



Dry Electrode Flight Helmet Integrated EEG System (DEFIES)

EEG Integrated into a Flight Helmet

DEFIES embeds QUASAR's high-fidelity dry EEG sensors into the HGU-68/P flight helmet to provide real-time brain monitoring for military aviators in operational environments. DEFIES integrates the Sensor Artifact and Noise Reduction Algorithm (SANOra), which automatically removes motion, sweat, and electromagnetic artifacts, making EEG signals interpretable in flight where conventional EEG fails. By combining robust hardware, artifact-resistant electrodes, and SANOra, DEFIES delivers reliable neural data for monitoring fatigue, hypoxia, and loss of consciousness risk during high-demand missions.

DEFIES Benefits

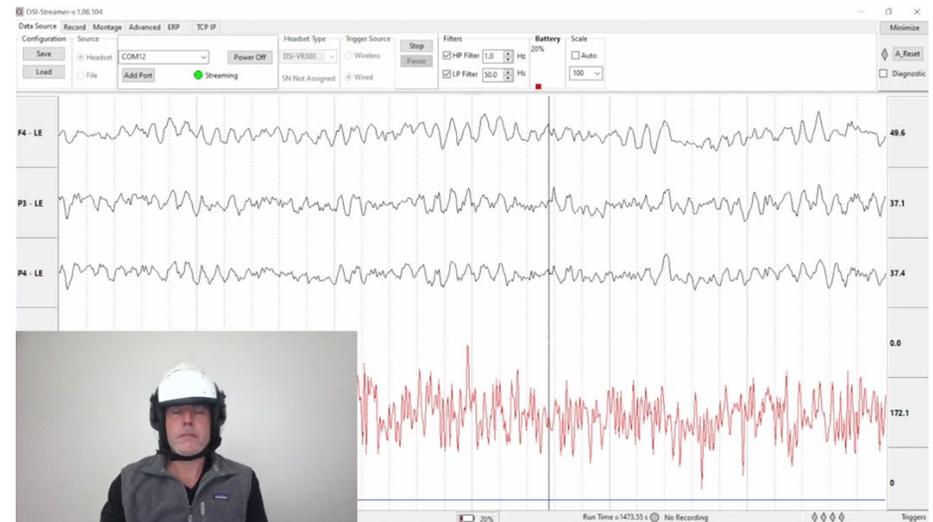
Actionable EEG in flight – SANOra transforms noisy in-flight EEG into usable signals for mission-critical decision support.

Operational safety – Detects physiological degradation related to fatigue, hypoxia, and G-LOC to enhance aviator survivability.

Mission-ready integration – Engineered to pass MIL-H-85025A helmet impact and EMI safety standards.

Research and training value – Provides a dataset for aeromedical research and pilot training in real-world conditions.

DEFIES in Use



Your Applications

QUASAR, an experienced DoD contractor, is developing DEFIES under DHA SBIR funding. DEFIES is in Phase II development and is projected to reach TRL 6 at completion. Applications include:

- In-flight EEG for fatigue and hypoxia monitoring
- Artifact-free EEG for simulator-based pilot training
- Operator state research in military environments
- Integration with future closed-loop mitigation systems