

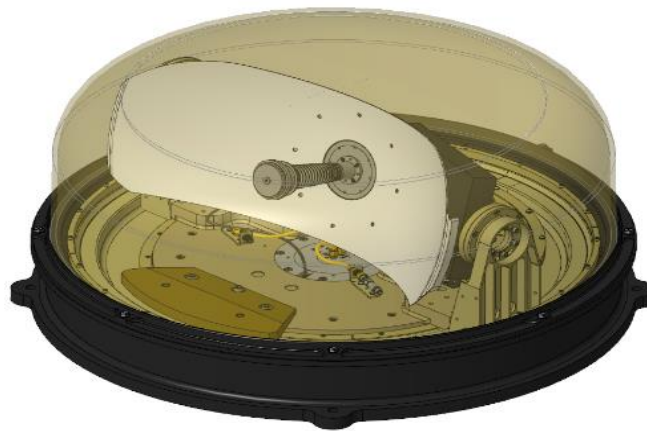
Operational Concept, L3-Datron's Low Profile Antenna, Hawaii Technology Demo, Sept 2019

Introduction:

L3 Datron has been in the SATCOM on the move business for over 15 years. One of our largest customers is the United States Marine Corp. They have asked Datron to demo a lower profile system in Hawaii this September. We are arranging space on a commercial Ka transponder for the demo. This is a mobile antenna, it will operate on improved roads within the military base, as part of a VIP display. Location: Kaneohe Bay, Hawaii, USMC Base.

Antenna Basics:

The antenna system is a truncated reflector mounted to an articulated gimbal system. It can transmit from 29-31GHz and can receive from 19.2-21.2 GHz. It is designed for communication on-the-move (COTM).



The reflector's major dimensions are 7 inches high, by 18 inches across.

TX and RX polarizations are independently electronically selectable. Therefore, they can be configured (LHCP/RHCP) for both co- or cross pol operation.

The antenna is steered by an on board ACU that is receiving inputs from GPS and an embedded inertial navigation system. We have used the same base equipment to gain ARSTRAT WGS approval for military COTM operation. For this demonstration, antenna pointing errors will be less than 0.5 degrees 100% of the time, and less than 0.2 degrees 95% of the time.

Performance Tables:

The following table shows basic features of the antenna

Parameter	Value	Notes
TX (Commercial)		
Gain	38.2 dB	average
Beamwidth AZ	1.1 deg	mid band
Beamwidth EL	2.8 deg	mid band
Axial Ratio	1.0 dB	
RX (Commercial)		

Gain	34.8 dB	average
Beamwidth AZ	1.6 deg	mid band
Beamwidth EL	4.2 deg	mid band
Axial Ratio	1.5 dB	

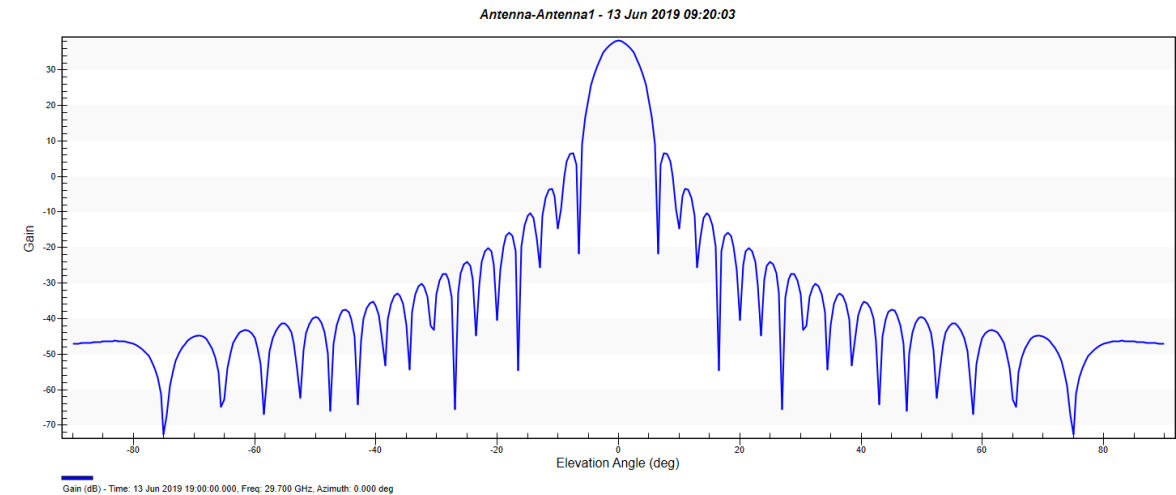
With our LNB and SSPA we will have the following nominal RX and TX performance levels:

Parameter	Value	Notes
Average value across 2 GHz		
EIRP	46 dBW	8W linear SSPA
G/T	11.2 dB/k	LNB Noise Figure 1.3dB

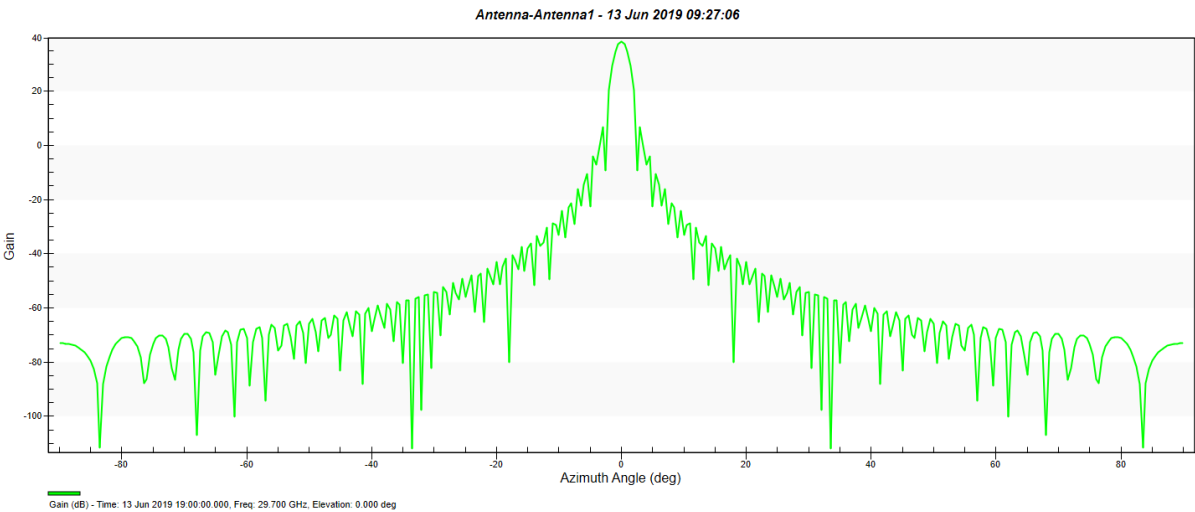
Some Calculated Patterns:

Transmit band azimuth and elevation:

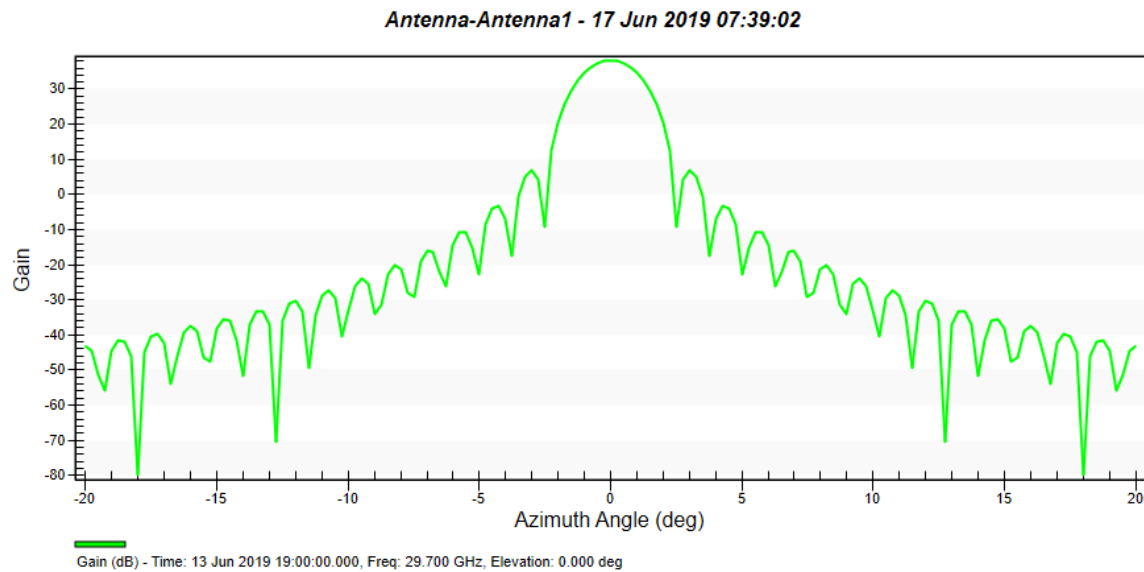
Calculated pattern at 29.7 GHz, Elevation Cut.



Calculated pattern at 29.7 GHz, Azimuth Cut.



Closer view of the Azimuth Cut.



Network:

No multiple access scheme will be in place. Single carrier operation only will be employed. Connection will be made to a hub designated by Inmarsat.

Muting:

We currently mute according to FCC 25.226, as well as over-temp, horizon mask, vehicle mask and an external user interlock.

Please feel free to contact us for any additional information that is needed.

Contact:

Peter Richardson
Sr. Systems Engineer
peter.richardson@L3T.com
L3 Technologies – Datron
200 W. Los Angeles Av
Simi Valley, CA
805-584-1717 x 3179