

A description of the nature of the research project being conducted.

The NASA LONESTAR Project for which the Bevo-2 Spacecraft will fly has the following Mission Objectives:

Evaluate sensors including but not limited to: GPS receivers, IMUs, rate gyros, accelerometers.
Evaluate Reaction Control System (RCS).
Evaluate GN&C system including guidance algorithms, absolute navigation, and relative navigation.
Evaluate communications capabilities between two spacecraft and from each spacecraft to their ground stations.
Evaluate the capability to take video.

A showing that the communications facilities requested are necessary for the research project.

The satellite will utilize the He-100 Radio created by Astronautical Development, LLC for downlinking data critical to mission success. Due to our Mission Objective of taking video, we require a higher downlink rate than traditional Part 97 equipment offers. The He-100 Radio will be used to operate at a higher downlink rate of 38400 bits per second, but is an experimental radio, necessitating this Experimental Application.

A showing that existing communications facilities are inadequate.

Our downlink margins show that it will not be possible to accomplish our Mission Objectives on a data rate less than 38400 bits per second. The He-100 Radio is the only commercially available device that satisfies our downlink needs.