

Luke Magdalin

617 875 9725 | LukeMagdalin@outlook.com | [linkedin.com/in/luke-magdalin](https://www.linkedin.com/in/luke-magdalin) | [LukeMagdalin.org](https://www.LukeMagdalin.org)

PROFESSIONAL SUMMARY

Electrical Engineering student (UMass Lowell, May 2028) with hands-on experience in embedded firmware, digital and analog circuit design, and Linux network infrastructure. Built a 32-bit shift-register system on an RP2040, a segmented PFSense/Proxmox home lab, and custom FPV drone hardware.

EDUCATION

B.S. in Electrical Engineering, University of Massachusetts Lowell, Lowell, MA

Expected May 2028

PROJECTS

Peltier-Powered Surgical Cold Table *Thermal Design, Water Cooling, Electrical Assembly* Jan 2026

- Engineered a Peltier-driven medical cart that stabilized a sterilizable Teflon work surface at -1°C , from commissioned design through clinical delivery for hair-transplant tissue preservation.
- Designed a dual water-cooling loop (two 360mm radiators, six 120mm fans) to reject heat from four 24V Peltier modules powered by a 1500W PSU derated to 24V for sustained clinical use.
- Built and wired the full electrical and plumbing assembly, including chassis grounding and leak testing, then validated cold-plate performance with IR-monitored thermal trials.

PicoWord *C++, Raspberry Pi Pico, Circuit Design, Oscilloscope Debugging* Jan 2026

- Engineered a real-time 32-bit binary-to-decimal converter on a Raspberry Pi Pico (RP2040), synchronously interfacing with 14 daisy-chained PISO and SIPO shift registers.
- Designed discrete 3.3V-to-5V logic level shifters with 2N3904 NPN transistors; used an oscilloscope to diagnose and fix RC time-constant degradation at high frequency.
- Wrote C++ firmware (Arduino framework) with GPIO interrupts and custom 7-segment bitmask encoding, achieving 100 kHz serial transmission.

Home Networking Lab *Linux, Docker, NGINX, PFSense, Proxmox, Git* 2021 – Present

- Built an enterprise-style home lab on Proxmox and TrueNAS, running Linux servers on a segmented network with PFSense routing, WireGuard VPNs, and OpenWrt access points.
- Deployed a distributed Docker environment (Portainer) hosting self-hosted services (Authentik, Gitea, NGINX) with automated CI-style deployments.
- Secured traffic with NGINX Proxy Manager, automated Let's Encrypt SSL, and a private PKI (Step-CA); added monitoring and alerting via Uptime Kuma and n8n.

High-Density Enterprise Wireless Network Deployment *OpenWrt, PoE, 802.11k/v/r, RF Planning* Jun 2025

- Engineered and deployed a decentralized wireless infrastructure across a 4-story, 4,300+ sq. ft. residence, provisioning 8 WS-AP3825i access points.
- Flashed and configured custom OpenWrt firmware on all APs to optimize channel distribution, minimize co-channel interference, and enable seamless 802.11k/v/r client roaming.
- Stress-tested and tuned the network to sustain consistent 200+ Mbps throughput across the property, maintaining low-latency connectivity under typical loads of 50+ clients and peak concurrency surges exceeding 400 devices.

Custom UAV & FPV Drone Systems *Onshape, Soldering, Betaflight, 3D Printing* 2023 – Present

- Designed and 3D printed custom airframes, camera mounts, and part retainers in Onshape; assembled flight controllers, ESCs, GPS, and analog video systems using fine-pitch soldering and high-current wiring.
- Configured PID loops, gyro filtering, and GPS failsafe recovery in Betaflight for stable flight and telemetry logging.

WORK EXPERIENCE

Dynamic Server Technician, Word Wide Tech Services, Wilmington, MA

Jun 2026 – Present

- Diagnosed and repaired client workstations, laptops, and servers, averaging **18 devices per week**.
- Managed parts and equipment inventory of **8 items**, keeping turnaround under **3 days**.

AV Technician, AKAV LLC, Boston, MA

Aug 2025

- Set up, maintained, and tore down AV equipment for events up to **600 attendees**.
- Followed safety standards and proper handling procedures to keep equipment damage-free.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, JavaScript

EE & Design Tools: KiCad, Multisim, Quartus Prime, MATLAB, Waveforms, Onshape, PrusaSlicer

Embedded & Avionics: UART/I2C/SPI, Microcontrollers, GPS/GNSS, MAVLink Telemetry, Betaflight, PID Tuning

Systems & Networking: Linux, SSH, Docker, Proxmox, PFSense, NGINX, WireGuard, Step-CA, Git, Gitea

Hands-on: Fine-pitch soldering, oscilloscope debugging, breadboarding, 3D printing

EXTRACURRICULARS

First Robotics | **Delta Kappa Phi Fraternity** | **FPV Drone Club** – Treasurer