

EXHIBIT A

Pursuant to 47 C.F.R. §25.115, SES Americom, Inc. (“SES Americom”) seeks authority to operate six gateway earth stations with the SES-15 satellite,¹ which is scheduled to be launched in the second quarter of 2017.²

I. Background

The SES-15 satellite will host 46 Ku-band high-throughput spot beams which will significantly increase the capacity and data rates available to satellite broadband and aeronautical consumers in the United States. In order to support the anticipated demand in the Ku-band, SES-15 is equipped with feeder link spectrum in the Ka-band, including the 27.5-28.35 GHz uplink band. This application seeks authority for gateway earth stations that will operate using that feeder link spectrum.

SES Americom intends to deploy the requested earth stations in 2016/2017 operating at the locations identified in Table 1 using the frequencies identified in Table 2 below. As further described in Table 1, the earth station antennas will include both 7.3 meter and 9.1 meter antennas.³ The technical information for each antenna is provided in the associated Form 312, Schedule B. The proposed earth stations will comply with the antenna performance requirements set out in Section 25.209(a) and the off-axis EIRP density levels set out in Section 25.138(a) of the Commission’s rules.

¹ SES Americom’s affiliate, SES Satellites (Gibraltar) Limited, is simultaneously filing a petition requesting U.S. market access for the SES-15 satellite. See File Number SAT-PPL-20160126-00007.

² SES Americom is continuing to evaluate the final number of earth stations it will require to support SES-15 service and is filing for the earth stations and antenna characteristics it is currently considering. Once a final decision is made, SES Americom will withdraw any applications for gateway facilities that it does not intend to pursue.

³ In two cases, SES Americom is considering more than one antenna size because it has not confirmed the full customer requirements for the specific earth stations. As soon as a decision is made, SES Americom will withdraw its request for antennas that will not be used.

Table 1: Gateway Earth Station Locations

	Gateway Site	Contact Information	Antenna Diameter (meters)	Longitude (Deg., Min., Sec.)	Latitude (Deg., Min., Sec.)	LMDS Licensed Area
1.	Brewster, WA	David Grooms 66c Teleport Dr., Brewster, WA 98812 (509) 689-7250	7.3 or 9.1	119°41'37"W	48° 8'46.7"N	No
2.	Cheyenne, WY	Silas Cole 530 EchoStar Dr. Cheyenne, WY 82007 (307) 633-5200	7.3	104°44'15.3"W	41°7'54.4"N	Yes
3.	Fort Collins, CO	Gary Myall 3350 Eastbrook Dr., Ft. Collins, CO, 80525 (970) 212-0706	7.3 or 9.1	105° 2'28.4"W	40°32'30.7"N	No
4.	Mt. Jackson, VA ⁴	Daniel Vernet 1305 Industrial Park Road, Mt. Jackson, VA 22842 (540) 477-5520	9.1	78°40'01.4"W	38°43'25.2"N	No
5.	South Mountain, CA	David Coyle 5920 Solano Verde Dr., PO Box 479, Somis, CA 93066 (805) 386-2712	7.3	118°59'41.4"W	34°19'31.9"N	Yes
6.	Woodbine, MD	Mark Rathert 2323 Grimville Rd., Mount Airy, MD, 21771 (410) 970-7501	9.1	77°4'49.1"W	39°22'38.7"N	Yes

⁴ The National Radio Quiet Zone has confirmed by a letter dated January 8, 2016 that neither the National Radio Astronomy Observatory located at Green Bank, WV, nor Sugar Grove Research Station located at Sugar Grove, WV, have any objections to SES Americom's proposed operations at Mt. Jackson, VA under 47 C.F.R. §1.942(a).

SES Americom will operate the requested earth stations in the following frequencies to provide gateway uplink services to support the Ku-band high-throughput spot beam operations of SES-15.

Table 2: Requested Frequencies

Frequency Band (GHz)	Function	US Allocation
18.3-18.8	Downlink	GSO FSS Primary
19.7-20.2	Downlink	GSO FSS Primary
27.5-28.35	Uplink	LMDS Primary, GSO Secondary
28.35-28.6	Uplink	GSO FSS Primary
29.25-30.0	Uplink	GSO FSS Primary

II. Public Interest Benefits

Grant of this application is in the public interest because it will allow SES Americom to deploy and operate the gateway earth stations that are necessary to ensure that the full capabilities of SES-15 will be available to U.S. consumers once the satellite begins operations. SES-15’s high-throughput spot beams will greatly increase the capacity available for satellite broadband service throughout the U.S., enhancing competition and supporting achievement of the Commission’s broadband goals.

III. LMDS Interference Analysis

As noted above, SES Americom requests authority to operate its earth stations in the 27.5-28.35 GHz band, which is allocated to LMDS on a primary basis and to FSS on a secondary basis.⁵ SES Americom commissioned the attached Comsearch reports, which demonstrate that the proposed earth stations will be capable of operating in the 27.5-28.35 GHz band on a non-harmful interference basis with existing and future LMDS systems. See

⁵ See 47 C.F.R. § 25.202(a)(1) n.2.

Attachment 1. Prior notification letters were sent to incumbent 28 GHz licensees and no objections were received.

SES Americom has also conducted an assessment to evaluate the potential interference each of the above earth stations may cause into LMDS systems under a worst-case scenario reflecting the following assumptions:

- The LMDS terminals have a gain of 31 dBi and a receiver noise figure of 6 dB;⁶
- An LMDS interference threshold of I/N of -12.2 dB;
- The LMDS Thermal Noise Density is -138 dBW/MHz;
- The LMDS hub is co-located with the gateway earth station;⁷
- Free space propagation;
- The transmitting earth station is pointing at the SES-15 satellite at 129.15° W.L. and in an azimuth direction that aligns with the LMDS user terminal.

Applying these assumptions, SES Americom calculated the maximum required separation distance between an LMDS user terminal and SES Americom's earth station. The scenario assumes the lowest elevation angle and smallest off-axis angle toward the LMDS user terminal, thereby producing the highest level of interference into the LMDS user terminal receive beam. The results of this worst case for the six gateway earth station locations are shown below.

⁶ Robert Duhamel, Telcordia Technologies, "Local Multipoint Distribution Service (LMDS) Cell Sizing and Availability," IEEE P802.16 Broadband Wireless Access Working Group, 9 June 1999.

⁷ The user terminals are more susceptible to interference due to their higher gain relative to the hub antennas, requiring larger separation distances. Therefore, SES Americom only presents the results for interference into the LMDS user terminals.

Table 3: Worst-Case LMDS Interference Analysis

	Brewster, WA	Cheyenne, WY	Fort Collins, CO	Mt. Jackson, VA	South Mountain, CA	Woodbine, MD
GSO ES On-Axis EIRP per 36 MHz (dBW/36 MHz) (clear-sky) ⁸	67	64.6	64.6	65.5	66.2	65.5
GSO ES On-Axis EIRP Density (dBW/MHz)	51.4	49	49	49.9	50.6	49.9
GSO ES antenna diameter ⁹	7.3	7.3	7.3	9.1	7.3	9.1
GSO ES On-Axis Transmit Antenna Gain (dBi)	64.6	64.6	64.6	66.4	64.6	66.4
Minimum off-axis angle	34	36	37	21	45	20
Maximum off-axis transmit antenna gain toward horizon (dBi) ¹⁰	-5.7	-6.5	-6.6	1.3	-8.7	1.9
Maximum off-axis EIRP density toward horizon (dBW/MHz)	-18.8	-21.9	-22.2	-15.2	-22.7	-14.6
Polarization Discrimination (dB)	0	0	0	0	0	0
LMDS thermal noise density (dBW/MHz)	-138	-138	-138	-138	-138	-138
LMDS required I/N (dB)	12.2	-12.2	-12.2	-12.2	-12.2	-12.2
Interference power density to meet required I/N (dBW/MHz)	-150.2	-150.2	-150.2	-150.2	-150.2	-150.2
LMDS user-terminal receive antenna gain (dBi)	31	31	31	31	31	31
Distance required to meet I/N (free space loss) (km)	112	78	76	170	71	181

⁸ Under rain-fade conditions, when the transmitting gateway earth station may increase its power to help overcome the rain attenuation, the resulting interference to an LMDS receiver is expected to be less than under clear-sky conditions because the rain attenuation will have a greater impact on the path between the gateway earth station and the LMDS receiver terminal than on the path between the gateway earth station and the SES-15 satellite.

⁹ For the Brewster and Ft. Collins earth stations, where the antenna size has not yet been determined, SES Americom used the antenna parameters for the 7.3 meter antennas because they present a higher likelihood of interference.

¹⁰ See 47 C.F.R. § 25.209.

The above analysis demonstrates that LMDS terminals located beyond the defined distances will not experience interference from SES Americom's earth stations; however, the assessment applies a worst-case methodology based on a free space loss propagation model. SES Americom conducted further analysis using radio frequency propagation simulation software to determine the areas around the proposed earth stations where the interference threshold may be exceeded under more realistic circumstances and taking into account actual terrain data. In the simulations run by SES Americom, the LMDS user terminals were located in a grid around each proposed gateway with 0.1 km between each user terminal. At each of the user terminal locations, the I/N from the gateway was calculated and compared to the -12.2 dB threshold. Any user terminal that experienced interference above the threshold was overlaid on the map for the specific gateway in blue. The attached plots show the areas around each gateway where the interference threshold was exceeded in light of attenuation caused by the terrain. See Attachment 2.

In the worst case LMDS interference analysis in Table 3 above it was shown that an SES gateway antenna could potentially interfere with an LMDS user terminal up to 181 km away depending on location. Though this analysis accurately reflects the underlying worst-case assumptions, in reality this level of interference will not occur. The propagation characteristics of the 28 GHz band ensure that signals do not penetrate surrounding terrain. As shown in Attachment 2, SES Americom's proposed gateway antennas are well shielded by surrounding terrain, and the required separation distances are far less than the worst case interference calculations. The areas of interference depicted in Attachment 2 demonstrate that the potential areas where harmful interference may occur to an existing LMDS operator are small and will

likely be reduced even further when a realistic LMDS hub location is considered and the measured gateway antenna performance is incorporated.

SES Americom notes that in its Notice of Proposed Rulemaking in the Spectrum Frontiers proceeding,¹¹ the Commission has proposed a means for FSS operators to obtain co-primary operating status in the LMDS band outside of areas with a current LMDS licensee and has requested comment on other potential approaches for elevating FSS operations to co-primary status in the LMDS band. Once the Commission has acted on these proposals and a framework under which FSS operators can seek co-primary status in the 27.5-28.35 GHz band is in place, SES Americom will update the record with respect to its gateway earth stations to request co-primary treatment.

IV. Iridium Feeder Link Coordination.

In addition to the LMDS band, SES Americom proposes to operate the requested earth stations in the 29.25-29.50 GHz band, which is shared on a co-primary basis with MSS NGSO systems under 47 C.F.R. § 25.258. SES Americom has initiated coordination discussions with Iridium, which is the only NGSO licensed operator in this band.

V. Waiver Requests

SES Americom requests a partial waiver of the information submission requirements set out in Sections 25.115(e) and 25.138(d-e) because the proposed antenna model details and specification have not been confirmed and have not yet entered production. As a result, SES Americom is unable to provide the required information until the antennas have been produced. Grant of the partial waiver is in the public interest because the information SES

¹¹ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*; Notice of Proposed Rulemaking, FCC 15-138, 30 FCC Rcd 11878 (2015) (“NPRM”).

Americom has provided with this application will allow the Commission and other commenters to assess the earth stations' ability to operate in a two-degree spacing environment and SES Americom will provide the requested information as soon as possible, but no later than 60 days after a grant of its applications. Furthermore, the waiver will allow SES Americom to build its earth stations in time to communicate with SES-15, which is scheduled to be launched in the second quarter of 2017.

Section 25.115(e) requires earth station applicants in the 20/30 GHz FSS spectrum to provide information specified in Section 25.138. Section 25.138(d) in turn requires applicants to provide radiation patterns measured on a production antenna for the bottom, middle and top frequencies of each uplink band.¹² Similarly, applicants seeking protection from adjacent satellites in the downlink bands must provide antenna performance plots for each antenna type in the same format prescribed in Section 25.138(d).¹³

Grant of the waivers requested here is consistent with Commission policy:

The Commission may waive a rule for good cause shown. Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule. Generally, the Commission may grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.¹⁴

SES Americom's affiliate in Luxembourg is in the process of contracting with specific manufacturers to construct the antennas SES will use to support its HTS operations around the world. This process is complex and requires consideration of numerous factors. As a result, SES Americom is unable to provide patterns for the production antennas because the

¹² 47 C.F.R. § 25.138(d).

¹³ 47 C.F.R. § 25.138(e).

¹⁴ *PanAmSat Licensee Corp.*, 17 FCC Rcd 10483, 10492 (Sat. Div. 2002) (footnotes omitted).

antennas are not yet in production, and therefore cannot be tested. Good cause exists to grant the requested waiver. The requested Ka-band earth stations are critical to the full and efficient use of the SES-15 satellite's Ku-band spot beams, and granting the partial waiver will ensure SES Americom can complete construction of the earth stations in time to operate with the satellite once it launches in 2017. The information requested under the rules, however, will not be available until after the antennas are in production, which could otherwise significantly delay licensing for SES Americom's earth stations. The information SES Americom has submitted with this application will allow all parties to evaluate the potential interference to adjacent satellites and SES Americom will provide the requested information within 60 days after grant. As a result, the ultimate goal of the rule will be met.

The Commission has previously granted a waiver request under similar circumstances. On December 2, 2015, the Commission authorized HNS License Sub, LLC authority to operate 17 gateway earth stations with the Jupiter 97W satellite.¹⁵ In its applications, HNS requested a waiver of the information requirements in Sections 25.115(e) and 25.138(d-e) because it had not yet constructed the antennas and could not provide the required measured data. The Commission granted the waiver and required HNS to provide the required information within 60 days of grant.¹⁶ The Commission should grant SES Americom a similar waiver.

VI. FAA Notification

SES Americom has conducted an assessment of its compliance with Section 17.7 of the Commission's rules and determined that the proposed earth station in Brewster, WA, does

¹⁵ See example HNS Licensee Sub, LLC, File No. SES-LIC-20150604-00337, granted Dec. 2, 2015.

¹⁶ *Id.*

not pass the FCC TOWAIR verification process.¹⁷ SES Americom believes there are other factors that mitigate the TOWAIR results and ensure that its proposed earth station will not cause a hazard to aircraft operating in the area.

Specifically, the antenna does not require notification to the FAA because it will not interfere with local air traffic routes due to large topographic features between the antenna and the airport.¹⁸ The antenna will be approximately 10 meters tall, but the elevation changes between the antenna and the airport runway total over 100 meters as shown in the below graph. It is also important to note that the SES antenna will be north of the Anderson Field runway, which runs east to west; therefore, the antenna will not be in the direct approach or take-off path for the airport. In addition to the ground based elevation changes the antenna will be among numerous other antennas of similar size, providing additional shielding.



VII. Conclusion

For the foregoing reasons, SES Americom requests authority to operate the earth stations described in this application. As described above, grant of this application is in the public interest, and the proposed operations will not cause any harmful interference.

¹⁷ 47 C.F.R. § 17.7. The TOWAIR results for this earth station are provided as Attachment 3.

¹⁸ 47 C.F.R. § 17.7(e)(1).

ATTACHMENT 1

Comsearch Reportsⁱ

ⁱ SES Americom originally requested Comsearch to conduct notifications based on three potential antenna sizes; therefore the attached reports include data sheets for 7.3, 9.1 and 13.5 meter antennas. SES Americom only requests authority to operate the antennas specifically described in this application.

Ka-Band Earth Station – Brewster, WA

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016



COMSEARCH
A CommScope Company



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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Brewster, Washington, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in Brewster, Washington was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Verizon	Continental US

A notification letter and datasheets for the earth station in Brewster, Washington were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensee on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
Nextlink/XO	BTA413	Seattle-Tacoma, WA

No objections were received from the LMDS incumbents.

4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in Brewster, Washington. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 46.7" N
Longitude (NAD 83) 119° 41' 37.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 382.11 m / 1253.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 150.7° to 200.2°
Corresponding Elevation Angles 30.5° / 32.8°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		7.3 meter		7.3 meter	
Gain / Diameter		60.8 dBi / 7.3 m		64.6 dBi / 7.3 m	
3-dB / 15-dB Beamwidth		0.17° / 0.34°		0.11° / 0.22°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			39.6 63.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	150.5 km / 93.5 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values		BREWSTER, WA			
Licensee Name		SES Americom, Inc.			
Latitude (NAD 83)		48° 8' 46.7" N			
Longitude (NAD 83)		119° 41' 37.0" W			
Ground Elevation (AMSL)		382.11 m / 1253.7 ft			
Antenna Centerline (AGL)		5.49 m / 18.0 ft			
Antenna Model		SES 7.3 meter			
Antenna Mode		Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power				-25.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.74	139.19	-10.00	104.14	-10.00	100.00
5	0.80	135.84	-10.00	101.56	-10.00	100.00
10	0.57	132.11	-10.00	111.04	-10.00	100.00
15	1.13	128.58	-10.00	100.00	-10.00	100.00
20	1.86	124.90	-10.00	100.00	-10.00	100.00
25	0.50	120.35	-10.00	114.05	-10.00	100.00
30	0.35	116.19	-10.00	125.56	-10.00	100.00
35	0.70	112.10	-10.00	105.82	-10.00	100.00
40	1.20	107.95	-10.00	100.00	-10.00	100.00
45	1.34	103.66	-10.00	100.00	-10.00	100.00
50	1.48	99.34	-10.00	100.00	-10.00	100.00
55	1.56	94.98	-10.00	100.00	-10.00	100.00
60	1.66	90.61	-10.00	100.00	-10.00	100.00
65	2.03	86.21	-10.00	100.00	-10.00	100.00
70	2.10	81.82	-10.00	100.00	-10.00	100.00
75	2.35	77.41	-10.00	100.00	-10.00	100.00
80	2.56	73.02	-10.00	100.00	-10.00	100.00
85	2.50	68.69	-10.00	100.00	-10.00	100.00
90	2.73	64.34	-10.00	100.00	-10.00	100.00
95	2.79	60.07	-10.00	100.00	-10.00	100.00
100	2.59	55.96	-10.00	100.00	-10.00	100.00
105	2.29	52.01	-10.00	100.00	-10.00	100.00
110	2.16	48.14	-10.00	100.00	-10.00	100.00
115	2.16	44.37	-9.18	100.00	-9.18	100.00
120	2.24	40.76	-8.26	100.00	-8.26	100.00
125	2.49	37.29	-7.29	100.00	-7.29	100.00
130	1.40	35.18	-6.66	100.00	-6.66	100.00
135	0.87	33.20	-6.03	108.76	-6.03	100.00
140	0.39	31.79	-5.56	132.75	-5.56	100.00
145	0.23	30.76	-5.20	147.54	-5.20	100.00
150	0.00	30.51	-5.11	150.51	-5.11	100.00
155	0.00	30.78	-5.21	150.21	-5.21	100.00
160	0.00	31.76	-5.55	149.15	-5.55	100.00
165	0.00	33.03	-5.97	147.85	-5.97	100.00
170	0.00	33.96	-6.27	146.93	-6.27	100.00
175	0.00	34.52	-6.45	146.39	-6.45	100.00
180	0.00	34.71	-6.51	146.21	-6.51	100.00
185	0.00	34.52	-6.45	146.39	-6.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**BREWSTER, WA**

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Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz	Transmit 28.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz
Max Available RF Power			-25.0 (dBW/4 kHz)
			0.0025%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	146.93	-6.27	100.00
195	0.00	33.11	-6.00	147.76	-6.00	100.00
200	0.00	32.75	-5.88	148.13	-5.88	100.00
205	0.00	33.07	-5.98	147.81	-5.98	100.00
210	0.00	34.04	-6.30	146.86	-6.30	100.00
215	0.00	35.61	-6.79	145.38	-6.79	100.00
220	0.00	37.71	-7.41	143.54	-7.41	100.00
225	0.00	40.24	-8.12	141.47	-8.12	100.00
230	0.00	43.15	-8.87	139.32	-8.87	100.00
235	0.00	46.34	-9.65	137.15	-9.65	100.00
240	0.00	49.77	-10.00	136.18	-10.00	100.00
245	0.34	53.22	-10.00	125.68	-10.00	100.00
250	0.98	56.74	-10.00	100.00	-10.00	100.00
255	2.35	60.21	-10.00	100.00	-10.00	100.00
260	1.93	64.43	-10.00	100.00	-10.00	100.00
265	2.29	68.49	-10.00	100.00	-10.00	100.00
270	3.14	72.55	-10.00	100.00	-10.00	100.00
275	3.48	76.80	-10.00	100.00	-10.00	100.00
280	3.62	81.13	-10.00	100.00	-10.00	100.00
285	3.44	85.49	-10.00	100.00	-10.00	100.00
290	3.25	89.85	-10.00	100.00	-10.00	100.00
295	2.43	94.17	-10.00	100.00	-10.00	100.00
300	1.58	98.40	-10.00	100.00	-10.00	100.00
305	2.27	102.74	-10.00	100.00	-10.00	100.00
310	1.98	106.94	-10.00	100.00	-10.00	100.00
315	1.86	111.12	-10.00	100.00	-10.00	100.00
320	1.57	115.19	-10.00	100.00	-10.00	100.00
325	2.04	119.41	-10.00	100.00	-10.00	100.00
330	2.15	123.45	-10.00	100.00	-10.00	100.00
335	1.85	127.22	-10.00	100.00	-10.00	100.00
340	1.66	130.87	-10.00	100.00	-10.00	100.00
345	1.06	134.07	-10.00	100.00	-10.00	100.00
350	0.32	136.86	-10.00	127.70	-10.00	100.00
355	0.00	139.57	-10.00	136.18	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 46.7" N
Longitude (NAD 83) 119° 41' 37.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 382.11 m / 1253.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 150.7° to 200.2°
Corresponding Elevation Angles 30.5° / 32.8°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		9.1 meter		9.1 meter	
Gain / Diameter		63.2 dBi / 9.1 m		66.4 dBi / 9.1 m	
3-dB / 15-dB Beamwidth		0.13° / 0.26°		0.10° / 0.20°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			41.4 65.4	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	150.5 km / 93.5 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**BREWSTER, WA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	48° 8' 46.7" N		
Longitude (NAD 83)	119° 41' 37.0" W		
Ground Elevation (AMSL)	382.11 m / 1253.7 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.74	139.19	-10.00	104.14	-10.00	100.00
5	0.80	135.84	-10.00	101.56	-10.00	100.00
10	0.57	132.11	-10.00	111.04	-10.00	100.00
15	1.13	128.58	-10.00	100.00	-10.00	100.00
20	1.86	124.90	-10.00	100.00	-10.00	100.00
25	0.50	120.35	-10.00	114.05	-10.00	100.00
30	0.35	116.19	-10.00	125.56	-10.00	100.00
35	0.70	112.10	-10.00	105.82	-10.00	100.00
40	1.20	107.95	-10.00	100.00	-10.00	100.00
45	1.34	103.66	-10.00	100.00	-10.00	100.00
50	1.48	99.34	-10.00	100.00	-10.00	100.00
55	1.56	94.98	-10.00	100.00	-10.00	100.00
60	1.66	90.61	-10.00	100.00	-10.00	100.00
65	2.03	86.21	-10.00	100.00	-10.00	100.00
70	2.10	81.82	-10.00	100.00	-10.00	100.00
75	2.35	77.41	-10.00	100.00	-10.00	100.00
80	2.56	73.02	-10.00	100.00	-10.00	100.00
85	2.50	68.69	-10.00	100.00	-10.00	100.00
90	2.73	64.34	-10.00	100.00	-10.00	100.00
95	2.79	60.07	-10.00	100.00	-10.00	100.00
100	2.59	55.96	-10.00	100.00	-10.00	100.00
105	2.29	52.01	-10.00	100.00	-10.00	100.00
110	2.16	48.14	-10.00	100.00	-10.00	100.00
115	2.16	44.37	-9.18	100.00	-9.18	100.00
120	2.24	40.76	-8.26	100.00	-8.26	100.00
125	2.49	37.29	-7.29	100.00	-7.29	100.00
130	1.40	35.18	-6.66	100.00	-6.66	100.00
135	0.87	33.20	-6.03	108.76	-6.03	100.00
140	0.39	31.79	-5.56	132.75	-5.56	100.00
145	0.23	30.76	-5.20	147.54	-5.20	100.00
150	0.00	30.51	-5.11	150.51	-5.11	100.00
155	0.00	30.78	-5.21	150.21	-5.21	100.00
160	0.00	31.76	-5.55	149.15	-5.55	100.00
165	0.00	33.03	-5.97	147.85	-5.97	100.00
170	0.00	33.96	-6.27	146.93	-6.27	100.00
175	0.00	34.52	-6.45	146.39	-6.45	100.00
180	0.00	34.71	-6.51	146.21	-6.51	100.00
185	0.00	34.52	-6.45	146.39	-6.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**BREWSTER, WA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	48° 8' 46.7" N		
Longitude (NAD 83)	119° 41' 37.0" W		
Ground Elevation (AMSL)	382.11 m / 1253.7 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	146.93	-6.27	100.00
195	0.00	33.11	-6.00	147.76	-6.00	100.00
200	0.00	32.75	-5.88	148.13	-5.88	100.00
205	0.00	33.07	-5.98	147.81	-5.98	100.00
210	0.00	34.04	-6.30	146.86	-6.30	100.00
215	0.00	35.61	-6.79	145.38	-6.79	100.00
220	0.00	37.71	-7.41	143.54	-7.41	100.00
225	0.00	40.24	-8.12	141.47	-8.12	100.00
230	0.00	43.15	-8.87	139.32	-8.87	100.00
235	0.00	46.34	-9.65	137.15	-9.65	100.00
240	0.00	49.77	-10.00	136.18	-10.00	100.00
245	0.34	53.22	-10.00	125.68	-10.00	100.00
250	0.98	56.74	-10.00	100.00	-10.00	100.00
255	2.35	60.21	-10.00	100.00	-10.00	100.00
260	1.93	64.43	-10.00	100.00	-10.00	100.00
265	2.29	68.49	-10.00	100.00	-10.00	100.00
270	3.14	72.55	-10.00	100.00	-10.00	100.00
275	3.48	76.80	-10.00	100.00	-10.00	100.00
280	3.62	81.13	-10.00	100.00	-10.00	100.00
285	3.44	85.49	-10.00	100.00	-10.00	100.00
290	3.25	89.85	-10.00	100.00	-10.00	100.00
295	2.43	94.17	-10.00	100.00	-10.00	100.00
300	1.58	98.40	-10.00	100.00	-10.00	100.00
305	2.27	102.74	-10.00	100.00	-10.00	100.00
310	1.98	106.94	-10.00	100.00	-10.00	100.00
315	1.86	111.12	-10.00	100.00	-10.00	100.00
320	1.57	115.19	-10.00	100.00	-10.00	100.00
325	2.04	119.41	-10.00	100.00	-10.00	100.00
330	2.15	123.45	-10.00	100.00	-10.00	100.00
335	1.85	127.22	-10.00	100.00	-10.00	100.00
340	1.66	130.87	-10.00	100.00	-10.00	100.00
345	1.06	134.07	-10.00	100.00	-10.00	100.00
350	0.32	136.86	-10.00	127.70	-10.00	100.00
355	0.00	139.57	-10.00	136.18	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 46.7" N
Longitude (NAD 83) 119° 41' 37.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 382.11 m / 1253.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 150.7° to 200.2°
Corresponding Elevation Angles 30.5° / 32.8°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		13.5 meter		13.5 meter	
Gain / Diameter		66.2 dBi / 13.5 m		69.6 dBi / 13.5 m	
3-dB / 15-dB Beamwidth		0.09° / 0.18°		0.06° / 0.12°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			44.6 68.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	150.5 km / 93.5 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

Coordination Values		BREWSTER, WA			
Licensee Name		SES Americom, Inc.			
Latitude (NAD 83)		48° 8' 46.7" N			
Longitude (NAD 83)		119° 41' 37.0" W			
Ground Elevation (AMSL)		382.11 m / 1253.7 ft			
Antenna Centerline (AGL)		5.49 m / 18.0 ft			
Antenna Model		SES 13.5 meter			
Antenna Mode		Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power				-25.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.74	139.19	-10.00	104.14	-10.00	100.00
5	0.80	135.84	-10.00	101.56	-10.00	100.00
10	0.57	132.11	-10.00	111.04	-10.00	100.00
15	1.13	128.58	-10.00	100.00	-10.00	100.00
20	1.86	124.90	-10.00	100.00	-10.00	100.00
25	0.50	120.35	-10.00	114.05	-10.00	100.00
30	0.35	116.19	-10.00	125.56	-10.00	100.00
35	0.70	112.10	-10.00	105.82	-10.00	100.00
40	1.20	107.95	-10.00	100.00	-10.00	100.00
45	1.34	103.66	-10.00	100.00	-10.00	100.00
50	1.48	99.34	-10.00	100.00	-10.00	100.00
55	1.56	94.98	-10.00	100.00	-10.00	100.00
60	1.66	90.61	-10.00	100.00	-10.00	100.00
65	2.03	86.21	-10.00	100.00	-10.00	100.00
70	2.10	81.82	-10.00	100.00	-10.00	100.00
75	2.35	77.41	-10.00	100.00	-10.00	100.00
80	2.56	73.02	-10.00	100.00	-10.00	100.00
85	2.50	68.69	-10.00	100.00	-10.00	100.00
90	2.73	64.34	-10.00	100.00	-10.00	100.00
95	2.79	60.07	-10.00	100.00	-10.00	100.00
100	2.59	55.96	-10.00	100.00	-10.00	100.00
105	2.29	52.01	-10.00	100.00	-10.00	100.00
110	2.16	48.14	-10.00	100.00	-10.00	100.00
115	2.16	44.37	-9.18	100.00	-9.18	100.00
120	2.24	40.76	-8.26	100.00	-8.26	100.00
125	2.49	37.29	-7.29	100.00	-7.29	100.00
130	1.40	35.18	-6.66	100.00	-6.66	100.00
135	0.87	33.20	-6.03	108.76	-6.03	100.00
140	0.39	31.79	-5.56	132.75	-5.56	100.00
145	0.23	30.76	-5.20	147.54	-5.20	100.00
150	0.00	30.51	-5.11	150.51	-5.11	100.00
155	0.00	30.78	-5.21	150.21	-5.21	100.00
160	0.00	31.76	-5.55	149.15	-5.55	100.00
165	0.00	33.03	-5.97	147.85	-5.97	100.00
170	0.00	33.96	-6.27	146.93	-6.27	100.00
175	0.00	34.52	-6.45	146.39	-6.45	100.00
180	0.00	34.71	-6.51	146.21	-6.51	100.00
185	0.00	34.52	-6.45	146.39	-6.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**BREWSTER, WA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	48° 8' 46.7" N		
Longitude (NAD 83)	119° 41' 37.0" W		
Ground Elevation (AMSL)	382.11 m / 1253.7 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz	Transmit 28.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz
Max Available RF Power			-25.0 (dBW/4 kHz)
			20%
			0.0025%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	146.93	-6.27	100.00
195	0.00	33.11	-6.00	147.76	-6.00	100.00
200	0.00	32.75	-5.88	148.13	-5.88	100.00
205	0.00	33.07	-5.98	147.81	-5.98	100.00
210	0.00	34.04	-6.30	146.86	-6.30	100.00
215	0.00	35.61	-6.79	145.38	-6.79	100.00
220	0.00	37.71	-7.41	143.54	-7.41	100.00
225	0.00	40.24	-8.12	141.47	-8.12	100.00
230	0.00	43.15	-8.87	139.32	-8.87	100.00
235	0.00	46.34	-9.65	137.15	-9.65	100.00
240	0.00	49.77	-10.00	136.18	-10.00	100.00
245	0.34	53.22	-10.00	125.68	-10.00	100.00
250	0.98	56.74	-10.00	100.00	-10.00	100.00
255	2.35	60.21	-10.00	100.00	-10.00	100.00
260	1.93	64.43	-10.00	100.00	-10.00	100.00
265	2.29	68.49	-10.00	100.00	-10.00	100.00
270	3.14	72.55	-10.00	100.00	-10.00	100.00
275	3.48	76.80	-10.00	100.00	-10.00	100.00
280	3.62	81.13	-10.00	100.00	-10.00	100.00
285	3.44	85.49	-10.00	100.00	-10.00	100.00
290	3.25	89.85	-10.00	100.00	-10.00	100.00
295	2.43	94.17	-10.00	100.00	-10.00	100.00
300	1.58	98.40	-10.00	100.00	-10.00	100.00
305	2.27	102.74	-10.00	100.00	-10.00	100.00
310	1.98	106.94	-10.00	100.00	-10.00	100.00
315	1.86	111.12	-10.00	100.00	-10.00	100.00
320	1.57	115.19	-10.00	100.00	-10.00	100.00
325	2.04	119.41	-10.00	100.00	-10.00	100.00
330	2.15	123.45	-10.00	100.00	-10.00	100.00
335	1.85	127.22	-10.00	100.00	-10.00	100.00
340	1.66	130.87	-10.00	100.00	-10.00	100.00
345	1.06	134.07	-10.00	100.00	-10.00	100.00
350	0.32	136.86	-10.00	127.70	-10.00	100.00
355	0.00	139.57	-10.00	136.18	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Joanna Lynch
Title:	Manager, Spectrum & Data Solutions
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5711
Fax:	703-726-5599
Email:	jlynch@comsearch.com
Web site:	www.comsearch.com

Ka-Band Earth Station – Cheyenne, WY

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016



COMSEARCH
A CommScope Company



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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Cheyenne, Wyoming, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in Cheyenne, Wyoming was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Verizon	Continental US

A notification letter and datasheets for the earth station in Cheyenne, Wyoming were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
EchoStar	BTA077 ²	Cheyenne, WY
Nextlink/XO	BTA110	Denver, CO

No objections were received from the LMDS incumbents.

² The proposed earth station will be located inside BTA077.



4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in Cheyenne, Wyoming. The coordinates provided represent a center point for the proposed earth station location. The actual earth station location will be within 520 meters of these coordinates.

This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information**CHEYENNE, WY**

Venue Name
Latitude (NAD 83) 41° 7' 54.4" N
Longitude (NAD 83) 104° 44' 15.3" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1812.49 m / 5946.5 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 168.3° to 221.6°
Corresponding Elevation Angles 41.8° / 33.3°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES
Model	7.3 meter	7.3 meter
Gain / Diameter	60.8 dBi / 7.3 m	64.6 dBi / 7.3 m
3-dB / 15-dB Beamwidth	0.17° / 0.34°	0.11° / 0.22°
Max Available RF Power (dBW/4 kHz)		-25.0
	(dBW/MHz)	-1.0
Maximum EIRP (dBW/4 kHz)		39.6
	(dBW/MHz)	63.6
Interference Objectives:	Long Term	-156.0 dBW/MHz 20%
	Short Term	-146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20%
		-128.0 dBW/4 kHz 0.0025%

Frequency Information**Receive 18.0 GHz****Transmit 28.0 GHz**

Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**CHEYENNE, WY**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	41° 7' 54.4" N		
Longitude (NAD 83)	104° 44' 15.3" W		
Ground Elevation (AMSL)	1812.49 m / 5946.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 Meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.80	129.11	-10.00	101.57	-10.00	100.00
5	0.78	132.61	-10.00	102.36	-10.00	100.00
10	0.80	134.54	-10.00	101.37	-10.00	100.00
15	0.77	132.38	-10.00	102.84	-10.00	100.00
20	0.80	129.96	-10.00	101.58	-10.00	100.00
25	0.78	127.24	-10.00	102.55	-10.00	100.00
30	0.78	124.31	-10.00	102.27	-10.00	100.00
35	0.76	121.17	-10.00	103.19	-10.00	100.00
40	0.68	117.85	-10.00	106.71	-10.00	100.00
45	0.62	114.43	-10.00	109.08	-10.00	100.00
50	0.65	110.94	-10.00	107.71	-10.00	100.00
55	0.46	107.30	-10.00	116.85	-10.00	100.00
60	0.41	103.65	-10.00	120.51	-10.00	100.00
65	0.35	99.95	-10.00	125.50	-10.00	100.00
70	0.32	96.23	-10.00	127.62	-10.00	100.00
75	0.29	92.49	-10.00	128.85	-10.00	100.00
80	0.34	88.75	-10.00	126.21	-10.00	100.00
85	0.36	85.01	-10.00	124.43	-10.00	100.00
90	0.39	81.28	-10.00	122.45	-10.00	100.00
95	0.00	77.65	-10.00	136.18	-10.00	100.00
100	0.00	74.02	-10.00	136.18	-10.00	100.00
105	0.00	70.45	-10.00	136.18	-10.00	100.00
110	0.00	66.96	-10.00	136.18	-10.00	100.00
115	0.25	63.46	-10.00	132.14	-10.00	100.00
120	0.46	60.06	-10.00	116.97	-10.00	100.00
125	0.57	56.83	-10.00	111.06	-10.00	100.00
130	0.59	53.84	-10.00	110.52	-10.00	100.00
135	0.70	50.98	-10.00	105.51	-10.00	100.00
140	0.72	48.43	-10.00	104.80	-10.00	100.00
145	0.65	46.26	-9.63	108.78	-9.63	100.00
150	0.73	44.31	-9.16	106.59	-9.16	100.00
155	0.80	42.75	-8.77	104.74	-8.77	100.00
160	0.79	41.70	-8.50	105.45	-8.50	100.00
165	0.76	41.15	-8.36	107.10	-8.36	100.00
170	0.79	41.04	-8.33	105.99	-8.33	100.00
175	0.85	41.38	-8.42	103.48	-8.42	100.00
180	0.95	41.51	-8.45	100.00	-8.45	100.00
185	0.93	41.29	-8.40	100.00	-8.40	100.00

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Coordination Values**CHEYENNE, WY**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	41° 7' 54.4" N		
Longitude (NAD 83)	104° 44' 15.3" W		
Ground Elevation (AMSL)	1812.49 m / 5946.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 Meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%
	Short Term	-146.0 dBW/MHz	0.01%
Max Available RF Power	Receive 18.0 GHz		Transmit 28.0 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.97	40.56	-8.20	100.00	-8.20	100.00
195	1.02	39.37	-7.88	100.00	-7.88	100.00
200	1.05	37.80	-7.44	100.00	-7.44	100.00
205	1.00	35.91	-6.88	101.12	-6.88	100.00
210	1.07	34.06	-6.30	101.05	-6.30	100.00
215	0.92	33.00	-5.96	107.06	-5.96	100.00
220	0.92	32.44	-5.78	107.36	-5.78	100.00
225	0.86	32.62	-5.84	109.61	-5.84	100.00
230	0.83	33.45	-6.11	110.15	-6.11	100.00
235	0.67	35.03	-6.61	115.75	-6.61	100.00
240	0.82	36.86	-7.16	107.76	-7.16	100.00
245	0.67	39.42	-7.89	112.42	-7.89	100.00
250	0.47	42.38	-8.68	119.69	-8.68	100.00
255	0.72	45.33	-9.41	106.28	-9.41	100.00
260	0.85	48.63	-10.00	100.00	-10.00	100.00
265	1.26	52.02	-10.00	100.00	-10.00	100.00
270	1.22	55.80	-10.00	100.00	-10.00	100.00
275	1.19	59.70	-10.00	100.00	-10.00	100.00
280	1.51	63.58	-10.00	100.00	-10.00	100.00
285	1.33	67.71	-10.00	100.00	-10.00	100.00
290	1.21	71.86	-10.00	100.00	-10.00	100.00
295	1.01	76.05	-10.00	100.00	-10.00	100.00
300	0.88	80.25	-10.00	100.00	-10.00	100.00
305	0.86	84.46	-10.00	100.00	-10.00	100.00
310	0.78	88.68	-10.00	102.50	-10.00	100.00
315	0.70	92.89	-10.00	105.67	-10.00	100.00
320	0.59	97.08	-10.00	110.23	-10.00	100.00
325	0.55	101.26	-10.00	112.16	-10.00	100.00
330	0.64	105.43	-10.00	108.16	-10.00	100.00
335	0.71	109.57	-10.00	105.43	-10.00	100.00
340	0.88	113.69	-10.00	100.00	-10.00	100.00
345	0.83	117.69	-10.00	100.43	-10.00	100.00
350	0.75	121.59	-10.00	103.57	-10.00	100.00
355	0.85	125.45	-10.00	100.00	-10.00	100.00

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Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information**CHEYENNE, WY**

Venue Name
Latitude (NAD 83) 41° 7' 54.4" N
Longitude (NAD 83) 104° 44' 15.3" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1812.49 m / 5946.5 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 168.3° to 221.6°
Corresponding Elevation Angles 41.8° / 33.3°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES
Model	9.1 meter	9.1 meter
Gain / Diameter	63.2 dBi / 9.1 m	66.4 dBi / 9.1 m
3-dB / 15-dB Beamwidth	0.13° / 0.26°	0.10° / 0.20°
Max Available RF Power (dBW/4 kHz)		-25.0
		(dBW/MHz) -1.0
Maximum EIRP (dBW/4 kHz)		41.4
		(dBW/MHz) 65.4
Interference Objectives:	Long Term	-156.0 dBW/MHz 20%
	Short Term	-146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20%
		-128.0 dBW/4 kHz 0.0025%

Frequency Information**Receive 18.0 GHz****Transmit 28.0 GHz**

Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

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Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.80	129.11	-10.00	101.57	-10.00	100.00
5	0.78	132.61	-10.00	102.36	-10.00	100.00
10	0.80	134.54	-10.00	101.37	-10.00	100.00
15	0.77	132.38	-10.00	102.84	-10.00	100.00
20	0.80	129.96	-10.00	101.58	-10.00	100.00
25	0.78	127.24	-10.00	102.55	-10.00	100.00
30	0.78	124.31	-10.00	102.27	-10.00	100.00
35	0.76	121.17	-10.00	103.19	-10.00	100.00
40	0.68	117.85	-10.00	106.71	-10.00	100.00
45	0.62	114.43	-10.00	109.08	-10.00	100.00
50	0.65	110.94	-10.00	107.71	-10.00	100.00
55	0.46	107.30	-10.00	116.85	-10.00	100.00
60	0.41	103.65	-10.00	120.51	-10.00	100.00
65	0.35	99.95	-10.00	125.50	-10.00	100.00
70	0.32	96.23	-10.00	127.62	-10.00	100.00
75	0.29	92.49	-10.00	128.85	-10.00	100.00
80	0.34	88.75	-10.00	126.21	-10.00	100.00
85	0.36	85.01	-10.00	124.43	-10.00	100.00
90	0.39	81.28	-10.00	122.45	-10.00	100.00
95	0.00	77.65	-10.00	136.18	-10.00	100.00
100	0.00	74.02	-10.00	136.18	-10.00	100.00
105	0.00	70.45	-10.00	136.18	-10.00	100.00
110	0.00	66.96	-10.00	136.18	-10.00	100.00
115	0.25	63.46	-10.00	132.14	-10.00	100.00
120	0.46	60.06	-10.00	116.97	-10.00	100.00
125	0.57	56.83	-10.00	111.06	-10.00	100.00
130	0.59	53.84	-10.00	110.52	-10.00	100.00
135	0.70	50.98	-10.00	105.51	-10.00	100.00
140	0.72	48.43	-10.00	104.80	-10.00	100.00
145	0.65	46.26	-9.63	108.78	-9.63	100.00
150	0.73	44.31	-9.16	106.59	-9.16	100.00
155	0.80	42.75	-8.77	104.74	-8.77	100.00
160	0.79	41.70	-8.50	105.45	-8.50	100.00
165	0.76	41.15	-8.36	107.10	-8.36	100.00
170	0.79	41.04	-8.33	105.99	-8.33	100.00
175	0.85	41.38	-8.42	103.48	-8.42	100.00
180	0.95	41.51	-8.45	100.00	-8.45	100.00
185	0.93	41.29	-8.40	100.00	-8.40	100.00

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Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	41° 7' 54.4" N		
Longitude (NAD 83)	104° 44' 15.3" W		
Ground Elevation (AMSL)	1812.49 m / 5946.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%
	Short Term	-146.0 dBW/MHz	0.01%
Max Available RF Power	Receive 18.0 GHz		Transmit 28.0 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.97	40.56	-8.20	100.00	-8.20	100.00
195	1.02	39.37	-7.88	100.00	-7.88	100.00
200	1.05	37.80	-7.44	100.00	-7.44	100.00
205	1.00	35.91	-6.88	101.12	-6.88	100.00
210	1.07	34.06	-6.30	101.05	-6.30	100.00
215	0.92	33.00	-5.96	107.06	-5.96	100.00
220	0.92	32.44	-5.78	107.36	-5.78	100.00
225	0.86	32.62	-5.84	109.61	-5.84	100.00
230	0.83	33.45	-6.11	110.15	-6.11	100.00
235	0.67	35.03	-6.61	115.75	-6.61	100.00
240	0.82	36.86	-7.16	107.76	-7.16	100.00
245	0.67	39.42	-7.89	112.42	-7.89	100.00
250	0.47	42.38	-8.68	119.69	-8.68	100.00
255	0.72	45.33	-9.41	106.28	-9.41	100.00
260	0.85	48.63	-10.00	100.00	-10.00	100.00
265	1.26	52.02	-10.00	100.00	-10.00	100.00
270	1.22	55.80	-10.00	100.00	-10.00	100.00
275	1.19	59.70	-10.00	100.00	-10.00	100.00
280	1.51	63.58	-10.00	100.00	-10.00	100.00
285	1.33	67.71	-10.00	100.00	-10.00	100.00
290	1.21	71.86	-10.00	100.00	-10.00	100.00
295	1.01	76.05	-10.00	100.00	-10.00	100.00
300	0.88	80.25	-10.00	100.00	-10.00	100.00
305	0.86	84.46	-10.00	100.00	-10.00	100.00
310	0.78	88.68	-10.00	102.50	-10.00	100.00
315	0.70	92.89	-10.00	105.67	-10.00	100.00
320	0.59	97.08	-10.00	110.23	-10.00	100.00
325	0.55	101.26	-10.00	112.16	-10.00	100.00
330	0.64	105.43	-10.00	108.16	-10.00	100.00
335	0.71	109.57	-10.00	105.43	-10.00	100.00
340	0.88	113.69	-10.00	100.00	-10.00	100.00
345	0.83	117.69	-10.00	100.43	-10.00	100.00
350	0.75	121.59	-10.00	103.57	-10.00	100.00
355	0.85	125.45	-10.00	100.00	-10.00	100.00

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Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES	
Model	13.5 meter	13.5 meter	
Gain / Diameter	66.2 dBi / 13.5 m	69.6 dBi / 13.5 m	
3-dB / 15-dB Beamwidth	0.09° / 0.18°	0.06° / 0.12°	
Max Available RF Power (dBW/4 kHz)		-25.0	
(dBW/MHz)		-1.0	
Maximum EIRP (dBW/4 kHz)		44.6	
(dBW/MHz)		68.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
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	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

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Ground Elevation (AMSL)	1812.49 m / 5946.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.80	129.11	-10.00	101.57	-10.00	100.00
5	0.78	132.61	-10.00	102.36	-10.00	100.00
10	0.80	134.54	-10.00	101.37	-10.00	100.00
15	0.77	132.38	-10.00	102.84	-10.00	100.00
20	0.80	129.96	-10.00	101.58	-10.00	100.00
25	0.78	127.24	-10.00	102.55	-10.00	100.00
30	0.78	124.31	-10.00	102.27	-10.00	100.00
35	0.76	121.17	-10.00	103.19	-10.00	100.00
40	0.68	117.85	-10.00	106.71	-10.00	100.00
45	0.62	114.43	-10.00	109.08	-10.00	100.00
50	0.65	110.94	-10.00	107.71	-10.00	100.00
55	0.46	107.30	-10.00	116.85	-10.00	100.00
60	0.41	103.65	-10.00	120.51	-10.00	100.00
65	0.35	99.95	-10.00	125.50	-10.00	100.00
70	0.32	96.23	-10.00	127.62	-10.00	100.00
75	0.29	92.49	-10.00	128.85	-10.00	100.00
80	0.34	88.75	-10.00	126.21	-10.00	100.00
85	0.36	85.01	-10.00	124.43	-10.00	100.00
90	0.39	81.28	-10.00	122.45	-10.00	100.00
95	0.00	77.65	-10.00	136.18	-10.00	100.00
100	0.00	74.02	-10.00	136.18	-10.00	100.00
105	0.00	70.45	-10.00	136.18	-10.00	100.00
110	0.00	66.96	-10.00	136.18	-10.00	100.00
115	0.25	63.46	-10.00	132.14	-10.00	100.00
120	0.46	60.06	-10.00	116.97	-10.00	100.00
125	0.57	56.83	-10.00	111.06	-10.00	100.00
130	0.59	53.84	-10.00	110.52	-10.00	100.00
135	0.70	50.98	-10.00	105.51	-10.00	100.00
140	0.72	48.43	-10.00	104.80	-10.00	100.00
145	0.65	46.26	-9.63	108.78	-9.63	100.00
150	0.73	44.31	-9.16	106.59	-9.16	100.00
155	0.80	42.75	-8.77	104.74	-8.77	100.00
160	0.79	41.70	-8.50	105.45	-8.50	100.00
165	0.76	41.15	-8.36	107.10	-8.36	100.00
170	0.79	41.04	-8.33	105.99	-8.33	100.00
175	0.85	41.38	-8.42	103.48	-8.42	100.00
180	0.95	41.51	-8.45	100.00	-8.45	100.00
185	0.93	41.29	-8.40	100.00	-8.40	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**CHEYENNE, WY**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	41° 7' 54.4" N		
Longitude (NAD 83)	104° 44' 15.3" W		
Ground Elevation (AMSL)	1812.49 m / 5946.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%
	Short Term	-146.0 dBW/MHz	0.01%
Max Available RF Power	Receive 18.0 GHz		Transmit 28.0 GHz
			-151.0 dBW/4 kHz
			20%
			-128.0 dBW/4 kHz
			0.0025%
			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.97	40.56	-8.20	100.00	-8.20	100.00
195	1.02	39.37	-7.88	100.00	-7.88	100.00
200	1.05	37.80	-7.44	100.00	-7.44	100.00
205	1.00	35.91	-6.88	101.12	-6.88	100.00
210	1.07	34.06	-6.30	101.05	-6.30	100.00
215	0.92	33.00	-5.96	107.06	-5.96	100.00
220	0.92	32.44	-5.78	107.36	-5.78	100.00
225	0.86	32.62	-5.84	109.61	-5.84	100.00
230	0.83	33.45	-6.11	110.15	-6.11	100.00
235	0.67	35.03	-6.61	115.75	-6.61	100.00
240	0.82	36.86	-7.16	107.76	-7.16	100.00
245	0.67	39.42	-7.89	112.42	-7.89	100.00
250	0.47	42.38	-8.68	119.69	-8.68	100.00
255	0.72	45.33	-9.41	106.28	-9.41	100.00
260	0.85	48.63	-10.00	100.00	-10.00	100.00
265	1.26	52.02	-10.00	100.00	-10.00	100.00
270	1.22	55.80	-10.00	100.00	-10.00	100.00
275	1.19	59.70	-10.00	100.00	-10.00	100.00
280	1.51	63.58	-10.00	100.00	-10.00	100.00
285	1.33	67.71	-10.00	100.00	-10.00	100.00
290	1.21	71.86	-10.00	100.00	-10.00	100.00
295	1.01	76.05	-10.00	100.00	-10.00	100.00
300	0.88	80.25	-10.00	100.00	-10.00	100.00
305	0.86	84.46	-10.00	100.00	-10.00	100.00
310	0.78	88.68	-10.00	102.50	-10.00	100.00
315	0.70	92.89	-10.00	105.67	-10.00	100.00
320	0.59	97.08	-10.00	110.23	-10.00	100.00
325	0.55	101.26	-10.00	112.16	-10.00	100.00
330	0.64	105.43	-10.00	108.16	-10.00	100.00
335	0.71	109.57	-10.00	105.43	-10.00	100.00
340	0.88	113.69	-10.00	100.00	-10.00	100.00
345	0.83	117.69	-10.00	100.43	-10.00	100.00
350	0.75	121.59	-10.00	103.57	-10.00	100.00
355	0.85	125.45	-10.00	100.00	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Joanna Lynch
Title:	Manager, Spectrum & Data Solutions
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5711
Fax:	703-726-5599
Email:	jlynch@comsearch.com
Web site:	www.comsearch.com

Ka-Band Earth Station – Front Range, CO

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016



COMSEARCH
A CommScope Company



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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Front Range, Colorado, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in Front Range, Colorado was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Verizon	Continental US

A notification letter and datasheets for the earth station in Front Range, Colorado were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.



3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
EchoStar	BTA077	Cheyenne, WY
Nextlink/XO	BTA110	Denver, CO

No objections were received from the LMDS incumbents.



4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in Front Range, Colorado. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information FRONT RANGE, CO

Venue Name
Latitude (NAD 83) 40° 32' 30.7" N
Longitude (NAD 83) 105° 2' 28.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1510.0 m / 4954.1 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 167.7° to 221.6°
Corresponding Elevation Angles 42.4° / 34.0°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

Manufacturer SES
Model 7.3 meter
Gain / Diameter 60.8 dBi / 7.3 m
3-dB / 15-dB Beamwidth 0.17° / 0.34°

Receive - FCC32**Transmit - FCC32**

SES
7.3 meter
64.6 dBi / 7.3 m
0.11° / 0.22°

Max Available RF Power (dBW/4 kHz) -25.0
(dBW/MHz) -1.0

Maximum EIRP (dBW/4 kHz) 39.6
(dBW/MHz) 63.6
(dBW)

Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%

Frequency Information

Emission / Frequency Range (MHz)

Receive 18.0 GHz

100KG7D - 250MG7D / 18300.0 - 18800.0
100KG7D - 250MG7D / 19700.0 - 20200.0
100KG7N - 250MG7N
100KG7W - 250MG7W

Transmit 28.0 GHz

100KG7D - 250MG7D / 27500.0 - 28600.0
100KG7D - 250MG7D / 29250.0 - 30000.0
100KG7N - 250MG7N
100KG7W - 250MG7W

Max Great Circle Coordination Distance 145.3 km / 90.3 mi 100.0 km / 62.1 mi
Precipitation Scatter Contour Radius 100.0 km / 62.1 mi 100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	128.35	-10.00	136.18	-10.00	100.00
5	0.00	131.77	-10.00	136.18	-10.00	100.00
10	0.00	133.12	-10.00	136.18	-10.00	100.00
15	0.00	131.04	-10.00	136.18	-10.00	100.00
20	0.00	128.65	-10.00	136.18	-10.00	100.00
25	0.00	126.00	-10.00	136.18	-10.00	100.00
30	0.00	123.13	-10.00	136.18	-10.00	100.00
35	0.00	120.08	-10.00	136.18	-10.00	100.00
40	0.00	116.88	-10.00	136.18	-10.00	100.00
45	0.00	113.54	-10.00	136.18	-10.00	100.00
50	0.00	110.11	-10.00	136.18	-10.00	100.00
55	0.00	106.59	-10.00	136.18	-10.00	100.00
60	0.00	103.01	-10.00	136.18	-10.00	100.00
65	0.00	99.37	-10.00	136.18	-10.00	100.00
70	0.00	95.71	-10.00	136.18	-10.00	100.00
75	0.00	92.02	-10.00	136.18	-10.00	100.00
80	0.00	88.33	-10.00	136.18	-10.00	100.00
85	0.00	84.65	-10.00	136.18	-10.00	100.00
90	0.00	80.98	-10.00	136.18	-10.00	100.00
95	0.00	77.34	-10.00	136.18	-10.00	100.00
100	0.00	73.75	-10.00	136.18	-10.00	100.00
105	0.00	70.23	-10.00	136.18	-10.00	100.00
110	0.00	66.78	-10.00	136.18	-10.00	100.00
115	0.00	63.44	-10.00	136.18	-10.00	100.00
120	0.00	60.22	-10.00	136.18	-10.00	100.00
125	0.00	57.15	-10.00	136.18	-10.00	100.00
130	0.00	54.26	-10.00	136.18	-10.00	100.00
135	0.00	51.60	-10.00	136.18	-10.00	100.00
140	0.00	49.18	-10.00	136.18	-10.00	100.00
145	0.00	47.07	-9.82	136.68	-9.82	100.00
150	0.00	45.30	-9.40	137.83	-9.40	100.00
155	0.00	43.92	-9.07	138.78	-9.07	100.00
160	0.00	42.96	-8.83	139.45	-8.83	100.00
165	0.00	42.46	-8.70	139.81	-8.70	100.00
170	0.00	42.44	-8.69	139.82	-8.69	100.00
175	0.00	42.87	-8.80	139.51	-8.80	100.00
180	0.00	43.12	-8.87	139.33	-8.87	100.00
185	0.00	42.87	-8.80	139.51	-8.80	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	42.14	-8.62	140.04	-8.62	100.00
195	0.00	40.94	-8.30	140.94	-8.30	100.00
200	0.00	39.32	-7.87	142.20	-7.87	100.00
205	0.22	37.16	-7.25	142.23	-7.25	100.00
210	0.36	35.33	-6.70	132.59	-6.70	100.00
215	0.35	34.18	-6.34	133.71	-6.34	100.00
220	0.22	33.78	-6.22	145.28	-6.22	100.00
225	0.27	33.86	-6.24	141.25	-6.24	100.00
230	0.31	34.58	-6.47	136.77	-6.47	100.00
235	0.35	35.92	-6.88	132.83	-6.88	100.00
240	0.43	37.75	-7.42	125.67	-7.42	100.00
245	0.43	40.12	-8.08	124.28	-8.08	100.00
250	0.53	42.80	-8.79	116.01	-8.79	100.00
255	0.68	45.77	-9.52	107.80	-9.52	100.00
260	0.52	49.19	-10.00	113.47	-10.00	100.00
265	0.59	52.68	-10.00	110.54	-10.00	100.00
270	0.57	56.37	-10.00	111.14	-10.00	100.00
275	0.40	60.24	-10.00	121.35	-10.00	100.00
280	0.37	64.15	-10.00	123.40	-10.00	100.00
285	0.35	68.14	-10.00	124.96	-10.00	100.00
290	0.31	72.19	-10.00	128.28	-10.00	100.00
295	0.27	76.28	-10.00	130.92	-10.00	100.00
300	0.24	80.40	-10.00	133.12	-10.00	100.00
305	0.23	84.55	-10.00	133.89	-10.00	100.00
310	0.00	88.70	-10.00	136.18	-10.00	100.00
315	0.00	92.85	-10.00	136.18	-10.00	100.00
320	0.00	96.99	-10.00	136.18	-10.00	100.00
325	0.00	101.11	-10.00	136.18	-10.00	100.00
330	0.00	105.21	-10.00	136.18	-10.00	100.00
335	0.00	109.26	-10.00	136.18	-10.00	100.00
340	0.00	113.26	-10.00	136.18	-10.00	100.00
345	0.00	117.19	-10.00	136.18	-10.00	100.00
350	0.00	121.03	-10.00	136.18	-10.00	100.00
355	0.00	124.76	-10.00	136.18	-10.00	100.00

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information FRONT RANGE, CO

Venue Name
Latitude (NAD 83) 40° 32' 30.7" N
Longitude (NAD 83) 105° 2' 28.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1510.0 m / 4954.1 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 167.7° to 221.6°
Corresponding Elevation Angles 42.4° / 34.0°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	SES	SES
Model	9.1 meter	9.1 meter
Gain / Diameter	63.2 dBi / 9.1 m	66.4 dBi / 9.1 m
3-dB / 15-dB Beamwidth	0.13° / 0.26°	0.10° / 0.20°
Max Available RF Power (dBW/4 kHz)		-25.0
(dBW/MHz)		-1.0
Maximum EIRP (dBW/4 kHz)		41.4
(dBW/MHz)		65.4
Interference Objectives:		
Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz 0.01%	-128.0 dBW/4 kHz 0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	145.3 km / 90.3 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	128.35	-10.00	136.18	-10.00	100.00
5	0.00	131.77	-10.00	136.18	-10.00	100.00
10	0.00	133.12	-10.00	136.18	-10.00	100.00
15	0.00	131.04	-10.00	136.18	-10.00	100.00
20	0.00	128.65	-10.00	136.18	-10.00	100.00
25	0.00	126.00	-10.00	136.18	-10.00	100.00
30	0.00	123.13	-10.00	136.18	-10.00	100.00
35	0.00	120.08	-10.00	136.18	-10.00	100.00
40	0.00	116.88	-10.00	136.18	-10.00	100.00
45	0.00	113.54	-10.00	136.18	-10.00	100.00
50	0.00	110.11	-10.00	136.18	-10.00	100.00
55	0.00	106.59	-10.00	136.18	-10.00	100.00
60	0.00	103.01	-10.00	136.18	-10.00	100.00
65	0.00	99.37	-10.00	136.18	-10.00	100.00
70	0.00	95.71	-10.00	136.18	-10.00	100.00
75	0.00	92.02	-10.00	136.18	-10.00	100.00
80	0.00	88.33	-10.00	136.18	-10.00	100.00
85	0.00	84.65	-10.00	136.18	-10.00	100.00
90	0.00	80.98	-10.00	136.18	-10.00	100.00
95	0.00	77.34	-10.00	136.18	-10.00	100.00
100	0.00	73.75	-10.00	136.18	-10.00	100.00
105	0.00	70.23	-10.00	136.18	-10.00	100.00
110	0.00	66.78	-10.00	136.18	-10.00	100.00
115	0.00	63.44	-10.00	136.18	-10.00	100.00
120	0.00	60.22	-10.00	136.18	-10.00	100.00
125	0.00	57.15	-10.00	136.18	-10.00	100.00
130	0.00	54.26	-10.00	136.18	-10.00	100.00
135	0.00	51.60	-10.00	136.18	-10.00	100.00
140	0.00	49.18	-10.00	136.18	-10.00	100.00
145	0.00	47.07	-9.82	136.68	-9.82	100.00
150	0.00	45.30	-9.40	137.83	-9.40	100.00
155	0.00	43.92	-9.07	138.78	-9.07	100.00
160	0.00	42.96	-8.83	139.45	-8.83	100.00
165	0.00	42.46	-8.70	139.81	-8.70	100.00
170	0.00	42.44	-8.69	139.82	-8.69	100.00
175	0.00	42.87	-8.80	139.51	-8.80	100.00
180	0.00	43.12	-8.87	139.33	-8.87	100.00
185	0.00	42.87	-8.80	139.51	-8.80	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	42.14	-8.62	140.04	-8.62	100.00
195	0.00	40.94	-8.30	140.94	-8.30	100.00
200	0.00	39.32	-7.87	142.20	-7.87	100.00
205	0.22	37.16	-7.25	142.23	-7.25	100.00
210	0.36	35.33	-6.70	132.59	-6.70	100.00
215	0.35	34.18	-6.34	133.71	-6.34	100.00
220	0.22	33.78	-6.22	145.28	-6.22	100.00
225	0.27	33.86	-6.24	141.25	-6.24	100.00
230	0.31	34.58	-6.47	136.77	-6.47	100.00
235	0.35	35.92	-6.88	132.83	-6.88	100.00
240	0.43	37.75	-7.42	125.67	-7.42	100.00
245	0.43	40.12	-8.08	124.28	-8.08	100.00
250	0.53	42.80	-8.79	116.01	-8.79	100.00
255	0.68	45.77	-9.52	107.80	-9.52	100.00
260	0.52	49.19	-10.00	113.47	-10.00	100.00
265	0.59	52.68	-10.00	110.54	-10.00	100.00
270	0.57	56.37	-10.00	111.14	-10.00	100.00
275	0.40	60.24	-10.00	121.35	-10.00	100.00
280	0.37	64.15	-10.00	123.40	-10.00	100.00
285	0.35	68.14	-10.00	124.96	-10.00	100.00
290	0.31	72.19	-10.00	128.28	-10.00	100.00
295	0.27	76.28	-10.00	130.92	-10.00	100.00
300	0.24	80.40	-10.00	133.12	-10.00	100.00
305	0.23	84.55	-10.00	133.89	-10.00	100.00
310	0.00	88.70	-10.00	136.18	-10.00	100.00
315	0.00	92.85	-10.00	136.18	-10.00	100.00
320	0.00	96.99	-10.00	136.18	-10.00	100.00
325	0.00	101.11	-10.00	136.18	-10.00	100.00
330	0.00	105.21	-10.00	136.18	-10.00	100.00
335	0.00	109.26	-10.00	136.18	-10.00	100.00
340	0.00	113.26	-10.00	136.18	-10.00	100.00
345	0.00	117.19	-10.00	136.18	-10.00	100.00
350	0.00	121.03	-10.00	136.18	-10.00	100.00
355	0.00	124.76	-10.00	136.18	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information**FRONT RANGE, CO**

Venue Name
Latitude (NAD 83) 40° 32' 30.7" N
Longitude (NAD 83) 105° 2' 28.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1510.0 m / 4954.1 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 167.7° to 221.6°
Corresponding Elevation Angles 42.4° / 34.0°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES
Model	13.5 meter	13.5 meter
Gain / Diameter	66.2 dBi / 13.5 m	69.6 dBi / 13.5 m
3-dB / 15-dB Beamwidth	0.09° / 0.18°	0.06° / 0.12°
Max Available RF Power (dBW/4 kHz)		-25.0
(dBW/MHz)		-1.0
Maximum EIRP (dBW/4 kHz)		44.6
(dBW/MHz)		68.6
Interference Objectives:	Long Term	-156.0 dBW/MHz 20%
	Short Term	-146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20%
		-128.0 dBW/4 kHz 0.0025%

Frequency Information**Receive 18.0 GHz****Transmit 28.0 GHz**

Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	145.3 km / 90.3 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	128.35	-10.00	136.18	-10.00	100.00
5	0.00	131.77	-10.00	136.18	-10.00	100.00
10	0.00	133.12	-10.00	136.18	-10.00	100.00
15	0.00	131.04	-10.00	136.18	-10.00	100.00
20	0.00	128.65	-10.00	136.18	-10.00	100.00
25	0.00	126.00	-10.00	136.18	-10.00	100.00
30	0.00	123.13	-10.00	136.18	-10.00	100.00
35	0.00	120.08	-10.00	136.18	-10.00	100.00
40	0.00	116.88	-10.00	136.18	-10.00	100.00
45	0.00	113.54	-10.00	136.18	-10.00	100.00
50	0.00	110.11	-10.00	136.18	-10.00	100.00
55	0.00	106.59	-10.00	136.18	-10.00	100.00
60	0.00	103.01	-10.00	136.18	-10.00	100.00
65	0.00	99.37	-10.00	136.18	-10.00	100.00
70	0.00	95.71	-10.00	136.18	-10.00	100.00
75	0.00	92.02	-10.00	136.18	-10.00	100.00
80	0.00	88.33	-10.00	136.18	-10.00	100.00
85	0.00	84.65	-10.00	136.18	-10.00	100.00
90	0.00	80.98	-10.00	136.18	-10.00	100.00
95	0.00	77.34	-10.00	136.18	-10.00	100.00
100	0.00	73.75	-10.00	136.18	-10.00	100.00
105	0.00	70.23	-10.00	136.18	-10.00	100.00
110	0.00	66.78	-10.00	136.18	-10.00	100.00
115	0.00	63.44	-10.00	136.18	-10.00	100.00
120	0.00	60.22	-10.00	136.18	-10.00	100.00
125	0.00	57.15	-10.00	136.18	-10.00	100.00
130	0.00	54.26	-10.00	136.18	-10.00	100.00
135	0.00	51.60	-10.00	136.18	-10.00	100.00
140	0.00	49.18	-10.00	136.18	-10.00	100.00
145	0.00	47.07	-9.82	136.68	-9.82	100.00
150	0.00	45.30	-9.40	137.83	-9.40	100.00
155	0.00	43.92	-9.07	138.78	-9.07	100.00
160	0.00	42.96	-8.83	139.45	-8.83	100.00
165	0.00	42.46	-8.70	139.81	-8.70	100.00
170	0.00	42.44	-8.69	139.82	-8.69	100.00
175	0.00	42.87	-8.80	139.51	-8.80	100.00
180	0.00	43.12	-8.87	139.33	-8.87	100.00
185	0.00	42.87	-8.80	139.51	-8.80	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**FRONT RANGE, CO**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	40° 32' 30.7" N		
Longitude (NAD 83)	105° 2' 28.4" W		
Ground Elevation (AMSL)	1510.0 m / 4954.1 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	42.14	-8.62	140.04	-8.62	100.00
195	0.00	40.94	-8.30	140.94	-8.30	100.00
200	0.00	39.32	-7.87	142.20	-7.87	100.00
205	0.22	37.16	-7.25	142.23	-7.25	100.00
210	0.36	35.33	-6.70	132.59	-6.70	100.00
215	0.35	34.18	-6.34	133.71	-6.34	100.00
220	0.22	33.78	-6.22	145.28	-6.22	100.00
225	0.27	33.86	-6.24	141.25	-6.24	100.00
230	0.31	34.58	-6.47	136.77	-6.47	100.00
235	0.35	35.92	-6.88	132.83	-6.88	100.00
240	0.43	37.75	-7.42	125.67	-7.42	100.00
245	0.43	40.12	-8.08	124.28	-8.08	100.00
250	0.53	42.80	-8.79	116.01	-8.79	100.00
255	0.68	45.77	-9.52	107.80	-9.52	100.00
260	0.52	49.19	-10.00	113.47	-10.00	100.00
265	0.59	52.68	-10.00	110.54	-10.00	100.00
270	0.57	56.37	-10.00	111.14	-10.00	100.00
275	0.40	60.24	-10.00	121.35	-10.00	100.00
280	0.37	64.15	-10.00	123.40	-10.00	100.00
285	0.35	68.14	-10.00	124.96	-10.00	100.00
290	0.31	72.19	-10.00	128.28	-10.00	100.00
295	0.27	76.28	-10.00	130.92	-10.00	100.00
300	0.24	80.40	-10.00	133.12	-10.00	100.00
305	0.23	84.55	-10.00	133.89	-10.00	100.00
310	0.00	88.70	-10.00	136.18	-10.00	100.00
315	0.00	92.85	-10.00	136.18	-10.00	100.00
320	0.00	96.99	-10.00	136.18	-10.00	100.00
325	0.00	101.11	-10.00	136.18	-10.00	100.00
330	0.00	105.21	-10.00	136.18	-10.00	100.00
335	0.00	109.26	-10.00	136.18	-10.00	100.00
340	0.00	113.26	-10.00	136.18	-10.00	100.00
345	0.00	117.19	-10.00	136.18	-10.00	100.00
350	0.00	121.03	-10.00	136.18	-10.00	100.00
355	0.00	124.76	-10.00	136.18	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Joanna Lynch
Title:	Manager, Spectrum & Data Solutions
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5711
Fax:	703-726-5599
Email:	jlynch@comsearch.com
Web site:	www.comsearch.com

Ka-Band Earth Station – Mt. Jackson, VA

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016





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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Mt. Jackson, Virginia, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in Mt. Jackson, Virginia was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Verizon	Continental US

A notification letter and datasheets for the earth station in Mt. Jackson, Virginia were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
StratusWave	BTA306	Morgantown, WV
Nextlink/XO	BTA374	Richmond-Petersburg, VA
Virginia Tech	BTA376	Roanoke, VA
Nextlink/XO	BTA461	Washington, DC

No objections were received from the LMDS incumbents.

4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in Mt. Jackson, Virginia. The coordinates provided represent a center point for the proposed earth station location. The actual earth station location will be within 60 meters of these coordinates.

This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information MT JACKSON, VA

Venue Name
Latitude (NAD 83) 38° 43' 25.2" N
Longitude (NAD 83) 78° 40' 1.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 284.52 m / 933.5 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 207.9° to 247.4°
Corresponding Elevation Angles 41.3° / 17.3°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		7.3 meter		7.3 meter	
Gain / Diameter		60.8 dBi / 7.3 m		64.6 dBi / 7.3 m	
3-dB / 15-dB Beamwidth		0.17° / 0.34°		0.11° / 0.22°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0	-1.0
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			39.6	63.6
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
Longitude (NAD 83)	78° 40' 1.4" W		
Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.12	111.68	-10.00	100.00	-10.00	100.00
5	0.97	116.42	-10.00	100.00	-10.00	100.00
10	0.95	121.15	-10.00	100.00	-10.00	100.00
15	0.95	125.85	-10.00	100.00	-10.00	100.00
20	0.86	130.50	-10.00	100.00	-10.00	100.00
25	0.45	134.98	-10.00	117.75	-10.00	100.00
30	0.32	139.03	-10.00	127.32	-10.00	100.00
35	0.31	138.55	-10.00	128.54	-10.00	100.00
40	0.00	137.32	-10.00	136.18	-10.00	100.00
45	0.00	135.94	-10.00	136.18	-10.00	100.00
50	0.00	134.16	-10.00	136.18	-10.00	100.00
55	0.00	132.01	-10.00	136.18	-10.00	100.00
60	0.37	129.83	-10.00	124.08	-10.00	100.00
65	0.98	127.49	-10.00	100.00	-10.00	100.00
70	1.43	124.74	-10.00	100.00	-10.00	100.00
75	2.71	122.18	-10.00	100.00	-10.00	100.00
80	3.84	119.21	-10.00	100.00	-10.00	100.00
85	4.15	115.68	-10.00	100.00	-10.00	100.00
90	4.21	111.94	-10.00	100.00	-10.00	100.00
95	3.37	107.89	-10.00	100.00	-10.00	100.00
100	1.90	103.75	-10.00	100.00	-10.00	100.00
105	2.35	100.01	-10.00	100.00	-10.00	100.00
110	2.84	96.19	-10.00	100.00	-10.00	100.00
115	3.17	92.29	-10.00	100.00	-10.00	100.00
120	3.45	88.35	-10.00	100.00	-10.00	100.00
125	3.25	84.42	-10.00	100.00	-10.00	100.00
130	2.60	80.58	-10.00	100.00	-10.00	100.00
135	2.05	76.84	-10.00	100.00	-10.00	100.00
140	1.47	73.20	-10.00	100.00	-10.00	100.00
145	1.03	69.65	-10.00	100.00	-10.00	100.00
150	0.75	66.17	-10.00	103.43	-10.00	100.00
155	0.40	62.86	-10.00	121.81	-10.00	100.00
160	0.24	59.61	-10.00	132.94	-10.00	100.00
165	0.52	56.29	-10.00	113.55	-10.00	100.00
170	0.79	53.11	-10.00	102.01	-10.00	100.00
175	1.13	50.06	-10.00	100.00	-10.00	100.00
180	1.53	47.18	-9.84	100.00	-9.84	100.00
185	2.36	44.19	-9.13	100.00	-9.13	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
Longitude (NAD 83)	78° 40' 1.4" W		
Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.43	42.16	-8.62	100.00	-8.62	100.00
195	1.65	41.31	-8.40	100.00	-8.40	100.00
200	1.33	39.95	-8.04	100.00	-8.04	100.00
205	1.03	38.15	-7.54	100.00	-7.54	100.00
210	1.40	35.45	-6.74	100.00	-6.74	100.00
215	1.05	33.02	-5.97	102.31	-5.97	100.00
220	1.69	29.60	-4.78	100.00	-4.78	100.00
225	2.67	25.76	-3.27	100.00	-3.27	100.00
230	3.02	22.21	-1.66	100.00	-1.66	100.00
235	2.74	19.04	0.01	100.00	0.01	100.00
240	2.01	16.96	1.26	100.01	1.26	100.00
245	1.95	15.55	2.21	103.90	2.21	100.00
250	2.37	15.18	2.47	100.00	2.47	100.00
255	2.80	16.36	1.65	100.00	1.65	100.00
260	3.09	18.94	0.07	100.00	0.07	100.00
265	3.09	22.51	-1.81	100.00	-1.81	100.00
270	3.55	26.30	-3.50	100.00	-3.50	100.00
275	3.85	30.50	-5.11	100.00	-5.11	100.00
280	3.88	35.00	-6.60	100.00	-6.60	100.00
285	4.30	39.50	-7.91	100.00	-7.91	100.00
290	4.25	44.21	-9.14	100.00	-9.14	100.00
295	3.56	49.11	-10.00	100.00	-10.00	100.00
300	3.38	53.90	-10.00	100.00	-10.00	100.00
305	3.28	58.70	-10.00	100.00	-10.00	100.00
310	3.10	63.53	-10.00	100.00	-10.00	100.00
315	2.68	68.39	-10.00	100.00	-10.00	100.00
320	2.36	73.23	-10.00	100.00	-10.00	100.00
325	2.17	78.06	-10.00	100.00	-10.00	100.00
330	2.01	82.89	-10.00	100.00	-10.00	100.00
335	1.91	87.71	-10.00	100.00	-10.00	100.00
340	2.02	92.53	-10.00	100.00	-10.00	100.00
345	1.78	97.34	-10.00	100.00	-10.00	100.00
350	1.29	102.12	-10.00	100.00	-10.00	100.00
355	0.90	106.88	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information MT JACKSON, VA

Venue Name
Latitude (NAD 83) 38° 43' 25.2" N
Longitude (NAD 83) 78° 40' 1.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 284.52 m / 933.5 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 207.9° to 247.4°
Corresponding Elevation Angles 41.3° / 17.3°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		9.1 meter		9.1 meter	
Gain / Diameter		63.2 dBi / 9.1 m		66.4 dBi / 9.1 m	
3-dB / 15-dB Beamwidth		0.13° / 0.26°		0.10° / 0.20°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0	-1.0
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			41.4	65.4
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
Longitude (NAD 83)	78° 40' 1.4" W		
Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.12	111.68	-10.00	100.00	-10.00	100.00
5	0.97	116.42	-10.00	100.00	-10.00	100.00
10	0.95	121.15	-10.00	100.00	-10.00	100.00
15	0.95	125.85	-10.00	100.00	-10.00	100.00
20	0.86	130.50	-10.00	100.00	-10.00	100.00
25	0.45	134.98	-10.00	117.75	-10.00	100.00
30	0.32	139.03	-10.00	127.32	-10.00	100.00
35	0.31	138.55	-10.00	128.54	-10.00	100.00
40	0.00	137.32	-10.00	136.18	-10.00	100.00
45	0.00	135.94	-10.00	136.18	-10.00	100.00
50	0.00	134.16	-10.00	136.18	-10.00	100.00
55	0.00	132.01	-10.00	136.18	-10.00	100.00
60	0.37	129.83	-10.00	124.08	-10.00	100.00
65	0.98	127.49	-10.00	100.00	-10.00	100.00
70	1.43	124.74	-10.00	100.00	-10.00	100.00
75	2.71	122.18	-10.00	100.00	-10.00	100.00
80	3.84	119.21	-10.00	100.00	-10.00	100.00
85	4.15	115.68	-10.00	100.00	-10.00	100.00
90	4.21	111.94	-10.00	100.00	-10.00	100.00
95	3.37	107.89	-10.00	100.00	-10.00	100.00
100	1.90	103.75	-10.00	100.00	-10.00	100.00
105	2.35	100.01	-10.00	100.00	-10.00	100.00
110	2.84	96.19	-10.00	100.00	-10.00	100.00
115	3.17	92.29	-10.00	100.00	-10.00	100.00
120	3.45	88.35	-10.00	100.00	-10.00	100.00
125	3.25	84.42	-10.00	100.00	-10.00	100.00
130	2.60	80.58	-10.00	100.00	-10.00	100.00
135	2.05	76.84	-10.00	100.00	-10.00	100.00
140	1.47	73.20	-10.00	100.00	-10.00	100.00
145	1.03	69.65	-10.00	100.00	-10.00	100.00
150	0.75	66.17	-10.00	103.43	-10.00	100.00
155	0.40	62.86	-10.00	121.81	-10.00	100.00
160	0.24	59.61	-10.00	132.94	-10.00	100.00
165	0.52	56.29	-10.00	113.55	-10.00	100.00
170	0.79	53.11	-10.00	102.01	-10.00	100.00
175	1.13	50.06	-10.00	100.00	-10.00	100.00
180	1.53	47.18	-9.84	100.00	-9.84	100.00
185	2.36	44.19	-9.13	100.00	-9.13	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
Longitude (NAD 83)	78° 40' 1.4" W		
Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz
Max Available RF Power			-25.0 (dBW/4 kHz)
			0.0025%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.43	42.16	-8.62	100.00	-8.62	100.00
195	1.65	41.31	-8.40	100.00	-8.40	100.00
200	1.33	39.95	-8.04	100.00	-8.04	100.00
205	1.03	38.15	-7.54	100.00	-7.54	100.00
210	1.40	35.45	-6.74	100.00	-6.74	100.00
215	1.05	33.02	-5.97	102.31	-5.97	100.00
220	1.69	29.60	-4.78	100.00	-4.78	100.00
225	2.67	25.76	-3.27	100.00	-3.27	100.00
230	3.02	22.21	-1.66	100.00	-1.66	100.00
235	2.74	19.04	0.01	100.00	0.01	100.00
240	2.01	16.96	1.26	100.01	1.26	100.00
245	1.95	15.55	2.21	103.90	2.21	100.00
250	2.37	15.18	2.47	100.00	2.47	100.00
255	2.80	16.36	1.65	100.00	1.65	100.00
260	3.09	18.94	0.07	100.00	0.07	100.00
265	3.09	22.51	-1.81	100.00	-1.81	100.00
270	3.55	26.30	-3.50	100.00	-3.50	100.00
275	3.85	30.50	-5.11	100.00	-5.11	100.00
280	3.88	35.00	-6.60	100.00	-6.60	100.00
285	4.30	39.50	-7.91	100.00	-7.91	100.00
290	4.25	44.21	-9.14	100.00	-9.14	100.00
295	3.56	49.11	-10.00	100.00	-10.00	100.00
300	3.38	53.90	-10.00	100.00	-10.00	100.00
305	3.28	58.70	-10.00	100.00	-10.00	100.00
310	3.10	63.53	-10.00	100.00	-10.00	100.00
315	2.68	68.39	-10.00	100.00	-10.00	100.00
320	2.36	73.23	-10.00	100.00	-10.00	100.00
325	2.17	78.06	-10.00	100.00	-10.00	100.00
330	2.01	82.89	-10.00	100.00	-10.00	100.00
335	1.91	87.71	-10.00	100.00	-10.00	100.00
340	2.02	92.53	-10.00	100.00	-10.00	100.00
345	1.78	97.34	-10.00	100.00	-10.00	100.00
350	1.29	102.12	-10.00	100.00	-10.00	100.00
355	0.90	106.88	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
 Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
 Call Sign <PCNCallSign>
 Licensee Code P3210
 Licensee Name SES Americom, Inc.

Site Information MT JACKSON, VA

Venue Name
 Latitude (NAD 83) 38° 43' 25.2" N
 Longitude (NAD 83) 78° 40' 1.4" W
 Climate Zone A
 Rain Zone 2
 Ground Elevation (AMSL) 284.52 m / 933.5 ft

Link Information

Satellite Type Geostationary
 Mode TR - Transmit-Receive
 Modulation Digital
 Satellite Arc 97° W to 135° West Longitude
 Azimuth Range 207.9° to 247.4°
 Corresponding Elevation Angles 41.3° / 17.3°
 Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		13.5 meter		13.5 meter	
Gain / Diameter		66.2 dBi / 13.5 m		69.6 dBi / 13.5 m	
3-dB / 15-dB Beamwidth		0.09° / 0.18°		0.06° / 0.12°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			44.6 68.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
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Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	20% -128.0 dBW/4 kHz
Max Available RF Power			0.0025% -25.0 (dBW/4 kHz)

Azimuth (°)	Receive 18.0 GHz		Transmit 28.0 GHz			
	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.12	111.68	-10.00	100.00	-10.00	100.00
5	0.97	116.42	-10.00	100.00	-10.00	100.00
10	0.95	121.15	-10.00	100.00	-10.00	100.00
15	0.95	125.85	-10.00	100.00	-10.00	100.00
20	0.86	130.50	-10.00	100.00	-10.00	100.00
25	0.45	134.98	-10.00	117.75	-10.00	100.00
30	0.32	139.03	-10.00	127.32	-10.00	100.00
35	0.31	138.55	-10.00	128.54	-10.00	100.00
40	0.00	137.32	-10.00	136.18	-10.00	100.00
45	0.00	135.94	-10.00	136.18	-10.00	100.00
50	0.00	134.16	-10.00	136.18	-10.00	100.00
55	0.00	132.01	-10.00	136.18	-10.00	100.00
60	0.37	129.83	-10.00	124.08	-10.00	100.00
65	0.98	127.49	-10.00	100.00	-10.00	100.00
70	1.43	124.74	-10.00	100.00	-10.00	100.00
75	2.71	122.18	-10.00	100.00	-10.00	100.00
80	3.84	119.21	-10.00	100.00	-10.00	100.00
85	4.15	115.68	-10.00	100.00	-10.00	100.00
90	4.21	111.94	-10.00	100.00	-10.00	100.00
95	3.37	107.89	-10.00	100.00	-10.00	100.00
100	1.90	103.75	-10.00	100.00	-10.00	100.00
105	2.35	100.01	-10.00	100.00	-10.00	100.00
110	2.84	96.19	-10.00	100.00	-10.00	100.00
115	3.17	92.29	-10.00	100.00	-10.00	100.00
120	3.45	88.35	-10.00	100.00	-10.00	100.00
125	3.25	84.42	-10.00	100.00	-10.00	100.00
130	2.60	80.58	-10.00	100.00	-10.00	100.00
135	2.05	76.84	-10.00	100.00	-10.00	100.00
140	1.47	73.20	-10.00	100.00	-10.00	100.00
145	1.03	69.65	-10.00	100.00	-10.00	100.00
150	0.75	66.17	-10.00	103.43	-10.00	100.00
155	0.40	62.86	-10.00	121.81	-10.00	100.00
160	0.24	59.61	-10.00	132.94	-10.00	100.00
165	0.52	56.29	-10.00	113.55	-10.00	100.00
170	0.79	53.11	-10.00	102.01	-10.00	100.00
175	1.13	50.06	-10.00	100.00	-10.00	100.00
180	1.53	47.18	-9.84	100.00	-9.84	100.00
185	2.36	44.19	-9.13	100.00	-9.13	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**MT JACKSON, VA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	38° 43' 25.2" N		
Longitude (NAD 83)	78° 40' 1.4" W		
Ground Elevation (AMSL)	284.52 m / 933.5 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.43	42.16	-8.62	100.00	-8.62	100.00
195	1.65	41.31	-8.40	100.00	-8.40	100.00
200	1.33	39.95	-8.04	100.00	-8.04	100.00
205	1.03	38.15	-7.54	100.00	-7.54	100.00
210	1.40	35.45	-6.74	100.00	-6.74	100.00
215	1.05	33.02	-5.97	102.31	-5.97	100.00
220	1.69	29.60	-4.78	100.00	-4.78	100.00
225	2.67	25.76	-3.27	100.00	-3.27	100.00
230	3.02	22.21	-1.66	100.00	-1.66	100.00
235	2.74	19.04	0.01	100.00	0.01	100.00
240	2.01	16.96	1.26	100.01	1.26	100.00
245	1.95	15.55	2.21	103.90	2.21	100.00
250	2.37	15.18	2.47	100.00	2.47	100.00
255	2.80	16.36	1.65	100.00	1.65	100.00
260	3.09	18.94	0.07	100.00	0.07	100.00
265	3.09	22.51	-1.81	100.00	-1.81	100.00
270	3.55	26.30	-3.50	100.00	-3.50	100.00
275	3.85	30.50	-5.11	100.00	-5.11	100.00
280	3.88	35.00	-6.60	100.00	-6.60	100.00
285	4.30	39.50	-7.91	100.00	-7.91	100.00
290	4.25	44.21	-9.14	100.00	-9.14	100.00
295	3.56	49.11	-10.00	100.00	-10.00	100.00
300	3.38	53.90	-10.00	100.00	-10.00	100.00
305	3.28	58.70	-10.00	100.00	-10.00	100.00
310	3.10	63.53	-10.00	100.00	-10.00	100.00
315	2.68	68.39	-10.00	100.00	-10.00	100.00
320	2.36	73.23	-10.00	100.00	-10.00	100.00
325	2.17	78.06	-10.00	100.00	-10.00	100.00
330	2.01	82.89	-10.00	100.00	-10.00	100.00
335	1.91	87.71	-10.00	100.00	-10.00	100.00
340	2.02	92.53	-10.00	100.00	-10.00	100.00
345	1.78	97.34	-10.00	100.00	-10.00	100.00
350	1.29	102.12	-10.00	100.00	-10.00	100.00
355	0.90	106.88	-10.00	100.00	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Joanna Lynch
Title:	Manager, Spectrum & Data Solutions
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5711
Fax:	703-726-5599
Email:	jlynch@comsearch.com
Web site:	www.comsearch.com

Ka-Band Earth Station – South Mountain, CA

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016





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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in South Mountain, California, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in South Mountain, California was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensees on December 11, 2015. These licensees are authorized to operate temporary fixed operations from 27.5 to 29.5 GHz in a designated geographic area.

Licensee	Authorized Geographic Area
MUT Licensing	Statewide: California
Verizon	Continental US

A notification letter and datasheets for the earth station in South Mountain, California were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
Nextlink/XO	BTA262 ²	Los Angeles, CA
T-Mobile ³	BTA262	Los Angeles, CA
TelePacific Communications ⁴	BTA262	Los Angeles, CA
Towerstream Corporation ⁵	BTA262	Los Angeles, CA
Nextlink/XO	BTA405	San Luis Obispo, CA
Nextlink/XO	BTA406	Santa Barbara-Santa Maria, CA

No objections were received from the LMDS incumbents.

² The proposed earth station will be located inside BTA262.

³ T-Mobile has acquired spectrum from Nextlink / XO in the Los Angeles, CA Basic Trading Area (BTA).

⁴ TelePacific is leasing spectrum from Nextlink / XO in the Los Angeles, CA BTA.

⁵ Towerstream is leasing spectrum from Nextlink / XO in the Los Angeles, CA BTA.



4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in South Mountain, California. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information SOUTH MTN, CA

Venue Name
Latitude (NAD 83) 34° 19' 31.9" N
Longitude (NAD 83) 118° 59' 41.4" W
Climate Zone A
Rain Zone 4
Ground Elevation (AMSL) 312.12 m / 1024.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 144.4° to 207.0°
Corresponding Elevation Angles 43.7° / 46.6°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		7.3 meter		7.3 meter	
Gain / Diameter		60.8 dBi / 7.3 m		64.6 dBi / 7.3 m	
3-dB / 15-dB Beamwidth		0.17° / 0.34°		0.11° / 0.22°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			39.6 63.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.3 km / 84.7 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**SOUTH MTN, CA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	34° 19' 31.9" N		
Longitude (NAD 83)	118° 59' 41.4" W		
Ground Elevation (AMSL)	312.12 m / 1024.0 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	14.35	135.13	-10.00	100.00	-10.00	100.00
5	14.21	131.36	-10.00	100.00	-10.00	100.00
10	14.39	127.59	-10.00	100.00	-10.00	100.00
15	13.49	123.26	-10.00	100.00	-10.00	100.00
20	13.83	119.33	-10.00	100.00	-10.00	100.00
25	13.95	115.22	-10.00	100.00	-10.00	100.00
30	12.49	110.68	-10.00	100.00	-10.00	100.00
35	12.30	106.46	-10.00	100.00	-10.00	100.00
40	13.68	102.43	-10.00	100.00	-10.00	100.00
45	14.45	98.18	-10.00	100.00	-10.00	100.00
50	15.10	93.85	-10.00	100.00	-10.00	100.00
55	15.64	89.46	-10.00	100.00	-10.00	100.00
60	16.43	85.01	-10.00	100.00	-10.00	100.00
65	15.98	80.62	-10.00	100.00	-10.00	100.00
70	17.38	76.04	-10.00	100.00	-10.00	100.00
75	17.26	71.63	-10.00	100.00	-10.00	100.00
80	17.32	67.22	-10.00	100.00	-10.00	100.00
85	16.05	63.19	-10.00	100.00	-10.00	100.00
90	16.12	58.93	-10.00	100.00	-10.00	100.00
95	16.24	54.72	-10.00	100.00	-10.00	100.00
100	15.78	50.84	-10.00	100.00	-10.00	100.00
105	13.37	48.15	-10.00	100.00	-10.00	100.00
110	10.54	46.30	-9.64	100.00	-9.64	100.00
115	8.54	44.57	-9.23	100.00	-9.23	100.00
120	7.23	42.91	-8.81	100.00	-8.81	100.00
125	6.12	41.61	-8.48	100.00	-8.48	100.00
130	5.67	40.27	-8.12	100.00	-8.12	100.00
135	4.75	39.89	-8.02	100.00	-8.02	100.00
140	3.77	40.13	-8.09	100.00	-8.09	100.00
145	5.15	38.55	-7.65	100.00	-7.65	100.00
150	5.95	38.10	-7.52	100.00	-7.52	100.00
155	6.77	38.21	-7.56	100.00	-7.56	100.00
160	5.74	40.59	-8.21	100.00	-8.21	100.00
165	6.69	41.33	-8.41	100.00	-8.41	100.00
170	6.82	42.37	-8.68	100.00	-8.68	100.00
175	7.89	42.00	-8.58	100.00	-8.58	100.00
180	6.70	43.41	-8.94	100.00	-8.94	100.00
185	4.10	45.76	-9.51	100.00	-9.51	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**SOUTH MTN, CA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	34° 19' 31.9" N		
Longitude (NAD 83)	118° 59' 41.4" W		
Ground Elevation (AMSL)	312.12 m / 1024.0 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.86	47.14	-9.83	100.00	-9.83	100.00
195	0.00	47.75	-9.97	136.26	-9.97	100.00
200	1.29	45.71	-9.50	100.00	-9.50	100.00
205	2.18	44.44	-9.19	100.00	-9.19	100.00
210	1.95	44.71	-9.26	100.00	-9.26	100.00
215	2.49	44.67	-9.25	100.00	-9.25	100.00
220	2.85	45.25	-9.39	100.00	-9.39	100.00
225	2.32	47.08	-9.82	100.00	-9.82	100.00
230	0.46	50.37	-10.00	117.03	-10.00	100.00
235	1.89	51.14	-10.00	100.00	-10.00	100.00
240	3.10	52.53	-10.00	100.00	-10.00	100.00
245	4.45	54.26	-10.00	100.00	-10.00	100.00
250	3.95	57.47	-10.00	100.00	-10.00	100.00
255	4.59	60.20	-10.00	100.00	-10.00	100.00
260	5.91	62.87	-10.00	100.00	-10.00	100.00
265	5.27	66.57	-10.00	100.00	-10.00	100.00
270	6.36	69.75	-10.00	100.00	-10.00	100.00
275	8.17	72.96	-10.00	100.00	-10.00	100.00
280	9.55	76.53	-10.00	100.00	-10.00	100.00
285	9.89	80.44	-10.00	100.00	-10.00	100.00
290	11.20	84.33	-10.00	100.00	-10.00	100.00
295	11.13	88.40	-10.00	100.00	-10.00	100.00
300	11.98	92.50	-10.00	100.00	-10.00	100.00
305	11.46	96.57	-10.00	100.00	-10.00	100.00
310	11.47	100.64	-10.00	100.00	-10.00	100.00
315	12.16	104.80	-10.00	100.00	-10.00	100.00
320	13.46	109.14	-10.00	100.00	-10.00	100.00
325	14.47	113.47	-10.00	100.00	-10.00	100.00
330	14.49	117.51	-10.00	100.00	-10.00	100.00
335	13.75	121.19	-10.00	100.00	-10.00	100.00
340	14.26	125.22	-10.00	100.00	-10.00	100.00
345	15.66	129.64	-10.00	100.00	-10.00	100.00
350	16.71	133.86	-10.00	100.00	-10.00	100.00
355	14.43	135.91	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information SOUTH MTN, CA

Venue Name
Latitude (NAD 83) 34° 19' 31.9" N
Longitude (NAD 83) 118° 59' 41.4" W
Climate Zone A
Rain Zone 4
Ground Elevation (AMSL) 312.12 m / 1024.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 144.4° to 207.0°
Corresponding Elevation Angles 43.7° / 46.6°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		9.1 meter		9.1 meter	
Gain / Diameter		63.2 dBi / 9.1 m		66.4 dBi / 9.1 m	
3-dB / 15-dB Beamwidth		0.13° / 0.26°		0.10° / 0.20°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0	-1.0
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			41.4	65.4
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.3 km / 84.7 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%
	Short Term	-146.0 dBW/MHz	0.01%
Max Available RF Power	Receive 18.0 GHz		Transmit 28.0 GHz
			-151.0 dBW/4 kHz
			20%
			-128.0 dBW/4 kHz
			0.0025%
			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	14.35	135.13	-10.00	100.00	-10.00	100.00
5	14.21	131.36	-10.00	100.00	-10.00	100.00
10	14.39	127.59	-10.00	100.00	-10.00	100.00
15	13.49	123.26	-10.00	100.00	-10.00	100.00
20	13.83	119.33	-10.00	100.00	-10.00	100.00
25	13.95	115.22	-10.00	100.00	-10.00	100.00
30	12.49	110.68	-10.00	100.00	-10.00	100.00
35	12.30	106.46	-10.00	100.00	-10.00	100.00
40	13.68	102.43	-10.00	100.00	-10.00	100.00
45	14.45	98.18	-10.00	100.00	-10.00	100.00
50	15.10	93.85	-10.00	100.00	-10.00	100.00
55	15.64	89.46	-10.00	100.00	-10.00	100.00
60	16.43	85.01	-10.00	100.00	-10.00	100.00
65	15.98	80.62	-10.00	100.00	-10.00	100.00
70	17.38	76.04	-10.00	100.00	-10.00	100.00
75	17.26	71.63	-10.00	100.00	-10.00	100.00
80	17.32	67.22	-10.00	100.00	-10.00	100.00
85	16.05	63.19	-10.00	100.00	-10.00	100.00
90	16.12	58.93	-10.00	100.00	-10.00	100.00
95	16.24	54.72	-10.00	100.00	-10.00	100.00
100	15.78	50.84	-10.00	100.00	-10.00	100.00
105	13.37	48.15	-10.00	100.00	-10.00	100.00
110	10.54	46.30	-9.64	100.00	-9.64	100.00
115	8.54	44.57	-9.23	100.00	-9.23	100.00
120	7.23	42.91	-8.81	100.00	-8.81	100.00
125	6.12	41.61	-8.48	100.00	-8.48	100.00
130	5.67	40.27	-8.12	100.00	-8.12	100.00
135	4.75	39.89	-8.02	100.00	-8.02	100.00
140	3.77	40.13	-8.09	100.00	-8.09	100.00
145	5.15	38.55	-7.65	100.00	-7.65	100.00
150	5.95	38.10	-7.52	100.00	-7.52	100.00
155	6.77	38.21	-7.56	100.00	-7.56	100.00
160	5.74	40.59	-8.21	100.00	-8.21	100.00
165	6.69	41.33	-8.41	100.00	-8.41	100.00
170	6.82	42.37	-8.68	100.00	-8.68	100.00
175	7.89	42.00	-8.58	100.00	-8.58	100.00
180	6.70	43.41	-8.94	100.00	-8.94	100.00
185	4.10	45.76	-9.51	100.00	-9.51	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**SOUTH MTN, CA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	34° 19' 31.9" N		
Longitude (NAD 83)	118° 59' 41.4" W		
Ground Elevation (AMSL)	312.12 m / 1024.0 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.86	47.14	-9.83	100.00	-9.83	100.00
195	0.00	47.75	-9.97	136.26	-9.97	100.00
200	1.29	45.71	-9.50	100.00	-9.50	100.00
205	2.18	44.44	-9.19	100.00	-9.19	100.00
210	1.95	44.71	-9.26	100.00	-9.26	100.00
215	2.49	44.67	-9.25	100.00	-9.25	100.00
220	2.85	45.25	-9.39	100.00	-9.39	100.00
225	2.32	47.08	-9.82	100.00	-9.82	100.00
230	0.46	50.37	-10.00	117.03	-10.00	100.00
235	1.89	51.14	-10.00	100.00	-10.00	100.00
240	3.10	52.53	-10.00	100.00	-10.00	100.00
245	4.45	54.26	-10.00	100.00	-10.00	100.00
250	3.95	57.47	-10.00	100.00	-10.00	100.00
255	4.59	60.20	-10.00	100.00	-10.00	100.00
260	5.91	62.87	-10.00	100.00	-10.00	100.00
265	5.27	66.57	-10.00	100.00	-10.00	100.00
270	6.36	69.75	-10.00	100.00	-10.00	100.00
275	8.17	72.96	-10.00	100.00	-10.00	100.00
280	9.55	76.53	-10.00	100.00	-10.00	100.00
285	9.89	80.44	-10.00	100.00	-10.00	100.00
290	11.20	84.33	-10.00	100.00	-10.00	100.00
295	11.13	88.40	-10.00	100.00	-10.00	100.00
300	11.98	92.50	-10.00	100.00	-10.00	100.00
305	11.46	96.57	-10.00	100.00	-10.00	100.00
310	11.47	100.64	-10.00	100.00	-10.00	100.00
315	12.16	104.80	-10.00	100.00	-10.00	100.00
320	13.46	109.14	-10.00	100.00	-10.00	100.00
325	14.47	113.47	-10.00	100.00	-10.00	100.00
330	14.49	117.51	-10.00	100.00	-10.00	100.00
335	13.75	121.19	-10.00	100.00	-10.00	100.00
340	14.26	125.22	-10.00	100.00	-10.00	100.00
345	15.66	129.64	-10.00	100.00	-10.00	100.00
350	16.71	133.86	-10.00	100.00	-10.00	100.00
355	14.43	135.91	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/03/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information**SOUTH MTN, CA**

Venue Name
Latitude (NAD 83) 34° 19' 31.9" N
Longitude (NAD 83) 118° 59' 41.4" W
Climate Zone A
Rain Zone 4
Ground Elevation (AMSL) 312.12 m / 1024.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 144.4° to 207.0°
Corresponding Elevation Angles 43.7° / 46.6°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES
Model	13.5 meter	13.5 meter
Gain / Diameter	66.2 dBi / 13.5 m	69.6 dBi / 13.5 m
3-dB / 15-dB Beamwidth	0.09° / 0.18°	0.06° / 0.12°
Max Available RF Power (dBW/4 kHz)		-25.0
		(dBW/MHz) -1.0
Maximum EIRP (dBW/4 kHz)		44.6
		(dBW/MHz) 68.6
Interference Objectives:	Long Term	-156.0 dBW/MHz 20%
	Short Term	-146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20%
		-128.0 dBW/4 kHz 0.0025%

Frequency Information**Receive 18.0 GHz****Transmit 28.0 GHz**

Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	136.3 km / 84.7 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**SOUTH MTN, CA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	34° 19' 31.9" N		
Longitude (NAD 83)	118° 59' 41.4" W		
Ground Elevation (AMSL)	312.12 m / 1024.0 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	14.35	135.13	-10.00	100.00	-10.00	100.00
5	14.21	131.36	-10.00	100.00	-10.00	100.00
10	14.39	127.59	-10.00	100.00	-10.00	100.00
15	13.49	123.26	-10.00	100.00	-10.00	100.00
20	13.83	119.33	-10.00	100.00	-10.00	100.00
25	13.95	115.22	-10.00	100.00	-10.00	100.00
30	12.49	110.68	-10.00	100.00	-10.00	100.00
35	12.30	106.46	-10.00	100.00	-10.00	100.00
40	13.68	102.43	-10.00	100.00	-10.00	100.00
45	14.45	98.18	-10.00	100.00	-10.00	100.00
50	15.10	93.85	-10.00	100.00	-10.00	100.00
55	15.64	89.46	-10.00	100.00	-10.00	100.00
60	16.43	85.01	-10.00	100.00	-10.00	100.00
65	15.98	80.62	-10.00	100.00	-10.00	100.00
70	17.38	76.04	-10.00	100.00	-10.00	100.00
75	17.26	71.63	-10.00	100.00	-10.00	100.00
80	17.32	67.22	-10.00	100.00	-10.00	100.00
85	16.05	63.19	-10.00	100.00	-10.00	100.00
90	16.12	58.93	-10.00	100.00	-10.00	100.00
95	16.24	54.72	-10.00	100.00	-10.00	100.00
100	15.78	50.84	-10.00	100.00	-10.00	100.00
105	13.37	48.15	-10.00	100.00	-10.00	100.00
110	10.54	46.30	-9.64	100.00	-9.64	100.00
115	8.54	44.57	-9.23	100.00	-9.23	100.00
120	7.23	42.91	-8.81	100.00	-8.81	100.00
125	6.12	41.61	-8.48	100.00	-8.48	100.00
130	5.67	40.27	-8.12	100.00	-8.12	100.00
135	4.75	39.89	-8.02	100.00	-8.02	100.00
140	3.77	40.13	-8.09	100.00	-8.09	100.00
145	5.15	38.55	-7.65	100.00	-7.65	100.00
150	5.95	38.10	-7.52	100.00	-7.52	100.00
155	6.77	38.21	-7.56	100.00	-7.56	100.00
160	5.74	40.59	-8.21	100.00	-8.21	100.00
165	6.69	41.33	-8.41	100.00	-8.41	100.00
170	6.82	42.37	-8.68	100.00	-8.68	100.00
175	7.89	42.00	-8.58	100.00	-8.58	100.00
180	6.70	43.41	-8.94	100.00	-8.94	100.00
185	4.10	45.76	-9.51	100.00	-9.51	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**SOUTH MTN, CA**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	34° 19' 31.9" N		
Longitude (NAD 83)	118° 59' 41.4" W		
Ground Elevation (AMSL)	312.12 m / 1024.0 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.86	47.14	-9.83	100.00	-9.83	100.00
195	0.00	47.75	-9.97	136.26	-9.97	100.00
200	1.29	45.71	-9.50	100.00	-9.50	100.00
205	2.18	44.44	-9.19	100.00	-9.19	100.00
210	1.95	44.71	-9.26	100.00	-9.26	100.00
215	2.49	44.67	-9.25	100.00	-9.25	100.00
220	2.85	45.25	-9.39	100.00	-9.39	100.00
225	2.32	47.08	-9.82	100.00	-9.82	100.00
230	0.46	50.37	-10.00	117.03	-10.00	100.00
235	1.89	51.14	-10.00	100.00	-10.00	100.00
240	3.10	52.53	-10.00	100.00	-10.00	100.00
245	4.45	54.26	-10.00	100.00	-10.00	100.00
250	3.95	57.47	-10.00	100.00	-10.00	100.00
255	4.59	60.20	-10.00	100.00	-10.00	100.00
260	5.91	62.87	-10.00	100.00	-10.00	100.00
265	5.27	66.57	-10.00	100.00	-10.00	100.00
270	6.36	69.75	-10.00	100.00	-10.00	100.00
275	8.17	72.96	-10.00	100.00	-10.00	100.00
280	9.55	76.53	-10.00	100.00	-10.00	100.00
285	9.89	80.44	-10.00	100.00	-10.00	100.00
290	11.20	84.33	-10.00	100.00	-10.00	100.00
295	11.13	88.40	-10.00	100.00	-10.00	100.00
300	11.98	92.50	-10.00	100.00	-10.00	100.00
305	11.46	96.57	-10.00	100.00	-10.00	100.00
310	11.47	100.64	-10.00	100.00	-10.00	100.00
315	12.16	104.80	-10.00	100.00	-10.00	100.00
320	13.46	109.14	-10.00	100.00	-10.00	100.00
325	14.47	113.47	-10.00	100.00	-10.00	100.00
330	14.49	117.51	-10.00	100.00	-10.00	100.00
335	13.75	121.19	-10.00	100.00	-10.00	100.00
340	14.26	125.22	-10.00	100.00	-10.00	100.00
345	15.66	129.64	-10.00	100.00	-10.00	100.00
350	16.71	133.86	-10.00	100.00	-10.00	100.00
355	14.43	135.91	-10.00	100.00	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Joanna Lynch
Title:	Manager, Spectrum & Data Solutions
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5711
Fax:	703-726-5599
Email:	jlynch@comsearch.com
Web site:	www.comsearch.com

Ka-Band Earth Station – Woodbine, MD

Frequency Coordination Report

28 GHz



Prepared on Behalf of
SES Americom Inc.

January 13, 2016



COMSEARCH
A CommScope Company



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1. Summary of Results

On behalf of SES Americom Inc., Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Woodbine, Maryland, which will transmit at 28 GHz¹. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 12, 2016.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at SES Americom Inc. has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the earth station in Woodbine, Maryland was prior-coordinated by Comsearch. A notification letter and datasheets for this system were sent to the following 28 GHz common carrier fixed microwave licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Verizon	Continental US

A notification letter and datasheets for the earth station in Woodbine, Maryland were also sent to the following 28 GHz local television transmission licensee on December 11, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

¹ The proposed earth station will operate in the 27.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 11, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
Nextlink/XO	BTA029 ²	Baltimore, MD
Sprint ³	BTA029	Baltimore, MD
Nextlink/XO	BTA346	Philadelphia, PA-Wilmington, DE
T-Mobile ⁴	BTA346	Philadelphia, PA-Wilmington, DE
Nextlink/XO	BTA461	Washington, DC

No objections were received from the LMDS incumbents.

² The proposed earth station will be located inside BTA029.

³ Sprint is leasing spectrum from Nextlink / XO in the Baltimore, MD Basic Trading Area (BTA).

⁴ T-Mobile has acquired spectrum from Nextlink / XO in the Philadelphia, PA—Wilmington, DE BTA.

4. Earth Station Coordination Data

This section presents the data pertinent to the proposed earth station in Woodbine, Maryland. The coordinates provided represent a center point for the proposed earth station location. The actual earth station location will be within 120 meters of these coordinates.

This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/11/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information **WOODBINE, MD**

Venue Name
Latitude (NAD 83) 39° 22' 38.7" N
Longitude (NAD 83) 77° 4' 49.1" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 195.78 m / 642.3 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 209.7° to 248.3°
Corresponding Elevation Angles 40.0° / 15.9°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		7.3 meter		7.3 meter	
Gain / Diameter		60.8 dBi / 7.3 m		64.6 dBi / 7.3 m	
3-dB / 15-dB Beamwidth		0.17° / 0.34°		0.11° / 0.22°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0 -1.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			39.6 63.6	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W

Max Great Circle Coordination Distance	155.1 km / 96.4 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	20% -128.0 dBW/4 kHz
Max Available RF Power			0.0025% -25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.33	111.06	-10.00	100.00	-10.00	100.00
5	2.02	115.85	-10.00	100.00	-10.00	100.00
10	1.87	120.64	-10.00	100.00	-10.00	100.00
15	1.59	125.38	-10.00	100.00	-10.00	100.00
20	1.46	130.10	-10.00	100.00	-10.00	100.00
25	1.25	134.76	-10.00	100.00	-10.00	100.00
30	1.02	139.33	-10.00	100.00	-10.00	100.00
35	1.02	140.76	-10.00	100.00	-10.00	100.00
40	1.22	140.13	-10.00	100.00	-10.00	100.00
45	1.38	138.95	-10.00	100.00	-10.00	100.00
50	0.80	136.67	-10.00	101.36	-10.00	100.00
55	0.78	134.51	-10.00	102.18	-10.00	100.00
60	0.82	132.06	-10.00	100.57	-10.00	100.00
65	0.92	129.36	-10.00	100.00	-10.00	100.00
70	0.93	126.35	-10.00	100.00	-10.00	100.00
75	0.79	123.07	-10.00	101.87	-10.00	100.00
80	0.73	119.68	-10.00	104.39	-10.00	100.00
85	0.67	116.17	-10.00	106.95	-10.00	100.00
90	0.65	112.57	-10.00	107.78	-10.00	100.00
95	0.73	108.91	-10.00	104.37	-10.00	100.00
100	0.88	105.19	-10.00	100.00	-10.00	100.00
105	0.87	101.38	-10.00	100.00	-10.00	100.00
110	0.56	97.51	-10.00	111.69	-10.00	100.00
115	0.69	93.66	-10.00	106.24	-10.00	100.00
120	0.88	89.79	-10.00	100.00	-10.00	100.00
125	0.83	85.92	-10.00	100.29	-10.00	100.00
130	0.64	82.07	-10.00	108.04	-10.00	100.00
135	0.24	78.31	-10.00	133.21	-10.00	100.00
140	0.00	74.60	-10.00	136.18	-10.00	100.00
145	0.00	70.90	-10.00	136.18	-10.00	100.00
150	0.00	67.27	-10.00	136.18	-10.00	100.00
155	0.00	63.73	-10.00	136.18	-10.00	100.00
160	0.00	60.30	-10.00	136.18	-10.00	100.00
165	0.29	56.85	-10.00	128.92	-10.00	100.00
170	0.38	53.65	-10.00	122.94	-10.00	100.00
175	0.39	50.69	-10.00	122.35	-10.00	100.00
180	0.52	47.88	-10.00	113.26	-10.00	100.00
185	0.49	45.48	-9.45	116.27	-9.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 7.3 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-25.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.51	43.37	-8.93	116.32	-8.93	100.00
195	0.47	41.72	-8.51	120.08	-8.51	100.00
200	0.40	40.12	-8.08	126.47	-8.08	100.00
205	0.39	38.08	-7.52	128.45	-7.52	100.00
210	0.57	35.54	-6.77	119.27	-6.77	100.00
215	0.44	32.98	-5.96	128.51	-5.96	100.00
220	0.33	30.14	-4.98	139.54	-4.98	100.00
225	0.29	27.05	-3.80	146.40	-3.80	100.00
230	0.55	23.58	-2.31	131.73	-2.31	100.00
235	0.65	20.12	-0.59	132.17	-0.59	100.00
240	0.49	17.44	0.96	144.83	0.96	100.00
245	0.47	15.75	2.07	150.20	2.07	100.00
250	0.42	15.55	2.21	155.11	2.21	100.00
255	0.40	16.83	1.35	153.88	1.35	100.00
260	0.59	19.16	-0.06	136.44	-0.06	100.00
265	0.46	22.57	-1.84	138.67	-1.84	100.00
270	0.71	26.25	-3.48	122.41	-3.48	100.00
275	0.99	30.29	-5.03	106.70	-5.03	100.00
280	1.18	34.61	-6.48	100.00	-6.48	100.00
285	1.48	39.04	-7.79	100.00	-7.79	100.00
290	1.59	43.64	-9.00	100.00	-9.00	100.00
295	1.75	48.30	-10.00	100.00	-10.00	100.00
300	1.98	53.00	-10.00	100.00	-10.00	100.00
305	2.21	57.75	-10.00	100.00	-10.00	100.00
310	2.35	62.54	-10.00	100.00	-10.00	100.00
315	2.81	67.33	-10.00	100.00	-10.00	100.00
320	3.49	72.13	-10.00	100.00	-10.00	100.00
325	4.06	76.98	-10.00	100.00	-10.00	100.00
330	4.06	81.87	-10.00	100.00	-10.00	100.00
335	4.23	86.76	-10.00	100.00	-10.00	100.00
340	4.22	91.65	-10.00	100.00	-10.00	100.00
345	3.42	96.53	-10.00	100.00	-10.00	100.00
350	3.04	101.39	-10.00	100.00	-10.00	100.00
355	2.52	106.22	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/11/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information **WOODBINE, MD**

Venue Name
Latitude (NAD 83) 39° 22' 38.7" N
Longitude (NAD 83) 77° 4' 49.1" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 195.78 m / 642.3 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 209.7° to 248.3°
Corresponding Elevation Angles 40.0° / 15.9°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		SES		SES	
Model		9.1 meter		9.1 meter	
Gain / Diameter		63.2 dBi / 9.1 m		66.4 dBi / 9.1 m	
3-dB / 15-dB Beamwidth		0.13° / 0.26°		0.10° / 0.20°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-25.0	-1.0
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			41.4	65.4
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0 100KG7D - 250MG7D / 19700.0 - 20200.0 100KG7N - 250MG7N 100KG7W - 250MG7W	100KG7D - 250MG7D / 27500.0 - 28600.0 100KG7D - 250MG7D / 29250.0 - 30000.0 100KG7N - 250MG7N 100KG7W - 250MG7W
Max Great Circle Coordination Distance	155.1 km / 96.4 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.33	111.06	-10.00	100.00	-10.00	100.00
5	2.02	115.85	-10.00	100.00	-10.00	100.00
10	1.87	120.64	-10.00	100.00	-10.00	100.00
15	1.59	125.38	-10.00	100.00	-10.00	100.00
20	1.46	130.10	-10.00	100.00	-10.00	100.00
25	1.25	134.76	-10.00	100.00	-10.00	100.00
30	1.02	139.33	-10.00	100.00	-10.00	100.00
35	1.02	140.76	-10.00	100.00	-10.00	100.00
40	1.22	140.13	-10.00	100.00	-10.00	100.00
45	1.38	138.95	-10.00	100.00	-10.00	100.00
50	0.80	136.67	-10.00	101.36	-10.00	100.00
55	0.78	134.51	-10.00	102.18	-10.00	100.00
60	0.82	132.06	-10.00	100.57	-10.00	100.00
65	0.92	129.36	-10.00	100.00	-10.00	100.00
70	0.93	126.35	-10.00	100.00	-10.00	100.00
75	0.79	123.07	-10.00	101.87	-10.00	100.00
80	0.73	119.68	-10.00	104.39	-10.00	100.00
85	0.67	116.17	-10.00	106.95	-10.00	100.00
90	0.65	112.57	-10.00	107.78	-10.00	100.00
95	0.73	108.91	-10.00	104.37	-10.00	100.00
100	0.88	105.19	-10.00	100.00	-10.00	100.00
105	0.87	101.38	-10.00	100.00	-10.00	100.00
110	0.56	97.51	-10.00	111.69	-10.00	100.00
115	0.69	93.66	-10.00	106.24	-10.00	100.00
120	0.88	89.79	-10.00	100.00	-10.00	100.00
125	0.83	85.92	-10.00	100.29	-10.00	100.00
130	0.64	82.07	-10.00	108.04	-10.00	100.00
135	0.24	78.31	-10.00	133.21	-10.00	100.00
140	0.00	74.60	-10.00	136.18	-10.00	100.00
145	0.00	70.90	-10.00	136.18	-10.00	100.00
150	0.00	67.27	-10.00	136.18	-10.00	100.00
155	0.00	63.73	-10.00	136.18	-10.00	100.00
160	0.00	60.30	-10.00	136.18	-10.00	100.00
165	0.29	56.85	-10.00	128.92	-10.00	100.00
170	0.38	53.65	-10.00	122.94	-10.00	100.00
175	0.39	50.69	-10.00	122.35	-10.00	100.00
180	0.52	47.88	-10.00	113.26	-10.00	100.00
185	0.49	45.48	-9.45	116.27	-9.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 9.1 meter		
Antenna Mode	Receive 18.0 GHz	Transmit 28.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz
Max Available RF Power			-25.0 (dBW/4 kHz)
			0.0025%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.51	43.37	-8.93	116.32	-8.93	100.00
195	0.47	41.72	-8.51	120.08	-8.51	100.00
200	0.40	40.12	-8.08	126.47	-8.08	100.00
205	0.39	38.08	-7.52	128.45	-7.52	100.00
210	0.57	35.54	-6.77	119.27	-6.77	100.00
215	0.44	32.98	-5.96	128.51	-5.96	100.00
220	0.33	30.14	-4.98	139.54	-4.98	100.00
225	0.29	27.05	-3.80	146.40	-3.80	100.00
230	0.55	23.58	-2.31	131.73	-2.31	100.00
235	0.65	20.12	-0.59	132.17	-0.59	100.00
240	0.49	17.44	0.96	144.83	0.96	100.00
245	0.47	15.75	2.07	150.20	2.07	100.00
250	0.42	15.55	2.21	155.11	2.21	100.00
255	0.40	16.83	1.35	153.88	1.35	100.00
260	0.59	19.16	-0.06	136.44	-0.06	100.00
265	0.46	22.57	-1.84	138.67	-1.84	100.00
270	0.71	26.25	-3.48	122.41	-3.48	100.00
275	0.99	30.29	-5.03	106.70	-5.03	100.00
280	1.18	34.61	-6.48	100.00	-6.48	100.00
285	1.48	39.04	-7.79	100.00	-7.79	100.00
290	1.59	43.64	-9.00	100.00	-9.00	100.00
295	1.75	48.30	-10.00	100.00	-10.00	100.00
300	1.98	53.00	-10.00	100.00	-10.00	100.00
305	2.21	57.75	-10.00	100.00	-10.00	100.00
310	2.35	62.54	-10.00	100.00	-10.00	100.00
315	2.81	67.33	-10.00	100.00	-10.00	100.00
320	3.49	72.13	-10.00	100.00	-10.00	100.00
325	4.06	76.98	-10.00	100.00	-10.00	100.00
330	4.06	81.87	-10.00	100.00	-10.00	100.00
335	4.23	86.76	-10.00	100.00	-10.00	100.00
340	4.22	91.65	-10.00	100.00	-10.00	100.00
345	3.42	96.53	-10.00	100.00	-10.00	100.00
350	3.04	101.39	-10.00	100.00	-10.00	100.00
355	2.52	106.22	-10.00	100.00	-10.00	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 12/11/2015
Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
Call Sign <PCNCallSign>
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information**WOODBINE, MD**

Venue Name
Latitude (NAD 83) 39° 22' 38.7" N
Longitude (NAD 83) 77° 4' 49.1" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 195.78 m / 642.3 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97° W to 135° West Longitude
Azimuth Range 209.7° to 248.3°
Corresponding Elevation Angles 40.0° / 15.9°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information**Receive - FCC32****Transmit - FCC32**

Manufacturer	SES	SES
Model	13.5 meter	13.5 meter
Gain / Diameter	66.2 dBi / 13.5 m	69.6 dBi / 13.5 m
3-dB / 15-dB Beamwidth	0.09° / 0.18°	0.06° / 0.12°
Max Available RF Power (dBW/4 kHz)		-25.0
	(dBW/MHz)	-1.0
Maximum EIRP (dBW/4 kHz)		44.6
	(dBW/MHz)	68.6
Interference Objectives: Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz 0.01%	-128.0 dBW/4 kHz 0.0025%

Frequency Information**Receive 18.0 GHz****Transmit 28.0 GHz**

Emission / Frequency Range (MHz)	100KG7D - 250MG7D / 18300.0 - 18800.0	100KG7D - 250MG7D / 27500.0 - 28600.0
	100KG7D - 250MG7D / 19700.0 - 20200.0	100KG7D - 250MG7D / 29250.0 - 30000.0
	100KG7N - 250MG7N	100KG7N - 250MG7N
	100KG7W - 250MG7W	100KG7W - 250MG7W
Max Great Circle Coordination Distance	155.1 km / 96.4 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 28.0 GHz -151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	20% -128.0 dBW/4 kHz
Max Available RF Power			0.0025% -25.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.33	111.06	-10.00	100.00	-10.00	100.00
5	2.02	115.85	-10.00	100.00	-10.00	100.00
10	1.87	120.64	-10.00	100.00	-10.00	100.00
15	1.59	125.38	-10.00	100.00	-10.00	100.00
20	1.46	130.10	-10.00	100.00	-10.00	100.00
25	1.25	134.76	-10.00	100.00	-10.00	100.00
30	1.02	139.33	-10.00	100.00	-10.00	100.00
35	1.02	140.76	-10.00	100.00	-10.00	100.00
40	1.22	140.13	-10.00	100.00	-10.00	100.00
45	1.38	138.95	-10.00	100.00	-10.00	100.00
50	0.80	136.67	-10.00	101.36	-10.00	100.00
55	0.78	134.51	-10.00	102.18	-10.00	100.00
60	0.82	132.06	-10.00	100.57	-10.00	100.00
65	0.92	129.36	-10.00	100.00	-10.00	100.00
70	0.93	126.35	-10.00	100.00	-10.00	100.00
75	0.79	123.07	-10.00	101.87	-10.00	100.00
80	0.73	119.68	-10.00	104.39	-10.00	100.00
85	0.67	116.17	-10.00	106.95	-10.00	100.00
90	0.65	112.57	-10.00	107.78	-10.00	100.00
95	0.73	108.91	-10.00	104.37	-10.00	100.00
100	0.88	105.19	-10.00	100.00	-10.00	100.00
105	0.87	101.38	-10.00	100.00	-10.00	100.00
110	0.56	97.51	-10.00	111.69	-10.00	100.00
115	0.69	93.66	-10.00	106.24	-10.00	100.00
120	0.88	89.79	-10.00	100.00	-10.00	100.00
125	0.83	85.92	-10.00	100.29	-10.00	100.00
130	0.64	82.07	-10.00	108.04	-10.00	100.00
135	0.24	78.31	-10.00	133.21	-10.00	100.00
140	0.00	74.60	-10.00	136.18	-10.00	100.00
145	0.00	70.90	-10.00	136.18	-10.00	100.00
150	0.00	67.27	-10.00	136.18	-10.00	100.00
155	0.00	63.73	-10.00	136.18	-10.00	100.00
160	0.00	60.30	-10.00	136.18	-10.00	100.00
165	0.29	56.85	-10.00	128.92	-10.00	100.00
170	0.38	53.65	-10.00	122.94	-10.00	100.00
175	0.39	50.69	-10.00	122.35	-10.00	100.00
180	0.52	47.88	-10.00	113.26	-10.00	100.00
185	0.49	45.48	-9.45	116.27	-9.45	100.00

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values**WOODBINE, MD**

Licensee Name	SES Americom, Inc.		
Latitude (NAD 83)	39° 22' 38.7" N		
Longitude (NAD 83)	77° 4' 49.1" W		
Ground Elevation (AMSL)	195.78 m / 642.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	SES 13.5 meter		
Antenna Mode	Receive 18.0 GHz	Transmit 28.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz
Max Available RF Power			-25.0 (dBW/4 kHz)
			0.0025%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.51	43.37	-8.93	116.32	-8.93	100.00
195	0.47	41.72	-8.51	120.08	-8.51	100.00
200	0.40	40.12	-8.08	126.47	-8.08	100.00
205	0.39	38.08	-7.52	128.45	-7.52	100.00
210	0.57	35.54	-6.77	119.27	-6.77	100.00
215	0.44	32.98	-5.96	128.51	-5.96	100.00
220	0.33	30.14	-4.98	139.54	-4.98	100.00
225	0.29	27.05	-3.80	146.40	-3.80	100.00
230	0.55	23.58	-2.31	131.73	-2.31	100.00
235	0.65	20.12	-0.59	132.17	-0.59	100.00
240	0.49	17.44	0.96	144.83	0.96	100.00
245	0.47	15.75	2.07	150.20	2.07	100.00
250	0.42	15.55	2.21	155.11	2.21	100.00
255	0.40	16.83	1.35	153.88	1.35	100.00
260	0.59	19.16	-0.06	136.44	-0.06	100.00
265	0.46	22.57	-1.84	138.67	-1.84	100.00
270	0.71	26.25	-3.48	122.41	-3.48	100.00
275	0.99	30.29	-5.03	106.70	-5.03	100.00
280	1.18	34.61	-6.48	100.00	-6.48	100.00
285	1.48	39.04	-7.79	100.00	-7.79	100.00
290	1.59	43.64	-9.00	100.00	-9.00	100.00
295	1.75	48.30	-10.00	100.00	-10.00	100.00
300	1.98	53.00	-10.00	100.00	-10.00	100.00
305	2.21	57.75	-10.00	100.00	-10.00	100.00
310	2.35	62.54	-10.00	100.00	-10.00	100.00
315	2.81	67.33	-10.00	100.00	-10.00	100.00
320	3.49	72.13	-10.00	100.00	-10.00	100.00
325	4.06	76.98	-10.00	100.00	-10.00	100.00
330	4.06	81.87	-10.00	100.00	-10.00	100.00
335	4.23	86.76	-10.00	100.00	-10.00	100.00
340	4.22	91.65	-10.00	100.00	-10.00	100.00
345	3.42	96.53	-10.00	100.00	-10.00	100.00
350	3.04	101.39	-10.00	100.00	-10.00	100.00
355	2.52	106.22	-10.00	100.00	-10.00	100.00



5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

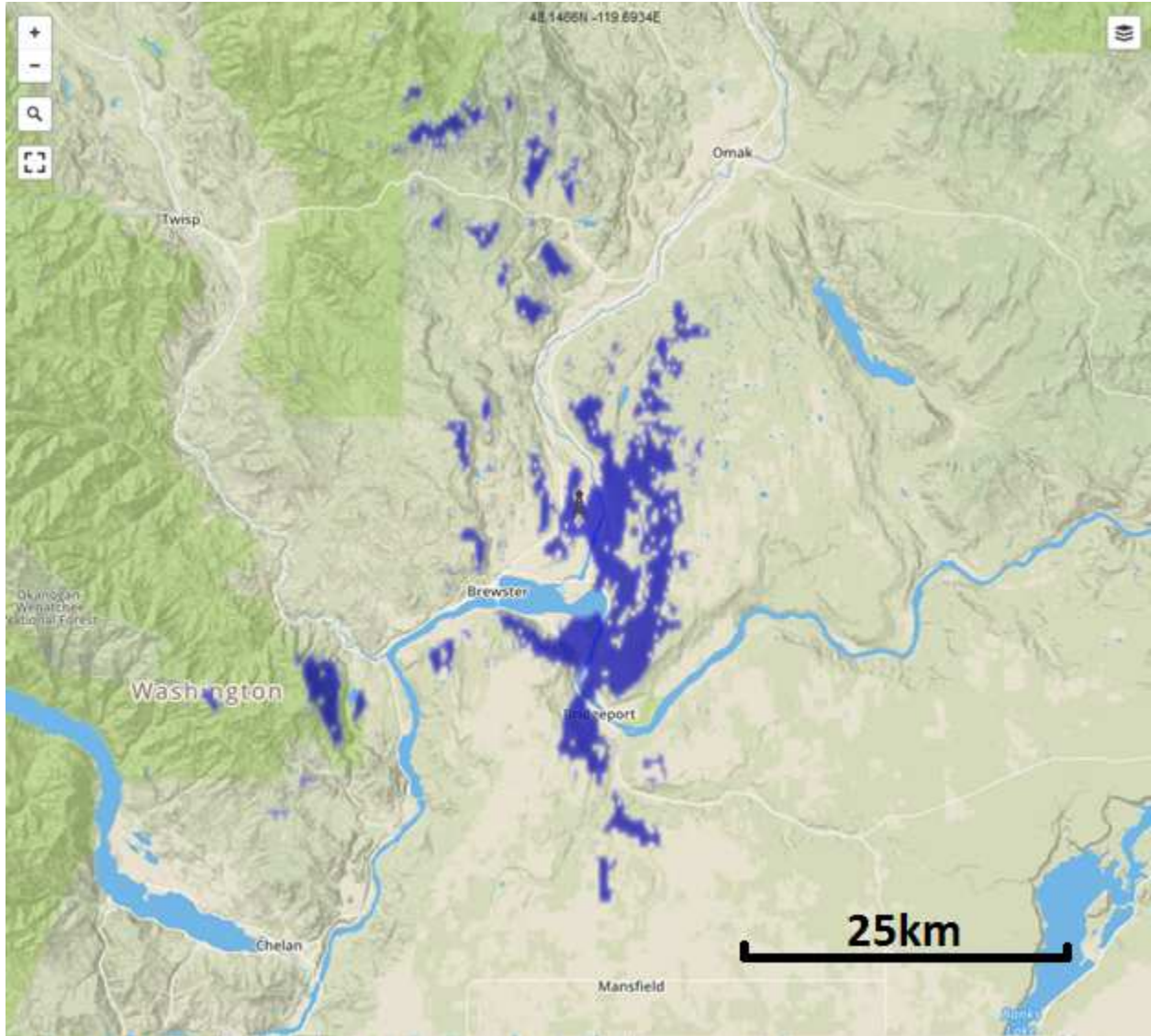
Contact person: Joanna Lynch
Title: Manager, Spectrum & Data Solutions
Company: Comsearch
Address: 19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone: 703-726-5711
Fax: 703-726-5599
Email: jlynch@comsearch.com
Web site: www.comsearch.com

ATTACHMENT 2

LMDS Interference Analysis Plots

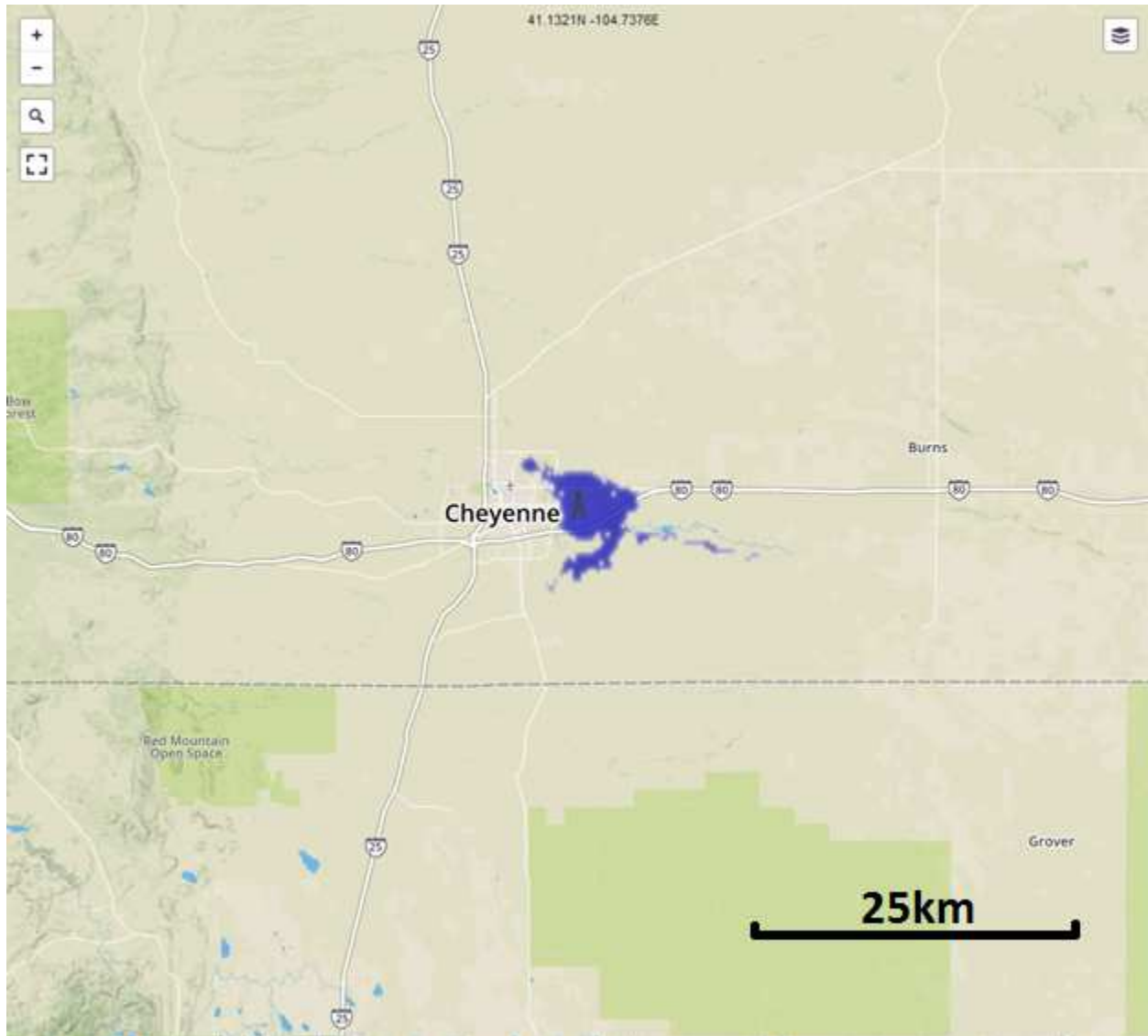
Brewster, WA

48.146564N 119.693426W



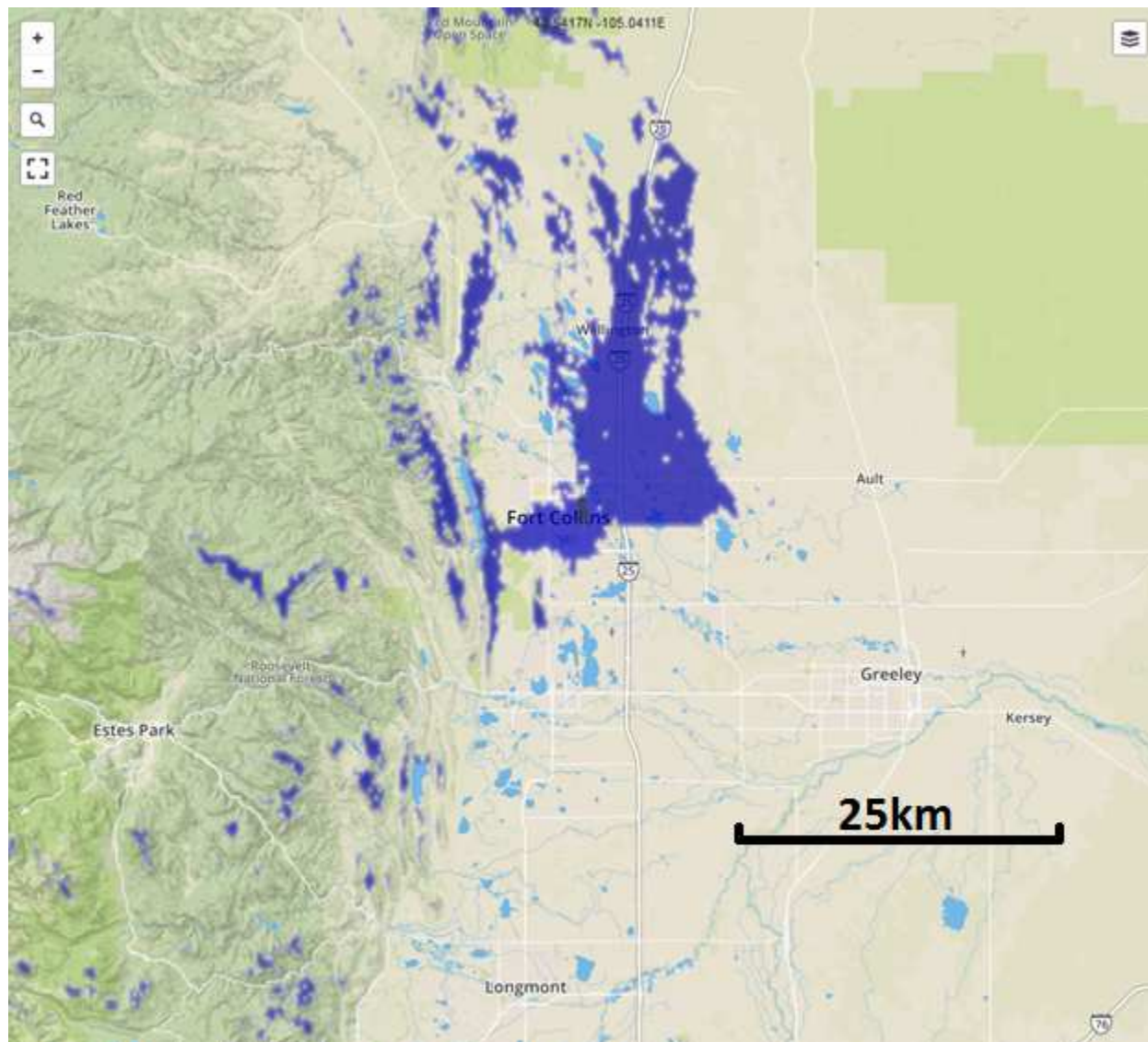
Cheyenne, WY

41.132149N 104.737606W



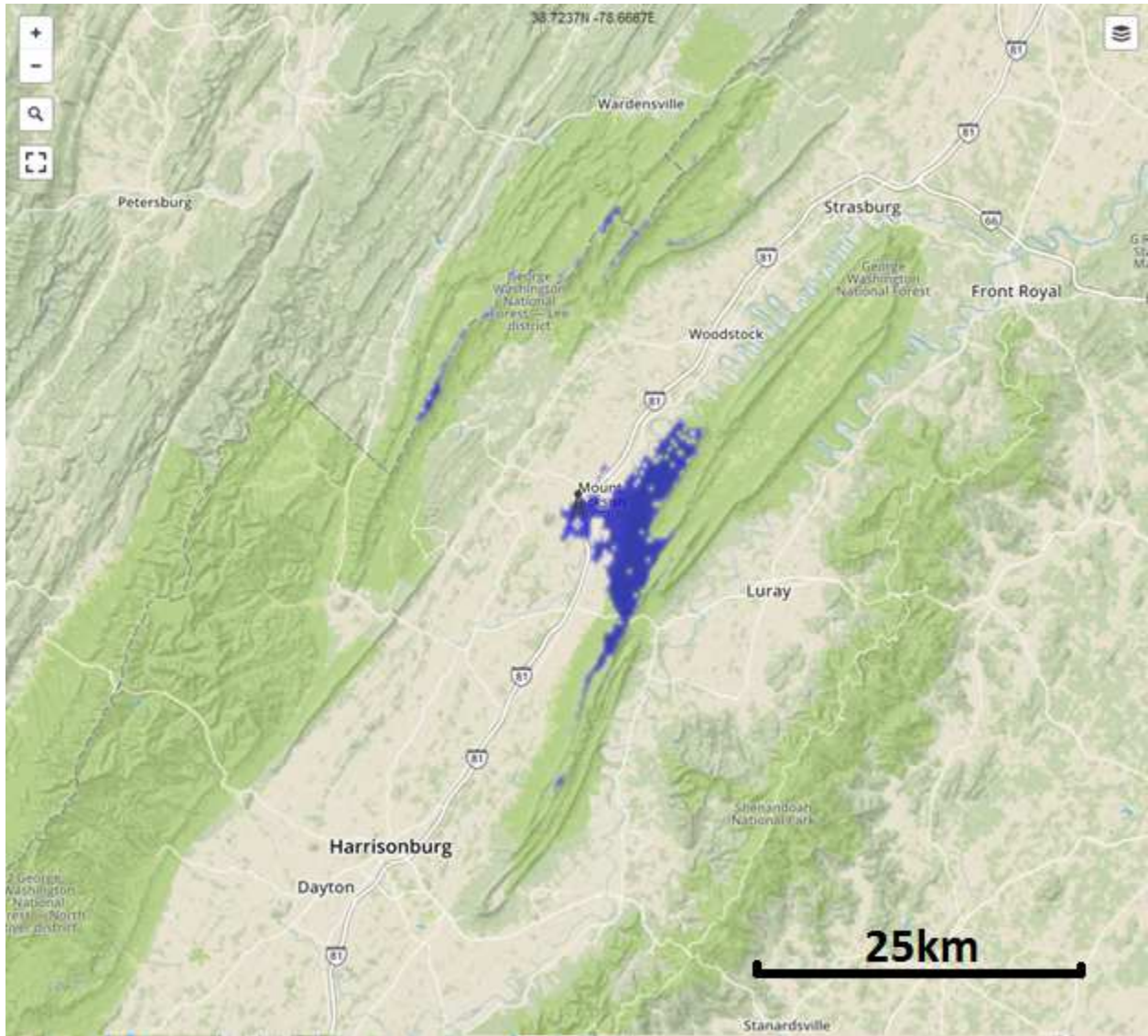
Ft. Collins, CO

40.541715N 105.041132W



Mt. Jackson, VA

38.723666N 78.666725W



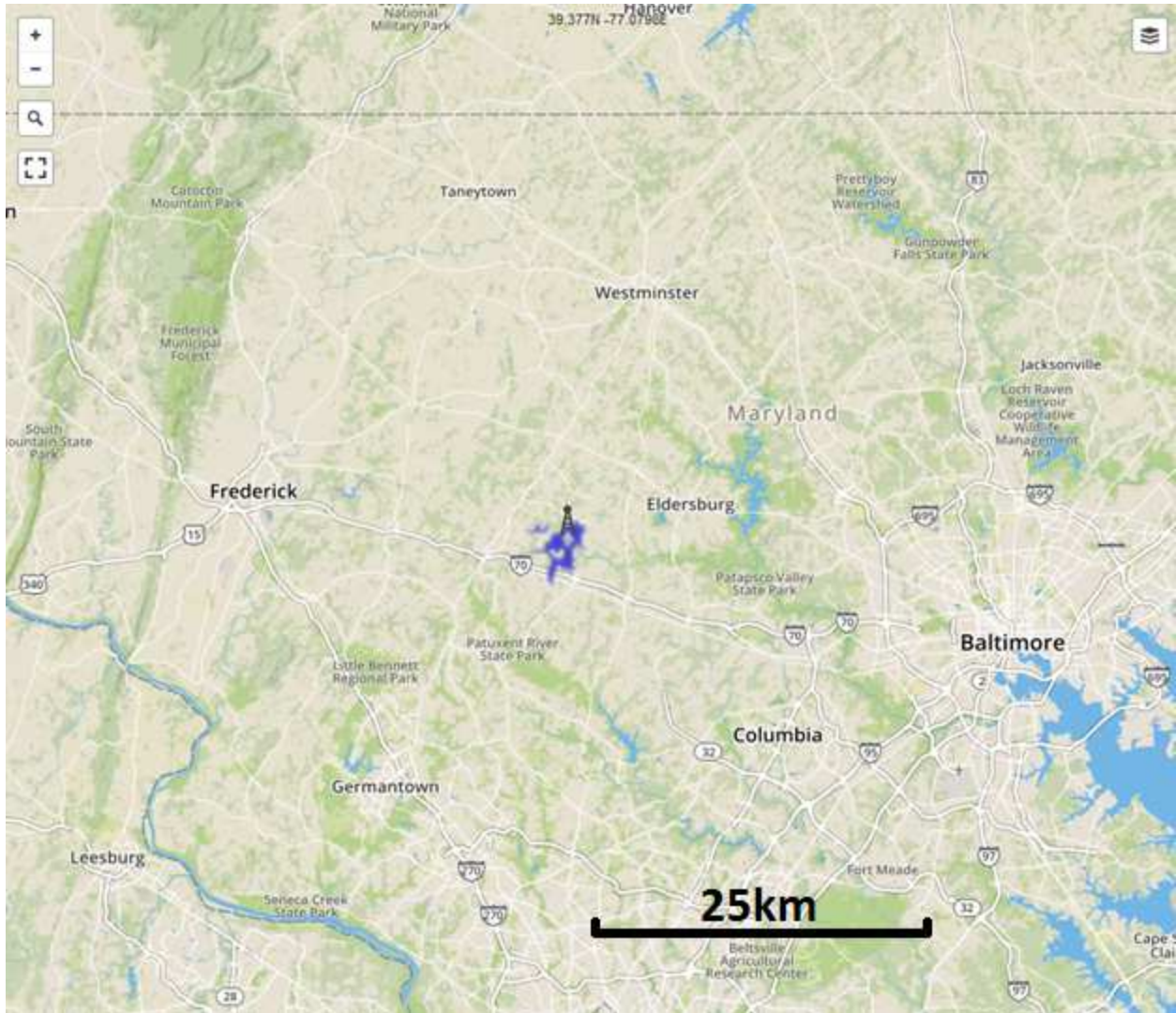
South Mountain, CA

34.325577N 118.995528W



Woodbine, MD

39.376955N 77.079840W



ATTACHMENT 3

TOWAIR Verification Results

Brewster TOWAIR

TOWAIR Determination Results

This structure requires FAA notification and FCC registration, based on a check of the coordinates, heights, and structure type you provided. As detailed below, one or more of the determination results produced a "fail slope" result, which means registration is required.

***** NOTICE *****

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

DETERMINATION Results							
FAIL SLOPE (100:1)FAA REQ - 3823.0 Meters(12542.5 Feet) away & exceeds by 71.0 Meters (232.94 Feet)							
Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	C	48-06-18.00N	119-43-14.00W	ANDERSON FIELD	OKANOGAN BREWSTER, WA	279.7	1219.2
Your Specifications							
NAD83 Coordinates							
Latitude						48-08-47.6 north	
Longitude						119-41-36.3 west	
Measurements (Meters)							
Overall Structure Height (AGL)						10	
Support Structure Height (AGL)						0	
Site Elevation (AMSL)						379	
Structure Type							
B - Building							