# ORB DYNAMICS LLC

Dual-Use Wearable Systems • Air-Gapped AI • Microkernel Security • Tactical Sensing

**COMPANY OVERVIEW:** ORB Dynamics LLC develops dual-use, air-gapped hardware ecosystems engineered for continuous operation in disconnected, intermittent, and low-bandwidth (DIL) environments. Based in Virginia, we bridge advanced research with deployable, ruggedized systems—delivering sovereign, localized AI, microkernel architectures, and resilient edge hardware for defense, industrial, and commercial operators.

## CORE COMPETENCIES

**Autonomous Edge AI Deployment:** LiminalWare Ecosystem delivering air-gapped, decentralized compute and local LLM inference for off-grid tactical intelligence without cloud dependency.

**High-Assurance Microkernel Architecture:** Sandboxed embedded architectures using BlackBerry QNX and seL4 for deterministic performance and verifiable isolation.

**Multispectral Wearable Sensing:** Modular sensor buses (PipGlove telemetry interface) integrating RF, acoustic, thermal, optical, and CBRN telemetry for real-time situational awareness.

**Low-Latency Tactical Data Links:** Zenoh and Cyclone DDS over ad-hoc Wi-Fi 6E/7, UWB, and mesh networks for secure node-to-console telemetry.

**Dual-Use Hardware Engineering:** Scalable, manufacturable platforms supporting mission profiles and commercial productization.

## DIFFERENTIATORS

**DFARS 252.227-7018 Compliance:** Architectural data rights protection ensuring all AI models, firmware, and edge IP remain sovereign.

**Air-Gapped Sovereign Compute:** 100% offline workflows eliminating cloud exposure, telemetry leakage, and external vendor dependencies.

**Commercial Scalability:** Crossover design ensuring continuous private-sector revenue and resilient, non-grant-dependent supply chains.

**Integrated Holding IP Structure:** Separation of operational R&D (ORB Dynamics) from asset licensing and patent protection (ORB Solutions LLC).

## CURRENT R&D & PAST PERFORMANCE

**SBIR Track B Preparation:** Prototyping PipGlove multispectral telemetry, local AI stack (Ollama/AnythingLLM), and compute testbenches.

**Wearable Ecosystem:** Ongoing modular development of Night Shades, Viceroy Gauntlet, VVM Belt, and VXE OS.

**Intellectual Property Portfolio:** Multiple provisional patents filed under ORB Solutions LLC covering wearable compute, sensing buses, and distributed microkernels.

## COMPANY DATA

**Entity:** ORB Dynamics LLC

**Parent IP:** ORB Solutions LLC

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**UEI / CAGE:** Pending Validation

## NAICS CODES

- **541715** (Primary) - R&D in Physical, Engineering & Life Sciences
- **541330** - Engineering Services
- **334511** - Navigation, Guidance & Detection Instruments
- **334118** - Computer Terminal & Peripheral Mfg
- **541512** - Computer Systems Design