Rocket Artillery in Future Scenarios, First Answer

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Outline

- Who we Are
- The Past
- The Future
- Options
- A Solution
  - Concept
  - Benefits
  - Performance
  - Programme Timeline
- Summary/Conclusions
Who we Are in a nutshell

- Diehl BGT Defence is a System House and Technology Company in the Areas of Defence and Security 1630 Employees $550 m Sales

Member of the privately owned Diehl Group

- Historically a direct Fire Company started “Indirect Fire” Activities
  - 1982 Development Sensor Fuzed Munitions → SMArt® 155 developed and manufactured under GIWS JV with Rheinmetall
  - 1983 Demonstration of First guided Mortar Round “Bussard”
  - 1983 MLRS Final Integrator for Rockets and RPC´s
  - 1985 Studies and Demonstrators on Guided 155 mm
  - 1997 First guided MLRS Flight “NAW”
  - 2005 Development of GMLRS-SMArt
The Past

This is not our only target!
The Future

- NBC
- DPICM
- Artillery Fragments (all around)
- RPGs (Front Sector)
- Medium Calibre Machine-gun (Front Sector)
- Heavy Machine-gun (all around)
- Directed Anti Personnel Mine
- Anti Tank Mine Under Wheel and under Hull
Options

- **DPICM**, (Dual Purpose Improved Conventional Munition)
  - small Fragments shaped Charge
  - Anti Personnel/(Material) Anti Armor/Material

- Unitary, (a single HE filled Effector in a Carrier)
  - Fragments Penetrator
  - Anti Personnel/Material Anti Infrastructure

- **SFM**, (Sensor Fuzed Munition)
  - Designed to fight hard and semi-hard Targets

SFM´s are perfect to fight all protected Targets!
A Solution

GMLRS M30 Rocket

No Payload

SMArt® DM 702

4 SMArt® Sub-Munitions

G-SMArt Rocket
Characteristics

- **Tri mode**
  - passive Infrared (IR)
  - passive 94 GHz Millimetre Wave (Radiometer)
  - active 94 GHz Millimetre Wave (Radar)
- High sophisticated Sensor Fusion
- High Performance **Tantalum Liner Warhead**
- IR/mmW Sensor, bore sighted with Warhead (apart from small lead angle)
- Single *(first)* pass Detection and Warhead Initiation
- **Redundant** built-in **Self-Destruct** Function
  - Altitude (Slant Range) commanded through Radar Channel
  - Battery burn-out initiates Self-Destruct

More than 20,000 SMArt® Sub-Munitions produced up to now!
SMArt Principle of Function

**MAIN PERFORMANCE DATA**

- Target detection and tracking
- Operational mode
- Engagement envelope:
  - Radar automatic

**SMArt**

- Angled lower and blast skirts resist RPG & IED attacks.

**SMArt`s Sensors are simple and the kill Mechanism is very robust!**

**Descent**

- Very short detection range (SLR) immune to adverse weather
- Very large scan area enclosed ≤3,500 m²
- High probability of target in footprint
- Top attack ... most vulnerable area on target
- Most vulnerable area on target at low speed submunition descent immune to DAS and very high speed SFF attack immune to ERA and other type of protection

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SMArt Adaptation to GMLRS

- Change Spin released Battery Activation to Rocket Control
- Change Spin opened Ballute to high Speed Drag Chute
- Change Acceleration Environmental Criteria of S&A to Rocket ESAD Control

No Change on Sub-Munition Descent, Search and Detect and Self Forging Fragment Function

Minor Modifications only to SMArt Sub-Munition!
G-SMArt Sub-Munition Dispense

- Payload Activation

- Warhead Event
  - 4 Sub-Munitions ejected
    - at the same Time
    - into 4 Quadrants

- Programmable
- Fixed
- Until detect or Selfdestruct

- ΔX
- ΔY

GMLRS Rocket

down Sub-Munition
Drag Chute Opening Time = T1 - ΔT

up Sub-Munition
Drag Chute Opening Time = T1 + ΔT

left/right Sub-Munitions
Drag Chute Opening Time = T1
G-SMArt Sub-Munition Function

Free Flight, Drag Chute Flight and Spin Chute Flight, some Hit Examples
Programme Timeline and Growth Potential

- **SMArt® 155 (Anti Tank)**
  - Insensitive HE
  - continuing production

- **G-SMArt Adaptation**

- **G-SMArt Serial Production**
  - Insensitive RM
  - Increased Range
  - full rate production

- **SMArt® Anti Material**
  - Multi Mode
  - demo

Leveraging form both GMLRS and SMArt® Improvements
G-SMArt will always be up-to-date
Performance Prediction

Command Posts
Air Defence Systems
Mechanized Infantry
Artillery

Number of Rockets

MBT  APC  SPG  ADA  Point  Area  MRL  ADU

SMArt  DPICM  UNITARY
G-SMArt Summary

- Quick Solution based on “In Production” SMArt® and GMLRS
  - low Cost/low Risk
- Effective against hard, semi-hard and protected Targets
  - robust to passive Protection and reactive Armor
  - robust to DAS Countermeasures
- Wide Attack Footprint
- Close Combat Capability
- Minimal Collateral Damage
- Clean battlefield operation due to redundant self-destruct

G-SMArt will take care of all future needs attacking protected Targets!
Thank you for your Attention!

Lance Corporal Klöbke is currently our only operational Rocket Launcher Colonel!

Any Questions?