

L3 Harris, Broadband Communications
Special Temporary Authorization
Date: 2/17/2020
STA Conf. No.: EL926164
STA File No.: 0311-EX-ST-2020
Call Sign: zzzzzz

Application Background:

The Deployable Surface Asset (DSA) is a communications surface terminal that operates according to Standard Common Data Link (Std-CDL) specifications. The purpose of this system is to establish a line-of-sight (LOS) data link with any aircraft capable of Std-CDL operation.

The purpose of this project is to perform ground to air antenna system development flight testing against a high flying military aircraft. See NTIA Certification of Support SPS-23103/1.

Concept of Operations:

The antenna-under-test (AUT) will be mounted on a tower located in a courtyard (40:47.0320N 111:57.0810W) near L3 Harris building E. The antenna under test (AUT) will have a full duplex link with a high flying military aircraft (> 40,000 ft.) that will fly in an established pattern within 200 nm of the DSA AUT. Tests will be conducted to evaluate the performance of the data link using this new antenna system.

The AUT is a 48" parabolic reflector antenna with a narrow beamwidth (X-band 3 dB BW = 1.7° ; Ku-band 3 dB BW = 1.1°) that utilizes closed loop tracking to maintain the connection to the aircraft. The DSA antenna has an X-band peak antenna gain = +37.6 dBi and a Ku-band peak antenna gain = +41.3 dBi. The ground station has an X-band EIRP of +76 dBm and Ku-band EIRP +80 dBm. The military high flyer aircraft uses one of two 9.5" open-loop pointing parabolic reflector antennas to transmit and receive to the ground station. The airborne X-band EIRP is +66.2 dBm and the Ku-band EIRP is +64.6 dBm. The peak gain of the 9.5" antenna is approximately +26 dBi. Figure 1 shows the nominal configuration for the AUT.

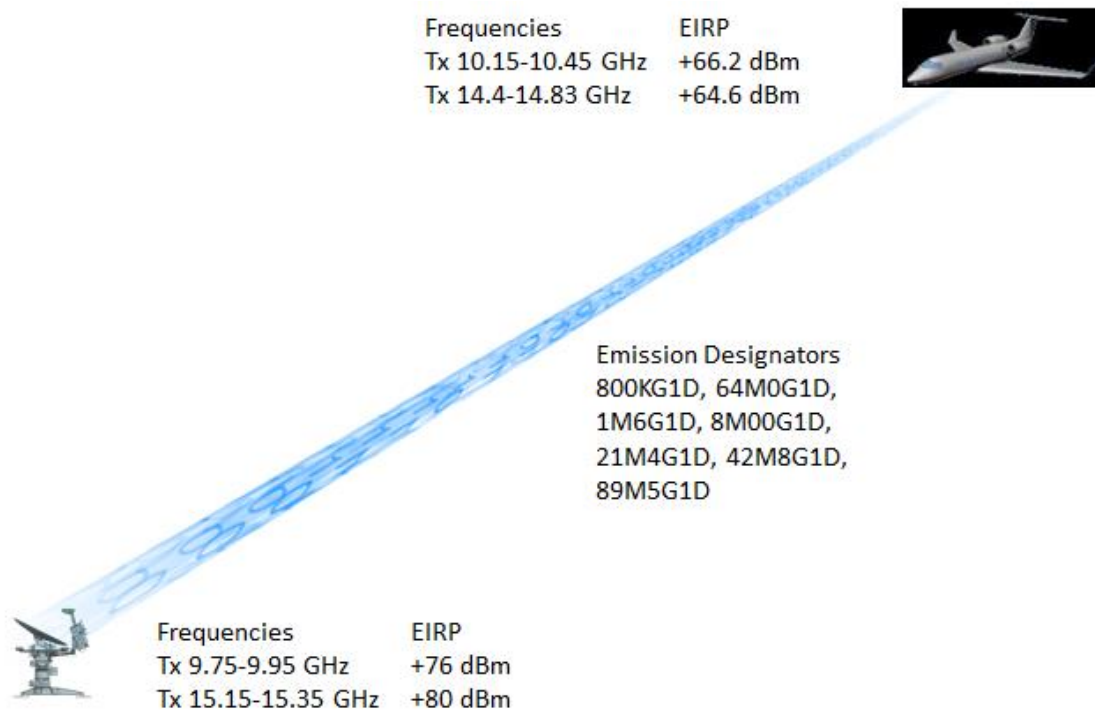


Figure 1. DSA Concept of Operations

Spectrum Requirements:

The AUT testing will be in the frequency ranges shown below in Table 1 and will use the waveforms shown below in Table 2.

Table 1. Test Frequencies

Operating Band	Frequency Range
X-band Transmit	9.75 – 9.95 GHz
X-band Receive	10.15 – 10.45 GHz
Ku-band Transmit	15.15 – 15.35 GHz
Ku-band Receive	14.40 – 14.83 GHz

Table 2. Test Waveforms

Modulation	Emission Designator
DS-SSBPSK	64M0G1D
BPSK	800KG1D
DS-SSBPSK	64M0G1D
BPSK	1M60G1D
DS-SSBPSK	64M0G1D
BPSK	8M00GD
OQPSK	21M4G1D
OQPSK	42M8G1D
OQPSK	89M5G1D

Location of Equipment:

The location of the AUT is shown in Figures 2 and 3 as shown below. The antenna terminal will be located at $40^{\circ}47'2.03''\text{N}$; $111^{\circ}57'4.86''\text{W}$.

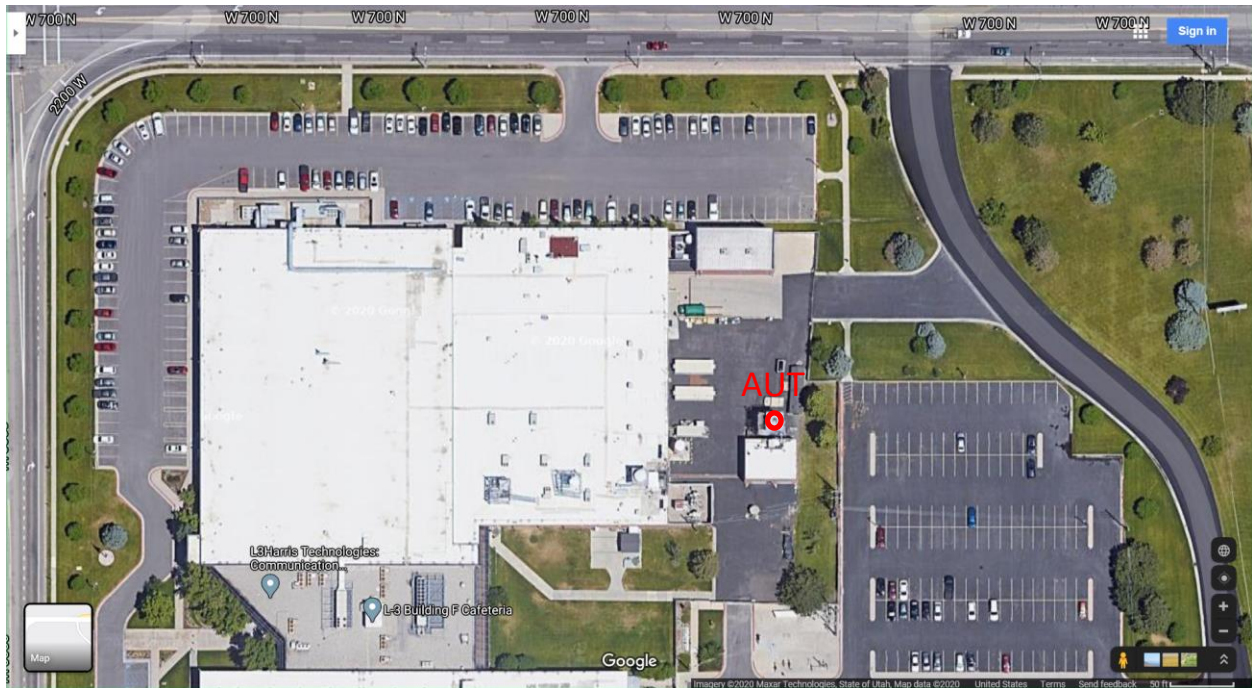


Figure 2. DSA Test Location L3 Harris Bldg E outbuilding tower



Figure 3. DSA Test Location Expanded View

The area of operation for the military high flyer aircraft is shown in Figure 4 shown below. The center of the circle is located at 40°47'2.03"N; 111°57'4.86"W (location of the AUT) with a radius of 200 nm.

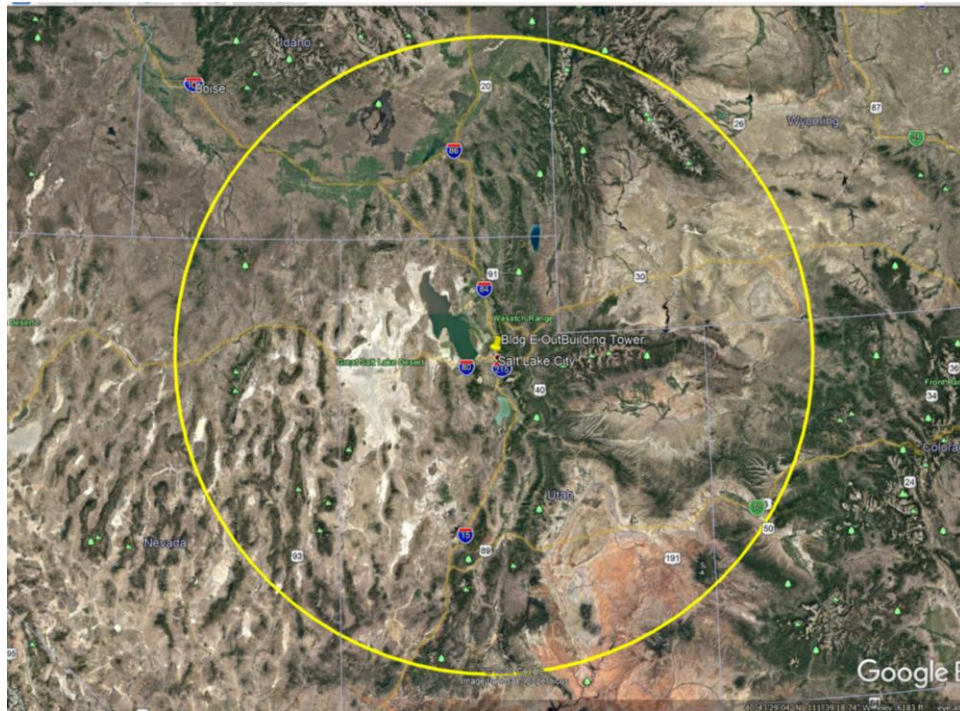


Figure 4. Military High Flying Aircraft Area of Operation