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# Space Dynamics

LABORATORY

Utah State University

## FCC FORM 442: Exhibit A

### Project Description

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Federal Communications Commission  
Office of Engineering and Technology

**Submitted By:**

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## 1. INTRODUCTION

The Space Dynamics Laboratory (SDL) of the Utah State University Research Foundation submits this document as Exhibit A of FCC Form 442 and in accordance with Section 5.3(b), (d) and (h) of CFR Title 47 for the purpose of testing technologies under a government contract. The specific equipment requiring approval is an AeroVironment II Digital Data and Video Link (DDVL). SDL requests an experimental license. This document provides a description of the government project and justification for the use of the communication system.

## 2. GOVERNMENT PROJECT DESCRIPTION

SDL is contracted (Contract No. N00173-12-D-2004) by the Naval Research Laboratory (NRL) to support various development efforts related to unmanned aerial systems (UAS). SDL is currently engaged in a project to demonstrate multi-intelligence (multi-INT) data collection and detection and recognition of targets of interest using manned and unmanned platforms. The technology is scheduled to be demonstrated at upcoming Department of Defense (DoD) sponsored exercises. In preparation for the demonstration, testing is taking place near SDL's facility in Logan, UT. The testing will include flying a Puma UAS, a hand-launched, 15-lb, fixed-wing aircraft carrying an electro-optical (EO) gimbaled sensor.

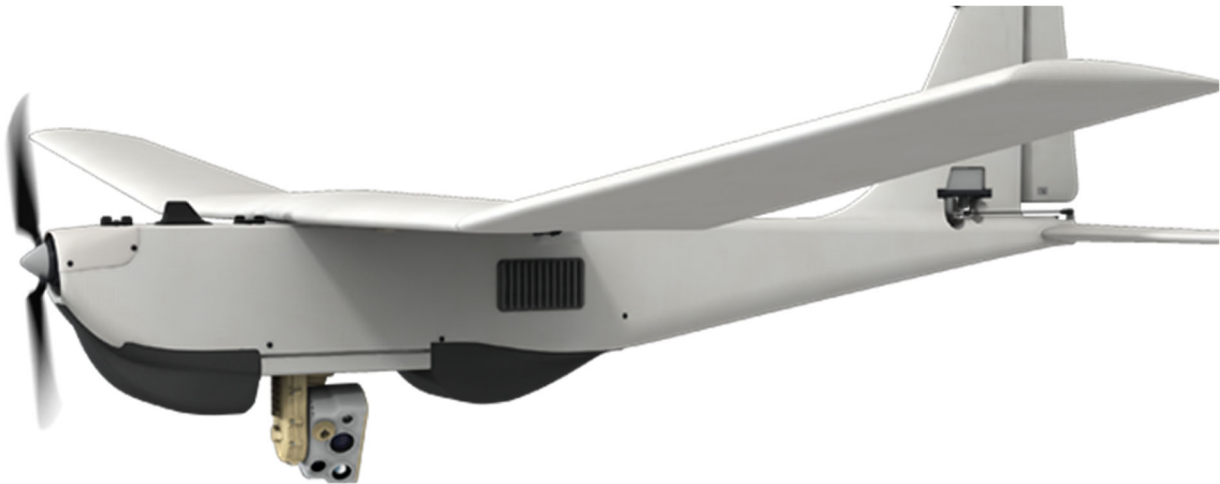


Figure 1. Puma UAS

### 2.1 JUSTIFICATION FOR COMMUNICATIONS SYSTEM

A critical part of testing the operational concept is to employ a communications system linking the Puma UAS to the ground station. This is done with an AeroVironment II DDVL, a bi-directional L-band data link designed for Puma UAS command and control. The Puma radio link is required for all Puma flight operations.

### 2.2 DESCRIPTION OF OPERATION

This exercise is accomplished by using a Puma UAS, controlled on the ground by trained operators from the United States Marine Corps (USMC). One side of the AeroVironment II DDVL is installed on the Puma aircraft and the other side is set up at a fixed location on the

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ground. The airborne system uses an omni-directional antenna and the ground system uses a stack patch antenna. The aircraft follows pre-planned flight paths designed to meet the objectives of the test. The ground system is set up at a temporary location at the Bridgerland R/C Airfield. The aircraft will stay within line of sight (<5km) of the operator. The two systems are only operational and transmitting during the flight test, which lasts approximately 1.5 hours. Approximately four flight tests are conducted per day on testing days.

### 2.3 PROPOSED LOCATIONS

SDL seeks authority to carry out its test flights in one location, as specified in Table 1. The location was chosen based on its proximity to SDL and planned test events. The area is defined by a center coordinate and radius as follows:

**Table 1. Location Specifications**

<b>Location</b>	<b>City, State</b>	<b>Center Latitude</b>	<b>Center Longitude</b>	<b>Radius (km)</b>	<b>Altitude (ft)</b>
Bridgerland R/C Airfield	Mendon, UT	<i>41°47'16"</i>	<i>111°58'52.4"</i>	5	<400 AGL

Both AeroVironment II DDVL units will be within the location specified, the airborne side having a changing location within the area and the ground side having a fixed location within the area.

### 3. CONTACT INFORMATION

Questions regarding this application should be referred to the following individual.

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