

Alaska Communications Internet LLC

**Amendment to Pending Modification of
Earth Station License SES-MFS-20220804-00834**

Technical Appendix

I. Site-specific Coordination Reports

and

II. 2.4m Radiation Hazard Reports

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: A2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Hooper Bay, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: A2223802

=====

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

=====

Company:	Alaska Communications Internet, LLC		
Site Name, State:	Hooper Bay, AK		
Call Sign:			
Latitude	(NAD83)	61 31	19.2 N
Longitude	(NAD83)	166 5	47.5 W
Elevation AMSL	(ft/m)	6.00	1.83
Receive Frequency Range	(MHz)	3700-4200	
Transmit Frequency Range	(MHz)	5925-6020.9/6047.4-6050.55/6077.05-6137.75/-6167.75-6272.94/6299.44-6302.59/6329.09-6389.79/6419.79-6425	
Range of Satellite Orbital Long.	(deg W)	95.00	191.00
Range of Azimuths from North	(deg)	106.75	207.84
Antenna Centerline	(ft/m)	6.56	2.00
Antenna Elevation Angles	(deg)	0.20	17.34

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
 Transmit: PRODELIN 2.4 METER

Max Transmitter Power	(dbW/4KHz)	-13.60
Max EIRP Main Beam	(dbW/4KHz)	28.10
Modulation / Emission Designator	DIGITAL 13M0G7W 10M5G7W	
8M00G7W5M50G72		

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	663.20	254.28
Max Rain Scatter Distances	(km)	345.33	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: B2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Mountain Village, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: B2223802

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

Company: Alaska Communications Internet, LLC
Site Name, State: Mountain Village, AK
Call Sign:
Latitude (NAD83) 62 5 20.6 N
Longitude (NAD83) 163 43 41.3 W
Elevation AMSL (ft/m) 120.00 36.58
Receive Frequency Range (MHz) 3700-4200
Transmit Frequency Range (MHz) 5925-6048.8/6078.8-6184.24/6210.24-6213.89/6239.89-6244.89/6268.19-6273.19/6299.19-6332.49/6358.49-6391.79/6417.79-6425
Range of Satellite Orbital Long. (deg W) 95.00 191.00
Range of Azimuths from North (deg) 108.99 210.26
Antenna Centerline (ft/m) 6.56 2.00
Antenna Elevation Angles (deg) 1.10 16.25

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
Transmit: PRODELIN 2.4 METER

Max Transmitter Power (dbW/4KHz) -15.36
Max EIRP Main Beam (dbW/4KHz) 26.34
Modulation / Emission Designator DIGITAL 13M0G7W 10M5G7W
8M00G7W5M50G7W

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	676.71	250.85
Max Rain Scatter Distances	(km)	660.22	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: C2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Emmonak, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

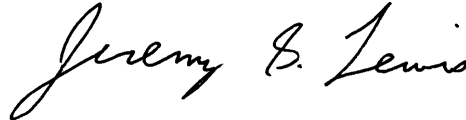
Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: C2223802

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

Company:	Alaska Communications Internet, LLC		
Site Name, State:	Emmonak, AK		
Call Sign:			
Latitude	(NAD83)	62 46	43.7 N
Longitude	(NAD83)	164 31	48.1 W
Elevation AMSL	(ft/m)	7.00	2.13
Receive Frequency Range	(MHz)	3700-4200	
Transmit Frequency Range	(MHz)	5925-5930.2/5989.85-6048.8/6108.45-6182.24/6241.89-6271.19/6301.19-6330.49/6360.49-6425	
Range of Satellite Orbital Long.	(deg W)	95.00	191.00
Range of Azimuths from North	(deg)	108.36	209.25
Antenna Centerline	(ft/m)	6.56	2.00
Antenna Elevation Angles	(deg)	0.52	15.82

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
Transmit: PRODELIN 2.4 METER

Max Transmitter Power	(dbW/4KHz)	-15.36
Max EIRP Main Beam	(dbW/4KHz)	26.34
Modulation / Emission Designator	DIGITAL 13M0G7W 10M5G7W	
8M00G7W5M50G7W		

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	706.01	263.50
Max Rain Scatter Distances	(km)	785.28	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: D2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Alakanuk, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

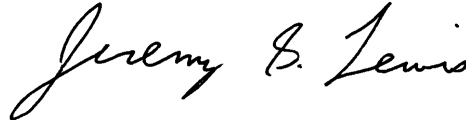
Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: D2223802

=====

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

=====

Company:	Alaska Communications Internet, LLC		
Site Name, State:	Alakanuk, AK		
Call Sign:			
Latitude	(NAD83)	62 41	5.3 N
Longitude	(NAD83)	164 40	9.6 W
Elevation AMSL	(ft/m)	10.00	3.05
Receive Frequency Range	(MHz)	3700-4200	
Transmit Frequency Range	(MHz)	5925-5930.2/5989.85-6019.15/6108.45-6182.24/6241.89-6271.19/6301.19-6330.49/6360.49-6425	
Range of Satellite Orbital Long.	(deg W)	95.00	191.00
Range of Azimuths from North	(deg)	108.22	209.12
Antenna Centerline	(ft/m)	6.56	2.00
Antenna Elevation Angles	(deg)	0.49	15.94

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
 Transmit: PRODELIN 2.4 METER

Max Transmitter Power	(dbW/4KHz)	-15.36
Max EIRP Main Beam	(dbW/4KHz)	26.34
Modulation / Emission Designator	DIGITAL 13M0G7W 10M5G7W	
8M00G7W5M50G7W		

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	698.50	260.26
Max Rain Scatter Distances	(km)	784.83	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: E2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Scammon Bay, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: E2223802

=====

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

=====

Company:	Alaska Communications Internet, LLC		
Site Name, State:	Scammon Bay, AK		
Call Sign:			
Latitude	(NAD83)	61 50	20.5 N
Longitude	(NAD83)	165 33	59.4 W
Elevation AMSL	(ft/m)	128.00	39.01
Receive Frequency Range	(MHz)	3700-4200	
Transmit Frequency Range	(MHz)	5925-5930.2/5989.85-6048.8/6078.8-6211.89/6241.89-6360.14/6390.14-6425	
Range of Satellite Orbital Long.	(deg W)	95.00	191.00
Range of Azimuths from North	(deg)	107.28	208.34
Antenna Centerline	(ft/m)	6.56	2.00
Antenna Elevation Angles	(deg)	0.35	16.92

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
 Transmit: PRODELIN 2.4 METER

Max Transmitter Power	(dbW/4KHz)	-15.36
Max EIRP Main Beam	(dbW/4KHz)	26.34
Modulation / Emission Designator	DIGITAL 13M0G7W 10M5G7W	
8M00G7W5M50G7W		

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	672.24	248.90
Max Rain Scatter Distances	(km)	695.75	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: F2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Pilot Station, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED2, LLC
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: F2223802

=====

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

=====

Company:	Alaska Communications Internet, LLC		
Site Name, State:	Pilot Station, AK		
Call Sign:			
Latitude	(NAD83)	61 56	10.7 N
Longitude	(NAD83)	162 53	31.2 W
Elevation AMSL	(ft/m)	223.00	67.97
Receive Frequency Range	(MHz)	3700-4200	
Transmit Frequency Range	(MHz)	5925-6048.8/6078.8-6182.24/6360.49-6389.79/6416.44-6425	
Range of Satellite Orbital Long.	(deg W)	95.00	191.00
Range of Azimuths from North	(deg)	109.72	211.19
Antenna Centerline	(ft/m)	6.56	2.00
Antenna Elevation Angles	(deg)	1.52	16.18

Equipment Parameters		Receive	Transmit
Antenna Gain, Main Beam	(dbI)	34.70	41.70
15 DB Half Beamwidth	(deg)	2.20	2.60

Antennas Receive: PRODELIN 2.4 METER
 Transmit: PRODELIN 2.4 METER

Max Transmitter Power	(dbW/4KHz)	-15.36
Max EIRP Main Beam	(dbW/4KHz)	26.34
Modulation / Emission Designator	DIGITAL 13M0G7W 10M5G7W	
8M00G7W5M50G7W		

Coordination Parameters		Receive	Transmit
Max Greater Circle Distances	(km)	672.47	249.00
Max Rain Scatter Distances	(km)	591.92	100.00
Max Interference Power Long Term	(dbW)	-158.60	-154.80
Max Interference Power Short Term	(dbW)	-153.90	-126.80
Rain Zone / Radio Zone		3	A

Micronet Communications, Inc.

812 Lexington Dr
Plano, Texas 75075
972-422-7200

SUPPLEMENTAL SHOWING PART 101.103(D)

File Number: M2223802 5.93 GHz
Licensee: Alaska Communications Internet, LLC

Page 1

Pursuant to Parts 25.203 and 101.103(d) of the FCC Rules and Regulations, a frequency coordination study was conducted by Micronet Communications, Inc. for the following proposed earth station:

Russian Mission, AK

The results of the study indicate that no unacceptable interference will result with existing, proposed or prior coordinated radio facilities.

Coordination was performed with existing, proposed and prior coordinated carriers within coordination range on the following dates:

09/09/2022 Original PCN (Expedited response requested by 09/23/2022)
There were no unresolved interference objections.

The attached coordination data was forwarded on the latest date to the following parties within coordination range or their authorized coordination agents:

COMSEARCH INC
UNITED UTILITIES, INC.
WIRELESS APPLICATIONS CORP

Respectfully Submitted,



Jeremy Lewis
Systems Engineer

Attached: 1 data sheet

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: M2223802

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

Company: Alaska Communications Internet, LLC
Site Name, State: Russian Mission, AK
Call Sign:
Latitude (NAD83) 61 47 10.0 N
Longitude (NAD83) 161 19 33.8 W
Elevation AMSL (ft/m) 158.00 48.16
Receive Frequency Range (MHz) 3700-4200
Transmit Frequency Range (MHz) 5925-5932.2/5958.2-5961.85/5987.85-
6052.15/6075.45-6080.45/6136.1-6139.75/6165.75-6184.24/6239.89-6304.19/6327.49-
6332.49/6358.49-6362.14/6388.14-6391.79/6417.79-6425
Range of Satellite Orbital Long. (deg W) 95.00 191.00
Range of Azimuths from North (deg) 111.12 212.89
Antenna Centerline (ft/m) 6.56 2.00
Antenna Elevation Angles (deg) 2.27 15.91

Equipment Parameters Receive Transmit

Antenna Gain, Main Beam (dbI) 34.70 41.70
15 DB Half Beamwidth (deg) 2.20 2.60

Antennas Receive: PRODELIN 2.4 METER
Transmit: PRODELIN 2.4 METER

Max Transmitter Power (dbW/4KHz) -15.36
Max EIRP Main Beam (dbW/4KHz) 26.34
Modulation / Emission Designator DIGITAL 13M0G7W 10M5G7W
8M00G7W5M50G7W

Coordination Parameters Receive Transmit

Max Greater Circle Distances (km) 607.89 220.63
Max Rain Scatter Distances (km) 521.57 100.00
Max Interference Power Long Term (dbW) -158.60 -154.80
Max Interference Power Short Term (dbW) -153.90 -126.80
Rain Zone / Radio Zone 3 A

ANALYSIS OF NON-IONIZING RADIATION
for Alaska Communications Internet LLC
Site: Hooper Bay State: AK
Latitude: 61 31 19.2 Longitude: 166 5 47.5 (NAD83)
09-26-2022

The Office of Science and Technology Bulletin, No. 65, October 1985 and revised August 1997, specifies that the maximum level of non-ionizing radiation that a person may be exposed to over a six minute period is an average power density equal to 5 mW/cm**2 (five milliwatts per centimeter squared) for a controlled environment. For an uncontrolled environment, the maximum level of non-ionizing radiation that a person may be exposed to over a thirty minute period is an average power density equal to 1 mW/cm**2 (one milliwatt per centimeter squared). It is the purpose of this report to determine the maximum power flux densities of the earth station in the far zone, near zone, transition zone, at the main reflector surface, and between the antenna edge and the ground.

Parameters which were used in the calculations:
=====

Antenna Diameter, (D) = 2.4000 m
Antenna Surface Area (Sa) = $\pi(D^2)/4$ = 4.5239 m**2
Wavelength at 6.1750 GHz (lambda) = 0.0485 m
Transmit Power at Flange (P) = 60.0000 Watts
Antenna Gain at Earth Site (GES) = 41.7000 dBi = 14791.0839
Power Ratio:
AntiLog(GES/10)
pi = 3.1415927
Antenna Aperture Efficiency (n) = 0.6000

1. FAR ZONE CALCULATIONS

=====

$$\begin{aligned} \text{Distance to the Far Zone} \quad (D_f) &= \frac{(n) (D^{**2})}{\lambda} = 71.2577 \text{ m} \\ \\ \text{Far Zone Power Density} \quad (R_f) &= \frac{(G_{ES}) (P)}{4\pi (D_f^{**2})} = 13.9084 \text{ W/m}^{**2} \\ &= 1.3908 \text{ mW/cm}^{**2} \end{aligned}$$

2. NEAR ZONE CALCULATIONS

=====

Power Flux Density is considered to be at a maximum value throughout the entire length of this Zone. The Zone is contained within a cylindrical volume which has the same diameter as the antenna. Beyond the Near Zone, the Power Flux Density will decrease with distance from the Antenna.

$$\begin{aligned} \text{Distance to the Near Zone} \quad (D_n) &= \frac{D^{**2}}{4\lambda} = 29.6907 \text{ m} \\ \\ \text{Near Zone Power Density} \quad (R_n) &= \frac{16.0 (n) P}{\pi (D^{**2})} = 31.8310 \text{ W/m}^{**2} \\ &= 3.1831 \text{ mW/cm}^{**2} \end{aligned}$$

3. TRANSITION ZONE CALCULATIONS

=====

The Power Density begins to decrease with distance in the Transition Zone. While the Power Density decreases inversely with distance in the Transition Zone, the Power Density decreases inversely with the square of the distance in the Far Zone. Since the maximum Power Density in the Transition Zone will not exceed the Near Zone values, it is not calculated.

4. MAIN REFLECTOR ZONE

=====

$$\begin{aligned} \text{Main Reflector Power Density} &= \frac{2(P)}{S_a} = 26.5258 \text{ W/m}^2 \\ &= 2.6526 \text{ mW/cm}^2 \end{aligned}$$

5. ZONE BETWEEN THE MAIN REFLECTOR AND THE GROUND

=====

Applying uniform illumination of the Main Reflector Surface:

$$\begin{aligned} \text{Main to Ground Power Density} &= \frac{P}{S_a} = 13.2629 \text{ W/m}^2 \\ &= 1.3263 \text{ mW/cm}^2 \end{aligned}$$

CALCULATED SAFETY MARGINS SUMMARY
AND EVALUATION

Controlled Safety Margin = 5.0 - Calculated Zone Value (mW/cm**2)

Zones	Safety Margins (mW/cm**2)	Conclusions
-----	-----	-----
1. Far Zone	3.6092	Complies with ANSI
2. Near Zone	1.8169	Complies with ANSI
3. Transition Zone	Rf < Rt < Rn	Complies with ANSI
4. Main Reflector Surface	2.3474	Complies with ANSI
5. Main Reflector to Ground	3.6737	Complies with ANSI

Uncontrolled Safety Margin = 1.0 - Calculated Zone Value (mW/cm**2)

Zones	Safety Margins (mW/cm**2)	Conclusions
-----	-----	-----
1. Far Zone	-0.3908	POTENTIALLY HAZARDOUS
2. Near Zone	-2.1831	POTENTIALLY HAZARDOUS
3. Transition Zone	Rf < Rt < Rn	Complies with ANSI
4. Main Reflector Surface	-1.6526	POTENTIALLY HAZARDOUS
5. Main Reflector to Ground	-0.3263	POTENTIALLY HAZARDOUS

6. EVALUATION

=====

A. Controlled Environment

B. Uncontrolled Environment

The FAR ZONE does not comply with the ANSI standards!

WARNING SIGNS will be posted for the affected Zone indicating danger while the system is in use. Additionally, the system will be shut down for servicing.

The NEAR ZONE does not comply with the ANSI standards!

WARNING SIGNS will be posted for the affected Zone indicating danger while the system is in use. Additionally, the system will be shut down for servicing.

The MAIN Reflector Surface ZONE does not comply with the ANSI standards!
WARNING SIGNS will be posted for the affected Zone indicating danger while
the system is in use. Additionally, the system will be shut down for
servicing.

The MAIN Reflector to GROUND ZONE does not comply with the ANSI standards!
WARNING SIGNS will be posted for the affected Zone indicating danger while
the system is in use. Additionally, the system will be shut down for
servicing.

ANALYSIS OF NON-IONIZING RADIATION
for Alaska Communications Internet LLC
Site: Mountain Village State: AK
Latitude: 62 5 20.6 Longitude: 163 43 41.3 (NAD83)
09-26-2022

The Office of Science and Technology Bulletin, No. 65, October 1985 and revised August 1997, specifies that the maximum level of non-ionizing radiation that a person may be exposed to over a six minute period is an average power density equal to 5 mW/cm**2 (five milliwatts per centimeter squared) for a controlled environment. For an uncontrolled environment, the maximum level of non-ionizing radiation that a person may be exposed to over a thirty minute period is an average power density equal to 1 mW/cm**2 (one milliwatt per centimeter squared). It is the purpose of this report to determine the maximum power flux densities of the earth station in the far zone, near zone, transition zone, at the main reflector surface, and between the antenna edge and the ground.

Parameters which were used in the calculations:
=====

Antenna Diameter,	(D) = 2.4000 m	
Antenna Surface Area	(Sa) = $\pi(D^2)/4$	= 4.5239 m**2
Wavelength at 6.1750 GHz	(lambda) = 0.0485 m	
Transmit Power at Flange	(P) = 40.0000 Watts	
Antenna Gain at Earth Site	(GES) = 41.7000 dBi	= 14791.0839
		Power Ratio:
		AntiLog(GES/10)
pi	= 3.1415927	
Antenna Aperture Efficiency	(n) = 0.6000	

1. FAR ZONE CALCULATIONS

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$$\text{Distance to the Far Zone} \quad (D_f) = \frac{(n) (D^{**2})}{\text{lambda}} = 71.2577 \text{ m}$$

$$\begin{aligned} \text{Far Zone Power Density} \quad (R_f) &= \frac{(GES) (P)}{4 * \pi * (D_f^{**2})} = 9.2723 \text{ W/m}^{**2} \\ &= 0.9272 \text{ mW/cm}^{**2} \end{aligned}$$

2. NEAR ZONE CALCULATIONS

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Power Flux Density is considered to be at a maximum value throughout the entire length of this Zone. The Zone is contained within a cylindrical volume which has the same diameter as the antenna. Beyond the Near Zone, the Power Flux Density will decrease with distance from the Antenna.

$$\text{Distance to the Near Zone} \quad (D_n) = \frac{D^{**2}}{4 * \text{lambda}} = 29.6907 \text{ m}$$

$$\begin{aligned} \text{Near Zone Power Density} \quad (R_n) &= \frac{16.0 (n) P}{\pi (D^{**2})} = 21.2207 \text{ W/m}^{**2} \\ &= 2.1221 \text{ mW/cm}^{**2} \end{aligned}$$

3. TRANSITION ZONE CALCULATIONS

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The Power Density begins to decrease with distance in the Transition Zone. While the Power Density decreases inversely with distance in the Transition Zone, the Power Density decreases inversely with the square of the distance in the Far Zone. Since the maximum Power Density in the Transition Zone will not exceed the Near Zone values, it is not calculated.

4. MAIN REFLECTOR ZONE

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$$\begin{aligned} \text{Main Reflector Power Density} &= \frac{2(P)}{S_a} = 17.6839 \text{ W/m}^2 \\ &= 1.7684 \text{ mW/cm}^2 \end{aligned}$$

5. ZONE BETWEEN THE MAIN REFLECTOR AND THE GROUND

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Applying uniform illumination of the Main Reflector Surface:

$$\begin{aligned} \text{Main to Ground Power Density} &= \frac{P}{S_a} = 8.8419 \text{ W/m}^2 \\ &= 0.8842 \text{ mW/cm}^2 \end{aligned}$$

CALCULATED SAFETY MARGINS SUMMARY
AND EVALUATION

Controlled Safety Margin = 5.0 - Calculated Zone Value (mW/cm**2)

Zones	Safety Margins (mW/cm**2)	Conclusions
-----	-----	-----
1. Far Zone	4.0728	Complies with ANSI
2. Near Zone	2.8779	Complies with ANSI
3. Transition Zone	Rf < Rt < Rn	Complies with ANSI
4. Main Reflector Surface	3.2316	Complies with ANSI
5. Main Reflector to Ground	4.1158	Complies with ANSI

Uncontrolled Safety Margin = 1.0 - Calculated Zone Value (mW/cm**2)

Zones	Safety Margins (mW/cm**2)	Conclusions
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1. Far Zone	0.0728	Complies with ANSI
2. Near Zone	-1.1221	POTENTIALLY HAZARDOUS
3. Transition Zone	Rf < Rt < Rn	Complies with ANSI
4. Main Reflector Surface	-0.7684	POTENTIALLY HAZARDOUS
5. Main Reflector to Ground	0.1158	Complies with ANSI

6. EVALUATION

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A. Controlled Environment

B. Uncontrolled Environment

The NEAR ZONE does not comply with the ANSI standards!

WARNING SIGNS will be posted for the affected Zone indicating danger while the system is in use. Additionally, the system will be shut down for servicing.

The MAIN Reflector Surface ZONE does not comply with the ANSI standards!

WARNING SIGNS will be posted for the affected Zone indicating danger while the system is in use. Additionally, the system will be shut down for servicing.