

Photonics for Defense: Securing the Future

MBDA KEY NOTE SPEECH

Low Cost Approaches to Missile Electro-Optic Seeker Development

Gareth Hesketh

SEEKERS AND DATALINK SYSTEMS

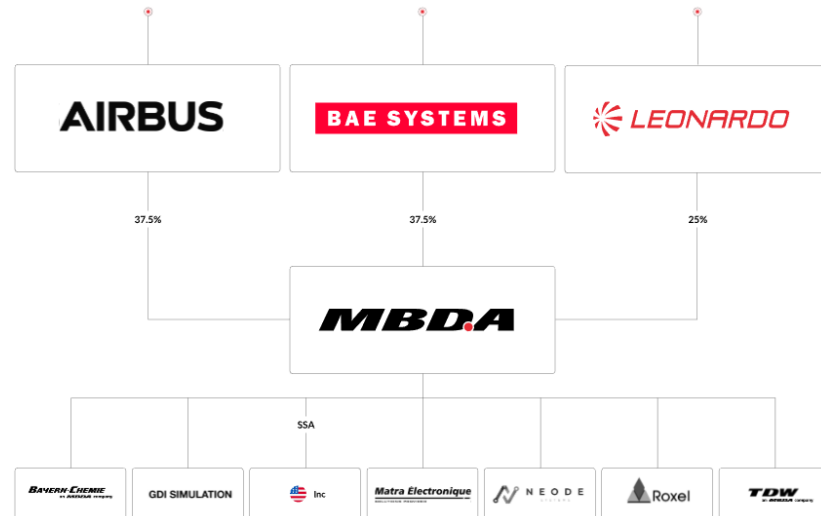
External Research and Technology Lead

MBDA Missile Systems

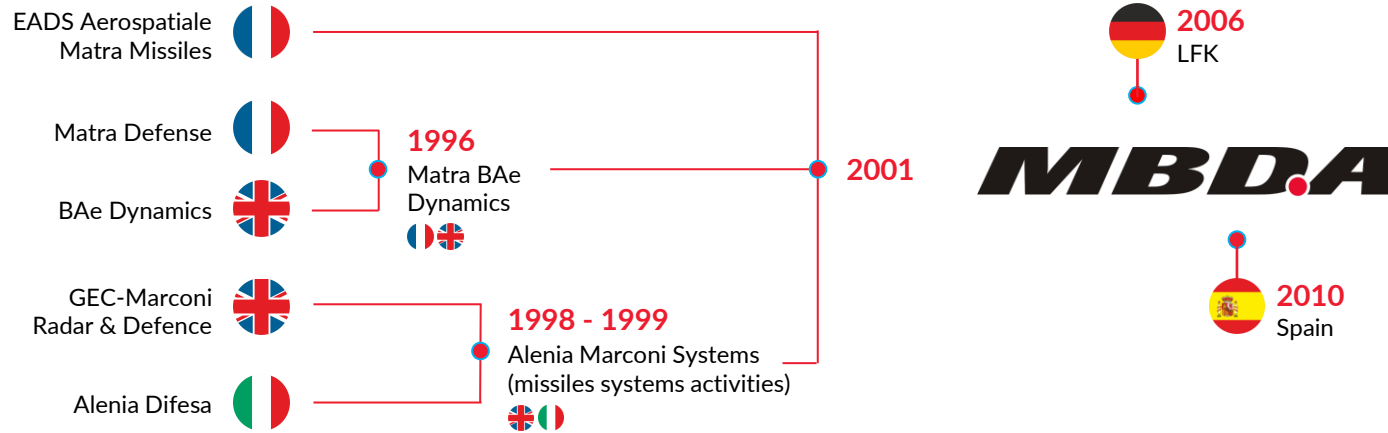
- MBDA – who we are
- Historic approach to missile development
- Portfolio Approach and Low cost era
- Consequences and Challenges



A EUROPEAN INTEGRATED DEFENCE COMPANY



MBDA Heritage



MBDA'S HERITAGE MIRRORS THE HISTORY OF TACTICAL MISSILES IN EUROPE

CREATED IN 2001

THE OUTCOME OF A SERIES OF STRATEGIC MERGERS IN THE TACTICAL MISSILE SECTOR IN EUROPE

THE LARGEST EUROPEAN COMPANY IN THE MISSILE SYSTEMS SECTOR

THE ONLY EUROPEAN COMPANY ABLE TO MEET THE WHOLE RANGE OF COMPLEX WEAPONS NEEDS OF THREE ARMED FORCES

Historic Approach to Missile Development

- Responding to customer needs on an **individual needs basis**
- Provide **high-end military capability**
 - Very high performance at both weapons and seeker level
 - Cutting edge technology
 - Demanding operational context e.g. very long shelf life, and still required to work as new
- Leads to bespoke engineering developments
- Lengthy and costly
 - Proving needed at all levels of development – systems through to sub-systems
 - Quality and assurance a large aspect of the development life-cycles

Portfolio Approach – UK Example

- Portfolio Management Agreement is a 10 year agreement between MBDA and UK MoD
 - Renewal of a long-term strategic relationship
 - Continuation and enhancement of a strategic partnership with MBDA that started in 2010
- Supports Commonality Modularity and Reuse through a **portfolio approach** to weapons development
- It presents a significant opportunity to counter current and future threats, providing military capability choice to the UK and Europe
- Creating savings of around £2.6 billion (as of July 2024)

Battle-winning complex weapons for UK Armed Forces secured for another decade



<https://des.mod.uk/battle-winning-complex-weapons-for-uk-armed-forces-secured-for-another-decade/>; July 2024

This closer Industry/Government engagement is mirrored across Europe

Low Cost Era

- Increasing focus on cost, due to
 - Lower complexity/performing products (Unit Product Cost)
 - Affordable combat mass
 - More timely delivery of higher performing products
- Example is the UK Brakestop programme
 - “Five incredibly simple requirements: on range, payload, cost, production quantities, and can you transport it in an ISO [shipping] container”



Source: ukdefencejournal.org.uk



MBDA DefendAir anti-drone system



MBDA One Way Effector



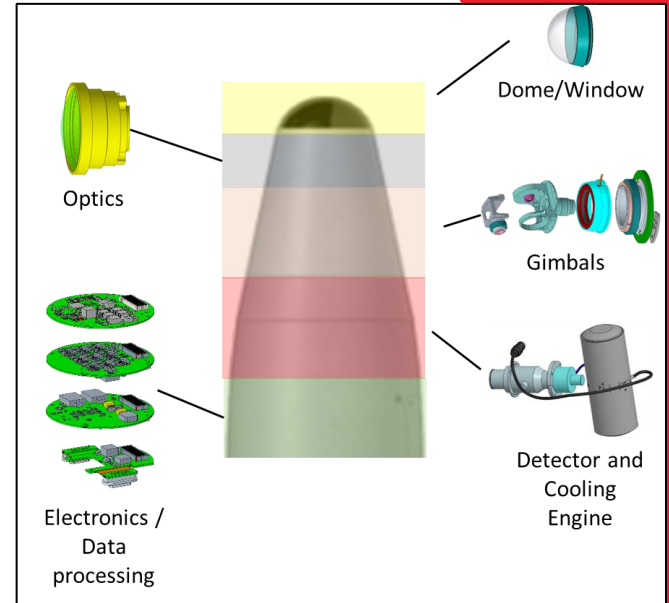
MBDA Crossbow

Low Cost Era – the challenge

- Reliance on COTS components for both time and cost reasons
- Impact on seeker and missile design, and operational impact
 - Compromise on performance but at significantly reduced cost
- This presents a number of challenges:
 - Less certainty on characteristics and performance
 - *Both in terms of “out of the box” and longer term emerging characteristics whilst embedded in a complex system*
 - Specification of interfaces/performance parameters
 - Supply chain longevity : managing obsolescence; understanding future roadmaps
 - Relatively high numbers of throughput
- Number of activities underway to mitigate this:
 - **Architectures definition** that provides a common interface into our image processing/guidance chain
 - **Cheaper/fewer components** in response to differing operational needs
 - Use of **computational imaging** to accommodate performance variation

Low Cost Era – Request to the EPIC community

- Do you have technologies or techniques that could answer some of the articulated challenges?
- Is there the opportunity for closer engagement with you, earlier in the design process?
 - Looking to better understand broader industry COTS developments
 - Engagement with Supplier Roadmaps
 - View on MBDA challenges and opportunities for future exploitation
 - Support with engagement in Defence investment frameworks
- Where can your component testing and quality processes be tuned to a low cost (& performance) system ?



End of Presentation
Thank you for your attention

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