

# Multi-Capable Airman Training Research for Interface Experience (MATRIX)

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MATRIX is a turnkey system that for Just in Time Training (JITT) for Multi- Capable Airman (MCA). MATRIX is a standalone system that provides the DAF with an enhanced training suite at home station, during Agile Combat Employment (ACE), and operational deployments. MATRIX utilizes an Open Architecture (OA) approach to integrate the right hardware, software, technology, and HMIs. MATRIX's preliminary system delivers rapid and comprehensive training implementing Multi-Modal HMI, Generative AI, Mixed Reality (MR) Applications, and traditional 2D applications.

MATRIX employs a user-centered design philosophy to provide MCA an initial operations capability as quickly as possible. During extensive end user interviews, S2RC identified the challenges and pain points shared by MCA and DoD personnel. Our research also incorporated knowledge gathered by studies and assessments of ACE and MCA by other organizations. S2RC's approach addresses

## Challenge

### Lack of MCA Training Standardization:

This challenge is twofold. First, MCA training varies greatly by unit. Second, MCA lack standardization across equipment, i.e. no AR headset has been selected as the MCA standard.

## MATRIX Approach & Solution

MATRIX harnesses the full potential of OA. Common filetypes, and common APIs create a modular and scalable framework. This flexibility enables seamless integration and futureproofs against the rapidly evolving technological landscape. MATRIX's methodology integrates existing software, content, and content creation tools to enable units training specific to their unique needs.

### Lack of MCA Training Equipment:

A critical concern for ACE is the lack of financial resources, equipment, and personnel to implement MCA training. A RAND study found "most wing-level MCA programs do not have their own equipment, or at least enough equipment, and thus rely on borrowing from various units on base. Accordingly, multiple wings reported difficulties securing equipment—particularly communications equipment—for MCA training and exercises."

MATRIX includes hardware dedicated to MCA training, alleviating the hardware burden on Wings. MATRIX's inclusion of digital twins reduces the operational hardware needed for training, such as communications systems that are often deployed.

**Limited User Interface Options:**

No Multi-Modal HMI exists to allow MCA to control MR and other devices. This severely hinders both training and user experience

**Lack of DDIL Mitigation:**

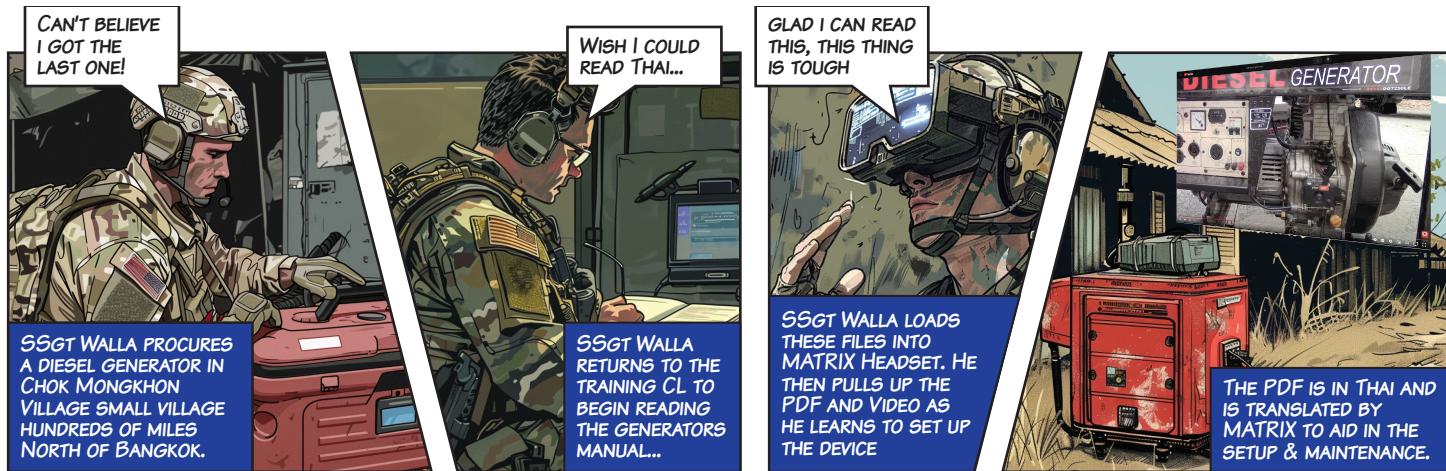
Fielded training systems require cloud connectivity. MATRIX does not.

**MATRIX Approach and Solution:** With MATRIX end users can select their preferred HMI, or combination of HMIs, to meet their training tasks' unique needs. MATRIX's integration of OpenXR invites future HMI options, as opposed to the limitations and expiration dates of a proprietary interface.

**MATRIX Approach and Solution:** MATRIX's Connectivity PACE plan enables a graceful degradation of capabilities. MATRIX offers reachback support via the cloud, extending to offline training and the capacity to create physical copies of instructions.

**Use Case**

User acquires a generator from a host nation and utilizes MATRIX to aid in the setup of the generator.

**The System**

MATRIX has two setups which also come with the MATRIX Software Suite. The MATRIX Software Suite is part of the system and there are no additional licensing or annual fees.

