

1<sup>st</sup> /2024 SCM

Subject No 11



**INTEGRATED AIR & MISSILE DEFENCE  
CENTRE OF EXCELLENCE**

Souda Air Base, 73100, Chania

<https://www.iamd-coe.org>



**1<sup>st</sup>/2024 Steering Committee Meeting  
POINT PAPER**

<b>Our Ref:</b>	NU. 679	Tel.:	+302821440781
		NCN:	302-615-4081
<b>Date:</b>	02 Aug 2024	Email:	<a href="mailto:info@iamd-coe.org">info@iamd-coe.org</a>

TO: See Distribution

SUBJECT: **Modern Air Combat Environment (MACE) Extended Warfare (EW) Software**

No: **11**

PURPOSE: To inform SC about the intended enhancement of M&S capabilities through the utilisation of MACE EW Software.

BACKGROUND: The general background for the IAMD COE M&S capabilities enhancement is provided in the relevant PP (No 3). More specifically, by researching NATO NATIONS synthetic training capabilities MACE has been identified as one software in use extensively in Distributed Synthetic Training (DST) activities (e.g by USAFE/HAF/NATO TLP) allowing an effective cooperation with highly accredited entities as USAFE Air Warfare Center (UAWC). Moreover, it is interoperable with hardware and software that IAMD COE possesses (e.g MICE/High Performance PC/ VARJO XR-4), a fact verified by the efficient and unproblematic use of a free provided trial version of MACE EW.

ANALYSIS & STATUS: MACE is a physics-based, full spectrum Computer Generated /Semi Automated Forces (CGF/SAF) application with a large and user-extensible order of battle, capable of many-on-many simulations yet having very high fidelity at the engagement level. MACE can simulate advanced, 5th generation systems including low observable platforms and Active and Passively Electronically Scanned Arrays (AESA and PESA radar).

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Moreover, MACE can simulate highly contested battlespaces including full Integrated Air Defense Systems (IADS) comprised of Early Warning, Acquisition, Height Finding and Target Tracking radar.

The ability to realistically simulate an IADS is a clear differentiator between MACE and simulations which rely on scripting or simplistic rules to trigger radar activity. In MACE, a complex algorithm is executed for each sensor in the battlespace.

Because of its capability to generate high-fidelity radar signals and the library of EW displays included, MACE-EW is also widely used as a stand-alone or networkable Electronic Warfare training simulation.

MACE-EW includes significant additional capabilities:

- a. Mission Rehearsal (the Propagation, Route Analysis and Flyout Tools)
- b. EW Planning – prediction of potential blue-on-blue jamming events, Propagation Tool.
- c. Creating your own MACE emitters & Manual Emitter Control (enhanced by the ability to view your beam & scan patterns).
- d. AAR/Debrief (enhanced by ability to view radar beam/scan, RCS and jamming activity).
- e. Night Vision and IR modes.
- f. Visualization of all EM activity by team and frequency (enabled by the Spectrum Viewer).
- g. MACE-based Pilot stations (enhanced by the MFD-style Tactical Awareness Display, C2 Displays, and EW Instruments).
- h. Creating your own terrains (enabled by the terrain generator plugin).
- i. Accredited Joint Fires training (enhanced by the additional 9-Lines and Call-For-Fire forms).

Taking all into account, MACE EW might support all IAMD COE transformational pillars including in surveillance, Offensive Defensive Options in Support of IAMD and Passive Air and Missile defense Focus Areas with a special interest in EW.

FINANCIAL  
CONSIDERATIONS  
& FUNDING:

Any financial impacts of the aforementioned acquisition (≈33.575 €) will be covered from the existing budget of the current year without the need for a supplementary budget as detailed in Point Paper No 12 (NU. 680/02 Aug 2024/IAMD COE).

Furthermore, any financial obligations for the following years, specifically related to optional (not mandatory) maintenance (including updates and access to support, approx. 3.500 € annually), will be planned within the shared budget of the respective Fiscal Years, without impacting the established limits and ceiling of the respective Medium-Term Financial Plan.

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RECOMMENDATIONS  
& DECISION:

Concerning the benefits that M&S offers, SACT's vision, the vision of IAMD – COE, and the proved benefits that MACE-EW will offer to all IAMD COE transformational activities, SC members are requested to note the initiation of utilising the MACE software to increase the M&S capabilities.

FOR THE IAMD COE:



B. Gen (OF-6) Nikolaos MAKRYGIANNIS GRC (AF)  
IAMD COE Director

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