Mark Opfell

Skills and Exposure

Standards	DVB-S2, CCSDS, FCC, IRIG, ITU
RF Tools	SDR, VNA, GNU Radio, VSA
General Software Tools	Python, Git*, Linux, Bash, AWS EC2
Python Libraries	NumPy, Matplotlib, Scapy
Networking	Ethernet, UDP/IP, Wireshark, iPerf
FPGA	Xilinx, PYNQ, Vivado
Significant Volcano Ascents	Rainier, Baker, Adams

Experience

Job Title **Senior RF and Telemetry Engineer**
Employer **Relativity** Long Beach, CA
Period **August 2025 – Present**

Developed, networked, and programmed RF HITL rack testing S-band telemetry bit error rate from vehicle UDP/IP multicast network traffic to radiated PSK waveform received by the ground receiver. Hands-on debugged a Xilinx FPGA radio's digital frame synchronizer. Fixed major errors in high level HDL, and flashed working bitstreams onto PCBAs.

Job Title **RF Communications System Engineer**
Employer **Amazon: Kuiper** Redmond, WA
Period **July 2024 – August 2025**

Developed and ran over the air Ka-band MIMO phased array system test UDP/IP throughput experiments on Xilinx Versal FPGAs.

Job Title **Lead Communication Systems Engineer**
Employer **Albedo** Remote & Some Travel
Period **October 2021 – March 2024**

Lead NGSO imaging satellite constellation ITU, and FCC 312 Schedule S regulatory filings. Ran RF analysis efforts with Python scripts, and ITU Spacecap. Collaborated with orbital dynamics, and mechanical design experts to decompose legal wording into requirements for satellite architecture and material choices ensuring proper post mission disposal.

Created a realistic and actionable plan to increase satellite constellation average payload data throughput by 42% yielding a 14% increase in capacity (directly correlated with revenue). Validated the plan with large scale year-in-the-life Python link budget modeling and systems engineering showing minimal schedule delay, and technical risk.

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Job Title	**Senior RF Systems Engineer**
Employer	**BlackSky** Tukwilla, WA & Remote
Period	**April 2019 – October 2021**

Created RF architecture diagrams, link budgets, test plans, and ran hands-on troubleshooting. Collaborated with customers and suppliers to design, manufacture, test, launch, and operate X (payload), S (TT&C), GPS, and UHF-band space-based software defined radios linked to ground stations enabled by AWS and the KSAT Lite ground station network.

Collaboratively designed, simulated, sourced, advised layout, and validated: parts, mixed signal PCB, connectors, cabling, and enclosure for a GPS RF system self-compatibility filter. Multiple spacecraft successful in-orbit operation.

Job Title	**RF Systems Engineer**
Employer	**Kymeta** Redmond, WA
Period	**February 2018 – March 2019**

Developed and executed over-the-air combined OSI application, transport, network, and physical layer level test cases for a mobile Azure cloud connected MIMO Ku-band terminal with software defined phased array flat panel antennas and a DVB-S2 satellite modem

Job Title	**Senior RF Systems Engineer**
Employer	**Maxar** Mountain View, CA
Period	**September 2013 – January 2018**

Wrote specifications, triaged vendors, reviewed test data collateral, and directed the installation, unit level and system level tests of the following passive and active RF units: diplexer, waveguide, directional coupler, band pass filter, low noise amplifier, downconverter, high power load, circulator, coaxial cable, master reference oscillator, and synthesizer.

Developed Python analysis tool from scratch to model complex amplitude and time delay of 10,000+ RF units for ground-based beam-forming.

Education & Certifications

Degree	**Bachelor of Science in Electrical Engineering**
University	**University of California, Davis**
Period	**2009 – 2012**

Certification	**Network Technician**
Organization	**Cisco**
Period	**2024**

Certification	**Apprentice Alpine Mountain Guide**
Organization	**American Mountain Guide Association**
Period	**2023**

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