

## EXHIBIT 1B: FREQUENCY ASSIGNMENTS

Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Maximum Channel Gain (dB)
1	NRF	RHCP	24773.50	1	NTF	LHCP	17323.50	24	133.4
3	NRF	RHCP	24802.66	3	NTF	LHCP	17352.66	24	133.4
5	NRF	RHCP	24831.82	5	NTF	LHCP	17381.82	24	133.4
7	NRF	RHCP	24860.98	7	NTF	LHCP	17410.98	24	133.4
9	NRF	RHCP	24890.14	9	NTF	LHCP	17440.14	24	133.4
11	NRF	RHCP	24919.30	11	NTF	LHCP	17469.30	24	133.4
13	NRF	RHCP	24948.46	13	NTF	LHCP	17498.46	24	133.4
15	NRF	RHCP	24977.62	15	NTF	LHCP	17527.62	24	133.4
17	NRF	RHCP	25006.78	17	NTF	LHCP	17556.78	24	133.4
19	NRF	RHCP	25035.94	19	NTF	LHCP	17585.94	24	133.4
21	NRF	RHCP	25065.10	21	NTF	LHCP	17615.10	24	133.4
23	NRF	RHCP	25094.26	23	NTF	LHCP	17644.26	24	133.4
25	NRF	RHCP	25123.42	25	NTF	LHCP	17673.42	24	133.4
2	NRF	LHCP	24788.08	2	NTF	RHCP	17338.08	24	133.4
4	NRF	LHCP	24817.24	4	NTF	RHCP	17367.24	24	133.4
6	NRF	LHCP	24846.40	6	NTF	RHCP	17396.40	24	133.4
8	NRF	LHCP	24875.56	8	NTF	RHCP	17425.56	24	133.4
10	NRF	LHCP	24904.72	10	NTF	RHCP	17454.72	24	133.4
12	NRF	LHCP	24933.88	12	NTF	RHCP	17483.88	24	133.4
14	NRF	LHCP	24963.04	14	NTF	RHCP	17513.04	24	133.4
16	NRF	LHCP	24992.20	16	NTF	RHCP	17542.20	24	133.4
18	NRF	LHCP	25021.36	18	NTF	RHCP	17571.36	24	133.4
				18	STF	RHCP	17571.36	24	141.9
20	NRF	LHCP	25050.52	20	NTF	RHCP	17600.52	24	133.4
				20	STF	RHCP	17600.52	24	141.9
22	NRF	LHCP	25079.68	22	NTF	RHCP	17629.68	24	133.4
				22	STF	RHCP	17629.68	24	141.9
24	NRF	LHCP	25108.84	24	NTF	RHCP	17658.84	24	133.4
				24	STF	RHCP	17658.84	24	141.9
26	NRF	LHCP	25138.00	26	NTF	RHCP	17688.00	24	133.4
				26	STF	RHCP	17688.00	24	141.9
28	NRF	LHCP	25167.16	28	STF	RHCP	17717.16	24	141.9
30	NRF	LHCP	25196.32	30	STF	RHCP	17746.32	24	141.9
32	NRF	LHCP	25225.48	32	STF	RHCP	17775.48	24	141.9
18	SRF	LHCP	25201.36	18	STF	RHCP	17571.36	24	141.9
20	SRF	LHCP	25050.52	20	STF	RHCP	17600.52	24	141.9
22	SRF	LHCP	25079.68	22	STF	RHCP	17629.68	24	141.9
24	SRF	LHCP	25108.84	24	STF	RHCP	17658.84	24	141.9
26	SRF	LHCP	25138.00	26	STF	RHCP	17688.00	24	141.9
28	SRF	LHCP	25167.16	28	STF	RHCP	17717.16	24	141.9
30	SRF	LHCP	25196.32	30	STF	RHCP	17746.32	24	141.9
32	SRF	LHCP	25225.48	32	STF	RHCP	17775.48	24	141.9
CMD1	NRF	RHCP	24751.5					1	
CMD2	NRF	LHCP	25248.5					1	
CMD3	Global	V	5925.5					1	
CMD4	Global	H	6424.5					1	
				TM1	NTF	RHCP	17303.0	0.35	
				TM2	NTF	LHCP	17303.5	0.35	
				TM3	Global	V	4197.0	0.35	
				TM4	Global	V	4198.5	0.35	
				UPC1	NTF	RHCP	17301.0	0.050	
				UPC2	NTF	LHCP	17301.5	0.050	

## EXHIBIT 1B: FREQUENCY ASSIGNMENTS (continued)

Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Maximum Channel Gain (dB)
A1	GRA1	LHCP	24802.66	A1	UTA1	RHCP	17352.66	48	130.2
A2	GRA1	LHCP	24860.98	A2	UTA2	RHCP	17410.98	48	130.2
A3	GRA1	LHCP	24919.30	A3	UTA3	RHCP	17469.30	48	130.2
A4	GRA1	LHCP	24977.62	A4	UTA4	RHCP	17527.62	48	130.2
B1	GRB1	LHCP	24802.66	B1	UTB1	RHCP	17352.66	48	130.2
B2	GRB1	LHCP	24860.98	B2	UTB2	RHCP	17410.98	48	130.2
B3	GRB1	LHCP	24919.30	B3	UTB3	RHCP	17469.30	48	130.2
B4	GRB1	LHCP	24977.62	B4	UTB4	RHCP	17527.62	48	130.2
C1	GRC1	LHCP	24802.66	C1	UTC1	RHCP	17352.66	48	130.2
C2	GRC1	LHCP	24860.98	C2	UTC2	RHCP	17410.98	48	130.2
C3	GRC1	LHCP	24919.30	C3	UTC3	RHCP	17469.30	48	130.2
C4	GRC1	LHCP	24977.62	C4	UTC4	RHCP	17527.62	48	130.2
D1	GRD1	LHCP	24802.66	D1	UTD1	RHCP	17352.66	48	130.2
D2	GRD1	LHCP	24860.98	D2	UTD2	RHCP	17410.98	48	130.2
D3	GRD1	LHCP	24919.30	D3	UTD3	RHCP	17469.30	48	130.2
D4	GRD1	LHCP	24977.62	D4	UTD4	RHCP	17527.62	48	130.2
E1	GRE1	LHCP	24802.66	E1	UTE1	RHCP	17352.66	48	130.2
E2	GRE1	LHCP	24860.98	E2	UTE2	RHCP	17410.98	48	130.2
E3	GRE1	LHCP	24919.30	E3	UTE3	RHCP	17469.30	48	130.2
E4	GRE1	LHCP	24977.62	E4	UTE4	RHCP	17527.62	48	130.2
F1	GRF1	LHCP	24802.66	F1	UTF1	RHCP	17352.66	48	130.2
F2	GRF1	LHCP	24860.98	F2	UTF2	RHCP	17410.98	48	130.2
F3	GRF1	LHCP	24919.30	F3	UTF3	RHCP	17469.30	48	130.2
F4	GRF1	LHCP	24977.62	F4	UTF4	RHCP	17527.62	48	130.2
A1	GRA1	LHCP	24802.66	A1	UTA1	RHCP	17352.66	48	130.2
A2	GRA2	LHCP	24860.98	A2	UTA1	RHCP	17410.98	48	130.2
A3	GRA3	LHCP	24919.30	A3	UTA1	RHCP	17469.30	48	130.2
A4	GRA4	LHCP	24977.62	A4	UTA1	RHCP	17527.62	48	130.2
B1	GRB1	LHCP	24802.66	B1	UTB1	RHCP	17352.66	48	130.2
B2	GRB2	LHCP	24860.98	B2	UTB1	RHCP	17410.98	48	130.2
B3	GRB3	LHCP	24919.30	B3	UTB1	RHCP	17469.30	48	130.2
B4	GRB4	LHCP	24977.62	B4	UTB1	RHCP	17527.62	48	130.2
C1	GRC1	LHCP	24802.66	C1	UTC1	RHCP	17352.66	48	130.2
C2	GRC2	LHCP	24860.98	C2	UTC1	RHCP	17410.98	48	130.2
C3	GRC3	LHCP	24919.30	C3	UTC1	RHCP	17469.30	48	130.2
C4	GRC4	LHCP	24977.62	C4	UTC1	RHCP	17527.62	48	130.2
D1	GRD1	LHCP	24802.66	D1	UTD1	RHCP	17352.66	48	130.2
D2	GRD2	LHCP	24860.98	D2	UTD1	RHCP	17410.98	48	130.2
D3	GRD3	LHCP	24919.30	D3	UTD1	RHCP	17469.30	48	130.2
D4	GRD4	LHCP	24977.62	D4	UTD1	RHCP	17527.62	48	130.2
E1	GRE1	LHCP	24802.66	E1	UTE1	RHCP	17352.66	48	130.2
E2	GRE2	LHCP	24860.98	E2	UTE1	RHCP	17410.98	48	130.2
E3	GRE3	LHCP	24919.30	E3	UTE1	RHCP	17469.30	48	130.2
E4	GRE4	LHCP	24977.62	E4	UTE1	RHCP	17527.62	48	130.2
F1	GRF1	LHCP	24802.66	F1	UTF1	RHCP	17352.66	48	130.2
F2	GRF2	LHCP	24860.98	F2	UTF1	RHCP	17410.98	48	130.2
F3	GRF3	LHCP	24919.30	F3	UTF1	RHCP	17469.30	48	130.2
F4	GRF4	LHCP	24977.62	F4	UTF1	RHCP	17527.62	48	130.2

**Notes:**

L: Linear vertical polarization

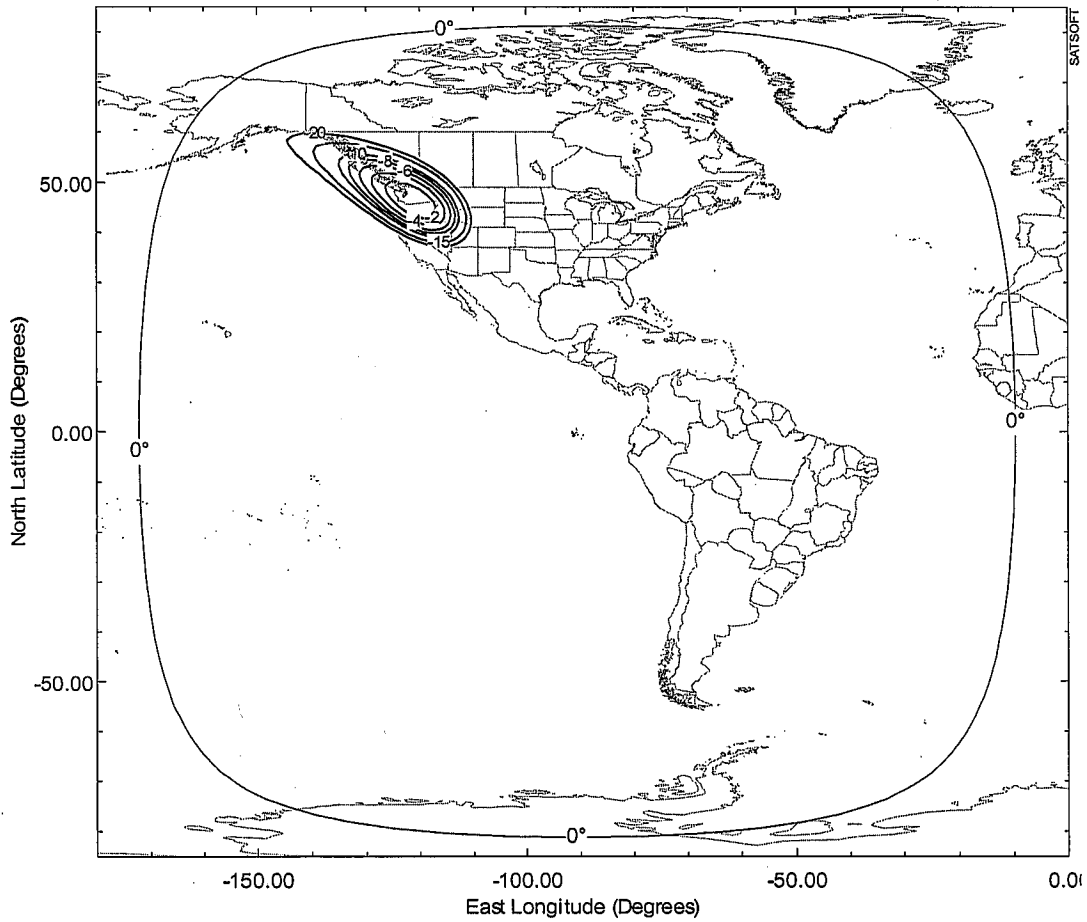
V: Linear horizontal polarization

LHCP: Left hand circular polarization

RHCP: Right hand circular polarization

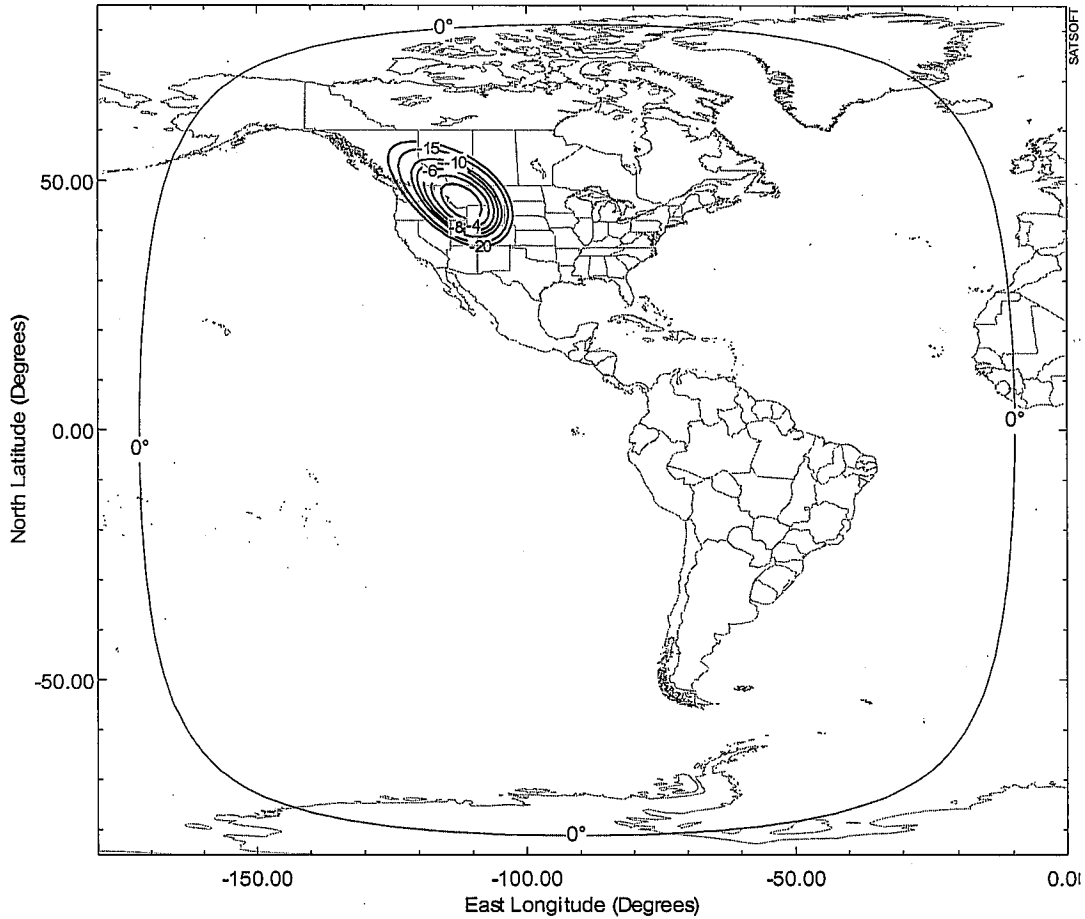
**EXHIBIT 3C-1: GRA1 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



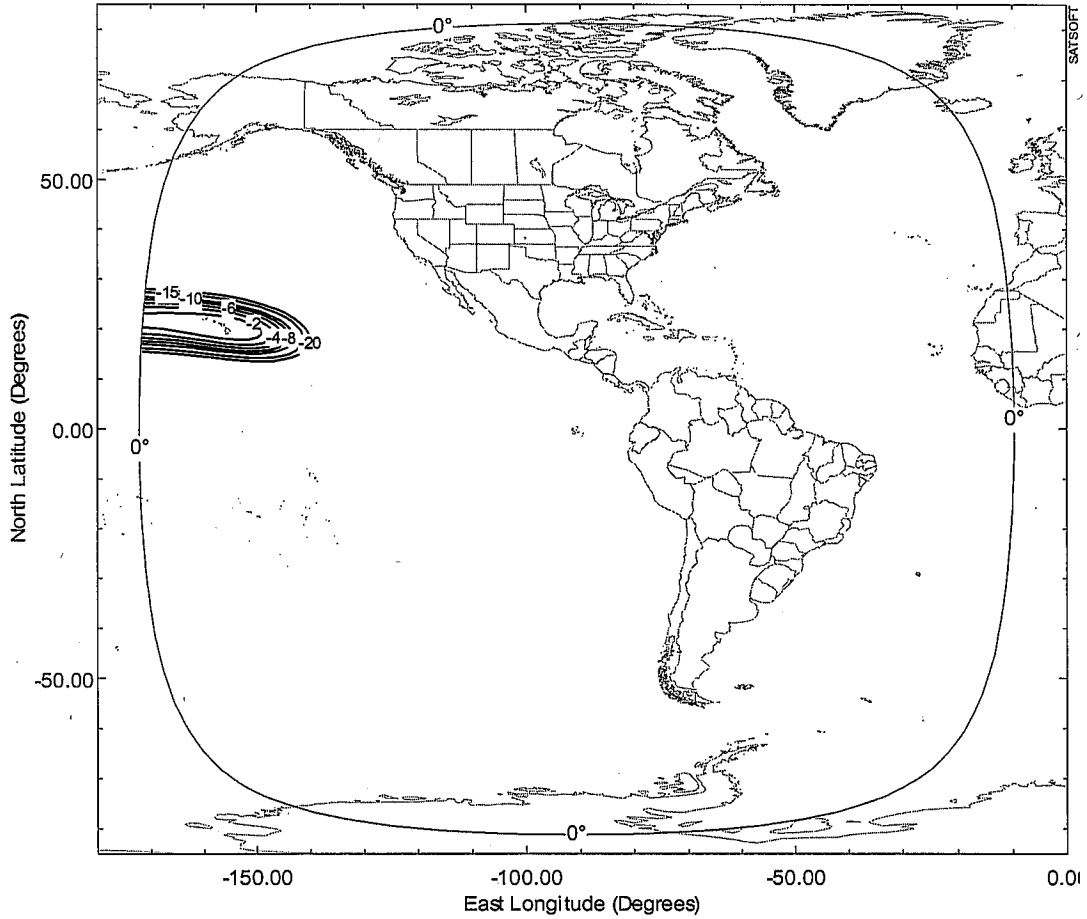
**EXHIBIT 3C-2: GRA2 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



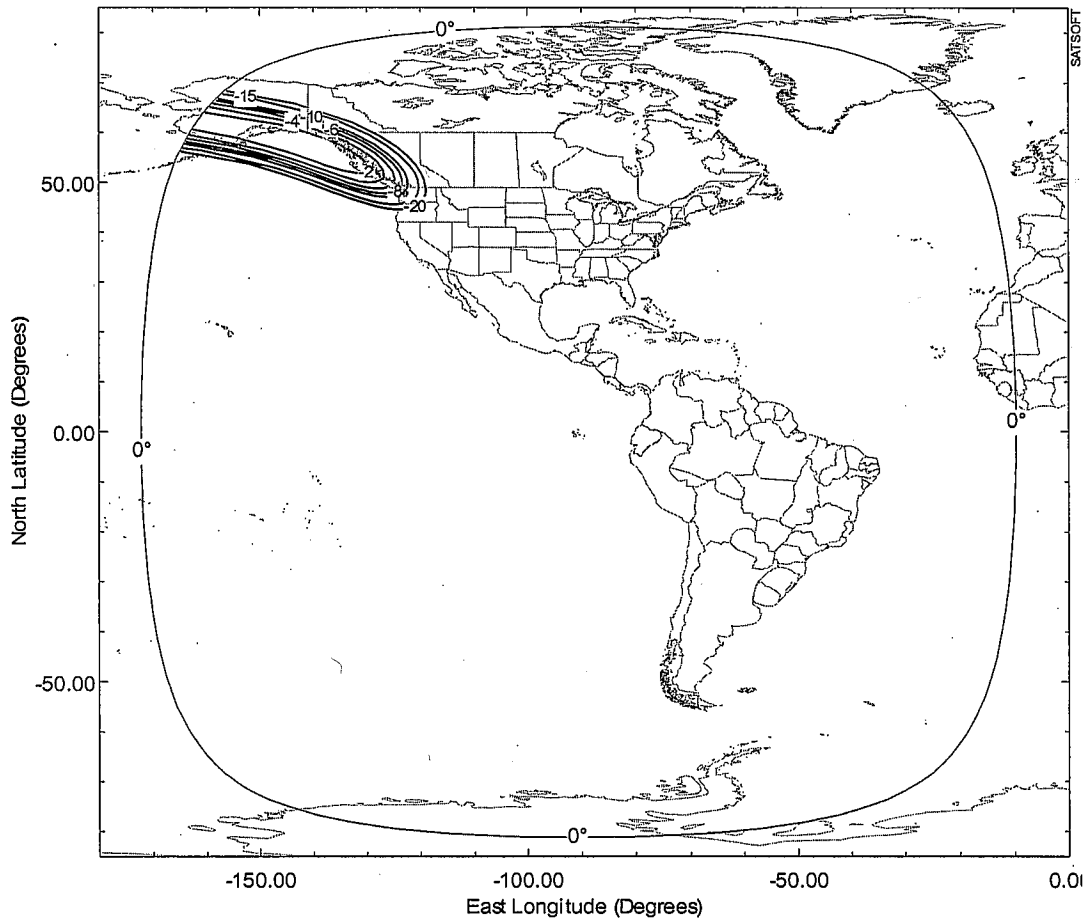
**EXHIBIT 3C-3: GRA3 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



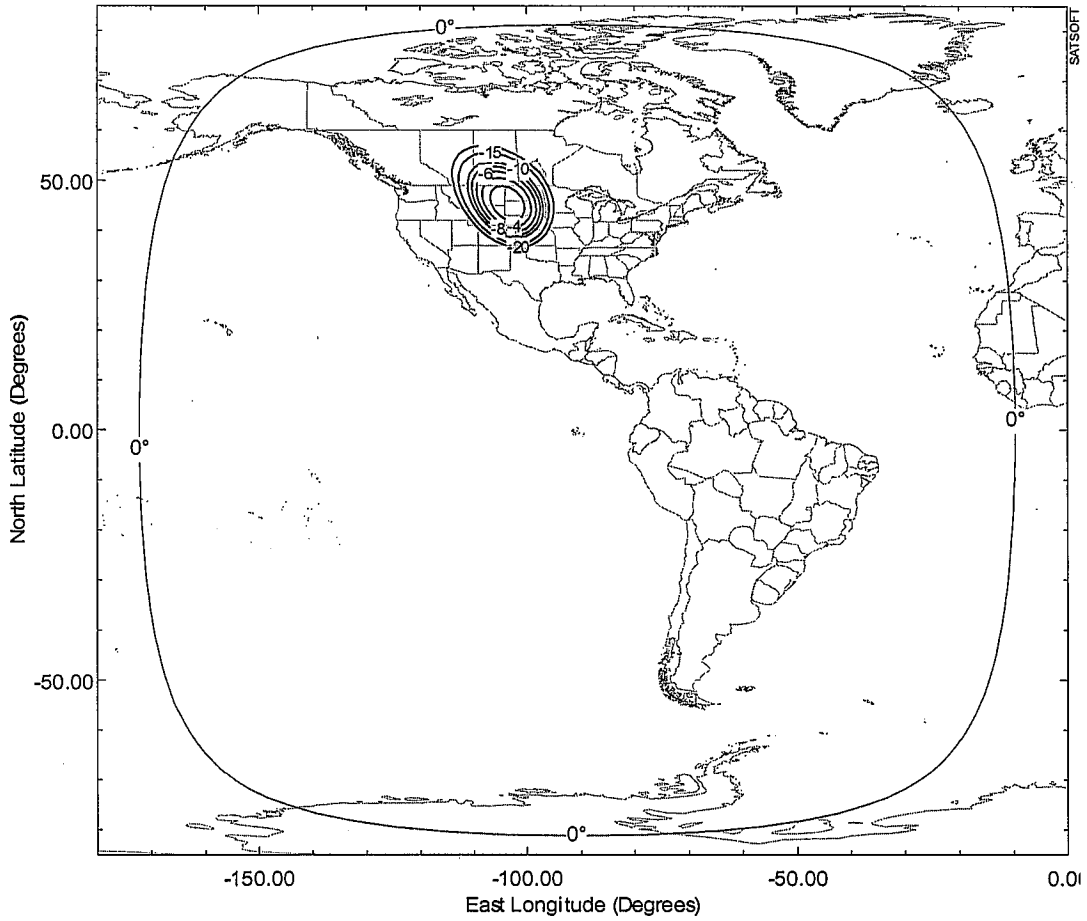
## EXHIBIT 3C-4: GRA4 LOCAL SPOT RECEIVE BEAM

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



**EXHIBIT 3C-5: GRB1 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



**EXHIBIT 3C-6: GRB2 LOCAL SPOT RECEIVE BEAM**

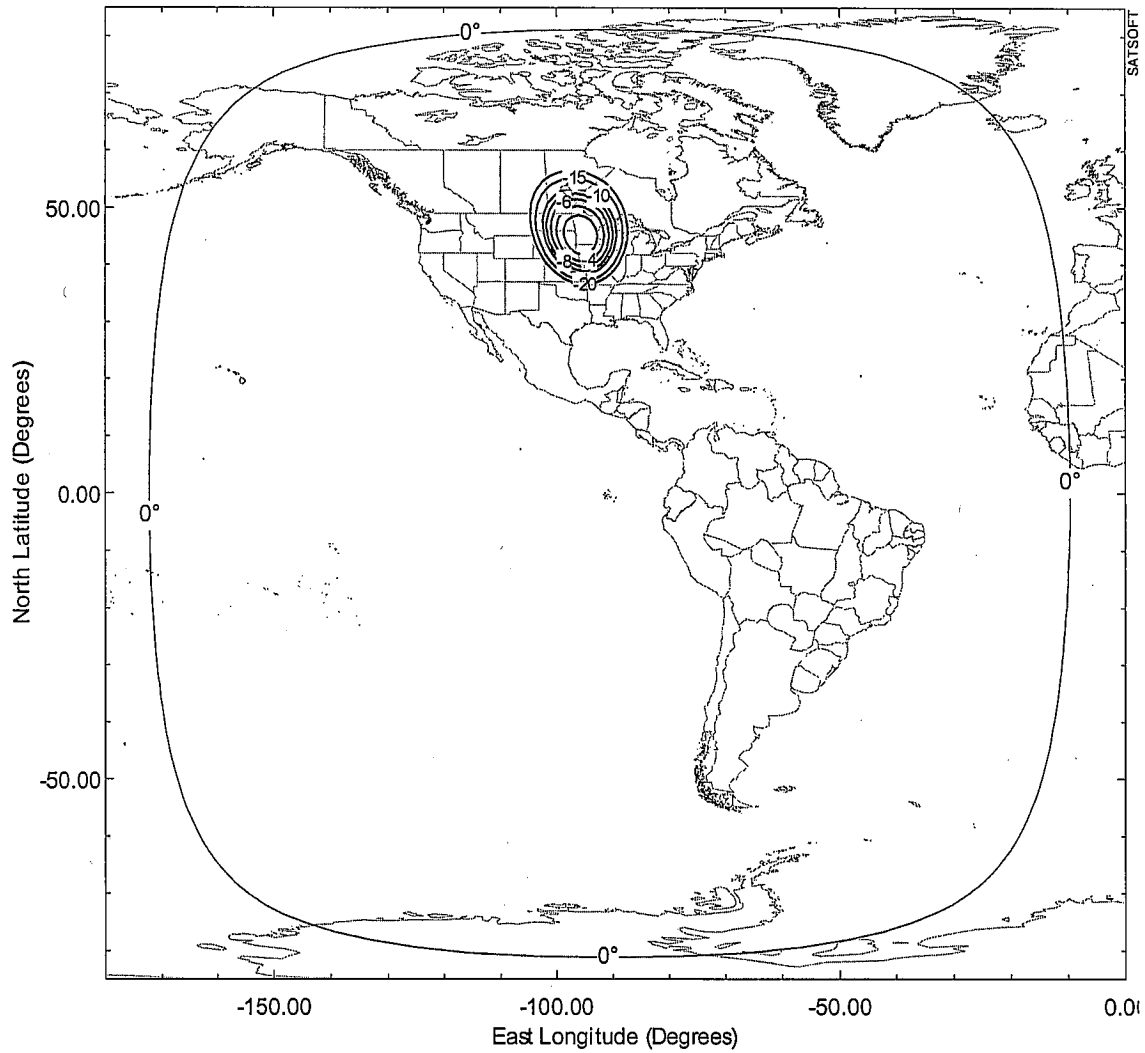
Beam Polarization: Left Hand Circular

Peak Antenna Gain: 46.1 dBi

Peak G/T: 16.5 dB/K

Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>

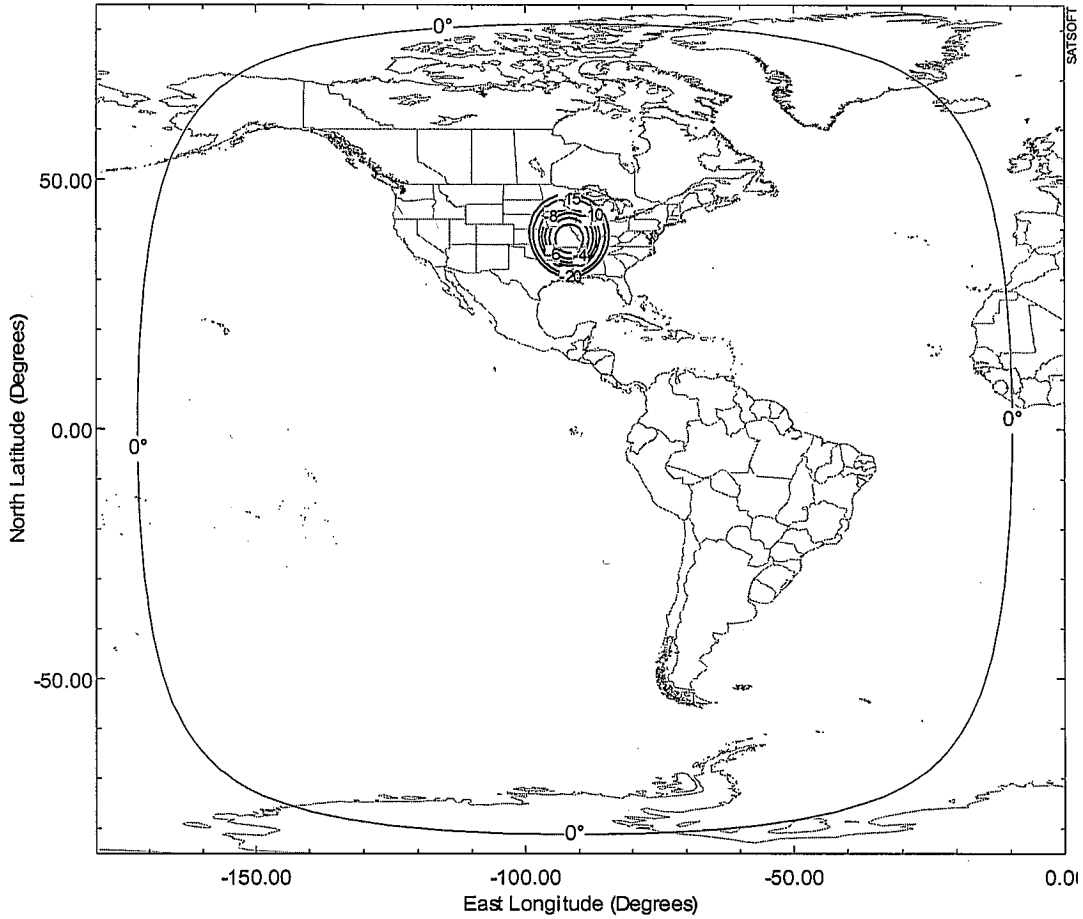
(Schedule S Beam Designation: GR)





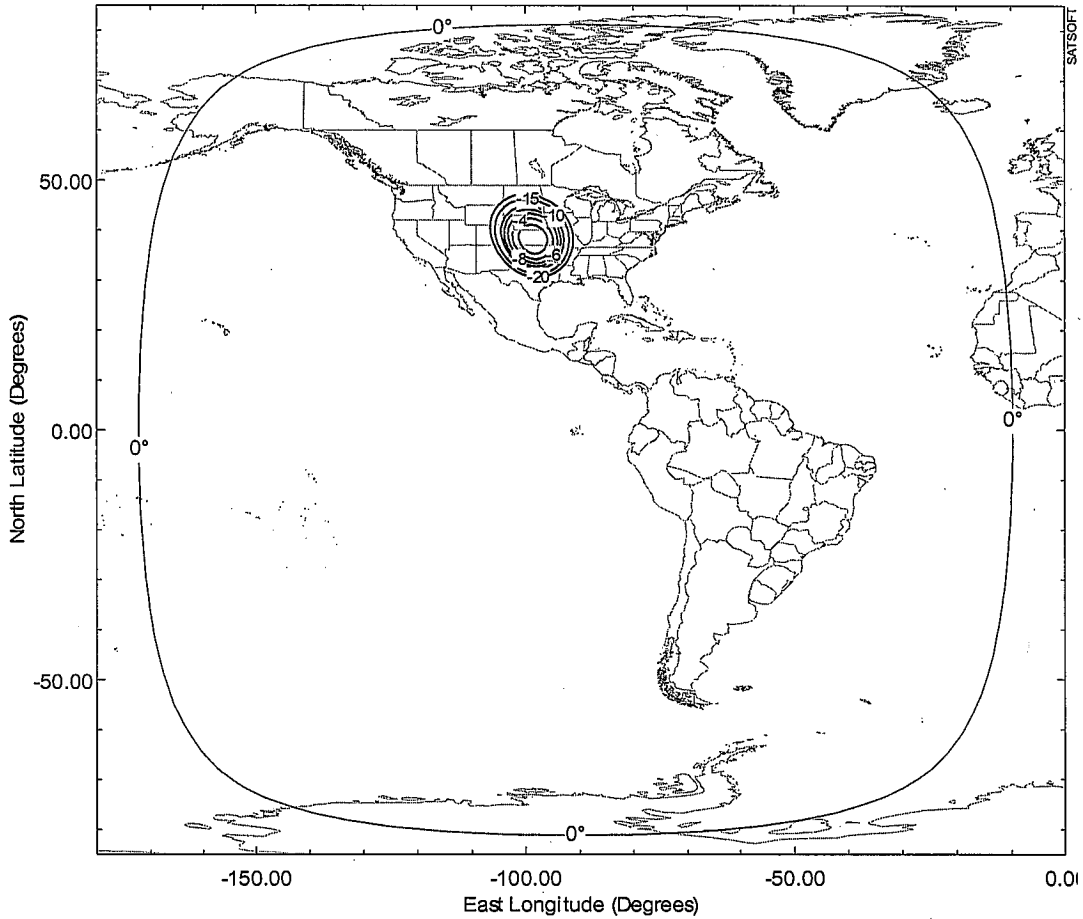
**EXHIBIT 3C-7: GRB3 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



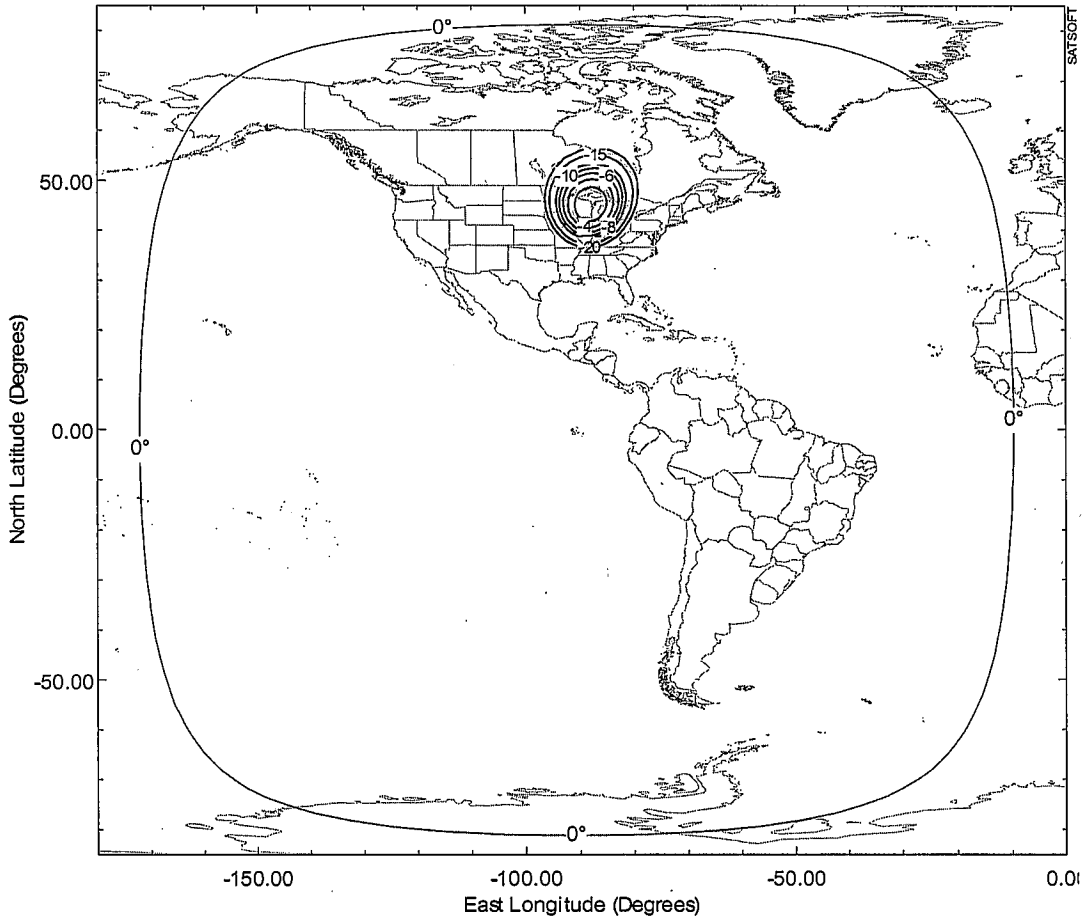
**EXHIBIT 3C-8: GRB4 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



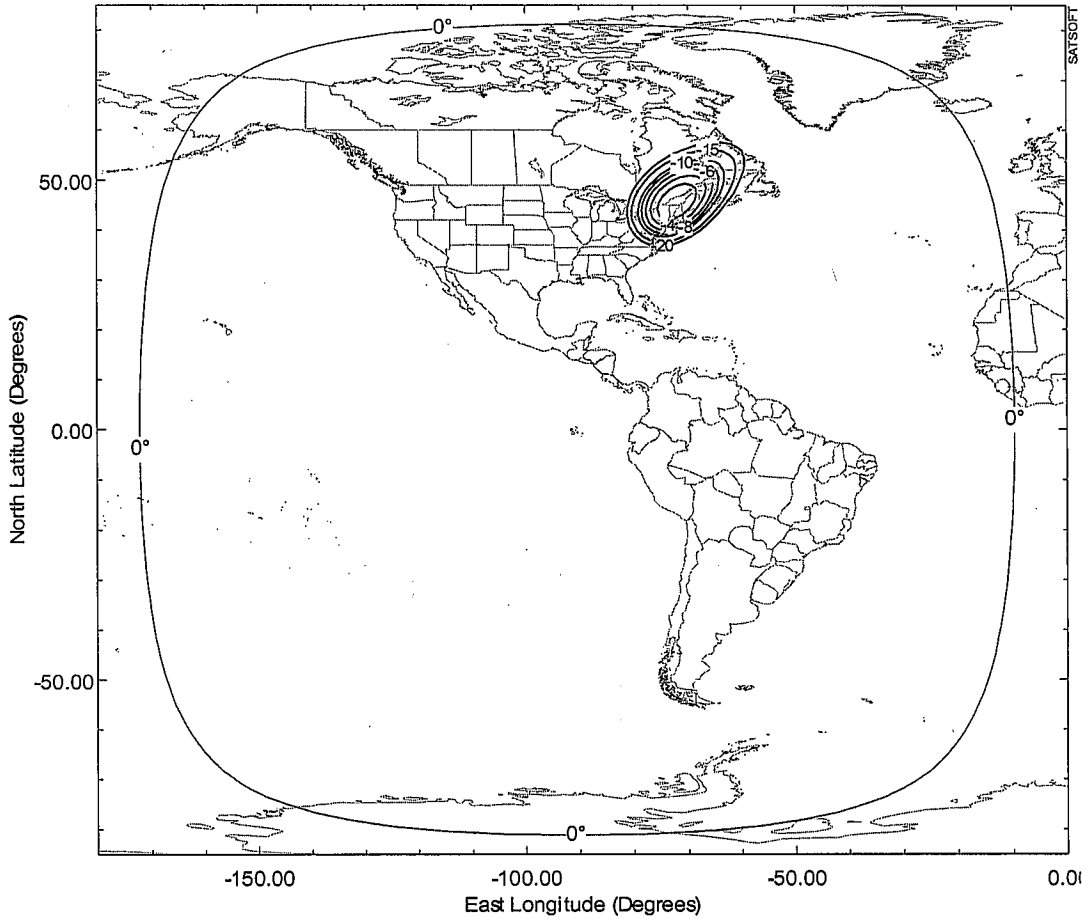
**EXHIBIT 3C-9: GRC1 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



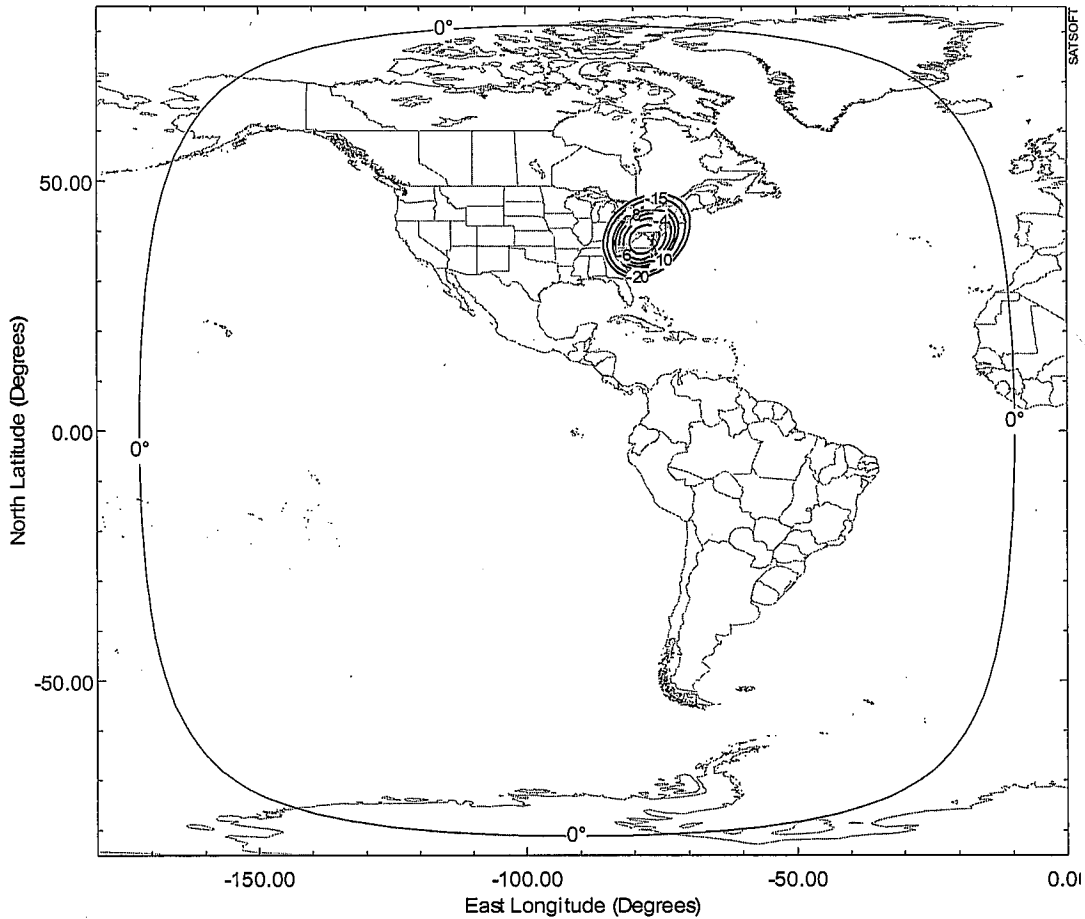
**EXHIBIT 3C-10: GRC2 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



## EXHIBIT 3C-11: GRC3 LOCAL SPOT RECEIVE BEAM

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T:  $-110$  to  $-85$  dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



**EXHIBIT 3C-12: GRC4 LOCAL SPOT RECEIVE BEAM**

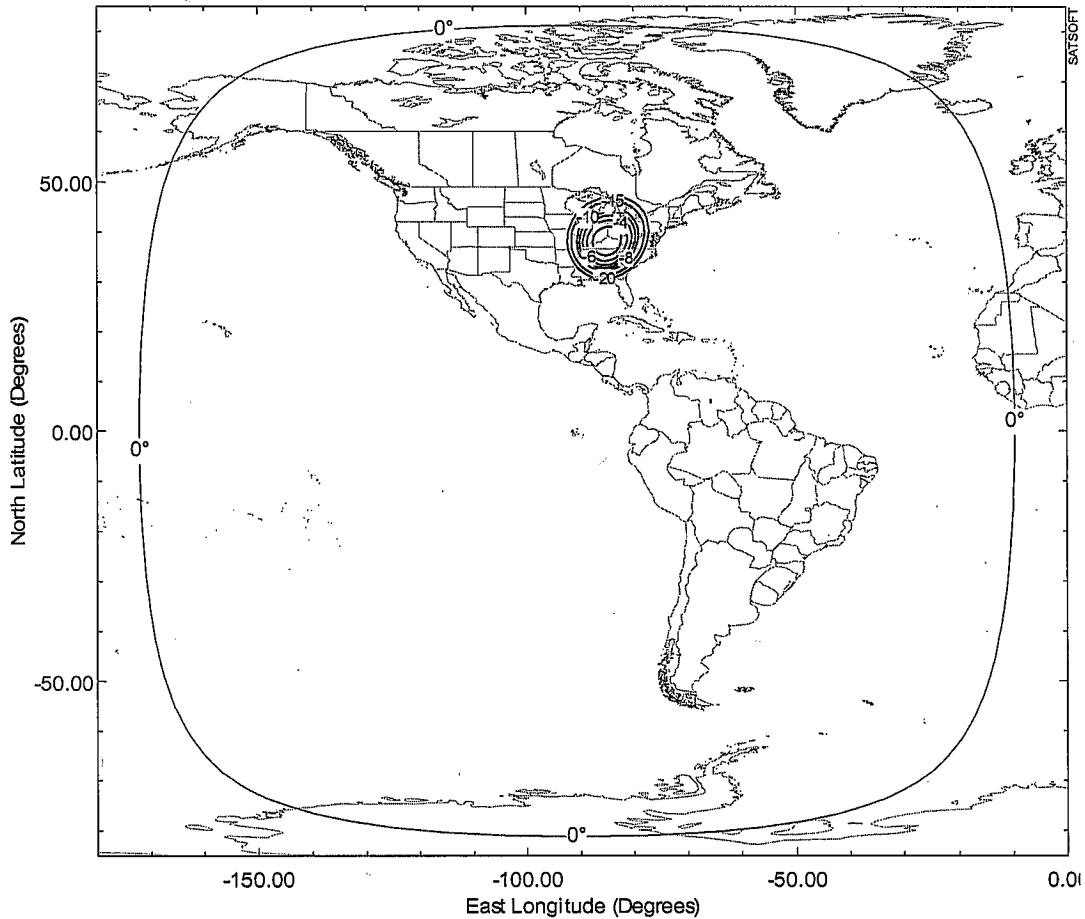
Beam Polarization: Left Hand Circular

Peak Antenna Gain: 46.1 dBi

Peak G/T: 16.5 dB/K

Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>

(Schedule S Beam Designation: GR)



**EXHIBIT 3C-13: GRD1 LOCAL SPOT RECEIVE BEAM**

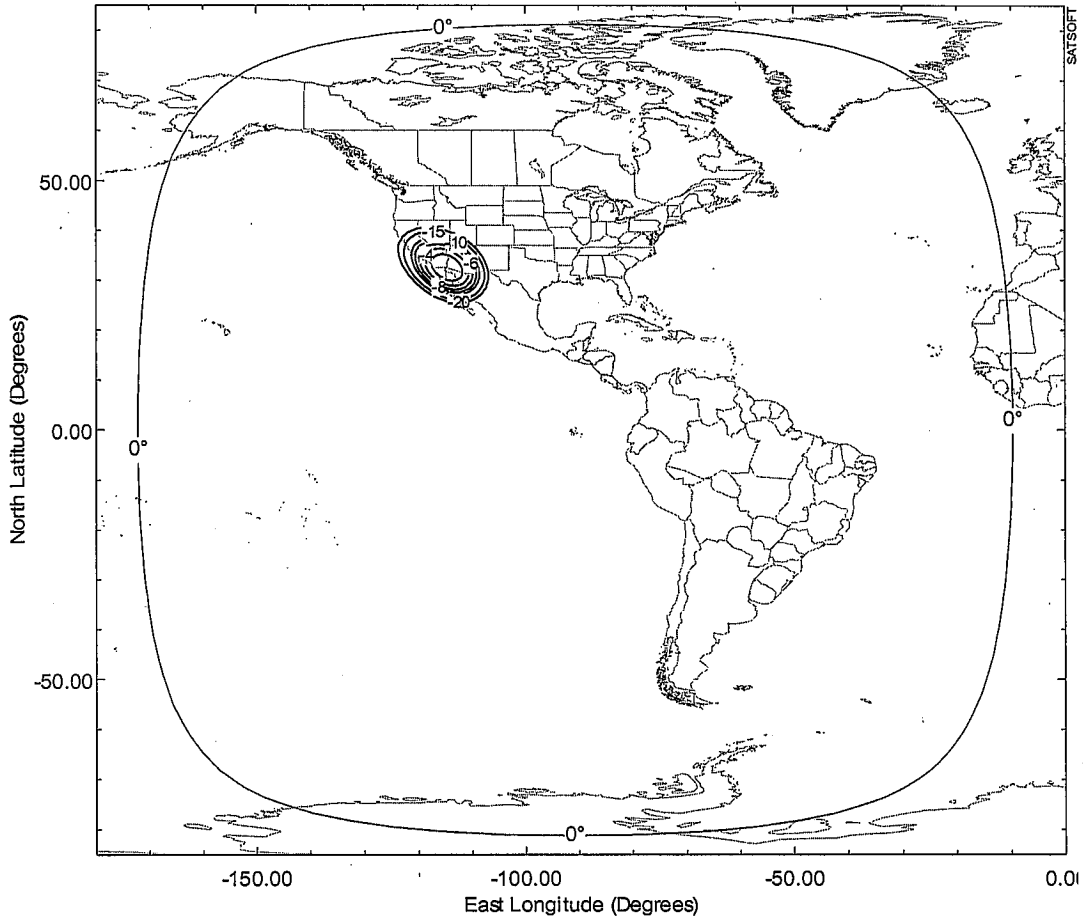
Beam Polarization: Left Hand Circular

Peak Antenna Gain: 46.1 dBi

Peak G/T: 16.5 dB/K

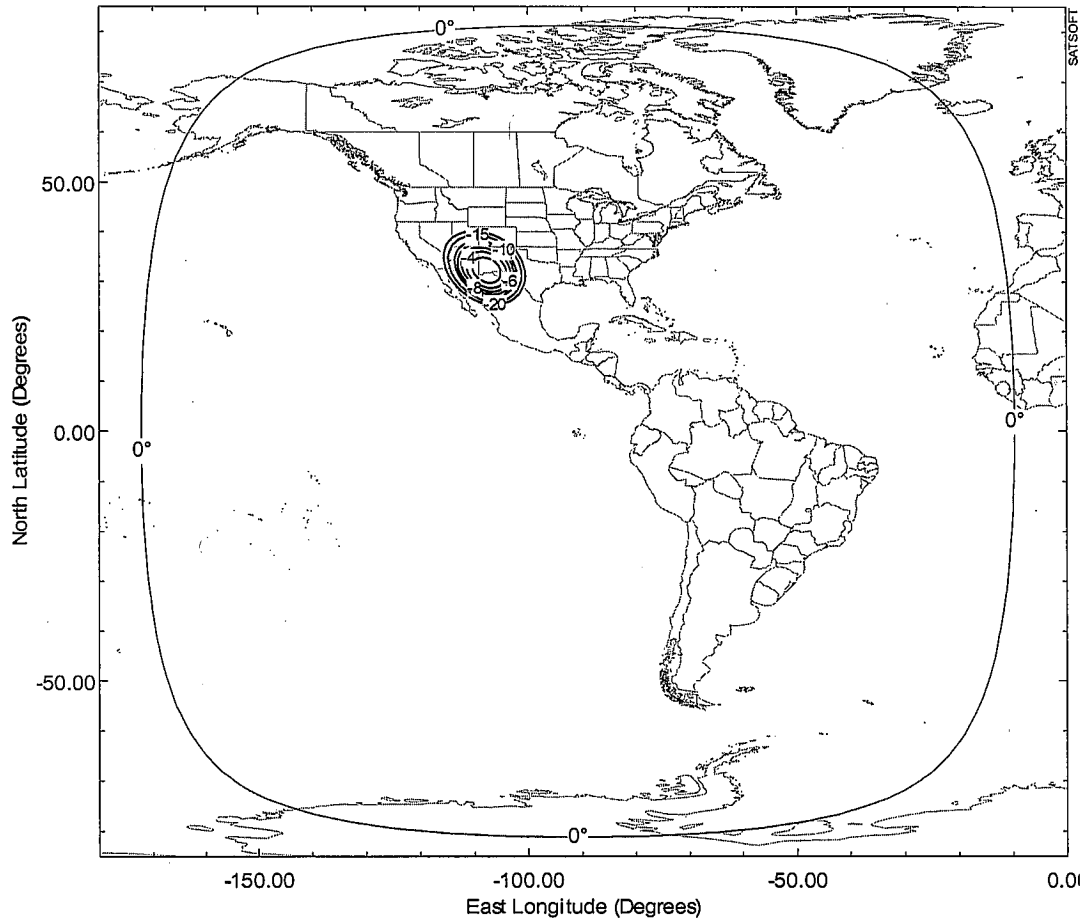
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>

(Schedule S Beam Designation: GR)



## EXHIBIT 3C-14: GRD2 LOCAL SPOT RECEIVE BEAM

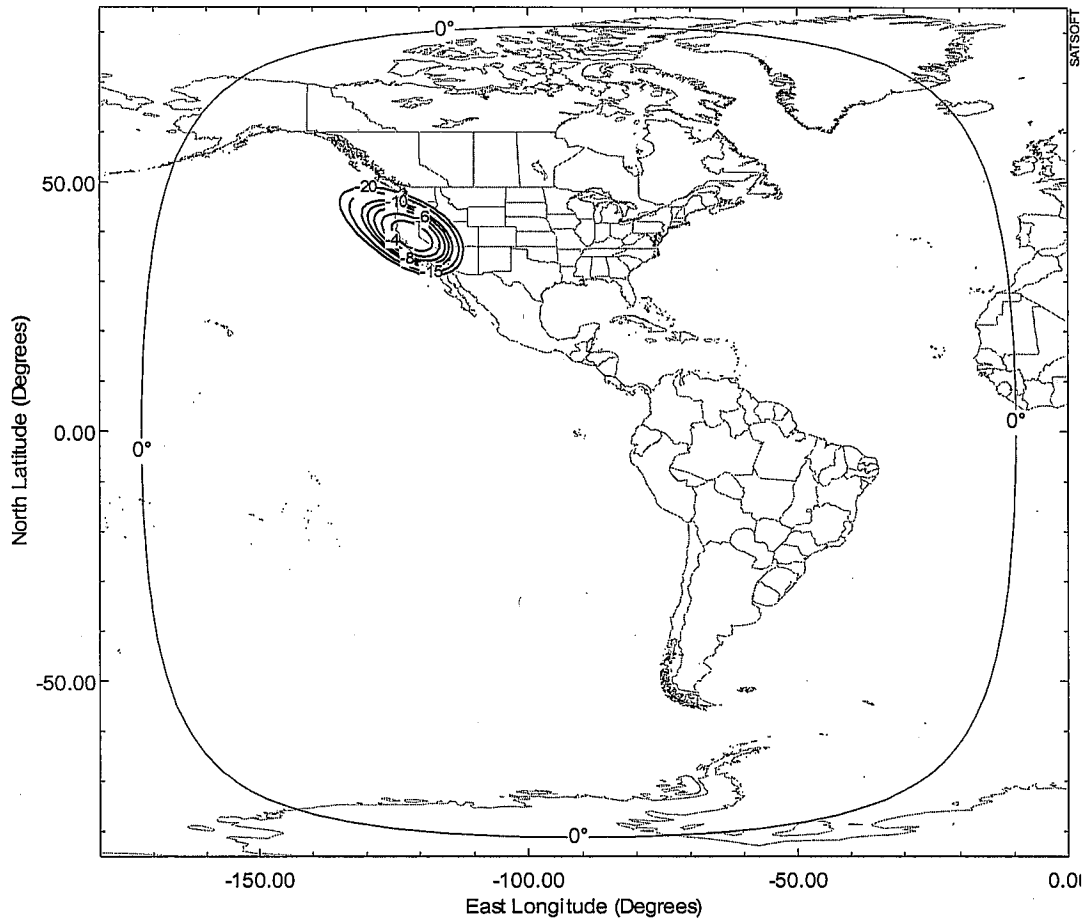
Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)





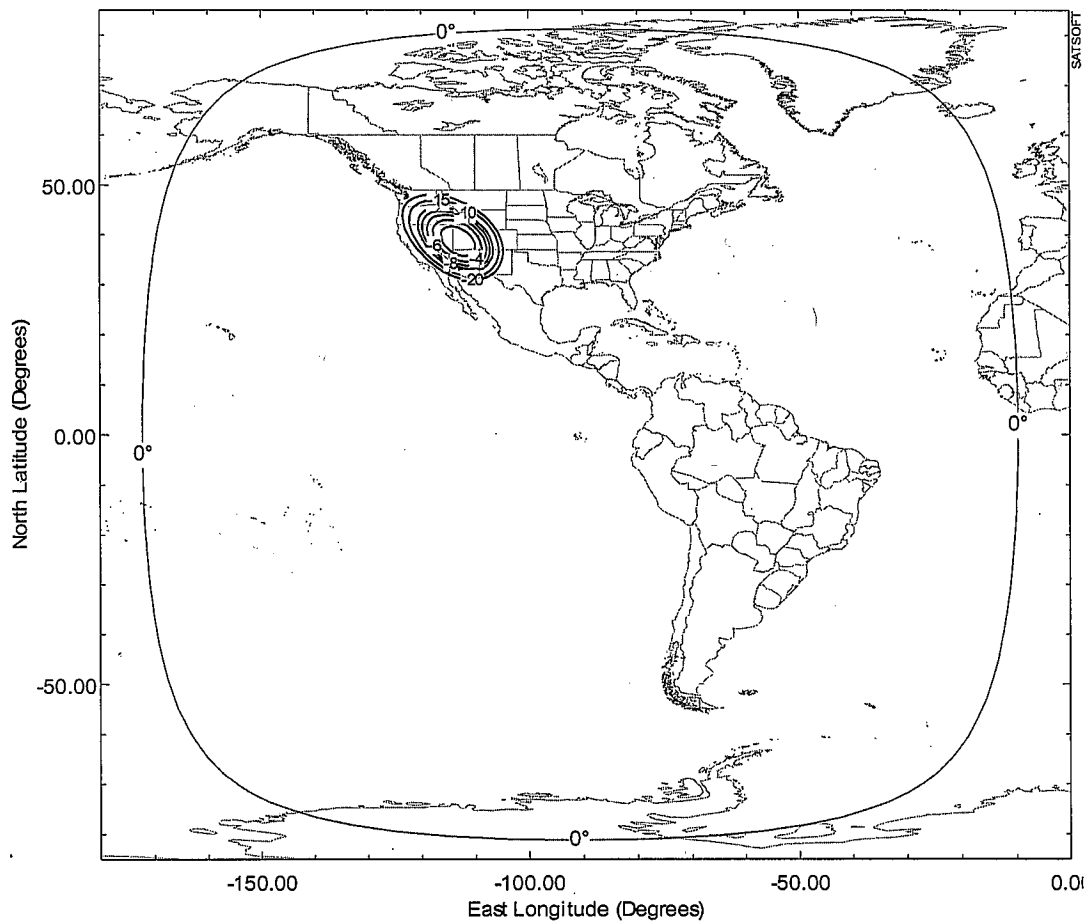
**EXHIBIT 3C-15: GRD3 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



## EXHIBIT 3C-16: GRD4 LOCAL SPOT RECEIVE BEAM

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T:  $-110$  to  $-85$  dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



## EXHIBIT 3C-17: GRE1 LOCAL SPOT RECEIVE BEAM

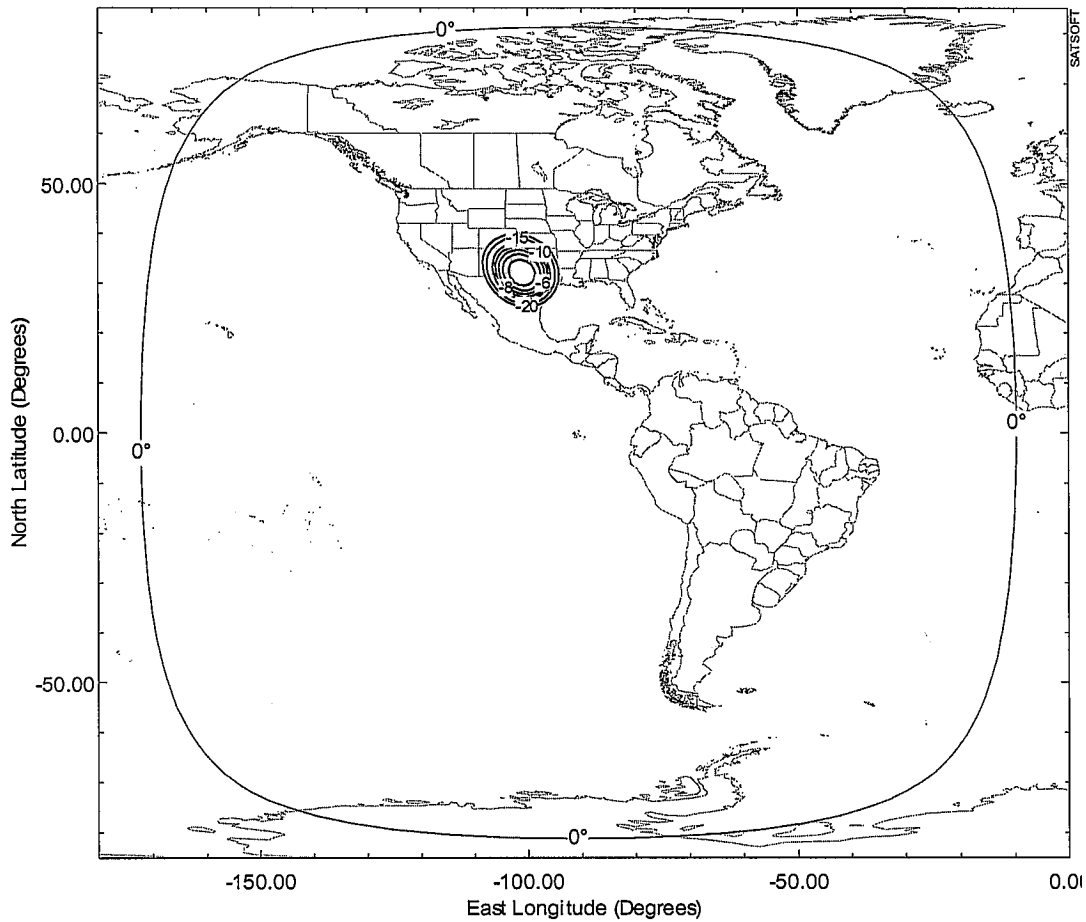
Beam Polarization: Left Hand Circular

Peak Antenna Gain: 46.1 dBi

Peak G/T: 16.5 dB/K

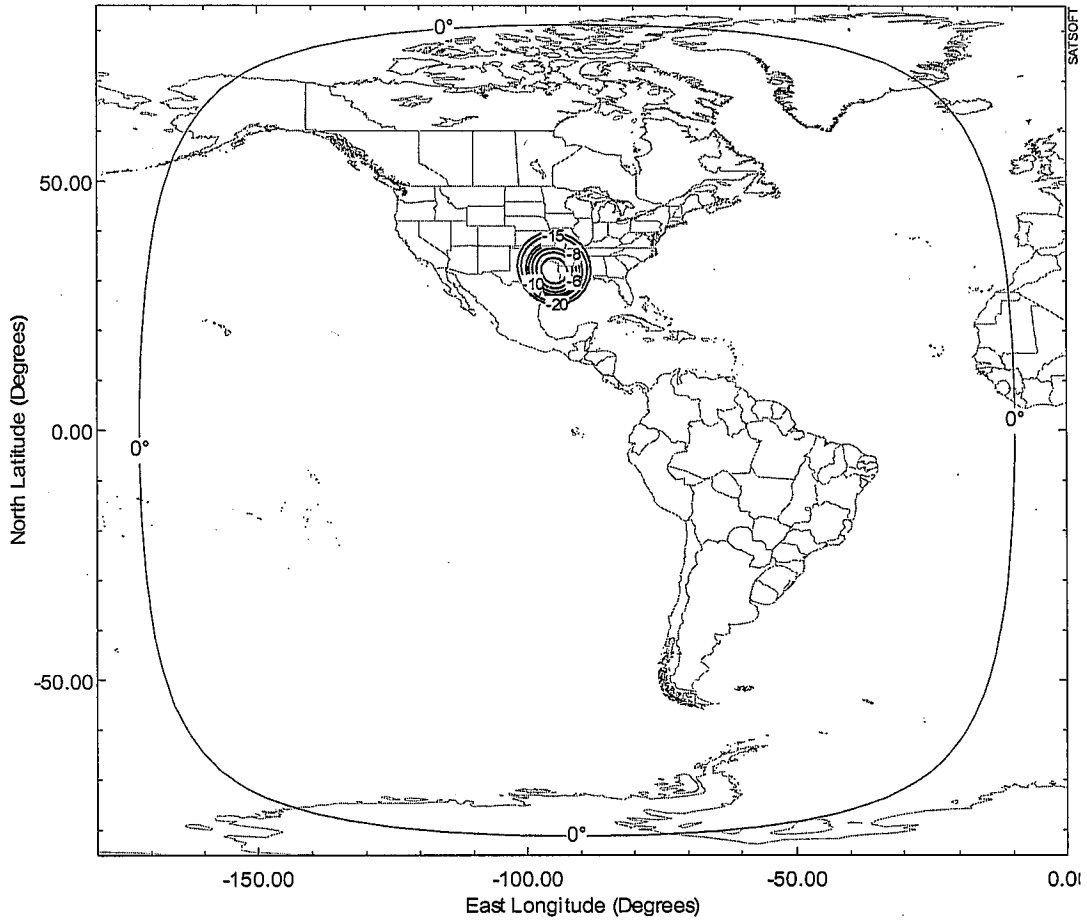
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>

(Schedule S Beam Designation: GR)



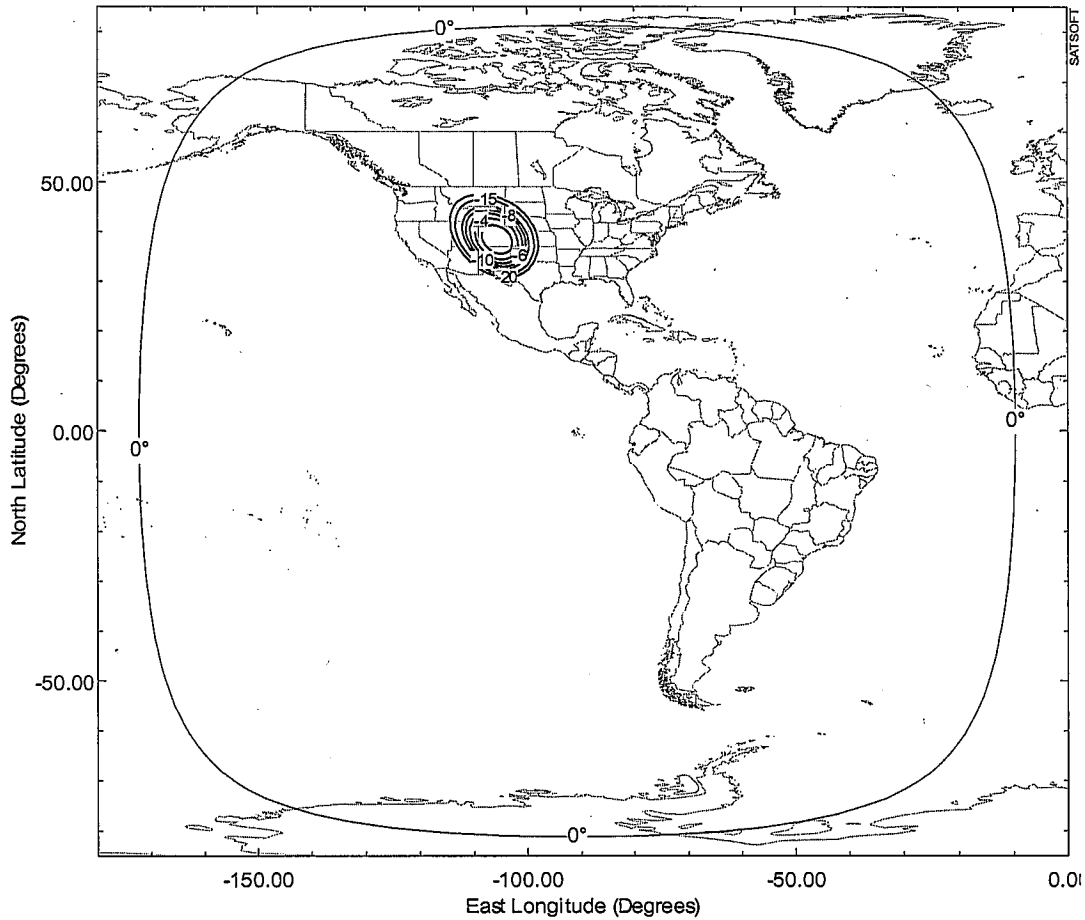
**EXHIBIT 3C-18: GRE2 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



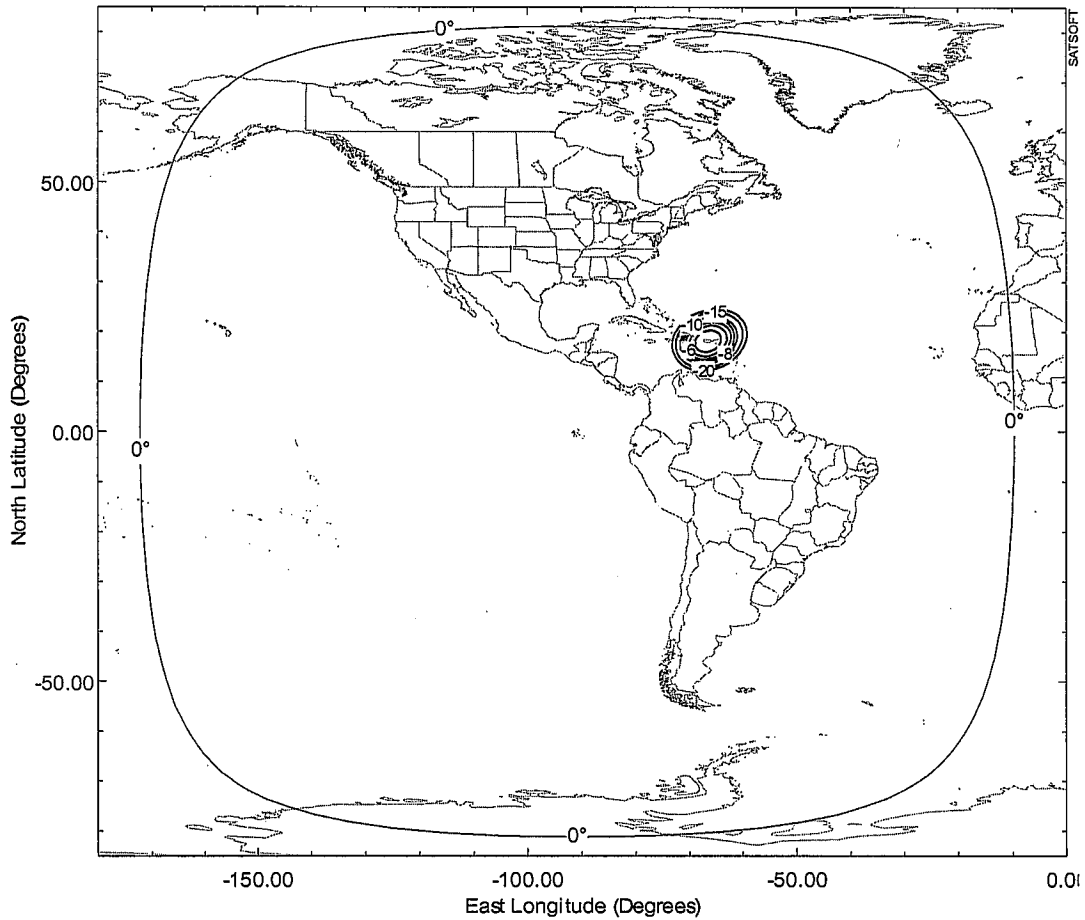
**EXHIBIT 3C-19: GRE3 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T:  $-110$  to  $-85$  dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



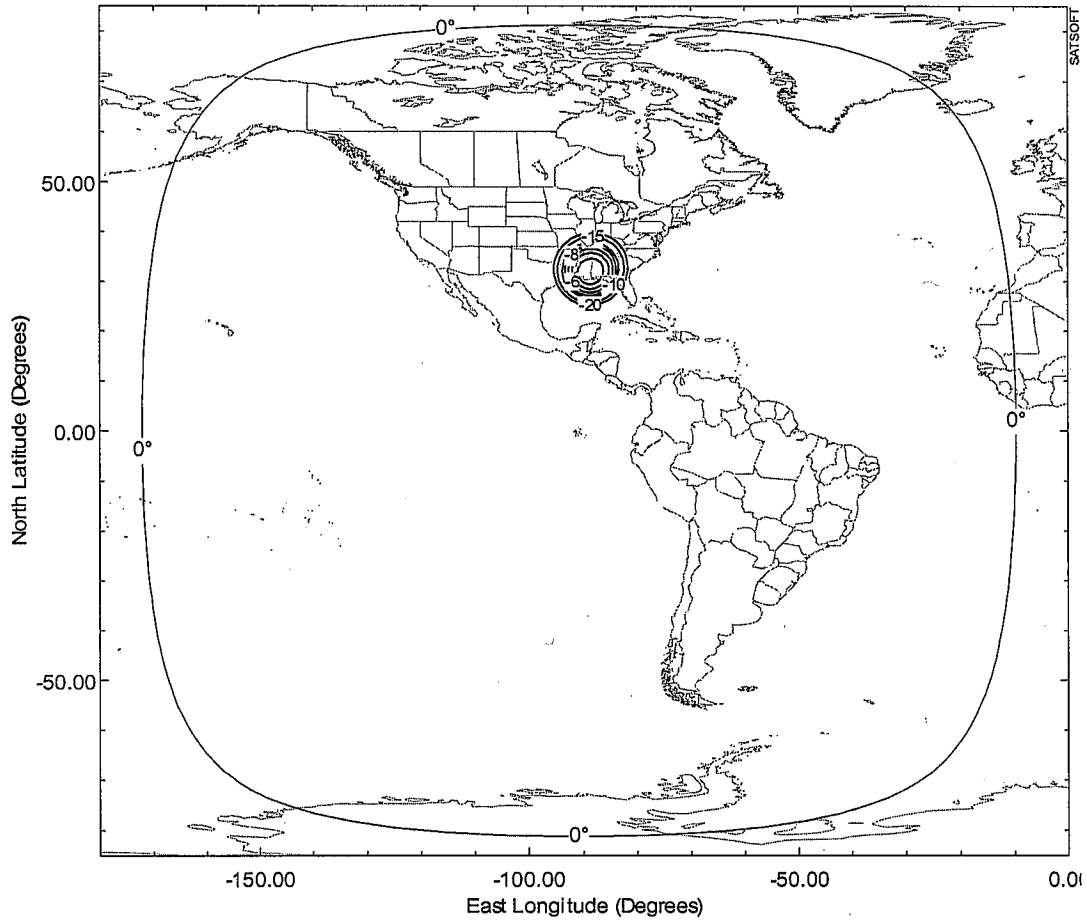
## EXHIBIT 3C-20: GRE4 LOCAL SPOT RECEIVE BEAM

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



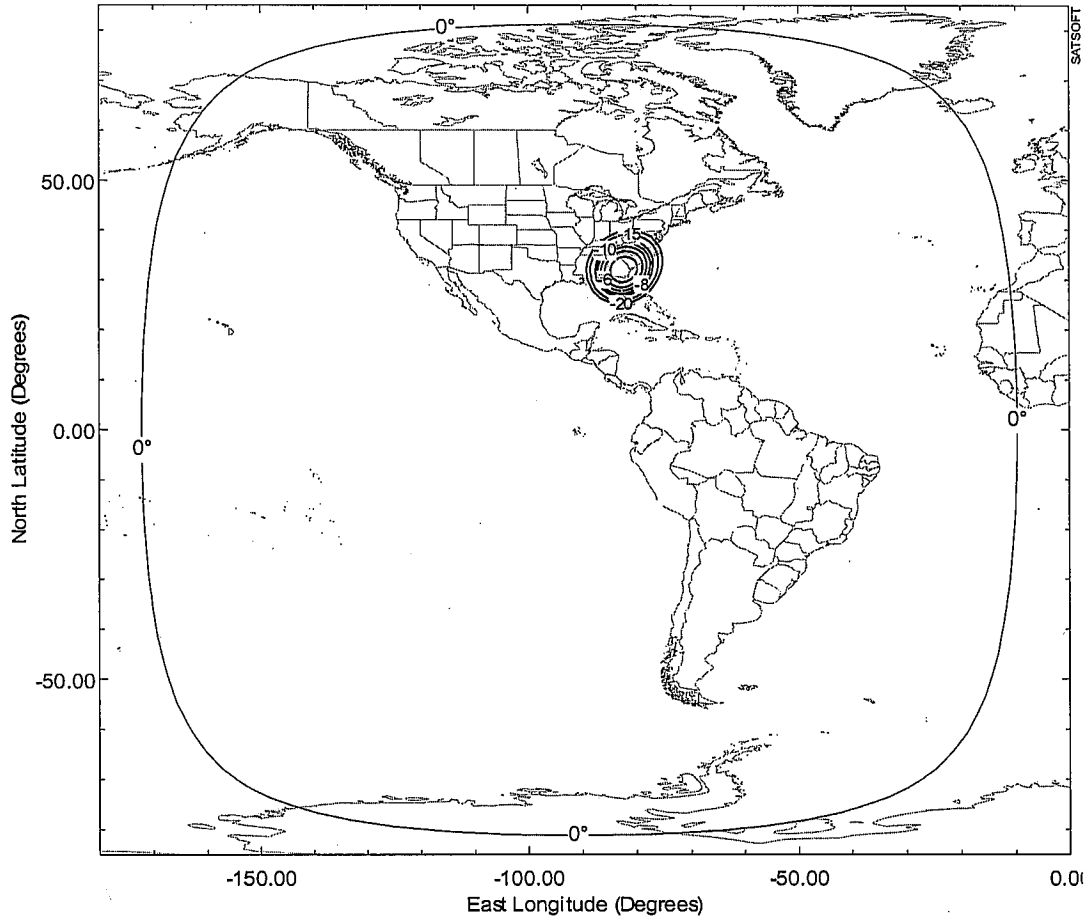
**EXHIBIT 3C-21: GRF1 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



**EXHIBIT 3C-22: GRF2 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T:  $-110$  to  $-85$  dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)





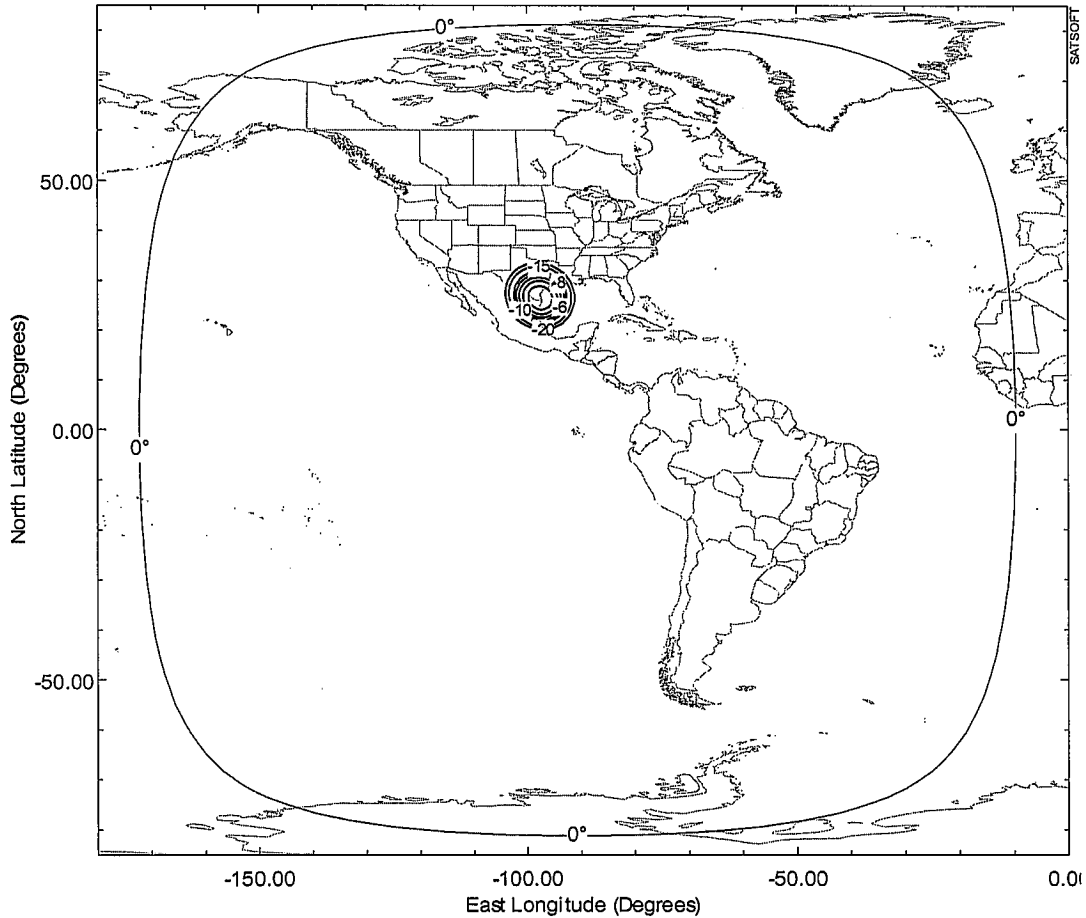
## EXHIBIT 3C-23: GRF3 LOCAL SPOT RECEIVE BEAM

Beam Polarization: Left Hand Circular

Peak Antenna Gain: 46.1 dBi

Peak G/T: 16.5 dB/K

Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)



**EXHIBIT 3C-24: GRF4 LOCAL SPOT RECEIVE BEAM**

Beam Polarization: Left Hand Circular  
Peak Antenna Gain: 46.1 dBi  
Peak G/T: 16.5 dB/K  
Saturated Flux Density at Peak G/T: -110 to -85 dBW/m<sup>2</sup>  
(Schedule S Beam Designation: GR)

