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CTAS Maturity Briefing

9th April 2009

David Leslie, Chairman CTAI

BAE Systems' medium calibre capabilities

- Designs and manufactures medium calibre weapons and ammunition
- Both buys and sells medium calibre systems
- Has unique global capabilities and knowledge in the medium calibre domain

MTIP & MTIP2

Toutatis (Remote Turret)

40mm Cased Telescoped (40CT)

CV90 30mm

CVR(T) 30mm

CV90 35mm

Warrior 30mm

20mm - 40mm

Bradley 25mm

CV90 40mm (Bofors)

Warrior 25mm

The JV Company

- CTAI - private joint venture (JV) company 50/50 BAE Systems and Nexter Systems
- Dedicated Anglo-French team, focused on 40mm Cased Telescoped Armament System (CTAS)
- All UK and French staff are based in Bourges, France

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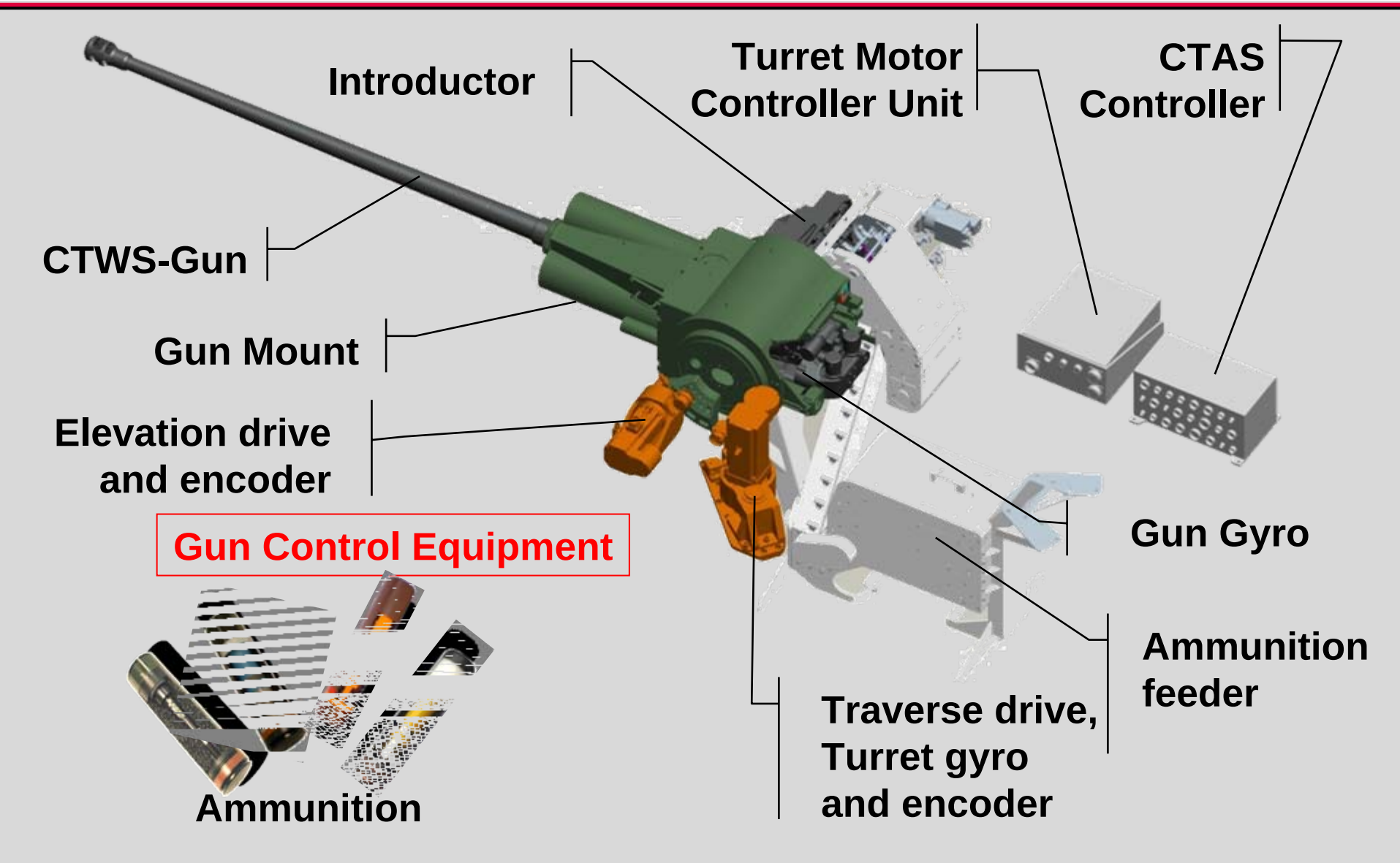
40 Cased Telescoped Armament System (CTAS)



CTAS background

- 1994 **CTAI created by Giat and Royal Ordnance**

  (First activities around 45mm CT)
- 1997 **40mm selected; CTAI scope of work is CTAS**

  (40CT Gun + Ammo + Ammo handling system)
- 1999 **MoD OA study output shared with US DoD;**

  First integration into turrets

  (Bradley IFV + US-UK Tracer/Scout programme)
- 2002 **MoD & DGA OA studies;**

  MoD & DGA risk reduction contract
- 2004 **MoD & DGA contracts to integrate 40CT into turrets**

  (MTIP & unmanned turret TOUTATIS)
- 2005 **Extended scope of JV agreement to CTAS**

  (40CT+Ammo+AHS+Gun Control Equipment + ballistics control)
- 2008 **Downselected by MoD after additional independent OA**

  (mandated item for Warrior and FRES-Scout programmes)

TRACER / FSCS

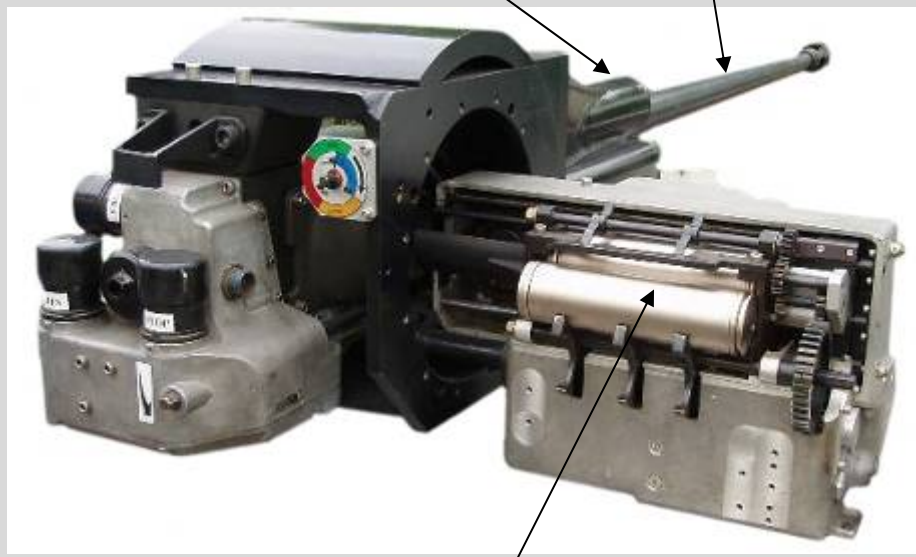
CT Technology background (gun and feeder)

- Rounds introduced through rotating breach

Rotating Breech

Mechanical recoil system

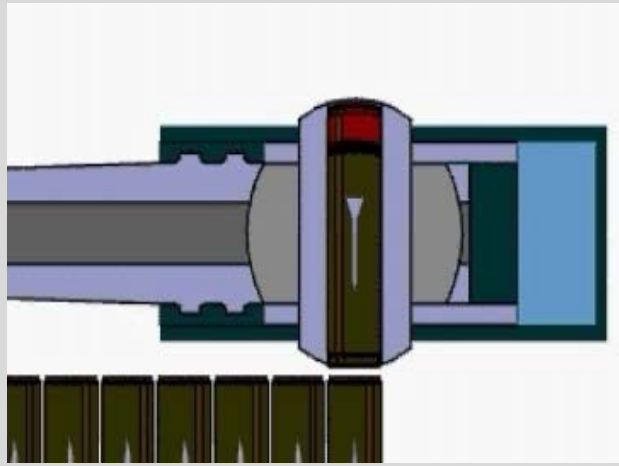
70-calibre barrel with muzzle brake

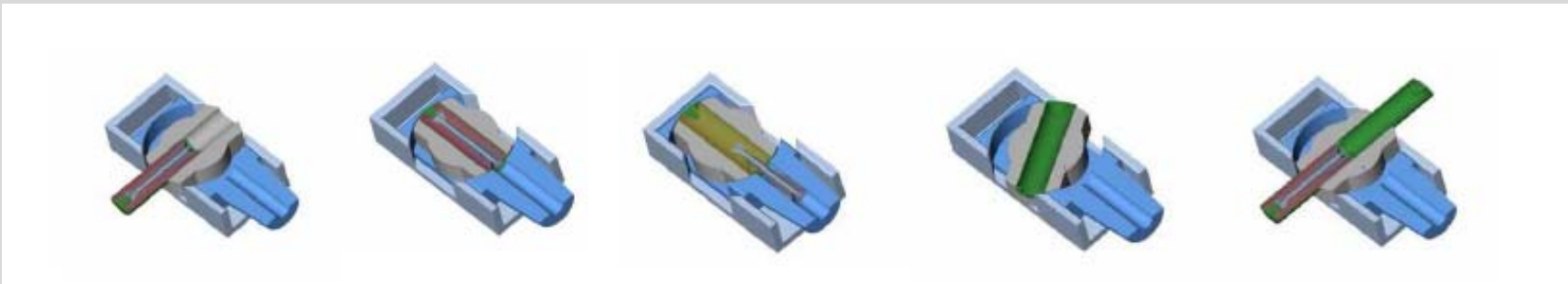


Ammunition in introductor

CT Technology background (gun and feeder)

- "Push-through" concept
- Commercial "Gear box" technology
- High reliability





1. Ammunition enters the rotating breech

2. breech revolves thru 90° to align with barrel

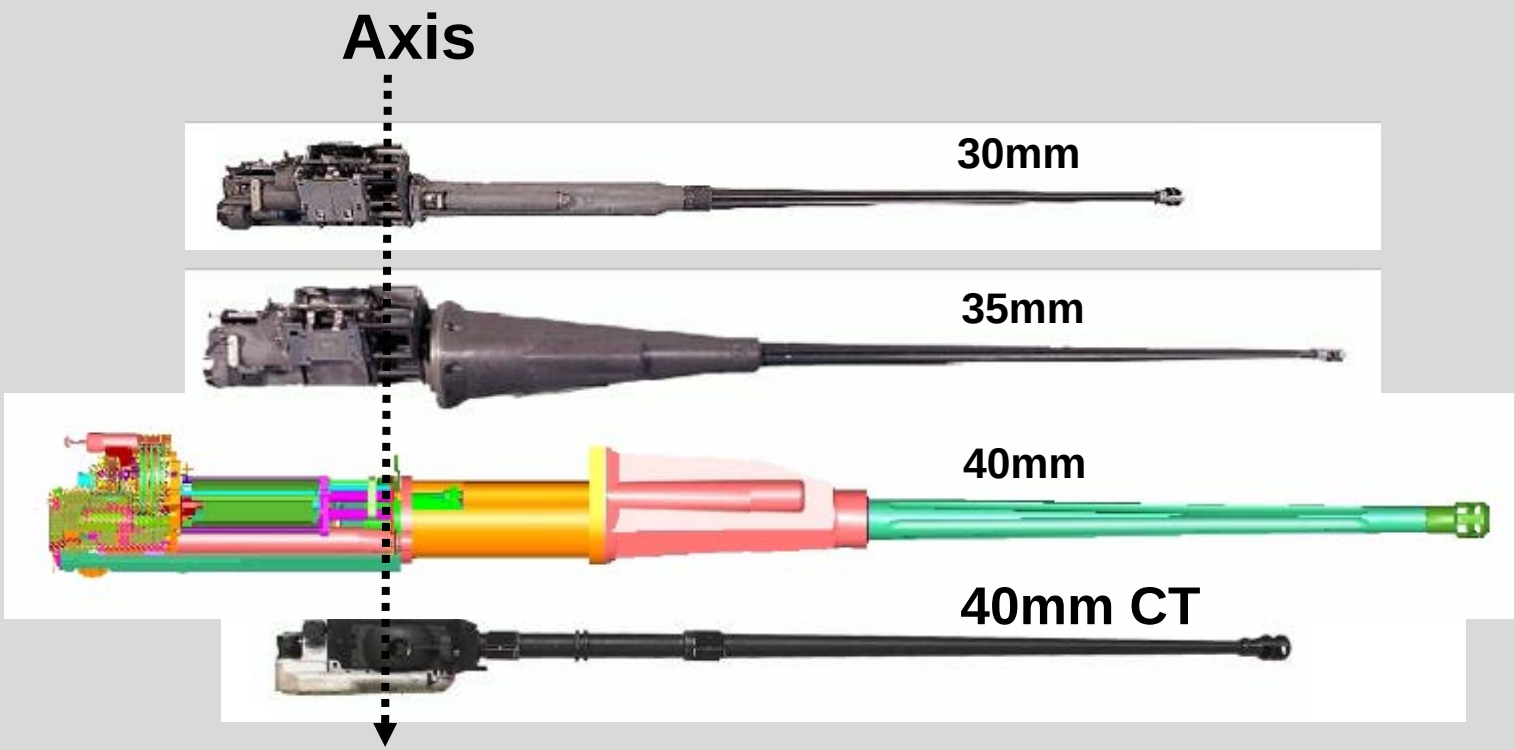
3.
- Round is fired
- the breech recoils
- the projectile leaves the barrel

4. breech revolves another 90°

5. Empty case is pushed out by the next round

CT Technology background (gun and feeder)

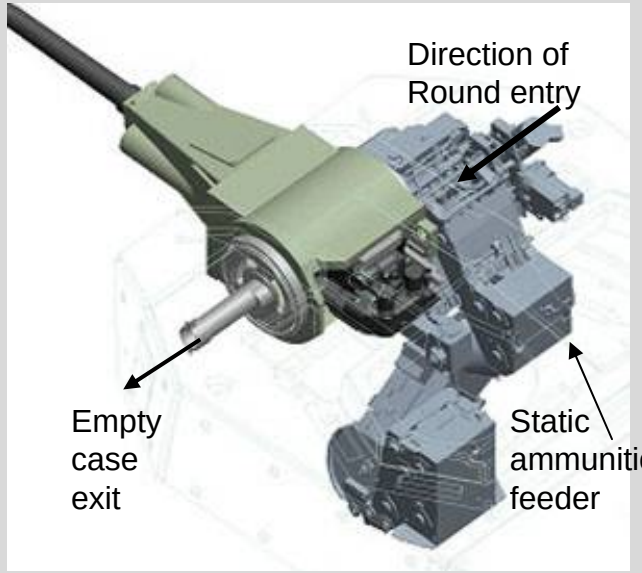
- Minimal intrusion to the crew compartment compared to conventional weapon systems

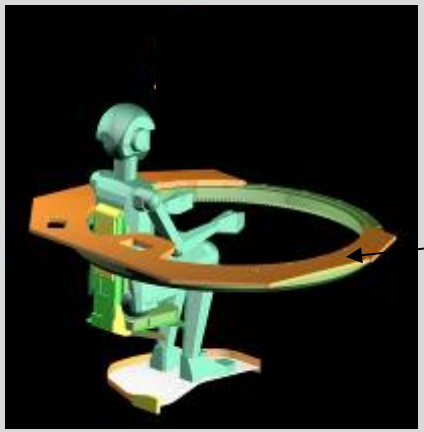


Source: Janes

CT Technology background (gun and feeder)

- Axis of introduction along the trunnion axis
  - minimizes gun intrusion
- Static ammunition feeder
  - minimizes swept volume
- Out-of-balance managed by high-performance GCE

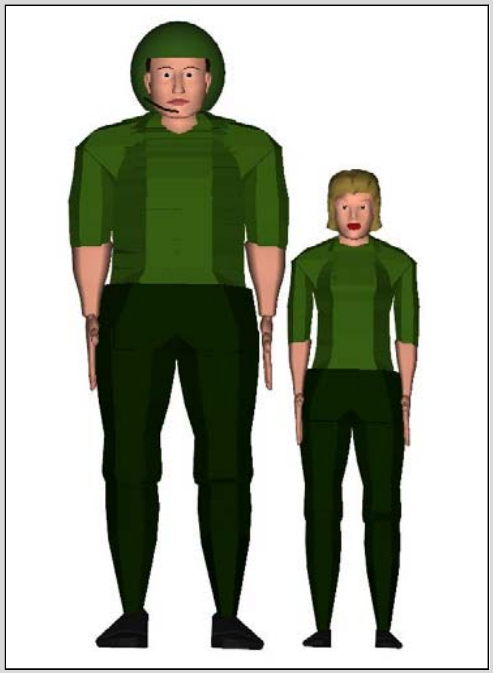




Maximises use of limited turret basket volume and an extreme 1.4m turret ring diameter

CT Technology background (gun and feeder)

- CTAS positioned well forward of the Commander and Gunner
- allows the turret crew to concentrate on their core tasks (IFV or Scout)



illustrative

designed to accommodate:

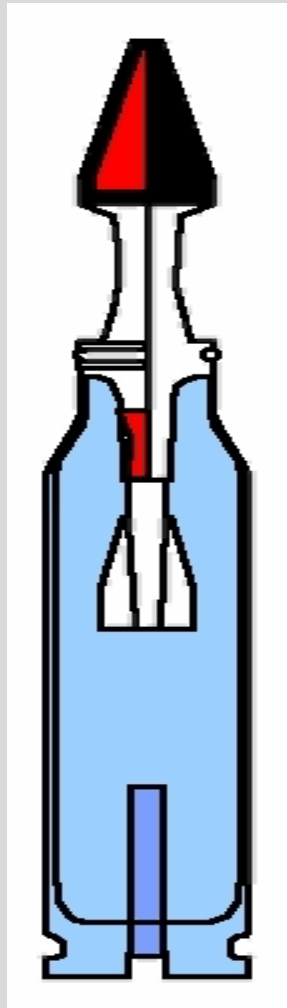
- 2x 95th percentile men
- or 2x 5th percentile women
- in full body armour and helmet

CT Technology background (ammunition)

- Unlike conventional rounds, the projectile is ‘telescoped’ within the cartridge case and surrounded by propellant

- The cartridge case diameter increases to provide efficient internal volume

- CT is 30% more volumetrically efficient than conventional ammunition



CT Technology background (ammunition)

- Two ammunition natures to achieve four effects
- 40mm offers significant Operational benefits
- UK MoD Operational Analysis of 40mm CT (Unclassified quotes from UK MoD)

"…clear advantage in urban Operations…increases platform survivability…"

Defeat of RHA and add-on special armours

Point Detonating defeat of structures with behind-structure effect

Airburst suppression, both 'line of sight' & 'non line of sight' land and air targets

Defeat of soft skin targets

'APFSDS' ammunition

'GPR' ammunition

i.e. Point Detonating + Air Burst fuzed HE ammunition combined in one general purpose round (GPR)

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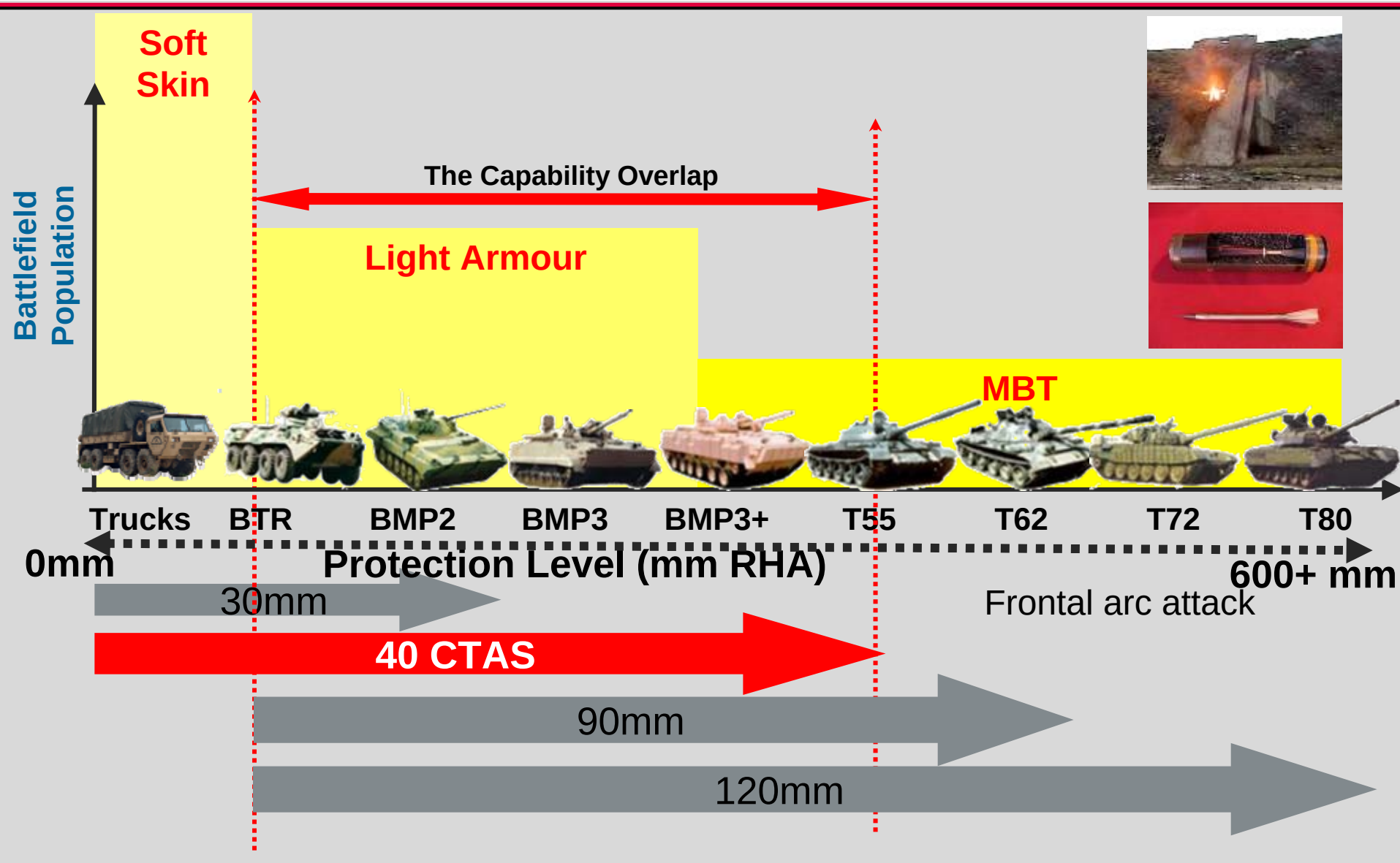
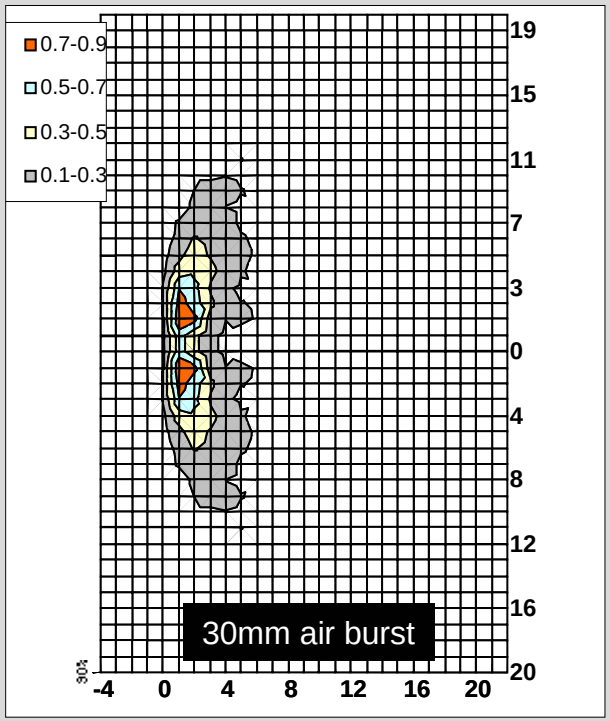
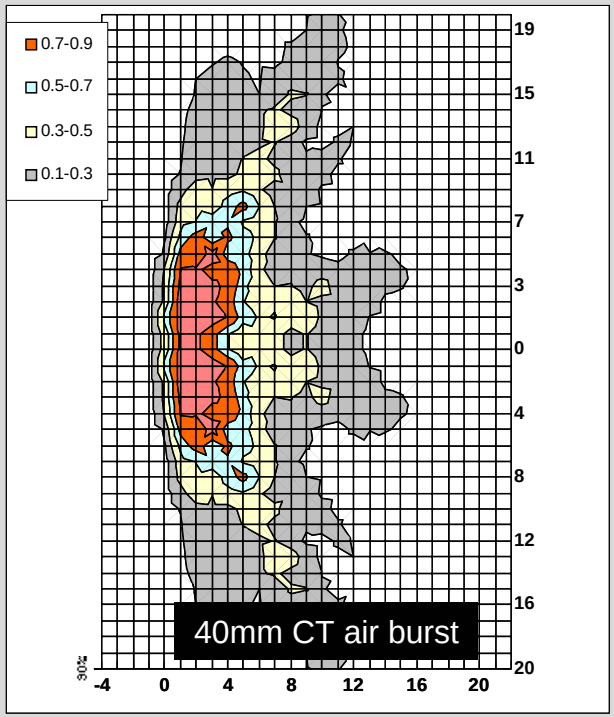
CT Technology background (ammunition: APFSDS)



CT Technology background (ammunition: GPR)

- 40mm General purpose round (GPR) ; one round type
- Air burst and point detonation functions combined
  - Air Burst for suppression tasks
  - Point Detonating for buildings (STANAG 4536) and defensive positions





General Purpose Round – Point detonating urban ops

- Breaches concrete walls with behind-structure effects
- 210mm steel-reinforced concrete (STANAG 4536)

General Purpose Round – Air Burst suppression tasks

Turret Integration

- Ammunition handling systems adaptable to user requirements and turret design
- Sustainable reloading

MTIP
42 shots - 2 types

VBCI
70 shots - 2 types

Toutatis
52 shots - 3+ types
(Remote turret)

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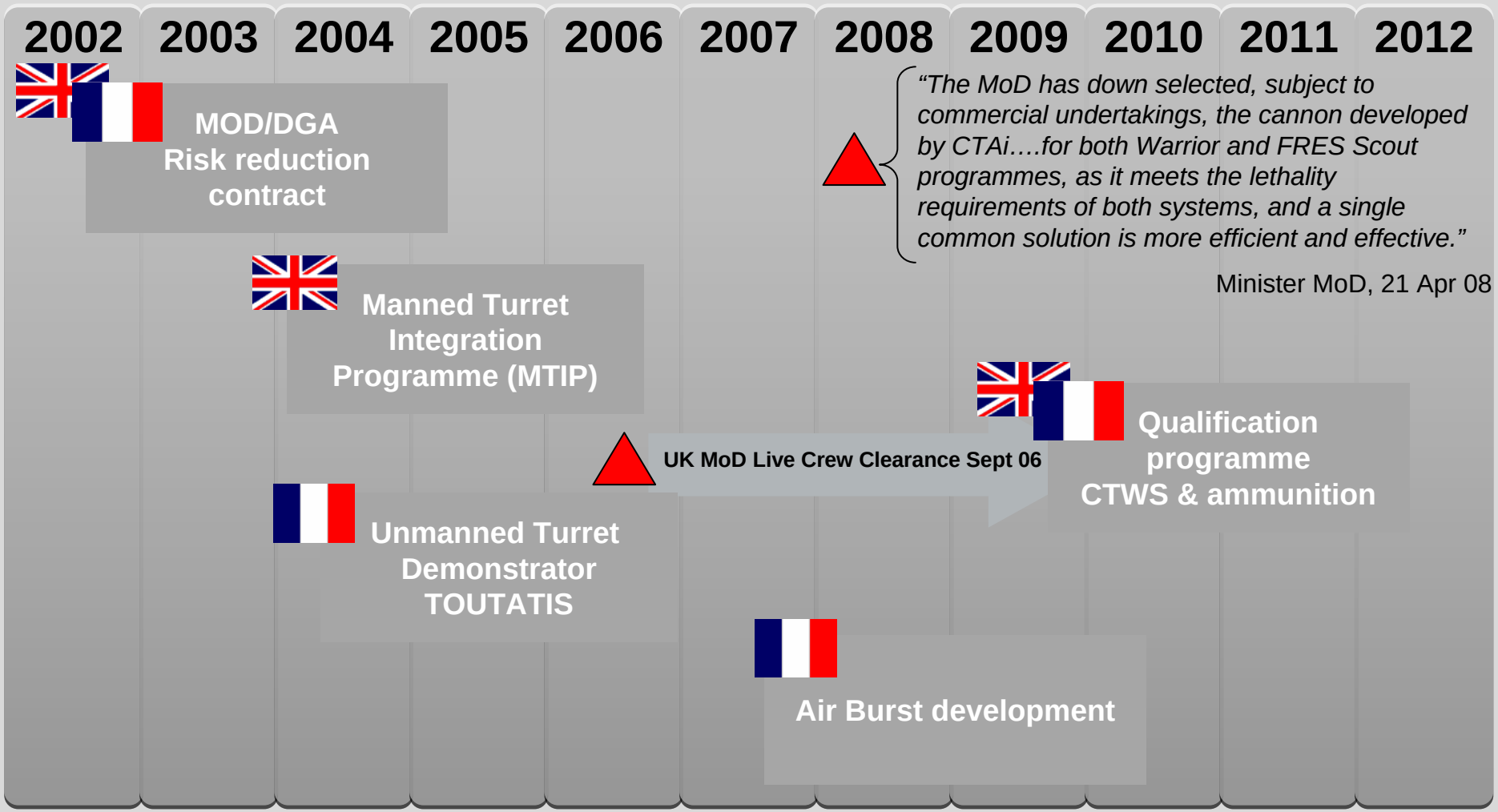
UK MoD and French DGA Cooperation



Output shared between UK MoD and FR DGA

UK MoD and French DGA programmes

Manned Turret
MTIP

Objective Future Cannon Programme (OFCP)

Unmanned Turret
Toutatis

WARRIOR

FRES Scout

AMX 10 RC
VBCI

EBRC

Industrialisation

- Industrialisation process started 2006 in UK and France after UK MoD awarded ‘Live Crew Clearance’
- First deliveries in 2010

BAE SYSTEMS

Glascoed, Wales

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Bourges, France

nexter MUNITIONS

La Chapelle, France

Summary

1. 40CT is moving from ‘development’ to ‘industrialisation’
2. 40CT offers an innovative approach to high lethality and lower integration burden
3. 40CT family of ammunition allows greater ‘utility’ from IFVs
4. FR aligning with UK for a joint launch
5. Offers a real choice to potential global customers

Questions?