

Description of research project

The research project for which we are requesting an experimental communications license has two aspects. The first is the experimental spacecraft itself, a university-built education and research project in automated docking called Akoya. The space activity will have approximately a 6 month duration, during which we will conduct an average of four 10-minute contacts per day. The rest of the time, the base station will not be broadcasting.

The second experiment is a technology demonstration of the communications equipment itself. The T96SR data radio is used for terrestrial packet communication between multiple, mobile systems. If this device/packet format could be adapted for space use; we believe it could greatly reduce the RF "clutter" from university-built student satellites (such as CubeSats). The packet format and data rates are high enough that multiple spacecraft and multiple Earth stations could share one frequency without significant interference. Therefore, we would like to demonstrate the space-worthiness of the T96SR and its communication format.

We are requesting an experimental license because our communications activity does not fit the requirements of the Amateur Radio Service.

A note regarding interference: the orbiting satellite poses very little interference hazard to Earth/mobile systems. We believe this to be true because we are presently using the proposed antenna system to control the Sapphire amateur spacecraft (NO-45). Sapphire broadcasts at 2 W, 437.1 MHz (very similar to the characteristics of our proposed spacecraft); the received power at ground level is extremely low in these conditions (we need to point our antenna within a few degrees and finely tune the receiver to pick up any signal).

The launch date for this mission has not yet been chosen. During preliminary development phases, the mobile (spacecraft) antenna would be located at Washington University; we would communicate between the antennas at very low (mW) power levels.