also filed in CS Docket No. 01-348

May 30, 2002

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Attn: JoAnn Lucanik
International Bureau

Re: Application of EchoStar Satellite Corporation and Hughes Electronics Corporation for Authority to Launch and Operate NEW ECHOSTAR 1

Dear Ms. Dortch:

On March 28, 2002, EchoStar Satellite Corporation and Hughes Electronics Corporation filed additional technical information (the "Technical Supplement") related to their application (FCC File No. SAT-LOA-20020225-00023) for authority to launch and operate a new state-of-the-art, spot-beam direct broadcast satellite, NEW ECHOSTAR 1, at the 110° W.L. orbital location. It has come to the parties' attention that the Commission's database may not include a complete copy of the Technical Supplement. In order to ensure that the Commission has all the information that the parties intended to submit, we are re-filing the Technical Supplement along with new engineering certifications. Also enclosed is a CD-ROM as referenced in Item B.3(g)(5) of the enclosed Technical Supplement.

Please do not hesitate to contact us should you have any questions.

Respectfully submitted,

Pantelis Michalopoulos /AHS

Pantelis Michalopoulos
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Respectfully submitted,

Gary Epstein
James H. Barker
Arthur S. Landerholm
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Latham & Watkins
Counsel for Hughes Electronics Corporation

(202) 637-2200

TECHNICAL ANNEX

NEW ECHOSTAR-1 (USABSS-16)

INTERFERENCE ANALYSES

March 2002

APPENDIX 1

ANNEX 2 TO APPENDIX S30

APPENDIX S4 INFORMATION FOR USABSS-16

BASIC CHARACTERISTICS TO BE FURNISHED IN NOTICES RELATING TO SPACE STATIONS IN THE BROADCASTING-SATELLITE SERVICE

APPENDIX S4 INFORMATION FOR USABSS-16

A.1 Identity of the satellite network

a) Identity of a satellite network: USABSS-16

b) Country: USA

Beam Identification: US16BS01, US16BS02, US16BS03, US16BS04, US16BS05, US16BS06, US16BS07, US16BS08, US16BS09, US16BS10, US16BS11, US16BS12, US16BS13, US16BS14, US16BS15, US16BS16, US16BS17, US16BS18, US16BS19, US16BS20, US16BS21, US16BS22, US16BS23, US16BS24, US16BS25, US16BS26, US16BS27, US16BS28, US16BS29, US16BS30, US16BS31, US16BS32, US16BS33, US16BS34, US16BS35, US16BS36, US16BS37, US16BS38

f) Country symbol of the notifying administration: USA

A.2 Date of Bringing Into Use

a) Date of Bringing into Use: February 2005

A.3 Operation administration or agency

A.3 Operating administration or agency: 120 (USA)

A.4 Orbital information

a) For the case of a space station onboard a GSO satellite:

1) nominal geographical longitude on the geostationary-satellite orbit: 110° W.L.

2) planned longitudinal tolerance and inclination excursion: ± 0.05° E-W; ± 0.05° N-S

A.5 Coordination

A.6 Agreements

A.8 Rain Climatic Zones:

A.8 Rain climatic zones consistent with Figure 3 of Annex 5 of Appendix 30

A.11 Regular Hours of Operation

A.11 Regular Hours of Operation: 24 hrs./day; 365 days/year

B.1 Designation of the satellite antenna beam

US16BS01, US16BS02, US16BS03, US16BS04, US16BS05, US16BS06, US16BS07, US16BS08, US16BS09, US16BS10, US16BS11, US16BS12, US16BS13, US16BS14, US16BS15, US16BS16, US16BS17, US16BS18, US16BS19, US16BS20, US16BS21,

US16BS22, US16BS23, US16BS24, US16BS25, US16BS26, US16BS27, US16BS28, US16BS29, US16BS30, US16BS31, US16BS32, US16BS33, US16BS34, US16BS35, US16BS36, US16BS37, US16BS38

B.3 Geostationary Space Station Antenna Characteristics

d) Pointing accuracy of the antenna: 0.1 degree in any direction

g) For the case of a space station submitted in accordance with Appendix S30:

1) co-polar and cross-polar gain of antenna: see Table 1
2) shape of the beam: all beams shaped
3) for circular beams: not applicable
4) for elliptical beams: not applicable
5) for beams other than circular or elliptical shape:
   - co-polar and cross-polar gain contours: co-polar and cross-polar beam contours in GIMS format are provided on CD-ROM accompanying this Technical Annex
   - beam aim point longitude and latitude: see Table 1

Table 1. USABSS-16 Beam Information

Beam	Co-pol Gain, dB	X-pol Gain, dB	Aim Point Long., W	Aim Point Lat., N		Beam	Co-pol Gain, dB	X-pol Gain, dB	Aim Point Long., W	Aim Point Lat., N
US16BS01	36.6	8.6	143.0	59.9		US16BS21	44.1	16.1	89.3	45.6
US16BS02	36.7	8.7	158.0	21.0		US16BS22	44.1	16.1	90.0	40.7
US16BS03	36.6	8.6	121.1	42.1		US16BS23	44.1	16.1	92.7	36.5
US16BS04	40.6	12.6	116.0	43.5		US16BS24	44.6	16.6	93.7	29.8
US16BS05	44.8	16.8	114.7	33.2		US16BS25	43.6	15.6	83.9	46.7
US16BS06	40.6	12.6	110.6	48.1		US16BS26	44.6	16.6	86.3	39.9
US16BS07	40.6	12.6	112.4	44.3		US16BS27	44.6	16.6	85.6	36.4
US16BS08	40.9	12.9	107.8	44.7		US16BS28	44.6	16.6	90.5	33.7
US16BS09	40.6	12.6	108.4	38.7		US16BS29	44.6	16.6	89.9	30.7
US16BS10	39.6	11.6	102.4	47.2		US16BS30	44.56	16.6	72.5	44.9
US16BS11	41.1	13.1	103.3	43.7		US16BS31	44.6	16.6	78.5	41.0
US16BS12	40.6	12.6	98.8	44.3		US16BS32	45.1	17.1	80.2	38.0
US16BS13	41.6	13.6	99.5	41.0		US16BS33	45.1	17.1	85.8	31.6
US16BS14	42.1	14.1	102.4	34.7		US16BS34	45.1	17.1	84.6	29.7
US16BS15	41.6	13.6	102.1	30.9		US16BS35	44.6	16.6	62.6	48.4
US16BS16	42.6	14.6	96.0	43.4		US16BS36	45.1	17.1	75.8	39.5
US16BS17	42.6	14.6	95.5	37.0		US16BS37	44.6	16.6	74.8	36.1
US16BS18	41.6	13.6	97.9	33.2		US16BS38	45.1	17.1	80.1	33.1
US16BS19	43.4	15.4	97.2	30.5						
US16BS20	42.6	14.6	99.3	27.5						

C.2 Assigned frequency (frequencies)

a) In accordance with Appendix S30, channel numbers 18, 20, 22, 24, 26, 28, 30, 32

NOTE: Channels will not be operated simultaneously with any other BSS space stations in the 110 degree W.L. cluster

C.4 Class of station(s) and Nature of service

Class of Station: EV

Nature of Service: CR

C.6 Polarization

Type of Polarization: Circular

Sense of Polarization: Left-hand

C.7 Class of Emission

a) Class of emission and necessary bandwith:

Class of Emission: 24M0G7W

Necessary Bandwidth: 24 MHz

C.8 Power characteristics of the transmission

h) Table 2 lists the power supplied to the antenna for each beam and each channel. Also provided for each beam and channel is the maximum power density per Hz.

Maximum power density per Hz for 24M0G7W emission: see Table 2

Table 2. USABSS-16 Transmission Characteristics

Beam	BSS CH.	Power to Antenna dBW	Max. Power Density per Hz			Beam	BSS CH.	Power to Antenna dBW	Max. Power Density per Hz		
			5 MHz	40 kHz	4 kHz				5 MHz	40 kHz	4 kHz
US16BS01	30	11.1	-62.7	-62.7	-62.7	US16BS23	18	17.2	-56.6	-56.6	-56.6
US16BS01	24	10.0	-63.8	-63.8	-63.8	US16BS24	28	19.6	-54.2	-54.2	-54.2
US16BS02	18	9.9	-63.9	-63.9	-63.9	US16BS25	24	12.1	-61.7	-61.7	-61.7
US16BS02	20	9.9	-63.9	-63.9	-63.9	US16BS26	20	14.9	-58.9	-58.9	-58.9
US16BS03	20	12.0	-61.8	-61.8	-61.8	US16BS26	28	13.1	-60.7	-60.7	-60.7
US16BS04	28	12.6	-61.2	-61.2	-61.2	US16BS26	22	13.3	-60.5	-60.5	-60.5
US16BS05	18	9.4	-64.4	-64.4	-64.4	US16BS27	26	15.5	-58.3	-58.3	-58.3
US16BS06	32	12.6	-61.2	-61.2	-61.2	US16BS27	24	17.1	-56.7	-56.7	-56.7
US16BS07	26	15.0	-58.8	-58.8	-58.8	US16BS28	32	17.3	-56.5	-56.5	-56.5
US16BS08	24	12.6	-61.2	-61.2	-61.2	US16BS28	20	17.1	-56.7	-56.7	-56.7
US16BS09	30	9.8	-64.0	-64.0	-64.0	US16BS29	22	17.3	-56.5	-56.5	-56.5

Beam	BSS CH.	Power to Antenna dBW	Max. Power Density per Hz			Beam	BSS CH.	Power to Antenna dBW	Max. Power Density per Hz		
US16BS10	30	12.7	-61.1	-61.1	-61.1	US16BS30	24	15.8	-58.0	-58.0	-58.0
US16BS11	22	15.1	-58.7	-58.7	-58.7	US16BS30	22	15.7	-58.1	-58.1	-58.1
US16BS12	32	14.0	-59.8	-59.8	-59.8	US16BS31	32	15.1	-58.7	-58.7	-58.7
US16BS13	26	13.8	-60.0	-60.0	-60.0	US16BS31	30	15.0	-58.8	-58.8	-58.8
US16BS14	18	15.2	-58.6	-58.6	-58.6	US16BS31	18	14.5	-59.3	-59.3	-59.3
US16BS15	26	14.6	-59.2	-59.2	-59.2	US16BS32	28	16.2	-57.6	-57.6	-57.6
US16BS16	18	12.1	-61.7	-61.7	-61.7	US16BS33	30	20.0	-53.8	-53.8	-53.8
US16BS17	24	18.0	-55.8	-55.8	-55.8	US16BS33	18	19.7	-54.1	-54.1	-54.1
US16BS18	22	19.4	-54.4	-54.4	-54.4	US16BS34	20	19.7	-54.1	-54.1	-54.1
US16BS19	32	16.0	-57.8	-57.8	-57.8	US16BS34	28	15.8	-58.0	-58.0	-58.0
US16BS20	18	8.9	-64.9	-64.9	-64.9	US16BS35	28	13.2	-60.6	-60.6	-60.6
US16BS21	20	11.0	-62.8	-62.8	-62.8	US16BS36	26	15.9	-57.9	-57.9	-57.9
US16BS21	22	14.6	-59.2	-59.2	-59.2	US16BS36	20	13.5	-60.3	-60.3	-60.3
US16BS21	28	14.5	-59.3	-59.3	-59.3	US16BS37	24	17.5	-56.3	-56.3	-56.3
US16BS22	26	15.6	-58.2	-58.2	-58.2	US16BS38	32	18.2	-55.6	-55.6	-55.6
US16BS22	32	14.3	-59.5	-59.5	-59.5	US16BS38	22	20.1	-53.7	-53.7	-53.7
US16BS22	30	16.0	-57.8	-57.8	-57.8						

C.9 Information on modulation characteristics

b) In the case of a space station submitted in accordance with Appendix S30:

1) type of modulation: QPSK
2) pre-emphasis characteristics: not applicable
3) TV standard: not applicable
4) sound-broadcasting characteristics: time division multiplexed compressed digital data
5) frequency deviation: not applicable
6) composition of the baseband: time division multiplexed compressed video and audio
7) type of multiplexing of the video and sound signal: time division multiplex
8) energy dispersal characteristics: carrier will always be modulated
9) digital modulation: effective bit rate: 30.32 Mbps (6/7 code rate), 23.58 Mbps (2/3 code rate); transmitted bit rate: 40 Mbps
10) roll-off factor of the filter of the receiver: in accordance with ITU-R BO1293-1

d) For stations operating in a frequency band subject to Nos. S22.5C, S22.5D or S22.5F provide:

- the type of mask;
- the mask idenfication code.

Not applicable

C.11 Service Area

c) Spot beams provide local coverage to several cities within the contiguous U.S. plus Hawaii and portions of Alaska (see Figure 1)

Test points

Beam	Test Point	Lat., N	Long., W
US16BS01	1	143.0	59.9
US16BS02	1	158.0	21.0
US16BS03	1	121.1	42.1
US16BS04	1	116.0	43.5
US16BS05	1	114.7	33.2
US16BS06	1	110.6	48.1
US16BS07	1	112.4	44.3
US16BS08	1	107.8	44.7
US16BS09	1	108.4	38.7
US16BS10	1	102.4	47.2
US16BS11	1	103.3	43.7
US16BS12	1	98.8	44.3
US16BS13	1	99.5	41.0
US16BS14	1	102.4	34.7
US16BS15	1	102.1	30.9
US16BS16	1	96.0	43.4
US16BS17	1	95.5	37.0
US16BS18	1	97.9	33.2
US16BS19	1	97.2	30.5
US16BS20	1	99.3	27.5

Beam	Test Point	Lat., N	Long., W
US16BS21	1	89.3	45.6
US16BS22	1	90.0	40.7
US16BS23	1	92.7	36.5
US16BS24	1	93.7	29.8
US16BS25	1	83.9	46.7
US16BS26	1	86.3	39.9
US16BS27	1	85.6	36.4
US16BS28	1	90.5	33.7
US16BS29	1	89.9	30.7
US16BS30	1	72.5	44.9
US16BS31	1	78.5	41.0
US16BS32	1	80.2	38.0
US16BS33	1	85.8	31.6
US16BS34	1	84.6	29.7
US16BS35	1	62.6	48.4
US16BS36	1	75.8	39.5
US16BS37	1	74.8	36.1
US16BS38	1	80.1	33.1

C.15 Description of the group(s) required in the case of non-simultaneous emissions

USABSS-16's spot beams (US16BS01 – US16BS38) are grouped in Group 21 with the Plan beam USAEH003. The USABSS-16 beams will not be operated simultaneously on the same channel with any other space station in Group 21.

Figure 1. USABSS-16 Downlink Service Area (Item C.11)

APPENDIX 2

ANNEX 2 TO APPENDIX 30A

APPENDIX S4 INFORMATION FOR USABSS-16

BASIC CHARACTERISTICS TO BE FURNISHED IN NOTICES RELATING TO FEEDER LINK STATIONS IN THE FIXED-SATELLITE SERVICE OPERATING IN THE FREQUENCY BANDS 14.5 – 14.8 GHZ AND 17.3 - 18.1 GHZ

APPENDIX S4 INFORMATION FOR USABSS-16

A.1 Identity of the satellite network

a) Identity of a satellite network: USABSS-16

c) Country and Beam Identification: USA and US16RCV1

f) Country symbol of the notifying administration: USA

A.2 Date of Bringing Into Use

a) Date of Bringing into Use: February 2005

A.3 Operation administration or agency

A.3 Operating administration or agency: 120 (USA)

A.4 Orbital information

a) For the case of a space station onboard a GSO satellite:

1) nominal geographical longitude on the geostationary-satellite orbit: 110° W.L.

2) planned longitudinal tolerance and inclination excursion: ± 0.05° E-W; ± 0.05° N-S

A.5 Coordination

A.6 Agreements

A.7 Earth station site characteristics

For a specific earth station:

a)1) the horizon elevation angle in degrees for each azimuth around the earth station: see Tables 1 and 2.

Table 1. Los Angeles Broadcast Center Horizon Elevation Angles

Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.
0	0.5	90	0.6	180	1.0	270	0.0
5	0.4	95	0.6	185	1.0	275	0.0
10	0.6	100	0.8	190	0.9	280	0.0
15	0.6	105	1.0	195	1.1	285	0.0
20	0.6	110	1.1	200	1.0	290	0.0
25	0.4	115	1.1	205	0.9	295	0.0
30	0.2	120	1.1	210	0.6	300	0.0
35	0.4	125	1.3	215	0.6	305	0.3
40	0.4	130	1.3	220	0.0	310	0.4
45	1.0	135	1.2	225	0.0	315	0.4
50	1.2	140	1.0	230	0.0	320	0.4
55	1.2	145	1.3	235	0.0	325	0.5
60	1.3	150	1.3	240	0.0	330	0.5
65	1.2	155	1.3	245	0.0	335	0.5
70	1.3	160	1.5	250	0.0	340	0.7
75	1.2	165	1.5	255	0.0	345	0.6
80	1.0	170	1.4	260	0.0	350	0.5
85	0.8	175	0.9	265	0.0	355	0.5

Table 2. Cheyenne Broadcast Center Horizon Elevation Angles

Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.	Azimuth, Degrees	Horizon Elevation Angle, Deg.
0	0.9	90	0.2	180	0.7	270	1.2
5	0.6	95	0.2	185	0.6	275	1.2
10	0.6	100	0.0	190	0.7	280	1.2
15	0.6	105	0.0	195	0.7	285	1.2
20	0.6	110	0.0	200	0.8	290	1.2
25	0.6	115	0.0	205	0.8	295	1.2
30	0.3	120	0.2	210	0.9	300	1.2
35	0.4	125	0.3	215	0.9	305	1.1
40	0.4	130	0.4	220	0.9	310	1.1
45	0.3	135	0.3	225	1.0	315	1.2
50	0.3	140	0.3	230	1.0	320	0.9
55	0.3	145	0.3	235	1.0	325	1.0
60	0.3	150	0.3	240	1.0	330	1.0
65	0.3	155	0.3	245	1.0	335	1.0
70	0.0	160	0.4	250	1.0	340	0.9
75	0.0	165	0.7	255	1.0	345	0.9
80	0.0	170	0.7	260	1.0	350	0.9
85	0.0	175	0.7	265	1.1	355	0.9

b) that is operating to an associated GSO space station:

1) the planned minimum angle of elevation of the antenna in the direction of maximum radiation in degrees from the horizontal plane:

Los Angeles Broadcast Center: 49.5 degrees

Cheyenne Broadcast Center: 42.2 degrees

d) the altitude (meters) of the antenna above mean sea level:

Los Angeles Broadcast Center: 17 meters

Cheyenne Broadcast Center: 1808 meters

A.11 Regular Hours of Operation

A.11 Regular Hours of Operation: 24 hrs./day; 365 days/year

A.12 Range of Automatic Gain Control

A.12 Range of Automatic Gain Control: 12 dB

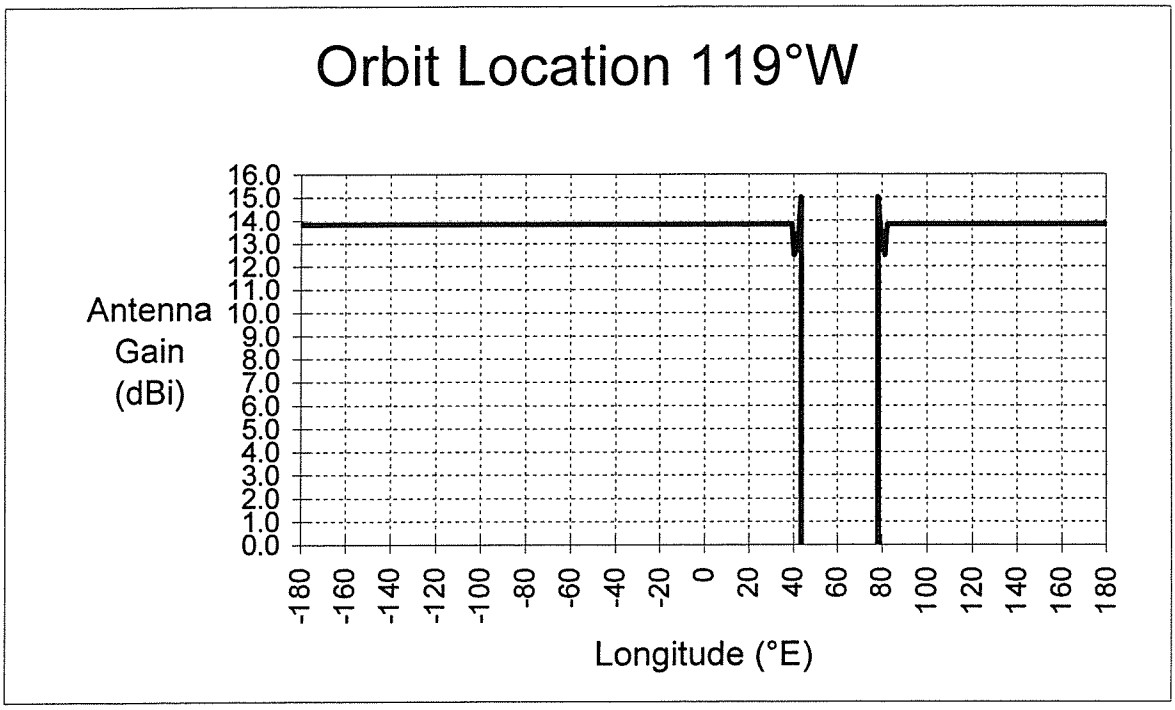
B.1 Designation of the satellite antenna beam

US16RCV1

B.3 Geostationary Space Station Antenna Characteristics

d) pointing accuracy of the antenna: 0.1 degree in any direction

f) Gain of antenna towards the GSO Arc: See figure below



g) For the case of a space station submitted in accordance with Appendix S30, Appendix S30A, or Appendix S30B:

1) co-polar antenna gain (receive): 48.3 dBi; cross-polar antenna gain (receive): 14.7 dBi
2) shape of the beam: shaped
3) for circular beams: not applicable
4) for elliptical beams: not applicable
5) for beams other than circular or elliptical shape:
   - co-polar and cross-polar gain contours: see Figures 1 and 2 and also on CD-ROM
   - beam aim point longitude and latitude:

     Longitude: 112.0° W
     Latitude: 37.0° N

C.2 Assigned frequency (frequencies)

a) Assigned frequencies: In accordance with Appendix S30A, channel numbers 1 - 32.

C.3 Assigned frequency band

a) The bandwidth of the assigned frequency band in kHz: 24,000 kHz

C.4 Class of station(s) and nature of service

Class of Station: EV
Nature of Service: CR

C.5 Receiving system noise temperature

a) In the case of a space station, the lowest total receiving system noise temperature, in kelvins, referred to the output of the receiving antenna of the space station: 7940° K

C.6 Polarization

Type of Polarization: Circular
Sense of Polarization: right-hand and left-hand

C.7 Class of Emission

a) Class of emission and necessary bandwith:
Class of Emissions: 24M0G7W
Necessary Bandwidth: 24 MHz

C.8 Power characteristics of the transmission

i) In the case of an earth station submitted in accordance with Appendix S30A:
   - total transmitting power supplied to the input of the antenna: 13.9 dBW
   - maximum power density averaged over worst 1 MHz: -59.9 dBW/Hz

- maximum power density averaged over worst 24 MHz: -59.9 dBW/Hz
- range of power control: 12 dB

C.9 Information on modulation characteristics

b) In the case of a space station submitted in accordance with Appendix S30 or Appendix S30A:

1. type of modulation: QPSK
2. pre-emphasis characteristics: not applicable
3. TV standard: not applicable
4. sound-broadcasting characteristics: time division multiplexed compressed digital data
5. frequency deviation: not applicable
6. composition of the baseband: time division multiplexed compressed video and audio
7. type of multiplexing of the video and sound signal: time division multiplex
8. energy dispersal characteristics: carrier will always be modulated
9. digital modulation: effective bit rate: 30.32 Mbps (6/7 code rate), 23.58 Mbps (2/3 code rate); transmitted bit rate: 40 Mbps
10. roll-off factor of the filter of the receiver: in accordance with ITU-R BO1293-1

d) For stations operating in a frequency band subject to Nos. S22.5C, S22.5D or S22.5F provide:

- the type of mask;
- the mask idenfication code.

Not applicable

C.10 Type and identity of associated stations

C.10b) Identity of Earth Station(s) and Geographical Coordinates

Los Angeles Broadcast Center

Latitude: 33° 59' 01"
Longitude: 118° 25' 27"

C.10 c)
1) Class of Station/Nature of Service:

Class of station: EV
Nature of service: CR

2) Isotropic Gain (dBi) in the direction of maximum radiation: 64.1 dBi

3) Beamwidth (degrees) between the half power points: 0.11°

4) Measured or Reference Radiation Pattern:

Co-polar:	29 - 25 logθ	1° < θ </= 7
	+8 dBi	7° < θ </= 9.2°
	32 - 25 logθ	9.2° < θ </= 48°
	-10 dBi	48° < θ </= 180°
Cross-polar:	19 - 25 logθ	1.8° < θ </= 7°
	-2 dBi	7° < θ </= 180°

6) Antenna Diameter (m): 11.3 meters

Cheyenne Broadcast Center

Latitude: 41° 07' 56"
Longitude: 104° 44' 09"

C.10 c)
1) Class of Station/Nature of Service:

Class of station: EV
Nature of service: CR

2) Isotropic Gain (dBi) in the direction of maximum radiation: 65 dBi

3) Beamwidth (degrees) between the half power points: 0.10°

4) Measured or Reference Radiation Pattern:

Co-polar:	29 - 25 logθ	1° < θ </= 7
	+8 dBi	7° < θ </= 9.2°
	32 - 25 logθ	9.2° < θ </= 48°
	-10 dBi	48° < θ </= 180°
Cross-polar:	19 - 25 logθ	1.8° < θ </= 7°
	-2 dBi	7° < θ </= 180°

6) Antenna Diameter (m): 13.2 meters

C.11 Service Area

b) Service Area: Figure 3 - USA

Test Point	Latitude, N	Longitude, W
1	34.0	118.4
2	41.1	104.7

C.15 Description of the group(s) required in the case of non-simultaneous emissions

USABSS-16's feeder link beam is grouped in Group 21 with the Plan beam USAEH003.

Figure 1. Space Station Receive Antenna Co-Polar Gain Contour (Item B.3 g) 3))

Figure 2. Space Station Receive Antenna Cross-Polar Gain Contour (Item B.3 g) 3))

Figure 3. USABSS-16 Feeder Link Service Area (Item C.11)

APPENDIX 3

ANNEX 1 TO APPENDIX S30

USABSS-16

LIMITS FOR DETERMINING WHETHER A SERVICE OF AN ADMINISTRATION IS AFFECTED BY A PROPOSED MODIFICATION TO THE PLANS OR WHEN IT IS NECESSARY UNDER THIS APPENDIX TO SEEK THE AGREEMENT OF ANY OTHER ADMINISTRATION

ANNEX 1 OF APPENDIX S30 FOR USABSS-16

1 Limits for the interference into frequency assignments in conformity with the Regions 1 and 3 Plan or with the Regions 1 and 3 List or into new or modified assignments in the Regions 1 and 3 List.

Not Applicable to Region 2 modifications.

2 Limits to the change in the overall equivalent protection margin for frequency assignments in conformity with the Region 2 Plan.

A detailed interference analysis will be performed using MSPACE to determine which administrations, if any, are affected. Coordination will be performed if required.

3 Limits to the change in the power flux-density to protect the broadcasting-satellite service in Regions 1 and 2 in the band 12.2-12.5 GHz and in Region 3 in the band 12.5-12.7 GHz.

For Region 2 modifications not to affect assignments in Region 1 or 3, the power flux density shall not exceed the limits given below:

-147 dB(W/(m^2 · 27 MHz))	for	$0° \le \theta < 0.44°$
$-138 + 25 \log \theta$ dB(W/(m^2 · 27 MHz))	for	$0.44° \le \theta < 19.1°$
-106 dB(W/(m^2 · 27 MHz))	for	$\theta \ge 19.1°$

where θ *is the difference in degrees between the longitudes of the broadcasting-satellite space station in Region 2 and the broadcasting-satellite space station affected in Region 1 or 3.*

No Region 1 or 3 BSS assignment is within 19.1 degrees of USABSS-16 at 110° W.L. The closest Region 1 or 3 assignment is the French OCE10100 beam at 160° W.L., which is 50 degrees from 110° W.L. Therefore, the -106 dBW/m^2/27 MHz level from the above limits applies.

The following table shows the pfd level calculated using the *minimum* isolation of USABSS-16's transmit beams to Regions 1 and 3 territories. The pfd limit is met with significant margin using the minimum isolation. Therefore, USABSS-16 is in compliance with Section 3.

Beam No.	EIRP, dBW	Minimum Isolation to R1 and R3 territory (antenna gain relative to peak)	PFD on Region 1/3 Territory (27 MHz)	PFD Limit in 27 MHz	Margin, dB
US16BS01	47.7	-10.0	-124.8	-106	18.8
US16BS02	46.6	-40.0	-155.9	-106	49.9
US16BS03	48.6	-40.0	-153.9	-106	47.9
US16BS04	53.2	-40.0	-149.3	-106	43.3
US16BS05	54.2	-40.0	-148.3	-106	42.3
US16BS06	53.2	-40.0	-149.3	-106	43.3
US16BS07	55.6	-40.0	-146.9	-106	40.9
US16BS08	53.5	-40.0	-149.0	-106	43.0
US16BS09	50.4	-40.0	-152.1	-106	46.1
US16BS10	52.3	-40.0	-150.2	-106	44.2
US16BS11	56.2	-40.0	-146.3	-106	40.3
US16BS12	54.6	-40.0	-147.9	-106	41.9
US16BS13	57.3	-40.0	-147.1	-106	41.1
US16BS14	57.3	-40.0	-145.2	-106	39.2
US16BS15	56.2	-40.0	-146.3	-106	40.3
US16BS16	54.7	-40.0	-147.8	-106	41.8
US16BS17	60.6	-40.0	-141.9	-106	35.9
US16BS18	61.0	-40.0	-141.5	-106	35.5
US16BS19	59.4	-40.0	-143.1	-106	37.1
US16BS20	51.5	-40.0	-151.0	-106	45.0
US16BS21	58.6	-40.0	-143.8	-106	37.8
US16BS22	60.1	-40.0	-142.4	-106	36.4
US16BS23	61.3	-40.0	-141.2	-106	35.2
US16BS24	64.2	-40.0	-138.3	-106	32.3
US16BS25	55.7	-40.0	-146.8	-106	40.8
US16BS26	59.5	-40.0	-143.0	-106	37.0
US16BS27	61.7	-40.0	-140.8	-106	34.8
US16BS28	61.9	-40.0	-140.6	-106	34.6
US16BS29	61.9	-40.0	-140.6	-106	34.6
US16BS30	60.4	-40.0	-142.1	-106	36.1
US16BS31	59.7	-40.0	-142.8	-106	36.8
US16BS32	61.3	-40.0	-141.2	-106	35.2
US16BS33	65.1	-40.0	-137.4	-106	31.4
US16BS34	64.8	-40.0	-137.7	-106	31.7
US16BS35	57.8	-40.0	-144.7	-106	38.7
US16BS36	61.0	-40.0	-141.5	-106	35.5
US16BS37	62.1	-40.0	-140.4	-106	34.4
US16BS38	65.2	-40.0	-137.3	-106	31.3

4 Limits to the power flux-density to protect the terrestrial services of other administrations.

The pfd limits for a Region 2 modification not to affect a Region 1, 2, or 3 terrestrial service are given below:

$$
\begin{aligned}
&-148 \ dB(W/(m^2 \cdot 4\ kHz)) && \text{for} \quad \theta \le 5^\circ \\
&-148 + 0.5\,(\theta - 5) \ dB(W/(m^2 \cdot 4\ kHz)) && \text{for} \quad 5^\circ < \theta \le 25^\circ \\
&-138 \ dB(W/(m^2 \cdot 4\ kHz)) && \text{for} \quad 25^\circ < \theta \le 90^\circ
\end{aligned}
$$

where θ *represents the angle of arrival.*

For territories of Regions 1 and 3 a similar analysis of the pfd levels in Section 3 was performed. As shown in the table, using minimum isolation to Regions 1 and 3 and the tightest pfd limit that could be applicable, -148 dB(W/(m^2 · 4 kHz)), the pfd limit is met with significant margin.

Beam No.	EIRP, dBW	Minimum Isolation to R1 and R3 territory (antenna gain relative to peak)	PFD on Region 1/3 Territory (4 kHz)	PFD Limit in 4 kHz	Margin, dB
US16BS01	47.7	-10.0	-152.6	-148	14.6
US16BS02	46.6	-40.0	-153.7	-148	45.7
US16BS03	48.6	-40.0	-151.7	-148	43.7
US16BS04	53.2	-40.0	-147.1	-148	39.1
US16BS05	54.2	-40.0	-146.1	-148	38.1
US16BS06	53.2	-40.0	-147.1	-148	39.1
US16BS07	55.6	-40.0	-144.7	-148	36.7
US16BS08	53.5	-40.0	-146.8	-148	38.8
US16BS09	50.4	-40.0	-149.9	-148	41.9
US16BS10	52.3	-40.0	-148.0	-148	40.0
US16BS11	56.2	-40.0	-144.1	-148	36.1
US16BS12	54.6	-40.0	-145.7	-148	37.7
US16BS13	57.3	-40.0	-144.9	-148	36.9
US16BS14	57.3	-40.0	-143.0	-148	35.0
US16BS15	56.2	-40.0	-144.1	-148	36.1
US16BS16	54.7	-40.0	-145.6	-148	37.6
US16BS17	60.6	-40.0	-139.7	-148	31.7
US16BS18	61.0	-40.0	-139.3	-148	31.3
US16BS19	59.4	-40.0	-140.9	-148	32.9
US16BS20	51.5	-40.0	-148.8	-148	40.8
US16BS21	58.6	-40.0	-141.6	-148	33.6
US16BS22	60.1	-40.0	-140.2	-148	32.2

Beam No.	EIRP, dBW	Minimum Isolation to R1 and R3 territory (antenna gain relative to peak)	PFD on Region 1/3 Territory (4 kHz)	PFD Limit in 4 kHz	Margin, dB
US16BS23	61.3	-40.0	-139.0	-148	31.0
US16BS24	64.2	-40.0	-136.1	-148	28.1
US16BS25	55.7	-40.0	-144.6	-148	36.6
US16BS26	59.5	-40.0	-140.8	-148	32.8
US16BS27	61.7	-40.0	-138.6	-148	30.6
US16BS28	61.9	-40.0	-138.4	-148	30.4
US16BS29	61.9	-40.0	-138.4	-148	30.4
US16BS30	60.4	-40.0	-139.9	-148	31.9
US16BS31	59.7	-40.0	-140.6	-148	32.6
US16BS32	61.3	-40.0	-139.0	-148	31.0
US16BS33	65.1	-40.0	-135.2	-148	27.2
US16BS34	64.8	-40.0	-135.5	-148	27.5
US16BS35	57.8	-40.0	-142.5	-148	34.5
US16BS36	61.0	-40.0	-139.3	-148	31.3
US16BS37	62.1	-40.0	-138.2	-148	30.2
US16BS38	65.2	-40.0	-135.1	-148	27.1

Consistent with provision 4.2.3 d) of Article 4 of Appendix S30, these pfd limits apply to countires not having frequency assignment in the broadcasting-satellite service in the channel concerned. Since both Canada and Mexico, among other Region 2 countries, are assigned all 32 channels in the Plan, and therefore, will not be deploying terrestrial services, these limits do not need to be met on their territories.

For other Region 2 countires, analysis was performed using the ITU GIMS program. Figure 3-1 provides a plot of elevation angle contours for the 110° W.L. orbital location. For territories with arrival angles between 25 and 90 degrees, the worst case interference condition occurs with Beam US16BS34 and the Caribbean islands of Cuba and the Bahamas. Both countries are outside the -20 dB contour of US16BS34. The maximum pfd can then be calculated as follows:

Beam US16BS34 EIRP	64.8 dBW
PFD	-135.5 dB(W/m^2 · 4kHz)
Minimum Isolation	-20 dB
US16BS34 Maximum PFD on Cuba/Bahamas	-155.5 dB(W/m^2 · 4kHz)
PFD Limit	-138 dB(W/m^2 · 4kHz)
Margin	17.5 dB

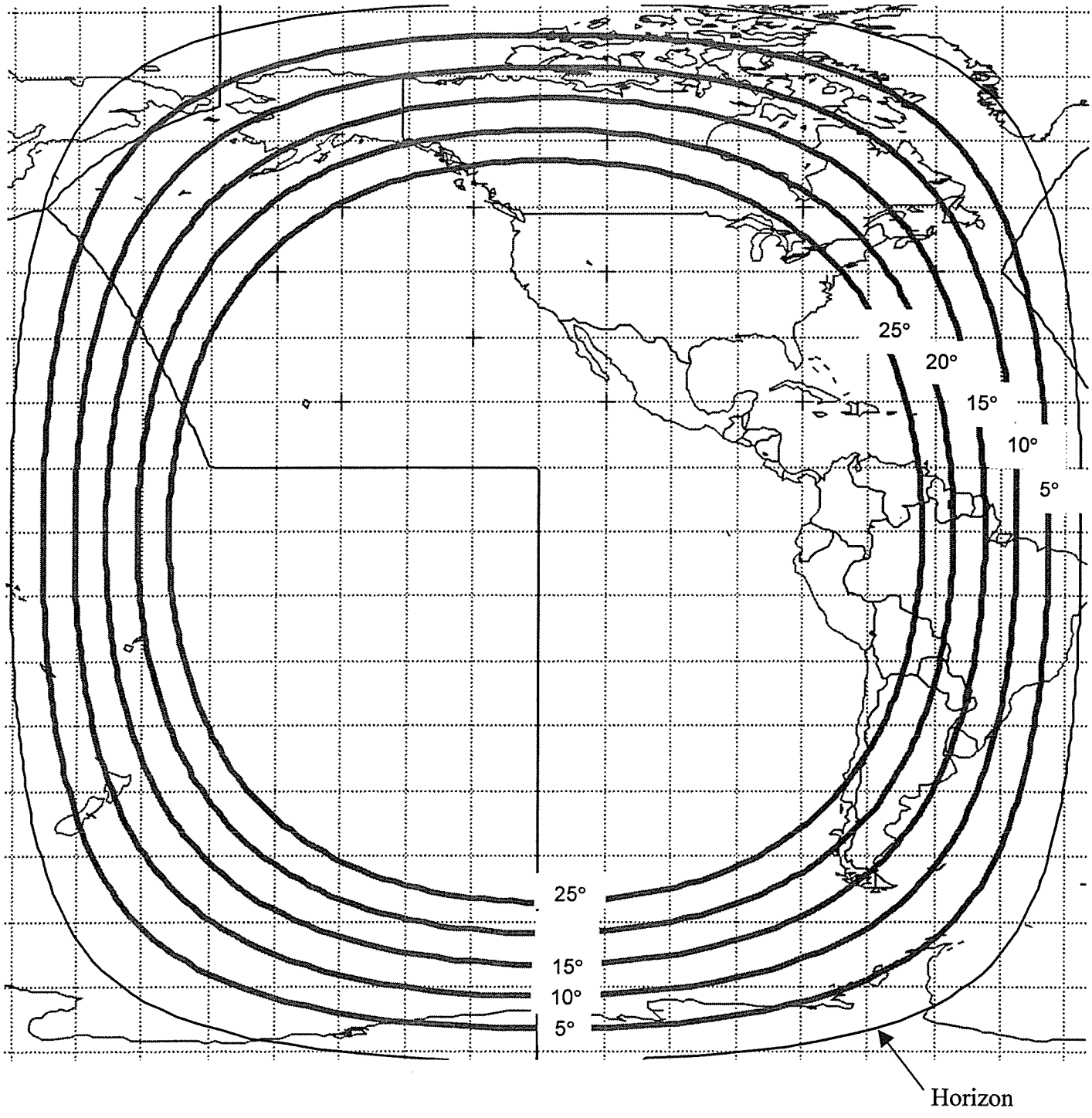
Since the worst case scenario for Region 2 countries with arrival angles to USABSS-16 between 25 and 90 degrees meets the PFD limits of Section 4, this limit is met for all other territories with arrival angles between 25 and 90 degrees.

All USABSS-16 beams have a minimum of 40 dB of isolation to all Region 2 territories with arrival angles to USABSS-16 between 5 and 25 degrees. Taking again the worst case scenario of a territory with a 5 degree elevation angle, and using the EIRP from beam US16BS33, the pfd on this territory can be calculated as follows:

Beam US16BS33 EIRP	65.1 dBW
PFD	-135.2 dB($W/m^2 \cdot 4kHz$)
Minimum Isolation	-40 dB
US16BS33 Maximum PFD on Cuba/Bahamas	-175.2 dB($W/m^2 \cdot 4kHz$)
PFD Limit	-148 dB($W/m^2 \cdot 4kHz$)
Margin	27.2 dB

Since none of the beams exceeds the appropriate pfd limit in any Region 2 country, USABSS-16 is in compliance with Section 4.

Figure 3-1. Elevation Angle Contours for 110 Degrees W.L.



5 **(Not used.)**

6 **Limits to the change in the power flux-density of assignments in the Regions 1 and 3 Plan to protect the fixed-satellite service (space-to-Earth) in the band 11.7-12.2 GHz in Region 2 or in the band 12.2-12.5 GHz in Region 3, and of assignments in the Region 2 Plan to protect the fixed-satellite service (space-to-Earth) in the band 12.5-12.7 GHz in Region 1 and in the band 12.2-12.7 GHz in Region 3.**

The provisional limits that where adopted at WRC-00 are included in Resolution 540. The limits applicable to Region 2 BSS are reproduced below.

For interference caused by Region 2 BSS to Regions 1 and 3 FSS (space-to-Earth in the band 12.5-12.7 GHz in Region 1 and in the band 12.2-12.7 GHz in Region 3):

-160 dB(W/(m^2 · 27 MHz))	for $0° \leq \theta < 0.054°$
$-137.46 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz))	for $0.054° \leq \theta < 3.67°$
$-141.56 + 25 \log \theta$ dB(W/(m^2 · 27 MHz))	for $3.67° \leq \theta < 11.54°$
-115 dB(W/(m^2 · 27 MHz))	for $11.54° \leq \theta$

where θ corresponds to the minimum geocentric angular separation between the interfering BSS and the interfered-with FSS space station. It is understood that, in the implementation of these criteria, the Bureau should take into account the pertinent station-keeping accuracy of the BSS and FSS space stations as filed by the notifying administrations.

NOTE – In addition, the 0.25 dB allowed increase over the pfd resulting from the original Plan assignments of all Regions should be maintained.

All Regions 1 and 3 FSS satellites are greater than 11.54° from the 110° W orbit location. Therefore, the -115 dB(W/(m^2 · 27 MHz)) level from the above limits applies. As shown in the table in response to Section 3, the pfd limit per 27 MHz in Regions 1 and 3 is less than this level. Therefore, USABSS-16 is in compliance with this section.

7 **Limits to the change in equivalent noise temperature to protect the fixed-satellite service (Earth-to-space) in Region 1 from modifications to the Region 2 Plan in the band 12.5-12.7 GHz**

In order for a Region 2 modification not to affect FSS in Region 1, the ΔT/T resulting from the modification must be less than 4%, or less than the ΔT/T resulting from the assignment in the Region 2 Plan.

After review of available ITU space network databases, no assignments in the Earth-to-space direction in the 12.5-12.7 GHz band were found. Therefore, no Region 1 space station is affected and USABSS-16 is in compliance with Paragraph 7.

APPENDIX 4

ANNEX 1 TO APPENDIX S30A

USABSS-16

LIMITS FOR DETERMINING WHETHER A SERVICE OF AN ADMINISTRATION IS CONSIDERED TO BE AFFECTED BY A PROPOSED MODIFICATION TO ONE OF THE REGIONAL PLANS OR WHEN IT IS NECESSARY UNDER THIS APPENDIX TO SEEK THE AGREEMENT OF ANY OTHER ADMINISTRATION

ANNEX 1 OF APPENDIX S30A FOR USABSS-16

1 Not Used.

2 Not Used.

3 Limits to the change in the overall equivalent protection margin with respect to frequency assignments in conformity with the Region 2 feeder-link Plan

A detailed interference analysis will be performed using MSPACE to determine which administrations, if any, are affected. Coordination will be performed if required.

4 Limits to the interference into frequency assignments in conformity with the Regions 1 and 3 feeder-link Plan or with the Regions 1 and 3 feeder-link Lists or proposed new or modified assignments in the Regions 1 and 3 feeder-link Lists

Not Applicable for Region 2 Modifications

5 Limits applicable to protect a frequency assignment in the bands 17.3-18.1 GHz (Regions 1 and 3) and 17.3-17.8 GHz (Region 2) to a receiving space station in the fixed-satellite service (Earth-to-space)

The closest Region 1 or 3 BSS assignment to USABSS-16 at 110° W.L. is OCE10100 at 160W.L. This network is 50 degrees from 110° W.L. No other Region 1 or 3 assignment is closer than 68 degrees. A ΔT/T calculation was made for OCE10100 in accordance with the method given in Appendix S8. It is reasonable to assume that space networks further away from 110° W.L., and with similar elliptical receive beams as OCE10100, will incur less increase in noise temperature than OCE10100, and therefore, the ΔT/T calculation is performed only for OCE10100.

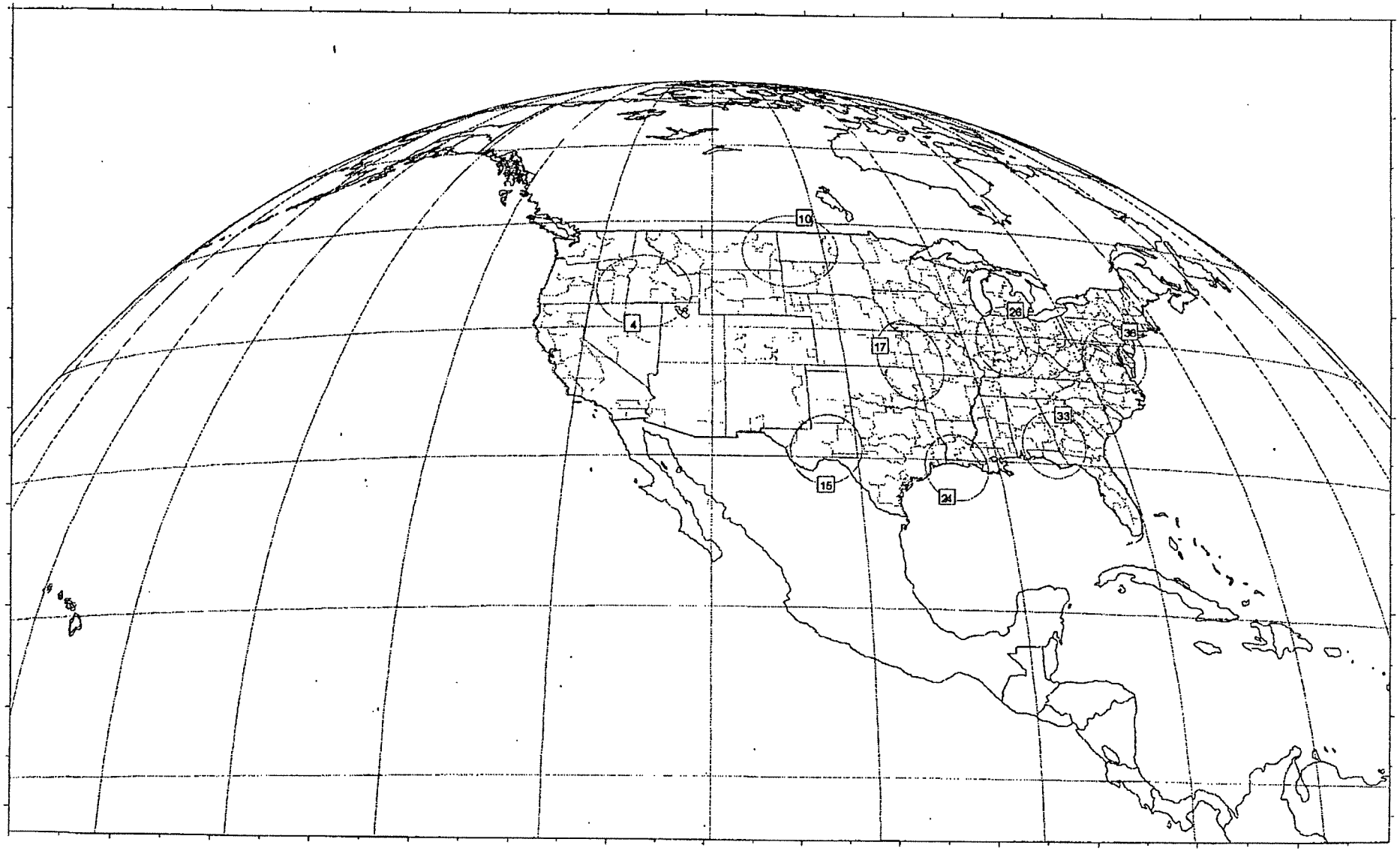
Beam	OCE10100
Frequency	17.5 GHz
Bandwidth	27 MHz
Orbital Position	160° W.L.
Degrees from USABSS-16	50
Receive Beam	MODRSS
Receive Antenna Gain	32.58 dB
Receive Antenna Gain Towards USABSS-16 Feeder-link	0 dB
Receive Noise Temp.	900° K
USABSS-16 Earth Station EIRP	76 dBW
Off-axis Antenna Discrimination	70 dB
Delta T/T	0.10%

The results show that the resulting ΔT/T is well below the specified criterion of 3%. Therefore, USABSS-16 is in compliance with Section 5.

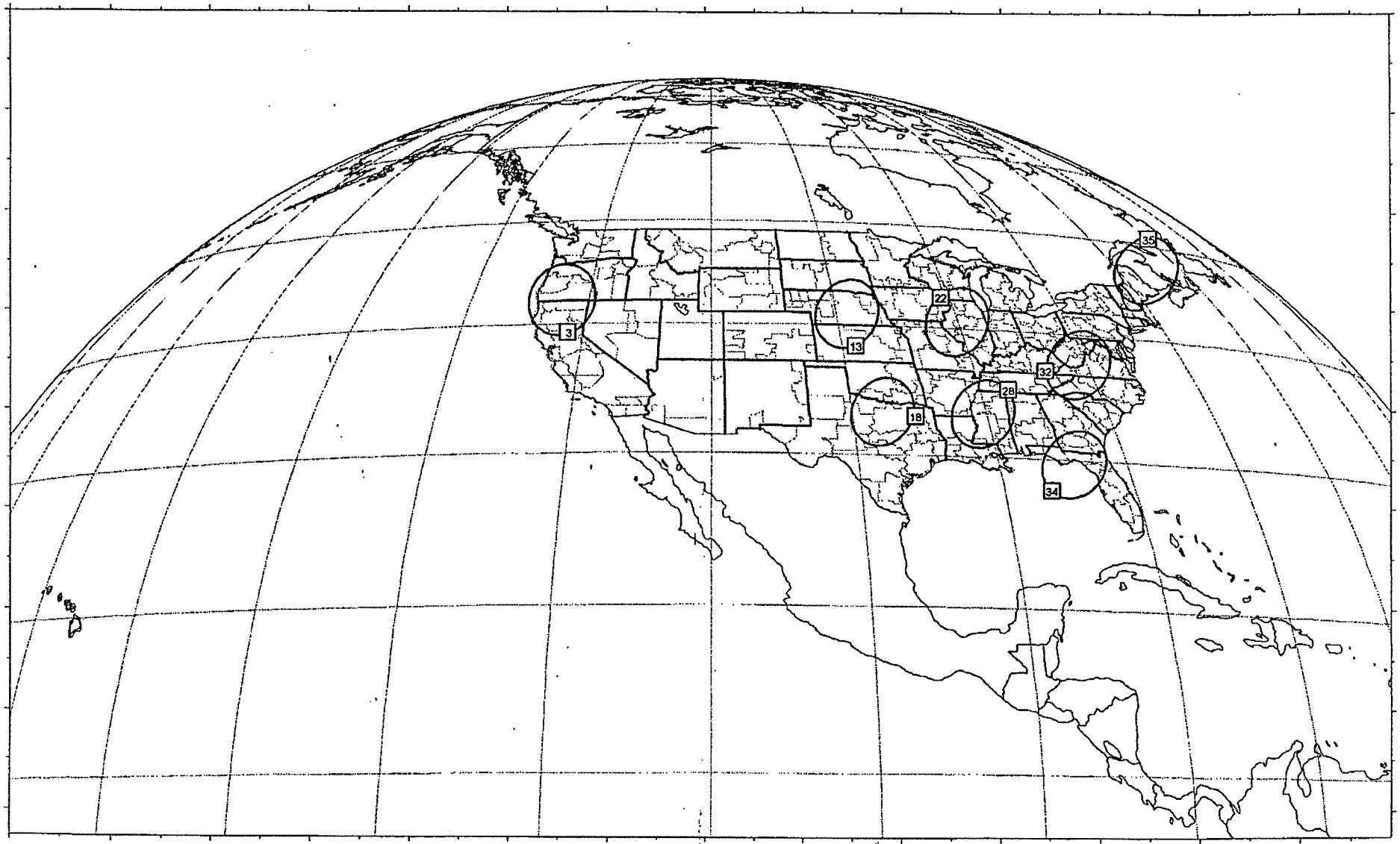
6 *Limits applicable to protect a frequency assignment in the band 17.8-18.1 GHz (Region 2) to a receiving feeder-link space station in the fixed-satellite service (Earth-to-space)*

Not Applicable for Region 2 Modifications

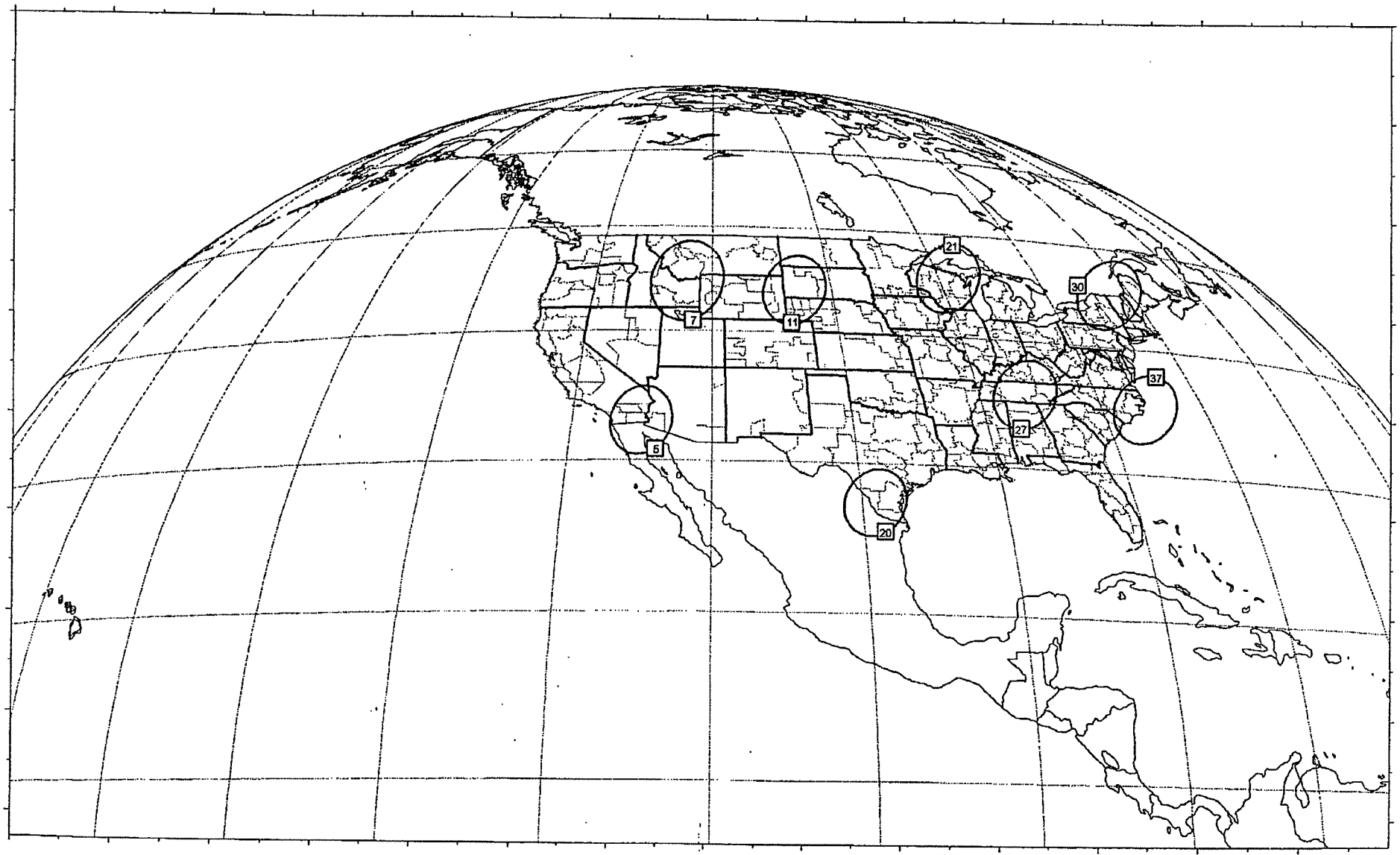
Beams 4, 10, 15, 17, 24, 26, 33, 36



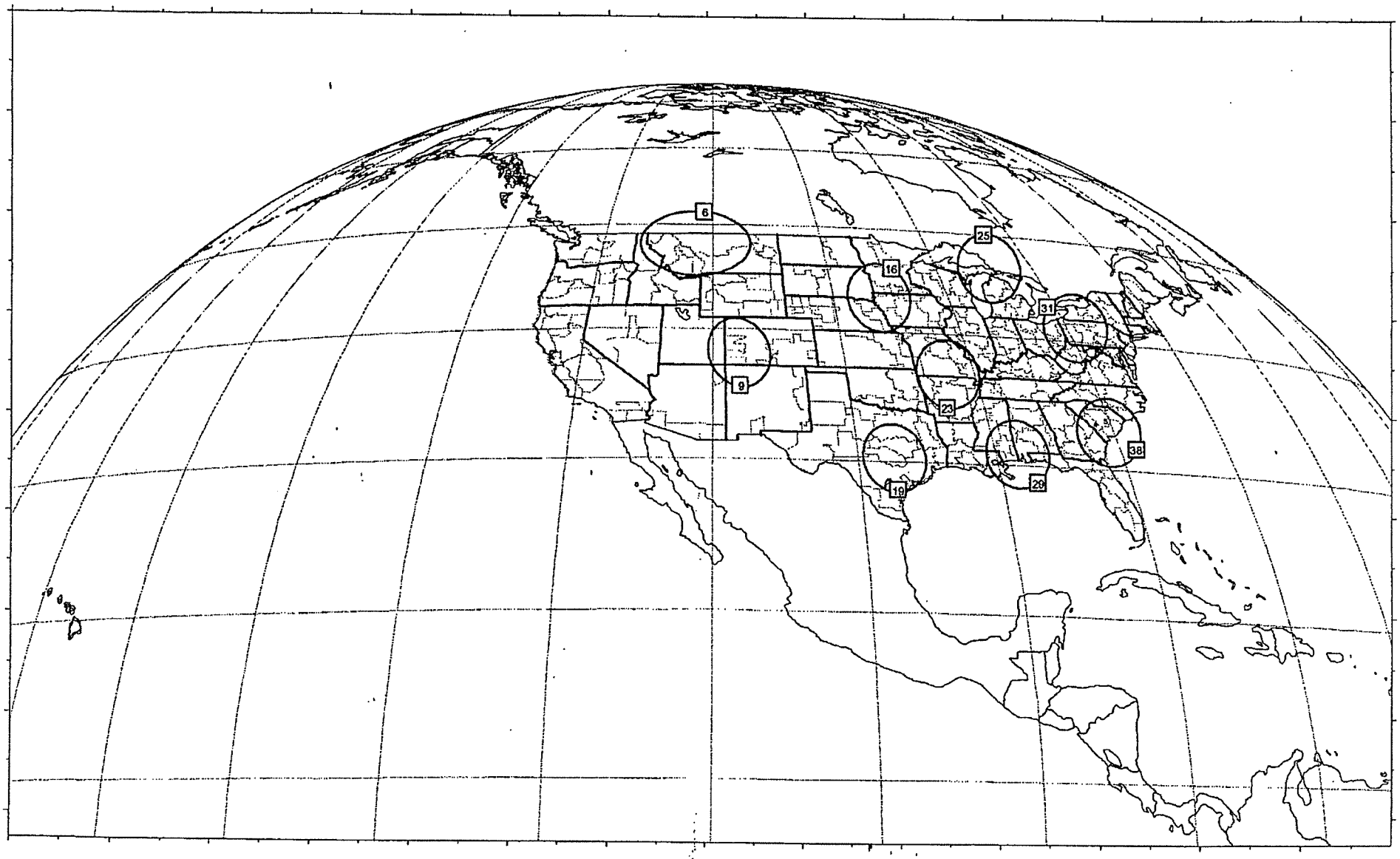
Beams 3, 13, 18, 22, 28, 32, 34, 35



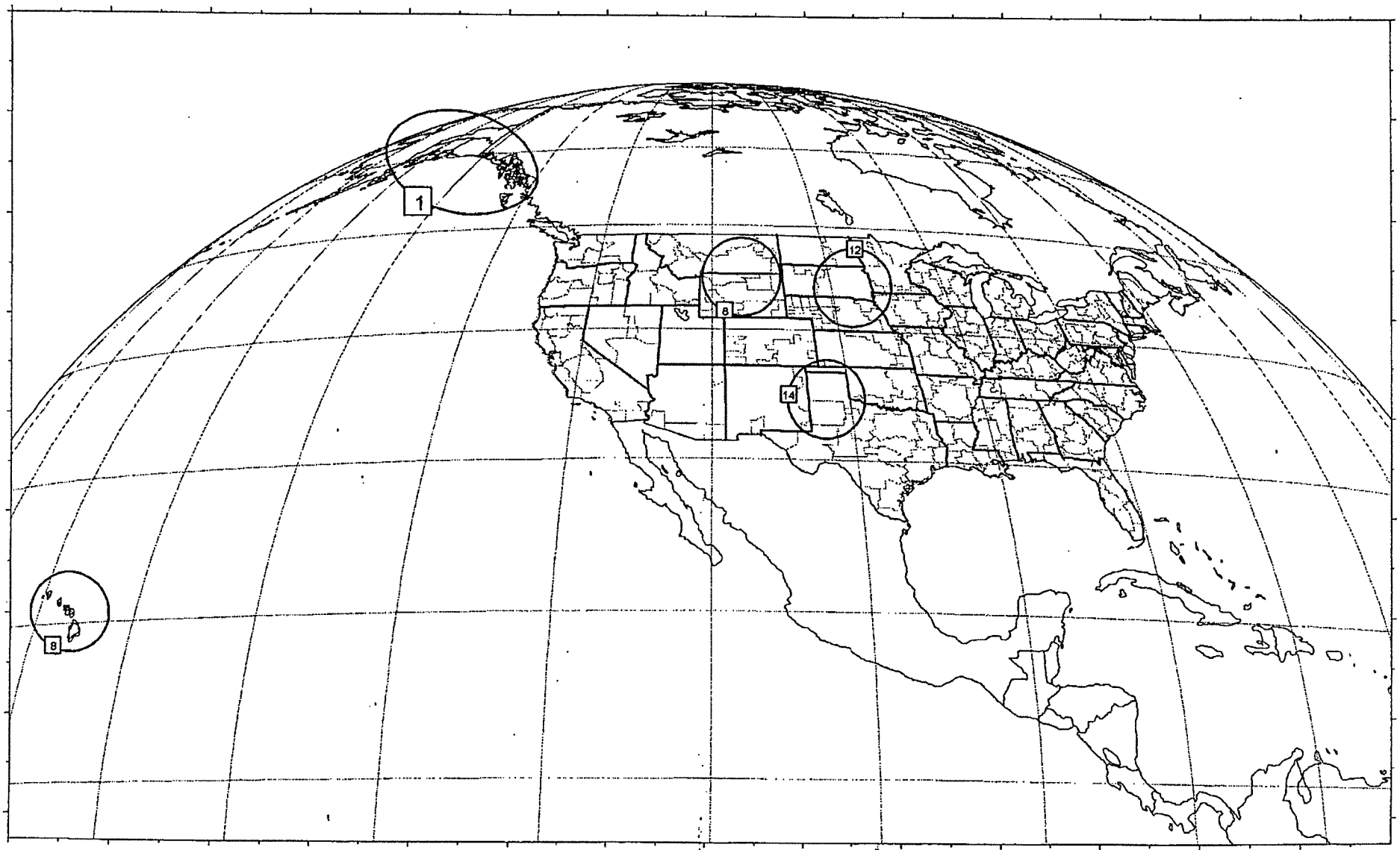
Beams 5, 7, 11, 20, 21, 27, 30, 37



Beams 6, 9, 16, 19, 23, 25, 29, 31, 38



Beams 1, 2, 8, 12, 14



CERTIFICATION OF PERSON RESPONSIBLE

FOR PREPARING ENGINEERING INFORMATION

I hereby declare under penalty of perjury that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing submission, that I am familiar with Parts 25 and 100 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this pleading, and that it is true and correct to the best of my knowledge and belief.

David A. Patillo
Sr. Manager, Communications Systems
DIRECTV, Inc.

Date: May 29, 2002

CERTIFICATION OF PERSON RESPONSIBLE

FOR PREPARING ENGINEERING INFORMATION

I hereby declare under penalty of perjury that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing submission, that I am familiar with Parts 25 and 100 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this pleading, and that it is true and correct to the best of my knowledge and belief.

Richard Barnett

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Date: May 29, 2002