

120mm HE - Ammunition

New Ammunition with Insensitive High Explosive

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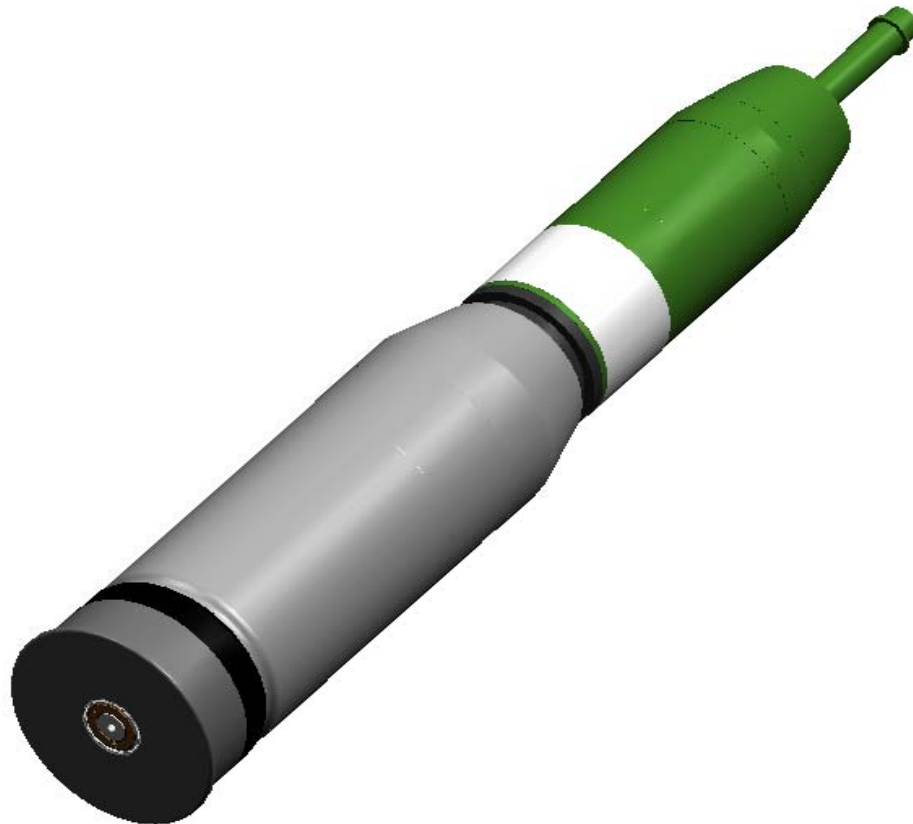
Contents

New Ammunition with Insensitive High Explosive

- **Requirements**
- **Configuration MP-HE / DM11**
- **JCB Data Link**
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New Ammunition with Insensitive High Explosive



Requirements

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Specifications of the New 120mm HE Cartridge

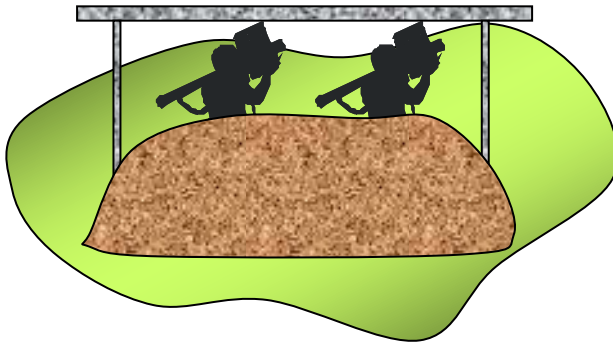
1. Requirement Germany

**Destroy Anti Tank Missile Position
(covered / non covered)
Range 5000m**

Concept

=> Air Burst (Time Fuze)

=> Axial Fragments (Tungsten-Balls)





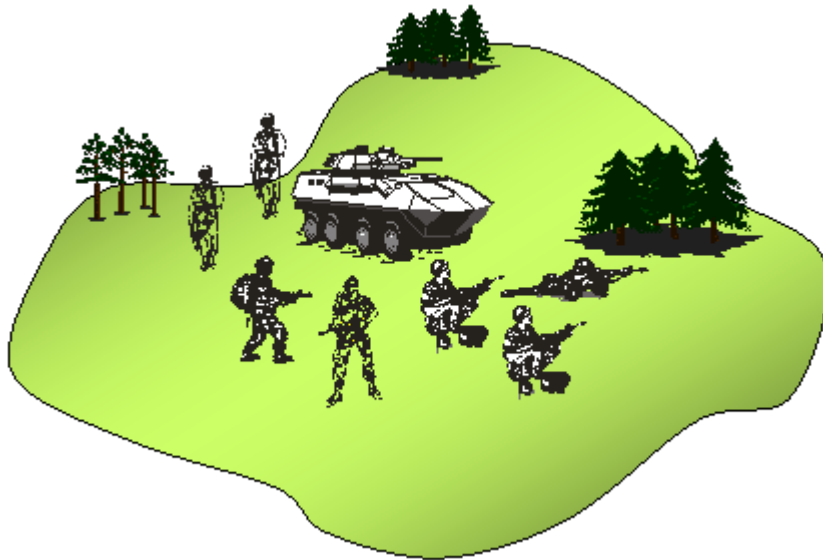
Specifications of the New 120mm HE Cartridge

2. Requirement Germany

Engage Dismounted Mechanized Infantry , Range 5000 m

Concept

=> Air Burst (Time Fuze)
=> Axial and Radial Fragments
(Tungsten-Balls + Shell Fragments)





Specifications of the New 120mm HE Cartridge

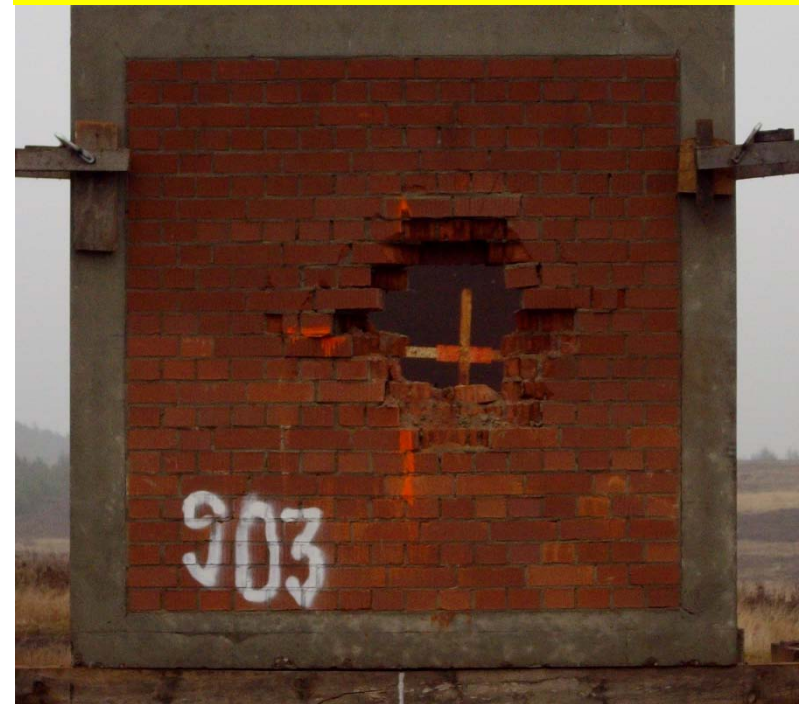
3. Requirement Germany

Concept

Defeat Covered Targets in Buildings



=> Wall Perforation (Thick-Shell)
=> Delayed Detonation (Delay Fuze)





Specifications of the New 120mm HE Cartridge

4. Requirement Germany

**Destroy Light Armored Targets
Targets at long Combat Ranges**



Concept

=> Impact Fuze (Short Ranges)

High Firing Accuracy

=> Air Burst (Long Ranges)

Heavy Fragments (Heavy-Shell)





Specifications of the New 120mm HE Cartridge

5. Requirement Germany

**High Flexibility
During Combat Operations**

Concept

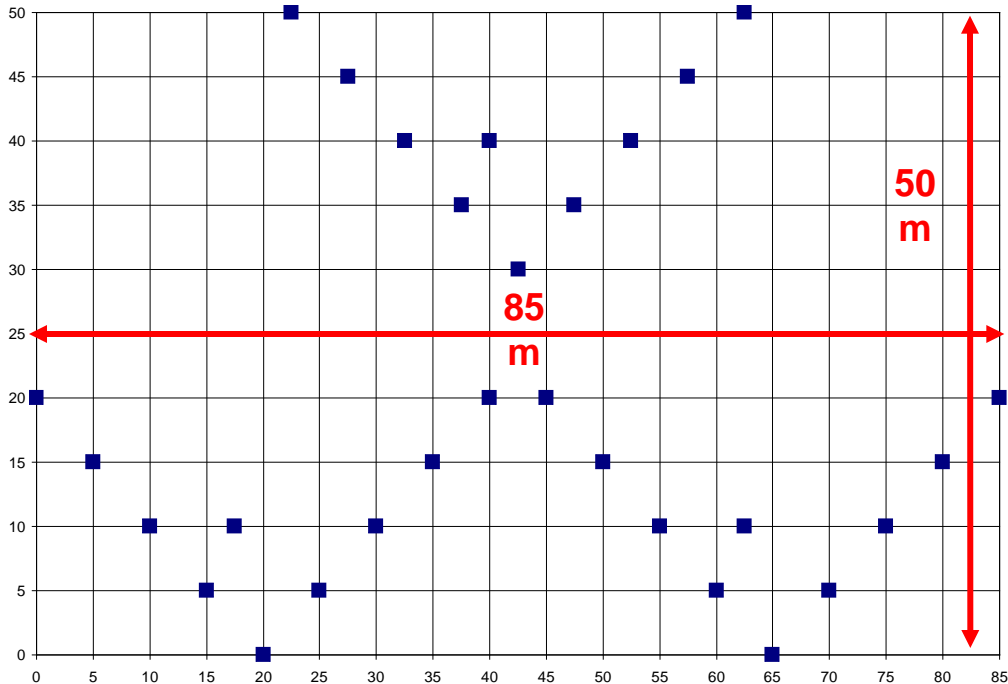
**=> Programming of Fuze while loaded
Impact / Delay / Air Burst Modus
=> Data Transmission inside Cartridge
(Status Report by Feedback-Signal)**



Specifications of the New 120mm HE Cartridge

1. Requirement US-MC

**Engage Dismounted Infantry Squad in Wedge Formation
50% out of action with 2 shots**



Concept

**=> Air Burst (Time Fuze)
=> Axial and Radial Fragments
(Tungsten-Balls
+ Shell Fragments)**





Specifications of the New 120mm HE Cartridge

2. Requirement US-MC

Breach a 8" Double Reinforced
Concrete Wall with max. 3 shots
Opening: 0,76 x 1,27 m



Concept

=> Wall Perforation
=> Detonation inside the Wall
(Thick-Shell)





Specifications of the New 120mm HE Cartridge

3. Requirement US-MC

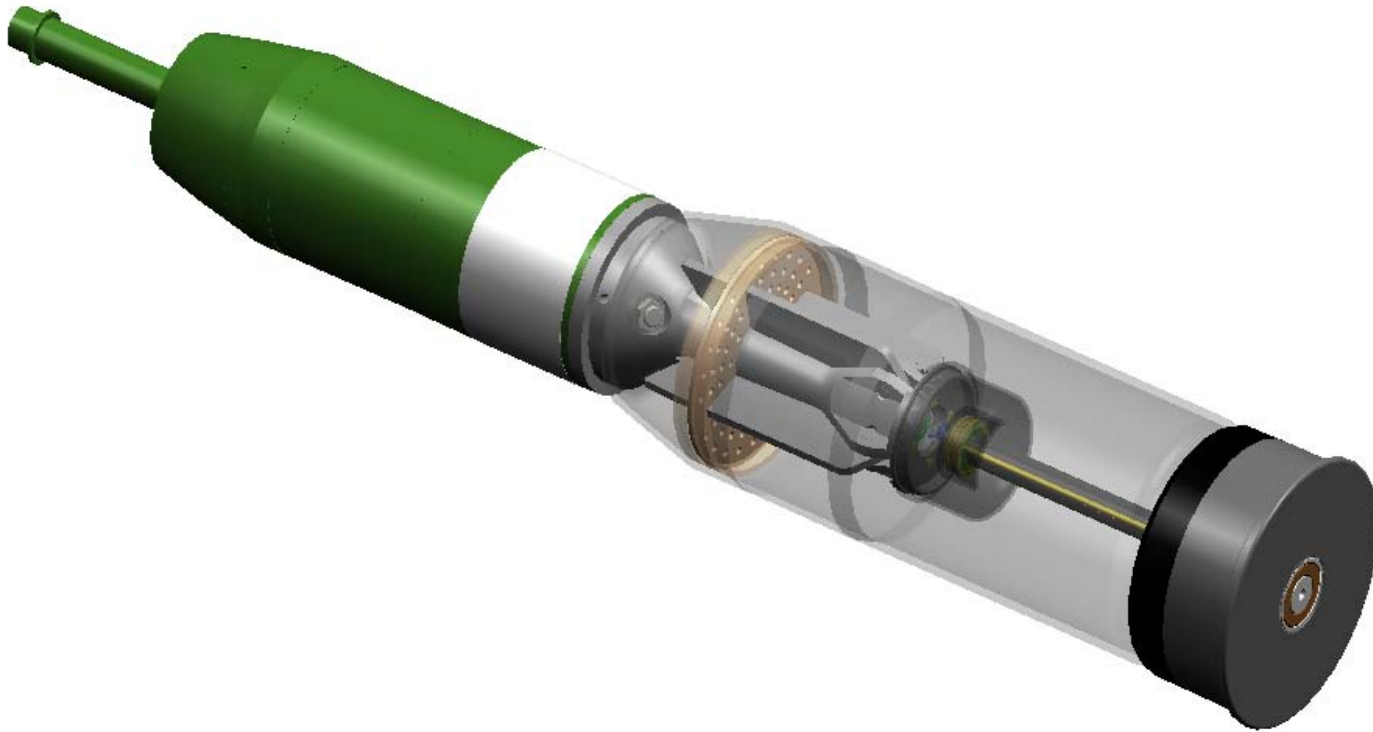
**Destroy Earth and Timber Bunker
with max. 2 shots**



Concept

**=> Impact or Delay Function
=> Detonation inside the
Sand Bags or inside the
Bunker
(High Firing Accuracy)**





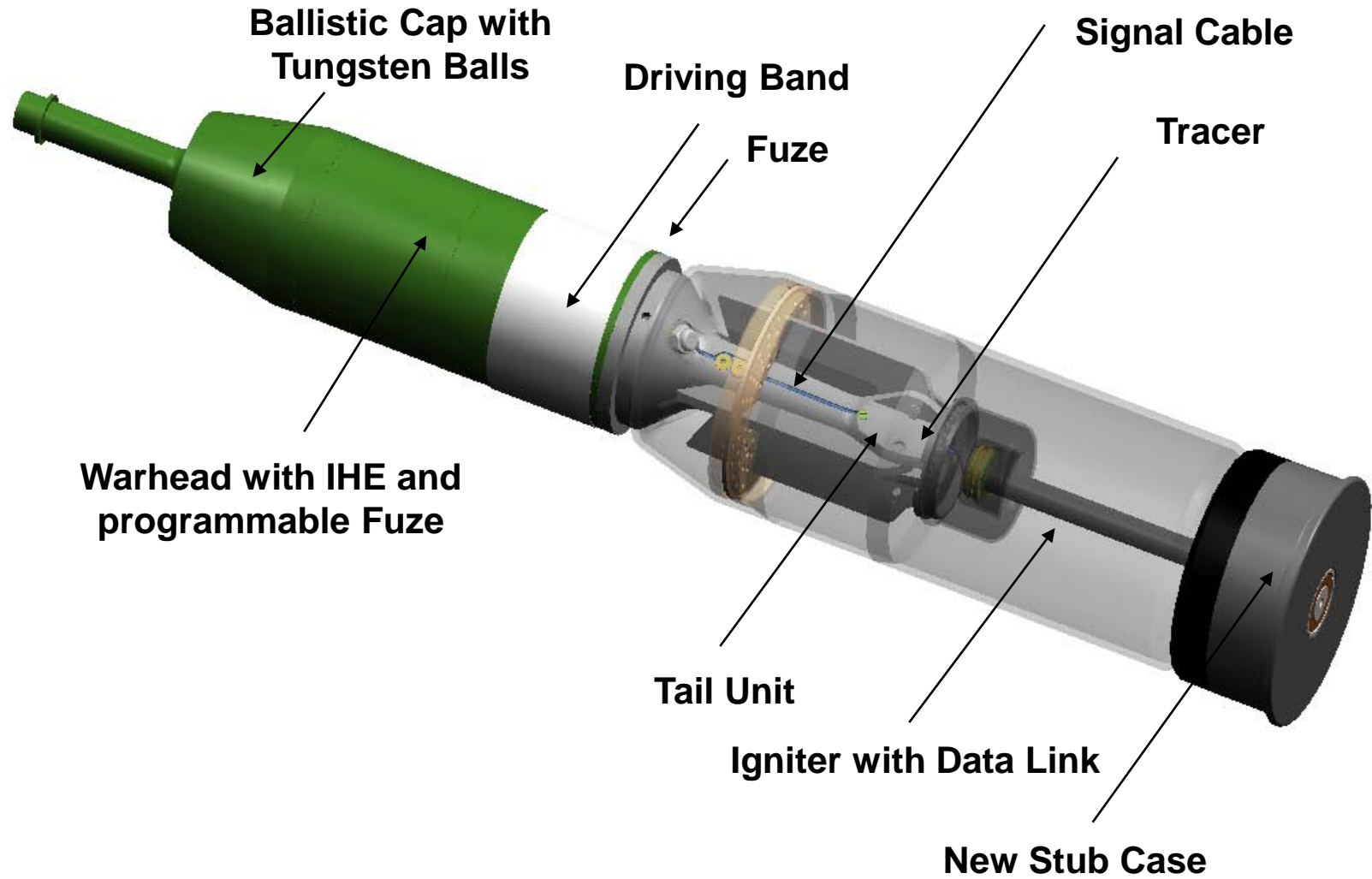
Configuration

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Programmable Cartridge, Signal Line Wiring





Modular Design



Propulsion Unit
Programmable with Cabling



Programmable Fuze (JMT)



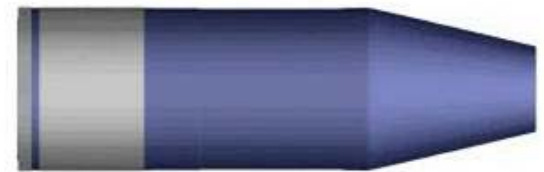
Warhead



Propulsion Unit
Without Cabling



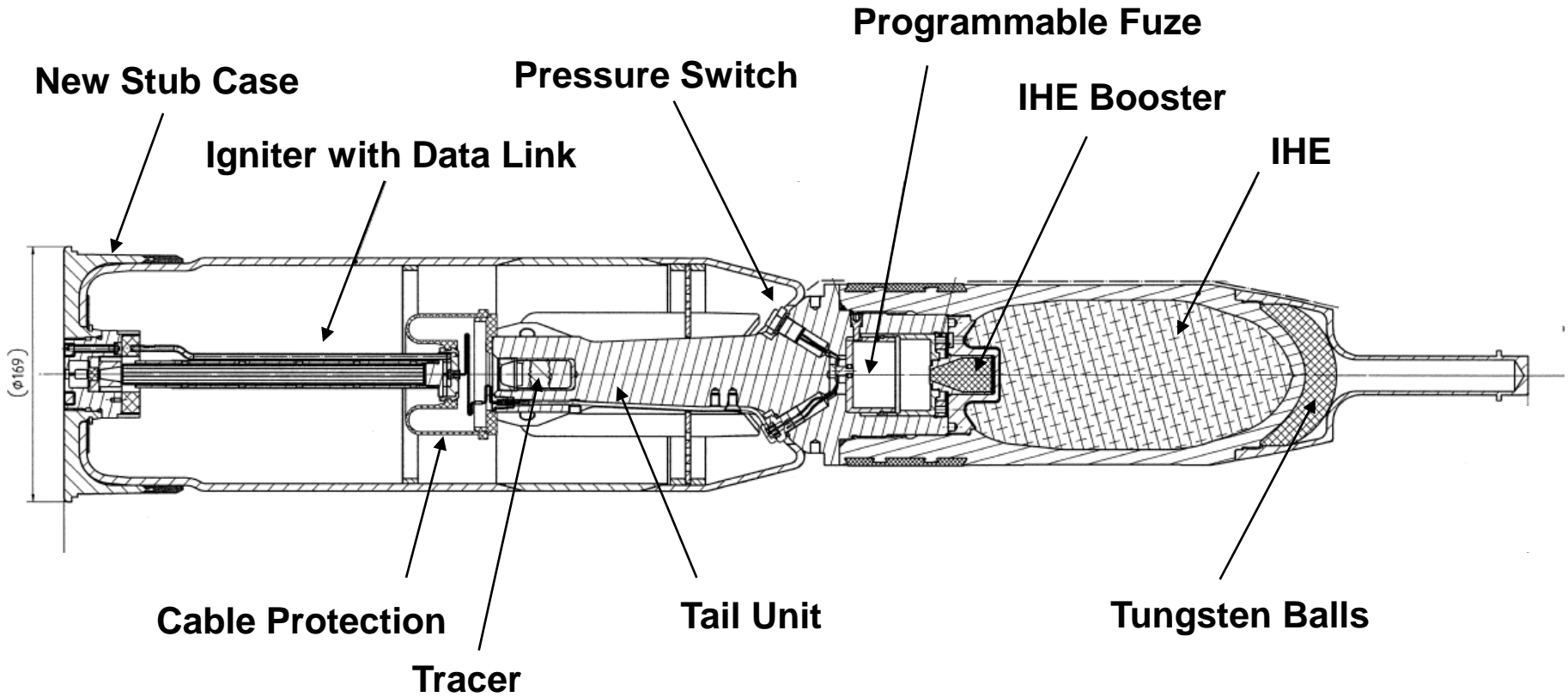
Inert-Fuze



TP-Head

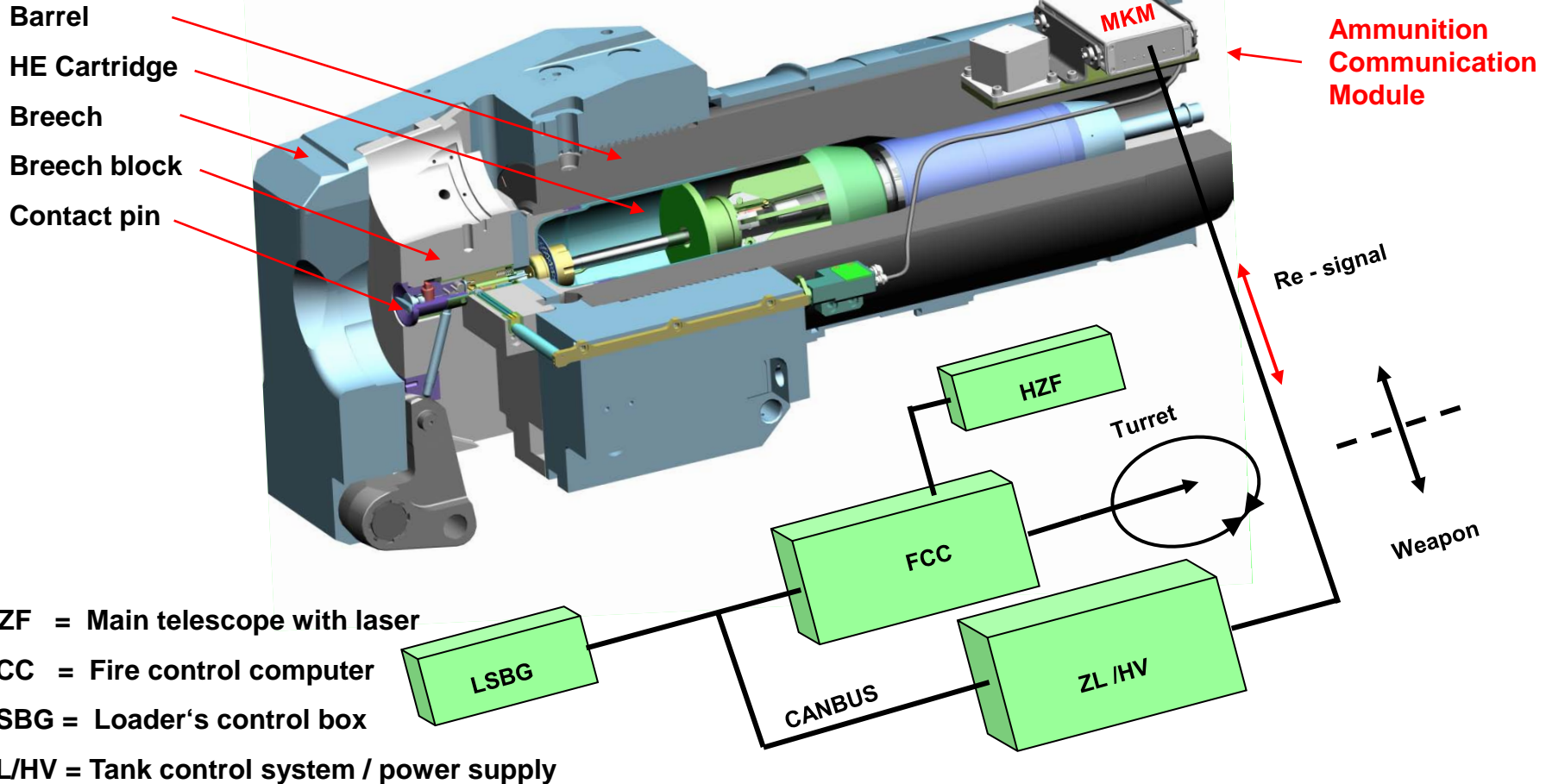


Programmable Cartridge, Signal Line Wiring





System Integration





120mm JCB Data Link

INTERFACE CONTROL DOCUMENTS

120 mm Tank Main Armament Systems
(Weapon and Ammunition)

Interface with Voltage Supply and Bidirectional
Data Transfer between System and Loaded Cartridge

SCHNITTSTELLEN- KONTROLLDOKUMENTE

120 mm Kampfpfanzershauptbewaffnung
(Waffe und Munition)

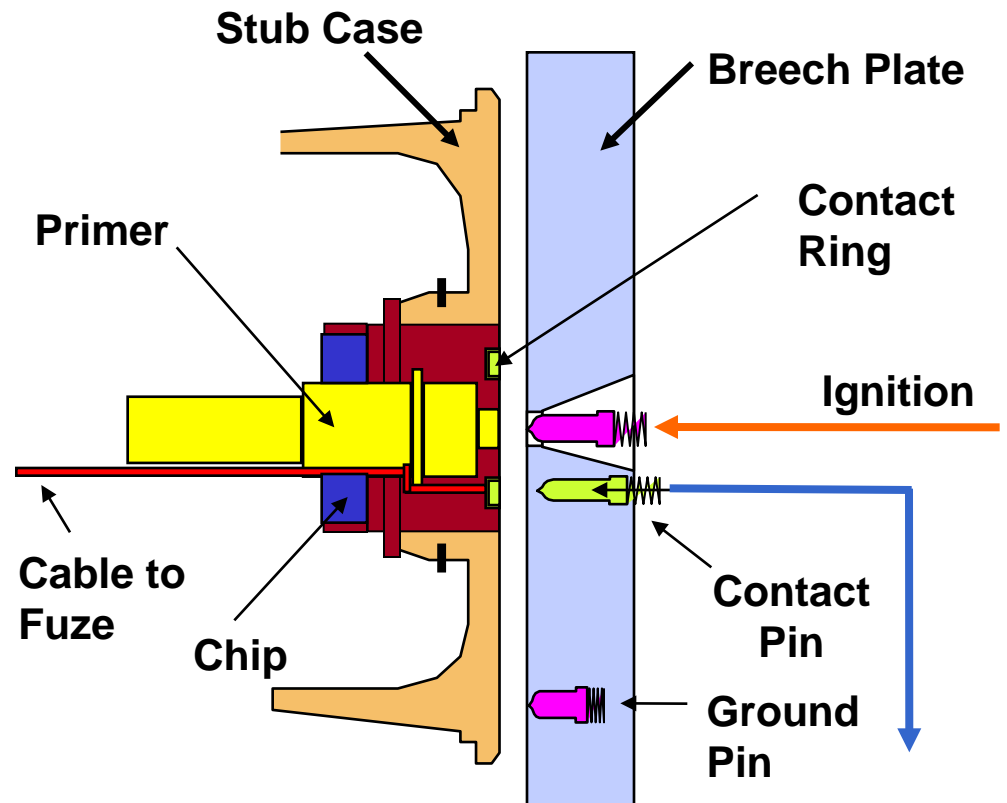
Schnittstelle mit Spannungsversorgung und bidirektionaler
Datenübertragung zwischen System und geladener Patrone



120-007.00

Issue 6 / Ausgabe 6 May 2004 / Mai 2004

Interface Stub Case / Breech Plate





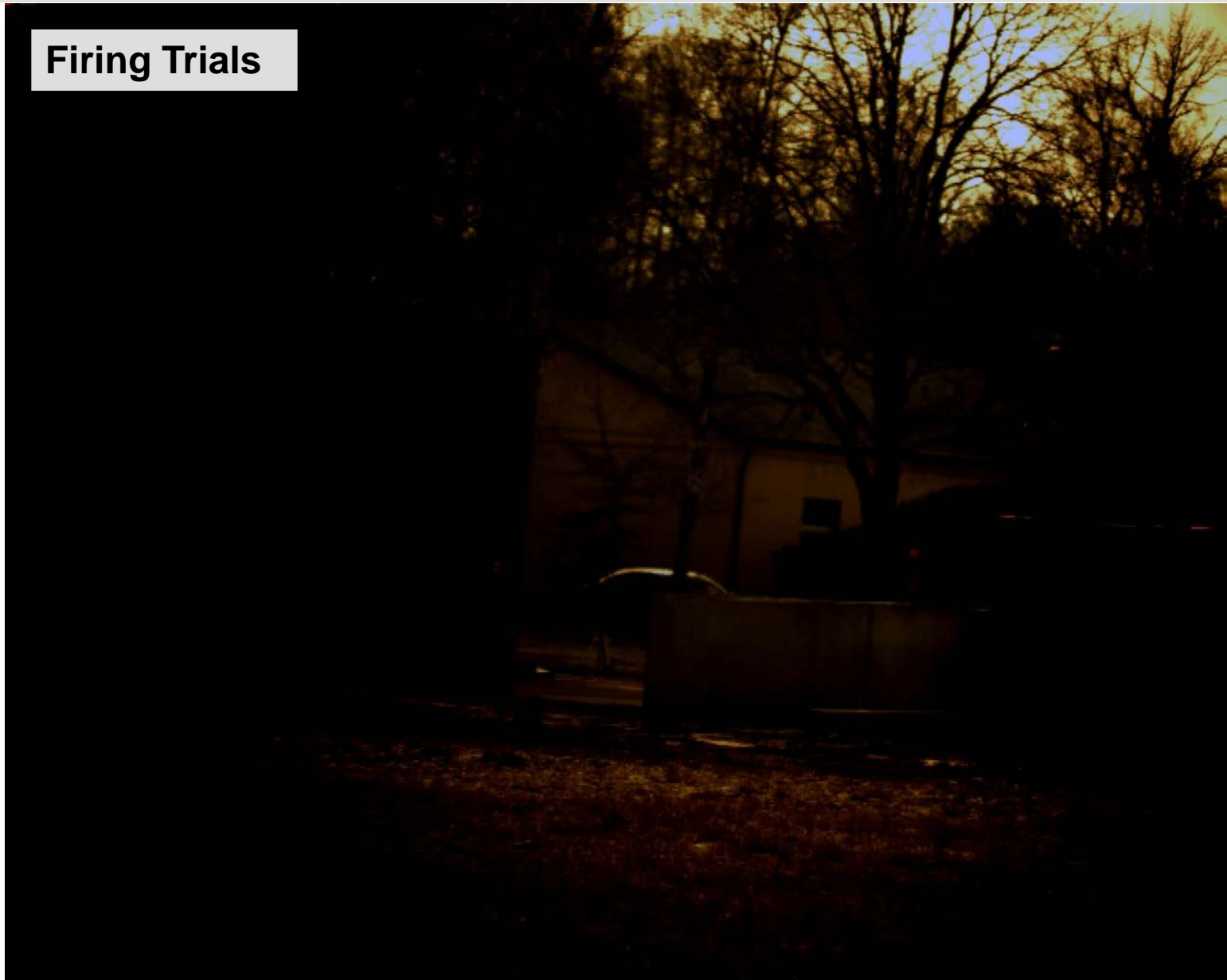
Firing Trials DM 11

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Firing Trials



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Firing Trials

Testing of Projectile Accuracy

January 2005

Firing with 120mm L55- Barrel

Cartridge 120mm HE (inert)

Distances: 1000m, 1500m, 2000m, 2500m



Firing Trials

Firing Results

Distance	n	Standard Deviation (')	
		Vertical	Lateral
1000 m	7	0,18	0,18
1500 m	5	0,17	0,26
1500 m	5	0,08	0,30
2000 m	5	0,09	0,34
2000 m	5	0,31	0,27
2500 m	5	0,25	0,19
2500 m	5	0,17	0,21
All Distances	37	0,17	0,23

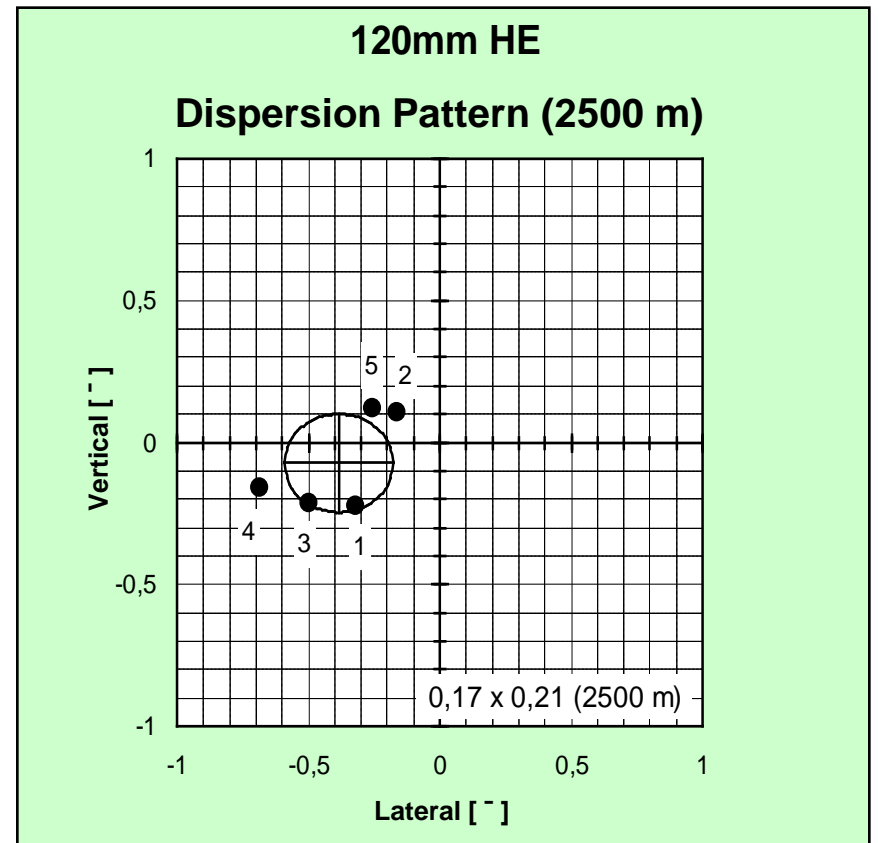
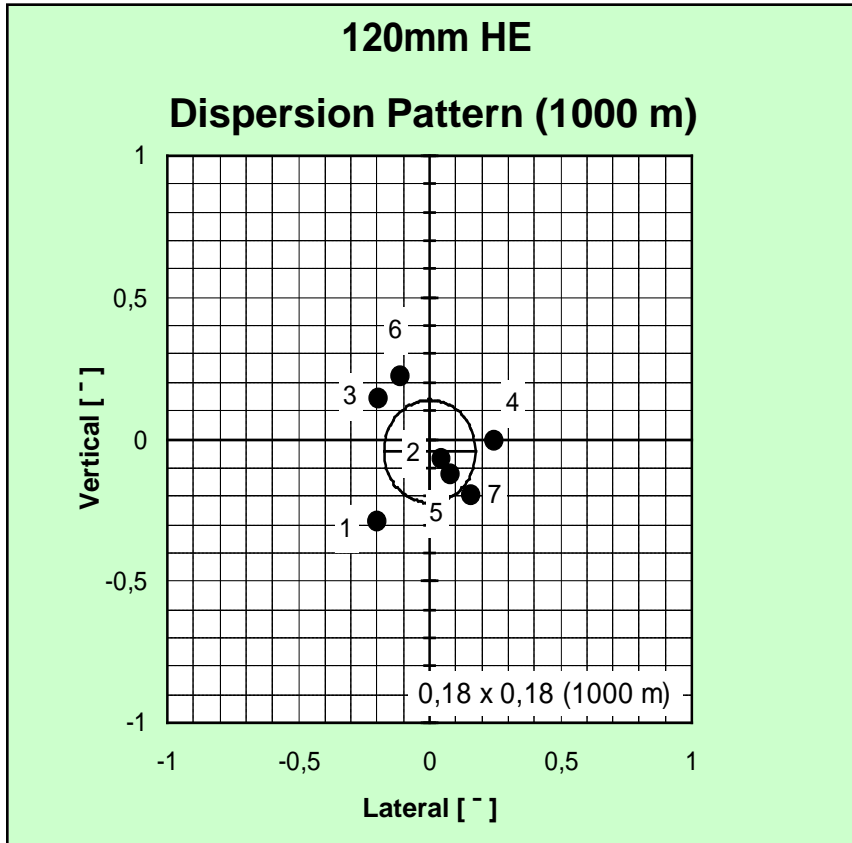
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Firing Trials

Firing Accuracy (Example)



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Firing Trials

Impact-Function with Delay (mV)

Target 3 Germany

Firing with Programmable Weapon System

Digital Programming of Fuze

(Impact-Function with Delay at Brick Wall)



Firing Trials

Impact-Function with Delay





Firing Trials

Impact-Function with Delay

**Brick Wall after
Perforation**



**Brick Wall
1000m**

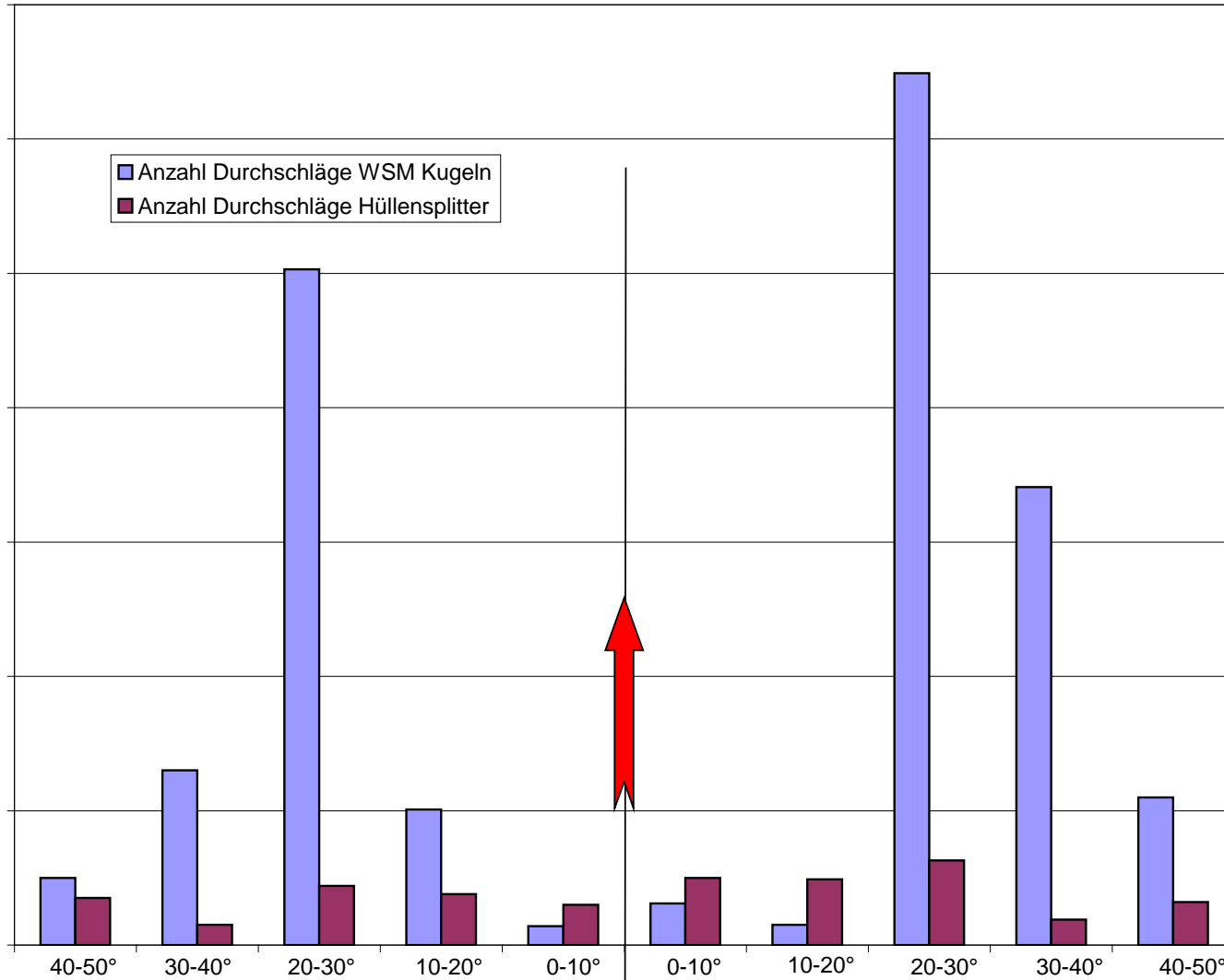
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Firing Trials

Impact-Function with Delay



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Firing Trials

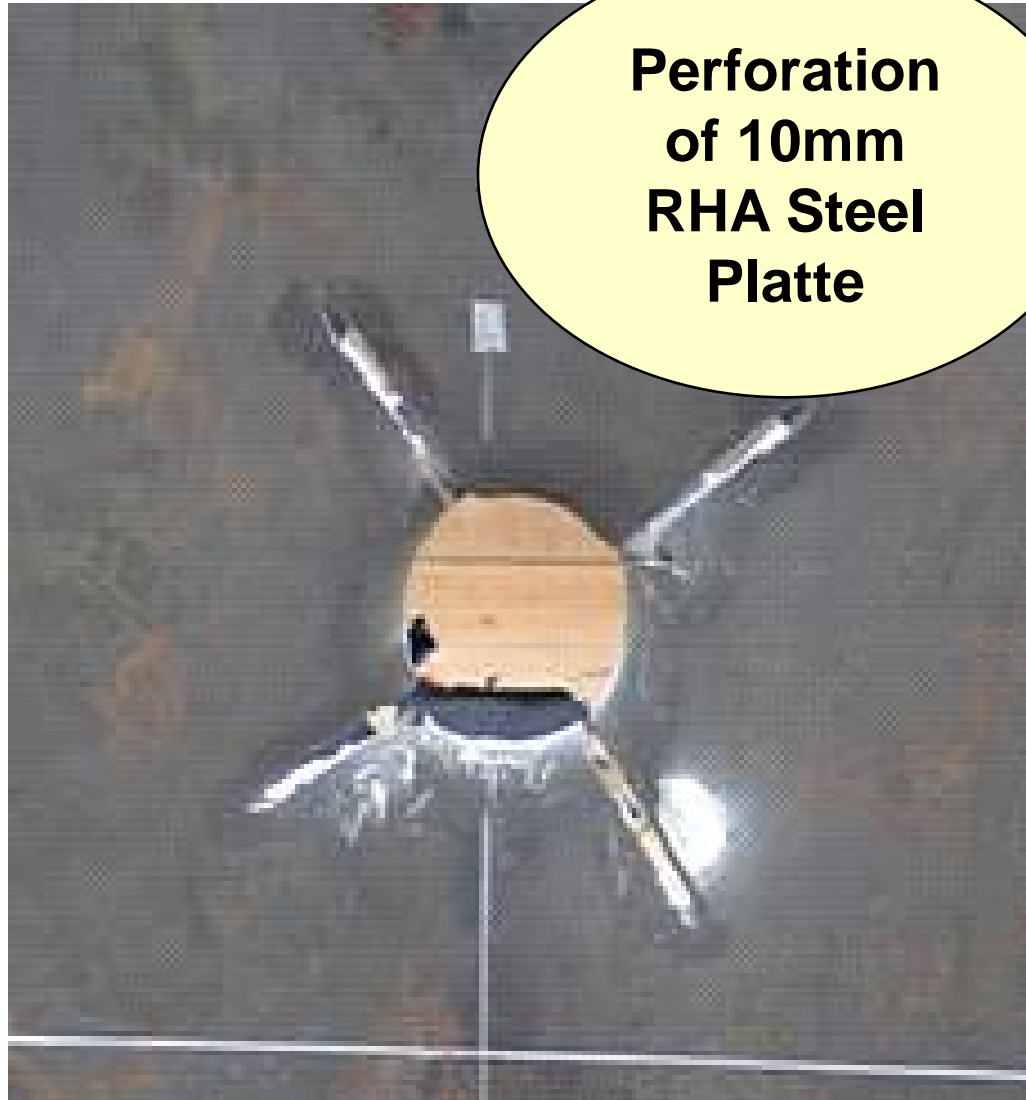
Impact Function at Steel Plate

Target 4 Germany

**Firing without Programming
(Impact Function of Fuze) or
Digital Programming of Fuze
(Impact-Function with Delay_)**



Firing Trials



**Perforation
of 10mm
RHA Steel
Platte**

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Firing Trials

Impact-Function at 5 mm Steel Plate

03_0767
Schuß Nr.: 368

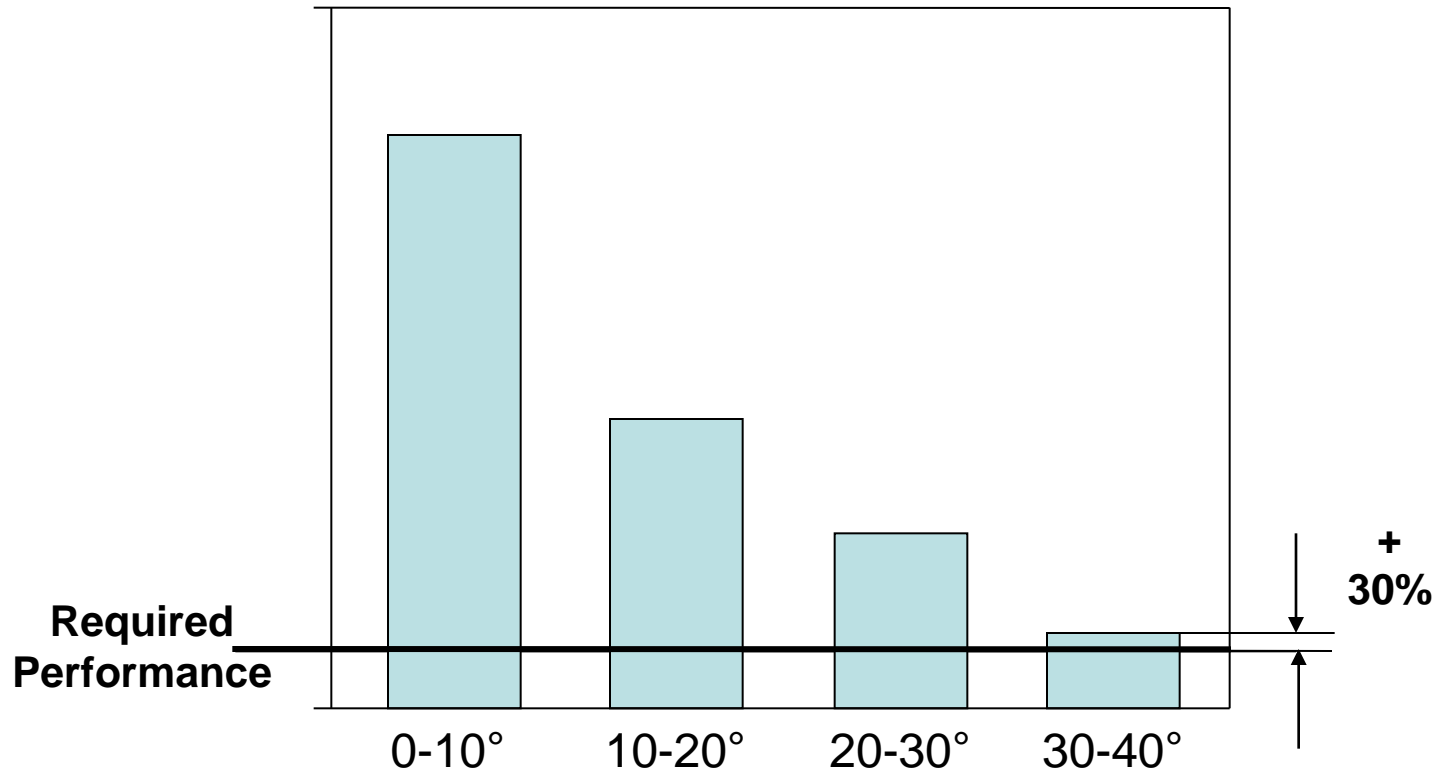




Firing Trials

Impact-Function at Steel Plate

Performance (Average of three Firings)



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Firing Trials

Air Burst Detonation

Target 1 and 2 Germany

Target 1 US-MC

Firing with Programmable Weapon System

Digital Programming of Fuze (Time-Function Mode)



Firing Trials

Air Burst Detonation



First Shot

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Firing Trials

Air Burst Detonation



Second Shot

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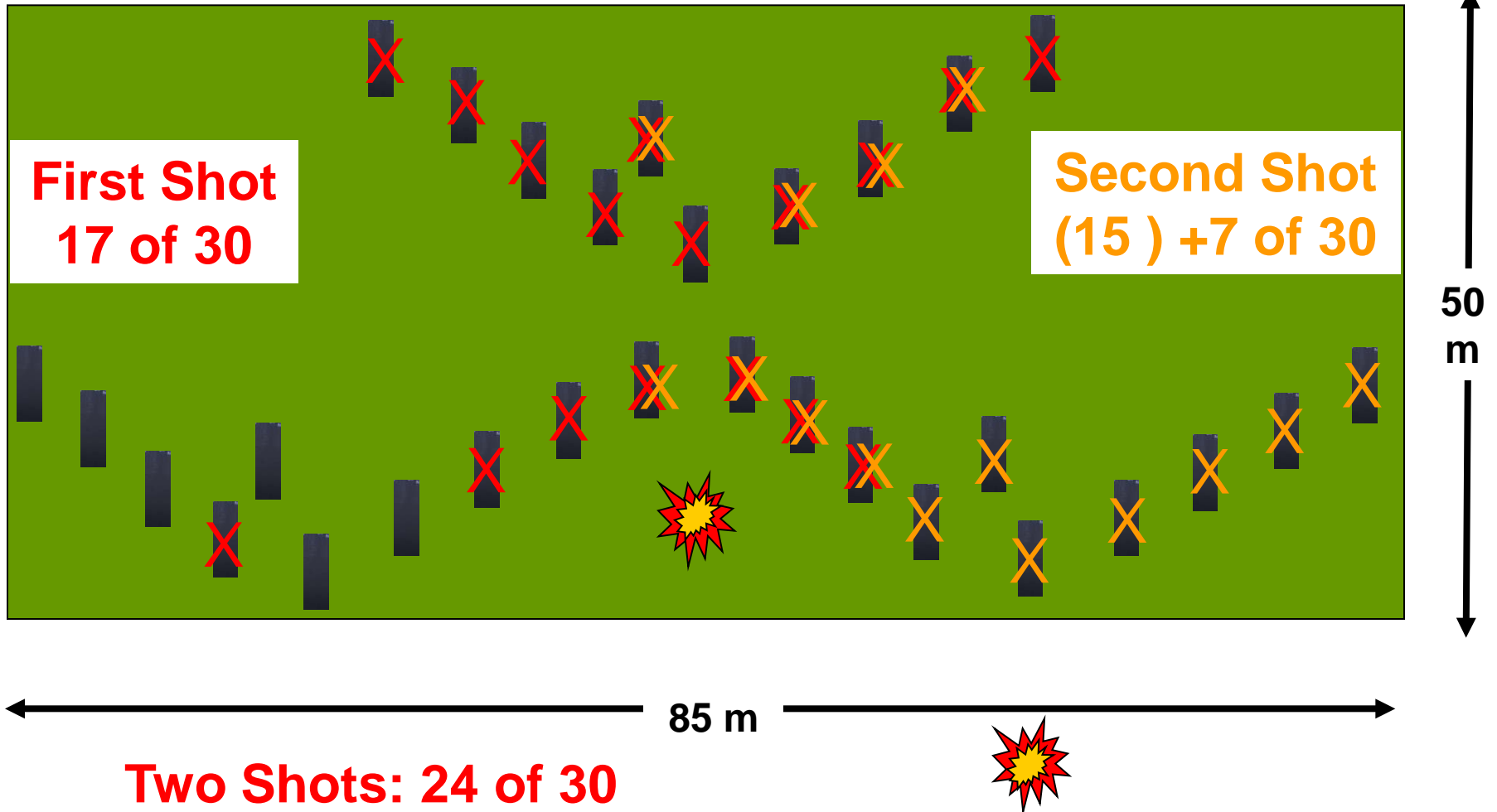
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Firing Trials

Air Burst Detonation

Squad in Wedge Formation (Shot 904, 905)



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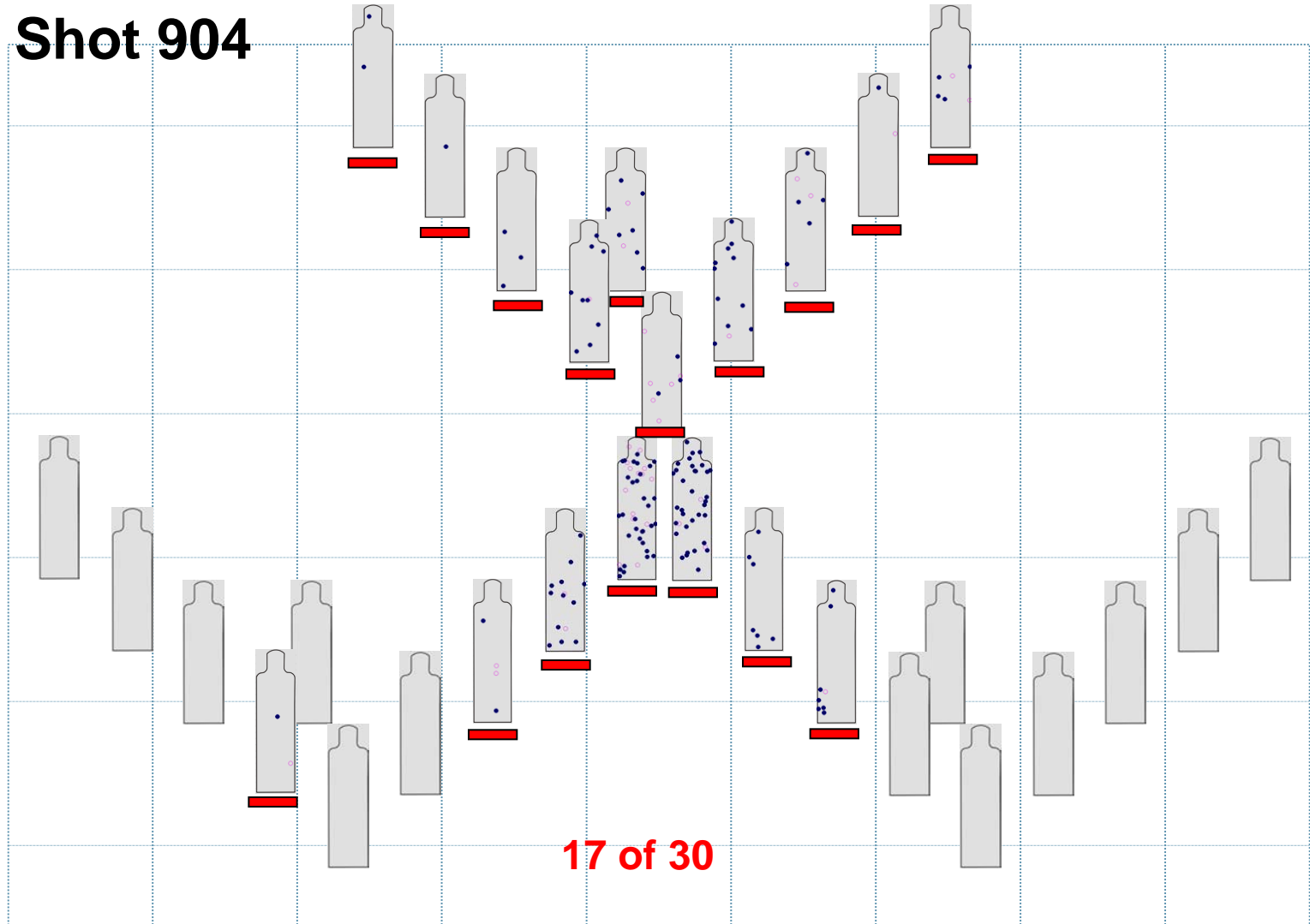
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Firing Trials

Air Burst Detonation

Shot 904



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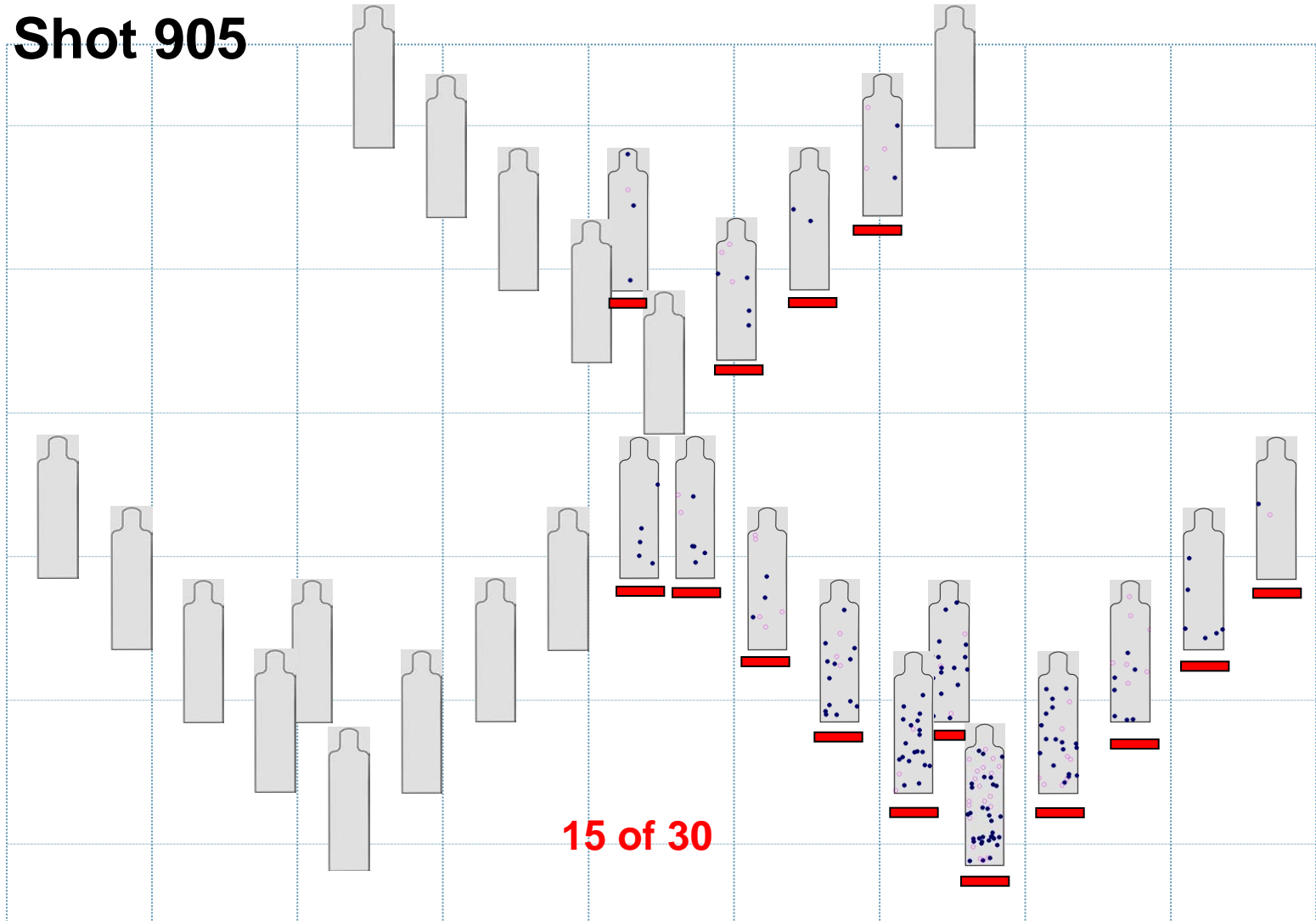
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Firing Trials

Air Burst Detonation

Shot 905



15 of 30

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Air Burst Detonation



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Firing Trials

Impact- Function at DRCW

Target 2 US-MC

**Firing without Programming of Fuze
(Impact-Function at Double Reinforced Concrete Wall)**



Firing Trials

Impact-Function at Concrete Wall

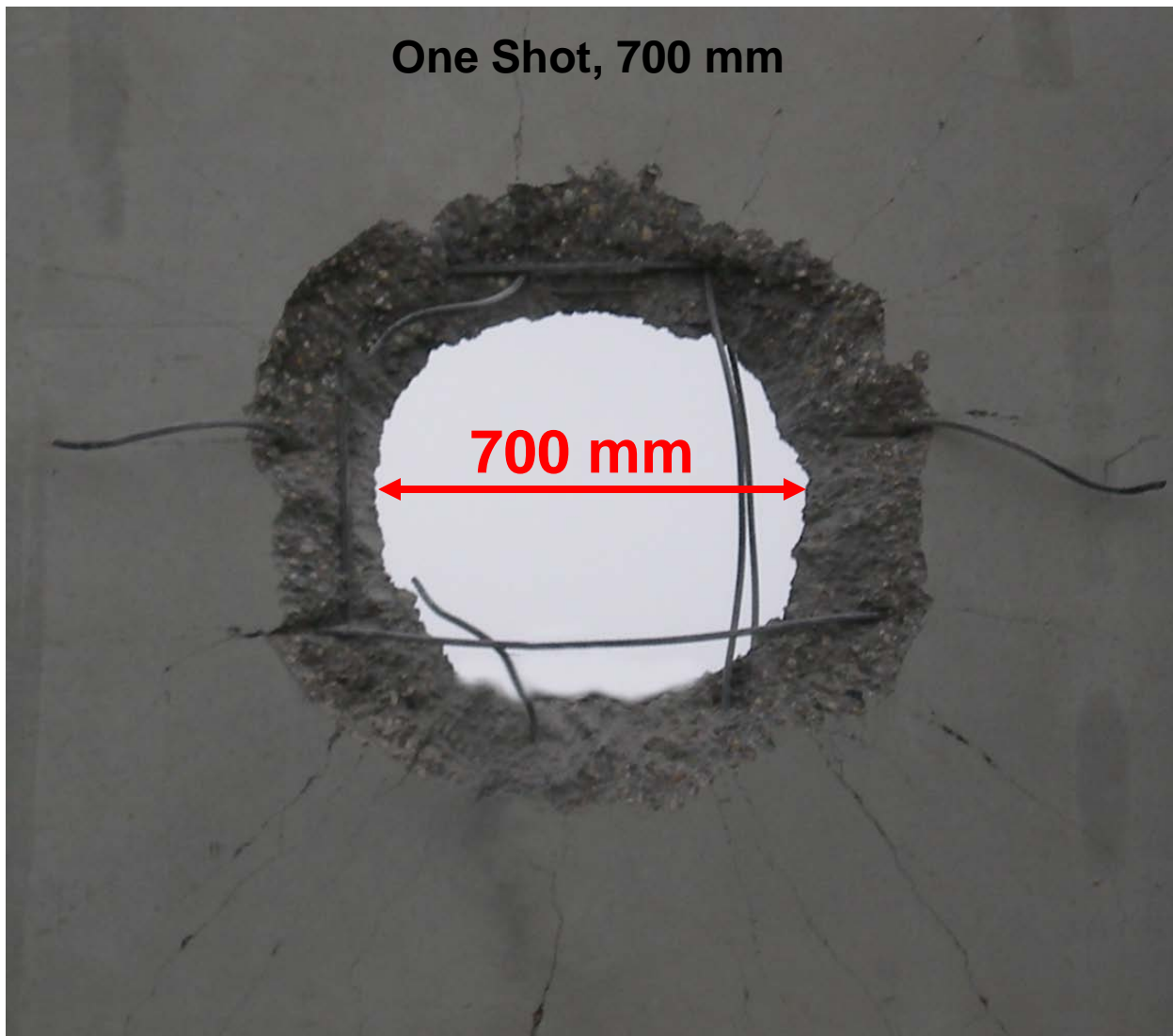
First Shot





Firing Trials

Double Reinforced Concrete Wall



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Firing Trials

Impact-Function at Concrete Wall

Second Shot



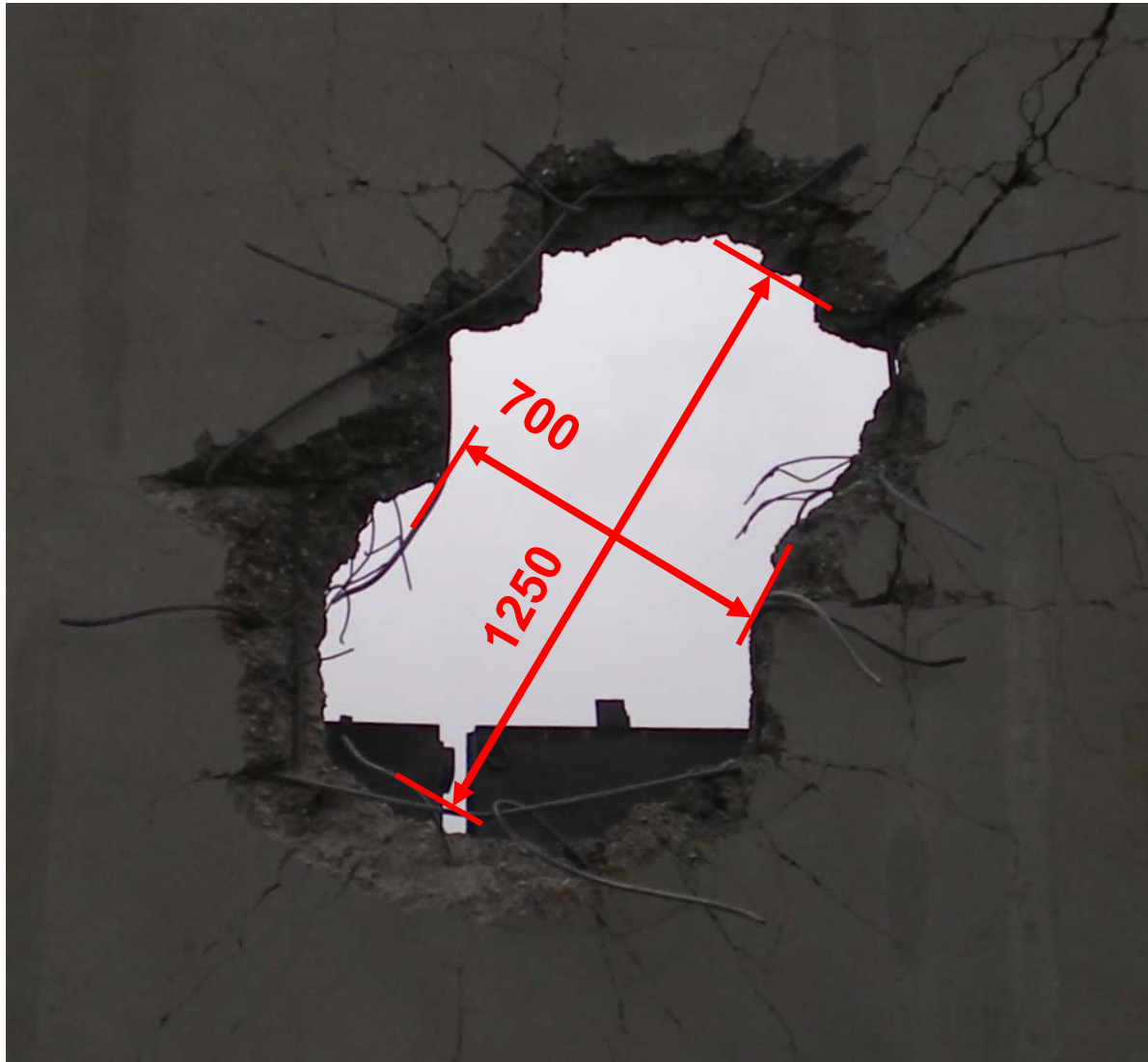


Firing Trials

Double Reinforced Concrete Wall

Two Shots
700 X 1250
mm

Requirement
Three Shots
760 X 1270



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Firing Trials

Function at Earth and Timber Bunker

Target 3 US-MC

**Firing without and with Programming of Fuze
(Impact-Function and Delay Function
at Earth and Timber Bunker)**



Firing Trials

Function at Earth and Timber Bunker



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Firing Trials

Function at Earth and Timber Bunker

Inside:

**Kneeling and
Standing Pressure
Gauge**



-  **Sand Bags**
-  **Loose Sand**
-  **Pine Timbers**



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Firing Trials

Impact Function at Earth and Timber Bunker

Target 3 US-MC

**Firing without Programming of Fuze
(Impact-Function (PD) at Earth and Timber Bunker)**



Firing Trials

PD Function at Earth and Timber Bunker



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Firing Trials

PD Function at Earth and Timber Bunker



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Firing Trials

Delay Function at Earth and Timber Bunker

Target 3 US-MC

**Firing with Programming of Fuze
(Delay Function at Earth and Timber Bunker)**



Firing Trials

Delay Function at Earth and Timber Bunker



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Firing Trials

Delay Function at Earth and Timber Bunker



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Current Status

- **Type Qualification completed in 2009**
- **Start of Serial Production 2010**
- **In Service with US Marine Corps**
- **In Procurement for German Bundeswehr**
- **In Contract Negotiations with various other Customers**



Questions ?