EX PARTE OR LATE FILED

DOCKET FILE COPY ORIGINAL

FEDERAL COMMUNICATIONS COMMISSION
INTERNATIONAL BUREAU

Satellite and Radiocommunication Division
Satellite Policy Branch

RECEIVED

APR 2 2 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

To: Mr. William F. Caton, Acting Secretary

Date: April 22, 1996

From: Jennifer M. Gilsenan

Re: Ex Parte presentation
CC Docket No. 92-297

This will serve to indicate that on April 19, 1996 representatives of the International Bureau's Satellite and Radiocommunication Division and the Wireless Telecommunications Bureau met with participants listed in attachment A to this memorandum. The participants discussed the subject matter contained in the documents in attachment B to this memorandum and the ex parte filing submitted by the Satellite and Radiocommunication Division on April 19, 1996.

No. of Copies rec'd 021
List ABCDE

Attachment A

4/19/97 – 28 GHz Meeting Sharing below 27.5 GHz

Name	Organization	Phone	Fax
Giselle Gomez	FCC	418-0755	418-0765
Bill Gamble	NTIA	482-1850	482-4396
DAVID STRUBA	NASA	202-358-4808	-3520/25
WAYNE WHYTE	NASA/LeRC	216-433-3482	-8705
GRADY STEVENS	NASA/LeRC	216-433-3463	-8705
Rodney L. Spence	NASA/LeRC	216-433-3464	-8705
Alan Rinker	CSC/NASA	703-834-5606 arinker@csc.com	-1094
PAUL REGZON	OSTP	202 456 6042	-6023
Jennifer Warren	FCC/Wireless	202-418-1469	-0787
BOB JAMES	FCC/WTB	202-418-0798	-2643
HARRY NG	FCC/IB	202-418-0752	-0765
Karl Kensinger	FCC/IB	(202) 418-0773	-0765
THOMAS S. TYCZ	FCC/IB	202-418-0735	-0748
David Wye	FCC/WTB	418-0600	-0787
Larry Browne	CSC/NASA	703 834 5611	703 834 1094

Attachment B

National Aeronautics and
Space Administration
Headquarters
Washington, DC 20546-0001

Reply to Attn of: OI

APR 17 1996

Mr. Lionel S. Johns
Associate Director of Technology
Office of Science and Technology Policy
Executive Office of the President
Washington, DC 20500

Dear Mr. Johns:

NASA has undertaken a study to assess the sharing feasibility between NASA space services and Local Multipoint Distribution Services (LMDS) in Federal Government allocated spectrum below 27.5 Ghz. This study was conducted at the request of the Federal Communications Commission (FCC) with the concurrence of your Office.

The enclosed report provides the results of NASA's analyses examining the potential impact to NASA space services from LMDS interference.

NASA concludes that sharing between NASA space services and LMDS systems is not feasible in the band below 27.5 Ghz. We further conclude, that due to the magnitude of unacceptable interference resulting from three of the four LMDS system types currently before the FCC, no rules acceptable to all parties could be drafted which would guarantee protection of NASA space services from harmful inference.

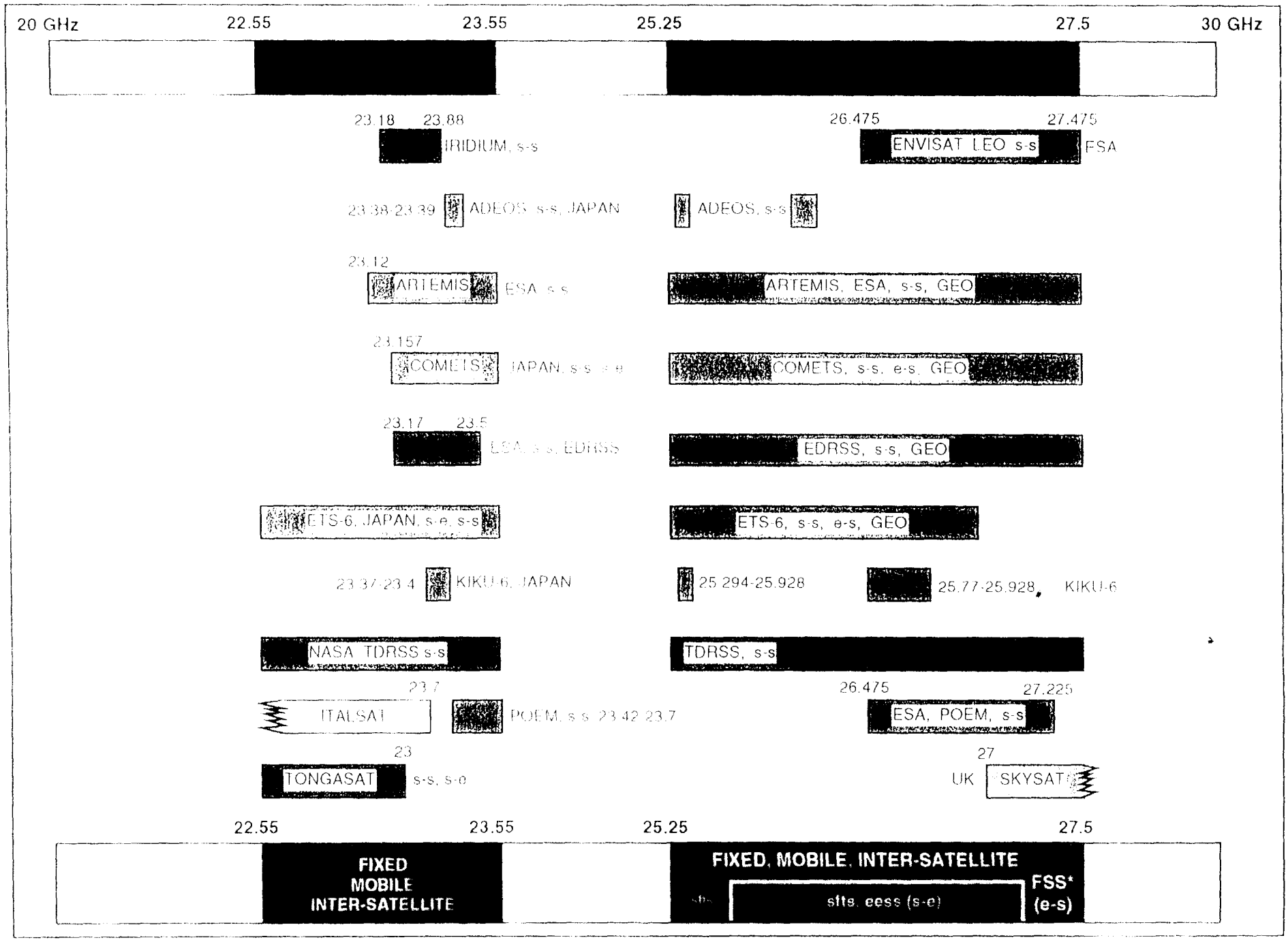
NASA requests your assistance in conveying these conclusions to the FCC.

Sincerely,

Charles T. Force
Associate Administrator for
Space Communications

Enclosure

cc:
NTIA/Mr. R. Parlow



Current and Planned Use of 20-30 GHz

783-5SM95-12b

IRIDIUM Parameters Used to Complete This Analysis

30.1 dB(i)

2.63° 1/2 Beamwidth

t 1295 Kelvin

altitude 780.6 km

int Criterion I/N -10 dB

Summary

Margin into IRIDIUM, 33% beam, fill Rain Region 3								
	CV	END	HP	TI	CV	END	HP	TI
	HUB	HUB	HUB	HUB	SUB	SUB	SUB	SUB
Elev								
0	-0.1	17.8	-2.4	-11.4	9.8	42.8	1.5	-3.9
1	-0.1	17.8	-2.4	-11.4	9.8	42.8	1.5	-3.9
2	-0.1	17.8	-2.5	-11.4	9.7	42.8	1.5	-4.0
3	-0.1	17.8	-2.5	-11.4	9.7	42.8	1.4	-4.1
4	-0.1	17.8	-2.4	-11.4	9.6	42.8	1.6	-4.1
5	0.3	17.9	-2.5	-11.4	9.7	42.8	1.6	-4.2
6	0.4	18.0	-2.6	-11.4	9.6	42.9	1.6	-4.3
7	0.5	18.1	-2.6	-11.4	9.6	43.1	1.7	-4.4
8	0.6	18.7	-2.7	-11.2	9.5	43.5	1.8	-4.5
9	0.9	19.2	-2.7	-10.8	9.5	43.8	2.0	-4.2
10	1.2	19.6	-2.4	-10.5	9.5	44.1	2.4	-4.2
11	2.2	21.0	-2.2	-10.1	9.8	45.3	2.8	-4.0
12	3.7	23.2	-1.7	-8.8	10.4	47.0	4.0	-3.4
13	8.9	35.2	-0.5	-5.2	11.6	51.9	7.9	-2.0
15	18.3	40.4	1.9	-1.1	12.6	53.3	9.0	-0.2
20	19.7	46.1	4.8	0.1	14.4	55.4	10.2	3.0
25	20.6	50.1	8.5	2.0	15.5	57.0	11.1	4.0
30	21.3	52.9	11.6	5.1	16.5	58.1	11.8	4.8
35	22.1	55.4	14.2	7.3	17.2	59.1	12.3	5.3
40	24.0	57.3	16.5	7.8	17.8	59.7	12.9	5.8
45	26.3	59.3	18.3	8.1	19.0	60.5	13.2	6.1
50	28.4	61.5	20.0	8.6	20.8	61.8	13.6	6.6
60	32.3	64.2	22.9	8.9	21.6	62.6	14.1	6.9
70	33.8	66.7	25.1	9.4	21.1	63.7	14.4	7.4
80	34.0	68.2	27.1	9.6	20.9	63.9	14.7	7.6
89.9	34.0	69.3	28.5	9.7	20.5	64.1	14.8	7.7

esa

D/TEL/FM/GFB/2105

Paris, 10 April 1996

Mr. C. Force, Associate Administrator OI
NASA Headquarters
Washington DC 20546
USA

Re: Potential FCC Rule Making on the Use of the 26 GHz Band

Dear Mr. Force,

I have taken note of a recent article in Space News (Vol.7, No. 10, March 11 - 17 1996) alluding to possible plans for an FCC rule making on the future use of the 25.25 - 27.5 GHz band, or significant parts thereof. I share the views of NASA reported in this article, i.e that such a rule making could endanger the future of a major international undertaking, such as Space Station Alpha.

The so-called 26 GHz band is of major importance for return links not only of ESA's data relay satellites but also of those of NASA and NASDA, which provide the connection between the International Space Station and associated earth stations. Moreover, other satellite projects, particularly in the field of Earth Exploration, rely on these return links, and in the future also direct space-Earth links in this band. Last but not least there are plans for the use of parts of this band for EVA and proximity communications near the International Space Station. Interference to these links could result in accidents.

You are certainly aware of the long process that we have been going through in Europe in order to arrive at a positive decision in favour of a manned space programme. It is therefore not acceptable that a vital component, such as the main data link between the International Space Station and the Earth, would be impaired by harmful radio frequency interference.

.../...

European Space Agency
Agence spatiale européenne

Headquarters - Siège
8-10 rue Mario-Nikis - F-75738 Paris Cedex 15
Tél (33) 1 53 69 76 54 - Fax (33) 1 53 69 75 60 - Télex ESA 202 746 F

In conclusion I urge you to do your utmost to influence the potential FCC rule making in such a way as to assure the continuing integrity of the 26 GHz band, which is of paramount importance for space agencies all over the world. This band will be the future refuge of many of those space activities that may get removed from the 2 GHz bands in the medium term, as stipulated by ITU Resolution 711.

Yours sincerely

R. Collette
Director of Telecommunications

esa
european space agency
agence spatiale européenne

8 , 10 rue Mario NIKIS
75738 PARIS CEDEX 15

FAX Télécopie

Téléphone (33 1) 53 69 76 54
FAX groupe 3 (33 1) 53 69 75 60
FAX groupe 4 (33 1) 44 38 70 25
TELEX 202746 ESA

Approved by :	Contact :	Date :	Nb. de pages : 3
	5369 7215	10 April 1996	ESA-ESTEC ESA-ESOC ESA-ESRIN ESA-KOUROU ESA-EAC ESA-ESA/CNES ESA-WASH.OFF ESA-BRUX. ESA-MOSC. ESA-DIVERS 06

FROM : Secretariat of Mr. Collette
Director of Telecommunications
European Space Agency

TO : Mr. C. Force,
Associate Administrator OI
NASA HQ
Fax: 1 202 358 3520

DATE D'ENVOI : 11/04/96

Please deliver urgently to Mr. C. Force.

Regards,

V. Simpson

p.o. R.C. Collette

cc: Dave Struba

4/11/96

APPROXIMATE TIME IN BEAM FOOTPRINTS FOR PROXIMITY OPERATIONS SPACE RECEIVE BEAM (5.9° HPBW; 350 km Altitude)[1]		
ALTITUDE (km)		350 km
ORBIT VELOCITY (miles/sec)		4.78 mi/sec
ORBIT PERIOD (min)		91.5 min
0.1% of ORBIT PERIOD (sec)		5.5 sec
BEAM ELEVATION	APPROX. FOOTPRINT DIMENSIONS (miles)	APPROXIMATE TIME IN FOOTPRINT (SEC)
0°	553 x 136 mi	115.6
3°	562 x 135 mi	117.5
5°	593 x 133 mi	124.0
10°	661 x 88 mi	138.2
15°	286 x 69 mi	59.8
20°	170 x 57 mi	35.5
30°	84.5 x 42.0 mi	17.7
40°	52.6 x 33.7 mi	11.0
50°	37.6 x 28.9 mi	7.9
60°	29.7 x 25.7 mi	6.2
70°	25.3 x 23.8 mi	5.3
80°	23.1 x 22.7 mi	4.8
90°	22.4 x 22.4 mi	4.7

[1]Times are estimated maximum times that a point on the earth's surface remains in the beam footprint assuming that the motion of the footprint on the earth's surface is along the footprint's major axis direction.

APPROXIMATE TIME IN BEAM FOOTPRINTS FOR PROXIMITY OPERATIONS SPACE RECEIVE BEAM (5.9° HPBW; 500 km Altitude)[1]		
ALTITUDE (km)		500 km
ORBIT VELOCITY (miles/sec)		4.73 mi/sec
ORBIT PERIOD (min)		94.6 min
0.1% of ORBIT PERIOD (sec)		5.7 sec
BEAM ELEVATION	APPROX. FOOTPRINT DIMENSIONS (miles)	APPROXIMATE TIME IN FOOTPRINT (SEC)
0°	587 x 160 mi	124.1
3°	601 x 160 mi	127.0
5°	639 x 159 mi	135.1
10°	723 x 116 mi	152.8
15°	393 x 92 mi	83.1
20°	233 x 77 mi	49.2
30°	118 x 59 mi	24.9
40°	74 x 48 mi	15.6
50°	53 x 41 mi	11.2
60°	42 x 37 mi	8.9
70°	36 x 34 mi	7.6
80°	33 x 32.5 mi	7.0
90°	32 x 32 mi	6.8

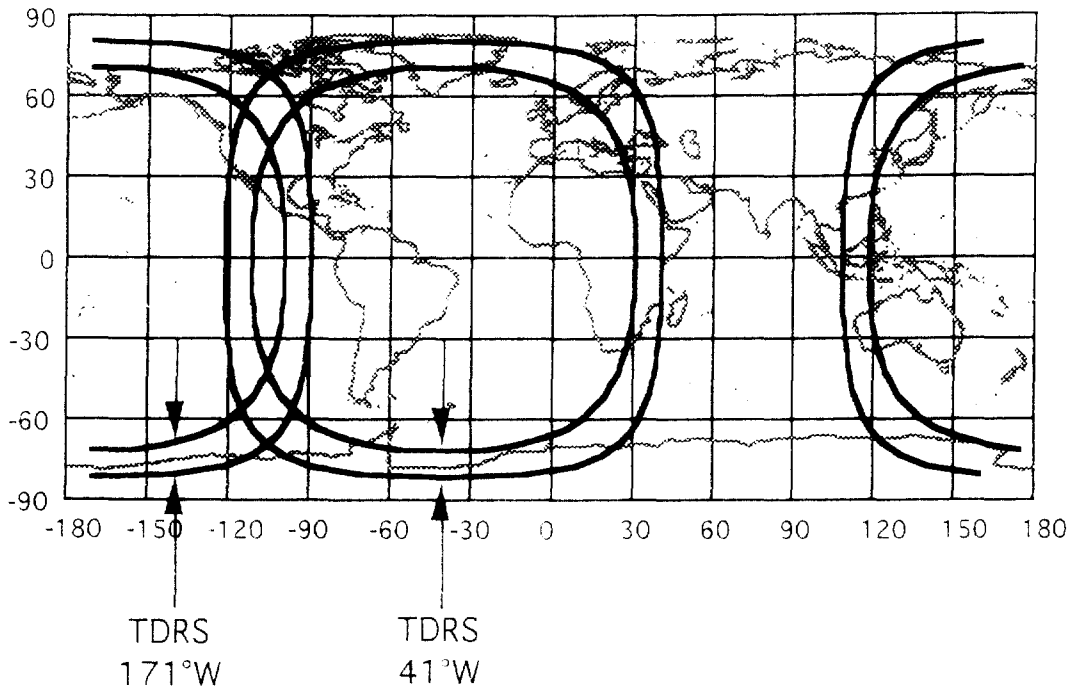
[1]Times are estimated maximum times that a point on the earth's surface remains in the beam footprint assuming that the motion of the footprint on the earth's surface is along the footprint's major axis direction.

APPROXIMATE TIME IN BEAM FOOTPRINTS FOR TDRSS SPACE RECEIVE BEAM (0.15° HPBW)[1]								
TDRSS USER SAT ALTITUDE (km)		300 km	500 km	700 km	900 km	1000 km	5000 km	10000 km
USER SAT ORBIT VELOCITY (miles/sec)		4.80 mi/sec	4.73 mi/sec	4.66 mi/sec	4.60 mi/sec	4.57 mi/sec	3.68 mi/sec	3.07 mi/sec
TDRSS USER SAT ORBIT PERIOD (min)		90.5 min	94.6 min	98.8 min	103.0 min	105.1 min	201.3 min	347.7 min
0.1% of USER SAT ORBIT PERIOD (sec)		5.4 sec	5.7 sec	5.9 sec	6.2 sec	6.3 sec	12.1 sec	20.9 sec
BEAM ELEVATION A	APPROX. FOOTPRINT DIMENSIONS (miles)	APPROXIMATE TIME IN FOOTPRINT (SEC)						
0°	509 x 68 mi	106.0	107.6	109.1	110.7	111.4	138.4	166.0
3°	531 x 67 mi	110.6	112.2	113.9	115.4	116.2	144.4	173.2
5°	600 x 67 mi	125.0	126.8	128.6	130.5	131.3	163.1	195.7
10°	398 x 66 mi	82.9	84.1	85.3	86.5	87.1	108.2	129.8
15°	254 x 65 mi	52.9	53.7	54.5	55.2	55.6	69.0	82.8
20°	189 x 64 mi	39.4	39.9	40.5	41.1	41.4	51.4	61.6
30°	126 x 63 mi	26.2	26.6	27.0	27.4	27.6	34.2	41.1
40°	96 x 61 mi	20.0	20.3	20.6	20.9	21.0	26.1	31.3
50°	79 x 60 mi	16.4	16.7	16.9	17.2	17.3	21.5	25.8
60°	69 x 59 mi	14.4	14.6	14.8	15.0	15.1	18.8	22.5
70°	63 x 58.7 mi	13.1	13.3	13.5	13.7	13.8	17.1	20.5
80°	59 x 58.4 mi	12.3	12.5	12.7	12.8	12.9	16.0	19.2
90°	58.2 x 58.2 mi	12.1	12.3	12.5	12.7	12.74	15.8	19.0

[1]Times are estimated maximum times that a point on the earth's surface remains in the beam footprint assuming that the motion of the footprint on the earth's surface while the TDRS beam is tracking a user satellite is along the footprint's major axis direction.

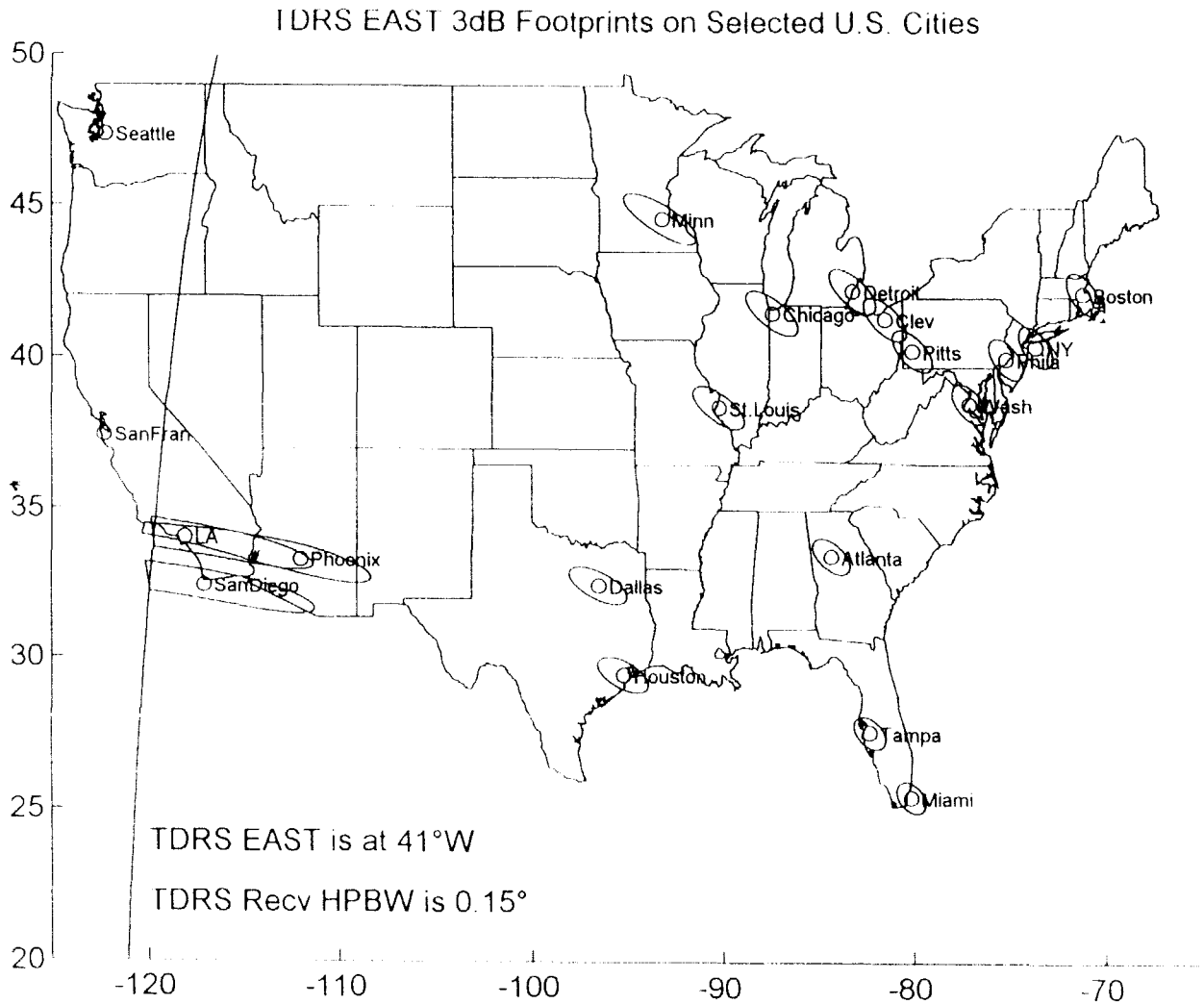
The Canadian Analysis re LMCS interference to DRS Doc 7B/43(9D/70) shows:

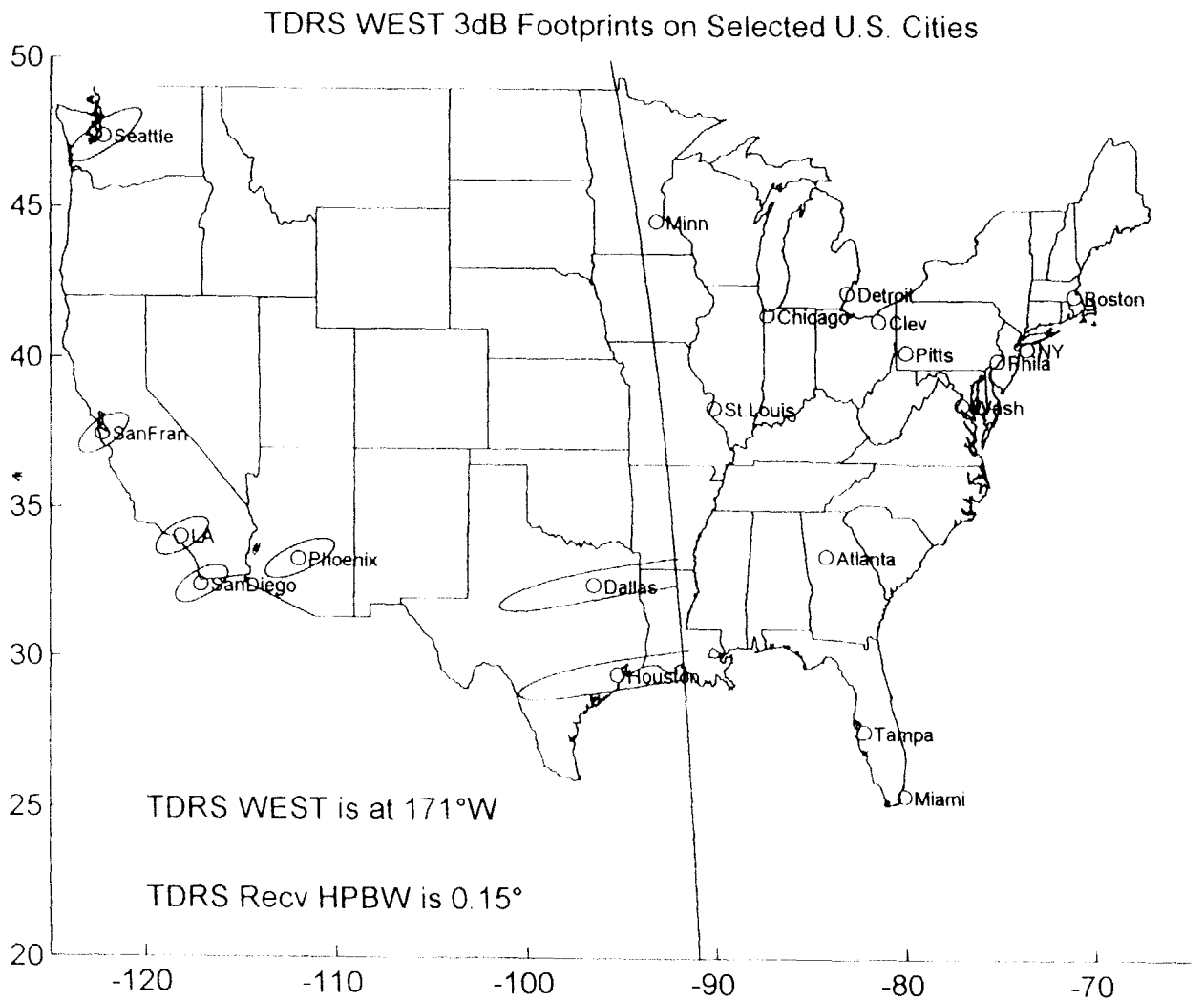
1)	LMCS A Hub, TV/FM FIg 17	-6 dB margin:
2)	LMCS B Hub, TV/FM Fig 20	+0.5 dB margin;
3)	LMCS B Hub, Digital Fig 21	+12.5 dB margin:
4)	LMCS A Sub, Fig 26	0 dB margin:
5)	LMCS B Sub, Fig 27	5 dB margin:



Ground Transmitters between these limits "see" TDRS
with an elevation angle between 0° and 10°

The critical 0° thru 10° elevation angle regions for TDRS miss the most populated areas in Canada, but include area around Los Angeles in the US.


TDRS EAST 3dB Footprints on Selected U.S. Cities
Seattle
Minn
Detroit
Chicago
Clev
Ritts
Boston
NY
Phila
Wash
St.Louis
SanFran
LA
Phoenix
SanDiego
Dallas
Atlanta
Houston
Tampa
Miami
TDRS EAST is at 41°W
TDRS Recv HPBW is 0.15°
50
45
40
35
30
25
20
-120
-110
-100
-90
-80
-70


TDRS WEST 3dB Footprints on Selected U.S. Cities
50
45
40
35
30
25
20
-120
-110
-100
-90
-80
-70
Seattle
Minn
Detroit
Boston
Chicago
Clev
Pitts
NY
Phila
St Louis
Wash
SanFran
LA
Phoenix
SanDiego
Dallas
Atlanta
Houston
Tampa
Miami
TDRS WEST is at 171°W
TDRS Recv HPBW is 0.15°

ELEVATION ANGLE FROM TDRS WEST (TDRW)

```
» ELEVW

ELEVW =

 1  -14.0811
 2   21.9594   LA
 3   -3.9424
 4   23.6029   SAN FRAN
 5  -12.9703
 6  -15.7181
 7   -7.0786
 8  -11.6254
 9    4.3409   DALLAS
10    3.6588   HOUSTON
11   -9.3867
12   -5.9586
13   18.2392   Seattle
14   -8.2933
15   -0.0786
16   17.1884   Phoenix
17   -1.5374
18   21.7451   San Diego
19   -9.3398
20   -7.5171

»
```

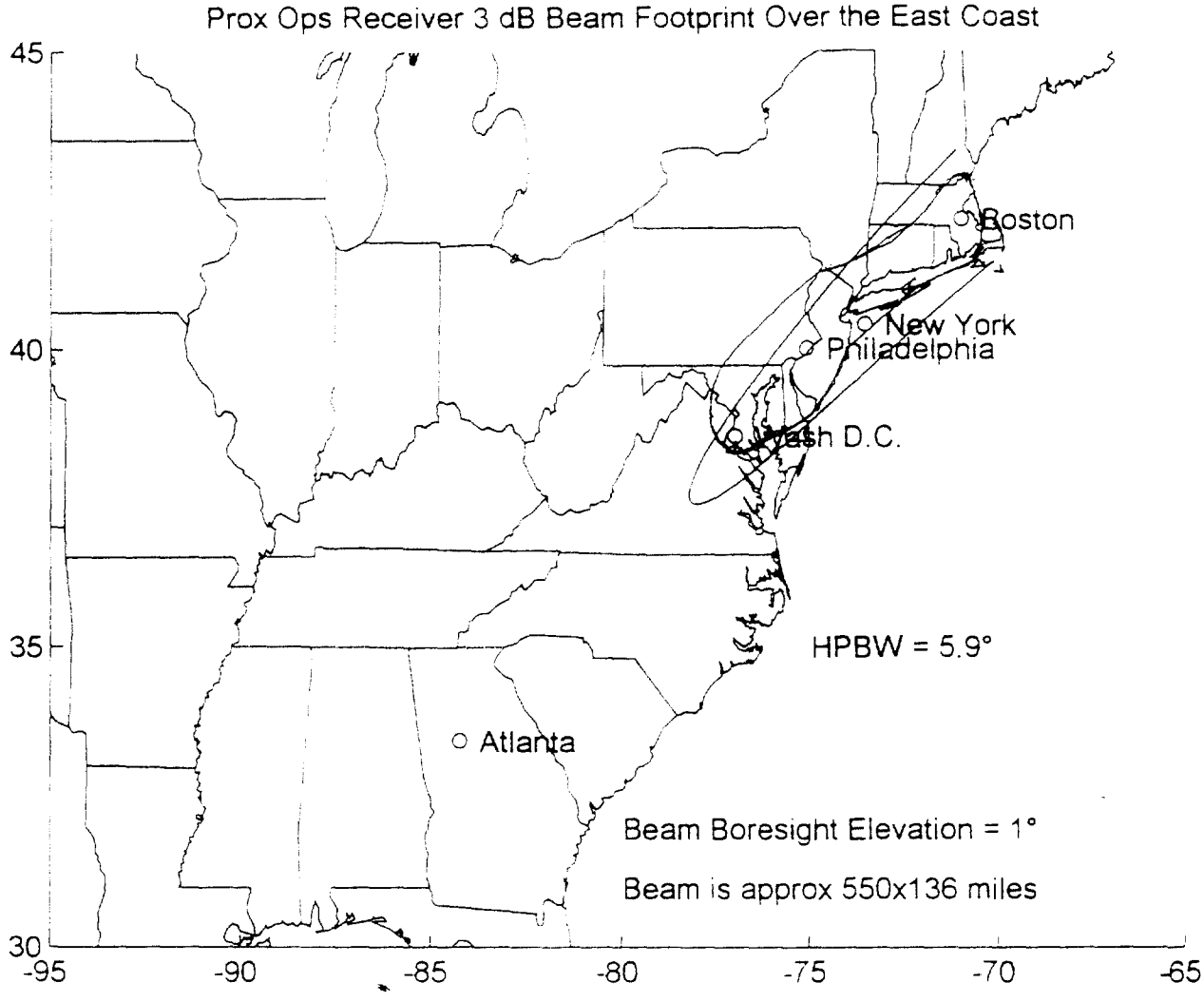
ELEVATION ANGLES FROM TDRS EAST (41°W)

» ELEVE

ELEVE =

1	32.5972	NY
2	1.9337	LA
3	23.1521	Chicago
4	-1.7678	
5	31.9818	Phila
6	32.5896	Boston
7	25.4833	Detroit
8	31.8636	Wash D.C
9	20.4186	Dallas
10	22.5816	Houston
11	37.5944	Miami
12	29.9051	Atlanta
13	-2.7422	Seattle
14	27.1505	Cleveland
15	17.6265	Minneapolis
16	7.1578	Phoenix
17	22.8274	St. Louis
18	3.0102	San Diego
19	28.7468	Pittsburgh
20	34.6461	Tampa

»


Prox Ops Receiver 3 dB Beam Footprint Over the East Coast
45
40
35
30
-95
-90
-85
-80
-75
-70
-65
Boston
New York
Philadelphia
Wash D.C.
Atlanta
HPBW = 5.9°
Beam Boresight Elevation = 1°
Beam is approx 550x136 miles