

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
STA request for D12 earth station E020241 for 30 day LEOP

1. Applicant

| | | | |
|-------------------|--------------------------|----------------------|-------------------------|
| Name: | DIRECTV Enterprises, LLC | Phone Number: | 301-663-0053 |
| DBA Name: | | Fax Number: | 240-358-0569 |
| Street: | 2230 E. Imperial Hwy | E-Mail: | jwengryniuk@directv.com |
| City: | El Segundo | State: | CA |
| Country: | USA | Zipcode: | 90245 - |
| Attention: | Jack Wengryniuk | | |

With Conditions



File # SES-STA-20091211-01572

Call Sign E020241 Grant Date 12/22/09
(or other identifier)

Term Dates
From Launch To: + 30 days

Approved: Janette R. Spriggs

Attachment

SES-STA-20091211-01572

E020241

Conditions:

- 1) DIRECTV's operations in the 18.3-18.8 GHz band (space-to-Earth) are not entitled to protection from co-primary terrestrial services until the period during which terrestrial Fixed Service stations remain co-primary has expired. 47 C.F.R. § 25.145(g).
- 2) The 17.8 - 20.2 GHz band is shared with U.S. Government space stations and associated earth stations in the Fixed-Satellite Services. Services within the United States over the satellite network of which this is a cooperating earth station are subject to coordination under USS34 and operation of the earth station(s) authorized herein will be subject to any technical constraints resulting from this coordination.

With Conditions



File # SES-STA-20091211-01572
Call Sign E020241 Grant Date 12/23/09
(or other identifier)
Term Dates
From Launch To: + 30 days
Approved: Bernette D. Spurgis

2. Contact

| | | | |
|-------------------|-------------------------|----------------------|---------------------------------|
| Name: | William M. Wiltshire | Phone Number: | 202-730-1350 |
| Company: | Wiltshire & Grannis LLP | Fax Number: | 202-730-1301 |
| Street: | 1200 18th Street, NW | E-Mail: | wwiltshire@wiltshiregrannis.com |
| City: | Washington | State: | DC |
| Country: | USA | Zipcode: | - |
| Attention: | William M. Wiltshire | 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?

If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).

Governmental Entity Noncommercial educational licensee

Other (please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

Use Prior to Grant

Change Station Location

Other

6. Requested Use Prior Date

| | |
|--|--|
| 7. City Canoga Park | 8. Latitude (dd mm ss.s h) 34 15 10.3 N |
| 9. State CA | 10. Longitude (dd mm ss.s h) 118 35 39.1 W |
| 11. Please supply any need attachments. Attachment 1: Radiation Analysis Attachment 2: STA Request Attachment 3: | |
| 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; margin: 10px 0;">DIRECTV Enterprises, LLC requests Special Temporary Authority for up to 30 days to provide launch and early orbit phase services for the DIRECTV 12 satellite from its Canoga Park, California earth station (call sign E020241).</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 | |
| 14. Name of Person Signing James Butterworth | 15. Title of Person Signing Senior Vice President |
| 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). | |

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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

Call Sign: E020241

DIRECTV Enterprises, LLC ("DIRECTV") hereby requests Special Temporary Authority ("STA") for up to 30 days to provide launch and early orbit phase ("LEOP") services for the DIRECTV 12 satellite (call sign S2797), from its Canoga Park, California earth station (call sign E020241). DIRECTV requests that the STA commence upon launch of DIRECTV 12, which is currently scheduled for December 28, 2009.

During LEOP operations with DIRECTV 12, this earth station will operate with the following parameters:

- Telecommand
 - 29255.00 or 29497.00 MHz for command uplinks
 - Emission designator: 1M30F9D
 - Maximum transmit EIRP: 73 dBW¹
 - Maximum EIRP density towards the horizon:² -9.1 dBW/4 kHz
- Telemetry
 - 18302.25 and 18302.75 MHz for telemetry downlinks
 - Emission designator: 106KG9D

The LEOP operations will consist of communicating with the DIRECTV 12 spacecraft at one of two specific frequencies at the band edge as the satellite moves across the sky during initial orbit raising. Operation of the earth station will be carefully coordinated with all operators of satellites that use the same frequencies and are in the LEOP path. All operators of satellites in that path will be provided with an emergency phone number in advance where the licensee can be reached in the event that harmful interference occurs.

The Flight Director for the DIRECTV 12 LEOP mission can be reached on a 24/7 basis at 310-744-9076 during the period of the requested STA.

The requested STA will serve the public interest by supporting the launch of the DIRECTV 12 satellite to geostationary orbit so that it can make productive use of valuable spectrum/orbital resources as soon as possible. Accordingly, DIRECTV respectfully requests that the Commission grant this STA request as expeditiously as possible.

¹ Note that the maximum transmit EIRP capability of this earth station is 89.5 dBW. However, such high transmit power would not be used except to the extent necessary in the event of a spacecraft anomaly. A revised radiation hazard report is included with this STA request.

² Note that the EIRP density towards the horizon assumes a minimum operating elevation angle of 5° for the earth station.

RADIATION HAZARD ANALYSIS 13 meter EARTH STATION

This analysis calculates the non-ionizing radiation levels due to transmission from the earth station. The Office of Engineering and Technology (OET) Bulletin, No. 65 Edition, specifies that the Maximum Permissible Exposure (MPE) limit for persons in a General Population/Uncontrolled environment to non-ionizing radiation is a power density equal to 1 milli-watt per centimeter squared averaged over a thirty minute period, and for a controlled environment is 5 milli-watts per centimetersquared averaged over a six minute period .

The analysis estimates the maximum power density levels in the vicinity of the antenna for six regions: near field; far field; transition zone; near the reflector surface; between the reflector and the ground; and between the sub-reflector and the main reflector.

A brief discussion for each region is given below and the results of the analysis are summarized. The attached table shows the assumptions, formulae and calculations for all cases.

1. NEAR FIELD REGION

The near field (or Fresnel region) is essentially a cylindrical volume with its axis co-incident with the antenna boresight. The base of this volume is the same as the aperture of the antenna. According to OET Bulletin No. 65, its length is equal to the square of the diameter divided by four times the wavelength. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

2. TRANSITION REGION

The transition region between the near field and the far field regions will have a power density that essentially decreases inversely with increasing distance. In any case, the maximum power density in this region will not exceed the maximum value calculated for the near field region, for the purpose of evaluating potential exposure.

3. FAR FIELD REGION

The far field (or Fraunhofer region) extends outwards from a distance equal to 0.6 times the square of the reflector diameter divided by the wavelength, according to OET Bulletin No. 65. Power density varies inversely as the square of the distance. The maximum value of the power density is calculated using the equation given in the Bulletin.

4. REGION BETWEEN THE MAIN REFLECTOR AND SUB-REFLECTOR

Transmissions from the feed assembly are directed toward the sub-reflector surface, and are reflected back toward the main reflector. The most common feed

assemblies are waveguide flanges, horns or sub-reflectors. The energy between the sub-reflector surfaces can be calculated by determining the power density at the sub-reflector surface. This is done by taking four times the power divided by the sub-reflector surface area.

5. REGION NEAR MAIN REFLECTOR SURFACE

The power density in the region near the main reflector surface can be estimated as equal to four times the power divided by the area of the main reflector surface, assuming that the illumination is uniform and that it would be possible to intercept equal amounts of energy radiated towards and reflected from the reflector surface.

6. REGION BETWEEN MAIN REFLECTOR AND GROUND

The power density in the region between the main reflector and the ground can be estimated as equal to the power divided by the area of the reflector surface, assuming uniform illumination over the surface of the reflector.

7. RESULTS OF ANALYSIS

The radiation hazard analyses in the following Table was performed in accordance with the discussion from the previous sections and assuming worst case operating conditions. Based on the analysis contained therein it is concluded that levels of radiation in excess of 1 mW/cm² will not exist in regions normally occupied by the public or the earth station's operating personnel. The transmitter will be turned off during antenna maintenance so that the FCC MPE of 5.0 mW/cm² will be complied with for those regions with close proximity to the reflector that exceed acceptable levels.

RADIATION HAZARD ANALYSIS

| Nomenclature | Formula | Value | Unit |
|---|---------------------------|------------|---------------------|
| INPUT PARAMETERS | | | |
| D = Antenna Diameter | | 13 | meters |
| d = Diameter of Subreflector | | 1.74 | meters |
| P = Max Power into Antenna | | 126 | Watts |
| η = Aperture Efficiency | | 43 | % |
| F = Frequency | | 29497 | MHz |
| λ = Wavelength | $300/F$ | 0.0102 | meters |
| CALCULATED VALUES | | | |
| A = Area of Reflector | $\pi^2 D^2/4$ | 132.73 | meters ² |
| a = Area of Subreflector | $\pi^2 d^2/4$ | 2.38 | meters ² |
| l = Length of Near Field | $D^2/4\lambda$ | 4154.16 | meters |
| L = Beginning of Far Field | $0.6D^2/\lambda$ | 9969.99 | meters |
| G = Antenna Gain @ F (n=100% max value) | $\eta(\pi^2 D/\lambda)^2$ | 6933748.62 | linear |
| Antenna Gain in dB | $10 \cdot \log(G)$ | 68.41 | dbi |

POWER DENSITY CALCULATIONS

| Region | Max Power Density In Region | | Hazard Assessment (FCC MPE Limit=1 mW/cm ²) |
|--|---|-----------------------------|--|
| | Formula | Value (mW/cm ²) | |
| 1. Srf = Max Near Field Power Density | $4 \cdot \eta \cdot P/A$ | 0.16 | <FCC MPE Limit |
| 2. Sff = Max Far Field Power Density | $G \cdot P / (4 \cdot \pi^2 \cdot l^2)$ | 0.07 | <FCC MPE Limit |
| 3. Max Transition Region Power Density | $\leq \text{Nr Fld Region}$ | 0.16 | <FCC MPE Limit |
| 4. Near Main Reflector Surface | $4 \cdot P/A$ | 0.38 | <FCC MPE Limit |
| 5. Between Main Reflector and Subreflector | $4 \cdot P/a$ | 21.20 | >FCC MPE Limit (See Text) |
| 6. Between Main Reflector and Ground | P/A | 0.09 | <FCC MPE Limit |