Press Information

June 2014

BRIMSTONE

The **Brimstone** family was launched in November 1996, when the UK MoD awarded MBDA the development and production contract for the development of the principal anti-armour weapon for the UK Royal Air Force (RAF).

This weapon provides fire-and-forget launch capability from an effective stand-off range. Its millimetric wave radar seeker ensures target searching and identification operations in poor visibility and in all weather conditions. Brimstone can be fired in a number of attack profiles; direct or indirect against single targets, a column of targets or against an array of targets. The latter utilises a salvo attack capability for multiple kills per engagement. Once launched, the platform is free to manoeuvre away from the target area or engage another target array. Brimstone entered service with the RAF on 31 March 2005.

Dual Mode Brimstone (DMB) is an air-to-ground precision attack weapon initially developed by MBDA following an Urgent Operational Requirement (UOR) issued by the UK RAF for an upgrade to its existing Brimstone capability. The UOR called for a precision, low collateral damage weapon with a man-in-the-loop capability to defeat a wide range of static and fast moving targets in restrictive rules of engagement (ROE).

The DMB UOR made maximum re-use of the existing Brimstone missiles, requiring only a modification to the existing seeker and revised software. DMB's seeker concept has been developed through UK MoD and MBDA research funding and is based on the original Brimstone millimetric wave radar seeker with the addition of a sensitive Semi-Active Laser (SAL) capability and the ability to operate in single mode or in a dual SAL / RF guidance mode. The guidance mode is selectable from the cockpit to enable the missile to engage all types of target with precision.

DMB fuses the inertial navigation system, digital autopilot and the seeker RF and new SAL guidance modes simultaneously to guide the missile with an unprecedented level of agility, responsiveness and accuracy down to the threat specifically targeted by the aircraft.

Brimstone 2 will see the DMB UOR capability being incrementally enhanced to meet the RAF's Selectable Precision Effects at Range (SPEAR) Capability 2 requirement. The changes that are currently in D&M are the replacement of the missile's energetics with a new Insensitive Munition (IM) compliant warhead and rocket motor, and a new modular airframe.

Brimstone 2's new IM subsystems will enhance the missile's air carriage life and reduce the logistics footprint. Its new airframe will enhance compatibility with future platforms to increase air carriage life, and enhance the flexibility of the missile for insertion of future technologies to provide the basis for continued spiral development of the weapon.

The advanced tandem shaped charge warhead design has been proven in Afghanistan (Operation HERRICK) and Libya (Operation ELLAMY/UNIFIED PROTECTOR) to minimise collateral damage, enabling the engagement of targets in high collateral risk environments. DMB's flexibility to engage any static and fast moving ground target with lethal efficiency, combined with precision, man-in-the-loop target

discrimination, extremely localised effects and, provides a transformational capability for an air force, allowing its pilots to select a precision effect for the target even when it is in close proximity to property and non-combatant personnel.

DMB maintains the re-usable triple-missile launcher, platform interface and targeting pods of the original Brimstone weapon. Whilst the RAF's Tornado GR4 utilises the Litening III pod, DMB's SAL capability is STANAG 3733 compliant to ensure maximum compatibility with other platforms and / or future targeting capabilities. Although designed primarily as an air-launched Fast Jet weapon, the missile can be operated from a wide variety of surface vessels and vehicles, helicopters and Unmanned Air Vehicles.

Programme status

In November 1996, the UK MoD awarded the development and production contract for Brimstone. The first batch of operational missiles was delivered in November 2004 with the weapon system subsequently entering service on the RAF's Tornado GR4/4A aircraft in March 2005. Integration is also planned on its Eurofighter Typhoon and is an option for F-35 Joint Strike Fighter (referred to as JCA or Joint Combat Aircraft by the RAF) aircraft.

In October 2005, the RAF conducted a series of Brimstone evaluation trials at China Lake in the USA where 31 live Brimstone missiles were fired against a range of targets. The trials confirmed Brimstone's effectiveness against a range of different target types both static and moving.

In 2007, the RAF issued an Urgent Operational Requirement for an upgraded Brimstone weapon featuring a man-in-the-loop capability. MBDA was contracted by the UK MoD on 10th August 2007 to meet this requirement with DMB which entered service with the RAF following operational capability evaluations against a wide range of targets during October and November 2008.

The first operational sortie with DMB was carried out by the RAF in Iraq on 18th December 2008 and the first combat firing in June 2009 during operations by the RAF in Afghanistan. Since then the missile has had numerous operational firings in Afghanistan and Libya, delivering low collateral effects with extreme precision to the target location.

In March 2010, UK MoD awarded the Selective Precision Effects At Range (SPEAR) Capability 2, Block 1 D&M contract. This contract will introduce the IM warhead, IM motor, the modular airframe and an overall increase in Brimstone's performance. In October 2013, significant progress on the development programme for Brimstone 2 (or Spear 2 as the new capability missile is referred to by the UK RAF) was demonstrated with a series of successful firings from a variety of launch conditions at a number of targets moving at speed.

In June 2012, an operational Dual Mode Brimstone missile was successfully fired from an RAF Tornado GR4 against a target representing a Fast-In-Shore Attack Craft (FIAC). Similarly in May 2013, MBDA successfully carried out a surface-to-surface, rapid salvo firing of three Brimstone missiles (Maritime Brimstone) in a test scenario also representing a FIAC attack. Each of the missiles hit its intended target. Such tests provide a clear demonstration of the unmatched operational flexibility that Brimstone provides for air, naval and land based platforms. Maritime Brimstone is also being offered to customers (along with other MBDA systems – SIMBAD RC and MARTE MK2/N) within MBDA's CWSP integrated combat

system to provide fast patrol boats and logistics vessels with the means for both self defence and to secure sensitive coastal zones

At the end of 2013 and at the beginning of 2014, MBDA successfully demonstrated DMB's ability to add firepower to UCAVs. During a series of firing trials from a MQ-9 Reaper Remotely Piloted aircraft (RPA) carried out at China Lake, DMB scored nine direct hits against a range of targets including manoeuvring vehicles and vehicles moving at high speed.