



Next-gen Military Synthetic Training

Run virtual simulations in a truly life-like environment and bring military personnel such as soldiers, pilots, drivers, or gunners as close to reality as possible. VRgineers' Military Synthetic Training systems are deployable across geo-regions and across military echelons, enabled by XTAL virtual and mixed reality technology.



XTAL

A nation's military readiness to successfully execute their missions is measured in terms of manpower, materiel, and training. Training is especially critical as it is the process by which military forces unite organized manpower and materiel within a doctrinal framework to attain levels of repeatable performance that will dictate the difference between mission success and failure.

The most advanced military forces worldwide are currently debating how to handle growing battlespace complexity and rapidly advancing force-enabling technologies. Live training for both new recruits and experienced warfighters (to maintain currency) often incurs costs, risks, and time that are increasingly valuable resources which need to be optimally allocated to ensure force readiness.

The US DOD stands at the forefront of the strategic effort to incorporate next-generation, highly immersive and broadly accessible synthetic and reconfigurable global training solutions, enabling on-demand training across echelons, at the point of need, and with ease of installation and operation.

Current State of Military Training

Current Live, Virtual, and Constructive (LVC) training solutions are losing pace with the rapidly evolving needs of modern military forces. Live trainings remain the pinnacle of real-life mission simulation and will remain an integral part of an effective training program; however, with the increasing complexity and diversity of modern military equipment, weaponry, and theaters of war (e.g., megacities), live trainings are increasingly difficult to execute at a truly representative scale due to the associated cost, logistics, safety, and security concerns. For example, reproducing the threat density of modern combat environments is not only costly, but may also be entirely unfeasible or risk exposure of classified technology or TTPs.

Virtual and Constructive trainings are intended to overcome the shortfalls of Live training solutions. However, current generation synthetic training solutions are inadequate (as evidenced by significant investments to overhaul these solutions such as the Army's Synthetic Training Environment (STE) program) on several key dimensions which limit their efficiency and effectiveness. For example:

- **Insufficient authenticity** due to low graphical detail, restricted fields of view (FOV), and/or limitations in the case of 2D monitors being used to visualize the 3D world may contribute to lower levels of immersion and retention, failing to cognitively transport a trainee to the simulated training environment.
- **Prohibitive costs** for installation, operation, and maintenance of dome systems, considerable space requirements, lack of mobility, and vendor-locked technology result in burdensome cost of ownership for solutions that limit trainee accessibility and throughput.
- **Difficult scalability.** Most current synthetic training systems rely on black box proprietary software which makes interoperability a costly, if not impossible, venture. This limits the scale at which multi-domain operation training, globally distributed training, and point of need training can be executed.

- **Narrow Training Focus.** Single-purpose trainers fail to offer multi-faceted skill training options, requiring additional costs, resources, and time to address training and currency needs.

XTAL Synthetic training technology

Warfighter decision making, awareness, performance, and ultimately readiness have all been proven to improve through training repetition. A critical aspect of modern synthetic training is the realism of the content, as judged by its ability to cognitively immerse and transport the trainee into the synthetic training environment.

A training system capable of achieving deep immersion and instilling a true sense of cognitive transport will yield the most transferable training experience.



To address the shortcomings of current virtual and constructive training solutions, and to drive the transition to next-generation synthetic training, VRG has developed the XTAL Virtual and Mixed reality headset. XTAL can visualize the most advanced synthetic training environments in true-to-life detail to support:

- ✓ **Increased learning efficiency due to the total immersion enabled by XTAL's high-res and wide-FOV VR/MR display.** The highest efficiency of training is achieved when the trainee is totally immersed. XTAL offers industry-leading 8K display resolution and 180° FOV with a 75 Hz refresh rate.
- ✓ **True-to-life Situational awareness training** enabled by XTAL's wide FOV combined with advanced algorithms that eliminate visual distortions common in competing headsets, makes it possible for trainees to fully leverage their visual field as they will during live mission operations.

- ✓ **Scalability.** XTAL is well suited to be sourced by military branches as an independent front-end visualization device, preventing vendor-lock situations and optimizing costs. It gives the military the capability for it to be rapidly deployed at the point of need.
- ✓ **Multi-purpose visualization device** reducing costs even further as it is suitable to be deployed in next-gen synthetic training scenarios for dismounted and mounted, pilot, and RPA simulators.

Military Synthetic Training

Military customers world-wide trust in our industry-leading VR expertise and turn to us with their requirements for design, integration and delivery of synthetic training solutions. We are capable of not only building Military Synthetic Training (MiST) systems which address their pain points and increase their training capability. We also partner with experienced military instructors to provide our customers with relevant training curricula.

Our MiST systems capable of:

- ✓ **Increasing the training capability** of armed forces. More operators and pilots will have access to training, with lower training costs.
- ✓ **A wide range of solutions.** Offering MiST systems ranging from low-cost, rapid setup solutions to state-of-the-art Full flight MR, 360° motion platform trainers.
- ✓ **Rapid reconfiguration** to support a wide range of rotary and fixed-wing aircraft, ground vehicles, unmanned systems, and dismounted warfighters, all with the ability to network trainee endpoints.
- ✓ **Lower cost** of acquisition, operation, maintenance, and transportation, thanks to minimal SWAP dimensions and a modular design including several COTS components.
- ✓ **Future-proof.** Modular MiST design enables upgrades as technologies advance.
- ✓ **Rapid lead times** to deploy new training solutions at the point of need on demand.

"Flying the XTAL in a full motion hydraulic sim and rolling in on a low-level bombing run literally felt like I was back in the cockpit, heart rate elevated, mental focus 100% on threat avoidance and target acquisition –incredible."

Bryant Church
Former US Naval Aviator

MiST systems Use cases

AERIAL



Fixed-wing aircraft



Rotary-wing aircraft



UAV

GROUND



Dismounted warfighter



Armoured vehicle



UGV

Consult with us

The importance of effective, efficient, and accessible training to ensure operational force readiness is a persistent and increasingly challenging need for modern militaries.

Only a state-of-the-art synthetic training system which can deeply immerse and transport a trainee to a virtual battlespace will provide the greatest opportunity to achieve a scalable solution for achieving training that can truly transfer to real-world operations. As defense budgets shrink and fall under greater scrutiny, multifaceted training systems which can drive mastery of skills across the warfighting spectrum will be the path to force readiness.

We can provide you with the MiST solution to address your requirements, fit your budget, and prepare your forces by adapting our proven TRL 9 MiST XTAL technology to cater to your training needs.

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