

Mark Opfell

Exposure & Skills

RF Standards	FCC, ITU, DVB-S2, CCSDS, VITA49
RF Tools	VNA, GNU Radio, Cloud SDRs, Antenna Hats
General Software Tools	Python, Git*, Bash, Excel (Wizard)
Scientific Python Libraries	NumPy, SciPy, Matplotlib, Pillow, Pandas
Significant Volcano Summits	Mount Rainier, Mount Adams (solo)

Work Experience

Job Title	Lead Communication Systems Engineer	
Employer	Albedo	Asynchronous Remote
Period	October 2021 – Present	

Creating, evaluating, and documenting space-to-ground digital communications, and the mission data chain from modulated waveform to frames, packets, and end-to-end UDP connections. Evaluated with GNU Radio software defined transceiver simulations, technical deep dives into open source communication standards, collaboration on product (satellite imagery) level vision, and merging dev code to the processing pipeline.

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. Continuously building consensus with the founders: CEO, CTO, and CPO, on which space and ground communication business partnerships to pursue.

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

Created technology roadmaps, architecture diagrams, link budgets, test plans, and ran hands-on troubleshooting. Collaborated with suppliers and customers to design, manufacture, test, launch, and operate X, S, GPS, and UHF-band space-based software defined radios linked to ground stations enabled by the AWS Ground Station product (global ground-station-as-a-service) as well as the KSAT Lite ground station network.

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.

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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	

Lead successful Forward downlink payload re-design, deployment, launch, in-orbit test, and handover of geostationary communication satellite Echostar 21 operating the forward payload receive at Ka-band and transmit at S-band.

Award winning role leading, developing, and managing a production Python client and services to exchange data between a PostgreSQL database storing 1 TB of antenna data and an RF downlink capacity tool.

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	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+ passive and active RF units for a ground-based beam-forming network.

Job Title	Associate RF Systems Engineer	
Employer	Space Systems/Loral	Mountain View, CA
Period	June 2012 – September 2013	

Education

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

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