K11 Dual-Barrel Air-Burst Weapon

In-Woo Kim, Dong-Hyun Kim, Eui-Jung Choe, Je-Wook Chae, Joon-Ho Lee

AGENCY FOR DEFENSE DEVELOPMENT
Background

Trend of Small-arms

Semi Automatic (1940’s)
M1

Maximize Combat Effectiveness
- Automation
- Small/Lightweight
- Series
- Useful Instrument

Present Small-arms (2000’s)
M16 / G36 / AK74 / K2

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)

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

- 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
System integration

Key technology

Fire Control System
- Laser Range Finder
- Integrated Controller

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

Complex Optical Modules
- Thermal Image Generator
- Battery
MEMS-Based Smart Multi-Option Fuse
Turns Count Sensor by Using Geomagnetism
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 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
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
Operation Procedure

Target Detection
Range Measurement and Aiming
Firing → Detonation above Target

REAL TIME

Day Sight View
Night Sight View
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
Contact Information

Name: Dr. In-Woo Kim
Phone Number: +82-42-821-3100
Company: ADD, Korea
   (Agency For Defense Development)
Email: kiw111@chol.com