Space Dynamics LABORATORY
Utah State University Research Foundation

# FCC FORM 442: Exhibit A

## TEISIT Project Description

**Submitted To:**
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 a Mini CDL 200 datalink produced by L-3 Communications. SDL requests a modification to its existing license, call sign WH2XDZ. The modification is to increase the allowable operation altitude. 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 the Tactical EO/IR, SIGINT Integrated for Targeting (TEISIT) program, which is funded and managed by the Office of Naval Research (ONR). The objective of the TEISIT program is to develop an integrated electro-optical/infrared/synthetic aperture radar/signals intelligence (EO/IR/SAR/SIGINT) payload for autonomous collection of multi-intelligence data from a Tier II unmanned aerial system (UAS) and deliver it to the tactical warfighter. Figure 1 illustrates the TEISIT operational concept.

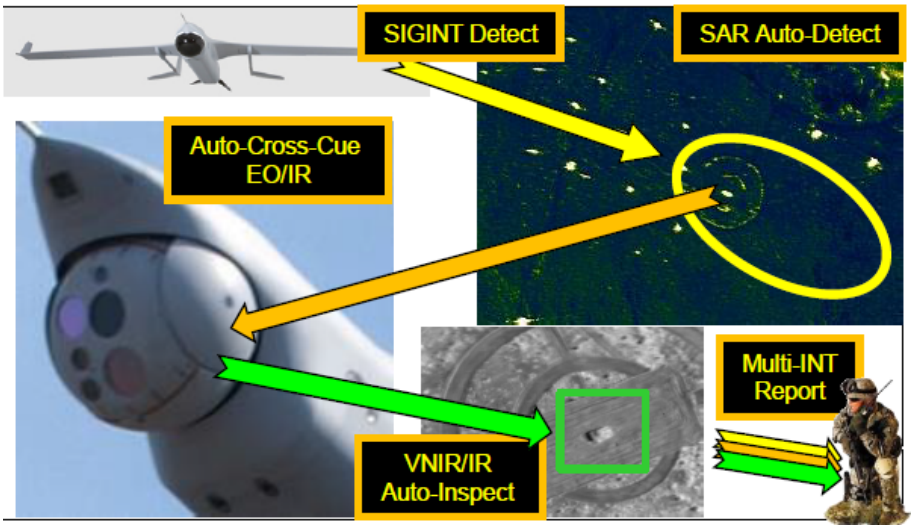


**Figure 1. Operational Concept of the TEISIT Program**

## 2.1 JUSTIFICATION FOR COMMUNICATIONS SYSTEM

A critical part of testing the operational concept is to employ a communications system linking the airborne system to the ground station. This is done with a Mini CDL 200, a bi-directional Ku-band data link designed for military use. Many of the technologies being developed require the communication for proper testing and demonstration to a customer. These technologies include data dissemination, real-time data display and analysis, and remote sensor command and control. The Mini CDL specifically is necessary because of its interoperability with military systems both present and future. It also fits the required size, weight, and power (SWaP) constraints of a Tier II UAS. In an application of this type, using an existing radio installation is not feasible.

## 2.2 DESCRIPTION OF OPERATION

The majority of the testing and demonstration under the TEISIT program is done using a manned aircraft owned and operated by SDL. One side of the Mini CDL 200 link is installed on the aircraft and the other side is set up at a fixed location on the ground. The airborne system uses an omni-directional antenna and the ground system uses a directional dish antenna that tracks the aircraft position. 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 within link range (30 km slant range) of the flight path. The two systems are only operational and transmitting during the flight test, which can last up to 4 hours. Approximately 15-20 flight tests are conducted in a given year.

## 2.3 PROPOSED LOCATIONS

SDL seeks authority to carry out its test flights in three locations as specified in Table 1. The locations were chosen based on areas convenient to SDL and our customer base. The areas are defined by a center coordinate and radius as follows:

**Table 1. Location Specifications**

| | Center Latitude | Center Longitude | Radius (km) | Altitude (ft) |
|---|---|---|---|---|
| Logan, UT | *41°46'42"* | *111°51'12"* | 40 | <8200 AGL |
| Virginia Beach, VA | *36°55'41"* | *76°01'09"* | 20 | <8200 AGL |
| Santa Rosa, CA | *38°38'58"* | *122°48'51"* | 50 | <12,500 AGL |

Both Mini CDL 200 units will be within the locations specified, the airborne side having a changing location within the area and the ground side having a fixed location within the area. When flying in military airspace to the west of the Great Salt Lake, frequency approval is also acquired from the proper military authority.

## 3. CONTACT INFORMATION

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

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