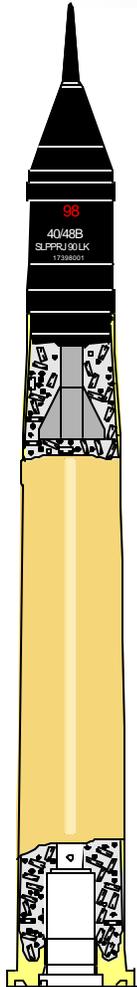


Presentation of the BOFORS 3P and System Concept

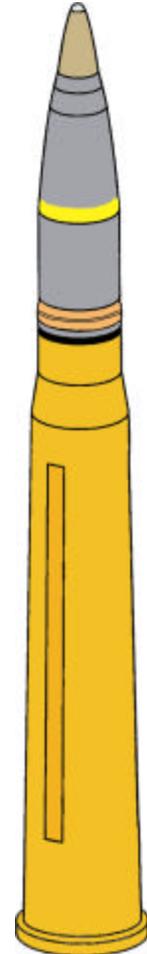


- **BOFORS 40/57 mm 3P**
- **Remotely Controlled Turret System**
- **Bushmaster IV integration**

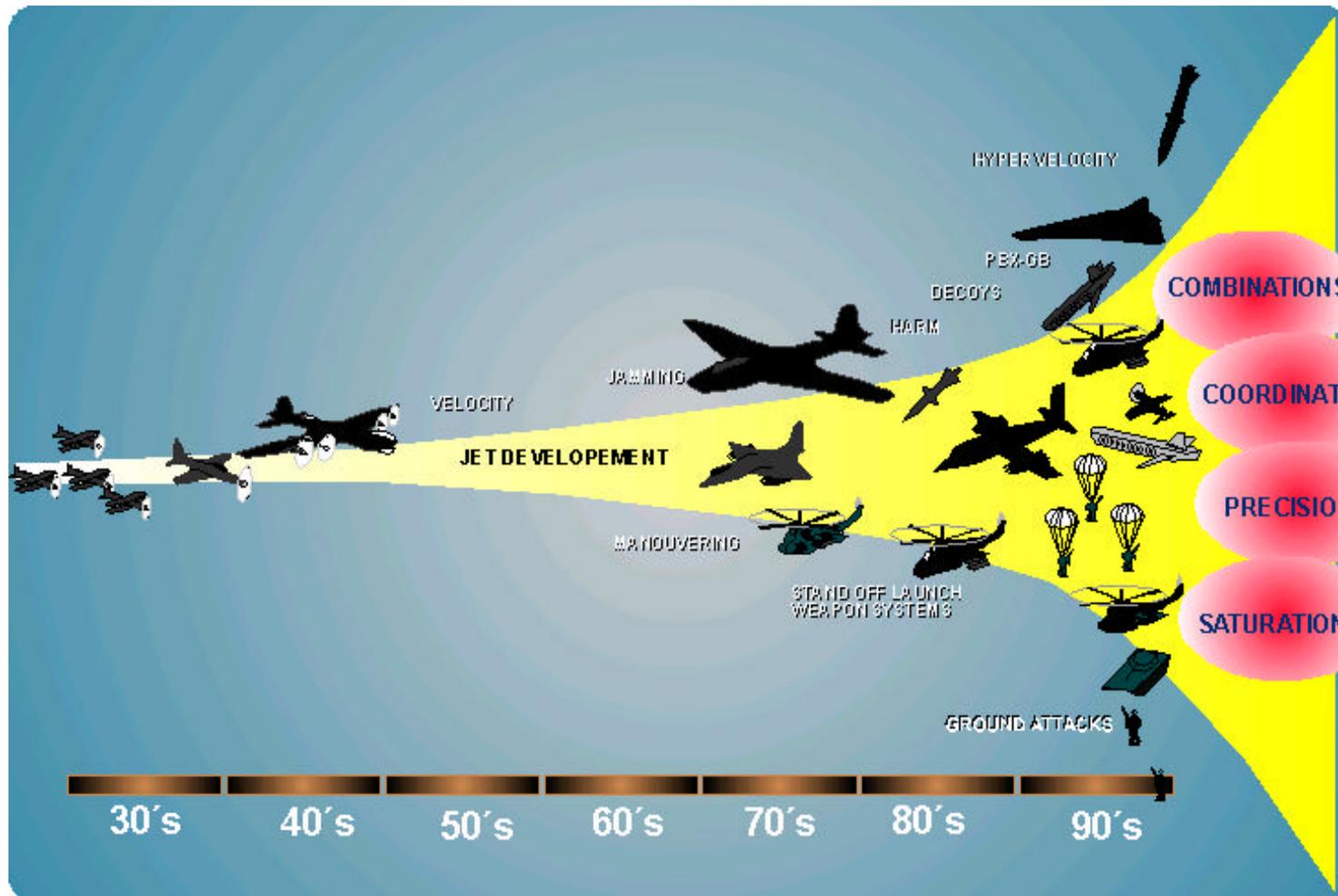
Mr Michael Borén

Product Director, Combat Vehicle Systems

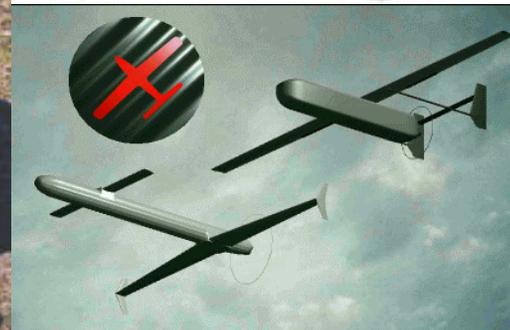
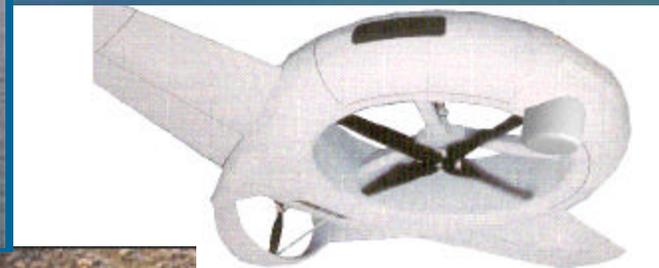
E-mail: michael.boren@boforsdefence.se



THREAT SCENARIO



UNMANNED COMBAT AIR VEHICLES



System / Armament Requirements

- **Multi-Role Functionality**
 - Various
 - Weapons
 - Sensors
 - Conflict Levels
 - Ground, Urban, Air, Naval
- **Multi-Target Capability**
 - Airburst Capability
 - Proximity Capability
 - Point Detonation Effect
 - Variable / Controlled Effect

40 mm Ammunition Family

COMBAT AMMUNITION



PFPPX "3P"

APFSDS-T

Insensitive Mmunition (IM)



TPDS-T

TP-T

TRAINING
AMMUNITION

40 mm APFSDS-T Mk II

Bofors Defence AB and QinetiQ studied the possibility to increase penetration performance with 25% (0° NATO, RHA) on the 40 mm APFSDS-T.

40 mm APFSDS-T Mk I

- Penetration: >120 mm RHA



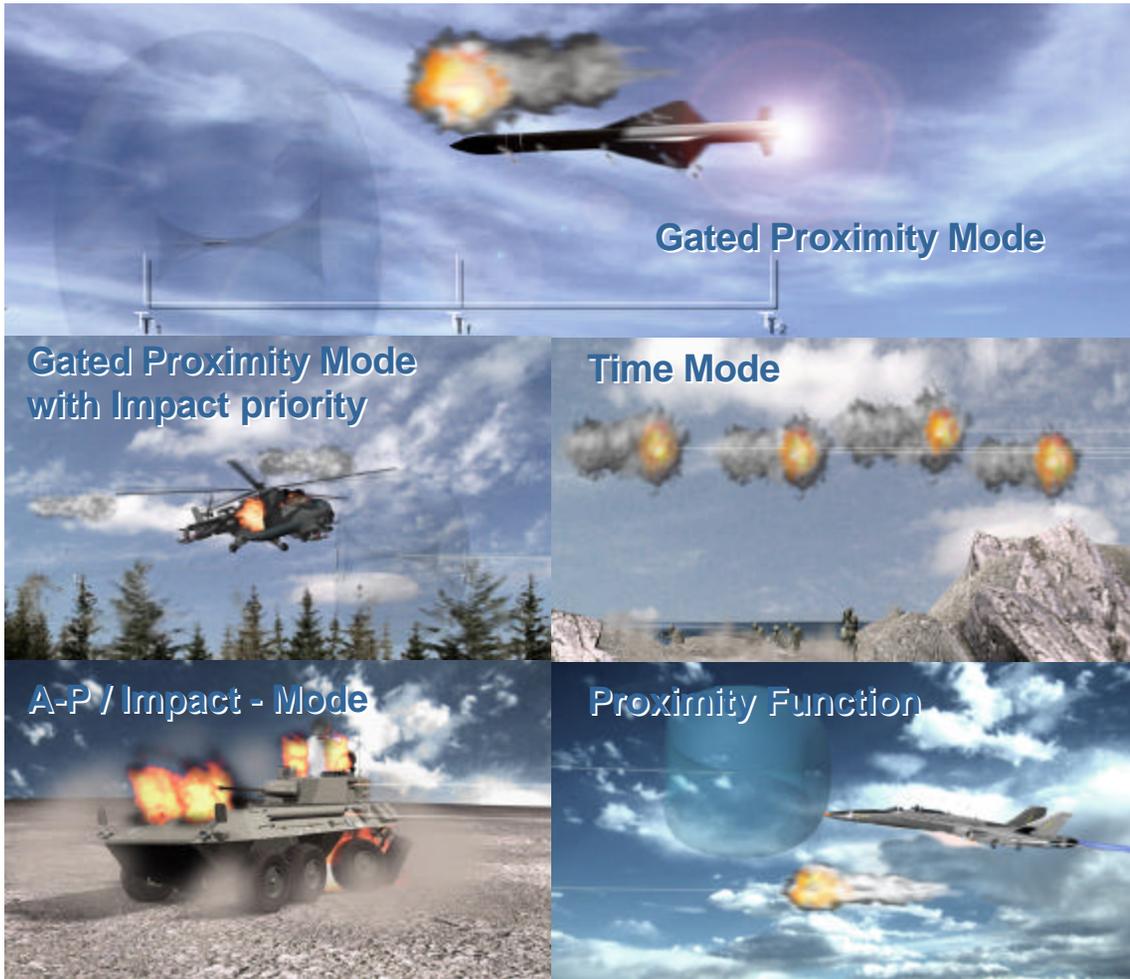
The study shows that 25% increase is possible in the L/70 gun system.

If the round is optimised for the new Bushmaster IV gun penetration will increase up to 50%.



This performance was demonstrated for the Swedish Army using the L/70 gun system in Nov. 2001.

3P Multi-target round



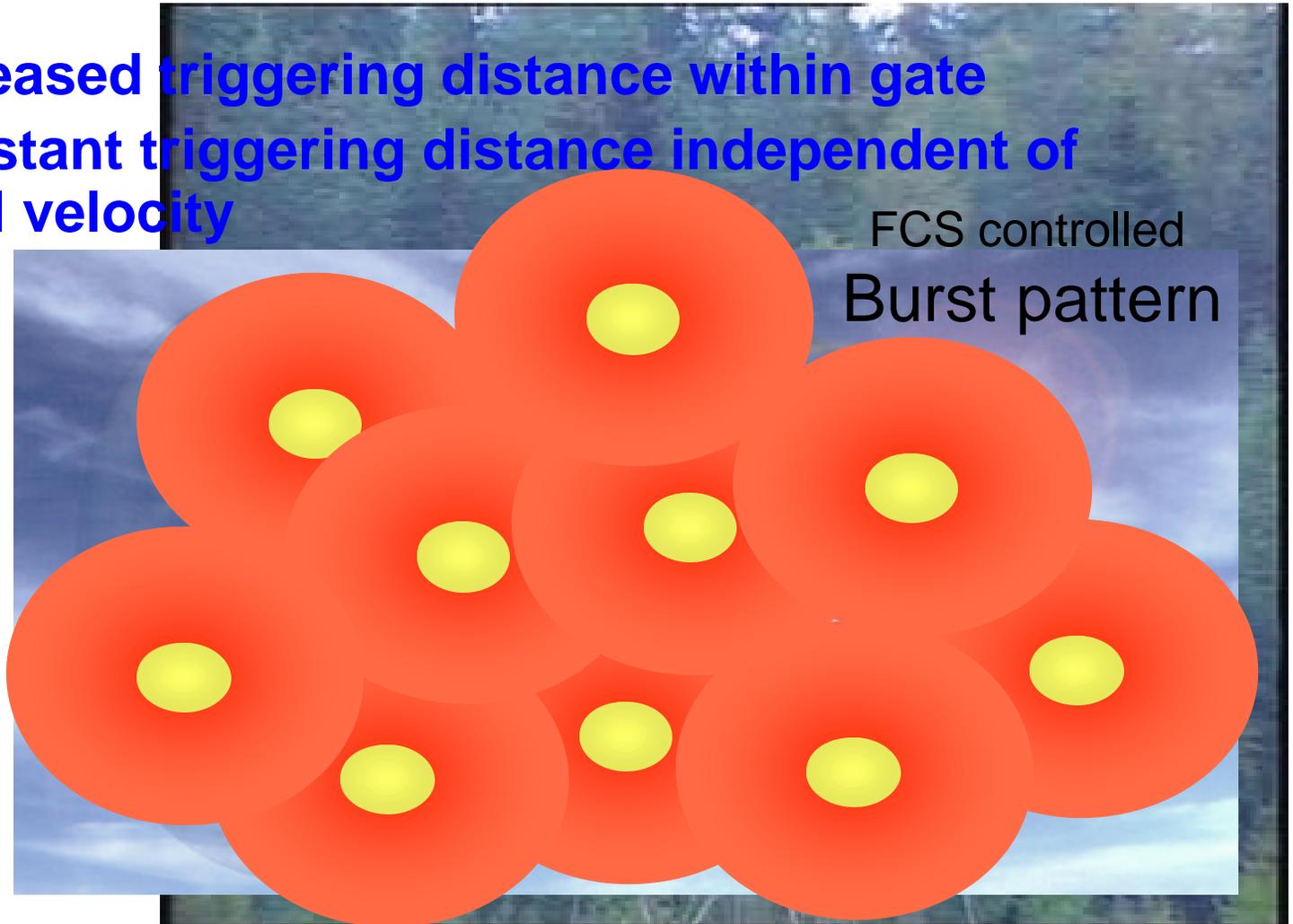
- ✘ **Gated Proximity Mode**
Attack aircraft, attack helicopters and missiles at extremely low altitudes, ground support aircraft.
- ✘ **Gated Proximity Mode with Impact Priority**
Large transport aircraft, helicopters.
- ✘ **Proximity Mode**
All aerial targets.
- ✘ **Time Mode**
Partly concealed hovering helicopters, anti- armour units, infantry, targets behind slopes, helicopters behind obstacles.
- ✘ **Impact Mode**
Trucks, personnel carriers.
- ✘ **Armour-piercing Mode**
Lightly armoured and urban fighting.

3P - Gated Proximity Mode

- Increased triggering distance within gate
- Constant triggering distance independent of shell velocity

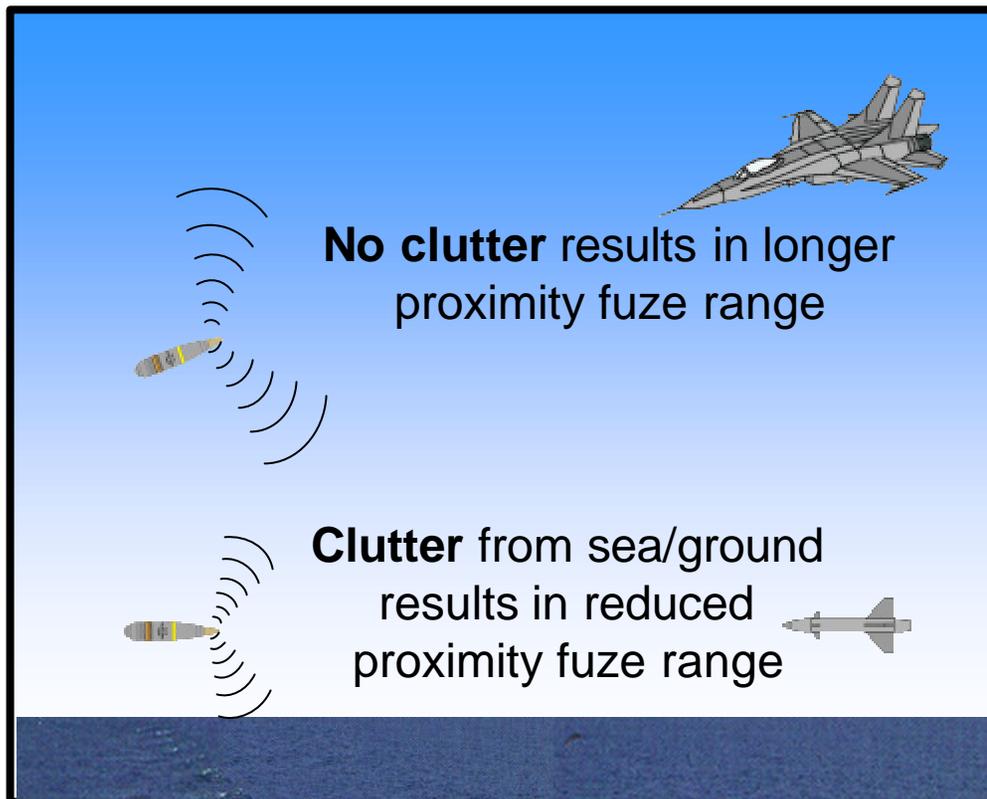
FCS controlled
Burst pattern

Immune to
ECM
and
ground/sea
clutter

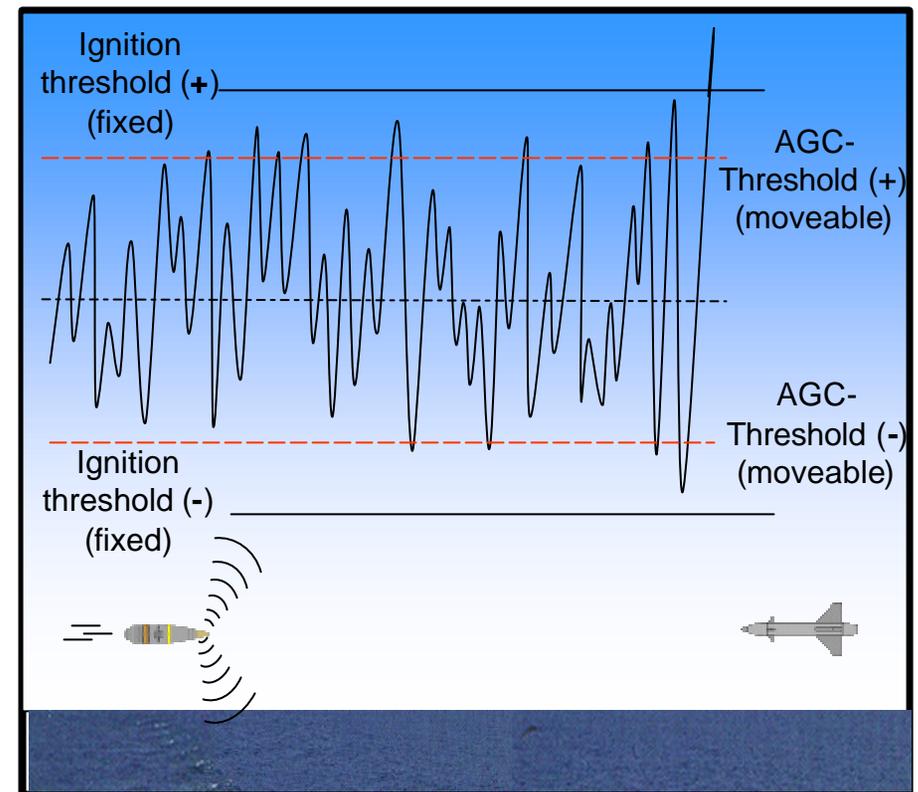


3P - Gated Proximity Mode

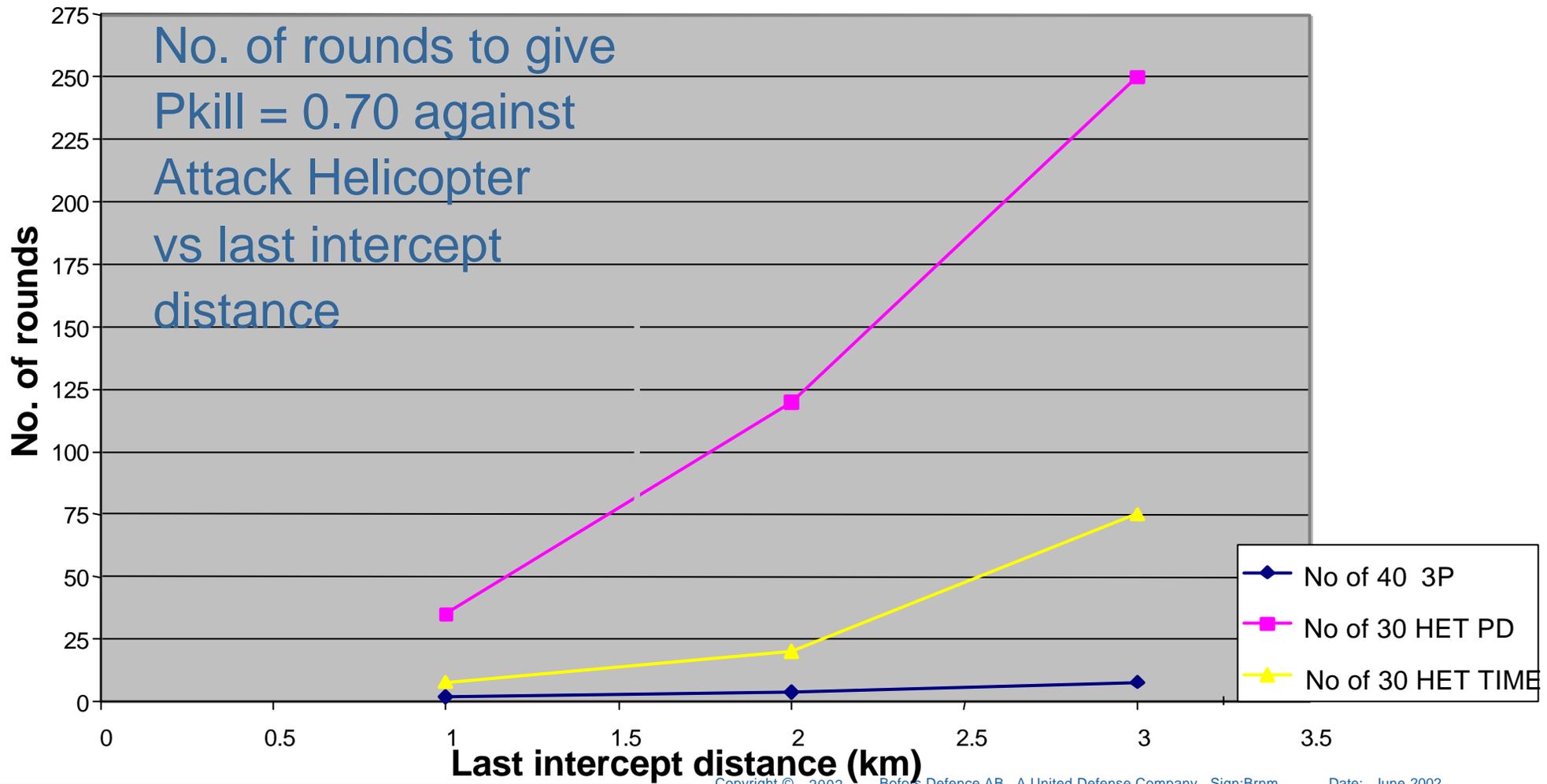
PROXIMITY FUZE SENSITIVITY SETTINGS



PROXIMITY FUZE SENSITIVITY ADJUSTMENTS



3P Effectivness



3P Gated Proximity Mode with Impact Priority

- Increased triggering distance within gate
- Constant triggering distance independent of Shell velocity



Immune to
ECM
and
ground/sea
clutter

3P GPMIP Effectiveness

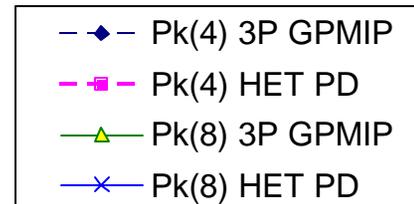
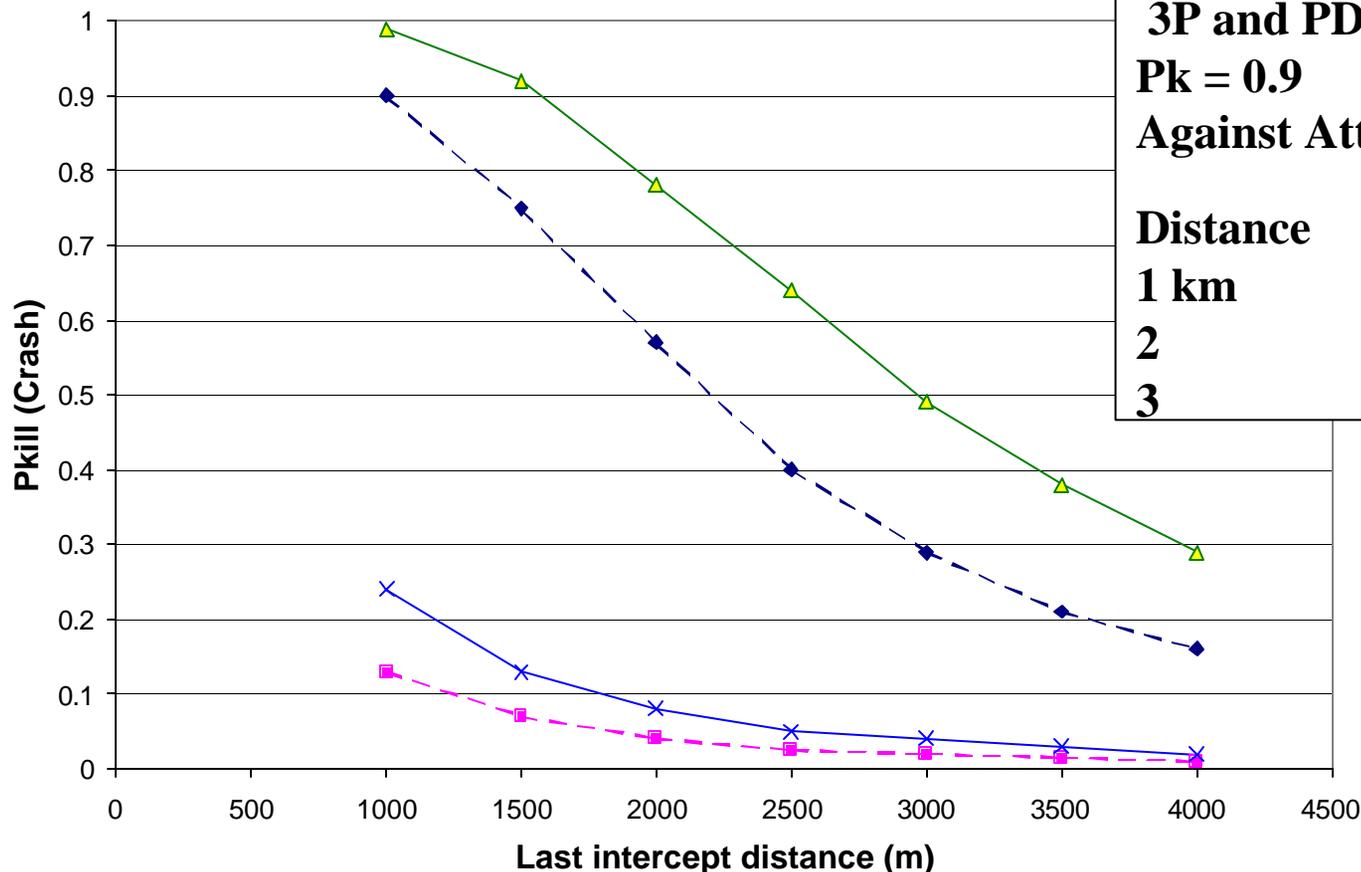
40 mm 3P Gated Proximity Mode with Impact Priority (GPMIP)

& 40 mm HET Point Detonating (PD) ammunition

Number of rounds in GPMIP for 3P and PD for HET to give $P_k = 0.9$

Against Attack Helicopter

| Distance | 3P | PD | Rel |
|----------|----|-----|------|
| 1 km | 4 | 67 | 1:17 |
| 2 | 14 | 230 | 1:16 |
| 3 | 27 | 460 | 1:17 |



3P - Proximity Mode

Constant triggering distance independent of Shell velocity

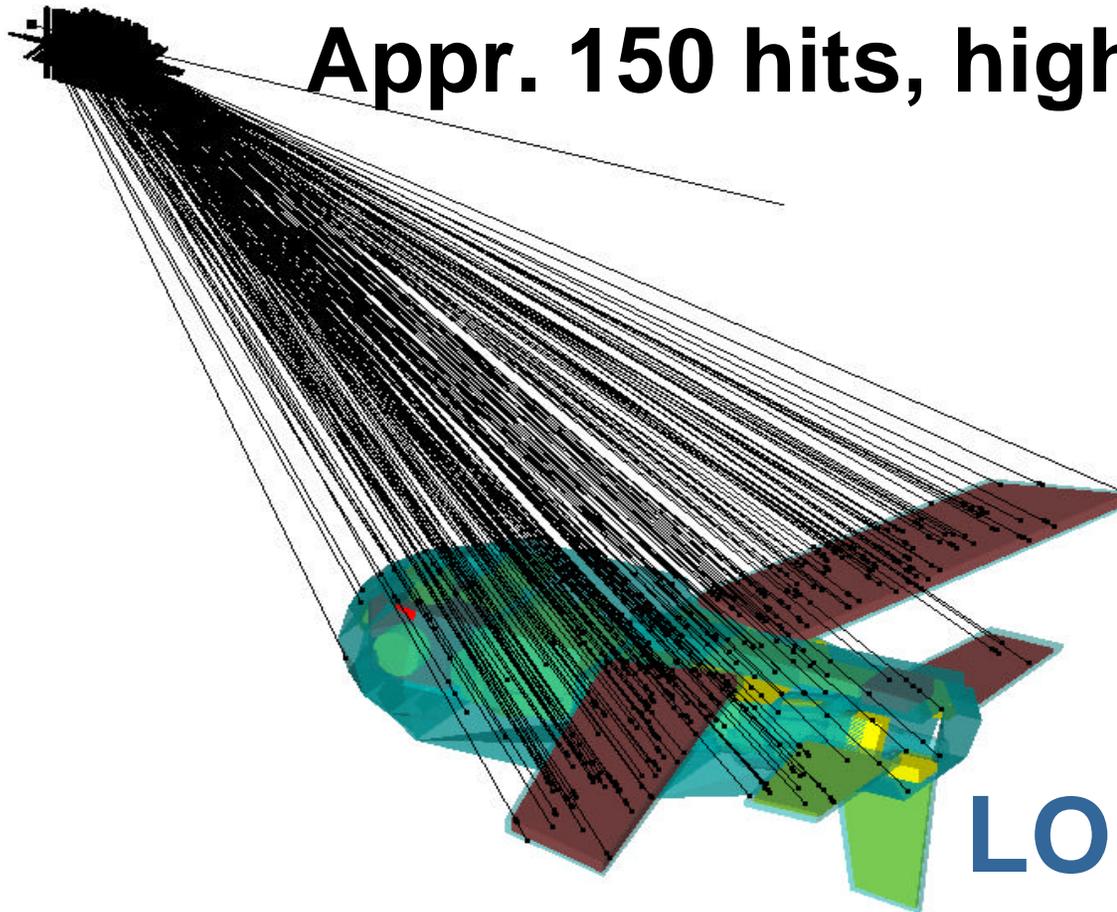


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Date: June 2002

Fragments 3P IM

Appr. 150 hits, high kill effect



LOCAAS

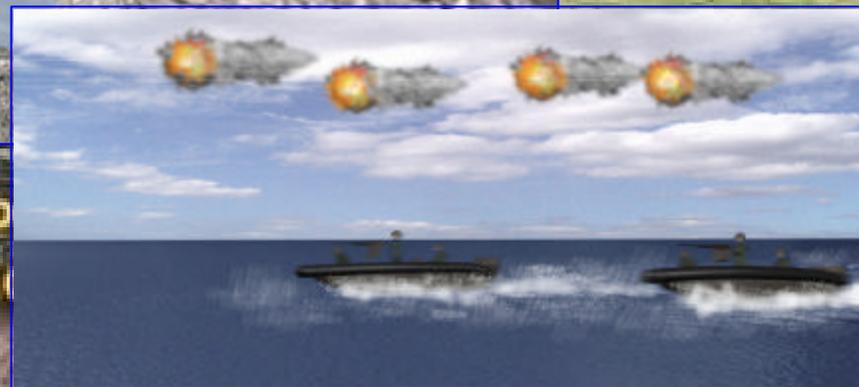
3P - Time Mode

Provides capability to combat concealed targets with air-bursts



Air-bursts against small boats

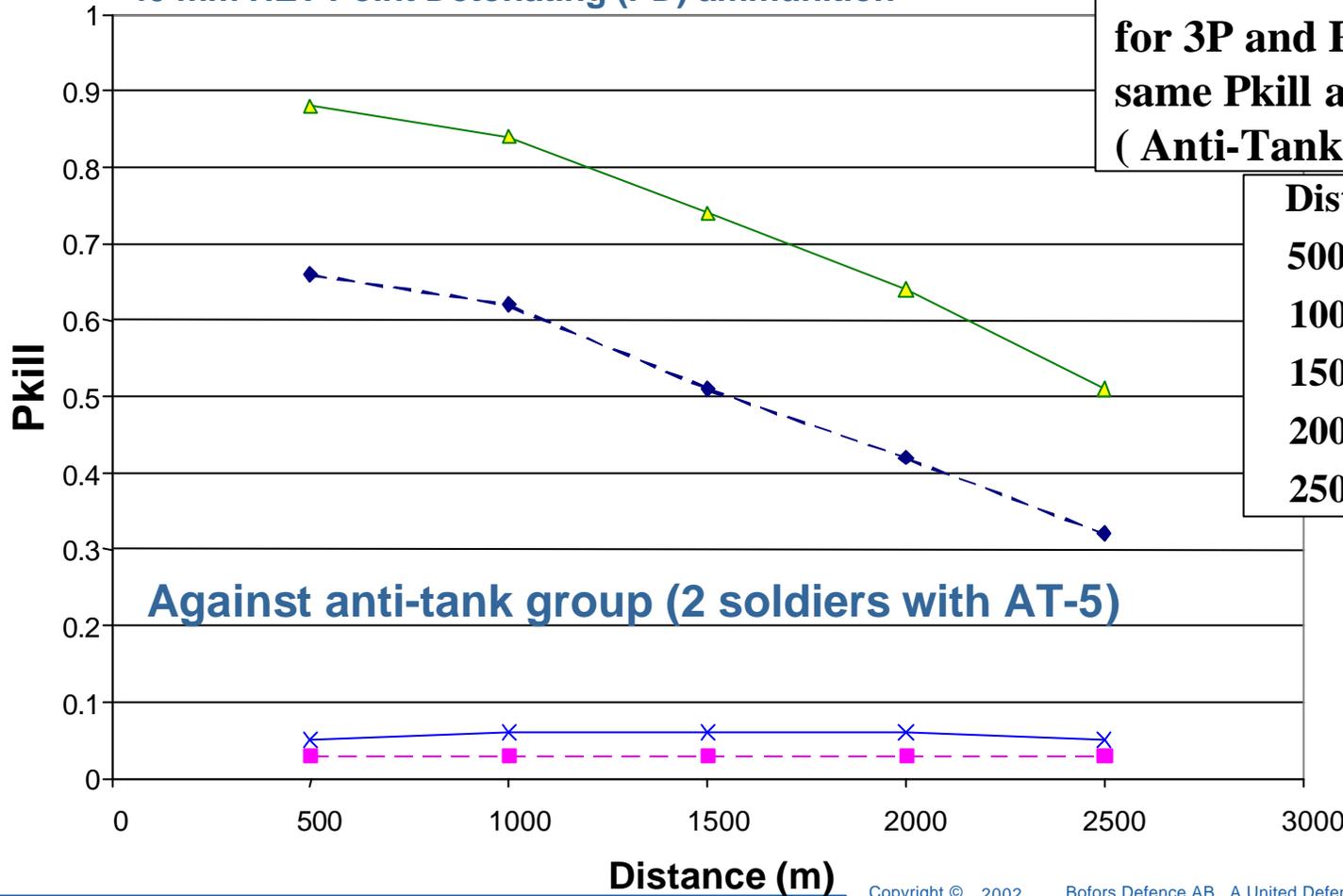
- with/ without dispersion



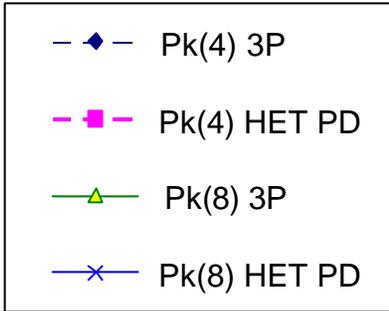
3P TIME MODE Effectiveness

40 mm 3P in Time Mode (TM) and
40 mm HET Point Detonating (PD) ammunition

**Number of rounds in mode TM
for 3P and PD for HET to give
same Pkill as 3P (burst height 5m)
(Anti-Tank Group incapacitated)**



| Distance | 3P | PD | Rel. |
|----------|----|-----|------|
| 500 m | 8 | 330 | 1:41 |
| 1000 | 8 | 235 | 1:29 |
| 1500 | 8 | 175 | 1:22 |
| 2000 | 8 | 135 | 1:17 |
| 2500 | 8 | 110 | 1:14 |



3P – Armoured piercing Mode



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3P - Impact Mode



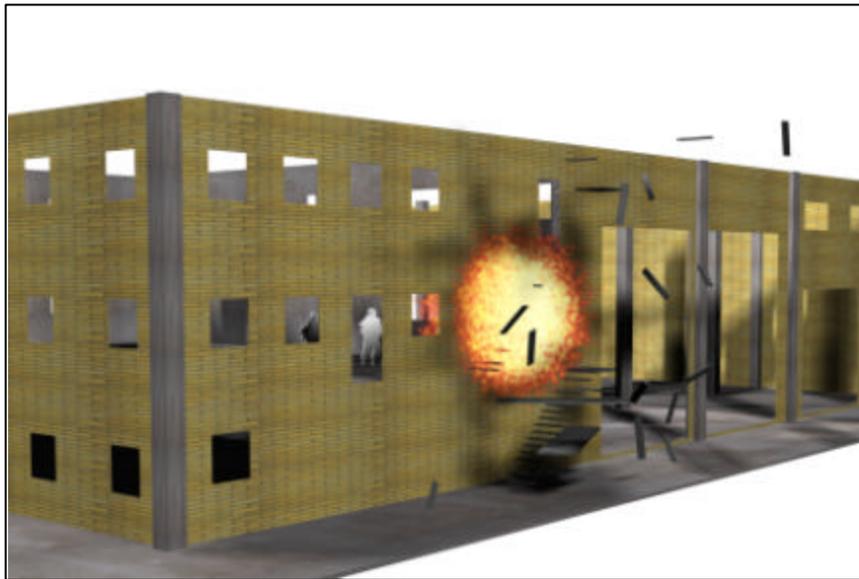
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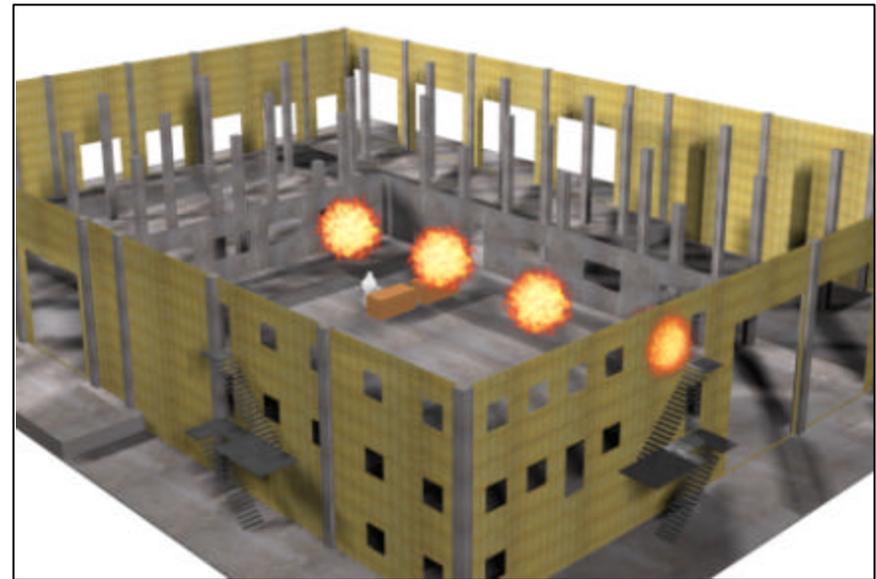
3P – AP / Impact / Time-Mode

Military Operation Urban Terrain

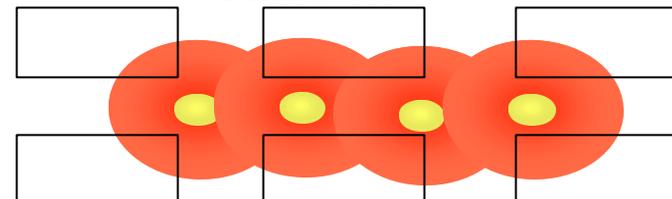


**Building
Impact Mode**

Armour Piercing Mode



Time Mode

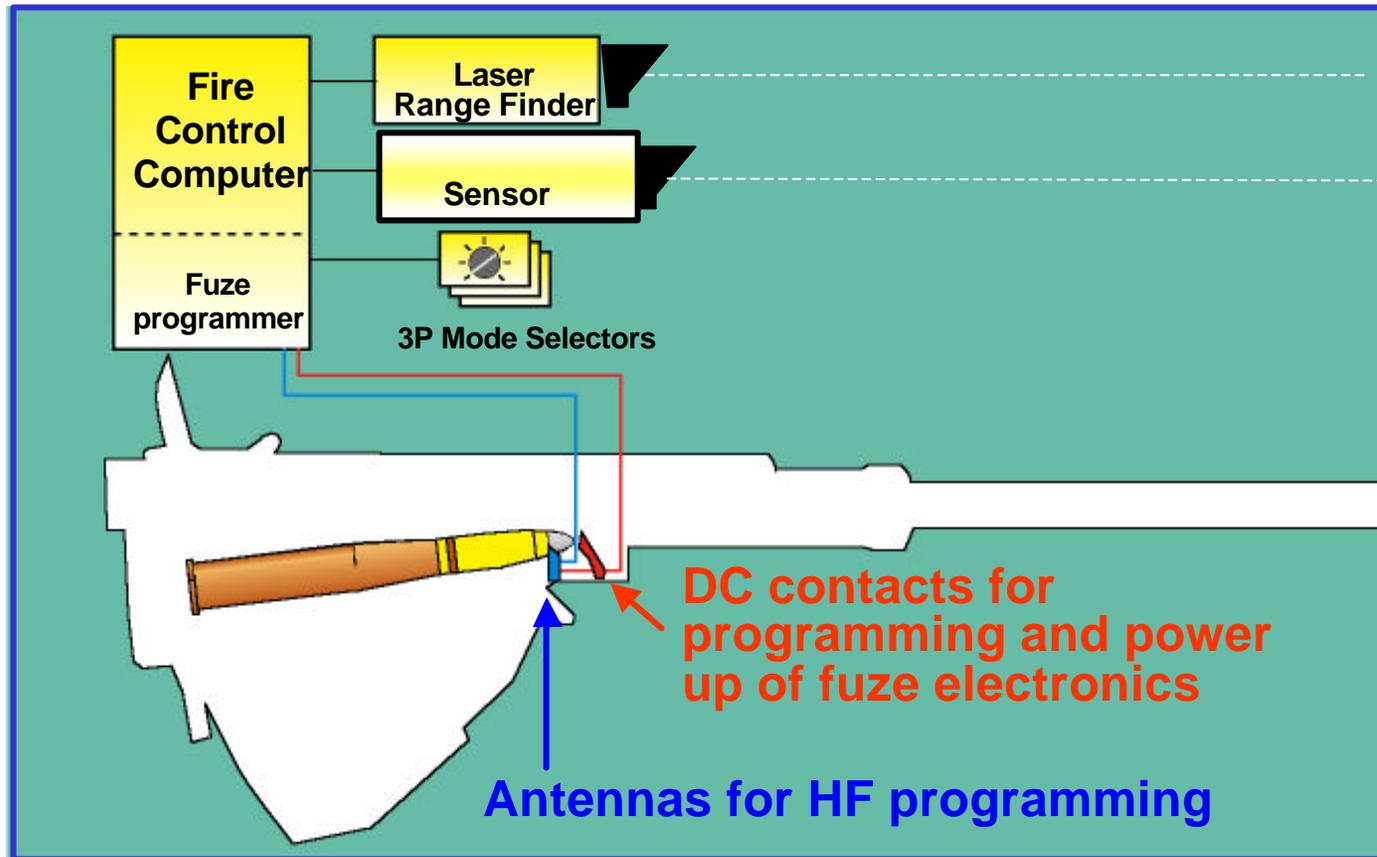


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3P Programming



3P round

(**P**refragmented **P**rogrammable **P**roximity fuzed ammunition)

DATA

Fuze

6-mode programmable

Tungsten pellets, 3 mm

1100/ 2400

Lethal area

140/ 400 m²

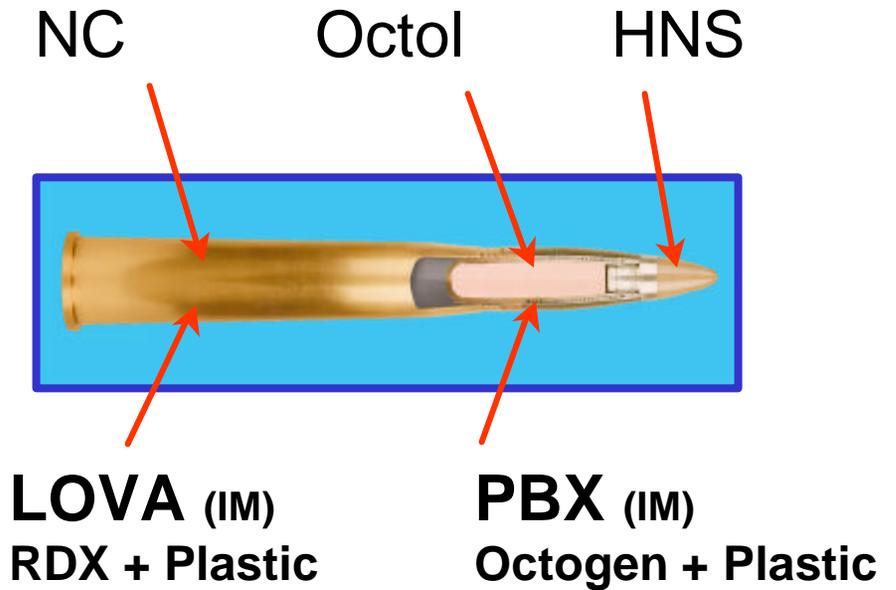
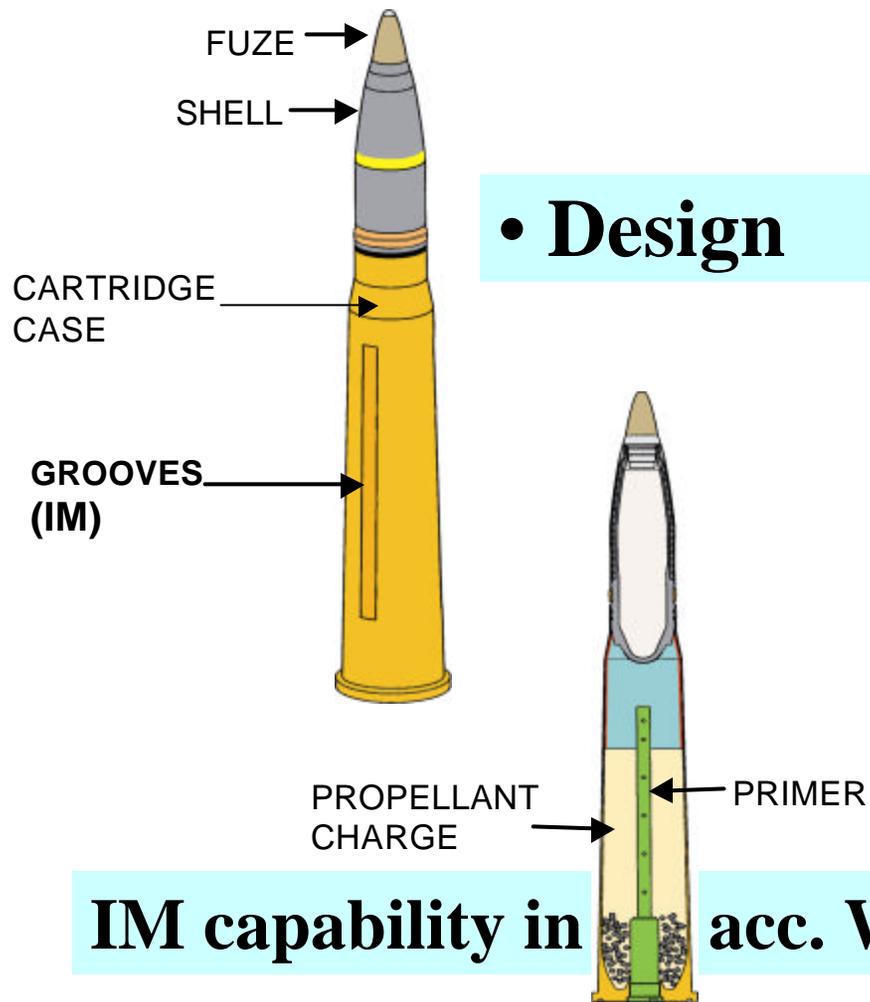


**Note: 3P at 5 m
burst height**

DATA 3P Rounds

|  | 40 mm 3P IM | 57 mm 3P IM |
|---|-------------|-------------|
| Total weight (kg) | 2.5 | 6.2 |
| Weight of shell (kg) | 0.975 | 2.4 |
| Weight of explosive (PBX) | 0.120 kg | 0.460 kg |
| Total length (mm) | 534.4 | 675.3 |
| IM capability in acc. with SE Req./MIL-STD 2105B | Yes | Yes |
| Number of fragments | >3000 | >8000 |
| Muzzle Velocity (+21°C) | 1012 m/s | 1035 m/s |

3P Insensitive Munition (IM)

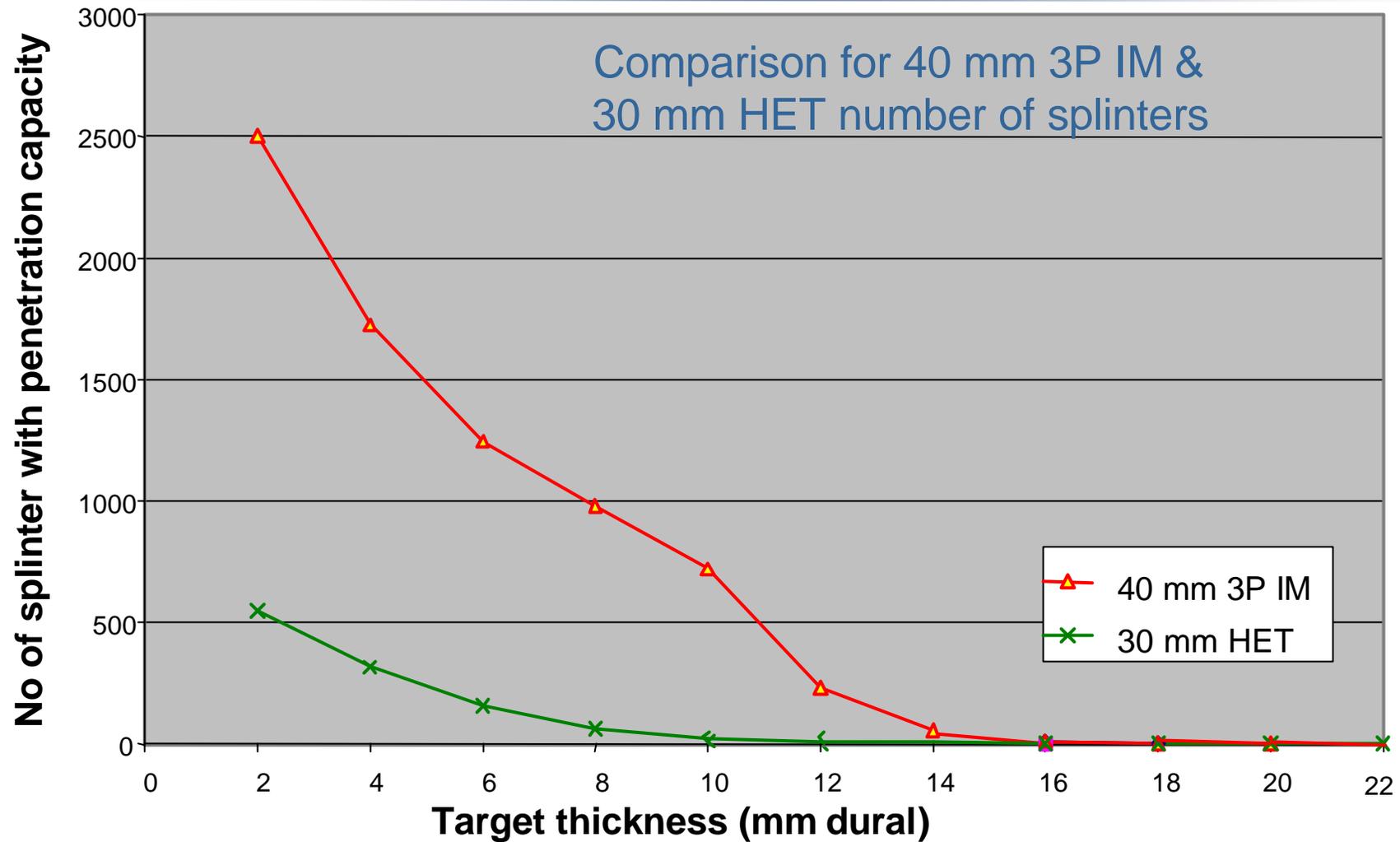


IM capability in acc. With SE req./MIL-STD 2105B

3P Prefragmented shell



3P Penetration capacity



Summary 40 mm Ammunition

Features:

- Powerful pre-fragmented bursting munition with Programmable multi-function fuze (3P):
 - **Air-burst capability**
 - **Immune to ECM**
- Armor Piercing munition with a Penetration capability well in excess of 150 mm armor (APFSDS-T Mk II)
- Qualified as Insensitive Munition according to Swedish requirements/ MILSTD-2105B

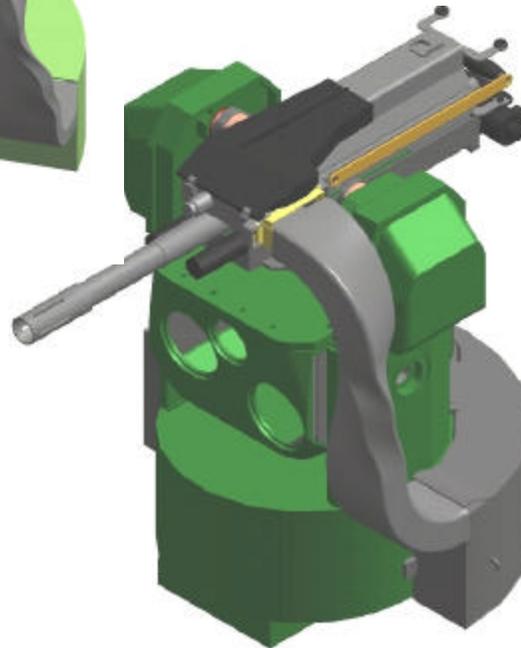
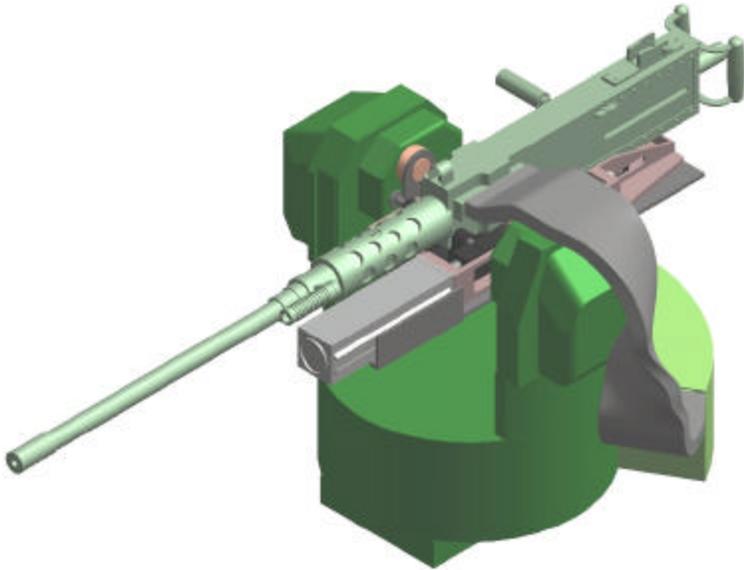
Qualitative advantages:

- Certain access to the correct ammunition in one and the same 3P round
- Reduced No. of rounds per kill
- Shorter engagement times
- Increased Engagement Range
 - **> 3 km Ground Targets**
 - **< 6 km Aerial Targets**

Development potential:

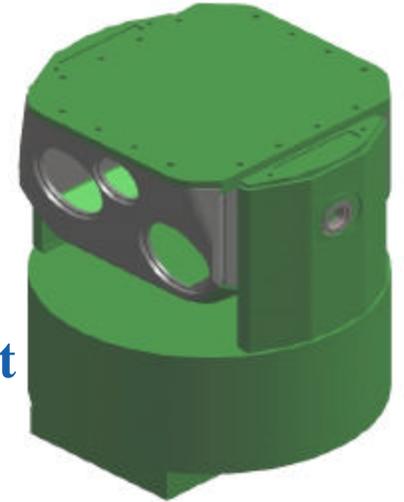
APFSDS-T Mk III additional 25% performance
2P round

LEMUR Concept



SENSOR

- IR
- CCD
- Laser
- Missile-sight
- etc.



MMI

- LCD-display
- Control handle
- Vehicles FCS

40 mm Bushmaster IV

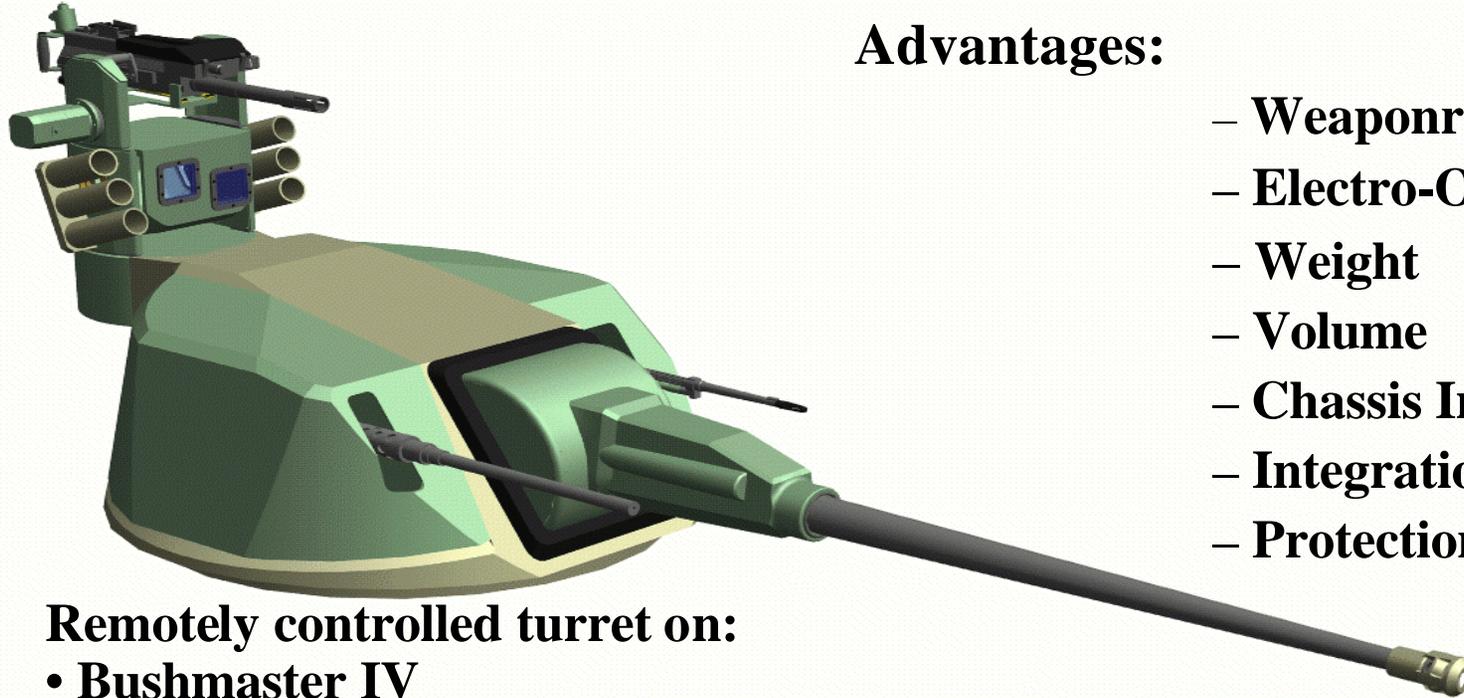
Bofors Defence AB and ATK, Gun Systems Company, studied on assignment from FMV, Sweden the possibility to upgrade the Bushmaster family with a 40 mm gun, Bushmaster IV built around the envelop of the existing 40 mm L70 ammunition family.

As the study clearly verified feasibility Bofors and AGSC decided to proceed with a prototype and the first firings were performed during May 2001.



Bushmaster IV

Remotely Controlled Turret / BM IV



Advantages:

- **Weaponry flexibility**
- **Electro-Optronic Sights**
- **Weight**
- **Volume**
- **Chassis Intrusion**
- **Integration flexibility**
- **Protection**

Remotely controlled turret on:

- **Bushmaster IV**
 - **LEMUR**
 - **40 mm AGL**
 - **Smoke launchers**
 - **7.62 mm MG**
 - **12.7 mm MG**

BFV / BUSH IV RC Turret System



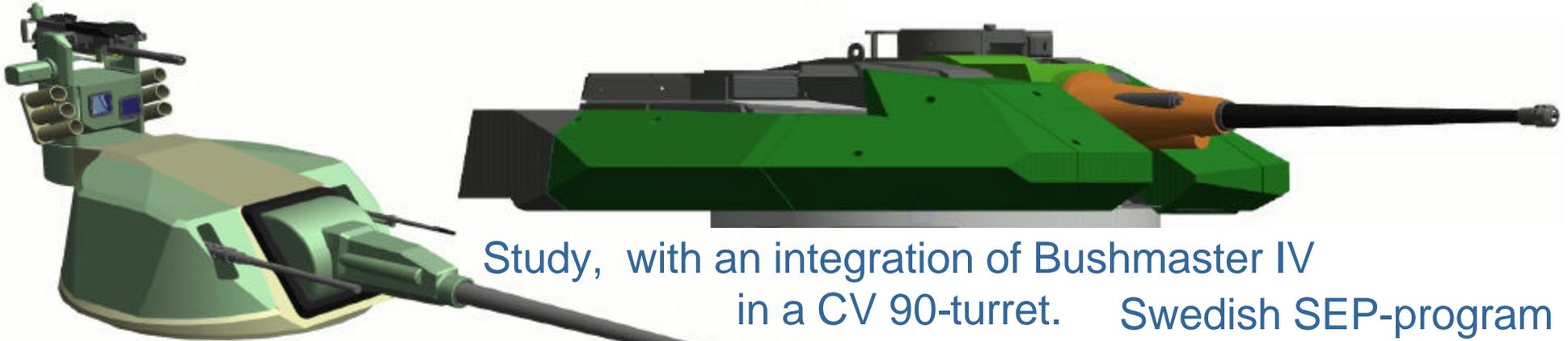
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BFV / BUSH IV RC Turret System

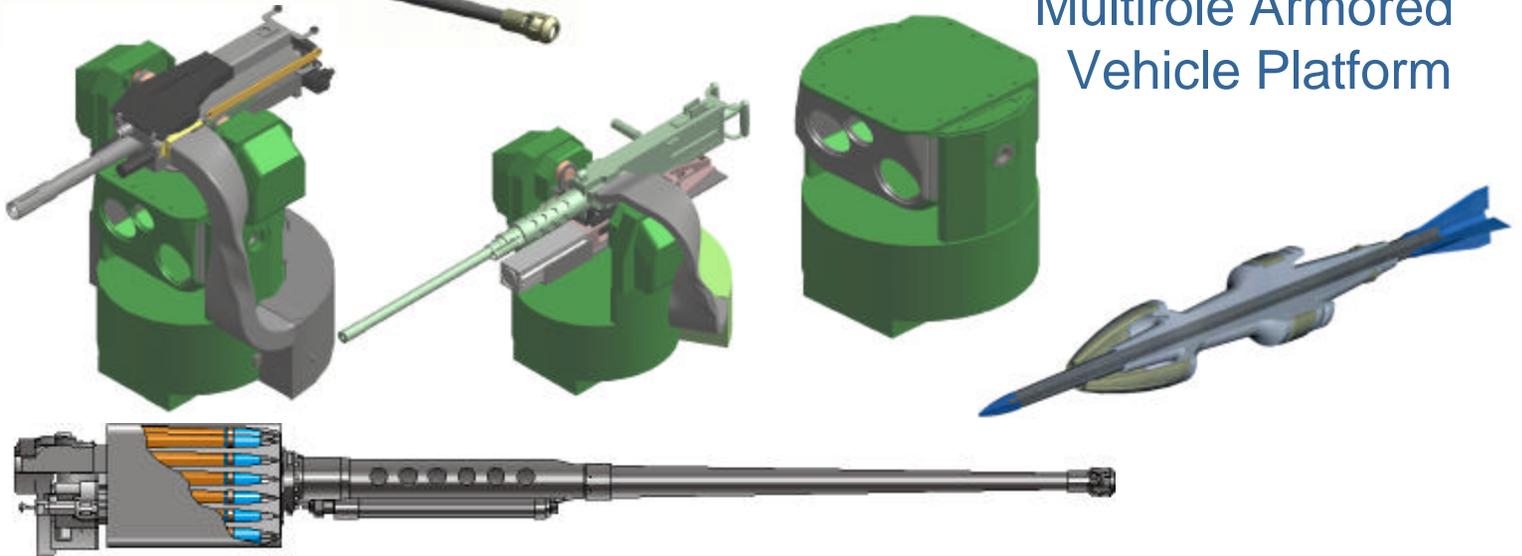


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System Modules



Study, with an integration of Bushmaster IV
in a CV 90-turret. Swedish SEP-program
Multirole Armored
Vehicle Platform



Summary

Bushmaster IV System Concept

- Bofors 40 mm ammunition with proven technology provides significant combat flexibility and the required effect in most scenarios at present and in the foreseeable future
- Bushmaster IV reduces the Weight and Volume of the 40 mm Armament System
- Remotely Controlled Turret System facilitates multi-role capabilities and enhances protection for the crew
- Insensitive munitions provides increased survivability

The Bofors 3P ammunition and APFSDS-T Mk I are in service today
and
The Bushmaster IV is under development.