

Request for Special Temporary Authority

Virgin Orbit, LLC

Explanation of Experiment:

Virgin Orbit LLC ("Virgin Orbit") is requesting "Special Temporary Authority (STA)" to operate an S-Band Transmitter at 2215.5 MHz. If 2215.5 MHz is unavailable Virgin Orbit is open to any frequency within 2200-2290MHz band.

The objective of the experiment is the following.

- Receive Telemetry data from LauncherOne rocket's S-Band Transmitter during captive carry test flights before space launch. The requested license is needed only for captive carry test flight campaign.

747 aircraft will take-off from either one of the two airports shown in Figure 3 with LauncherOne rocket in captive carry. S-Band transmitter will be turned on in R2508, R2515, W289S and W291 airspaces (shown in Figure 2). Virgin Orbit coordinates the use of the above mentioned airspaces with the concerned authorities.

Two different data rates will be tested at the same assigned frequency. LauncherOne transmitter will only be turned on within the requested areas. Virgin Orbit will have the ability to turn the LauncherOne transmitter on and off from the 747 Aircraft while in captive carry. The 747 might be flown to a maximum altitude of 40,000 ft. The transmitter will be turned on at the ground at the airport locations shown in Figure 3 for RF checkouts.

The S-Band Transmitter will not be turned on without prior co-ordination with DoD WAFC. Exact date and time of the testing will be flexible based on DoD coordination.

	Data Rate	
Transmitter Output Power	20 Watts	20 Watts
EIRP	49 dBm	49 dBm
Bandwidth	4.99 MHz	2.73 MHz
Modulation Scheme	SOQPSK-TG	SOQPSK-TG
Emissions Designator	4M99G1W	2M73G1W
Carrier Frequency Tolerance	+/- 20 ppm	+/- 20 ppm
Transmitter Manufacturer	Quasonix	
Transmitter Partnumber	QSX-VSR4-1111-20-80-04AB-VP-WV	
Antenna Manufacturer	Haigh Farr	
Antenna Part Number	13155	

Figure 1: Transmitter Specs

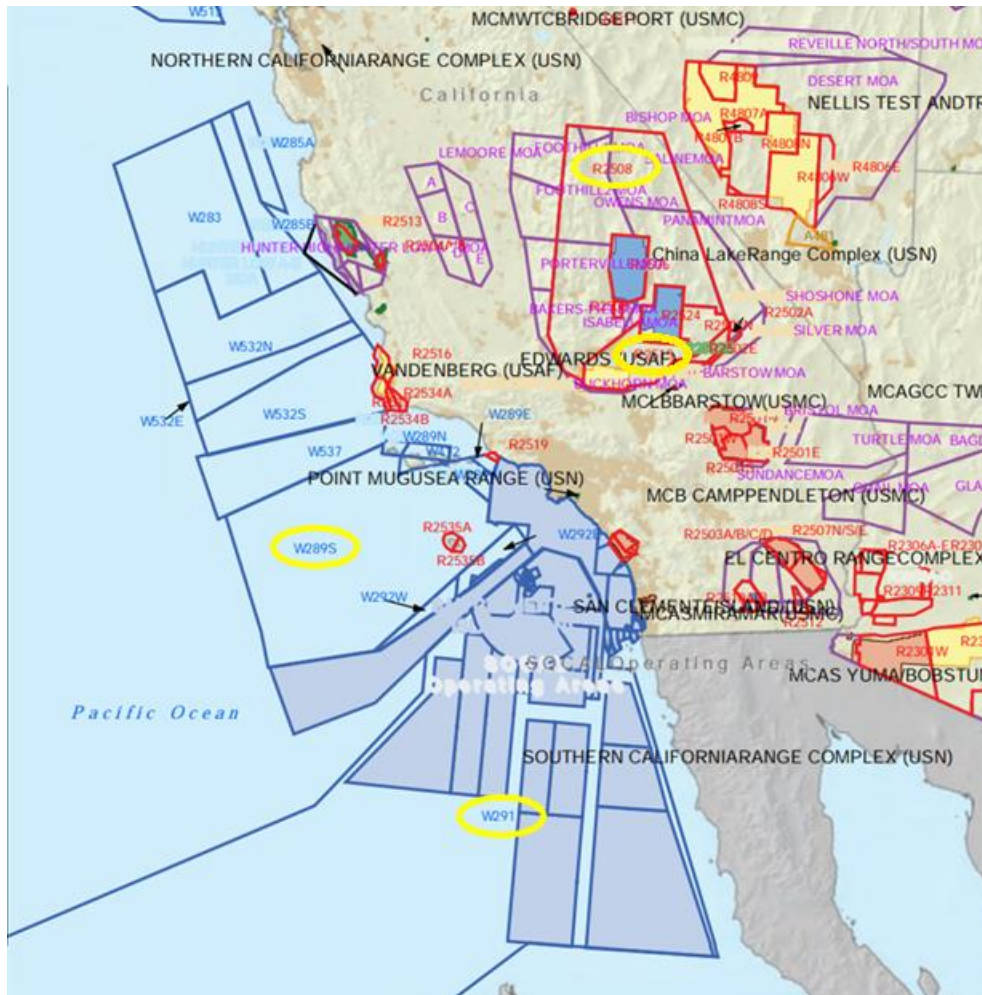


Figure 2: Map showing areas of requested operation circled in yellow

	Latitude	Longitude
Air and Space Port Mojave, Mojave, CA	35° 3' 24.4188"	-118° 9' 28.1304"
Southern California Logistics Airport, Victorville, CA	34° 35' 2.7594"	-117° 22' 44.1474"

Figure 3: Take-off and landing Airport locations for Captive Carry

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