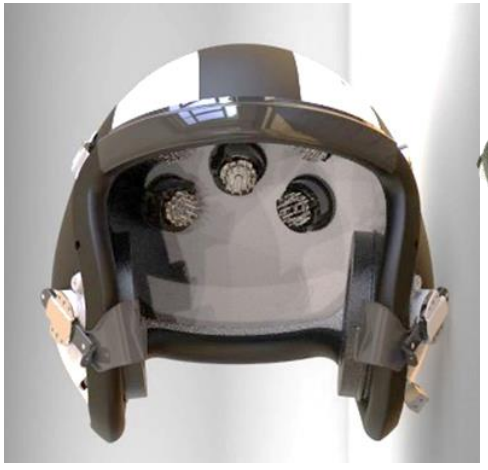
Cognitive Health, Impact, and Physiological Sensor (CHIPS) Helmet

Sensing Integrated into HGU-56/P Helmets

The CHIPS system is an operator state monitoring (OSM) platform designed for rotary-wing aviators integrating functional near-infrared spectroscopy (fNIRS), EEG, ballistic impact detection, skin temperature, ECG, and respiration sensors within a flight helmet to deliver continuous, high-fidelity, mission-relevant monitoring of physiological and cognitive status and interpretable outputs, such as workload, stress, fatigue, and vital signs.

By combining multimodal sensing, CHIPS is engineered to enhance mission readiness, reduce operational risk, and support data-driven aeromedical research for the warfighter.

CHIPS in Use



CHIPS Benefits

CHIPS will provide monitoring of the physiological status of pilots and aircrew, enabling early detection of degraded operator performance, enhancing aviator safety.

CHIPS can be used for the early detection of hypoxia and potential loss of consciousness under high-G or operational stress, improving aviator safety and mission readiness. Its multimodal sensor suite enables real-time OSM for supervised autonomy and has the potential to create a high-value dataset to support training, research, and future aeromedical innovations.

Your Applications

QUASAR, an experienced DoD contractor, is developing CHIPS under DHA SBIR funding. CHIPS is in the first year of a two-year Phase II development effort and is projected to reach TRL 6 upon completion.

The modular CHIPS platform can be adapted for:

- Pilot training
- In-flight physiological monitoring
- Human performance research

QUASAR can also support collaborations with academic or commercial partners to integrate CHIPS into specialized research, leasing, or system customization efforts.

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