

Denver Paul

PROFILE

Year 12 student (completing December 2026) in Mathematical Methods, Specialist Mathematics, Physics and Aerospace Systems, working toward aerospace engineering. Holds a CASA Remote Pilot Licence and a Certificate III in Aviation (Remote Pilot). Turns open-ended engineering questions into numbers: scoring options in matrices, checking models against flight data, and stating the limits of the evidence.

EDUCATION AND CREDENTIALS

Coolum State High School	Year 12, 2021–2026. Mathematical Methods, Specialist Mathematics, Physics, Aerospace Systems, Legal Studies, English.
Assessment highlights	Internal assessments, 2026: Aerospace Systems IA3 23/25 · Physics IA2 18/20 · Mathematical Methods IA1 19/20 · Specialist Mathematics IA1 20/20 · English IA1 25/25
Licences	CASA Remote Pilot Licence (RePL), issued Dec 2024: up to 25 kg, automatic and manual flight modes, 20-module course. Eligible to fly as a remote pilot under a ReOC holder. Queensland P1 driver licence.
Qualification	AVI30419 Certificate III in Aviation (Remote Pilot), Skills Generation, completed 2024.
Awards	Referee of the Season, Noosa Basketball (2026) · Junior Representative Referee of the Year (2024) · Gold Award for Year 12 Academic Excellence (2026) · Platinum Music Award

ENGINEERING PROJECTS

Solar Sail Propulsion Feasibility · Physics investigation Aug 2026

- Tested whether photon momentum gives usable deep-space thrust by cross-checking a solar-pressure model, JAXA IKAROS flight data and a torsion-pendulum study: measured thrust of **1.12 mN** sat **~38% below** the **~1.8 mN** ideal, the same order of magnitude, explained by sail reflectivity and orientation.
- Computed radiation pressure at nine distances (0.39–39 AU), **6.1×10^{-5} to 5.9×10^{-9} Pa**, showing the inverse-square falloff and supporting a perihelion-boost profile.

F/A-18 Safety and Reliability Upgrade · Aerospace Systems report May 2026

- Recommended four layered upgrades for the RAAF fleet, each tied to a documented crash pathway: Ti-575 hub alloy (**+88%** fracture toughness, dwell-life debit **10× to 1–2×**), helmet display field of view **20° to 40°**, weather profiles **1.4 to 225 per day**, and fatigue prediction with a 90% planning target. Selected from 4 engines, 4 radars, 4 alloys, 3 displays and 3 fatigue models using PMI tables and ranking matrices.

Emergency Rescue Rocket Redesign · Aerospace Systems Jul 2025

- Designed a ravine-deployed beacon rocket against four success criteria and flew a prototype with the clipped-delta fins to **68 m** (target above 96 m). Fins chosen for **92 N less drag** than rectangular fins at Mach 2.5 (published CFD data); specified an ideal-case carbon-fibre tube (**1,035 MPa**) and dual-trigger parachute (altimeter plus timer).

Sunshine Coast Airport Noise Abatement · Aerospace Systems report Feb 2026

- Scored nine noise-reduction options in weighted matrices (weather data, infrastructure, residential protection): Spire Aviation **27/30** vs current BOM practice **12/30**, sound barriers **10–15 dB**, acoustic windows **26/30**. Proposed an ICAO Annex 16 mandate for sound barriers.

Magnetic Force vs Wire Angle · Physics experiment May 2026

- Verified $F = BIL\sin\theta$ with 5 trials at each 10° step across 360° on a 3D-printed magnet fixture: **$R^2 = 0.9917$** , experimental gradient about **12% below** theory, attributed to damaged magnets, edge effects and manual rotation.

EXPERIENCE

Referee · Basketball Queensland, Sunshine Coast Phoenix Sep 2022 – present

- Officiate about **95 competitive junior games per season**, making real-time rulings under pressure from players, coaches and spectators and explaining calls against the rules. Mentored about **12 new referees**.

Work experience · McDermott Aviation 1 week, Year 10

- Prepared aircraft body panels for painting and helped drain fuel from a helicopter, following site safety procedures. Worked in the paint mixing area and controlled-environment paint room, observing its access, cleanliness and handling rules.

SKILLS

Engineering	Desmos, Excel (scoring matrices, data analysis); basic: OpenRocket, Logger Pro, Visual Studio Code
Creative	Adobe Lightroom, Photoshop and Premiere Pro; Microsoft Office

MUSIC AND COMMUNITY

State Honours Ensemble Program (Queensland 2025–26, Sunshine Coast 2021–24). Lead trombone, Wind Symphony 2021–26 and Sunshine Coast Youth Orchestra 2021–22. AMEB Grade 5. Triathlon volunteer, Noosa District Basketball Association. References available on request.