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Objective

Experienced RF system architect and manager, seeks challenging management position where skills in system architecture and management will be critical in quickly bringing a product to market.

Education

- **University of California** — Los Angeles, CA
  Bachelor of Science, Electrical Engineering — *June 2011*

Computer Skills

- **Languages**: C, C++, Python, LaTeX
- **Design & Simulation Tools**: HFSS, ADS, AWR, Altium, Visio, Powerpoint

Experience

- **Astra Space, Inc.** — Alameda, CA
  Radio Systems Manager — *May 2018-Present*
  - **Radio System Architect**: Designed rocket radio system from clean slate. Developed some novel architecture designs to support Astra's novel approach to a multi-stage rocket architecture. Designed system with clean interfaces to other products, which allowed a completely independent development path with very minimal integration headaches.
  - **Manager**: Built cross-functional team of 3 people. Conducted all interviews, including technical screens to build out team. So far with a team of 4 people, we have covered all RF / mixed signal circuit design, PCB layout, bare metal C firmware, embedded Linux software, FPGA Verilog, Python for ground side software, all test software.
  - **Radio Systems - Avionics**: My team at Astra designed, built, and qualified the GPS and telemetry transmitters for the rocket. My team also has the firmware and software engineers to do all of the embedded coding and test software.
  - **Radio Systems - Ground Support Equipment**: My team at Astra has deigned, built, and tested a portable tracking station for receiving telemetry from the rocket. It consists of a 2.4m dish on a forklift-able pedestal, and a weatherproof support cart with telemetry receivers, telemetry servers, and other support equipment. My team has designed and implemented the software that closed loop controls the dish to point at the rocket during flight.
  - **Verilog**: Needed to develop a telemetry encoder, and the quickest path forward seemed to be to teach myself Verilog. In 2 months I learned Verilog and implemented a Reed-Solomon encoder from first principles. Peformed all simulations. Once in hardware, design matched simulation every time. Design has proven to be extremely stable.
- **Sky Wave Design, LLC** — Los Angeles, CA
  Chief Engineer — *April 2014-Nov. 2015, June 2016-May 2018*
  - **Consulting**: Sky Wave Design is an embedded electronics development consulting business, focused primarily on embedded systems and Bluetooth Low Energy
  - **Firmware**: Expert level embedded firmware developer, especially with Bluetooth LE. Many firmware projects completed, including systems with complex state-machine behavior that is completely reconfigurable using configuration files. All firmware developed in C for bare metal processors.
  - **Circuit Design**: Designed many circuits, from complex sensor data acquisition platforms using a Raspberry Pi, to tiny BLE beacons designed to be embedded into a workplace environment for motion detection and reporting. All circuits designed in Altium.
  - **PCB Layout**: Many layouts performed, both for circuits that we designed in-house, and also some layouts performed on their own. Most complex example was a three PCB stack, each PCB with up to 16 layers, including a switching power supply, FPGA board, and RF transmitter board.
  - **Manufacturing**: Most circuits we design get taken all the way through to low volume manufacturing in quantities of up to 1000. We design the production tooling to minimize production costs and time. We have relationships with local vendors to get PCBAs assembled right here in Southern California at affordable prices. We have also taken plastic parts and enclosures through the manufacturing process and had injection molds created.

- **Certification**: Preparing for certification starts with the schematic design. We have taken products all the way through the complex and painful process successfully. We know how to ensure your project gets done without surprises and setbacks.
- **Mechanical Design**: We are able to design simple mechanical systems and electronics enclosures in 3D and then print prototypes using our 3D printer.

- **FORM Lifting** — Los Angeles, CA
  Co-founder / CTO — *June 2015-Nov. 2017*
  - **Circuit Design**: Designed a sensor board for a weightlifting collar that included a 6-axis accelerometer and a barometric altimeter. Wrote firmware to stream data back to phone using Bluetooth Low Energy.
  - **Manufacturing**: Produced 1,500 units. Built and programmed a fixture for automated testing and flashing. Had unit FCC/CE/IC/NZ/AUS certified.

- **Tyvak Nano-Satellites, Inc.** — Irvine, CA
  Lead RF Engineer — *Nov. 2015-June 2017*
  - **Lead RF Engineer**: As the lead RF engineer I was responsible for all RF development and performance. Duties included new radio designs, supporting off-the-shelf radio sourcing and integration, debugging, link budget maintenance, and system design.
  - **Manager**: Hired 2 RF engineers for team during my tenure. Team remained productive and brought our designs to market after I left.
  - **System Design**: Designed several systems, including bi-directional low power S-Band links, Space-to-Ground X-Band telemetry at both low and high data rates, a complete SAR RF chain, including 800W power amplifier.
  - **Transmitter Design**: Designed a complete X-Band transmitter. Designed hairpin filters and directional couplers in AWR. Simulations matched passive circuit performance on the first try. Designed low jitter 6 GHz PLL. Laid out all PCBs. Developed the calibration and integration procedures and assembled and calibrated flight units for four flight vehicles. Developed PyQt GUI for controlling the radio to help automate bringup, test, and calibration.
  - **Antenna Design**: Designed deployable 1m S-Band dish that stowed to a 10cm cube. Designed several patch antennas. Designed helix antenna for UHF and also wrote Python code to take the pattern data and project it to the Earth's surface with an arbitrary rotation for ground coverage analysis. All designs simulated in HFSS.

- **Space Exploration Technologies** — Hawthorne, CA
  Lead RF Engineer — *Sep. 2011-March 2014*
  - **Crew Dragon**: Responsible engineer for designing and implementing the Crew Dragon communication system. This was a clean-slate novel communication system design that met many demanding criteria. Coordinated development effort across many disciplines such as thermodynamics, structures, dynamics, and avionics integration. Kept design focused on fundamental objective which was to close communication links to ground, International Space Station, and TDRSS while also minimizing impact to mass budget. Did not have any direct reports, but job required much technical leadership and developing teamwork across teams.
  - **RF Circuit Design**: Designed many RF circuits from scratch. Designed SDR transmitters and receivers, including upconveter and downconverter chains and selecting appropriate DACs/ADCs. Wrote Python scripts to optimize frequency planning. Designed several filters, both microstrip and lumped-element. Designed a high power PIN diode T/R switch.
  - **PCB Layout**: Over 10 PCB layouts for prototype and flight boards for transmitters and receivers. Most layouts were 8-12 layers with FPGAs and RF circuits. Every design was part of a multi-PCB stack and at a minimum required compliance with MIL-STD-1540E as well as tough vibration, shock, and thermal environments.
  - **Power Amplifiers**: Designed several power amplifiers for UHF and S-Band using both LDMOS and GaN. Simulated in ADS. Accurately predicted ACPR, mask compliance, and power consumption in ADS which matched measured results. Achieved over 70% saturated drain efficiency for S-Band GaN PA. Designed a multi-PA phased array driver with feedback control on both phase and amplitude.
  - **Manufacturing**: Designed a test rack for automated transmitter testing. It was designed to accurately measure output power from up to 6 transmitters simultaneously. Included was a custom designed test set and scalar network analyzer for characterizing loads and cables under power. Wrote Python GUI for running test scripts.

- **Topanga Technologies** — Canoga Park, CA
  Lead RF Engineer — *Feb. 2010-Sep. 2011*
  - **Part Time**: Majority of employment at Topanga was part-time (30 hours/week) while attending UCLA with a full-time academic load.

- **Firmware Development**: Developed a unique state-machine approach to plasma lighting algorithms. Designed a system where the algorithm was specified in a text file loaded by the firmware. This allowed any variant of either the lamp or the driver to all use the same version of the firmware.
- **Circuit Design**: Designed a mixed-signal RF driver board that contained a microcontroller and RF source which excited and controlled a 170W UHF power amplifier. Designed a 5W driver amplifier using LDMOS.
- **Desktop Software**: Developed a suite of applications in C++/Qt for monitoring and controlling drivers, data acquisition, database storage, automated inventory management, calibration, and characterization. Also developed software that automated PA characterization, so I was able to generate various sweeps of PA performance automatically.

- **Floor 84 Studio** North Hollywood, CA
  Lead Game Engine Programmer *Feb. 2008-Dec. 2009*
  - **Game Engine**: Designed a 2D game engine for Nintendo DS in C++. Developed library of 2D widgets such as buttons, and other types of graphics. Wrote all of my own design patterns from scratch.
  - **iOS Apps**: Developed several iOS games and apps, including one of the first every DJ mixing and scratching sound apps with a sound mixing engine written in C++ (Objective-C was too slow).

Patents

- MULTIPLE PULSE WIDTH MODULATION WAVEFORMS FOR PLASMA LAMP
  United States 8957593 Issued February 7, 2015

Extracurriculars

- **Aviation**: Private pilot with over 130 hours of flight time.
- **Backcountry Skiing**: New favorite outdoor activity! - Avi L1 certified
- **Backpacking**: Hiked the John Muir Trail, summer of 2017. 220 miles from Yosemite to Mt. Whitney.