Green Light for SPEAR-EW Technology Demonstrator Program – JED, November 2019

– By Richard Scott –

MBDA (Stevenage, UK), partnered by Leonardo (Luton, UK), has been awarded a Technology Demonstrator Program (TDP) contract by the UK Ministry of Defence (MOD) to develop an electronic warfare (EW)/stand-in jammer variant of its SPEAR stand-off miniature precision-strike missile.

The 12-month, £10 million SPEAR-EW TDP contract will integrate a miniaturized Digital Radio Frequency Memory (DRFM) jamming payload developed by Leonardo into the MBDA-developed SPEAR powered air vehicle. SPEAR-EW is designed to take the EW payload inside the missile engagement zone to jam threat radars and provide screening for other strike platforms.

Designed to meet the UK's Selective Precision Effects At Range Capability 3 (SPEAR Cap 3) requirement, the SPEAR weapon system is being developed by MBDA under a four-year, £411 million contract awarded by the MOD in March 2016. SPEAR Cap 3 calls for an intermediate range (>100 km) all-weather precision weapon to prosecute fixed, mobile and re-locatable targets in complex, hostile environments bound by restrictive Rules of Engagement.

The baseline SPEAR technical solution developed by MBDA is a sub-100-kg weapon featuring a Pratt & Whitney TJ-150-3 turbojet engine, flip-out wing surfaces, mid-course guidance via a combined GPS/inertial navigation subsystem (with a two-way datalink enabling mid-course updates, re-targeting and mission abort functions) and a multi-mode seeker. A "tunable" multi-effects warhead, combining precursor and penetrator

charges, is fitted to provide a capability against a range of different target sets.

Development of the SPEAR-EW stand-in jammer variant was publicly acknowledged by MBDA for the first time in April 2019. While retaining the outer mold line and mass properties of the baseline missile, the SPEAR-EW variant dispenses with the seeker package and warhead in order to accommodate additional fuel (increasing range and loiter time) and the miniaturized DRFM payload (generating jamming techniques for the suppression of enemy air defenses [SEAD]).

The objective of the current TDP is to demonstrate the maturity of the SPEAR-EW design, which has emerged from privately funded work performed by MBDA and Leonardo over the last 18-24 months. Leonardo has already undertaken chamber tests to characterize jammer performance (including beam patterns, power levels and DRFM-based techniques).

Leonardo has been working on the development of stand-in jamming technologies and techniques with the MOD for over 10 years. One part of this effort was a Capability Concept Demonstrator program, delivered in conjunction with the UK Defence Science and Technology Laboratory, which demonstrated the maturity of this sovereign stand-in jammer payload, and proved its viability as a near-term option to meet any future SEAD requirement.

The UK subsequently conducted integration of a derivative sovereign jamming payload with a Raytheon Miniature Air-Launched Decoy (MALD) vehicle at Raytheon UKÕs Harlow facility. However, *JED* understands that the EW payload for SPEAR-EW is a new development specific to the form/factor requirements of the SPEAR air vehicle (which is somewhat smaller than MALD).

SPEAR is being integrated onto the F-35B as part of the F-35 Block 4 upgrade program. In March 2019, it was announced that

BAE Systems had received initial funding from Lockheed Martin, as F-35 prime contractor, to begin integration efforts for both SPEAR and MBDA's Meteor beyond visual range air-to-air missile.

The compact size of the SPEAR family allows four weapons to be carried internally in each of the two internal weapons bays of the F-35, or three per weapon station on the Eurofighter Typhoon. SPEAR-EW will keep the same form and fit as the baseline SPEAR to enable a single integration pathway and launcher solution. ♦

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