Mac Cartier

Fairfax, VA · maccartier.com · mac.c.cartier@gmail.com
Active TS/SCI

Experience

Northrop Grumman Space Systems — Dulles, VA
Principal Electrical Engineer — Oct 2025 – Present
Electrical Engineer — Feb 2022 – Oct 2025
Associate Electrical Engineer — July 2021 – Feb 2022

- **Lead Engineer:** Technical lead for six avionics boxes comprising over 36 CCAs on a classified spacecraft program; responsible for design, analysis, testing, and integration.
- **R&D Leadership:** Leading internal R&D on a next-generation avionics backplane (mixed analog/digital); completed full specification and schematic capture, currently supporting routing and signal integrity analysis.
- **High-Reliability Design:** Designed multiple mixed-signal CCAs and performed worst-case, parts stress, and signal integrity analyses (EEE-INST-002, AS9100, MIL-STD-1543).
- **Process Improvement:** Diagnosed and dispositioned 30+ nonconformance reports (NCRs) and released 40+ engineering change notices (ECNs), directly recovering ≈2 months of schedule.
- **Strategic Architecture:** Performed a spacecraft-level C&DH architecture trade study for commercial satellites to inform future product line development.
- **Test & Integration:** Debugged flight hardware using oscilloscopes, DLAs, and spectrum analyzers. (Previously conducted environmental/functional testing of avionics boxes as Associate).

University of Virginia — Charlottesville, VA
Researcher — Jan 2021 – July 2021

- Developed a novel process for generating UWB fractal-based patch antennae, allowing for fine-tuned control of frequency response.
- Authored "Koch Curve Polar Coordinate Transform for UWB Antenna Applications," published in AES conference proceedings.

Northrop Grumman — Baltimore, MD
Hardware Design Intern — June 2020 – Aug 2020

- Performed data analysis for an RFIC team debugging a MMIC using Keysight ADS and custom data processing tools.

Education

University of Virginia — May 2021
B.S. Electrical Engineering — GPA: 3.5

Technical Skills

Hardware	High-Reliability Analog/Digital Circuit Design, C&DH Avionics, Mixed-Signal PCBs
Analysis	Worst-case (WCA), Parts Stress, Signal Integrity, Reliability, Root Cause Analysis
Tools	Cadence Allegro (HDL & PCB Editor), LTspice/PSpice, Windchill, DOORS, TipQA
Standards	AS9100, EEE-INST-002, MIL-STD-1543, MIL-STD-883, MIL-STD-750