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40mm Air Bursting Munition System (ABMS) and Light Weight Automatic Grenade Launcher (LWAGL)

Kok Chung, Fong Cheng Hok, Aw (PM)

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Outline

- ABMS ?
- Operation Concept
- LWAGL
- System / Munition Concept
- Fire Control System Concept
- Features
- Possible Applications
- Technical Data
- Live Firing Demonstration
ABMS?

The 40mm ABMS is an upgrade of the 40mm AGL with air bursting munition that showers lethal fragments effectively in front, above or from the side of intended targets.
OPERATION CONCEPT

- against infantry fighting vehicles
- against troops in the open or build-up area
OPERATION - advantages

- More effective
- First shot hit
- Reduced logistic
- Versatile
  - effective against various types of targets
  - adaptable to various 40AGLs
OPERATION - weapon versatility

One ABM System for various 40mm AGL with min. modification

CIS 40AGL

H&K GMG

STK LWAGL

MK 19 Mod 3

FCS

Ammo Programmer

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Man-pack Configuration
3 soldiers with each not carrying more than 25 kg.
Total System Weight = 65 kg
Light Weight Automatic Grenade Launcher Qualification Tests
1. Obtain target data

2. FCS computes firing data & transmits to ammunition programmer

3. Programme ABM

4. Fire ABM, HE, HEDP, TP-T and TP

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Munition Concept

- Receiving Coil for Fuze Programming
- Blast Fragmentation Warhead
- Safe & Arm
- Electronic Timer Module
- Power Supply (Setback Generator)

ABM Projectile

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Munition Concept

Warhead

HE (PD Fuze)

ABM
Munition Concept

Warhead

Fragment : Tungsten Ball  
Nos. of ball : 330  
Mass      : 0.25g per ball
Effectiveness

Analysis: Nose Vs Base Fuze

Nose Fuze:
\[ V_{\text{frags}} = V_{\text{grenade}} - V_{\text{explosive}} \]

Base Fuze:
\[ V_{\text{frags}} = V_{\text{grenade}} + V_{\text{explosive}} \]

scale: black bar reference = 5m
Effectiveness

Max. Allowable Error in the Open - Nose Fuze

Max. Error Allowed $\Delta$
Effectiveness

Max. Allowable Error in the Open - Base Fuze

Max. Error Allowed $\Delta$
Effectiveness

ABM met the ‘Protected Man criteria of Pk 0.224’

1.0 mm Al
1.5 mm Steel
25 mm PS

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1.6 mm Ti-alloy
20 layers Kevlar

Body Armor
STANAG 4512

Unprotected Man
Effectiveness

Static and Dynamic Arena Tests

Static Results

- 3m → 3 frag/m²
- 5m → 2 frag/m²

Dynamic Results

- 1.6mm Titanium
- 20 layers Kelvar

Target: 3m

Target: 5m

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Fire Control System Concept

Ammunition Programmer

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Features

1. Air-Burst Mode

Bunker

2. Impact Mode

BMP 3 Basic Hull

3. Self-Destruct
Features

Simulate firing through foliage

40mm HV HE

12.7mm Celotex

Firing Direction

40mm ABM HE

12.7mm Celotex

Firing Direction
Possible Applications

Operation Versatility of the 40mm ABM

Targets in defilade

Targets in open

“String of Pearls”

Moving target behind foliage

Landing craft

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Possible Applications

Operation Versatility of the 40mm x 53 ABM

Target behind opening

Point burst against Opening or Installation

Installation
Technical Data - ABM

HE Round Parameter

- Round Length 112mm max.
- Round Mass 350 g
- Projectile Mass 248 g
- Fuze Design Programmable Base Fuze
- Arming Distance 18 to 40 m
- Muzzle Velocity 242 m/s

Warhead

- Direction of fragments Front and Side
- Payload Tungsten Balls
- Number of balls > 330
Technical Data - ABM Training

Flash & Bang Round Parameter

- Round Length: 112mm max.
- Round Mass: 350 g
- Projectile Mass: 248 g
- Fuze Design: Programmable Base Fuze
- Arming Distance: 18 to 40 m
- Muzzle Velocity: 242 m/s

Warhead

- Sound Level: 145 db
Technical Data - FCS

System Parameters

- **Dimensions**: 265 (L) x 160 (W) x 160 (H)mm
- **Weight**: < 4.0 kg with batteries
- **Sighting**
  - Day sight: 15° @ 3x magnification
  - Night sight: Integrated GE II+I²
- **Laser (Eye Safe)**
  - Range: up to 2.5km (max.)
  - Ranging accuracy: ± 1m
- **Battery**
  - Power: 12V DC nominal
  - Life: > 6 hours (continuous operation at -40°C)
- **Operating temperature**: -40°C to +71°C

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Live Firing Demonstration

40mm Air Bursting Munition System

Live Firing Demonstration

2nd October 2003
Live Firing Demonstration

Target Set-up

Alley
Demonstration Live Firing
2nd October 2003
THANK YOU

Contact:

Kok Chung, Fong
Cheng Hok, Aw

fongkc@stengg.com
awch@stengg.com