Mark Opfell

Exposure & Skills

RF Standards	FCC, ITU, DVB-S2, CCSDS
RF Tools	VNA, SDR, GNU Radio, VSA
General Software Tools	Python, Git*, Linux, Bash
Python Libraries	NumPy, Matplotlib, Scapy
Networking	Wireshark, Cisco Networking Technician
Cloud	AWS EC2 & S3
Significant Volcano Ascents	Mount Rainier, Mount Baker, Mount Adams

Work Experience

Job Title	**RF Communications System Engineer**	
Employer	**Amazon**	Redmond, WA
Period	**July 2024 – Present**	

Project Kuiper: Ka-band payload phased array system testing.

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

Created, evaluated, and built space-to-ground digital communications payload (gigabit class) and TT&C links from scratch. Developed the mission data chain from modulated waveform to frames, packets, and connections. Analyzed and tested with: Physical software defined transceivers, GNU radio, technical deep dives into CCSDS and DVB-S2 standards, and Python code for the processing pipeline.

Procured, set up, coded, documented, and maintained FlatSat (hardware-in-the-loop) S-band TT&C megabit speed links with test equipment, and ground station hardware & software stack. Defined and tested first contact ConOps. Architected facility RF testing flow, and lab-to-cloud remote VPN network.

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

Joined just after Seed funding as the 12th employee.

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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 the AWS Ground Station service and the KSAT Lite ground station network. Lead RF design reviews from systems to flight (SRR -> FRR).

Designed, simulated, purchased, laid out, 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**	

Wrote phased array antenna cross-polarization optimization algorithm in Python and integrated it with production level test codebase along with documentation, theoretical and actual response data.

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	**Space Systems/Loral**	Mountain View, CA
Period	**March 2015 – 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.

Job Title	**Associate -> RF Systems Engineer**	
Employer	**Space Systems/Loral**	Mountain View, CA
Period	**September 2013 – March 2015**	

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

Education

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

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