

18/12

E960131 SES-STA-20160804-00719 IB2016001799
Iridium Satellite LLC


Approved by OMB
3060-0678

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
E960131 Tempe Gateway STA during launch and early operations phase for NEXT

1. Applicant

Name:	Iridium Satellite LLC	Phone Number:	703-287-7518
DBA Name:		Fax Number:	
Street:	1750 Tysons Boulevard	E-Mail:	maureen.mclaughlin@iridium.com
	Suite 1400		
City:	McLean	State:	VA
Country:	USA	Zipcode:	22102
Attention:	Ms Maureen C McLaughlin		



GRANTED
International Bureau

File # SES-STA-20160804-00719
Call Sign E960131 **Grant Date** 9-9-16
(or other identifier)
Term Dates
From: 9-16-16 **To:** 10-16-16
Approved: *[Signature]*

Iridium Satellite LLC
Call Sign E960131
File Number SES-STA-20160804-00719

Iridium Satellite is granted Special Temporary Authority (STA), for a period of 30 days commencing September 16, 2016, to provide LEOP service to the Iridium NEXT NGSO satellites and to operate at a U.S. licensed authorize gateway earth station located in Tempe, AZ in the 29.1-29.3 GHz Earth-to-Space frequency band and the 19.4-19.6 GHz Space-to-Earth frequency band. The STA operations must comply with all operational parameters described in Iridium's request for STA. The STA operation subjects to the following conditions:

- Operations shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference.
- Grant of this STA is without prejudice to any determination that the Commission may make regarding other pending or future applications.
- Any action taken or expense incurred as a result of operations pursuant to this STA is solely at the applicant's risk.
- This action is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. §0.261, and is effective immediately.



File # SES-STA-20160804-00719
Call Sign _____ Grant Date 9-9-16
(or other identifier)
Term Dates
From: 9-16-16 To: 10-16-16
Approved: Paul E. Hines

2. Contact	
Name:	Joseph A. Godles Esq.
Company:	Goldberg, Godles, Wiener & Wright LLP
Street:	1229 Nineteenth St. N.W.
City:	Washington
Country:	USA
Attention:	
Phone Number:	202-429-4900
Fax Number:	202-429-4912
E-Mail:	jgodles@g2w2.com
State:	DC
Zipcode:	20036
Relationship:	Legal Counsel
(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)	
3. Reference File Number or Submission ID	
4a. Is a fee submitted with this application?	
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).	
<input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee	
<input type="radio"/> Other (please explain):	
4b. Fee Classification CGX - Fixed Satellite Transmit/Receive Earth Station	
5. Type Request	
<input checked="" type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input type="radio"/> Other	
6. Requested Use Prior Date	

7. City Tempe	8. Latitude (dd mm ss.s h) 33 20 32.2 N
9. State AZ	10. Longitude (dd mm ss.s h) 111 53 48.5 W
11. Please supply any need attachments. Attachment 1: STA Request Attachment 2: FQ Coord 28GHz Attachment 3: Final Coordination	
12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.) <div style="border: 1px solid black; padding: 5px;">Iridium Satellite LLC ('Iridium') pursuant to 47 CFR ss 25.120, hereby requests special temporary authority ('STA') to operate its gateway earth station E960131 in Tempe, AZ in the manner described herein during the launch and early operations phase ('LEOP') of the Iridium NEXT constellation of satellites.</div>	
13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application"; for these purposes. Yes <input checked="" type="radio"/> No <input type="radio"/>	
14. Name of Person Signing Maureen C. McLaughlin	15. Title of Person Signing Vice President, Public Policy
WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).	

FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT

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THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

Iridium Satellite LLC and Iridium Constellation LLC (collectively, "Iridium"), pursuant to Section 25.120 of the Commission's Rules, hereby request special temporary authority ("STA") to operate their gateway earth stations located in Tempe, Arizona; Chandler, Arizona; and Fairbanks, Alaska, in the manner identified below.¹ Iridium seeks STAs for 30 days commencing on September 16, 2016.²

These gateway earth stations transmit and receive the feeder links and tracking, telemetry, and command ("TT&C") links for Iridium's non-geostationary satellite orbit, mobile satellite service constellation (call sign : S 2110). The STAs requested herein are needed for Iridium to satisfy system requirements for TT&C during the launch and early operation phase ("LEOP") of Iridium's next generation system, which is known as Iridium NEXT.

The Iridium NEXT telecommand signals are transmitted on two carriers, a 29.102 GHz carrier and a 29.298 GHz carrier, using a bandwidth of 1 MHz and a 1M00F9D emission designator. Iridium seeks STAs authorizing it to transmit these carriers at 69.1 dBW EIRP and a 69.1 dBW/MHz EIRP density with a transmitter power of 11.7 dBW.

Iridium also seeks authority to operate both Iridium NEXT uplink carriers from its gateway earth station in Chandler, Arizona. Iridium's license for Chandler includes the 29.1-29.25 GHz portion of Iridium's feeder link band that encompasses the 29.102 GHz Iridium NEXT TT&C frequency, but does not include the 29.25-29.3 GHz portion of Iridium's feeder link band that encompasses the 29.298 GHz Iridium NEXT TT&C frequency.

In addition, Iridium seeks authority to use its Tempe, Chandler, and Fairbanks gateway earth stations to receive 13 Iridium NEXT telemetry carriers spaced at 400 kHz with center frequencies from 19400.2 to 19405 MHz. The emission designator for these telemetry carriers is 200KF9D.

Iridium's request for STAs is supported by good cause. TT&C transmissions are essential to the implementation, health and safety of Iridium's constellation, and the authority requested in this filing is needed to implement its TT&C links and provide coverage from all essential facilities. Ensuring the deployment, implementation, health and safety of Iridium's constellation is unquestionably in the public interest.

¹ The call signs for these gateway earth stations are E050282, E060300, E960131, and E960244. The licensee of the first three call signs is Iridium Satellite LLC. The licensee of the fourth call sign is Iridium Constellation LLC. This exhibit accompanies separate STA requests that Iridium is filing for each call sign.

² The initial launch of Iridium NEXT space stations is scheduled for September 19, 2016, which is on a Monday. Out of an abundance of caution, Iridium is requesting that the term of its STAs commence on the preceding Friday.

Operating in the manner requested in this filing, moreover, presents no concerns of interference to the LMDS stations, Fixed Service stations, and Fixed-Satellite Service stations that share Iridium's TT&C/feeder link band.

LMDS stations. Iridium shares the 29.1-29.25 GHz portion of its uplink TT&C/feeder link band with LMDS. Iridium has coordinated its proposed uplink operations with LMDS licensees; coordination reports prepared by Comsearch are attached.

Fixed Service stations. Iridium shares its 19.4-19.6 GHz downlink TT&C/feeder link band with the Fixed Service. Iridium has coordinated its proposed downlink operations with Fixed Service licensees. Coordination reports prepared by Comsearch concerning those operations are attached.³

Geostationary Satellite Orbit ("GSO") Fixed-Satellite Service ("FSS") stations. The 29.25-29.3 GHz band Iridium uses to uplink its feeder link and TT&C transmissions is shared on a co-primary basis with GSO FSS stations. Iridium's Tempe and Fairbanks gateway earth stations have been operating on these frequencies for years.⁴

In order to avoid interference to Iridium's satellites, GSO FSS earth stations operate in the 29.25-29.3 GHz band only in areas that are widely separated from Iridium's gateway earth stations. There are fixed separations in the case of individually-licensed GSO FSS earth stations and exclusion zones around Iridium gateway earth stations in the case of blanket-licensed GSO FSS earth stations.

The separation distances required to avoid interference from GSO FSS earth stations to Iridium's satellites are far greater than the separation distances that are required to avoid interference from Iridium gateway earth stations to GSO FSS satellites. The locations at which GSO FSS stations transmit in the 29.25-29.3 GHz band, therefore, of necessity are locations that protect GSO FSS satellites against interference from Iridium gateway earth stations. In any event, the Iridium NEXT LEOP operations pursuant to the requested STAs will be on a secondary, unprotected, non-interference basis.

Conclusion

Accordingly, and for good cause shown, Iridium respectfully asks that its STA requests be granted.

³ Please note that the coordinates shown for Iridium's gateway earth stations in the Comsearch reports all are based on NAD83. The coordinates shown in the FCC license for Iridium's Chandler gateway earth stations are based on NAD27, and Comsearch converted the coordinates to NAD83.

⁴ Although Iridium's Chandler earth station has not been operating in the 29.25-29.3 GHz band, it is located only 8.5 km (*i.e.*, 5.3 miles) from Iridium's Tempe earth station, which has been operating in the 29.25-29.3 GHz band.

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Iridium Constellation LLC
TEMPE, AZ
(E960131)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
July 28, 2016

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1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

Company

Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT

No other carriers reported potential interference cases.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 06/23/2016.

Company

AT&T Corp.
AT&T Mobility Spectrum LLC - Arizona
Affiniti LLC
Agua Fria Unified School District
Alltel Comm Southwest Holdings Inc.
American Medical Response, Inc.
Arizona Board of Regents Arizona St Univ
Arizona Board of Regents Univ of Arizona
Arizona State University - Tempe
Avondale Police Department
BNCCORP INC.
Banner Health
Bluewire LLC
Camp Verde Fire District
Casa Grande Union HS Distrist
Central Yavapai Fire District
City of Avondale
City of Casa Grande
City of Glendale Water Services Wireless
City of Surprise
City of Tucson IT Department
Clearwire Spectrum Holdings III, LLC
Commnet Four Corners, LLC
Conterra Ultra Broadband, LLC
Coppernet Systems, Inc.
Creative Airtime Services
DW Holdings, LLC
Deer Valley Unified School District
Dysart Unified School District
EVDI Medical Imaging, LLC
El Paso Natural Gas Company, LLC
FibAire Communications, LLC
Gila River Cellular General Partnership
Global Telecom & Technology Americas
Global Telecom & Technology Americas, In
Golder Ranch Fire District
GovNET Licenses LLC
Gutierrez-Palmenberg, Inc.
J.O. Combs Elementary School District
Littleton Unified School District

Maricopa County Wireless Systems
Mesa, City of
NW Communications of Phoenix, Inc.
New Cingular Wireless PCS LLC - AZ
Next Level Solutions
Nextel License Holdings 4 Inc.
Nextlink Wireless, LLC
North West Fire District
Paradise Valley Unified School District
Pendergast School District #92
Peoria, City of
Phoenix, City of
Prescott Valley, Town of
Qwest Corporation
Rio Verde Wireless, LLC
SWWG, LLC
Saddleback Communications
Scottsdale Medical Imaging
Scottsdale, City of
Shamrock Foods Company
Silver Bell Mining LLC
Simply Bits, LLC
Skyview Networks
Spanish Independent Broadcast Network
Sparkplug Southwest, LLC
SpeedConnect, LLC
Sprint PCS
Sprint Spectrum L.P.
Sprint Spectrum LP DBA Sprint PCS
Sun City West Fire District
Sun Health Corporation
T-Mobile License LLC
Telink Networks SW, LLC
Tempe Union High School District #213
Tempe, City of
Town of Florence
Town of Gilbert, AZ
Treach, James E
Union Pacific Railroad Company
Univision Radio License Corporation
Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT
Western Broadband, LLC
Western WiMax, LLC
XO Communications, LLC

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Date: 07/28/2016
Job Number: 160623COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E960131
Licensee Code IRICON
Licensee Name Iridium Constellation LLC

Site Information

Venue Name **TEMPE, AZ**
Latitude (NAD 83) 33° 20' 32.2" N
Longitude (NAD 83) 111° 53' 48.5" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 362.7 m / 1190.0 ft

Link Information

Satellite Type Low Earth Orbit
Mode TR - Transmit-Receive
Modulation Digital
Minimum Elevation Angle 5.0°
Azimuth Range 0.0° to 360°
Antenna Centerline (AGL) 4.88 m / 16.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	Scientific-Atlanta	Scientific-Atlanta
Model	3.0 meter	3.0 meter
Gain / Diameter	54.0 dBi / 3.0 m	57.4 dBi / 3.0 m
3-dB / 15-dB Beamwidth	0.40° / 0.70°	0.24° / 0.45°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)	(1) -12.3 (2) -23.7 11.7 0.3
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)	45.1 33.7 69.1 57.7
Interference Objectives:	Long Term -156.0 dBW/MHz 20% Short Term -150.2 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)	200KF9D / 19400.2 - 19405.0 14M0G7W / 19400.0 - 19600.0	(1) 1M00F9D / 29102.0 (1) 1M00F9D / 29298.0 (2) 14M0G7W / 29100.0 - 29300.0
Max Great Circle Coordination Distance	142.1 km / 88.3 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)726-5500 <http://www.comsearch.com>

Coordination Values

TEMPE, AZ

Licensee Name	Iridium Constellation LLC		
Latitude (NAD 83)	33° 20' 32.2" N		
Longitude (NAD 83)	111° 53' 48.5" W		
Ground Elevation (AMSL)	362.7 m / 1190.0 ft		
Antenna Centerline (AGL)	4.88 m / 16.0 ft		
Antenna Model	Scientific-Atlanta 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	-150.2 dBW/MHz 0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-23.7 (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	78.82	2.60	142.10	11.50	100.00
5	0.00	74.36	2.60	142.10	11.50	100.00
10	0.00	69.92	2.60	142.10	11.50	100.00
15	0.00	65.51	2.60	142.10	11.50	100.00
20	0.00	61.15	2.60	142.10	11.50	100.00
25	0.00	56.86	2.60	142.10	11.50	100.00
30	0.00	52.64	2.60	142.10	11.50	100.00
35	0.00	48.52	2.60	142.10	11.50	100.00
40	0.00	44.53	2.60	142.10	11.50	100.00
45	0.00	40.72	2.60	142.10	11.50	100.00
50	0.00	37.14	2.60	142.10	11.50	100.00
55	0.00	33.87	2.60	142.10	11.50	100.00
60	0.00	30.99	2.60	142.10	11.50	100.00
65	0.00	28.65	2.60	142.10	11.50	100.00
70	0.00	26.97	2.60	142.10	11.50	100.00
75	0.00	26.08	2.60	142.10	11.50	100.00
80	0.00	26.08	2.60	142.10	11.50	100.00
85	0.00	26.95	2.60	142.10	11.50	100.00
90	0.00	28.61	2.60	142.10	11.50	100.00
95	0.00	30.95	2.60	142.10	11.50	100.00
100	0.00	33.81	2.60	142.10	11.50	100.00
105	0.00	37.08	2.60	142.10	11.50	100.00
110	0.00	40.66	2.60	142.10	11.50	100.00
115	0.00	44.46	2.60	142.10	11.50	100.00
120	0.00	48.45	2.60	142.10	11.50	100.00
125	0.00	52.56	2.60	142.10	11.50	100.00
130	0.00	56.78	2.60	142.10	11.50	100.00
135	0.00	61.08	2.60	142.10	11.50	100.00
140	0.00	65.43	2.60	142.10	11.50	100.00
145	0.00	69.84	2.60	142.10	11.50	100.00
150	0.00	74.28	2.60	142.10	11.50	100.00
155	0.00	78.74	2.60	142.10	11.50	100.00
160	0.00	83.22	2.60	142.10	11.50	100.00
165	0.00	87.71	2.60	142.10	11.50	100.00
170	0.00	92.21	2.60	142.10	11.50	100.00
175	0.00	96.70	2.60	142.10	11.50	100.00
180	0.00	101.18	2.60	142.10	11.50	100.00
185	0.00	105.64	2.60	142.10	11.50	100.00

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values

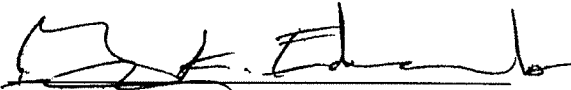
TEMPE, AZ

Licensee Name	Iridium Constellation LLC				
Latitude (NAD 83)	33° 20' 32.2" N				
Longitude (NAD 83)	111° 53' 48.5" W				
Ground Elevation (AMSL)	362.7 m / 1190.0 ft				
Antenna Centerline (AGL)	4.88 m / 16.0 ft				
Antenna Model	Scientific-Atlanta 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	-150.2 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power	-23.7 (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	110.08	2.60	142.10	11.50	100.00
195	0.00	114.49	2.60	142.10	11.50	100.00
200	0.00	118.85	2.60	142.10	11.50	100.00
205	0.00	123.14	2.60	142.10	11.50	100.00
210	0.00	127.36	2.60	142.10	11.50	100.00
215	0.00	131.48	2.60	142.10	11.50	100.00
220	0.00	135.47	2.60	142.10	11.50	100.00
225	0.00	139.28	2.60	142.10	11.50	100.00
230	0.00	142.86	2.60	142.10	11.50	100.00
235	0.00	146.13	2.60	142.10	11.50	100.00
240	0.00	149.01	2.60	142.10	11.50	100.00
245	0.00	151.35	2.60	142.10	11.50	100.00
250	0.00	153.03	2.60	142.10	11.50	100.00
255	0.00	153.92	2.60	142.10	11.50	100.00
260	0.00	153.92	2.60	142.10	11.50	100.00
265	0.00	153.05	2.60	142.10	11.50	100.00
270	0.00	151.39	2.60	142.10	11.50	100.00
275	0.00	149.05	2.60	142.10	11.50	100.00
280	0.00	146.19	2.60	142.10	11.50	100.00
285	0.24	142.76	2.60	142.10	11.50	100.00
290	0.23	139.21	2.60	142.10	11.50	100.00
295	0.00	135.54	2.60	142.10	11.50	100.00
300	0.00	131.55	2.60	142.10	11.50	100.00
305	0.00	127.44	2.60	142.10	11.50	100.00
310	0.00	123.22	2.60	142.10	11.50	100.00
315	0.00	118.92	2.60	142.10	11.50	100.00
320	0.00	114.57	2.60	142.10	11.50	100.00
325	0.00	110.16	2.60	142.10	11.50	100.00
330	0.00	105.73	2.60	142.10	11.50	100.00
335	0.00	101.26	2.60	142.10	11.50	100.00
340	0.00	96.78	2.60	142.10	11.50	100.00
345	0.00	92.29	2.60	142.10	11.50	100.00
350	0.00	87.79	2.60	142.10	11.50	100.00
355	0.00	83.30	2.60	142.10	11.50	100.00

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: July 28, 2016

Ka-Band Earth Station – Tempe, AZ

Frequency Coordination Report

28 GHz



Prepared on Behalf of
Iridium Constellation LLC

July 27, 2016





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1. Summary of Results

On behalf of Iridium Constellation, Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their existing Ka-Band earth station in Tempe, Arizona, 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 July 27, 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 non-interference basis in relation to primary LMDS Block A operations. A contact at Iridium Constellation has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Tempe, Arizona was prior-coordinated by Comsearch. A notification letter and datasheets for this earth station were sent to the following 28 GHz common carrier fixed microwave licensee on June 21, 2016. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Frontier	Continental US

A notification letter and datasheet for the Ka-Band earth station in Tempe, Arizona were also sent to the following 28 GHz local television transmission licensee on June 21, 2016. 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 29.1 – 29.3 GHz portion of the Ka-Band.



3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on June 21, 2016. 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	BTA347 ²	Phoenix, AZ
Nextlink / XO ³	BTA347	Phoenix, AZ
Nextlink / XO	BTA447	Tucson, AZ

No objections were received from the LMDS incumbents.

² The Iridium Constellation earth station is located inside BTA347.

³ XO Communications is leasing spectrum from EchoStar in the Phoenix, AZ Basic Trading Area (BTA).



4. Earth Station Coordination Data

This section presents the data pertinent to the Ka-Band earth station in Tempe, Arizona. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.



Iridium Constellation LLC
Ka-Band Earth Station – Tempe, AZ
Frequency Coordination Report
28 GHz

Date: 06/23/2016
 Job Number: 160620COMSGE04

Administrative Information

Status: ENGINEER PROPOSAL
 Call Sign: E960131
 Licensee Code: IRICON
 Licensee Name: Iridium Constellation LLC

Site Information

TEMPE, AZ
 Venue Name:
 Latitude (NAD 83): 33° 20' 32.2" N
 Longitude (NAD 83): 111° 53' 48.5" W
 Climate Zone: A
 Rain Zone: 5
 Ground Elevation (AMSL): 362.7 m / 1190.0 ft

Link Information

Satellite Type: Low Earth Orbit
 Mode: TR - Transmit-Receive
 Modulation: Digital
 Minimum Elevation Angle: 5.0°
 Azimuth Range: 0.0° to 360°
 Antenna Centerline (AGL): 4.88 m / 16.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	Scientific-Atlanta	Scientific-Atlanta
Model	3.0 meter	3.0 meter
Gain / Diameter	54.0 dBi / 3.0 m	57.4 dBi / 3.0 m
3-dB / 15-dB Beamwidth	0.40° / 0.70°	0.24° / 0.45°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)	(1) -12.3 (2) -23.7 11.7 0.3
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)	45.1 33.7 69.1 57.7
Interference Objectives:	Long Term Short Term	-156.0 dBW/MHz 20% -150.2 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)	200KF9D / 19400.2 - 19405.0 14M0G7W / 19400.0 - 19600.0	(1) 1M00F9D / 29102.0 (1) 1M00F9D / 29298.0 (2) 14M0G7W / 29100.0 - 29300.0
Max Great Circle Coordination Distance	142.1 km / 88.3 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi



Iridium Constellation LLC
Ka-Band Earth Station – Tempe, AZ
Frequency Coordination Report
28 GHz

Coordination Values	TEMPE, AZ		
Licensee Name	Iridium Constellation LLC		
Latitude (NAD 83)	33° 20' 32.2" N		
Longitude (NAD 83)	111° 53' 48.5" W		
Ground Elevation (AMSL)	362.7 m / 1190.0 ft		
Antenna Centerline (AGL)	4.88 m / 16.0 ft		
Antenna Model	Scientific-Atlanta 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	-150.2 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power		-12.3 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz		Coordination Distance (km)
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)	
0	0.00	78.82	2.60	142.10	11.50	100.00	
5	0.00	74.36	2.60	142.10	11.50	100.00	
10	0.00	69.92	2.60	142.10	11.50	100.00	
15	0.00	65.51	2.60	142.10	11.50	100.00	
20	0.00	61.15	2.60	142.10	11.50	100.00	
25	0.00	56.86	2.60	142.10	11.50	100.00	
30	0.00	52.64	2.60	142.10	11.50	100.00	
35	0.00	48.52	2.60	142.10	11.50	100.00	
40	0.00	44.53	2.60	142.10	11.50	100.00	
45	0.00	40.72	2.60	142.10	11.50	100.00	
50	0.00	37.14	2.60	142.10	11.50	100.00	
55	0.00	33.87	2.60	142.10	11.50	100.00	
60	0.00	30.99	2.60	142.10	11.50	100.00	
65	0.00	28.65	2.60	142.10	11.50	100.00	
70	0.00	26.97	2.60	142.10	11.50	100.00	
75	0.00	26.08	2.60	142.10	11.50	100.00	
80	0.00	26.08	2.60	142.10	11.50	100.00	
85	0.00	26.95	2.60	142.10	11.50	100.00	
90	0.00	28.61	2.60	142.10	11.50	100.00	
95	0.00	30.95	2.60	142.10	11.50	100.00	
100	0.00	33.81	2.60	142.10	11.50	100.00	
105	0.00	37.08	2.60	142.10	11.50	100.00	
110	0.00	40.66	2.60	142.10	11.50	100.00	
115	0.00	44.46	2.60	142.10	11.50	100.00	
120	0.00	48.45	2.60	142.10	11.50	100.00	
125	0.00	52.56	2.60	142.10	11.50	100.00	
130	0.00	56.78	2.60	142.10	11.50	100.00	
135	0.00	61.08	2.60	142.10	11.50	100.00	
140	0.00	65.43	2.60	142.10	11.50	100.00	
145	0.00	69.84	2.60	142.10	11.50	100.00	
150	0.00	74.28	2.60	142.10	11.50	100.00	
155	0.00	78.74	2.60	142.10	11.50	100.00	
160	0.00	83.22	2.60	142.10	11.50	100.00	
165	0.00	87.71	2.60	142.10	11.50	100.00	
170	0.00	92.21	2.60	142.10	11.50	100.00	
175	0.00	96.70	2.60	142.10	11.50	100.00	
180	0.00	101.18	2.60	142.10	11.50	100.00	
185	0.00	105.64	2.60	142.10	11.50	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
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