COMSEARCH

Electronic Filing

January 14, 2003

FEDERAL COMMUNICATIONS COMMISSION
Experimental Radio Service
P.O. Box 358320
Pittsburgh, PA 15251-5320

Dear Sir or Madam:

This letter is to request an extension of the Special Temporary Authority (STA) granted to Alcatel USA Marketing Inc. (File # 0331-EX-ST-2002). This STA was allow Alcatel to operate a transmitter in certain selected bands between 11.7 GHz to 12.2 GHz, and 14.0 to 14.5 in Plano (Collin County), Texas, and Miami (Dade County), Florida, as described below. In accordance with 47 CFR chapter 1, (10-1-00 edition), section 5.61, the attached Exhibit A – System Description is being provided to support the application.

Alcatel USA is planning a DVB-RCS platform to be used for a satellite 2-way broadband access demonstrations to customers for a limited period of time. Demonstrations will run from January 17, 2003, 2002 until June 16, 2002. Since all the original STA is due to expire on January 16, 2003, Comsearch respectfully requests the FCC to expedite the approval of this STA request. The attached exhibit contains information on the operation of these satellite links and is identical with regards the technical operations to the exhibit provided with the original STA request. If you have any questions please call.

Sincerely,
COMSEARCH

Kenneth G. Ryan
Director, Spectrum Management Services
(703) 726-5685
kryan@comsearch.com

Exhibit A– System Description

A.1 - Name, address, phone number of the applicant.

Alcatel USA Marketing, Inc..
Attn: Ravi Chari
660 Data Drive
Plano, Texas 75075
Voice: (972) 477-2573
Email: ravi.chari@alcatel.com

A.2 - Description of why a Special Temporary Authority (STA) is needed.

Alcatel USA Marketing Inc., of Plano, Texas, is developing a project to test a DVB-RCS platform out of Montreal, Canada, into their Plano, Texas and Miami, Florida sites where terminals are located. This platform is to be used for a limited time, for a satellite 2-way broadband access demonstration to customers.

The reason for the STA request is to perform outdoor demonstrations between the hub location in Montreal, Canada and selected terminals in Plano, Texas and Miami, Florida.

A.3 Description of the operation to be conducted and its purpose

Alcatel will perform real-time satellite link testing of their DVB equipment using a hub earth station located in Montreal, Canada and two US based transmit-receive VSATs, located in Plano, TX and Miami, Fl.

The points of contact for each transmitting site are as follows:

Plano, Texas Site

Ravi Chari
Alcatel USA Marketing, Inc.
660 Data Drive
Plano, Texas 75075
Voice: (972) 477-2573
Email: ravi.chari@alcatel.com

Miami, Florida Site

Olivier Badard
Alcatel USA Marketing, Inc.
Andesat
7065 NW 52nd Street
Miami, Florida 33166
Voice: (305) 569-1440
Email: olivier.badard@space.alcatel.fr

A.4 Time and dates of proposed operation.

There will be demonstration sessions, from the Plano and Miami locations. It is anticipated that tests will be run during business hours and on weekends during daylight, beginning around January 16, 2003, and extending until about June 16, 2003.

A.5 Class of station

The transmitters, in both Miami and Plano, will be fixed all of the time.

A.6 Description of the location and, if applicable, geographic coordinates of the proposed operation.

All transmit signals will be from rooftop locations at the Plano, Texas (Coordinates: 33° – 00' - 32.5"North Latitude and 96° – 45' – 26.9" West Longitude), and Miami, Florida (Coordinates $25^{O\ 9}$04' 15.4" North Latitude and $80^{O\ -}$ 18' - 43.5" West Longitude) sites.

A.7 Equipment to be used, including name of manufacturer, model and number of units.

The VSATs will use a Channel Master 1.2 meter antenna, model # 123, and 2 watt RFT transmitting at 1.8 watts. The 1.2 meter antenna gain is 43.3 dBi, the maximum EIRP out of both transmitting locations is 45.9 dBW. Both Miami and Plano will have same VSAT configurations.

A.8 Frequencies Desired

The tests will be performed in the US domestic FSS Ku-band. Transmissions will be between 14,000 and 14,500 MHz and reception will be between 11,700 and 12,200 MHz.

A.9 Maximum effective radiated power (ERP) or equivalent isotropically radiated power (EIRP)

A transmit antennas in Plano, Texas and Miami, Florida are Channel Master 1.2 meter earth stations (Model 123), with a gain of 43.3 dBi (at 14.25 GHz). The high powered amplifier is rated for 2 watts maximum. The maximum total EIRP at the feed flange of the earth stations will be 45.9 DBW, or a total RF power of 1.82 Watts.

A.10 Emission designator and description of emission (bandwidth, modulation, etc.)

The VSAT return link transmission is digital data at 210 ksps in an allocated bandwidth of 360 kHz. The received emission is a digital DVB signal at 7373 kbps in an allocated bandwidth of 11 MHz.

A.11 Overall height of antenna structure above the ground

Both the Plano and Miami transmitters will be roof mounted no higher than 6’ above roof top level.

EXHIBIT B Miami, Fl Site Data

SATELLITE EARTH STATION
09/04/2002

Company	ALCATEL USA	
Earth Station Name, State		MIAMI, FL
Latitude (DMS) (NAD83)		25 49 15.4 N
Longitude (DMS) (NAD83)		80 18 43.5 W
Ground Elevation AMSL (Ft/m)		5.02 / 1.53
Antenna Centerline AGL (Ft/m)		50.00 / 15.24
Receive Antenna Type:	FCC32	FCC Reference 32-25LOG(THETA)
12.0 GHz Gain (dBi) / Diameter (m)		41.8 / 1.2
3 dB / 15 dB Half Beamwidth		0.75 / 1.50
Transmit Antenna Type:	FCC32	FCC Reference 32-25LOG(THETA)
14.0 GHz Gain (dBi) / Diameter (m)		43.3 / 1.2
3 dB / 15 dB Half Beamwidth		0.60 / 1.20
Operating Mode		TRANSMIT AND RECEIVE
Modulation		DIGITAL
Emission / Receive Band (MHz)		11M0G7D / 11700.0000 - 12200.0000
Emission / Transmit Band (MHz)		360KG7D / 14000.0000 - 14500.0000
Max. Available RF Power	(dBW)/4 kHz)	-16.00
	(dBW)/MHz)	8.00
Max. EIRP	(dBW)/4 kHz)	27.30
	(dBW)/MHz)	51.30
	(dBW)	45.90
Max permissible Interference Power		
12.0 GHz, 20% (dBW/1 MHz)		-165.0
12.0 GHz, 0.0100% (dBW/1 MHz)		-155.0
14.0 GHz, 20% (dBW/4 kHz)		-151.0
14.0 GHz, 0.0025% (dBW/4 kHz)		-128.0
Range of Satellite Arc (Geostationary)		
Degrees Longitude		123.0 W / 123.0 W
Azimuth Range (Min/Max)		244.7 / 244.7
Corresponding Elevation Angles		34.2 / 34.2
Radio Climate		B
Rain Zone		1
Max Great Circle Coordination Distance (Mi/Km)		
12.0 GHz		261.1 / 420.2
14.0 GHz		81.1 / 130.5
Precipitation Scatter Contour Radius (Mi/Km)		
12.0 GHz		337.3 / 542.9
14.0 GHz		62.1 / 100.0

Note: Horizon is less than 0.2 degrees at all azimuths

Table of Earth Station Coordination Values
09/04/2002

Earth Station Name MIAMI FL
Owner ALCATEL USA
Latitude (DMS) (NAD83) 25 49 15.4 N
Longitude (DMS) (NAD83) 80 18 43.5 W
Ground Elevation (Ft/m) 5.02 / 1.53 AMSL
Antenna Centerline (Ft/m) 50.00 / 15.24 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Receive -165.0 (dBW /1 MHz)
Transmit -151.0 (dBW /4 kHz) TX Power -16.0 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	12.0 GHz Antenna Gain (dBi)	12.0 GHz Coordination Distance (Km)	14.0 GHz Antenna Gain (dBi)	14.0 GHz Coordination Distance (Km)
0	0.00	110.67	-10.00	381.6	-10.00	118.7
5	0.00	114.63	-10.00	381.6	-10.00	118.7
10	0.00	118.52	-10.00	381.6	-10.00	118.7
15	0.00	122.31	-10.00	381.6	-10.00	118.7
20	0.00	125.97	-10.00	381.6	-10.00	118.7
25	0.00	129.48	-10.00	381.6	-10.00	118.7
30	0.00	132.80	-10.00	381.6	-10.00	118.7
35	0.00	135.88	-10.00	381.6	-10.00	118.7
40	0.00	138.67	-10.00	381.6	-10.00	118.7
45	0.00	141.09	-10.00	381.6	-10.00	118.7
50	0.00	143.08	-10.00	381.6	-10.00	118.7
55	0.00	144.56	-10.00	381.6	-10.00	118.7
60	0.00	145.47	-10.00	381.6	-10.00	118.7
65	0.00	145.75	-10.00	381.6	-10.00	118.7
70	0.00	145.40	-10.00	381.6	-10.00	118.7
75	0.00	144.43	-10.00	381.6	-10.00	118.7
80	0.00	142.88	-10.00	381.6	-10.00	118.7
85	0.00	140.84	-10.00	381.6	-10.00	118.7
90	0.00	138.37	-10.00	381.6	-10.00	118.7
95	0.00	135.55	-10.00	381.6	-10.00	118.7
100	0.00	132.44	-10.00	381.6	-10.00	118.7
105	0.00	129.10	-10.00	381.6	-10.00	118.7
110	0.00	125.57	-10.00	381.6	-10.00	118.7
115	0.00	121.89	-10.00	381.6	-10.00	118.7
120	0.00	118.09	-10.00	381.6	-10.00	118.7
125	0.00	114.19	-10.00	381.6	-10.00	118.7
130	0.00	110.22	-10.00	381.6	-10.00	118.7
135	0.00	106.20	-10.00	381.6	-10.00	118.7
140	0.00	102.13	-10.00	381.6	-10.00	118.7
145	0.00	98.02	-10.00	381.6	-10.00	118.7
150	0.00	93.90	-10.00	381.6	-10.00	118.7
155	0.00	89.77	-10.00	381.6	-10.00	118.7
160	0.00	85.64	-10.00	381.6	-10.00	118.7
165	0.00	81.52	-10.00	381.6	-10.00	118.7
170	0.00	77.42	-10.00	381.6	-10.00	118.7
175	0.00	73.35	-10.00	381.6	-10.00	118.7
180	0.00	69.33	-10.00	381.6	-10.00	118.7

Table of Earth Station Coordination Values
09/04/2002

Earth Station Name MIAMI FL
Owner ALCATEL USA
Latitude (DMS) (NAD83) 25 49 15.4 N
Longitude (DMS) (NAD83) 80 18 43.5 W
Ground Elevation (Ft/m) 5.02 / 1.53 AMSL
Antenna Centerline (Ft/m) 50.00 / 15.24 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Receive -165.0 (dBW /1 MHz)
Transmit -151.0 (dBW /4 kHz) TX Power -16.0 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	12.0 GHz Antenna Gain (dBi)	12.0 GHz Coordination Distance (Km)	14.0 GHz Antenna Gain (dBi)	14.0 GHz Coordination Distance (Km)
185	0.00	65.37	-10.00	381.6	-10.00	118.7
190	0.00	61.48	-10.00	381.6	-10.00	118.7
195	0.00	57.70	-10.00	381.6	-10.00	118.7
200	0.00	54.03	-10.00	381.6	-10.00	118.7
205	0.00	50.52	-10.00	381.6	-10.00	118.7
210	0.00	47.20	-9.85	383.1	-9.85	119.2
215	0.00	44.12	-9.12	390.7	-9.12	121.5
220	0.00	41.33	-8.41	398.1	-8.41	123.8
225	0.00	38.91	-7.75	405.1	-7.75	125.9
230	0.00	36.92	-7.18	411.2	-7.18	127.7
235	0.00	35.44	-6.74	416.1	-6.74	129.2
240	0.00	34.53	-6.46	419.2	-6.46	130.2
245	0.00	34.25	-6.37	420.2	-6.37	130.5
250	0.00	34.60	-6.48	418.9	-6.48	130.1
255	0.00	35.57	-6.78	415.6	-6.78	129.1
260	0.00	37.12	-7.24	410.6	-7.24	127.6
265	0.00	39.16	-7.82	404.3	-7.82	125.7
270	0.00	41.63	-8.48	397.3	-8.48	123.5
275	0.00	44.45	-9.20	389.8	-9.20	121.2
280	0.00	47.56	-9.93	382.3	-9.93	118.9
285	0.00	50.90	-10.00	381.6	-10.00	118.7
290	0.00	54.43	-10.00	381.6	-10.00	118.7
295	0.00	58.11	-10.00	381.6	-10.00	118.7
300	0.00	61.91	-10.00	381.6	-10.00	118.7
305	0.00	65.81	-10.00	381.6	-10.00	118.7
310	0.00	69.78	-10.00	381.6	-10.00	118.7
315	0.00	73.80	-10.00	381.6	-10.00	118.7
320	0.00	77.87	-10.00	381.6	-10.00	118.7
325	0.00	81.98	-10.00	381.6	-10.00	118.7
330	0.00	86.10	-10.00	381.6	-10.00	118.7
335	0.00	90.23	-10.00	381.6	-10.00	118.7
340	0.00	94.36	-10.00	381.6	-10.00	118.7
345	0.00	98.48	-10.00	381.6	-10.00	118.7
350	0.00	102.58	-10.00	381.6	-10.00	118.7
355	0.00	106.65	-10.00	381.6	-10.00	118.7

Earth Station Azimuth and Elevation Table
09/04/2002

Earth Station Name	MIAMI FL	
Owner	ALCATEL USA	
Latitude (DMS) (NAD83)	25 49 15.4 N	
Longitude (DMS) (NAD83)	80 18 43.5 W	
Ground Elevation (Ft/m)	5.02 /	1.53 AMSL
Antenna Centerline (Ft/m)	50.00 /	15.24 AGL
Satellite Arc Range	123.0 W	
	123.0 W	

Satellite Longitude	Azimuth (Degrees)	Elevation (Degrees)	Satellite Name
123.0	244.7	34.2	Galaxy 10R

Exhibit C – Plano, TX Site Data

SATELLITE EARTH STATION
09/04/2002

Company	ALCATEL USA	
Earth Station Name, State		PLANO, TX
Latitude (DMS) (NAD83)		33 0 32.5 N
Longitude (DMS) (NAD83)		96 45 26.9 W
Ground Elevation AMSL (Ft/m)		700.03 / 213.36
Antenna Centerline AGL (Ft/m)		75.00 / 22.86
Receive Antenna Type:	FCC32	FCC Reference 32-25LOG(THETA)
12.0 GHz Gain (dBi) / Diameter (m)		41.8 / 1.2
3 dB / 15 dB Half Beamwidth		0.75 / 1.50
Transmit Antenna Type:	FCC32	FCC Reference 32-25LOG(THETA)
14.0 GHz Gain (dBi) / Diameter (m)		43.3 / 1.2
3 dB / 15 dB Half Beamwidth		0.60 / 1.20
Operating Mode		TRANSMIT AND RECEIVE
Modulation		DIGITAL
Emission / Receive Band (MHz)		11M0G7D / 11700.0000 - 12200.0000
Emission / Transmit Band (MHz)		360KG7D / 14000.0000 - 14500.0000
Max. Available RF Power	(dBW)/4 kHz)	-16.90
	(dBW)/MHz)	7.10
Max. EIRP	(dBW)/4 kHz)	26.40
	(dBW)/MHz)	50.40
	(dBW)	45.90
Max permissible Interference Power		
12.0 GHz, 20% (dBW/1 MHz)		-165.0
12.0 GHz, 0.0100% (dBW/1 MHz)		-155.0
14.0 GHz, 20% (dBW/4 kHz)		-151.0
14.0 GHz, 0.0025% (dBW/4 kHz)		-128.0
Range of Satellite Arc (Geostationary)		
Degrees Longitude		123.0 W / 123.0 W
Azimuth Range (Min/Max)		222.1 / 222.1
Corresponding Elevation Angles		42.4 / 42.4
Radio Climate		A
Rain Zone		2
Max Great Circle Coordination Distance (Mi/Km)		
12.0 GHz		173.0 / 278.4
14.0 GHz		69.5 / 111.9
Precipitation Scatter Contour Radius (Mi/Km)		
12.0 GHz		62.1 / 100.0
14.0 GHz		62.1 / 100.0

Note: Horizon is less than 0.2 degrees at all azimuths

Table of Earth Station Coordination Values
09/04/2002

Earth Station Name PLANO TX
Owner ALCATEL USA
Latitude (DMS) (NAD83) 33 0 32.5 N
Longitude (DMS) (NAD83) 96 45 26.9 W
Ground Elevation (Ft/m) 700.03 / 213.36 AMSL
Antenna Centerline (Ft/m) 75.00 / 22.86 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Receive -165.0 (dBW /1 MHz)
Transmit -151.0 (dBW /4 kHz) TX Power -16.9 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	12.0 GHz Antenna Gain (dBi)	12.0 GHz Coordination Distance (Km)	14.0 GHz Antenna Gain (dBi)	14.0 GHz Coordination Distance (Km)
0	0.00	123.22	-10.00	271.4	-10.00	108.6
5	0.00	126.09	-10.00	271.4	-10.00	108.6
10	0.00	128.73	-10.00	271.4	-10.00	108.6
15	0.00	131.11	-10.00	271.4	-10.00	108.6
20	0.00	133.19	-10.00	271.4	-10.00	108.6
25	0.00	134.92	-10.00	271.4	-10.00	108.6
30	0.00	136.25	-10.00	271.4	-10.00	108.6
35	0.00	137.15	-10.00	271.4	-10.00	108.6
40	0.00	137.59	-10.00	271.4	-10.00	108.6
45	0.00	137.56	-10.00	271.4	-10.00	108.6
50	0.00	137.05	-10.00	271.4	-10.00	108.6
55	0.00	136.09	-10.00	271.4	-10.00	108.6
60	0.00	134.69	-10.00	271.4	-10.00	108.6
65	0.00	132.91	-10.00	271.4	-10.00	108.6
70	0.00	130.79	-10.00	271.4	-10.00	108.6
75	0.00	128.37	-10.00	271.4	-10.00	108.6
80	0.00	125.69	-10.00	271.4	-10.00	108.6
85	0.00	122.80	-10.00	271.4	-10.00	108.6
90	0.00	119.72	-10.00	271.4	-10.00	108.6
95	0.00	116.50	-10.00	271.4	-10.00	108.6
100	0.00	113.15	-10.00	271.4	-10.00	108.6
105	0.00	109.70	-10.00	271.4	-10.00	108.6
110	0.00	106.17	-10.00	271.4	-10.00	108.6
115	0.00	102.58	-10.00	271.4	-10.00	108.6
120	0.00	98.94	-10.00	271.4	-10.00	108.6
125	0.00	95.27	-10.00	271.4	-10.00	108.6
130	0.00	91.58	-10.00	271.4	-10.00	108.6
135	0.00	87.89	-10.00	271.4	-10.00	108.6
140	0.00	84.20	-10.00	271.4	-10.00	108.6
145	0.00	80.53	-10.00	271.4	-10.00	108.6
150	0.00	76.90	-10.00	271.4	-10.00	108.6
155	0.00	73.32	-10.00	271.4	-10.00	108.6
160	0.00	69.80	-10.00	271.4	-10.00	108.6
165	0.00	66.36	-10.00	271.4	-10.00	108.6
170	0.00	63.03	-10.00	271.4	-10.00	108.6
175	0.00	59.83	-10.00	271.4	-10.00	108.6
180	0.00	56.78	-10.00	271.4	-10.00	108.6

Table of Earth Station Coordination Values
09/04/2002

Earth Station Name PLANO TX
Owner ALCATEL USA
Latitude (DMS) (NAD83) 33 0 32.5 N
Longitude (DMS) (NAD83) 96 45 26.9 W
Ground Elevation (Ft/m) 700.03 / 213.36 AMSL
Antenna Centerline (Ft/m) 75.00 / 22.86 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Receive -165.0 (dBW /1 MHz)
Transmit -151.0 (dBW /4 kHz) TX Power -16.9 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	12.0 GHz Antenna Gain (dBi)	12.0 GHz Coordination Distance (Km)	14.0 GHz Antenna Gain (dBi)	14.0 GHz Coordination Distance (Km)
185	0.00	53.91	-10.00	271.4	-10.00	108.6
190	0.00	51.27	-10.00	271.4	-10.00	108.6
195	0.00	48.89	-10.00	271.4	-10.00	108.6
200	0.00	46.81	-9.76	272.6	-9.76	109.2
205	0.00	45.08	-9.35	274.8	-9.35	110.2
210	0.00	43.75	-9.02	276.6	-9.02	111.0
215	0.00	42.85	-8.80	277.8	-8.80	111.6
220	0.00	42.41	-8.69	278.4	-8.69	111.8
225	0.00	42.44	-8.69	278.4	-8.69	111.8
230	0.00	42.95	-8.82	277.7	-8.82	111.5
235	0.00	43.91	-9.07	276.4	-9.07	110.9
240	0.00	45.31	-9.40	274.5	-9.40	110.1
245	0.00	47.09	-9.82	272.3	-9.82	109.1
250	0.00	49.21	-10.00	271.4	-10.00	108.6
255	0.00	51.63	-10.00	271.4	-10.00	108.6
260	0.00	54.31	-10.00	271.4	-10.00	108.6
265	0.00	57.21	-10.00	271.4	-10.00	108.6
270	0.00	60.28	-10.00	271.4	-10.00	108.6
275	0.00	63.50	-10.00	271.4	-10.00	108.6
280	0.00	66.85	-10.00	271.4	-10.00	108.6
285	0.00	70.30	-10.00	271.4	-10.00	108.6
290	0.00	73.83	-10.00	271.4	-10.00	108.6
295	0.00	77.42	-10.00	271.4	-10.00	108.6
300	0.00	81.06	-10.00	271.4	-10.00	108.6
305	0.00	84.73	-10.00	271.4	-10.00	108.6
310	0.00	88.42	-10.00	271.4	-10.00	108.6
315	0.00	92.11	-10.00	271.4	-10.00	108.6
320	0.00	95.80	-10.00	271.4	-10.00	108.6
325	0.00	99.47	-10.00	271.4	-10.00	108.6
330	0.00	103.10	-10.00	271.4	-10.00	108.6
335	0.00	106.68	-10.00	271.4	-10.00	108.6
340	0.00	110.20	-10.00	271.4	-10.00	108.6
345	0.00	113.64	-10.00	271.4	-10.00	108.6
350	0.00	116.97	-10.00	271.4	-10.00	108.6
355	0.00	120.17	-10.00	271.4	-10.00	108.6

Earth Station Azimuth and Elevation Table
09/04/2002

Earth Station Name	PLANO TX
Owner	ALCATEL USA
Latitude (DMS) (NAD83)	33 0 32.5 N
Longitude (DMS) (NAD83)	96 45 26.9 W
Ground Elevation (Ft/m)	700.03 / 213.36 AMSL
Antenna Centerline (Ft/m)	75.00 / 22.86 AGL
Satellite Arc Range	123.0 W
	123.0 W

Satellite Longitude	Azimuth (Degrees)	Elevation (Degrees)	Satellite Name
123.0	222.1	42.4	Galaxy 10R

Exhibit D – Radiation Hazard Study

Analysis of Non-Ionizing Radiation
for a 1.2 Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 1.2 meter earth station system. The analysis and calculations performed in this report are in compliance 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 (mWatts/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 (mWatts/cm**2)
30-300	1.0
300-1500	Frequency(MHz)*(4.0/1200)
1500-100,000	5.0

Table 3 contains the parameters that are used to calculate the various power densities for the earth stations.

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

Parameter	Abbreviation	Value	Units
Antenna Diameter	D	1.2	meters
Antenna Surface Area	Sa	II * D**2/4	meters**2
Feed Flange Diameter	Df	7.6	cm
Area of Feed Flange	Fa	II * Df**2/4	cm**2
Frequency	Frequency	14250	MHz
Wavelength	lambda	300/frequency(MHz)	meters
Transmit Power	P	1.8	Watts
Antenna Gain	Ges	43.3	dBi
Pi	II	3.1415927	n/a
Antenna Efficiency	n	0.67	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:(1)

Distance to the Far Field Region,(Rf) = 0.60 * D**2 / lambda (1)
= 41.0 meters

The maximum main beam power density in the Far Field can be determined from the following equation:(2)

On-Axis Power Density in the Far Field,(Wf) = Ges * P / 4 * II * Rf**2 (2)
= 1.818 Watts/meters**2
= 0.182 mWatts/cm**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:(3)

Extent of the Near Field,(Rn) = D**2 / (4 * lambda) (3)
= 17.1 meters

The maximum power density in the Near Field can be determined from the following equation:(4)

Near Field Power Density,(Wn) = 16.0 * n * P / II * D**2 (4)
= 4.245 Watts/meters**2
= 0.424 mWatts/cm**2

3. Transition Region Calculations

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 Rt can be determined from the following equation:(5)

Transition region Power Density,(Tt) = Wn * Rn / Rt (5)
= 0.424 mWatts/cm**2

4. Region between Feed Assembly and Antenna Reflector

Transmissions from the feed assembly are directed toward the antenna reflector surface, and are confined within a conical shape defined by the type of feed assembly. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the feed assembly and reflector surface can be calculated by determining the power density at the feed assembly surface. This can be determined from the following equation:(6)

Power Density at Feed Flange,(Wf) = 4 * P / Fa (6)
= 158.714 mWatts/cm**2

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the feed assembly. The area is now the area of the reflector aperture and can be determined from the following equation:(7)

Power Density at the Reflector Surface,(Ws) = 4 * P / Sa (7)
= 6.366 Watts/meters**2
= 0.637 mWatts/cm**2

6. Region between Reflector and Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and ground can be determined from the following equation:(8)

Power Density between Reflector and Ground,(Wg) = P / Sa (8)
= 1.592 Watts/meters**2
= 0.159 mWatts/cm**2

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mWatts/cm**2)	Hazard Assessment
1. Far Field (Rf) = 41.0 meters	0.182	Satisfies FCC MPE
2. Near Field (Rn) = 17.1 meters	0.424	Satisfies FCC MPE
3. Transition Region Rn < Rt < Rf, (Rt)	0.424	Satisfies FCC MPE
4. Between Feed Assembly and Antenna Reflector	158.714	Potential Hazard
5. Main Reflector	0.637	Satisfies FCC MPE
6. Between Reflector and Ground	0.159	Satisfies FCC MPE

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mWatts/cm**2)	Hazard Assessment
1. Far Field (Rf) = 41.0 meters	0.182	Satisfies FCC MPE
2. Near Field (Rn) = 17.1 meters	0.424	Satisfies FCC MPE
3. Transition Region Rn < Rt < Rf, (Rt)	0.424	Satisfies FCC MPE
4. Between Feed Assembly and Antenna Reflector	158.714	Potential Hazard
5. Main Reflector	0.637	Satisfies FCC MPE
6. Between Reflector and Ground	0.159	Satisfies FCC MPE

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

7. Conclusions

Based on the above analysis it is concluded that harmful levels of radiation 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/cm**2 will be complied with for those regions with close proximity to the reflector that exceed acceptable levels.