



Memorandum

Date: 13 Feb 2018

From: Michael C. Maguire
Vector Launch

FRN 0026456863

FCC File Number: 0162-EX-ST-2018

To: Leann Nguyen, FCC – OET
Jeanette Spriggs, FCC – OET

Subject: Vector Launch Inc. Experimental STA Application for
Vector-R Series B 0003 Launch Vehicle - Amendment

Reference Documents:

REF1 FCC, DA-13-446, Guidance on Obtaining Experimental Authorizations for Commercial Space Launch Activities, 15 Mar 2013.

REF2 GN-0275-VSS-001, Vector FCC Memo Block 0.003 Update (this document), 13 Feb 2018.

REF3 GN-0276-VSS-001, Vector Supporting Material Experimental STA Application B 0003 Update, 13 Feb 2018.

REF4 FCC Table of Frequency Allocations (Note US276).

REF5 AFTRCC Coordination E-mail ICN 1159-18/7200, 12 Feb 2018.

Vector is pleased to provide this Amendment to our STA request, 0162-EX STA-2018. This update provides minor clarifications to the original submission. An updated data table, REF3, has been uploaded to the OET ELS application website.

This application applies to a single, low altitude (< 3000 m), demonstration launch of our Vector-R launch vehicle. The STA requests telemetry downlink from the vehicle only; no transmissions will be made from the ground to the vehicle.

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A summary of the STA application changes (REF3 data table) follows:

- Reduced transmitter output power to 10 W maximum.
- Updated necessary bandwidth calculation.
- Updated emission designators.
- Corrected error in transmitter part numbers. Part number change related to baseband data interface. No impact on unit RF functionality.

This application covers a **single test flight** of the Vector-R B 0003 launch vehicle. The Vector-R B 0003 vehicle is a low altitude test launch required to develop the orbital launch capable Vector-R B 100X series.

Vector will finalize the planned launch date with local area frequency managers per REF5 AFRCC Coordination E-mail; the E-Mail is attached to Vector's application on the FCC OET ELS website. Coordination will be via email and telephone. Vector will also provide an update 2-days prior to launch and the day of launch prior to the flight. Vector has included a stop buzzer phone number in the data table REF3. Vector will confirm the stop buzzer contact information prior to the flight.

A brief summary of Vector-R B 0003 launch follows; detailed technical data for the B 0003 series is contained in GN-0276-VSS-001 (REF3) attached.

Launch Date	Vehicle	Launch Site	Comment
March 2018	B 0003	Randsburg (Mojave) CA	Planned
April 2018	TBD	TBD	Additional launch opportunity TBD
May 2018	TBD	TBD	Additional launch opportunity TBD

The Randsburg launch site is located at 35.348°N, -117.810°W, and at an altitude of 1070 m. The test vehicle will not exceed 3050 m (10000 ft) above the launch site.

Three downlink frequencies are requested as a worst case; one or more of the links may not be used for the flight.

	Frequency	Modulation	Data Rate	Emission Designator	Use
Link 1	2364.5 MHz	SOQPSK	128 kbps	120KG1D	1 st Stage Telemetry
Link 2	2370.5 MHz	SOQPSK	256 kbps	230KG1D	2 nd Stage Telemetry
Link 3	2382.5 MHz	SOQPSK	5000 kbps	4M49G1D	HD Digital Video

Antenna registration is provided for 3 downlinks. A single transmitter type will be used. The launch vehicle antenna patterns are omnidirectional in azimuth. All transmitter outputs will be split to two conformal antennas located on either side of the launch vehicle. The hemispherical patterns of the antenna pairs create an omnidirectional pattern centered on the vehicle. All antennas are right hand circularly polarized (RHCP).

The antenna height will vary from 5 m off the ground while on the launch pad to approximately 3050 m (10000 feet) altitude.

The transmitters are Quasonix nanoTX™ (www.quasonix.com) ; these are Commercial-Off-The-Shelf (COTS) telemetry transmitters used extensively throughout the aerospace and space industries. The Quasonix units employ Shaped Offset Quadrature Phase Shift Key (SOQPSK) modulation.

Vector greatly appreciates the FCC's help on this activity, and we are fully prepared to support your needs or questions. Please contact me as soon as possible should additional information be required.

Thank you,

Mike

Michael C. Maguire

Vector Launch Inc.
824 E 16th Street
Tucson AZ 85719

radio@vector-launch.com
mike.maguire@vector-launch.com
+1 (626) 676 7230

cc: Matt Baker, matt.baker@vector-launch.com

Robert R. Cleave, Robert.cleave@vector-launch.com

Archive, radio@vector-launch.com