

S40x180mm Ammunition for the MK44 Weapon

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**“21st Century Weapon Systems - Providing the
Right Response”**

THE STRENGTH
OF THE NATION



GENERAL DYNAMICS
Ordnance and Tactical Systems

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Distribution is Unlimited

S40x180mm MK44 Ammunition

- Brief S40mm ammunition history
 - US Army Contract Efforts
 - Internal Research and Development (IRAD) Efforts
- S40mm Ammunition Family
 - Armor Piercing Fin Stabilized Discarding Sabot with Tracer (APFSDS-T)
 - Multi Purpose Air Burst with Tracer (MPAB-T)
- Summary



S40x180mm - Introduction

A S40mm MK44 capable weapon and ammunition solution is ready for U.S. Army study and test.

- The 30mm MK44 weapon is a battle proven system with a complete family of qualified ammunition ranging from target practice, armor piercing and high explosive cartridges.
- The proven MK44 weapon contains growth provisions for S40mm cartridges
 - Increasing lethality over 30mm where...bigger is better.
 - Minimal up-gun cost impacts due to a combination of MK44 weapon part commonality and interchangeability.

**30mm to S40mm Projectile Growth
Placing more Lethality on Target**



Why S40mm

- Maintains lethality overmatch against the most common/capable threats.
- Leverages existing scalable 30mm cartridge technologies and qualified explosive items.
- Can use existing and established US supplier base to meet growth objective needs.
- Allows use of common 30mm MK44 and S40mm MK44 weapon parts

30mm, S40mm, and larger caliber commonalities = Lower Cost

Scalable technologies for all calibers

S40mm Ammunition History

- US Army Contract Efforts
- Internal Research and Development (IRAD) Efforts

S40mm – US Army Contracts

2001-2005 – US Army Contract for the Advanced Light Armaments Combat Vehicle (ALACV):

- Propellant development for:
 - Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T)
 - Multi Purpose Air Burst with Trace (MPAB-T)
 - Target Practice with Trace (TP-T)
- Cartridge development:
 - S40mm x 218 APFSDS-T
 - S40mm x 165 MPAB-T
- Live fire demonstrations at High Rate Bursts (HRB) out of the MK44 mounted in a Bradley Fighting Vehicle.
- Successful APFSDS-T ballistic penetration performed.
- Successful MPAB-T ballistic function demonstrated.

S40mm–Internal Research and Development (IRAD)

2001-Present –IRAD:

- S40mm x 180 case design
 - Used with both MPAB-T and APFSDS-T rounds
 - Tooling and manufacturing process ready
- S40mm APFSDS-T cartridge:
 - Composite sabot successfully developed
 - Tooling and manufacturing process ready
 - Gun launch survivability proven
 - Favorable RHA penetration achieved with tungsten penetrator
- S40mm MPAB-T Cartridge Design
 - Induction or contact set fuze with:
 - PD/PD delay for wall penetration
 - Self destruct
 - Selectable short/long fuze arming ranges
- S40mm TP-T Cartridge Design
 - Simple two piece metal projectile design for low cost production.

S40mm Ammunition Family



S40mm Ammunition Family

- APFSDS-T for armor targets. Features include:
 - Cobalt free penetrator
 - Composite sabot assembly
- MPAB-T for urban and troop targets. Features include:
 - PD/PD delay for wall penetration
 - Short or long selectable arming ranges
 - Airburst function
 - Self destruct function
 - Induction or contact communication fuze



MPAB-T

TP-T

APFSDS-T

Projectile technology is scalable to larger calibers for increased requirements.

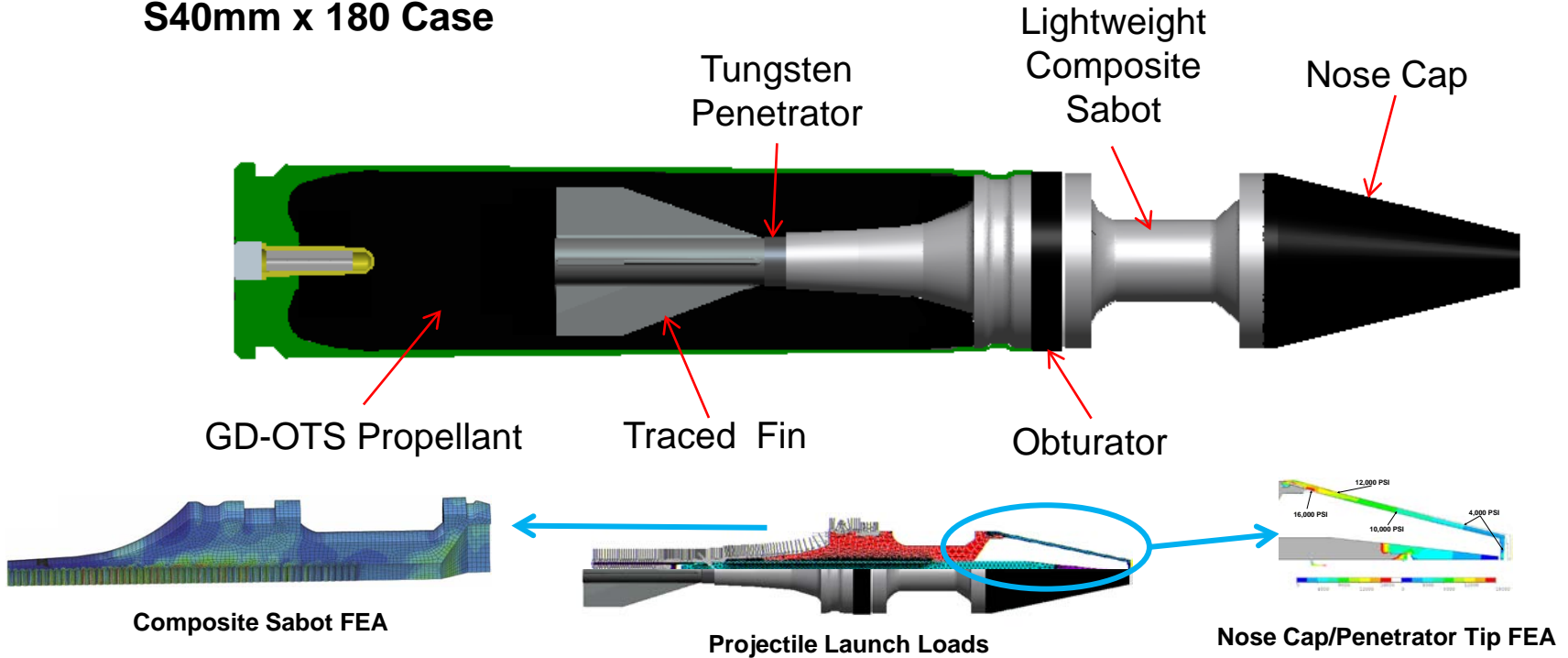
S40mm Armor Piercing Fin Stabilized Discarding Sabot with Tracer (APFSDS-T)



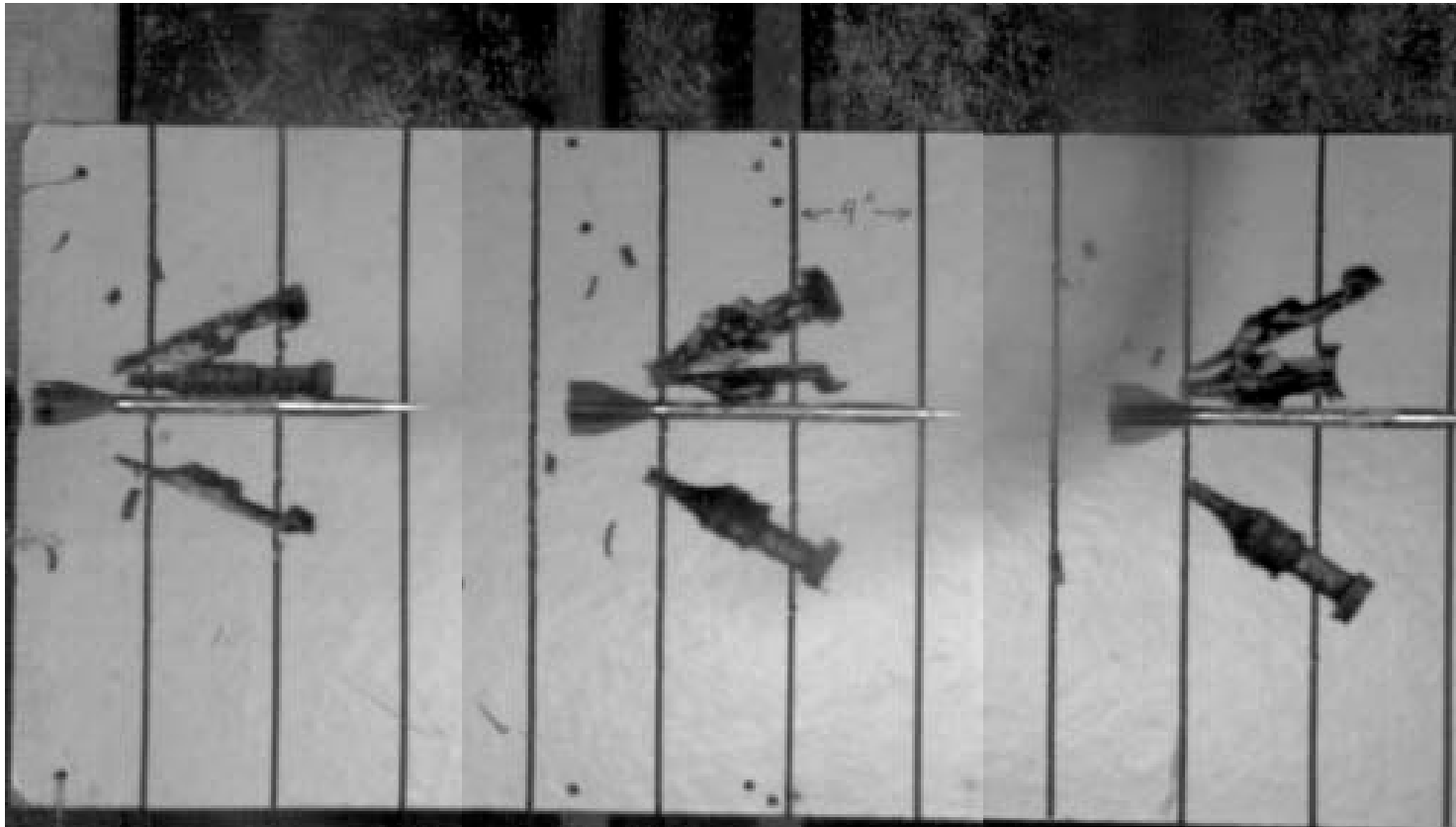
S40mm APFSDS-T – Design Characteristics

APFSDS-T Cartridge

S40mm x 180 Case



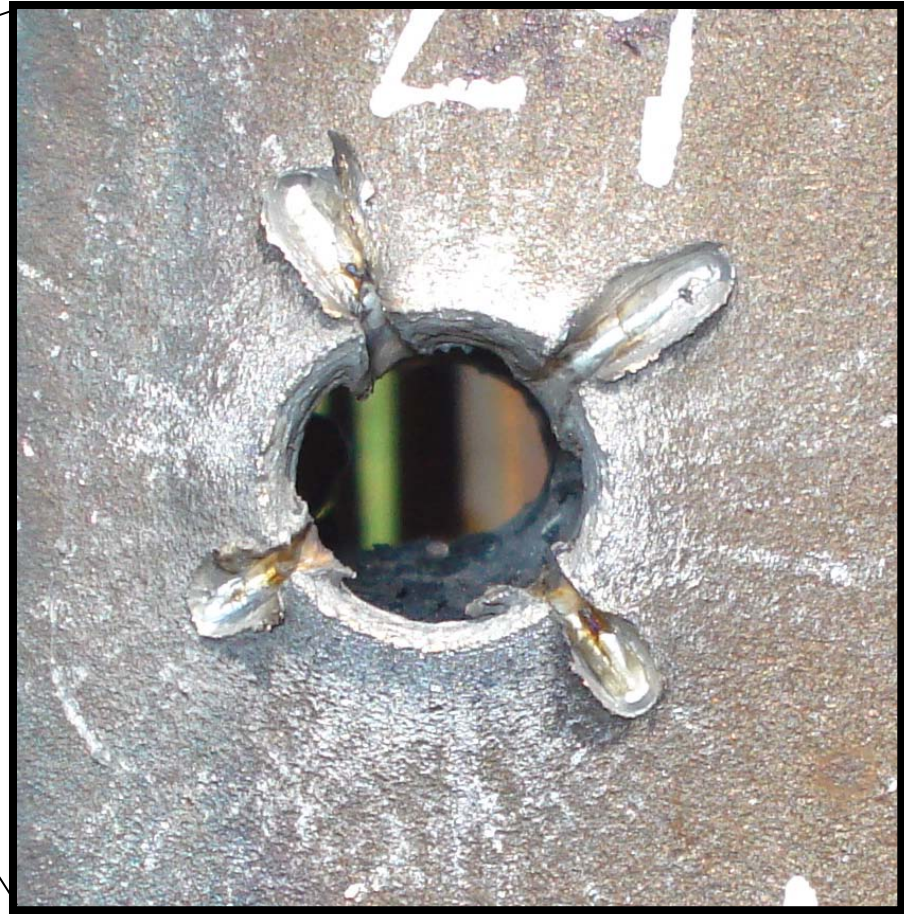
S40mm Composite Sabot Ballistic Testing



Continued S40mm success using composite sabot technology



S40mm Composite Sabot Ballistic Test: Successful penetration of RHA at Effective Range



Successful RHA
penetration using:

- Tungsten penetrator
- Composite sabot
- St. Marks Powder Hybrid®
Propellant



S40mm APFSDS-T

Status:

- Composite sabot mold fabricated, test parts produced, successful ballistic testing achieved. Sabot mass reduced by 43%
- RHA penetration test successful
- Long range trajectory test verification of modeling successful

Next Steps:

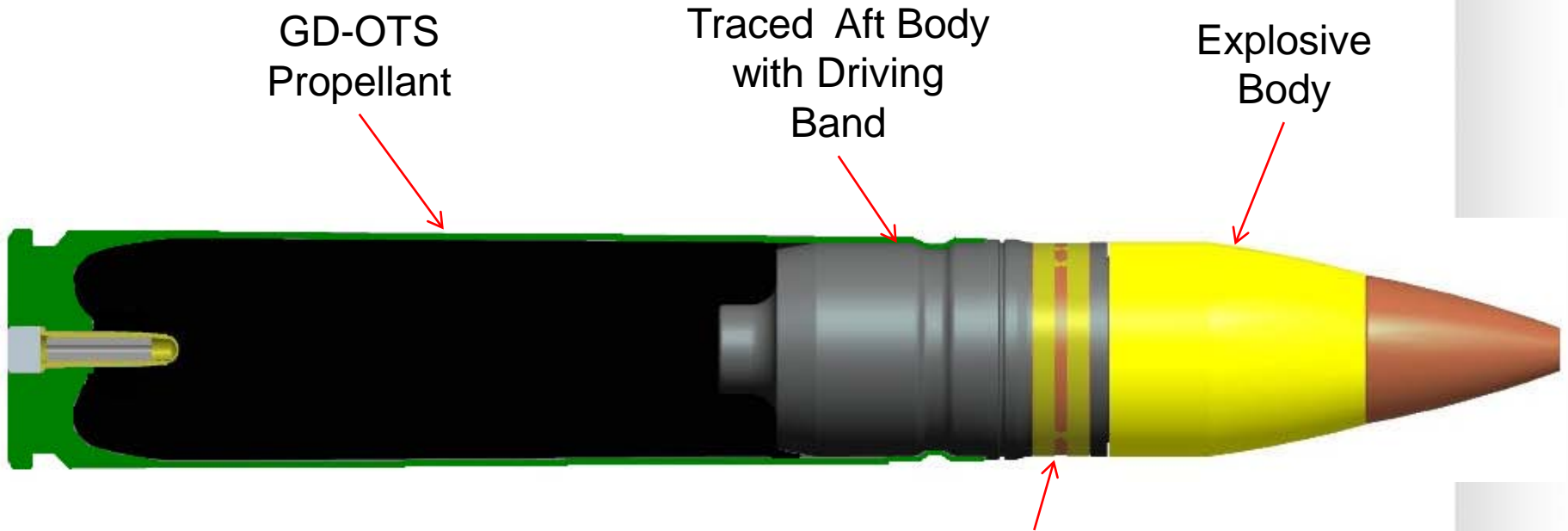
- Additional penetration testing against additional target sets
- Continued propellant development

Higher velocity = Higher kinetic energy on target = Increased penetration capability

S40mm Multi Purpose Air Burst with Tracer (MPAB-T)



S40mm MPAB-T Cartridge



MPAB-T Cartridge
S40mm x 180 Case

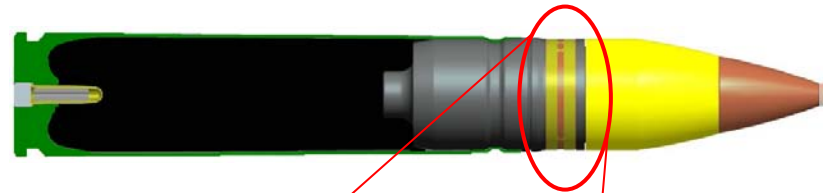
Electronic Induction or
Contact Set Fuze
(contact version
shown)

Induction communication option
follows STANAG 4547 protocol



S40mm Air Burst – Fuze Characteristics

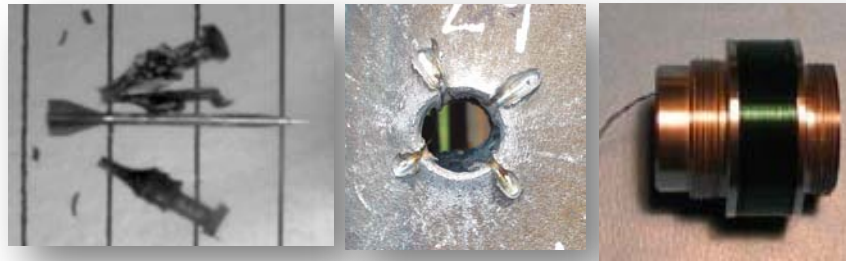
- Inductive or contact set, time-based, programmable electronic fuze.
- Airburst function
- PD/PD Delay feature to:
 - Increase capability of the ammunition and eliminate the need for HEI PD ammunition.
 - Defeat light materiel targets
 - Provide PD function in the unlikely event that an air burst communication signal fails.
- Selectable arming: allows user to select an arming range of short or long.
- Self destruct function



Airburst Fuze

Summary

- The S40mm cartridges offer greater lethality than 30mm without reducing the number of stowed rounds:
 - APFSDS-T design provides more kinetic energy on target vs. 30mm
 - MPAB-T design is up to 3 times more lethal than 30mm using fuze technology that is scalable from 25mm to 50mm cartridges
- S40mm technology is scalable to larger calibers as required
- GD-OTS is committed to the advancement of lethal medium caliber solutions using technologies that are scalable to platform caliber and requirements



MK44 Weapon

S40mm Family



MPAB TP KE

Questions

