

Air Burst Munition (ABM)

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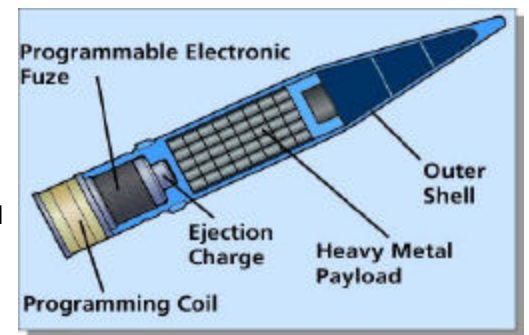
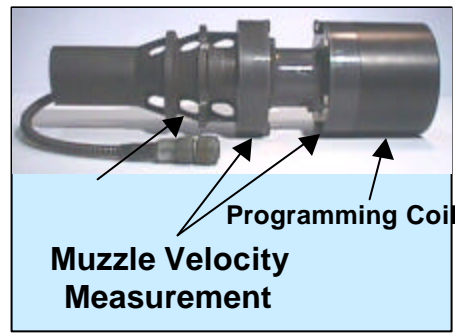
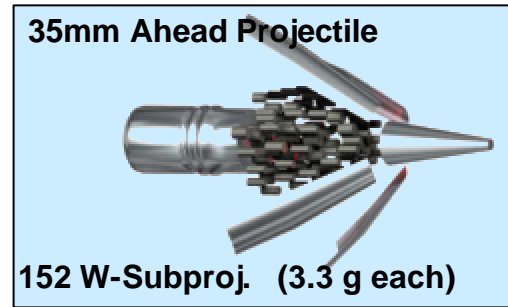
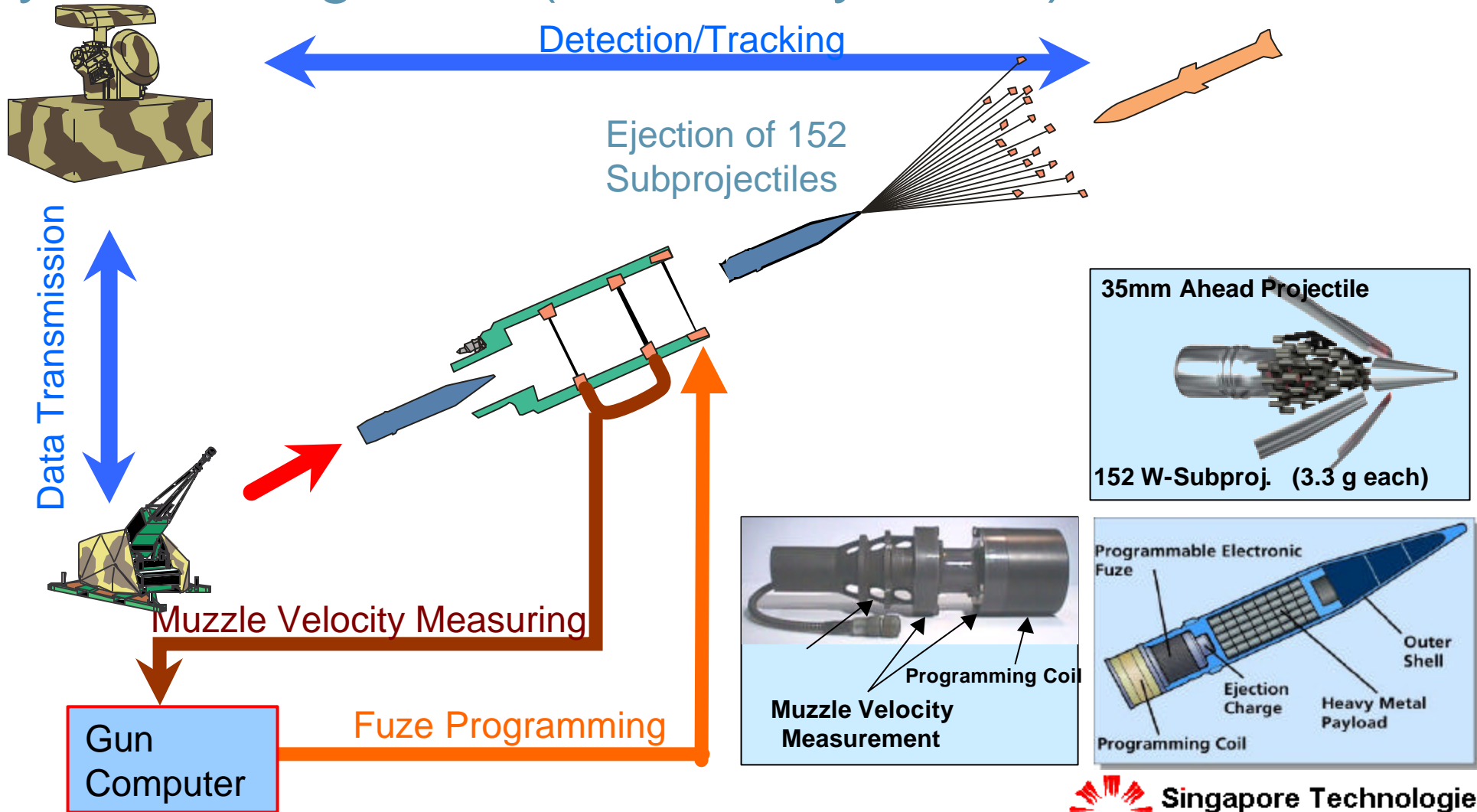
# 40 MM x 53 AIR BURST MUNITION FOR AUTOMATIC GRENADE LAUNCHERS

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# System Integration (35mm SkyShield)



# Fuze Challenge!

## Programmable Payload Delivery (Demo 1992)

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 Ammuno

# Fuze Programming without & with Compensation of Muzzle Veloc. Variation

DEMO 1992



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

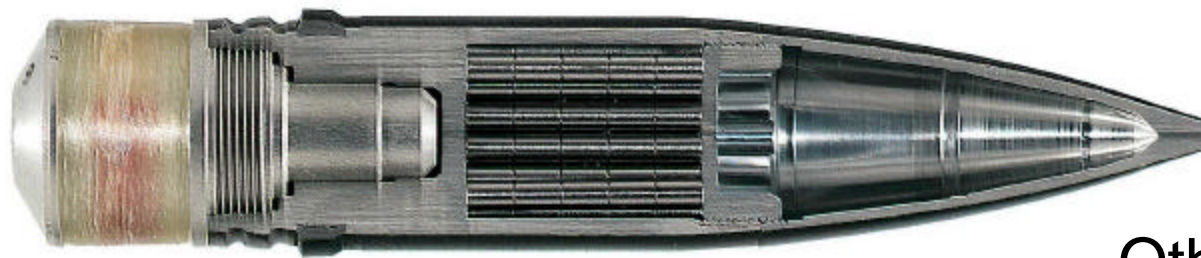


# ABM Family of Oerlikon Contraves

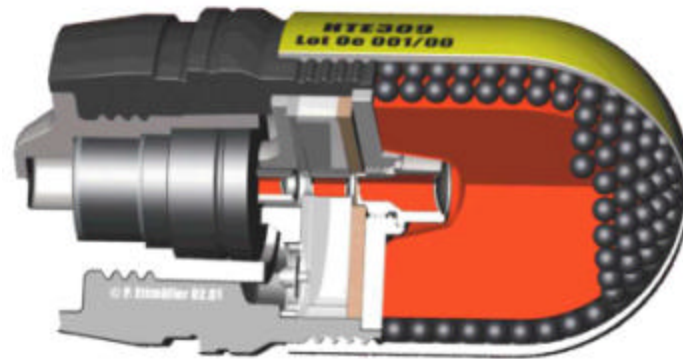
35mm x 228  
Ahead  
NATO Qual.



30mm x 173



40mm x 53  
selected by  
Sweden for  
evaluation

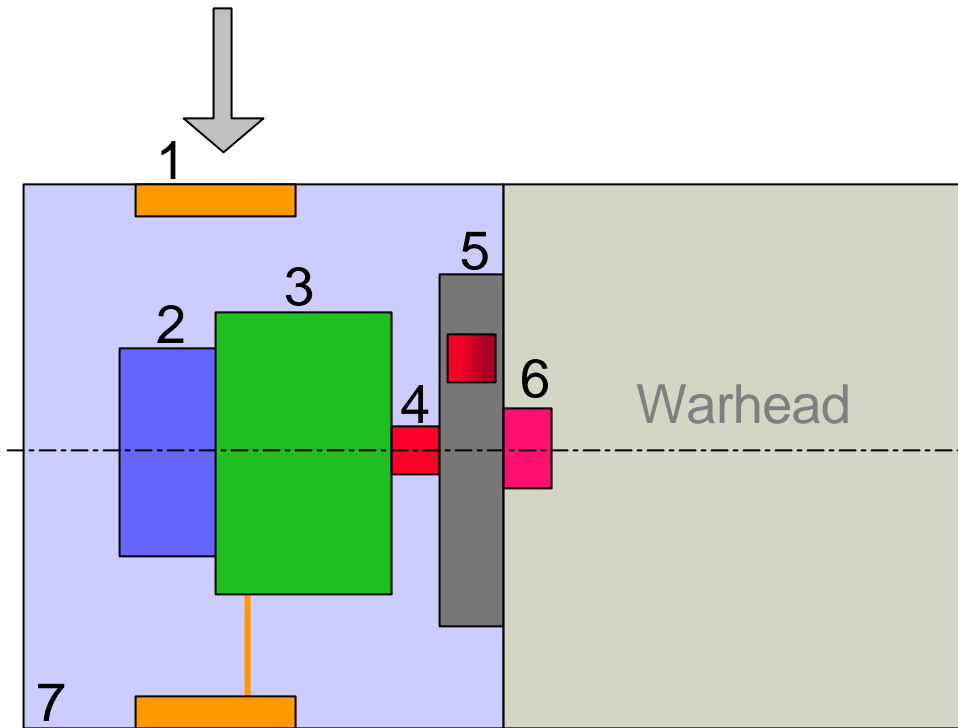


Scale:



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

# 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



# Air Bursting System Upgrade For All 40mm Automatic Grenade Launchers



**ONE ABM-SYSTEM for all  
40mm x 53 Weapon  
with minimal modifications !**





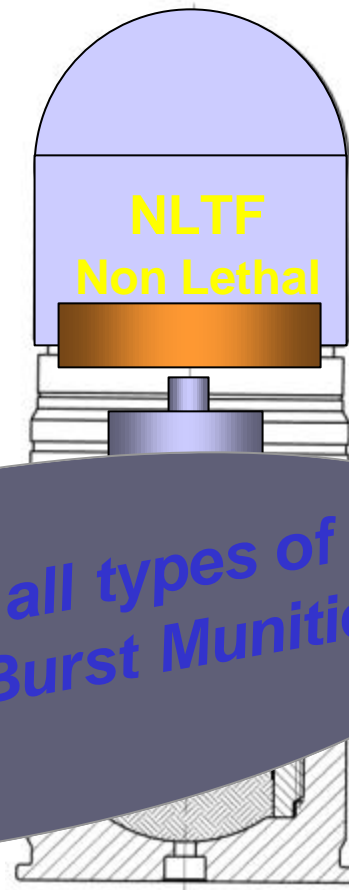
# 40mm x 53 AGL Air Burst Munition: One Fuze for All Types



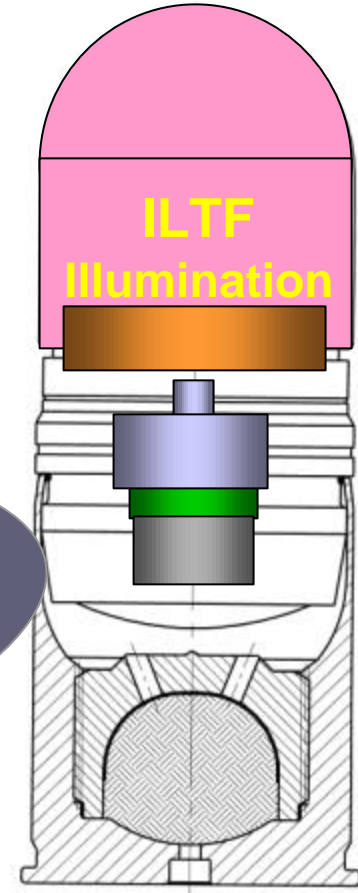
**HE**



**F&B**



Future Type?

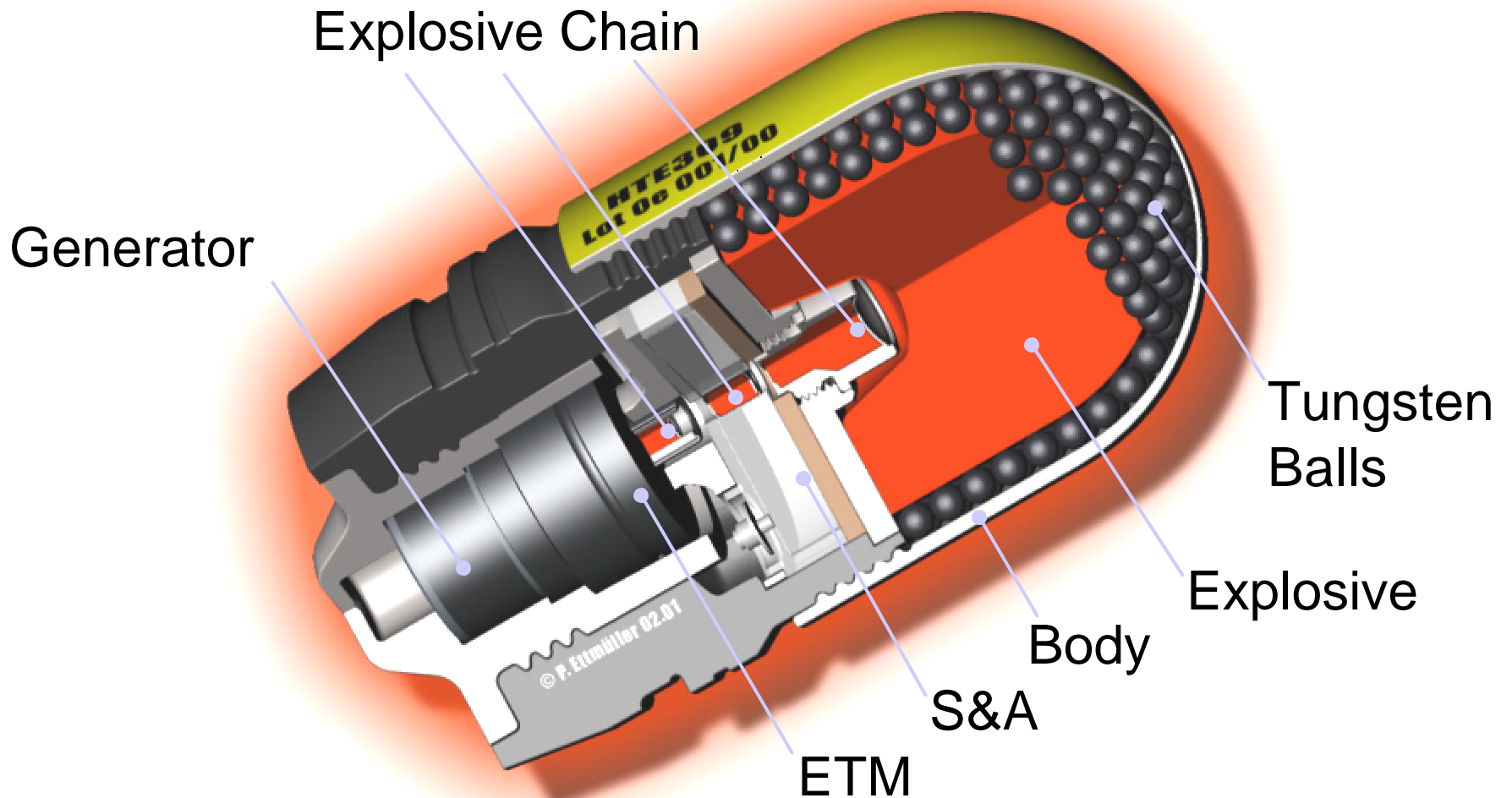


Future Type?

ONE Fuze for all types of  
40mm x 53 Air Burst Munition



# 40mm x 53 Automatic Grenade Launchers: Air Bursting Munition HTE309



# Air Bursting Muniton Concept Electronic Timer Module ETM

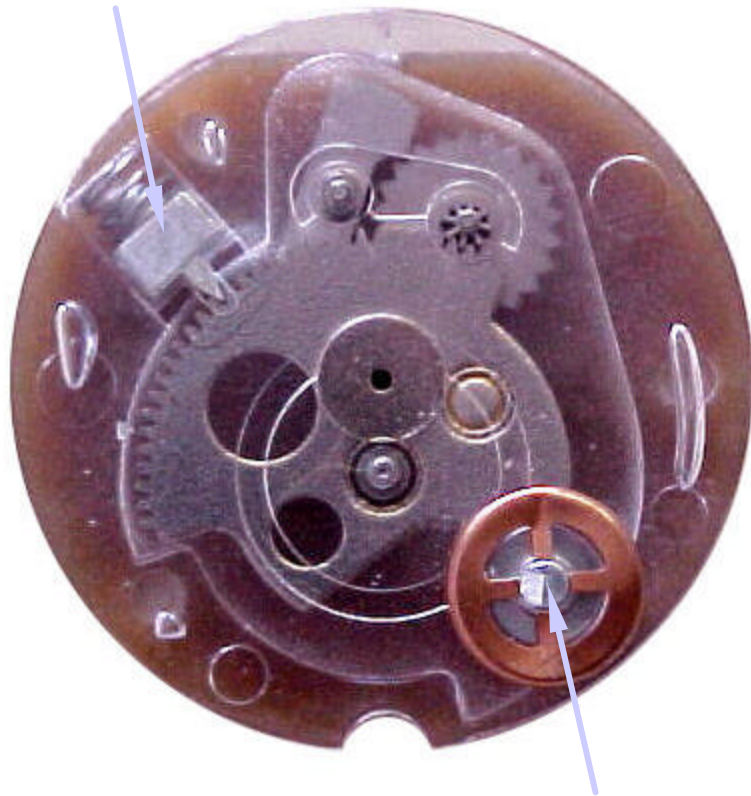
## Parameters & Features



- Operating range 40 m to 1600 m
- Self-Destruction (SD) 1600 m
- Programming of impact function On / Off
- Impact function & SD On if not programmed
- Sensitivity of impact sensor 2 mm Alum. Alloy
- Data transmission check if negative -> SD is On
- Absolutely ECM safe
- Without external energy the fuze still works on impact even at graze angles

# Air Bursting Muniton Concept Safe and Arm System

Centrifugal pin

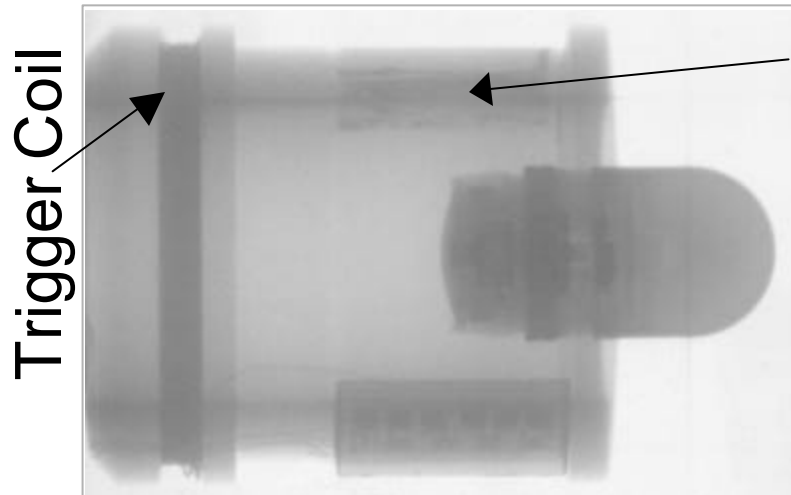


Setback pin

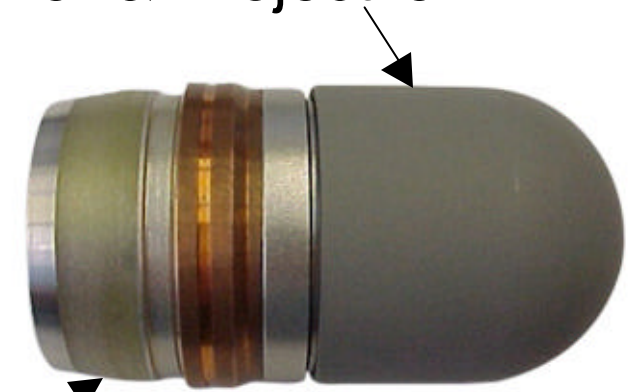
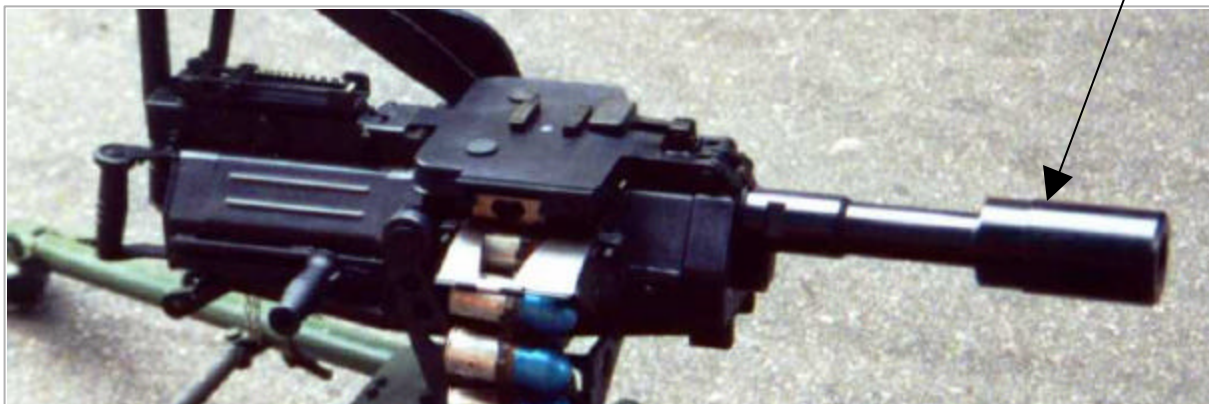
## SAFETIES

- Setback pin
- Centrifugal pin
- Setback generator
- Detonator Safety
- Mechanical muzzle safety    $\approx$  18m
- Mechanical arming            $\pounds$  40m
- Electronic muzzle safety    $\sim$  40m

# ABM HETF 40 mm x 53 Muzzle Programming Device



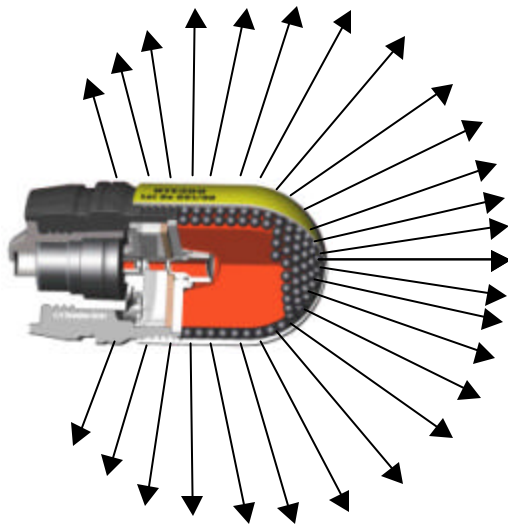
Ammunition Programmer & Projectile



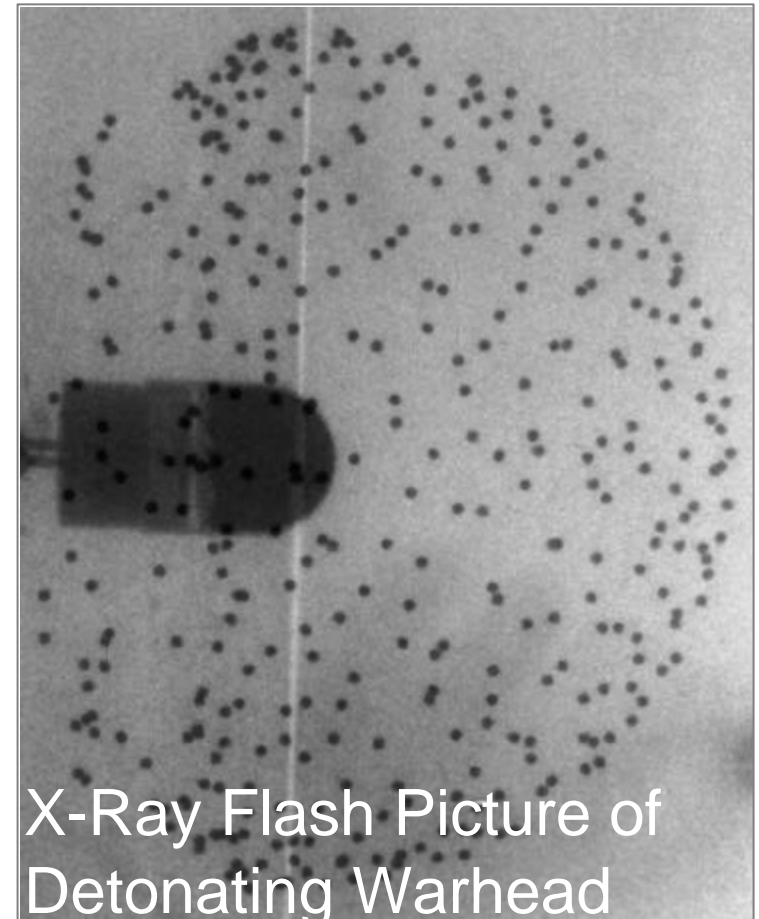


# 40mm x 53 ABM HTE309: Pre-Fragmented High Explosive Warhead

- Fragments Tungsten Balls
- Number of Balls min 330
- Ball Mass 0.25 g each



Warhead designed to be effective against the „NATO Protected Man“

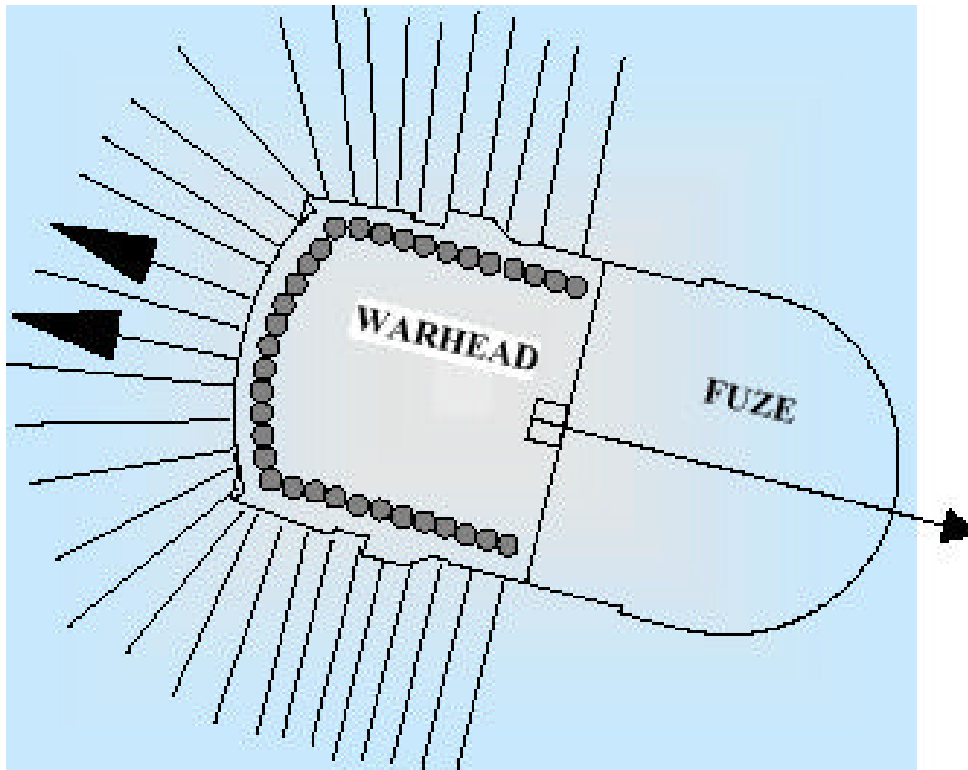


Air Burst Munition (ABM)

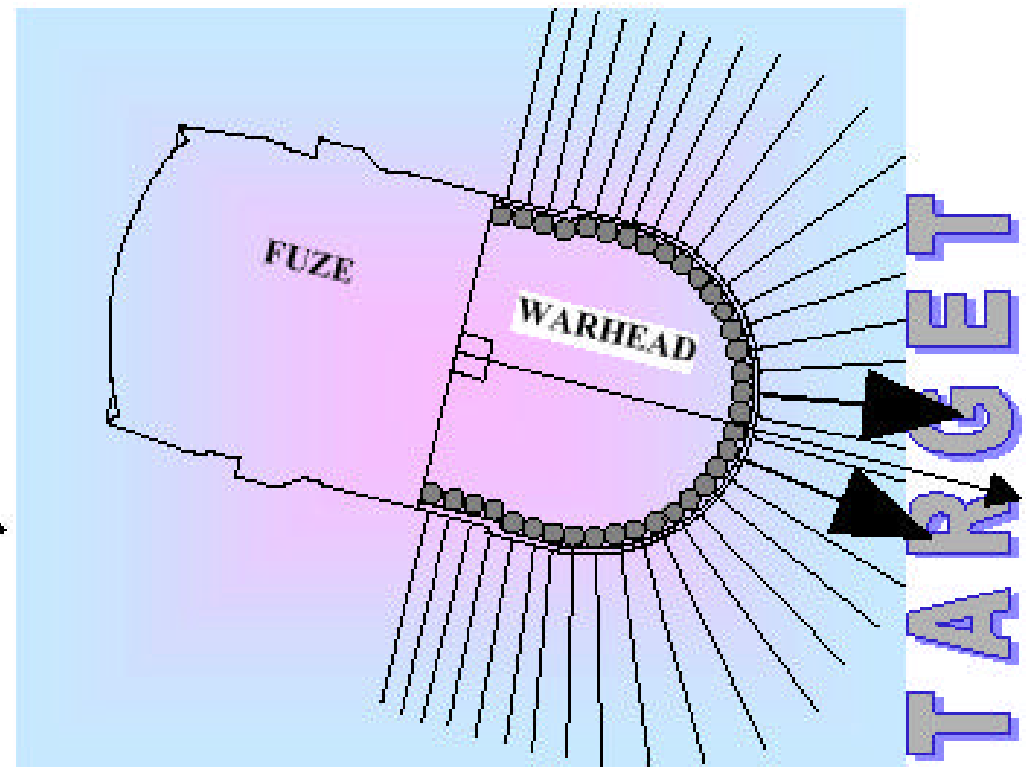
# 40mm x 53 ABM HTE309: Warhead Function



# 40mm x 53 Air Burst Munition for AGL Two Blast Fragmentation Warhead Concepts



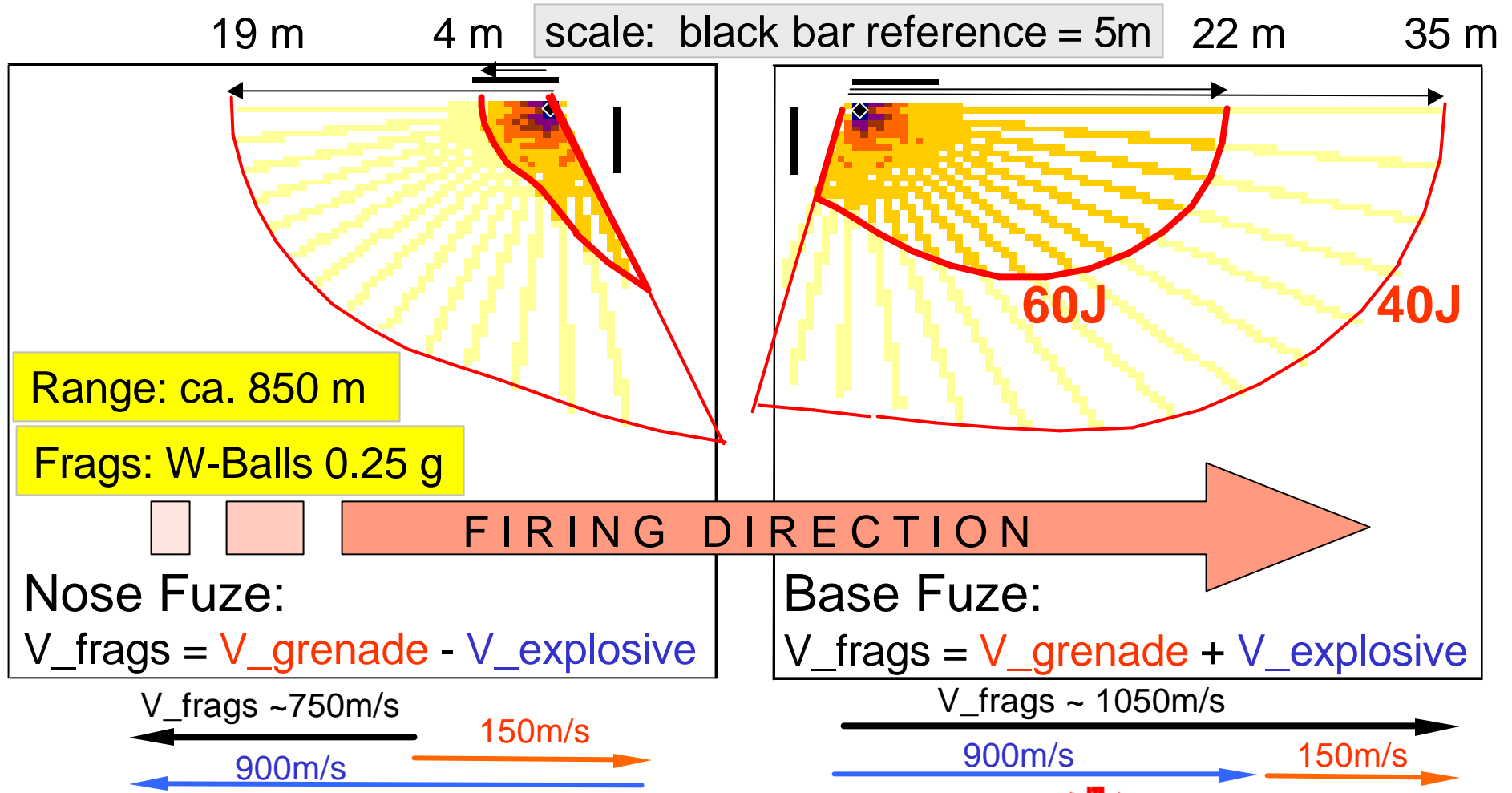
Nose Fuze Concept (Others)



Base Fuze Concept (Oerlikon)

# Air Bursting Munition Analysis

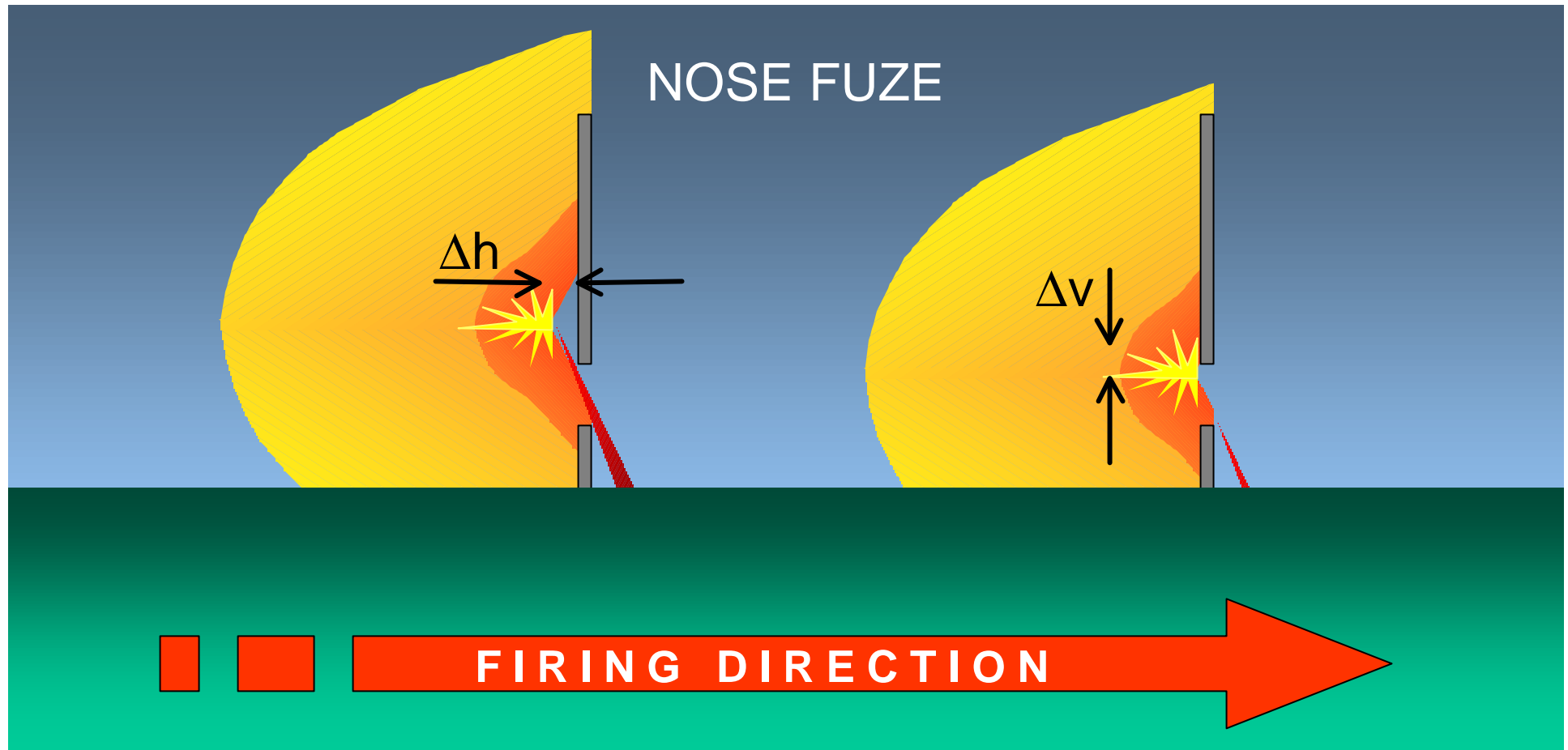
## Energy Pattern: Nose vs Base Fuze





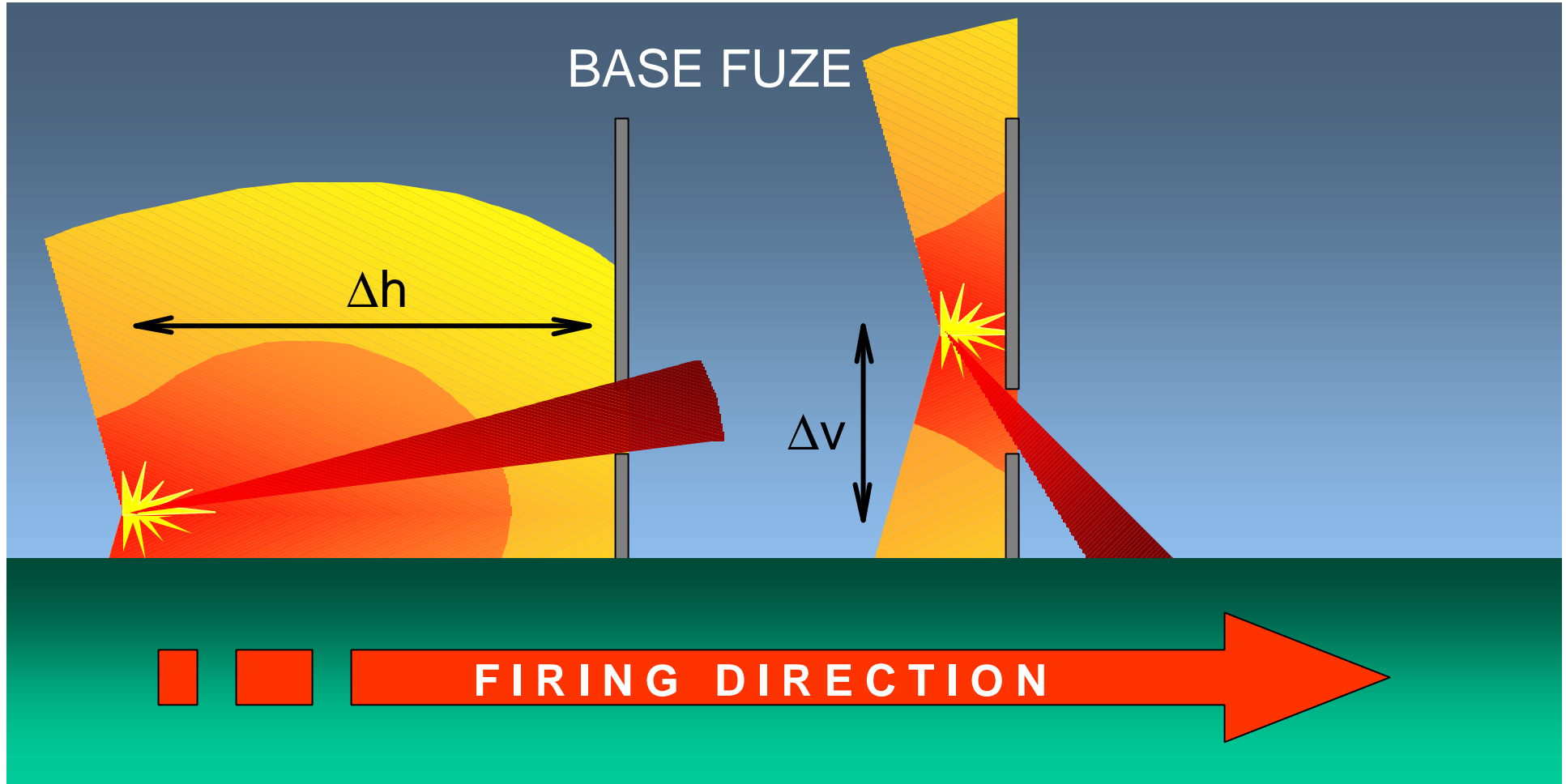
# Air Bursting Muniton Analysis

## Max. Allowable Error Against Openings - N.F.

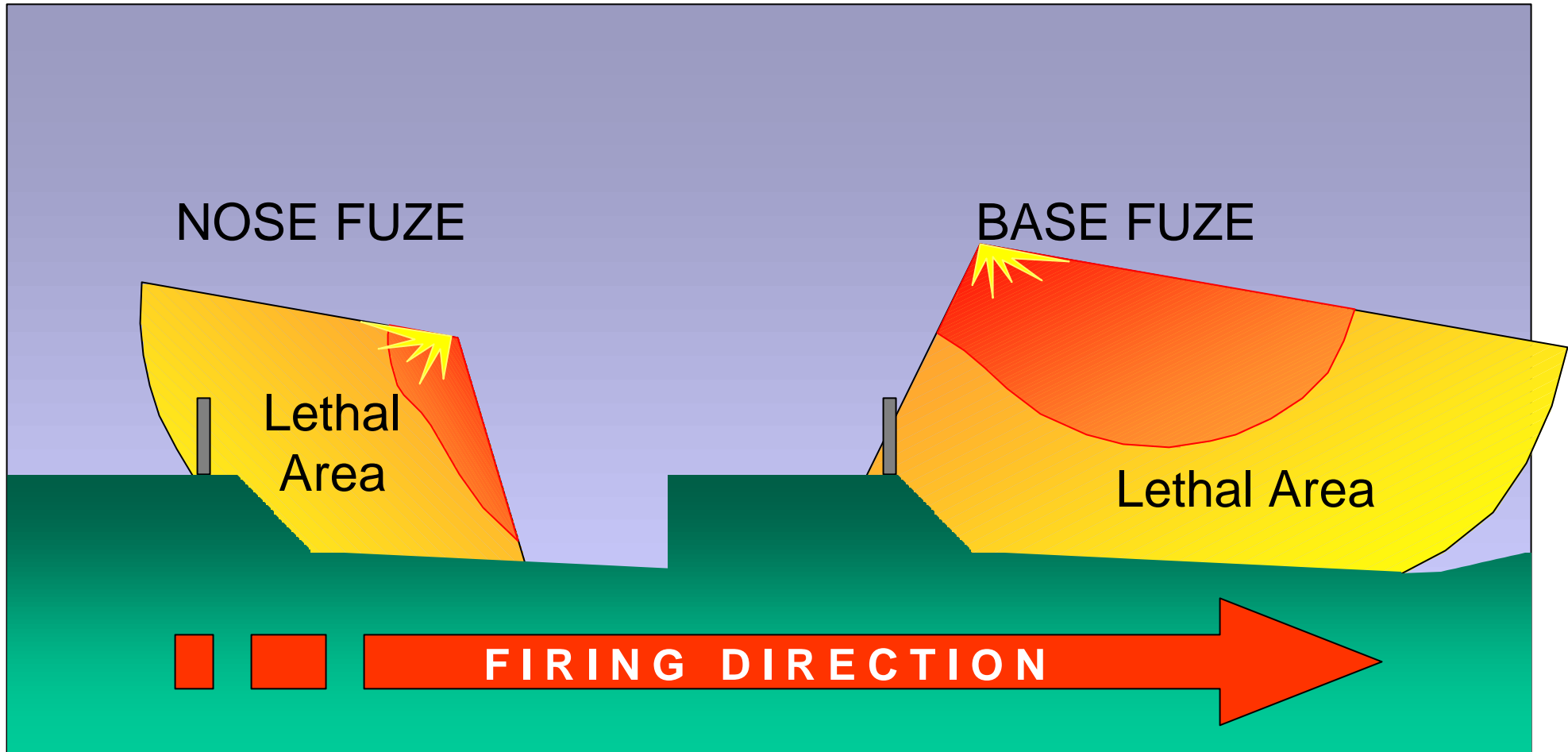


# Air Bursting Muniton Analysis

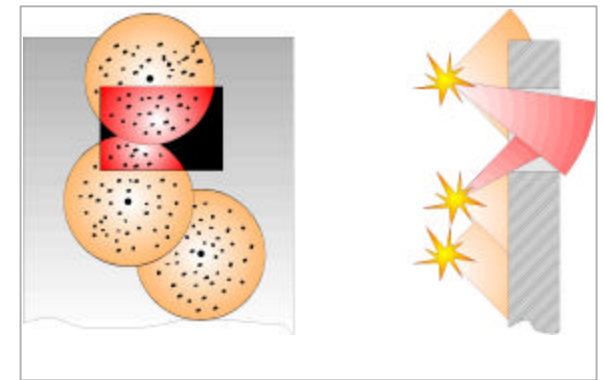
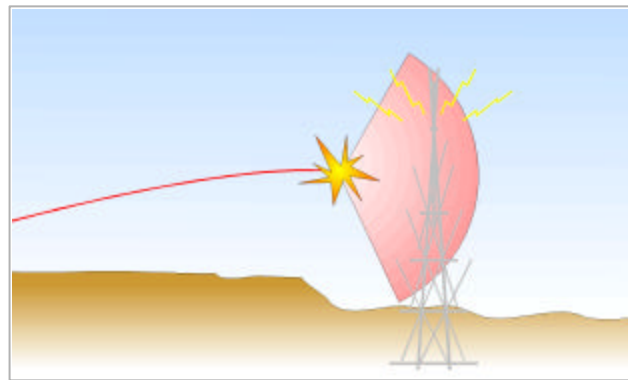
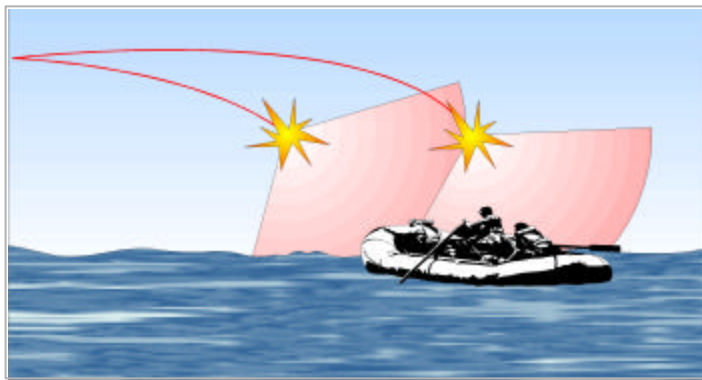
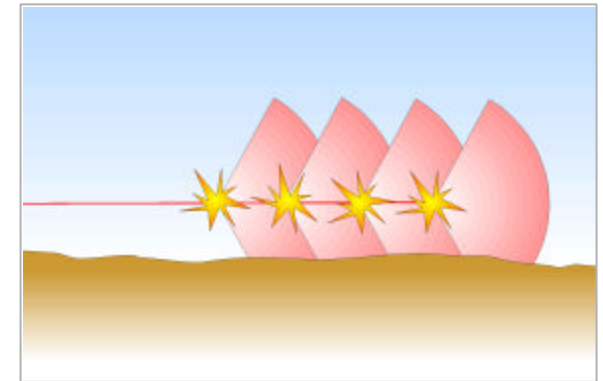
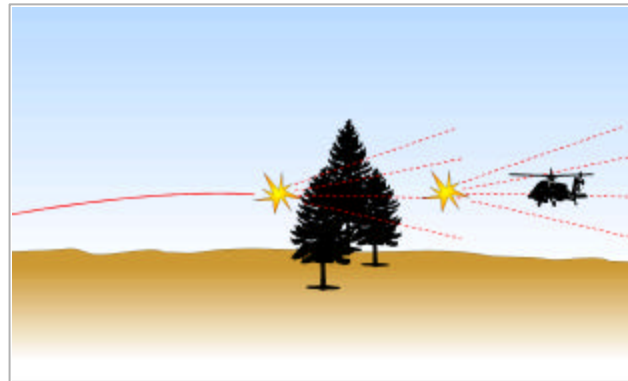
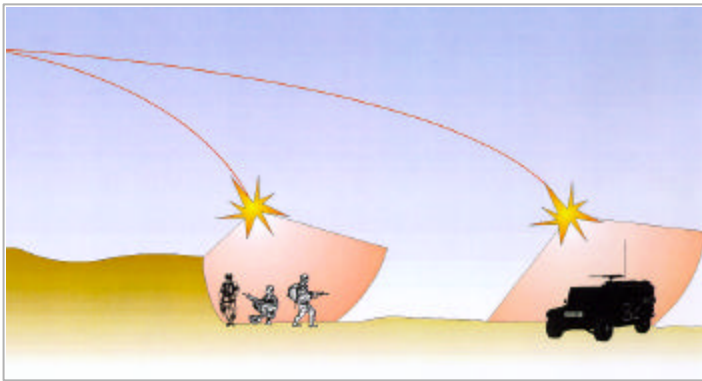
## Max. Allowable Error Against Openings - B.F.



# Air Bursting Munition Analysis “Behind Wall” Lethal Area



# Operation Versatility of the 40mm x 53 ABM







# 40mm x 53 Air Bursting Munition for AGL

## Summary of 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 (optional)
- 5 Easy system upgrade: minimal 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



# 40mm x 53 Air Bursting Munition for AGL

## Summary of Main Features

Electronic Base Fuze:	Ahead technology
Programmable at Muzzle:	Fuze time / impact sensor
Arming Time:	Mechanically & electronically driven
Safe and Arm:	Mechanically driven (Stanag)
Propulsion System:	Accurate / low muzzle velocity variation
Exterior Ballistics:	Compatible with standard ballistics
Point Detonating:	Piezo impact sensor / graze angle capability
Impact Sensor:	<ul style="list-style-type: none"><li>- Automatically On w/o fuze programming</li><li>- Switched Off function programmable</li></ul>
Warhead:	HE pre-fragmentation / large footprint / high lethality (forward and lateral fragment release)
Self-Destruct Function:	Automatically On when no fuze programming

# 40mm x 53 Air Burst Munition System for AGL: Programme Mile Stones



- Start R&D (ABMS) Early 1998
- Start Partnership OCP - ST Kinetics May 1999
- Contract Signed with FMV-Sweden Dec. 2000
- Prototype Delivery FMV-Sweden May 2002
- Product Qualification Completed End 2003
- Start Serial Production 2004

# 40mm x 53 ABM HTE309: Firing Tests

Slow Motion Videos  
of single shot  
and burst firings  
up to 570 Rd/min

