

Name: M. Mills, RF Engineer, Orbital Sciences Corporation

Date: 31 July 2012

Subject: Number of telemetry links used by Antares Launch Vehicle

NTIA has requested an explanation for the number of telemetry links used during the Antares launch operations, stating the typical number is 1-2, while Antares is using 3 or more.

---

The number of telemetry links is a function of both the configuration of the vehicle and the available link margin. The overall scenario for Antares launch vehicle telemetry links is as follows:

Flight 1 – 5 telemetry links

Flight 2 – 4 telemetry links

Flight 3 and beyond – 3 telemetry links

- Flight 1 is uniquely configured for a payload simulator, and it requires a telemetry link that will only exist for the first mission. (Freq = 2259.5 MHz)
- There is a separate link on the first stage for instrumentation data that significantly simplifies the interfaces on the vehicle and makes that stage a stand-alone component. This link is present on all flights. (Freq = 2288.5 MHz)
- The remaining 3 links are associated with the second stage assembly. One link is dedicated to transmitting video. This link is a stand-alone optional video system that is scheduled to fly on only Flight 1 and 2. (Freq = 2225.5 MHz)
- The other two links are associated with flight computer and instrumentation data. Insufficient bandwidth was available to allow consolidation of these into a single link. The data rates of these two links are 3 Mbps. At this speed, the link margins to the various receiving sites have adequate but not overly robust margins. Therefore, consolidating these two links into one link at a higher data rate was not a viable possibility. (Freq = 2241.5 MHz, 2269.5 MHz)