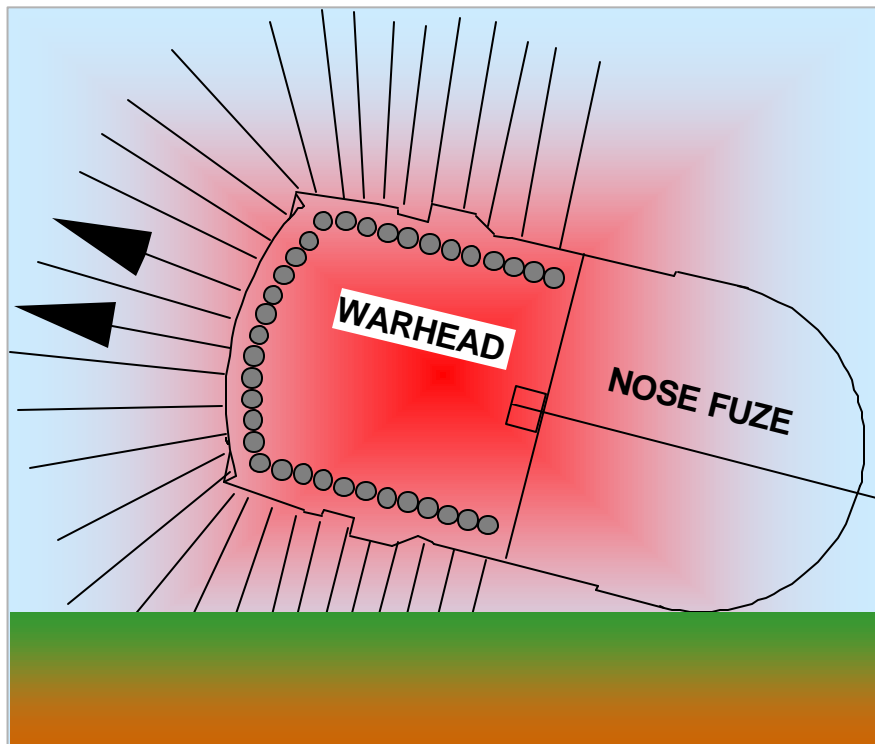
# ABM KETF 35mm x 228 Ahead Simulated Lethality > 2 km Range

Target: Maverick Missile

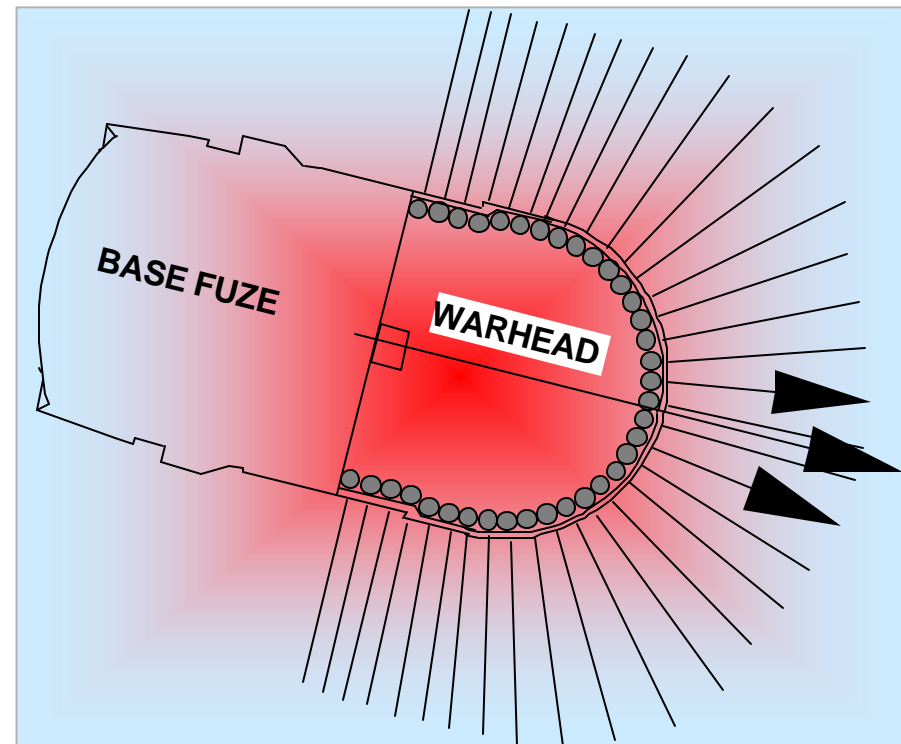


Subprojectile Graze Angle Impact <math>< 10^\circ</math>

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



Conventional HE Round  
(PD-Fuze)



Optimum for  
Air Burst Munition

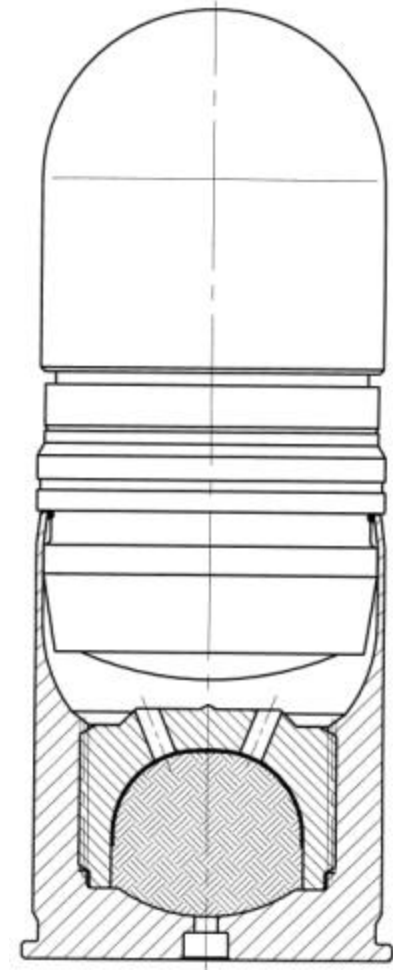
TARGET



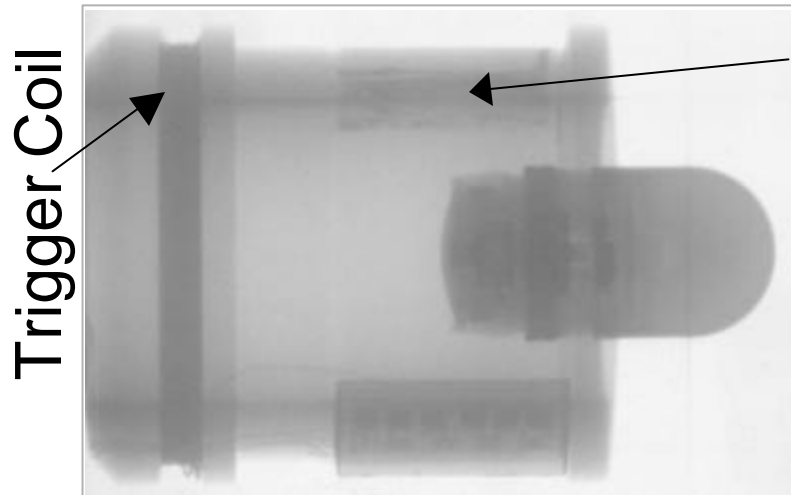
# ABM HETF 40mm x 53 for AGL

## Round Parameters

• Round Length	max. 112 mm	
• Round Volume	approx. 130 cm <sup>3</sup>	
• 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

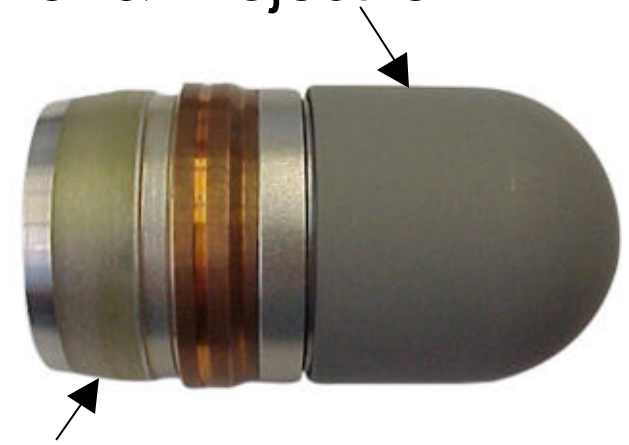
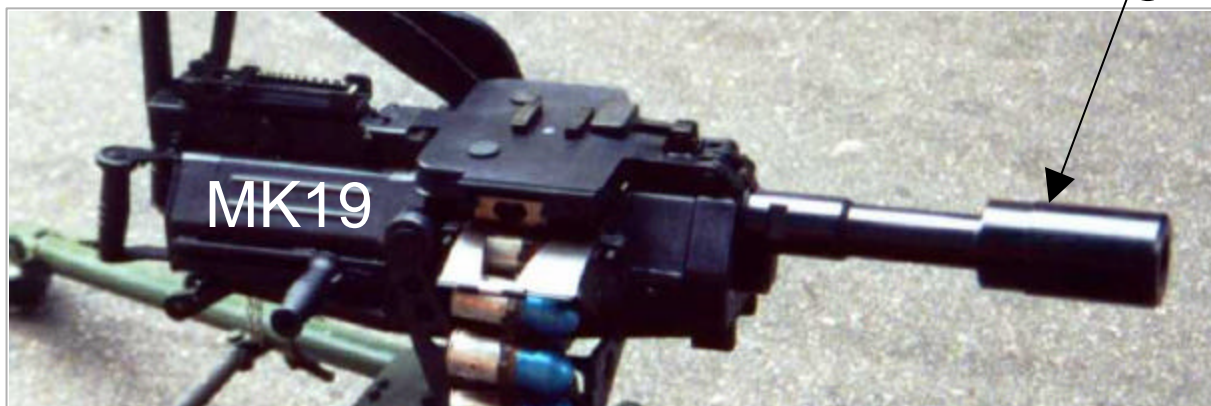


Programming Coil

Ammunition Programming Phase in  
Muzzle Programming Device

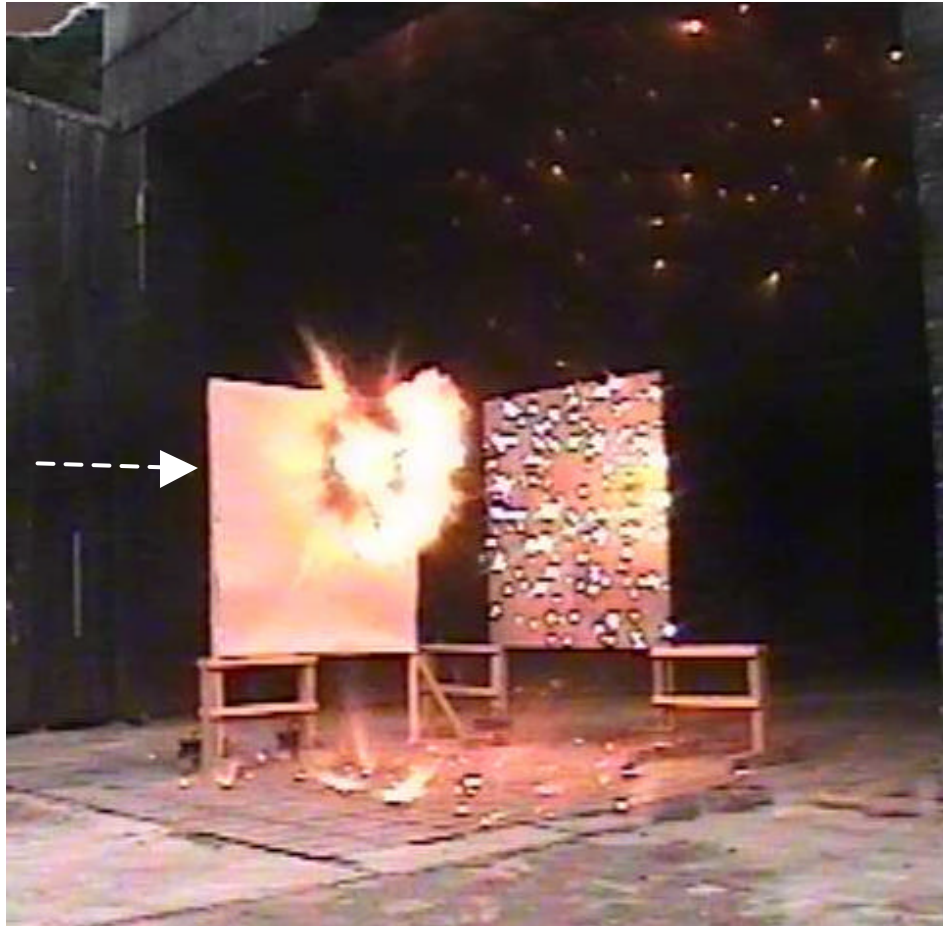
(X-Ray Picture)

Ammunition Programmer & Projectile



Receiving Coil

# ABM HETF 40 mm x 53 Firing Trials



Range 200 m



3 Round Burst  
at 570 Shot/min  
(AGL of ST Kinetics)

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