FCC Experimental STA Application

Narrative Summary -- Consolidated Update

Astranis Space Technologies Corp. ("Astranis") is a U.S.-based, space technology company headquartered in San Francisco, California. Astranis is developing a line of agile, frequency flexible and low-cost geostationary telecommunications satellites to open new and underserved markets, including those which do not otherwise support a costly traditional telecommunications satellite and those would benefit from a more incremental addition of satellite capacity.

To accomplish this mission, Astranis seeks to validate and demonstrate key technologies. Towards this end the Astranis Demosat-2 satellite, with its Software Defined Radio ("SDR") digital transponder payload, will allow Astranis to test and demonstrate components, software design, and operational concepts that are integral to the planned satellite product line.

The experimental tests and demonstrations planned by Astranis will be conducted intermittently over a six-month period commencing shortly after launch of the satellite. The TT&C and experimental payload communications frequencies, ground station location and operational constraints have been carefully identified to avoid the potential for interference to other spectrum users. In addition, this request is filed in accordance with the guidance and time frames established by the Commission for consideration of such experimental satellite applications.[1] Accordingly, grant of the requested experimental special temporary authorization ("STA") is fully consistent with Commission's guidance, policy and experimental licensing rules.[2]

Astranis notes that due to a launch slip, the expected launch date is now expected to be approximately September 1, 2017. In addition, Astranis provides responses to questions received from the Commission staff and other updates to the information originally submitted with this STA request. In view of the new launch schedule and other updates, Astranis respectfully requests that the Commission consider and authorize the proposed experimental satellite operations (as appropriately conditioned) as soon as practicable, and in any event not later than approximately July 1, 2017, to ensure Astranis obtains such authority in time to support integration into the launcher as required by its launch provider.

Pursuant to consultations with the Commission staff, Astranis is filing this material in a consolidated narrative update in its existing experimental STA application docket. There is no change to the previously submitted orbital debris assessment. Astranis will separately forward updated ITU-related information to the Commission staff.

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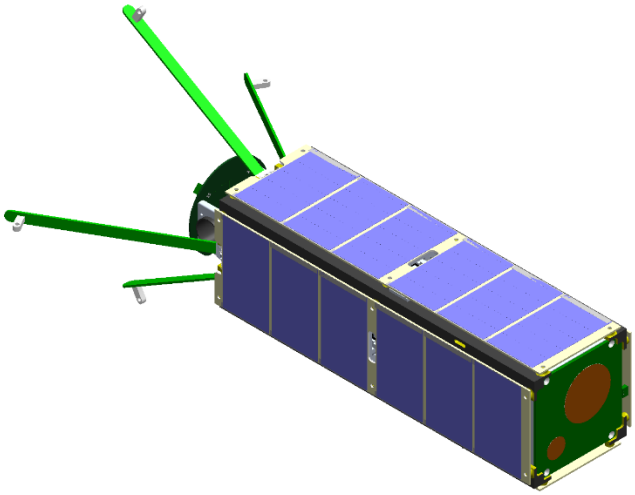
[1] *See* Guidance on Obtaining Licenses for Small Satellites, *Public Notice*, DA 13-445 (March 15, 2013) ("*Small Satellite Guidance*").

[2] *See* 47 C.F.R. Part 5; *see also* 47 C.F.R. §5.61 (Procedure for obtaining a special temporary authorization).

Experimental Satellite

The Astranis Demosat-2 satellite conforms to the form factor of a 3U cubesat (35 cm X 10 cm X 10 cm in size), with a total mass of approximately 5 kg. The maximum power generated by the solar panels is approximately 10 W, with a maximum transmitter output power of approximately 3 W. The communications payload uses patch antennas and the TT&C radio uses monopole antennas, as indicated in Figure 1.

Figure 1 – Demosat-2 Configuration



Orbit. The Astranis Demosat-2 satellite will be launched as a secondary payload aboard a Polar Satellite Launch Vehicle (PSLV) in September 2017. The satellite will be launched into a circular, sun-synchronous orbit at 500 km apogee and 500 km perigee with an inclination from the equator of 97.4°. De-orbiting due to atmospheric drag occurs approximately 6.4 years after launch, as calculated via Orbital Debris Assessment.[3] Even under worst-case assumptions, de-orbiting would occur in accordance with internationally accepted guidelines.

Communications Payload. The payload consists of an SDR-based digital transponder, including a low noise amplifier and a GaN solid state power amplifier with patch antennas for transmit and receive operations. Specific technical parameters include:

- 3 W spacecraft transmitter output power, 12.6 dBW EIRP
- TX in 2.390-2.400 GHz, RX in 5.950-5.960 GHz (10 MHz bandwidth)
- Circularly polarized, QPSK modulation

[3] *See* Orbital Debris Assessment Report (attached).

The communications payload will operate intermittently and on an as-needed basis to conduct experiments between one to six times per day while the satellites pass over dedicated earth stations located in Fairbanks, Alaska. Satellite communications will begin once the satellite has been deployed into its intended orbit (currently planned for mid-September 2017) and will cease six months thereafter. Accordingly, Astranis requests an STA period from September 1, 2017 to March 1, 2018.

Operation of the downlink payload will only take place during the brief periods (approximately 10 minutes) that the satellite is passing over the Fairbanks TT&C and communications earth station site. Satellite downlink (earth station receive) operations will be conducted in the 2.390-2.400 GHz band, which was chosen because it is consistent with Commission small satellite guidance.[4] In addition, based on NTIA spectrum use reports, Astranis understands there are no U.S. government operations in this band in Alaska,[5] and ULS reveals no licenses within Alaska that could be adversely affected by the proposed downlink operations. Nonetheless, and out of an abundance of caution, Astranis has successful coordinated its earth station receive operations in the 2390-2400 MHz band with the following entities: (i) the Enterprise Wireless Alliance (EWA), the coordinator for medical body area network (MBAN) operations; (ii) the National Oceanic and Atmospheric Administration (NOAA); (iii) the local amateur radio community; and (iv) the amateur satellite community.

TT&C. Tracking, telemetry and control of the Astranis Demosat-2 satellite will be conducted using a GomSpace AX100 UHF transceiver, with monopole antennas, for transmit and receive operations. TT&C downlink operations in the 401 MHz band will take place intermittently when the satellite is in view of the Fairbanks, Alaska earth station site. Astranis will coordinate its TT&C operations to ensure compatibility with any other co-frequency TT&C operations in the area. Particulars of the TT&C downlink operations include:

- 1 W spacecraft transmitter output power, 1.4 dBW EIRP
- Tx (downlink) at 401.600-401.750 MHz (150 kHz bandwidth)
- Linearly polarized, GMSK modulation

Communications Earth Stations

Earth station uplink and downlink operations will be conducted at a site in Fairbanks, Alaska. General Dynamics Series 1244 2.4 m antennas will be located at a University of Alaska Fairbanks site that provides associated support functionality (power, terrestrial connectivity, etc.). Note that the site location of 64°51'31.0"N, 147°50'07.0"W is slightly different than that originally proposed in the experimental STA form and this corrected location should be reflected in any STA grant. The earth station antennas will track the satellite as it passes over the site, and will

[4] *See Small Satellite Guidance* at 2 ("What Frequencies Can Be Used?").

[5] *See* https://www.ntia.doc.gov/page/federal-government-spectrum-use-reports-225mhz-5ghz.

transmit and receive intermittently and for brief periods (approximately 10 minutes) when the satellite is in view.

The uplink earth station will transmit with an EIRP of 49 dBW in the 5.950-5.960 GHz band. The earth station will be subject to operational constraints to prevent harmful interference to co-frequency terrestrial FS operations and C-band geostationary satellites. Astranis will operate at a minimum elevation angle of approximately 35° in southerly directions to maintain a 20° separation from the GSO arc and minimum elevation angles in more northerly directions that ensure there is no interference into any potentially affected terrestrial links. Astranis also plans to confirm coordination with potentially affected licensees.

The 20° minimum angular separation from the GSO arc will ensure compliance with the C-band equivalent power flux-density (EPFD↑) limit in the ITU Radio Regulations, with a substantial margin, to fully protect such operations from potential interference. Radio Regulation 22.5D provides that the EPFD↑ produced at any point in the GSO by emissions from NGSO earth stations shall not exceed the limits given in Table 22-2, establishes a limit of -183 dBW/m^2 per 4 kHz of spectrum for 100% of the time.

TABLE **22-2** (WRC-03)

Limits to the epfd↑ radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands[15]

Frequency band	**epfd↑ (dB(W/m^2))**	**Percentage of time epfd↑ level may not be exceeded**	**Reference bandwidth (kHz)**	**Reference antenna beamwidth and reference radiation pattern**[16]
5 925-6 725 MHz	−183.0	100	4	1.5° Recommendation ITU-R S.672-4, $Ls = -20$

Using the §25.209-compliant General Dynamics Series 1244 2.4 m earth station antenna and a 20° angular separation from the GSO arc, Astranis' uplink operations in the 5.950-5.960 GHz band will produce an EPFD↑ value of -189.4 dBW/m^2/4 kHz, which satisfies the limit by more than 6 dB.

Geostationary Satellite Altitude	35786.0	km
Slant Range to Closest Possible GSO Satellite	39868.0	km
Main Lobe EIRP	49.0	dBW
Necessary Bandwidth	7.65	MHz
Sidelobe Isolation at 20 degrees	42.6	dB
Max EIRP toward GSO Arc	6.4	dBW
Max EIRP density toward GSO Arc	-62.4	dBW/Hz
Max EIRP density toward GSO Arc in 4 kHz band	-26.4	dBW/4 KHz
Spreading Loss	163.0	dB
EPFD up	-189.4	dBW/m^2/4 kHz
EPFD up - Margin	6.4	dB

Because compliance with the ITU EPFD↑ value is deemed to fully protect GSO operations, Astranis can conduct its intermittent, temporary uplink operations without causing interference to GSO satellite operations. Nonetheless, Astranis commits to adjust or suspend earth station operations in the 5.950-5.960 GHz band upon notification that such operations are causing harmful interference to GSO satellite operations.

In addition, Astranis has carefully examined co-frequency terrestrial microwave operations to ensure they are also not adversely affected by the proposed experimental operations. Employing a minimum elevation angle to preserve the 20° angular separation from the GSO arc will fully protect two terrestrial links in southerly directions from the Fairbanks, Alaska earth station site. In addition, Astranis will ensure that its minimum elevation angle in northerly directions protect the single FS link located in this region. Nonetheless, Astranis commits to adjust or suspend earth station uplink operations in the 5.950-5.960 GHz band upon notification that such operations are causing harmful interference to terrestrial operations.

TT&C Earth Station

Astranis will utilize a GomSpace GS100 radio and associated equipment, including an AS100 Yagi antenna, to conduct TT&C operations. The TT&C earth station will be collocated with the communications earth stations at the Fairbanks, Alaska facility. The TT&C earth station will transmit and receive in the 401.600-401.750 MHz band (150 kHz bandwidth). This band was selected because it is allocated to space operations and similar services, and can be used in both directions of transmission.[6]

[6] The U.S. Table of Allocations includes Earth Exploration Satellite and Meteorological-Satellite operations in the Earth-to-space direction in the 401 MHz band, and such operations are similar to and compatible with intermittent, temporary TT&C operations. Astranis' proposed experimental TT&C uplink operations can be permitted in the band because they will be conducted on an unprotected, non-interference basis.

TT&C uplink operations in the 401 MHz band will take place intermittently and for brief periods (approximately 10 minutes) when the satellite is in view of the Fairbanks, Alaska earth station site. Through coordination with any other co-frequency operations in the area, Astranis will ensure its TT&C operations will be fully compatibility with other spectrum users and are conducted on a strictly unprotected, non-interference basis only. Nonetheless, Astranis commits to adjust or suspend earth station uplink operations in the 401.600-401.750 MHz band upon notification that such operations are causing harmful interference to other spectrum users.

FCC Experimental STA Application

Responses to Questions

On May 2, 2017, Astranis received the following questions from the FCC. Astranis appreciates the FCC's commitment to a thorough review of the application and the request for clarification on a number of points. Astranis has included its answers to the questions below, as well as updated its experimental STA application materials accordingly.

IB/SD has reviewed the subject request (API file/Form 442/Exhibits) and has the following questions.

1) Has the applicant perform any RF compatibility analysis for any of the frequency band?

> Astranis has examined the FCC's ULS system to identify potentially affected terrestrial microwave links in the 5950-5960 MHz band. Based on distance and orientation to the proposed earth station site, Astranis is implementing extremely conservative minimum elevation angles to limit EIRP spectral density towards the horizon and fully protect these fixed links. Astranis intends to prior coordinate with potentially affected licensees either directly or through a frequency coordinator. Astranis will update this application to reflect the results of this coordination effort.
>
> As reflected in the attached emails, Astranis has also successfully coordinated its use of the 2390-2400 MHz band with the following entities: (i) the Enterprise Wireless Alliance (EWA), the coordinator for medical body area network (MBAN) operations; (ii) the National Oceanic and Atmospheric Administration (NOAA); (iii) the local amateur radio community; and (iv) out of an abundance of caution, the amateur satellite community (which has no allocation in the band).

2) Please provide an antenna pattern (or a representative one) showing both horizontal (from -180 to 180 degrees) and vertical (0 to 90 degrees) planes for the 5950-5960 MHz band.

> Astranis has now provided masks based upon ITU-R S.465-6 for both the C-band uplink and the S-band downlink. The masks are circularly symmetric.

3) We found a discrepancy with the 5 GHz antenna gain; in the API the gain value is 41.6 dBi, yet in other calculations in exhibit it appears that the gain could be 40.5 dBi; please verify the antenna gain for the 5 GHz uplink band and provide the correct value.

> The 5 GHz antenna gain has been updated to 42 dBi in all places.

EPFD calculation comments (5950-5960 MHz):

6) In the Exhibit Narrative Summary, page 4, the GSO arc distance is provided as 35786 km; however, our spreading loss calculation showed a value of 162.07 dB; the exhibit has a value for the spreading loss of 163.0 dB; could the applicant please explain the differences. If a slant distance was used, please provide the slant distance value.

> 162.07 is the spreading loss to GSO from the equator, 163 is the minimum spreading loss to the GSO arc from our filed earth station location. Astranis has updated the EPFD analysis table in the Narrative Statement to show the slant range value.

7) We calculated the EIRP using the output power 7 dBW and antenna gain of 41.6 dBi (as provided in the API) and our calculation shows a 48.6 dBW; your EIRP value is set at 47.5 dBW; please check the antenna gain and output power value and let us know which value is correct.

As noted above in #2, we will need an antenna pattern to obtain the off-axis gain at 35 degrees.

> All documents have been updated to reflect that the maximum EIRP is now 49 dBW, based upon an RF power of 7 dBW and 42 dBi of antenna gain. Astranis has now provided masks based upon ITU-R S.465-6 for both the C-band uplink and the S-band downlink. The masks are circularly symmetric.

8) Using the exhibit max EIRP off axis value (4.9 dBW) towards the GSO arc, our calculation could not come up with the EIRP density of -63.3 dBW/Hz using the 10 MHz emission or any other emissions shown in the API. Please show how this EIRP density value was derived or provide us which emission bandwidth was used.

> 10 MHz was actually the full bandwidth of the signal and not the necessary bandwidth. The necessary bandwidth, as calculated using ITU-R SM.853 is 7.65 MHz. EIRP density is now -62.4 dBW/Hz. The max EIRP towards GSO arc is 6.4 dBW.

9) Using the input values in the exhibit to calculate the EPFD for each emission in the API, we notice that only the highest three bandwidth would meet the EPFD of -183 dBW/Hz/m^2; all the other emissions exceed the ITU EPFD limit. Please provide a technical explanation how the applicant plans to meet the EPFD limit when using the emissions bandwidth that are less than 2.5 MHz?

> Astranis has removed all but three of the emission designators. Astranis has also kept the spectral density the same by reducing the power commensurate with the bandwidth used.

Form 442 ALL frequency bands

10) We note that the API filing contains 14 emission designators and FCC Form 442 only has one emission designator of 10 MHz; please explain why all the emission were not included in the Form 442.

The original thinking was that ITU API typically cover an interference envelope while FCC filing are more focused upon a specific point design. The API, STA and narrative have all been updated to reflect the same set of emission designators.

Form 442 UPLINK (5.9 GHz band):

11) In Form 442, we checked the UPLINK ERP value and our calculation shows an EIRP of (7 + 41.6) = 48.6 dBW; convert to ERP subtract 2.15 dB = 46.45 dBW then convert to watts; 44.052 kW ERP; currently Form 442 shows ERP value of 34.196 kW ERP; we note that if the antenna gain is 40.5 dBi, the ERP value of 34.196 kW would be correct. Please confirm the antenna gain value.

Antenna gain has been updated to 42 dBW such that the EIRP is 49 dBW. This results in a ERP of 48,417 W.

12) We also notice a small discrepancy in the antenna beamwidth provided in Form 442 of 1.5 deg and in the API file of 1.4 deg. Let us know which one is the correct value.

Astranis has determined that the beam with will be 1.4 degrees and we have reflected this in all locations.

Form 442 UPLINK (401 MHz band):

13) In Form 442, we checked the UPLINK ERP value and our calculation shows an EIRP of (14 + 16.2) = 32.2 dBW; convert to ERP subtract 2.15 dB = 30.05 dBW then convert to watts; 638.3 W ERP; currently Form 442 shows ERP value of 764 W ERP. Please review the ERP calculation and confirm the value.

From link budgets this should be 14dB + 17dB = 31dB. The results in an ERP of 767 W.

14) We also notice a small discrepancy in the antenna beamwidth provided in Form 442 of 33 deg and in the API of 30 deg. Let us know which one is the correct value.

Astranis has determined the beam width will be 30 degrees we have reflected this in all locations.

API ALL frequency bands

15) The power spectral density calculation for each emission were off by either 1.5 dB to .5 dB in all the calculations; we used the following formula: PSD = Power (dBW) – 10*Log10(emission bandwidth in Hertz). Please review and verify the PSD calculation for each emission.

> Mostly driven by the fact that we previously reported 10MHz in the emission designator versus the actual necessary bandwidth of 7.65MHz. All emission designators and BW calculations should now reflect the same necessary BW.

API file, UPLINK Beam (5.9 GHz band):

16) The spacecraft receive antenna has a reference of ND-SPACE which indicates an omnidirectional antenna; however, the antenna has a gain of 7.3 dBi which would have some directionality. Can the applicant provide an antenna pattern or a representative one?

> Astranis has provided the antenna patterns for the C-Band and S-Band satellite patch antennas in Attachment #1. These payload antennas in the s_beam table of the API filing now reference Attachment #1.

17) In the associated earth station, Box C10b1 has a reference antenna of REC-465-5; however, we search the ITU website and found the most current version of REC-S.465-6; please check if we search the correct reference and update the API as appropriate.

> Updated to REC-465-6 for the C-Band and S-Band earth station antennas

API file, DOWNLINK Beam (2.9 GHz band):

18) The spacecraft transmit antenna has a reference of ND-SPACE which indicates an omnidirectional antenna; however, the antenna has a gain of 7.3 dBi and in Form 442 it indicates a directional antenna with beamwidth of 79 degree. Please provide an antenna pattern or a representative antenna pattern for this beam.

> Astranis has provided the antenna patterns for the C-Band and S-Band satellite patch antennas in Attachment #1. These payload antennas in the s_beam table of the API filing now reference Attachment #1.

19) Please provide the minimum elevation angle (the minimum is typically 5 degrees).

While this data is considered optional for the API and not subject to coordination (per ITU Radio Regulations Appendix 4), Astranis has added a value of 30 degrees out of an abundance of caution.

API DOWNLINK (401 MHz band):

20) The spacecraft transmit antenna has an antenna gain of -1 dBi; however, the spacecraft receive antenna gain is 1 dBi; please verify if the transmit antenna gain is correct.

The antenna gain has been update to 1.4 dBi for both TX and RX in all locations.

21) Please provide the minimum elevation angle (the minimum is typically 5 degrees).

While this data is considered optional for the API and not subject to coordination (per ITU Radio Regulations Appendix 4), Astranis has added a value of 10 degrees out of an abundance of caution.

22) In the associated earth station, Box C10d6, noise temperature; we note that the noise temp is 1003 Kelvin; typically this value is in the 400 K range; please review and confirm your value of 1003 K.

Astranis has updated the value to 500 Kelvin. The original value of 1003 Kelvin reflected a noisy urban environment. However since we will be operating in Alaska, Astranis believes that 500 Kelvin is still safely conservative number and should reflect the maximum system noise temperature, including man made noise, for a significant fraction of the time.

Carlos Nalda

Subject: Astranis: MBAN Information/Coordination

From: Carlos Nalda [mailto:cnalda@lmiadvisors.com]
Sent: Wednesday, February 22, 2017 3:19 PM
To: Robin Cohen <Robin.Cohen@enterprisewireless.org>
Cc: cnalda@lmiadvisors.com
Subject: RE: MBAN Information/Coordination

Robin,
Apologies for the delay in responding. The ELS file number is: 0113-EX-ST-2017 (searchable at https://apps.fcc.gov/oetcf/els/reports/GenericSearch.cfm) .
This is otherwise very good news and we will certainly cooperate in further consultations to the extent necessary or appropriate.
Thanks very much again for your guidance.
Best regards,
Carlos

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From: Robin Cohen [mailto:Robin.Cohen@enterprisewireless.org]
Sent: Wednesday, February 22, 2017 1:04 PM
To: Carlos Nalda <cnalda@lmiadvisors.com>
Subject: RE: MBAN Information/Coordination

Carlos,

Thank you for the discussion this morning. As a follow up, can you provide the file number of the Experimental STA? Also, now that we've confirmed your clients request is only for the upper 10 MHz of the band (2390-2400 MHz), I've confirmed there are no AMT operations in that upper 10 MHz, therefore, you won't require AFTRCC consent nor registration with EWA. Health care facilities are required per the rules to register with EWA their operations in the upper 10 MHz, but there isn't additional engineering to be performed by EWA since there are no AMT operations at 2390-2400 MHz. Since your client is purely filing for experimental for testing satellite downlinks and not MBAN operations, this doesn't apply to them. However, out of the abundance of caution, I'd like to make sure I include your clients Experimental STA information in our database, in case we receive a request for actual MBAN operations in 2390-2400 in Alaska during the time of their STA.

Hope this helps. Sorry it didn't register you were only talking about the upper 10 MHz. Teaches me to read your email at o' dark thirty and clearly not retain that important information! My apologies.

Thanks again.

Robin

Robin Cohen | Executive Director, Regulatory Affairs & Spectrum Strategies | Enterprise Wireless Alliance | 703-797-5112
2121 Cooperative Way, Suite 225 | Herndon, VA 20171
Delivering Spectrum Solutions to Power Your Business

From: Robin Cohen
Sent: Wednesday, February 22, 2017 11:09 AM
To: 'Carlos Nalda' <cnalda@lmiadvisors.com>
Subject: RE: MBAN Information/Coordination

https://mbanregistration.org/

From: Carlos Nalda [mailto:cnalda@lmiadvisors.com]
Sent: Wednesday, February 22, 2017 5:54 AM
To: Robin Cohen <Robin.Cohen@enterprisewireless.org>
Cc: cnalda@lmiadvisors.com
Subject: MBAN Information/Coordination

Robin,

I am following up on my voicemail regarding MBAN operations in the 2390-2400 MHz band. I understand that EWA serves as the coordinator and that you are an appropriate contact for questions.

I represent a company seeking an FCC experimental STA for intermittent, temporary satellite downlinks in the band to an earth station near Fairbanks, AK. We do not believe there is any potential for interference given the lower power levels at the surface of the Earth, which would be entirely blocked indoors. Nonetheless, we would like to touch base to ensure that you are aware of the proposed operations, which would be on a non-interference basis only, and have our contact information in the unlikely event of an issue.

Wondering if you might have some time to discuss.

Thanks very much.

Best regards,
Carlos

Carlos M. Nalda

Carlos Nalda

Subject: FW: Temp Satellite Downlink Ops in 2390-2400 MHz

On Wed, Mar 22, 2017 at 07:41 Larry Ledlow - NOAA Federal <larry.ledlow@noaa.gov> wrote:

I concur. Based on what I have learned, there is very low probability of interference to our local operations. We should establish a protocol with points of contact so we can coordinate in the event of any. I suggest having available an operations schedule emailed to our shift leaders just for their awareness. Fcdas_leaders@noaa.gov. The 24/7 phone to the shift leader desk is 907-451-1222.

Regards.

From: Carlos Nalda mailto:cnalda@lmiadvisors.com]
Sent: Monday, March 20, 2017 1:49 PM
To: 'Larry Ledlow - NOAA Federal'; 'Larry Ledlow, Jr. N1TX'; 'webmaster'; 'Dan'
Cc: cnalda@lmiadvisors.com
Subject: RE: Temp Satellite Downlink Ops in 2390-2400 MHz

Larry and Dan,

I hope all is well. Following up on our conversation last month.

I believe we concluded that there are no issues with the experimental satellite downlink operations in the 2390-2400 MHz band proposed by Astranis, but I wanted to confirm your agreement with this conclusion. At a minimum, it would be useful to be able to inform the FCC that Astranis has reached out to NOAA and the amateur community, and no issues of concern have been identified.

Thanks very much.

Best regards,

Carlos

Carlos M. Nalda

Principal

cnalda@lmiadvisors.com

Carlos Nalda

To: 'Dan'
Subject: RE: Temp Satellite Downlink Ops in 2390-2400 MHz

From: Carlos Nalda [mailto:cnalda@lmiadvisors.com]
Sent: Tuesday, March 21, 2017 11:41 PM
To: 'Dan' <powellite@hotmail.com>
Cc: cnalda@lmiadvisors.com
Subject: RE: Temp Satellite Downlink Ops in 2390-2400 MHz

Dan,
Thank you for the confirmation below.
Best regards,
Carlos

Carlos M. Nalda
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Washington, D.C. 20037

M: +1.571.332.5626

From: Dan [mailto:powellite@hotmail.com]
Sent: Tuesday, March 21, 2017 11:33 PM
To: Carlos Nalda <cnalda@lmiadvisors.com>
Subject: Re: Temp Satellite Downlink Ops in 2390-2400 MHz

Carlos,

I am part of the local Fairbanks amateur radio community, elected webmaster of the local Arctic Amateur Radio Club (KL7KC.com) and consider myself a very active member of both the local and statewide amateur community and hold membership in several elite radio contesting groups (KL2R, North Pole Contesting Group and KL4SD). As an amateur radio operator holding an Extra Class License and heavily involved in many facets of active radio operating including experimentation, I can state that I am not aware of any frequency conflicts in the scope of your request for Temporary Satellite Downlink Operations in 2390-2400 MHz range.

Dan Wietchy
FCC license: KL1JP – Extra Class
Army MARS license: ALM7DF

Carlos Nalda

To: 'Hans Blondeel Timmerman'
Subject: RE: [satcoord-i:6612] FCC Experimental Satellite Operations

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From: Carlos Nalda [mailto:cnalda@lmiadvisors.com]
Sent: Monday, February 20, 2017 11:08 AM
To: 'Hans Blondeel Timmerman' <pb2t@me.com>
Cc: cnalda@lmiadvisors.com
Subject: RE: [satcoord-i:6612] FCC Experimental Satellite Operations

Thank you for these clarifications.
We understand that no IARU satellite coordination is required for this non-Amateur Satellite band.
We will follow up with the licensing administration for additional guidance.
Thanks very much again.
Best regards,
Carlos

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From: Hans Blondeel Timmerman [mailto:pb2t@me.com]
Sent: Monday, February 20, 2017 11:05 AM
To: Carlos Nalda <cnalda@lmiadvisors.com>
Subject: Re: [satcoord-i:6612] FCC Experimental Satellite Operations
Importance: High

Threec orrections in my email

> On 20 Feb 2017, at 08:26, Hans Blondeel Timmerman <pb2t@me.com> wrote:
>
> Mr Nalda,
>
> IARU Region 2 contacts are copied when using "satcoord@iaru.org". They are part of my team and aware of the correspondence.

Allow me to make an observation in relation to your understanding "that the 2390-2400 MHz band is not typically used for Amateur Satellite operations". This band is not used for amateur satellite operations because there is no ***allocation*** for the amateur satellite service.
In Region 2 the frequency band 2390-2400 MHz is ***allocated*** to terrestrial services only, including the amateur ~~**satellite**~~ service (terrestrial). IARU is not in a position to make exceptions to the radioregulations. Again I suggest that you contact your licensing authorities.

<IARU small.jpg>
Hans P. Blondeel Timmerman PB2T
IARU Satellite Advisor

On 17 Feb 2017, at 23:33, Carlos Nalda <cnalda@lmiadvisors.com> wrote:

Thank you very much for the prompt response.

I understand that the 2390-2400 MHz band is not typically used for Amateur Satellite operations, but there is an Amateur allocation in the band in the United States so we wanted to confirm that there are no concerns with the limited downlink operations that have been proposed in this band.

I am copying IARU Region 2 contacts on this email.

Thanks very much again for your assistance.

Best regards,
Carlos

Carlos M. Nalda
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M: +1.571.332.5626

From: Hans Blondeel Timmerman [mailto:pb2t@me.com]
Sent: Friday, February 17, 2017 12:43 AM
To: Carlos Nalda <cnalda@lmiadvisors.com>
Cc: satcoord@iaru.org
Subject: Re: [satcoord-i:6584] FCC Experimental Satellite Operations
Importance: High

Dear Mr Nalda,