

The Aerospace Corporation
Experimental STA Application
File Number: 1573-EX-ST-2026

Explanation of Experiment and Need for an STA

The Aerospace Corporation (“Aerospace”) is seeking an experimental STA from the FCC to conduct testing on behalf of its federal customer, NASA. The NASA contract number is: 80GSFC190011. This application seeks authorization to use frequencies in the 50 GHz band for the experimentation to determine the potential for interference to NASA satellites from 50 GHz operations on the ground.

Aerospace is a federally funded research and development corporation. A significant part of its mission is to run tests to deliver results information to its federal customers. This application falls in that category.

Need for an STA:

Aerospace is seeking operations of this system for four to five months, starting in November 2026. Because the current operations envision short term operations – less than six months – an STA is appropriate. The on-orbit asset used for the testing will de-orbit soon after the testing is concluded.

Technical Synopsis:

- Spectrum Requested: 50.4-52.4 GHz
- Power and ERP: output power is 10 W, small antenna ERP 4.84 MW, large antenna ERP 38.47 MW
- Emission Designators: 50M0F1N, 100MF1N, 200MF1N, 1G00F1N (HOM or QAM modulation)
- Half Power Beamwidth: 0.49 degrees (small antenna); 0.17 degrees (large antenna)
- Limited time of use – only a few minutes when the satellite is near

Description of Operations:

NOAA operates an Advanced Technology Microwave Sounder (ATMS) from satellites in low earth orbit. Those satellites are engaged in earth observation and sensing to predict weather and measure atmospheric conditions, among other missions. NOAA has concerns about the introduction of new terrestrial radio services in the 50-52 GHz range because it does not know how those new radio signals will affect the performance of the EESS satellite operations. NASA has issued this contract to allow experimentation to address those concerns.

Typically, NOAA satellites are measuring fluctuations in the atmosphere that are below the radio noise floor. It is looking for minute changes in energy and heat in the atmosphere from which it extrapolates a great deal of essential weather prediction information.

The purpose of the test is to evaluate the impact of potential Radio Frequency Interference (RFI) from new radio services proposed for the spectral region – 50-52 GHz – in which the NOAA on-orbit instrument operates. This experiment has been designed to mimic emissions from the planned new services and directs them at (and nearby) the ATMS to explore and estimate the impact on ATMS measurements. The testing is being conducted on an instrument and platform (Suomi NPP) that is planned for deorbiting shortly after this testing. Thus, timely operations are required and short term operations are appropriate.

Spectrum Use:

Aerospace will be using different emissions during this testing. The emission designators have been selected to explore the effects of various transmissions on the degradation of performance of the satellite sensors. The transmissions will use various parts of the band requested at different times. The whole bandwidth will never be in use all at once.

Antennas and EIRP:

The radio to be used is a Rohde and Schwarz signal generator. The transmitter power coming from the radio will be up to 40 dBm. The testing will use two different antennas. At the smaller antenna, EIRP will be 89 dBm. At the larger antenna, EIRP will be 98 dBm. The smaller antenna is expected to be the primary one used for this testing. Both antennas will be at the same location. Only one antenna will be in use at any given time.

As noted above, the antennas have a narrow half power beamwidth: 0.49 degrees for the small antenna and 0.17 degrees for the large antenna.

Locations and Time of Use:

El Segundo Location:

2310 E. El Segundo Blvd., El Segundo, CA
Latitude: 33.9130882 N, Longitude: 118.3811437 W
(Latitude: 33-54-47 N, Longitude: 118-22-52 W)

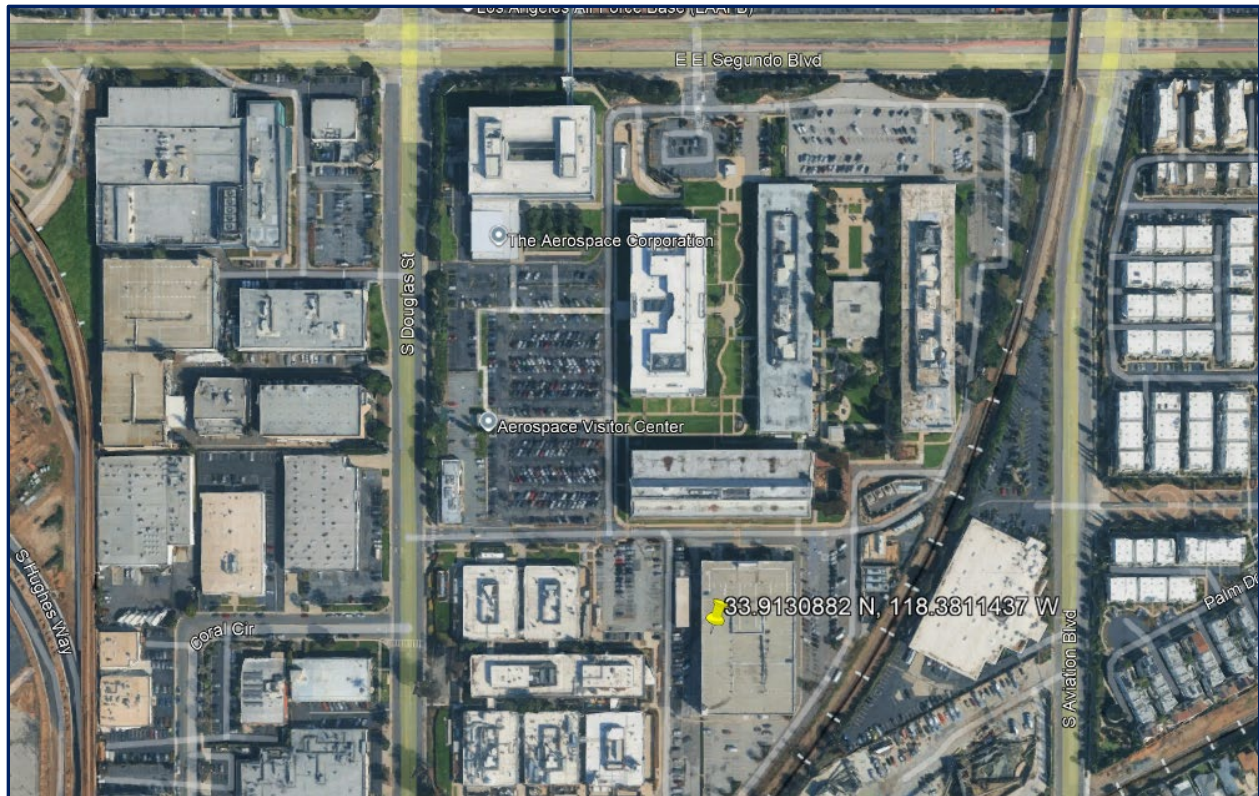


Figure 1. El Segundo Site, antennas will be mounted on the roof.

The radio system will be in use for approximately 20 minutes per satellite pass – a few minutes before the satellite is overhead, during the pass while it is in sight, and for a few minutes after the pass, because that will help to establish the window of potential interference.

This is a polar orbiting satellite. It is expected to pass over the El Segundo site approximately twice a day for 10 minutes per pass. That would result in approximately 40 minutes of radio use per day at the El Segundo site.

Fairbanks, Alaska Location:

Fairbanks AK proximate to NOAA NESDIS Ground Station
Latitude: 64.97657 N, Longitude: 147.51962 W
(Latitude: 64-58-36 N, Longitude: 147-31-11 W)



Figure 2. Fairbanks, Alaska Site

The Alaskan site in Fairbanks has been selected as a backup location. There, the satellite will pass over approximately 10 times per day, leading to 200 minutes of expected radio use in total. However, this site is less convenient for the analysis, so it will only be used if there is not sufficient data collection available from operations in El Segundo.

Should the Fairbanks site be needed, Aerospace will ship the radio equipment and antennas from California to Alaska for installation and operations. If the site is not needed, there will be no radio transmissions there.

NASA Contract:

Contract Number: 80GSFC190011

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Conclusion:

Aerospace is seeking an experimental STA from the FCC to conduct tests on the vulnerabilities of a NOAA satellite that is engaged in earth sensing in the 50-52 GHz band. The purpose of the testing is to provide data that will predict the impact of commercial radio operations in the 50-52 GHz band on these essential NOAA operations sensing the atmosphere. The current satellite is using minor fluctuations in the atmosphere to predict weather and evaluate other atmospheric patterns.

The sites chosen are El Segundo, California, and as a back up location Fairbanks, Alaska. It is possible that only the El Segundo site will be used. Only one site at a time will be used.

Aerospace has selected two antennas for these operations. The smaller dish is likely to be used for most of the testing, because of its slightly wider beam. The locations are shown above.

The satellite that will be used to measure the impact of the ground-based transmissions is scheduled to deorbit shortly after this testing is completed, so time is of the essence in starting these operations. NOAA has selected this satellite because it has been replaced by other satellites, so this one is an ideal choice for using for the key measurements. NOAA has other satellites on orbit that are using the 50 GHz band, and the results of this testing will give NOAA some idea of the potential impact to its operations from the proposed use of 50 GHz band radios terrestrially.

All radio operations will be ground-based. The satellite will be operating in its normal fashion, reporting on the effect of these experimental test signals.

If there are any questions about this application, please contact Anne Cortez, Esq. Counsel to Aerospace, anne@washingtonfederalstrategies.com or anne@washingtonfederalstrategies.com.