Technical Overview of the K11 Dual-Barrel Air-Burst Weapon

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Contents

Background

Trend of Rifles

M1

M16 / G36 / AK74 / K2

Limits of Current Rifles

- Low accuracy in real combat situation
- Inefficiency in taking out defilade targets
- Necessity of supplementary night vision at night time

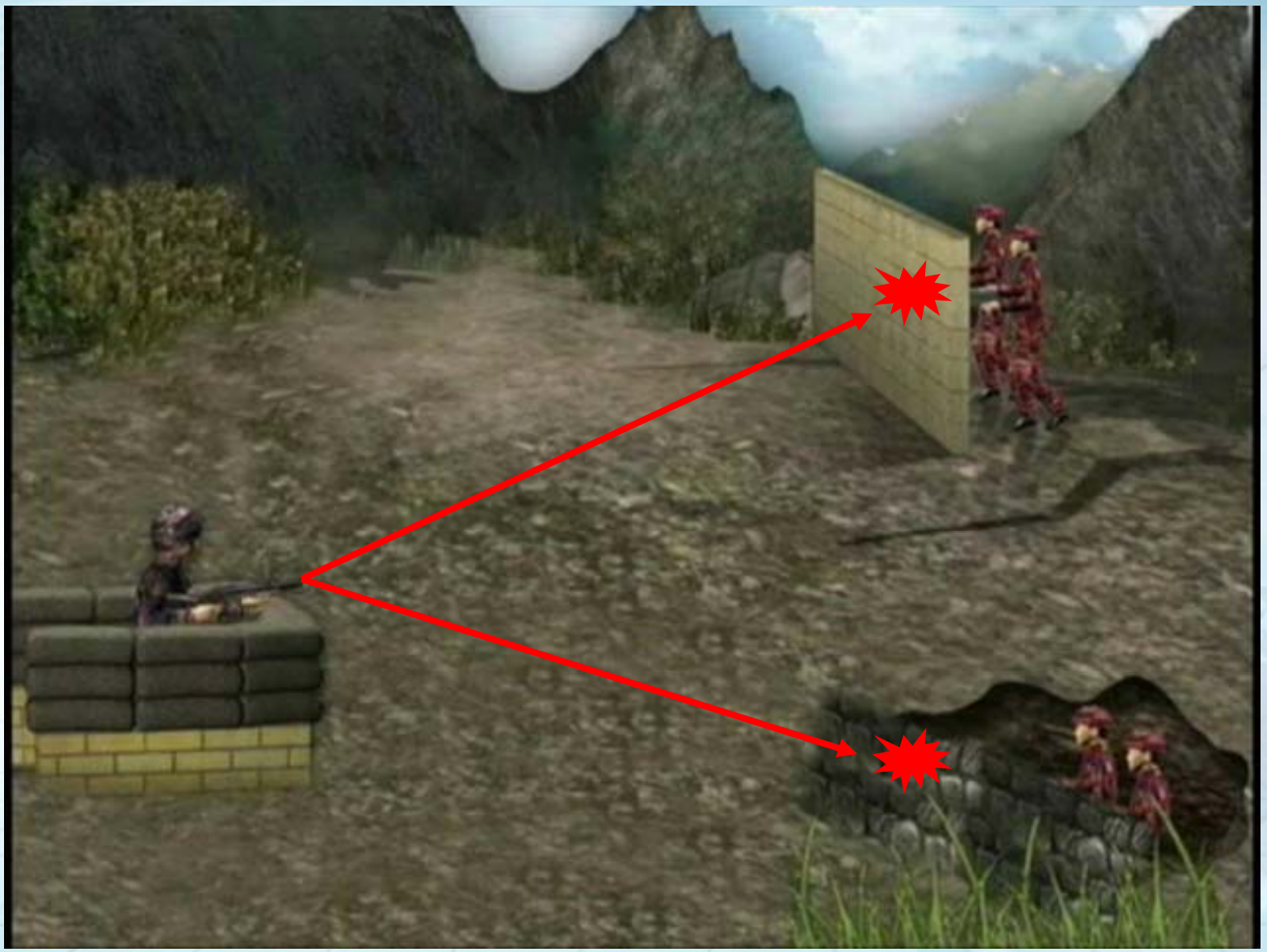
Introduction

New attempts in the world (1994~2004)

Rifles	Characteristics	Configuration	Conclusion
4.7 mm G11 Caseless (Germany)	3 rds. Burst, High rate of fire		Fail to double up the combat effectiveness
5.45 mm AN94 (Russia)	2 rds. Burst, High rate of fire		
5.56 mm Double Bullet (USA)	Shot gun		
5.56 mm Flechette (USA)	Flat Ballistics		
OICW (USA) PAPOP (France)	Dual Barrel, Air Bursting	 	

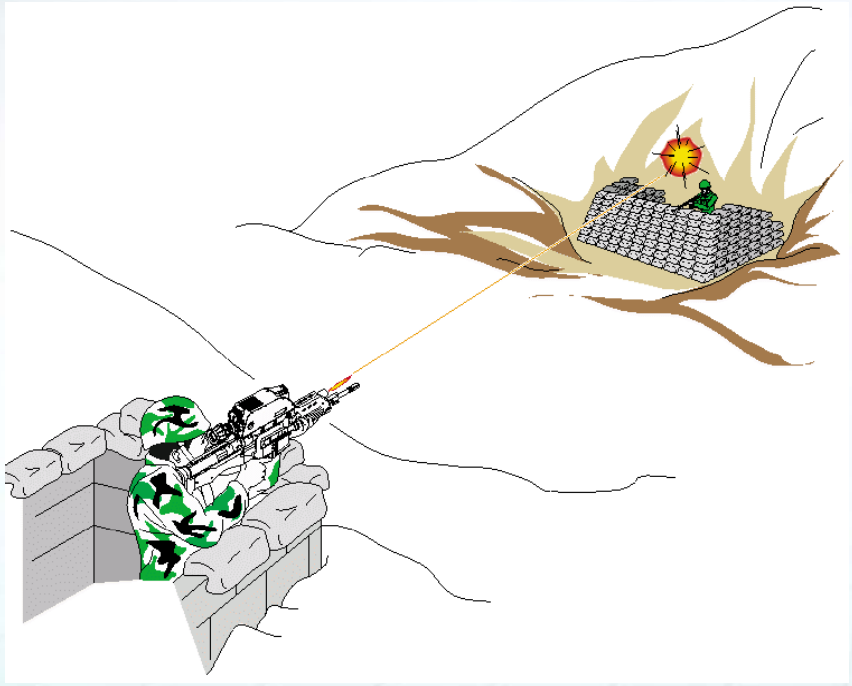
- To maximize combat effectiveness by considering new concept and technology
  - ➢ Precise air bursting against defilade targets
  - ➢ Fire control system at day & night
  - ➢ Lightweight rifle system

Limit of Current Weapons

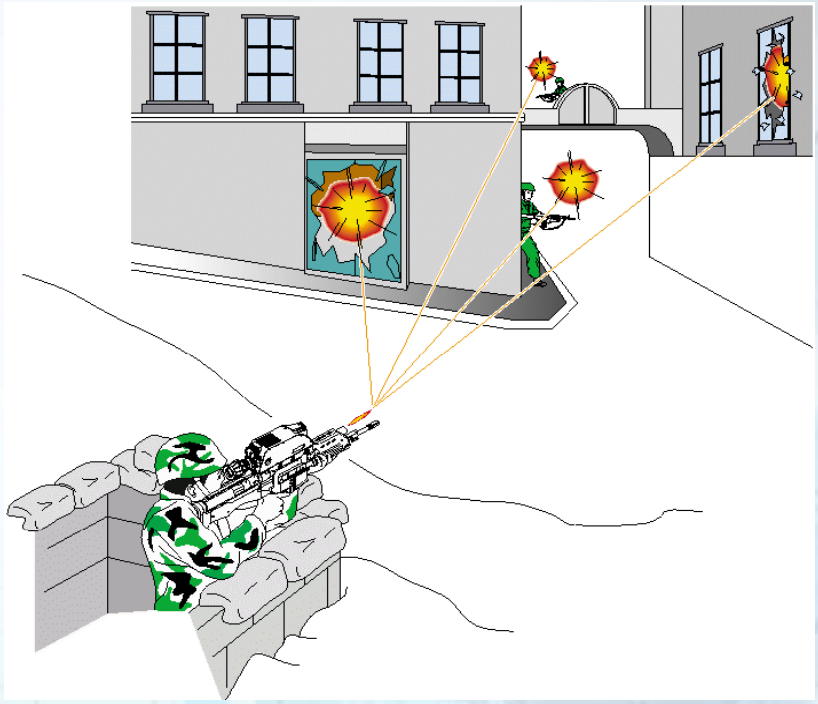


ADD Solution for Next-Generation Rifle

- Increase in Lethality and Precision Firing at Day & Night under All-Weather Conditions
- Effective on Defilade Targets



Field Operation



Urban Operation

System Concept

Fire Control System

Laser Range Finder

Integrated Controller

Complex Optical Modules

Thermal Image Generator

Battery

HE(20 mm) Module

- Fuse Setter
- Bolt Action
- 5 Rds. Magazine

Air-Bursting Ammo

Fragmentation Warhead

Programmable Electronic Fuse

KE(5.56 mm) Module

- Complex Trigger System
- Direct Gas Impingement
- 20/30 Rds. STANAG Magazine

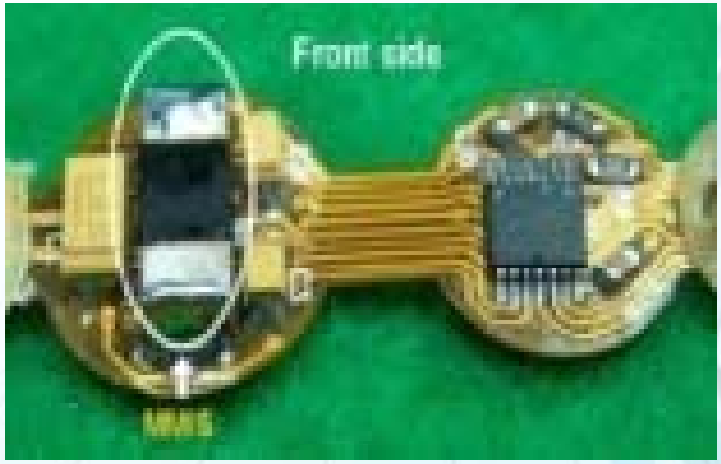
Trade-off Parameters of System

Lightweight Fire Control System

- Apply Functions of Tank FCS (Day and Night Target Detection, Range Finding and Ballistic Trajectory Calculation) to Firearm
- Low Power Laser Range Finding, Image Synthesis Using Micro Display
- Instantaneous High Power Supply by Optimal Power Control
- Improved Ballistic Trajectory Calculation by Cant/Tilt and Temperature Sensors

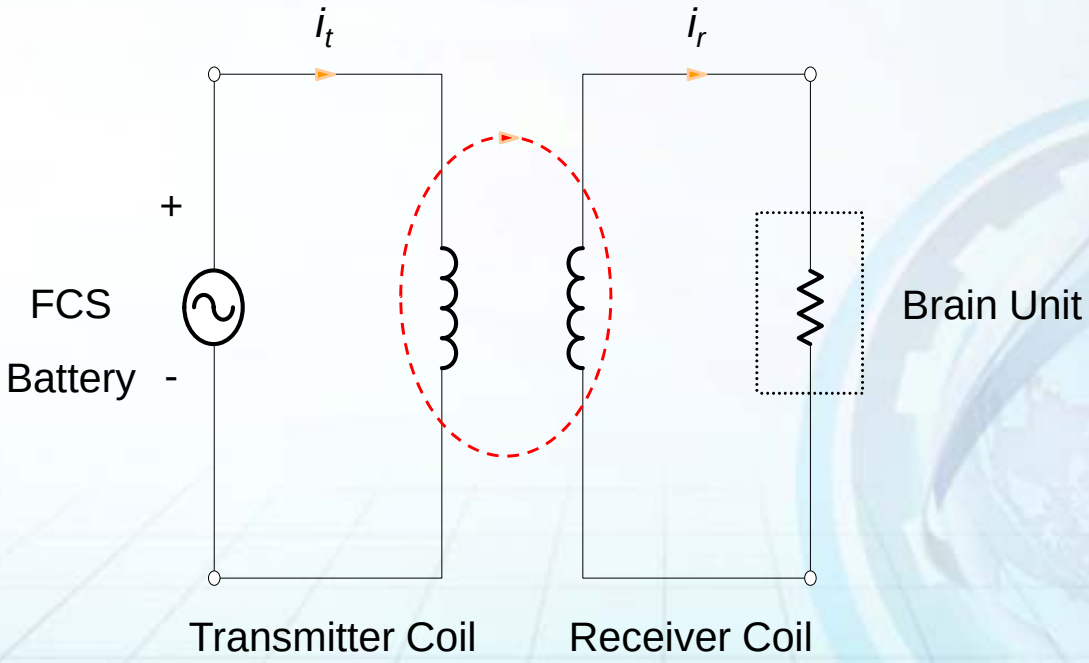
Ultra Precision Electronic Fuse

- MEMS-Based Smart Multi-Option Fuse
- Turns Count Sensor by Using Geomagnetism



Communication of Air-bursting Data

- Maximizing the transfer efficiency of the power energy and turns
- Algorithm to figure out the transferring error



Fuse Function

PD Mode

PDD Mode

AB Mode

- PD / Point Detonation

  : Target Impact by Inertia Type Impact Switch

- PDD / Point Detonation Delayed

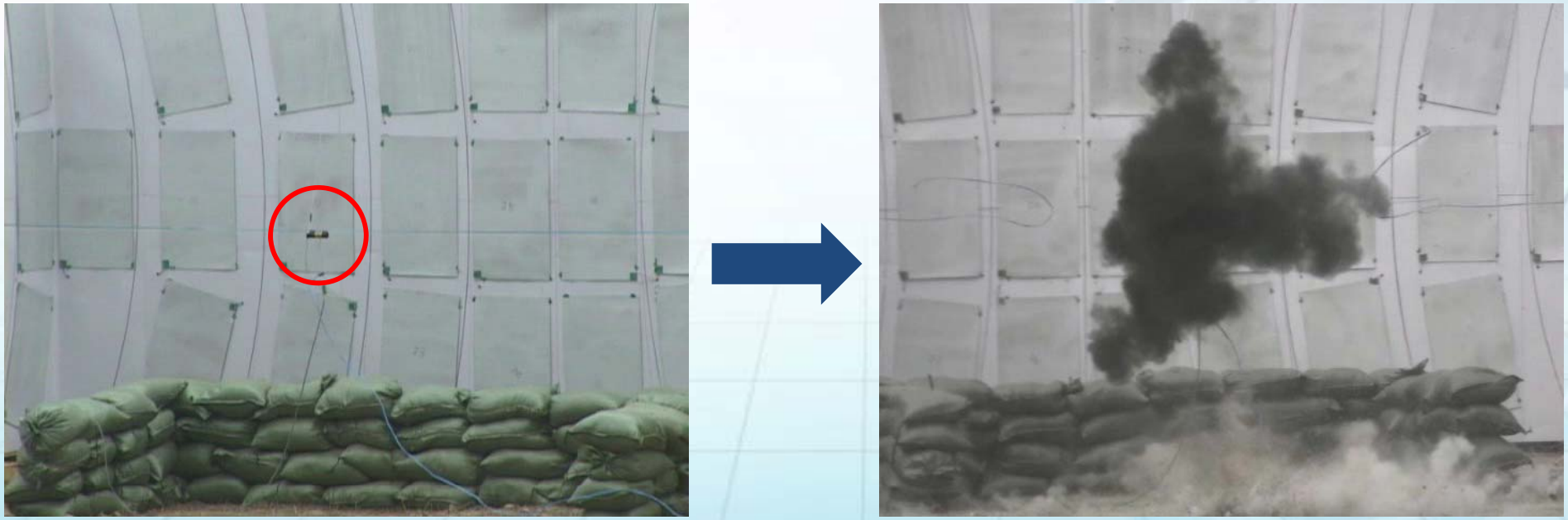
  : Constant Delay Functioning after Target Impact

- AB / Air-Bursting

  : Function when Revolution Number of Projectile is Met to the Received Data from FCS

Fragmentations of HEAB Ammunition

- High Performance and Low Vulnerable Propellant
- Applied to Small Ammunition under Volume and Weight Limitations
- Controlled Dual Fragmentation Structure → Epochal Increase of Lethality (Increased Effective Fragmentations)



Lightweight Triggering Mechanism

- Lightweight Material Developed by Korean Science and Technology

  : Weight Reduction of More than 20% by Using Ti Alloy (for 20 mm Barrel) and High Strength Al Alloy Containing Scandium (for Upper Receiver).

- 2.5 Times Increase of 20 mm Barrel Life by Developing TiN Surface Treatment Method

- Highly Reliable Creative Mechanisms : Complex Trigger System, Link Type Percussion Lock

Operation Procedure

Day Sight View

Night Sight View

REAL TIME

Target Detection

Range Measurement and Aiming

Firing → Detonation above Target

Effective Range Test (5.56 mm @ 000 m)

0.0 mm NATO Mild Steel Plate

Effective Range Test (20 mm @ 000 m)

AB

PD

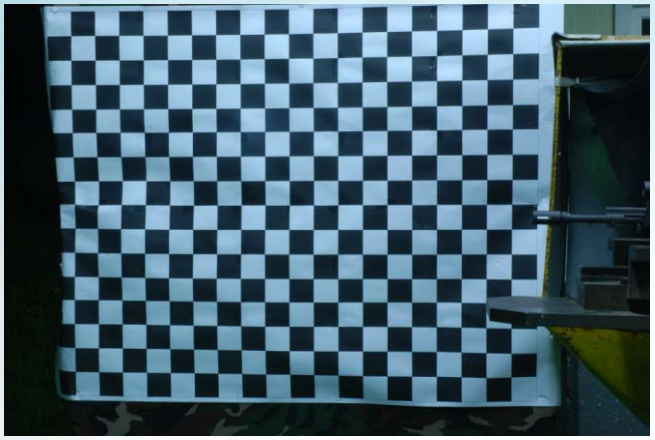
PDD

- Both in-plane accuracy (PDD/PD mode) and longitudinal (range)-directional accuracy (AB mode) were satisfied at the effective range.

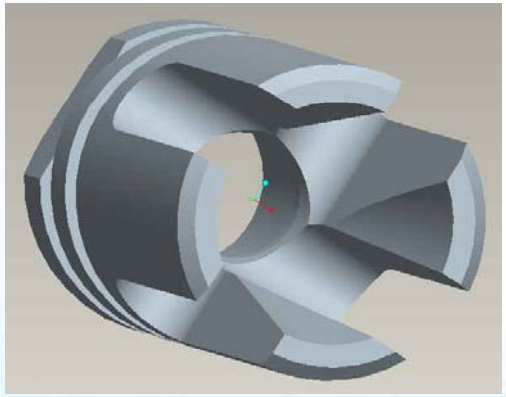
Lethality Test (20 mm)

0.0 mm Mild Steel Plate

Flash Test



Test Setup



5.56 mm Flash Hider

5.56 mm

20 mm

- 5.56 mm : a very small muzzle flash due to an effective flash hider, regardless of a short barrel length
- 20 mm : nearly no muzzle flash

Conclusions

- Development of K11 dual-barrel air-burst weapon with our own technology
  - Provide full solution for next-generation rifles
  - Give flexibility for urban engagement
  - Proven to be very accurate

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