

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 a 1.8 meter Ku-band fixed transmit/receive earth station.

1. Applicant

Name:	Dome Productions	Phone Number:	416-341-2114
DBA Name:		Fax Number:	416-341-2020
Street:	1 Blue Jays Way Suite 3400	E-Mail:	mejohanson@domeprod.com
City:	Toronto	State:	
Country:		Zipcode:	-
Attention:	Mr Mike E Johnson		




File # SES-STA-20130326-00294
Call Sign _____ Grant Date 4-1-13
(or other identifier)
Term Dates
From 4-1-13 To: 5-1-13
Approved: Paul E. [Signature]

Applicant: Dome Productions
Call Sign: No Call Sign
File No.: SES-STA-20130326-00294
Special Temporary Authority (STA)

Dome Productions is granted STA for 30 days under the following conditions:

1. Transmit and receive earth station operations at Kauffman Stadium, Kansas City, Missouri located at 39° 03' 08.3" NL and 094° 28' 55.0" WL using a 1.8-meter General Dynamics, model C180M, antenna in the conventional Ku-band (downlink frequencies 11.7-12.2 GHz and uplink frequencies 14.0-14.5 GHz) with Galaxy 17 satellite at 91° W.L. is authorized within the operational parameters specified in this application.
2. Operations under this authority are on a non-interference basis only.
3. Operations under this authority are on a non-protected basis only.
4. In the event that there is a report of interference, Dome Productions must immediately terminate transmissions and notify the FCC in writing.
5. Grant of this authorization is without prejudice to any determination that the Commission may make regarding pending or future Dome Productions' application.
6. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Dome Productions' risk.
7. Grant of this authorization is without prejudice to any future FCC enforcement action in connection with any unauthorized operation of radio facilities.
8. 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-20130326-00294
Call Sign (or other identifier)	Grant Date 4-1-13
From 4-1-13	Term Dates To: 5-1-13
Approved: <i>Paul E. Miller</i>	

2. Contact

Name:	Mr Mike E Johnson	Phone Number:	416-341-2114
Company:	Dome Productions	Fax Number:	416-341-2020
Street:	1 Blue Jays Way Suite 3400	E-Mail:	mejohanson@domeprod.com
City:	Toronto	State:	
Country:	Canada	Zipcode:	-
Attention:		Relationship:	

(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
04/12/2013

7. City Kansas City

8. Latitude
(dd mm ss.s h) 39 3 8.3 N

FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT

The public reporting for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the required data, and completing and reviewing the collection of information. If you have any comments on this burden estimate, or how we can improve the collection and reduce the burden it causes you, please write to the Federal Communications Commission, AMD-PERM, Paperwork Reduction Project (3060-0678), Washington, DC 20554. We will also accept your comments regarding the Paperwork Reduction Act aspects of this collection via the Internet if you send them to PRA@fcc.gov. PLEASE DO NOT SEND COMPLETED FORMS TO THIS ADDRESS.

Remember – You are not required to respond to a collection of information sponsored by the Federal government, and the government may not conduct or sponsor this collection, unless it displays a currently valid OMB control number or if we fail to provide you with this notice. This collection has been assigned an OMB control number of 3060-0678.

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.

Analysis of Non-Ionizing Radiation for a 1.8-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 1.8-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	1.8	m
Antenna Surface Area	A _{surface}	$\pi D^2/4$	2.54	m ²
Subreflector Diameter	D _{sr}	Input	19.0	cm
Area of Subreflector	A _{sr}	$\pi D_{sr}^2/4$	283.53	cm ²
Frequency	F	Input	14250	MHz
Wavelength	λ	300 / F	0.021053	m
Transmit Power	P	Input	400.00	W
Antenna Gain (dBi)	G _{as}	Input	45.9	dBi
Antenna Gain (factor)	G	$10^{G_{as}/10}$	38904.5	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.54	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

$$\begin{aligned} \text{Distance to the Far Field Region} \quad R_{ff} &= 0.60 D^2 / \lambda \\ &= 92.3 \text{ m} \end{aligned} \quad (1)$$

The maximum main beam power density in the far field can be determined from the following equation:

$$\begin{aligned} \text{On-Axis Power Density in the Far Field} \quad S_{ff} &= G P / (4 \pi R_{ff}^2) \\ &= 145.235 \text{ W/m}^2 \\ &= 14.523 \text{ mW/cm}^2 \end{aligned} \quad (2)$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Extent of the Near Field} \quad R_{nf} &= D^2 / (4 \lambda) \\ &= 38.5 \text{ m} \end{aligned} \quad (3)$$

The maximum power density in the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Near Field Power Density} \quad S_{nf} &= 16.0 \eta P / (\pi D^2) \\ &= 339.042 \text{ W/m}^2 \\ &= 33.904 \text{ mW/cm}^2 \end{aligned} \quad (4)$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

$$\begin{aligned} \text{Transition Region Power Density} \quad S_t &= S_{nf} R_{nf} / R_t \\ &= 33.904 \text{ mW/cm}^2 \end{aligned} \quad (5)$$

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Subreflector} \quad S_{sr} &= 4000 P / A_{sr} & (6) \\ &= 5643.167 \text{ mW/cm}^2 \end{aligned}$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the subreflector. The area is now the area of the main reflector aperture and can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Main Reflector Surface} \quad S_{\text{surface}} &= 4 P / A_{\text{surface}} & (7) \\ &= 628.760 \text{ W/m}^2 \\ &= 62.876 \text{ mW/cm}^2 \end{aligned}$$

6. Region between the Main Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

$$\begin{aligned} \text{Power Density between Reflector and Ground} \quad S_g &= P / A_{\text{surface}} & (8) \\ &= 157.190 \text{ W/m}^2 \\ &= 15.719 \text{ mW/cm}^2 \end{aligned}$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)	Hazard Assessment
1. Far Field ($R_{rf} = 92.3$ m)	S_{ff} 14.523	Potential Hazard
2. Near Field ($R_{nf} = 38.5$ m)	S_{nf} 33.904	Potential Hazard
3. Transition Region ($R_{nf} < R_f < R_{ff}$)	S_t 33.904	Potential Hazard
4. Between Main Reflector and Subreflector	S_{sr} 5643.167	Potential Hazard
5. Main Reflector	$S_{surface}$ 62.876	Potential Hazard
6. Between Main Reflector and Ground	S_g 15.719	Potential Hazard

Table 5. Summary of Expected Radiation levels for Controlled Environment

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5. Main Reflector	$S_{surface}$ 62.876	Potential Hazard
6. Between Main Reflector and Ground	S_g 15.719	Potential Hazard

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that the FCC MPE guidelines have been exceeded (or met) in the regions of Table 4 and 5. The applicant proposes to comply with the MPE limits by one or more of the following methods.

The applicant proposes to comply with the MPE limits by one or more of the following methods. Radiation hazard signs will be posted while this earth station is in operation. The earth station is located on the Roof of a vehicle with secured access. All individuals having access to the roof will be aware of the Radiation Hazard from the antenna, thus creating a controlled environment. The earth station will be located approximately 12 feet above ground level and since one diameter removed from the center of main beam the levels are down at least 20 dB, or by a factor of 100, public safety will be ensured for the near and far field regions of the Uncontrolled Environment.

Radiation Hazard Report

Exhibit B
Page 5 of 5

The earth station's operational staff will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance.

The applicant agrees to abide by the conditions specified in Condition 5208 provided below:

Condition 5208 - The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for worker.

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE RADIATION HAZARD REPORT, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _____



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

DATED: March 21, 2013

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

Date: 03/21/2013
 Job Number: <PCNJJobCode>

Administrative Information

Status ENGINEER PROPOSAL
 Call Sign <PCNCallSign>
 Licensee Code
 Licensee Name DOME PRODUCTIONS

Site Information KANSAS CITY, MO

Venue Name
 Latitude (NAD 83) 39° 3' 8.3" N
 Longitude (NAD 83) 94° 28' 55.0" W
 Climate Zone A
 Rain Zone 2
 Ground Elevation (AMSL) 268.83 m / 882.0 ft

Link Information

Satellite Type Geostationary
 Mode TR - Transmit-Receive
 Modulation Digital
 Satellite Arc 91° W to 91° West Longitude
 Azimuth Range 174.5° to 174.5°
 Corresponding Elevation Angles 44.6° / 44.6°
 Antenna Centerline (AGL) 3.66 m / 12.0 ft

Antenna Information

Manufacturer Receive - FCC32
 General Dynamics
 Model C180M
 Gain / Diameter 44.7 dBi / 1.8 m
 3-dB / 15-dB Beamwidth 0.93° / 1.95°

Transmit - FCC32
 General Dynamics
 C180M
 45.9 dBi / 1.8 m
 0.83° / 1.74°

Max Available RF Power (dBW/4 KHz)
 (dBW/MHz) -16.5
 7.5

Maximum EIRP (dBW/4 KHz)
 (dBW/MHz) 29.4
 53.4

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
 Emission / Frequency Range (MHz) Receive 12.0 GHz 4M00G7D - 36M0G7D / 11700.0 - 12200.0 Transmit 14.0 GHz 4M00G7D - 36M0G7D / 14000.0 - 14500.0

Max Great Circle Coordination Distance 207.1 km / 128.7 mi
 Precipitation Scatter Contour Radius 100.0 km / 62.1 mi 100.0 km / 62.1 mi

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Licensee Name		DOME PRODUCTIONS	
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Ground Elevation (AMSL)		268.83 m / 882.0 ft	
Antenna Centerline (AGL)		3.66 m / 12.0 ft	
Antenna Model		General Dynamics, 1.8 Meter	
Antenna Mode		Receive 12.0 GHz	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%
	Short Term	-146.0 dBW/MHz	0.01%
Max Available RF Power		Transmit 14.0 GHz	
		-151.0 dBW/4 KHz	20%
		-128.0 dBW/4 KHz	0.0025%
		-16.5 (dBW/4 KHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	7.03	142.05	-10.00	100.00	-10.00	100.00
5	6.35	140.51	-10.00	100.00	-10.00	100.00
10	4.94	137.85	-10.00	100.00	-10.00	100.00
15	4.94	136.11	-10.00	100.00	-10.00	100.00
20	3.82	133.08	-10.00	110.59	-10.00	100.00
25	3.70	130.60	-10.00	112.52	-10.00	100.00
30	3.81	128.01	-10.00	110.84	-10.00	100.00
35	3.71	125.06	-10.00	112.38	-10.00	100.00
40	3.49	121.85	-10.00	116.12	-10.00	100.00
45	2.96	118.36	-10.00	125.35	-10.00	100.00
50	2.76	114.93	-10.00	129.03	-10.00	100.00
55	2.46	111.39	-10.00	133.50	-10.00	100.00
60	2.50	107.90	-10.00	132.59	-10.00	100.00
65	2.11	104.23	-10.00	140.81	-10.00	100.00
70	1.87	100.58	-10.00	147.03	-10.00	100.00
75	1.75	96.94	-10.00	150.36	-10.00	100.00
80	1.53	93.27	-10.00	157.14	-10.00	100.00
85	1.49	89.63	-10.00	158.42	-10.00	100.00
90	1.32	85.99	-10.00	166.56	-10.00	100.00
95	1.30	82.37	-10.00	167.21	-10.00	100.00
100	1.06	78.83	-10.00	175.37	-10.00	100.00
105	1.20	75.26	-10.00	170.75	-10.00	100.00
110	1.38	71.72	-10.00	162.13	-10.00	100.00
115	1.49	68.26	-10.00	158.44	-10.00	100.00
120	1.20	65.06	-10.00	170.75	-10.00	100.00
125	1.19	61.86	-10.00	171.08	-10.00	100.00
130	0.95	58.94	-10.00	179.73	-10.00	100.00
135	0.69	56.25	-10.00	193.46	-10.00	100.00
140	0.58	53.68	-10.00	199.00	-10.00	100.00
145	0.54	51.31	-10.00	200.78	-10.00	100.00
150	0.51	49.22	-10.00	202.56	-10.00	100.00
155	0.46	47.46	-9.91	204.09	-9.91	100.00
160	0.48	46.01	-9.57	203.72	-9.57	100.00
165	1.14	44.32	-9.17	176.58	-9.17	100.00
170	1.14	43.69	-9.01	177.31	-9.01	100.00
175	2.76	41.88	-8.55	133.13	-8.55	100.00
180	2.80	42.13	-8.62	132.10	-8.62	100.00
185	2.80	42.90	-8.81	131.35	-8.81	100.00

COMSEARCH

Earth Station Data Sheet

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Antenna Model	General Dynamics, 1.8 Meter	
Antenna Mode	Receive 12.0 GHz	
Interference Objectives:	Long Term	20%
	Short Term	0.01%
Max Available RF Power	Receive 12.0 GHz	Transmit 14.0 GHz
	-156.0 dBW/MHz	-151.0 dBW/4 KHz
	-146.0 dBW/MHz	-128.0 dBW/4 KHz
		0.0025%
		-16.5 (dBW/4 KHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.71	45.13	-9.36	154.66	-9.36	100.00
195	1.71	46.71	-9.73	152.91	-9.73	100.00
200	0.46	49.67	-10.00	203.57	-10.00	100.00
205	0.42	51.87	-10.00	207.13	-10.00	100.00
210	0.58	54.20	-10.00	198.90	-10.00	100.00
215	0.55	56.90	-10.00	200.22	-10.00	100.00
220	0.58	59.77	-10.00	198.95	-10.00	100.00
225	0.77	62.71	-10.00	189.09	-10.00	100.00
230	0.77	65.91	-10.00	189.09	-10.00	100.00
235	1.48	68.96	-10.00	158.73	-10.00	100.00
240	2.40	72.13	-10.00	134.71	-10.00	100.00
245	2.40	75.70	-10.00	134.71	-10.00	100.00
250	2.40	79.33	-10.00	134.71	-10.00	100.00
255	3.41	82.88	-10.00	117.52	-10.00	100.00
260	3.41	86.63	-10.00	117.51	-10.00	100.00
265	3.41	90.39	-10.00	117.51	-10.00	100.00
270	4.13	94.19	-10.00	106.00	-10.00	100.00
275	4.14	97.97	-10.00	105.99	-10.00	100.00
280	4.74	101.84	-10.00	100.00	-10.00	100.00
285	4.74	105.59	-10.00	100.00	-10.00	100.00
290	4.74	109.29	-10.00	100.00	-10.00	100.00
295	5.51	113.19	-10.00	100.00	-10.00	100.00
300	5.50	116.78	-10.00	100.00	-10.00	100.00
305	4.74	119.89	-10.00	100.00	-10.00	100.00
310	5.63	123.66	-10.00	100.00	-10.00	100.00
315	5.63	126.85	-10.00	100.00	-10.00	100.00
320	5.10	129.47	-10.00	100.00	-10.00	100.00
325	6.35	133.09	-10.00	100.00	-10.00	100.00
330	6.55	135.74	-10.00	100.00	-10.00	100.00
335	6.55	137.90	-10.00	100.00	-10.00	100.00
340	6.55	139.64	-10.00	100.00	-10.00	100.00
345	7.03	141.38	-10.00	100.00	-10.00	100.00
350	7.03	142.16	-10.00	100.00	-10.00	100.00
355	7.03	142.39	-10.00	100.00	-10.00	100.00