

Richard P. Anderson

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Professor of Aerospace Engineering and Director of the Eagle Flight Research Center Embry-Riddle Aeronautical University

BIOGRAPHICAL SUMMARY:

Dr. Anderson works in the area of new technologies including vehicle concepts, alternative aircraft propulsion, advanced flight controls, learn-to-fly and novel certification strategies. He was the advisor for the World's first piston gas/electric hybrid aircraft, the EcoEagle, designed by students and flown in NASA's Green Flight Challenge. In 2012, he was awarded Florida State University Professor of the Year by The Carnegie Foundation. He has been the recipient of Embry-Riddle's Researcher of the Year and the Lindbergh Foundation's Electric Propulsion Innovation Prize. Dr. Anderson has advanced degrees in Mechanical and Aerospace Engineering and holds an airline transport pilot rating, certified flight instructor rating for airplanes (land and sea), instrument airplanes, multi-engine, gliders and helicopters and an airframe & powerplant mechanic rating with inspection authorization. Pat Anderson is currently a Professor of Aerospace Engineering and the Director of the Eagle Flight Research Center at Embry-Riddle Aeronautical University.

EDUCATION:

Doctor of Philosophy in Mechanical, Materials and Aerospace Engineering (2003)
Master of Science in Aerospace Engineering (1993)
Bachelor of Science in Aerospace Engineering (1991)

The University of Central Florida
The Pennsylvania State University
The Pennsylvania State University

AERONAUTICAL EXPERIENCE:

- Airline Transport Pilot (ATP-A), Certified Flight Instructor (CFI-AGMIH), Commercial Pilot (C-A(L&S)GMIH), Ground Instructor (BGI): PIC in 75 different aircraft, 65 types flown solo.
- FAA certified aviation airframe and powerplant mechanic (A&P) with inspection authorization (IA).

PROFESSIONAL EXPERIENCE:

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| Embry-Riddle Aeronautical University | 1996-Present |
| 2011- | Tenured Professor and Director of the Eagle Flight Research Center |
| 2006-2011 | Tenured Associate Professor and Director of the Eagle Flight Research Center |
| 2003 –2006 | Assistant Professor |
| 1997-2003 | Engineering Instructor |
| 1996-1997 | Instructor Pilot |

- Lead the Eagle Flight Research Center to a 15x growth over the past 5 years.
- \$8M in research funding in the past five years including a Boeing Hybrid Contract for \$2.5M.
- Flight of the World's first manned parallel hybrid Gas/Battery aircraft, the Eco Eagle in NASA's GFC.
- The formation of an industry consortium on hybrid electric propulsion research.
- Leading research in the area of eVTOL, propulsive electric motors, motor controllers, prop-rotors, batteries, battery management, battery weight fractions, fly-by-wire, control laws, safety and certification.
- Teaching duties include graduate courses in advanced aerodynamics, aircraft controls and eVTOL design.

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| Eagle Sport Aviation Club | 1998-Present |
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Founder and Chairman of the Board

- This 501(c)3 organization promotes education through the use of aeronautical experiences.
- There are four divisions: aerobatics, tailwheel (antique military), soaring (gliders) and conventional aircraft.
- This Club is the largest aircraft owning competition aerobatic organization in the United States.
- 20 years of operating non-traditional aircraft with an accident free record.

SELECT PUBLICATIONS:

Juan M. Rosales Fajardo and Richard Anderson. "Gas-Battery vs. Gas-Only Serial Hybrid Propulsion System Comparison", AIAA Scitech 2019 Forum, AIAA SciTech Forum, (AIAA 2019-1673)

Noriega, Alfonso, Balas, Mark J., Anderson, Richard P., "Robust Adaptive Control of a Weakly Minimum Phase General Aviation Aircraft", Complex Adaptive Systems, Publication 6, Los Angeles, CA 2016. 95 (2016) 497 – 506

Noriega, Alfonso, Balas, Mark J., Anderson, Richard P., "Sensor Blending with an Application of a Non-Minimum Phase Aircraft", AIAA, Grapevine, TX, USA, January 2017. AIAA 2017-1893

Marwa, Milton, Martin Scott, M., Martos, Borja C., Anderson, Richard P., "Analytical and Numeric Forms for the Performance of Propeller-Powered Electric and Hybrid Aircraft", AIAA, Grapevine, TX, USA, January 2017. AIAA 2017-0211

SELECT PATENTS:

Gartenberg, L., Anderson, R., Martos, B., Inventors, Systems and Methods for Noise Mitigation for Hybrid and Electric Aircraft, US 2018/0327081, Patent Pending.

Anderson, R., Costello, L., Eastlake, C., Greiner, G., Inventors, Hybrid assembly for an aircraft. US Patent, 9,102,326. 2015 and European Patent, EP 2 946 524 B1.

Anderson; R., Eastlake; C., Gonitzke; M., Greiner; G., Inventors, Hybrid clutch assembly for an aircraft. US Patent 9,254,922. 2014.

SYNERGISTIC ACTIVITIES:

Chairman – General Aviation Manufacturers Association (GAMA) – Electric Propulsion Committee

- This committee is comprised of most large aerospace OEMs and the emerging electric aircraft innovation companies.
- Embry-Riddle Aeronautical University is the only academic member of this organization.

Founder and Principal Investigator – The Hybrid Electric Propulsion Consortium

- The organization is performing precompetitive research in the area of electrified propulsion for large scale aircraft.
- Contributing industry partners include: Boeing, Airbus, Rolls-Royce, GE, Textron (Cessna, Bell Helicopter, Lycoming and Beechcraft), Hartzell, Honeywell, Aviation and CapeAir.
- Non-industry partners: The Argonne National Laboratory Energy Systems Division, GAMA.

SELECT ACADEMIC WORKS:

Thesis/Dissertation Advisor

- PhD Committee Chairman – Alfonso Noriega, "Safety Assurance of Non-Deterministic Flight Controllers", internal support. First Aerospace Engineering PhD awarded at Embry-Riddle Aeronautical University. 2016.
- MS Committee Chairman – Xavier Santaeruz, "Low-Tip-Mach High-Torque Prop-Rotor Noise Approximation for Design Cycle Analysis", ERAU internal. Expected 2019.
- MS Committee Chairman – Thomas Graham, "Urban Air Mobility Rotor Aeroacoustics Experiments for Quiet eVTOL", ERAU internal. Expected 2019.
- MS Committee Chairman – Agustin Giovagnoli, "Control Driven Scaling Effects of Motors and Rotors for Urban Air Mobility Designs", Verdego support. 2018.
- MS Committee Chairman – Tianyuan Zhao, "Propulsive Battery Pack Sizing for Aviation Applications", US Department of Interior support. 2018.
- MS Committee Chairman – Jingsi Lilly, "Aviation Propulsive Lithium-Ion Battery Packs State-of-Charge, State-of-Health Estimation and Propulsive Battery System Weight Analysis", Department of Interior support. 2017.
- MS Committee Chairman – Lenny Gartenberg, "Battery Centric Serial Hybrid Aircraft Performance and Design Space", Hybrid Consortium support (Boeing, Airbus, RR, GE and others). 2017.
- MS Committee Chairman – Milton Marawa, "Analytic and Numeric Forms of Range and Endurance for Hybrid and Electric Aircraft", Hybrid Consortium support (Boeing, Airbus, RR, GE and others). 2017.
- MS Committee Chairman – Francois Hugon, "Adjustment of the Inceptor Trim Position to Provide Positive Speed Stability in an Augmented Longitudinal Control Law", Joint Gulfstream/ERAU Master's program. 2013.
- MS Committee Chairman – Robert Hartley, "Design and Analysis of a Full Augmentation Lateral-Directional Feedback Control Law for High Speed Transport Aircraft", Joint Gulfstream/ERAU Master's program. 2013.