



# Wireless Programming of 40mm Grenade Launcher Ammunition

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**Nammo**

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# Nammo Raufoss AS

- The ammunition factory was established in 1896
- Nammo is located at various sites in Norway, Sweden, Finland, Germany, Switzerland and the US.
- The main office is at Raufoss in Norway
- Nammo has about 1800 employees and a turnover of approximately 3 Billion NOK

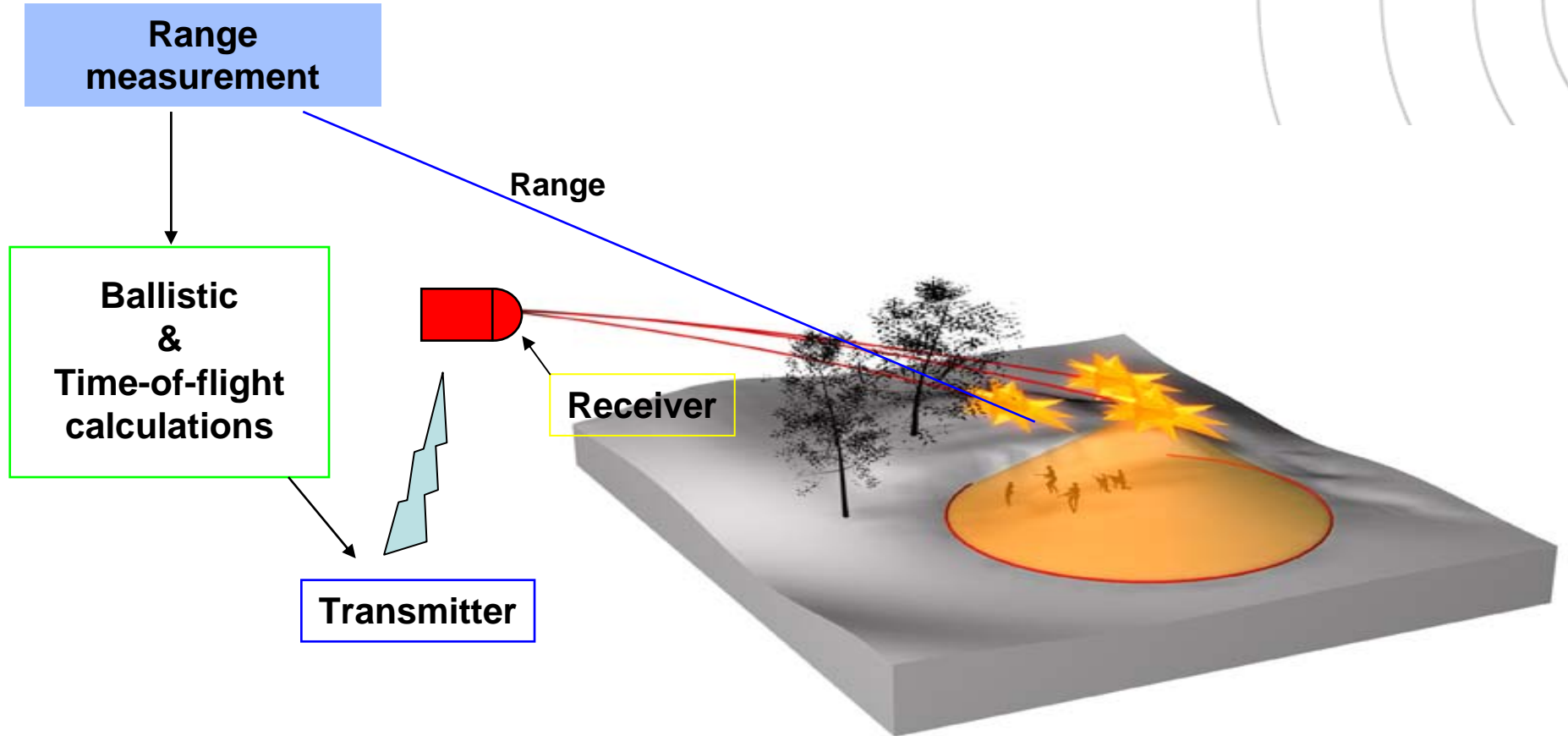


# Nammo Test Center

- Nammo has its own test center located 8 km from the main office at Raufoss
- 15 firing ranges from 0 to 2000 m
- Monorail for rocket firing
- Firing of 5.56mm to 155mm
- Environmental test center
- Example of test equipment
  - Radar
  - High speed video cameras
  - X-ray
  - Acceleration, shock and pressure



# *RF Air-Burst Ammunition Concept*



## Easy integration to weapon systems

- Antenna unit
- Cable to Fire Control Unit
- Standard SPI or RS232 interface to Fire Control System
- **No modification of the weapon is needed**



# *H&K AGL with Vingmate Fire Control Units*



Antenna

# *H&K AGL with AIM Fire Control Units*

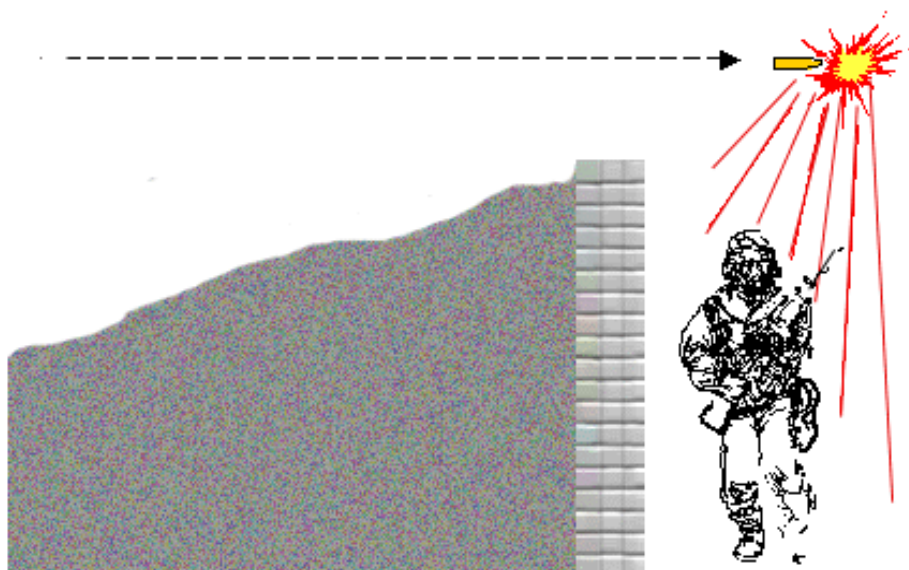


Antenna



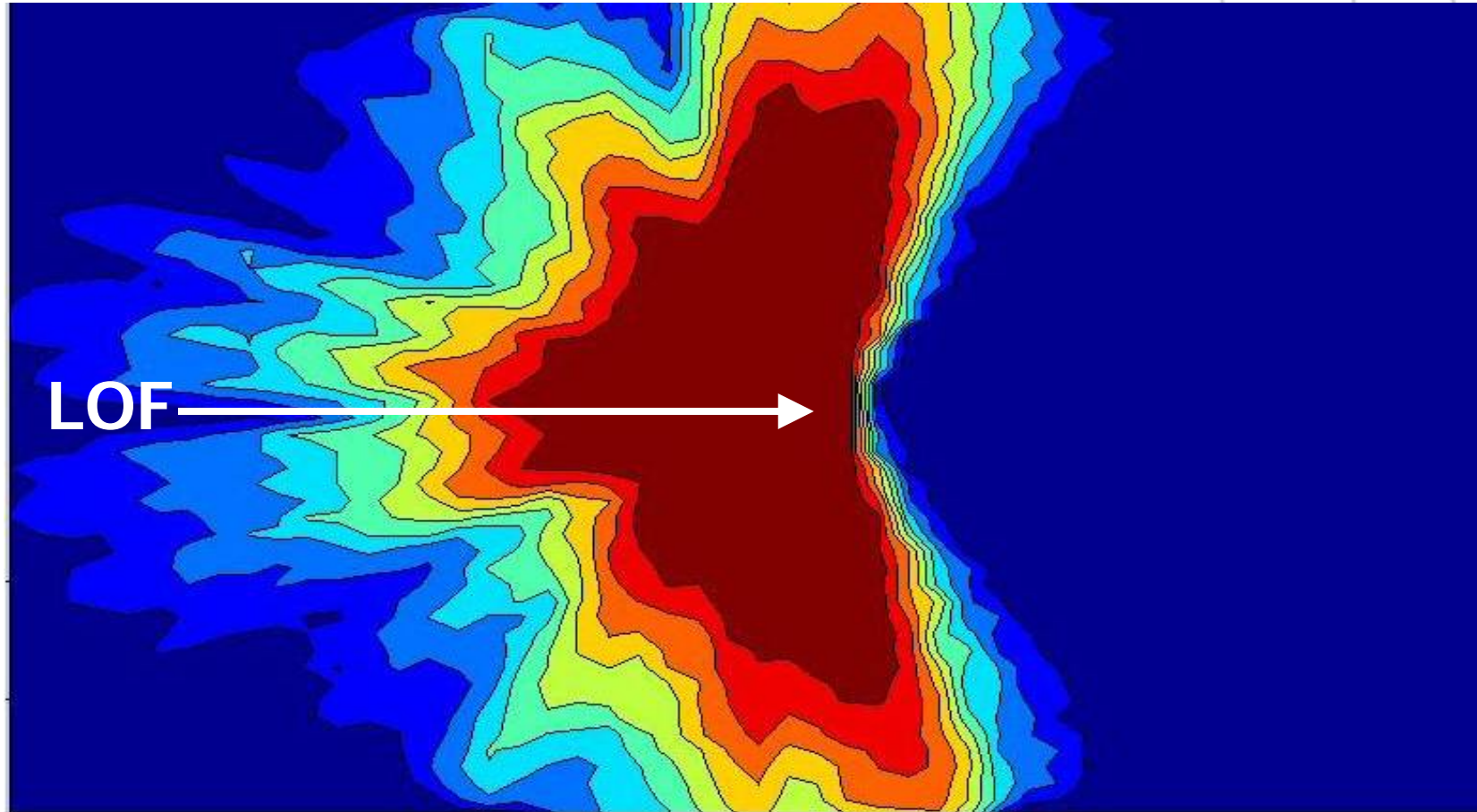
# Airburst Round, Highly effective in Urban Combat

Takes out Targets in Defilade



**Nammo**

# Incapacitation Contour



# Specifications



- Electronic programmable Time Fuze
  - Airburst function (electronic)
  - Point detonating function (mechanical)
  - Self-Destruct function (electronic)
  - Mechanical Safe & Arm (US MK91)
- Pre-fragmented shell body
- IM Properties (use of PBXN 5 & 9)
- Improved Propulsion System

# 40RF grenade

Electronics

Loop Antenna

Safe & Arm Unit

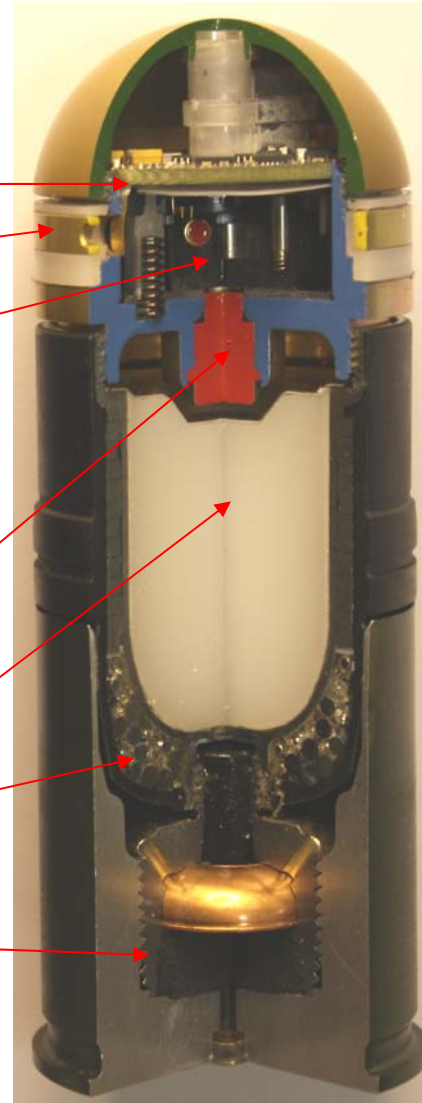
with electrical detonator

Booster (PBXN5)

Main Explosives (PBXN9)

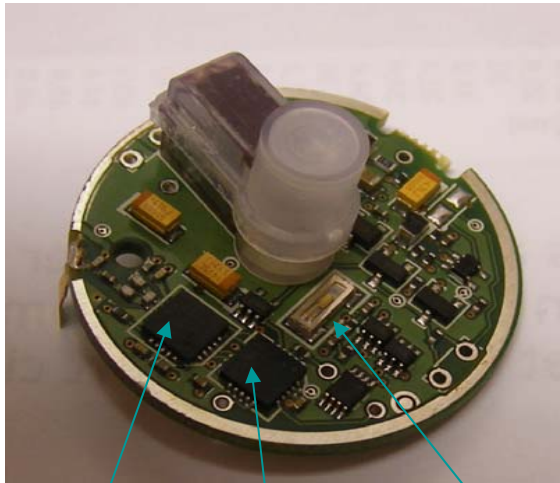
Prefragmented body

Propulsion system





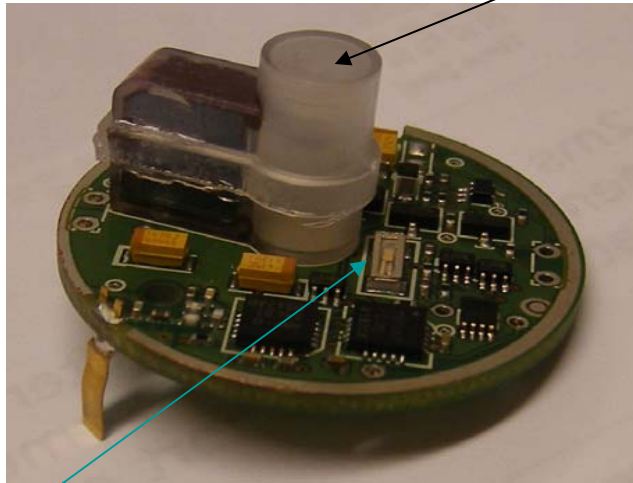
# Fuze electronics



RF chip

μC

Crystal



Battery



- Airburst function
- Self destruct function ~20s (RC)
- Safe separation time ~430ms/100m (RC)





# Jamming

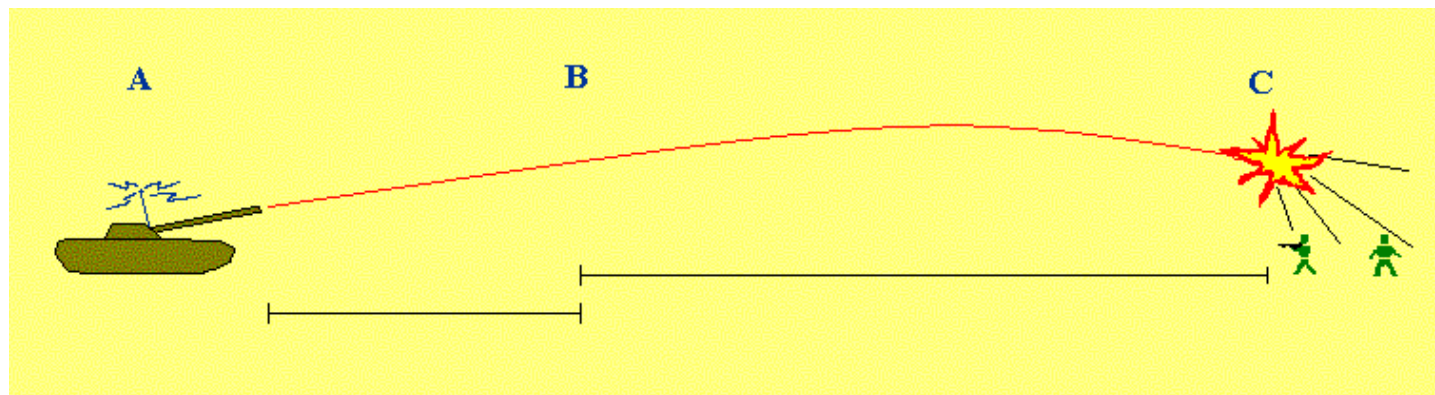
- Very narrow band transmission -> high effect in the actual band
- Distance from jammer to projectile >> distance from weapon to projectile
- Reprogramming the projectile not possible
- Frequency > 1 GHz in practice requires free sight
  - The jammer could be localized and taken out

# Status

- In qualification
- Will be qualified this year (2009) for the H&K gun

## Other calibers

- The RF concept can be used on other weapon platforms that need a Programmable Airburst capability



# Questions?