

JACOB CHISUM

Mechanical Engineering Student | Avionics, Controls & Materials Engineering
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EDUCATION

Eastern Washington University | B.S. Mechanical Engineering Expected 2027

Relevant coursework: Strength of Materials, Statics, Dynamics

ENGINEERING EXPERIENCE

Kaiser Aluminum | Advanced Engineering Intern Jun–Oct 2026

- Independently developed Project AQUA, see Selected Engineering Projects for technical details.
- Characterized aluminum samples using scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDS), and optical microscopy to investigate inclusions and microstructures.
- Prepared metallographic samples through sectioning, mounting, grinding, polishing, and etching; performed hardness testing, grain analysis, and recrystallization evaluation.

EWU Aerospace Club | Avionics Team Lead — IREC 2027 2026–Present

- Leading up to eight engineers developing custom flight computers, GPS/LoRa telemetry, apogee detection, electronic recovery deployment, and ground station systems for the 2027 IREC rocket.
- Directing development of carbon-fiber-embedded strain gauge instrumentation and live telemetry visualization of strain and stress on the airframe in flight.
- Coordinating active aerodynamic control development on a non-competition test rocket. Evaluating for potential use on the 2028 IREC rocket.
- Organized summer solid-motor development meetings and helped cast and fabricate 29 mm and 54 mm motors. I personally machined a 54 mm nozzle on a manual lathe based on simulated data and have heavily contributed to ongoing 72 mm motor development.

EWU Aerospace Club | Avionics & GPS Team Member 2025

- Designed and assembled GPS bay and ground station hardware. I supported integration and flight testing of another member's SRAD avionics for attempted live telemetry reception.

SELECTED ENGINEERING PROJECTS [Full project portfolio: JacobChisum.com](http://JacobChisum.com)

Thrust-Vector-Controlled Rocket Personal Project | Completed 2026

- Designed, built failed and persevered to successfully fly a fully custom TVC rocket with custom flight computers, onboard sensors, and servo-actuated thrust vectoring. The rocket(s) flew 4 times culminating in 2 successful control system tests and 1 fully successful flight and undamaged recovery.
- Implemented embedded PID control and Kalman filtering for flight stabilization and state estimation; logged and graphed flight data to validate control effectiveness and guide design changes.

Project AQUA — Automated Chemical Control System Kaiser Aluminum | 2026

- Independently engineered a four-pool automated monitoring and control platform using a custom PCB, a Raspberry Pi 5, and 12 isolated pH, conductivity, and temperature sensor channels. In under 4 months.
- Built Python-based control software with a touchscreen user friendly interface. The control system had active control of the pool with the ability to dose the pool with a base to keep the pH within ASTM standards.
- The project featured a flow meter to account for the amount of water in the pool and from there was also able to add water to lower the salinity without overshoot to keep salinity within a 0.035% of a target well within ASTM standards.

TECHNICAL SKILLS

Programming & Controls: C/C++ (Arduino), Python, Raspberry Pi, PID control, Kalman filtering, sensor fusion, TVC, simulation, automated control systems.

Electronics & Instrumentation: Custom PCBs, schematic design, I²C/SPI/UART, GPS, LoRa telemetry, sensors, data acquisition, SMD/THT soldering.

CAD & Fabrication: Fusion 360 (advanced), Onshape and SolidWorks (intermediate), FDM printing, manual lathe/mill, 5-axis CNC milling and CNC waterjet experience, wiring and fluid plumbing.

Materials & Mechanical: SEM/EDS, metallography, optical microscopy, hardness/corrosion testing, grain analysis, drivetrain and engine rebuilding.