JOSEPH OTT

Human Systems Integration Technical Authority | Engineering Manager | Expert Witness
Aerospace, Aviation, Defense, and Spaceflight Human Factors
Top Secret (TS) Clearance
FAA Private Pilot | 130+ Flight Hours
email: aero.workpro@proton.me

PROFESSIONAL SUMMARY

Human factors engineering and human systems integration expert with 12+ years of experience in safety-critical aerospace, aviation, and defense systems. Specializes in aviation cockpit and flight deck design, pilot error and human error analysis, aviation accident investigation, root cause analysis, FMEA, UAV/UAS ground control station design, and crew interface engineering for human-rated spacecraft. Three US patents on aircraft pilot interface technologies. Two peer-reviewed publications on aviation human factors. FAA licensed private pilot. Direct operational experience with NASA astronaut crews, DoD customers, and international defense programs. Full lifecycle engineering expertise from requirements through design, test, certification, and delivery. Experienced in patent litigation support for aerospace interface technologies.

Areas of Expert Specialization: Aviation Human Factors and Cockpit Design | Pilot Error and Human Error Analysis | Aviation Accident Investigation and Root Cause Analysis | Failure Mode and Effects Analysis (FMEA) | UAV/UAS Ground Control Station Design and Operator Performance | Flight Deck Display Interface Design | Crew Interface Design for Human-Rated Spacecraft | Task Analysis and Workload Assessment | Usability Evaluation and Human-in-the-Loop Testing | Anthropometric and Biomechanical Analysis | Safety Risk Assessment | Aerospace Product Liability | Patent Analysis (Aircraft Pilot Interface Technology) | NASA-STD-3001 and MIL-STD-1472G Compliance | FAA Human Factors Regulatory Standards | eVTOL and Advanced Air Mobility Human Factors

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PROFESSIONAL EXPERIENCE

Northrop Grumman — Tactical Space Division | 2019–Present

Human Systems Integration Technical Authority / Engineering Manager

Human Systems Integration Technical Authority and Engineering Manager

Programs: NASA Artemis Lunar Gateway (HALO Module), Ground Based Strategic Deterrent/Sentinel (ICBM Modernization), US Space Command

- Served as primary Human Systems Integration authority for NASA Lunar Gateway HALO module, responsible for all human factors engineering analysis, crew interface design, and human error controls across the vehicle
- Led systematic human error analysis, task analysis, and workload assessment for safety-critical crew operations, including IVA, EVA, robotic workstation operation, and cargo handling
- Conducted Failure Mode and Effects Analysis (FMEA) and root cause analysis for crew interface systems and operational procedures
- Planned and executed human-in-the-loop (HITL) test campaigns with astronaut crews using full-scale mockups, virtual reality simulation, motion capture, and rapid prototyping to validate crew interface designs
- Developed and owned all system-level requirements for crew interface compliance with NASA-STD-3001 and anthropometric, biomechanical, and crew loading constraints for lunar mission profiles
- Served as primary authority on requirements deviations and waivers from NASA Level 2 customer requirements
- Performed anthropometric analysis and crew loads assessment for EVA crew interfaces including spacesuit-constrained operations, translation corridors, handrails, tether points, and tool interfaces
- Designed and validated robotic workstation configurations for Canadarm3 operations through hands-on evaluation at NASA Neutral Buoyancy Laboratory and simulation facilities
- Authored NASA contract deliverables including Task and Error Analysis, Workload Assessment (NASA-TLX, Bedford Scale), System Usability Scale evaluations, anthropometric and crew loads reports, worksite lighting and acoustics analyses, and vibration exposure assessments

- Coordinated flight hardware development through full lifecycle: design, procurement, fabrication, environmental testing (vibration, acoustics, radiation, atmospheric), certification, and delivery
- Conducted hardware troubleshooting and root cause investigation on development, qualification, and test support articles
- Performed CAD-based design review and anthropometric/operational analysis using NX, Jack 3D, Rhino, Blender, and Creo
- Managed cost, schedule, and risk across matrix engineering teams; authored basis of estimates and maintained cross-cutting risk registers
- Direct interface with NASA program management, ISS and Orion program representatives, NASA Human Factors and HMTA organizations, and astronaut end-users at Johnson Space Center
- Participated in technical evaluation committees for crew systems across multiple JSC organizations
- Developed concept of operations, crew task sequencing, operational constraints, and training inputs for Mission Operations

HSI Proposal Lead — Lunar Terrain Vehicle (LTV) | *2021—2023*

Northrop Grumman partnership with Intuitive Machines, Lunar Outpost, and Michelin

- Sole Human Systems Integration subject matter expert through Preliminary Design Review for NASA Lunar Terrain Vehicle proposal (Northrop Grumman partnership with Intuitive Machines, Lunar Outpost, and Michelin)
- Defined EVA crew interface requirements: mount/dismount, tool interfaces, and crew commonality across lunar architecture
- Developed complete HSI verification strategy, HITL test planning, and verification activity definitions
- Delivered full human factors engineering documentation package with integrated cost, schedule, and risk analysis

Human Factors Research Laboratory Oversight

- Technical oversight of HIVE Virtual Reality/Augmented Reality Laboratory and HabLab full-scale reconfigurable habitat mockup facility
- Converted engineering trade studies into proposals supported by human performance data and virtual prototyping results

Northrop Grumman — Aerospace Division | 2014–2019

Lead Human Factors Engineer — UAV/UAS Ground Control Stations

ROK Program (International Customer)

- Led Cognitive Walkthrough Group planning, execution, and reporting for ground control station operator interface evaluation
- Managed cross-functional integrated product team and full MIL-STD-1472G compliance program
- Authored complete human factors engineering documentation suite: Basis of Estimates, Human Engineering Program Plan, Human Interface Analysis, Usability Interface Analysis, and Contract Data Requirements List deliverables
- Primary interface with international customer; flowed human factors requirements to subcontractors

Triton (US Navy)

- Developed Human Engineering Test Plan matrices and verification definitions for unmanned maritime patrol aircraft ground control station
- Authored Interface Requirements Specifications with full engineering traceability via IBM DOORS
- Supported systems engineering and system safety analysis

JMPS (USAF)

- Designed and executed operator usability testing for mission planning software
- Coordinated stakeholder reviews for human factors assessments, reports, and contract deliverables

Human Factors Proposal Lead

Ground Based Strategic Deterrent (GBSD/Sentinel)

- Authored all human factors engineering proposals and initial deliverable drafts for ICBM operator and maintainer human systems integration
- Defined human factors requirements and analysis approach for nuclear deterrence system operators and field maintenance personnel

Human Systems Integration Engineer — US Space Command / US Air Force — EPS CAPS Program

Enhanced Polar System Control and Planning Segment

- Conducted operator-in-the-loop usability evaluations of software and hardware systems for space command applications
- Performed Task Analysis and Workload Analysis per MIL-STD-1472G
- Direct customer and operator interface for system optimization based on human performance findings

NASA Flight Deck Display Research Lab — Human Systems Integration Division | 2012–2014

Human Factors Engineer

- Conducted research on aviation cockpit interface technologies, flight deck display design, and pilot performance evaluation
- Performed requirements decomposition and allocation for flight deck display systems
- Evaluated prototype cockpit interfaces through operator-in-the-loop simulation
- Authored technical research reports for NASA stakeholders

Honeywell Aerospace — Human Factors Center of Excellence | 2012–2013

Human Factors Engineer

- Conducted multi-configuration flight simulator research for NASA, FAA, and DARPA programs
- Developed complex flight system interfaces and evaluated pilot interaction with novel cockpit technologies
- Research contributed to three awarded US patents on aircraft pilot interface technologies

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PATENTS

- US Patent 14/079,445: Aircraft pilot interface technology (Honeywell EGTS)
- US Patent 14/141,150: Aircraft pilot interface technology (Honeywell EGTS)
- US Patent 14/163,332: Aircraft pilot interface technology (Honeywell EGTS)

EDUCATION

- Master of Science (M.S.), Human Factors and Ergonomics Engineering | San Jose State University, 2014
- Bachelor of Science (B.S.), Human Factors (Systems Engineering Focus), Minor: Aviation Systems Safety | Embry-Riddle Aeronautical University, 2011

PEER-REVIEWED PUBLICATIONS

- Ott, J., Adams, S., Miller, L. (2022). Artemis's HALO as a Use Case for Designing Against Human Error in Deep Space. International Astronautical Congress, Paris.
- Ott, J. T. (2015). Well Clear: General Aviation and Commercial Pilots' Perception of UAVs in the National Airspace System. HFES Annual Meeting.

ADDITIONAL QUALIFICATIONS

Private Pilot (130+ hrs) | DOORS, NX, CATIA, JACK 3D, Rhino, Blender, SharePoint, MS Office | Field ops at MCC-H, NBL, simulator facilities | Experience across multiple NASA organizations and JSC centers | AI Tools (Claude, CoPilot, Gemini, ChatGPT, many others)