K11 Dual-Barrel Air-Burst Weapon

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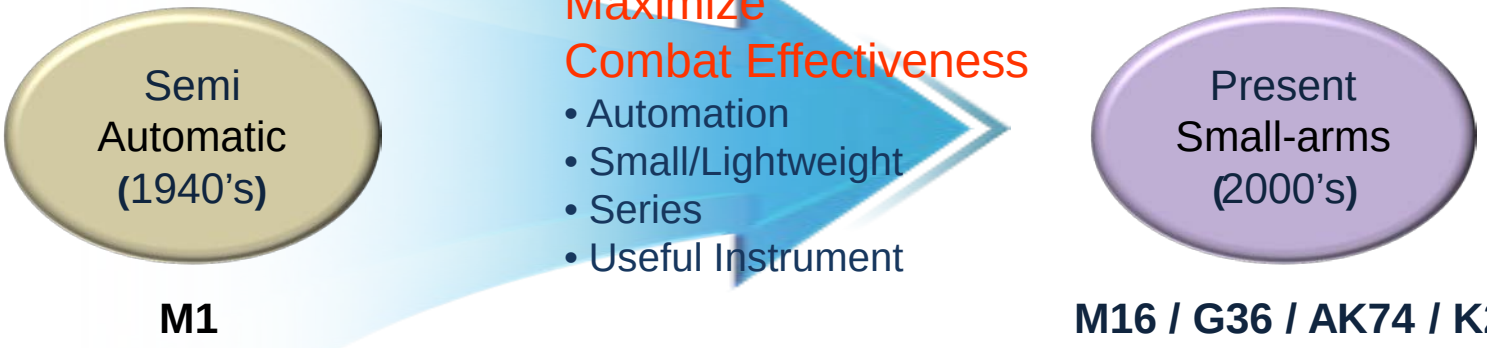
국 방 과 학 연 구 소
AGENCY FOR DEFENSE DEVELOPMENT

Contents

Background

Trend of Small-arms



Defect of Present Small-arms

- Distinction of accuracy between training and real Combat situation
- Incompetency to a defiladed target
- Necessity of supplementary night vision at night time

Introduction

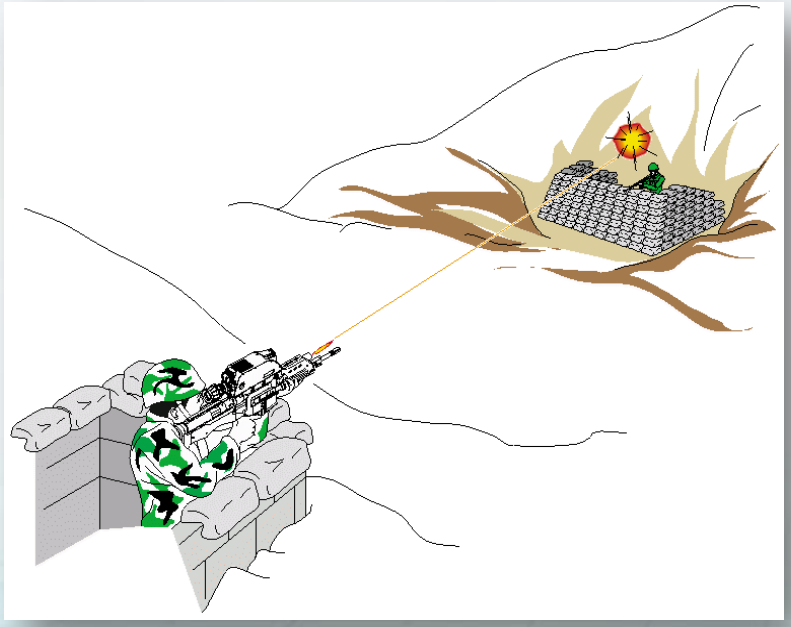
New attempt in the world (1994~2004)

Smallarms	Characteristics	Conclusion
4.7mm G11 Caseless (Germany)	3 Burst, High firing rate	Fail to Double up The Combat Effectiveness ⇩ Quit the Development Program
5.45 AN94 (Russia)	2 Burst, High firing rate	
5.56mm Double Bullet (USA)	Shot gun	
5.56mm Flechette (USA)	Flat Ballistics	
OICW (USA) PAPOP (France)	Dual Barrel, Air Bursting	

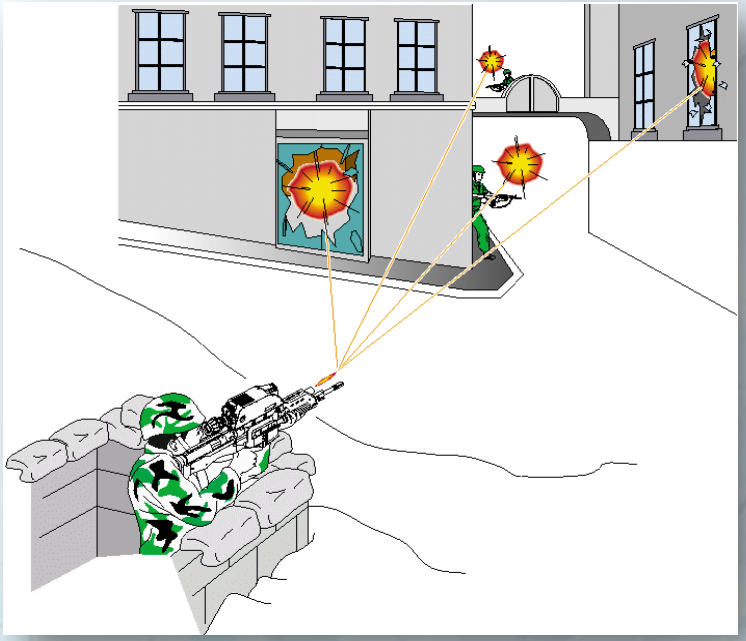
- Maximize Combat effectiveness considering New concept and technology
  - ➢ Precise Air Bursting against Defiladed Targets
  - ➢ Fire Control System at Day & Night, and All-Weather Conditions
  - ➢ Lightweight Rifle System

Requirements of Army

- Increase in Lethality and Precision Firing at Day & Night, and All-Weather Conditions
- Effective on Defiladed Targets and linked with Future Soldier System
- High Reliability, Availability, Maintainability and Durability



Field Operation



Urban Operation

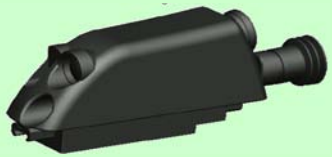
Technical Approach

System integration

Fire Control System

Laser Range Finder

Integrated Controller



Complex Optical Modules

Thermal Image Generator

Battery

HE(20mm) Module

Fuse Setter
Bolt Action
5 Rds. Magazine

Air-Bursting Ammo

Fragmentation Warhead

Programmable Electronic Fuse

KE(5.56mm) Module

Complex Trigger System
Gas Operated
20/30 Rds. Magazine

Key technology

Ultra Precision Electronic Fuse

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

Fragmentations of HEAB Ammunition

- High Performance and Low Vulnerability Propellant
- Applied to Small Ammunition under Volume and Weight Limitation
- 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 and High Strength Al Alloy Containing Scandium.

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

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

Simulation & Optimization

- Simulator for System Test and Evaluation to Reduce Development Period and Cost
- Pre-Evaluation of System Performance by Simulator at Early Stage of Full Scale Development
- Optimization of Operation Menu of FCS and Analysis on Combat Effectiveness
- Optimal Design by Human Parameter Analysis on Various Firing Postures
- Dynamic Analysis of Rifle/Human Integrated System for Ergonomic Design

Lightweight Fire Control System

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

Operation Procedure

Day Sight View

Night Sight View

REAL TIME

Target Detection

Range Measurement and Aiming

Firing → Detonation above Target

Conclusions

- Development of K11 dual-barrel air-burst weapon with indigenous technology.
- Key Features
  - Gives flexibility for urban engagement
  - Proved to be very accurate
- Future plans
  - To be delivered to ROK Army by 2010
  - Technical support for mass production and export

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