Fletcher, Heald & Hildreth, P.L.C.
1300 North 17th Street 11th floor
Arlington VA 22209
703-812-0400 (voice)
703-812-0486 (fax)

MITCHELL LAZARUS
703-812-0440
LAZARUS@FHHLAW.COM

February 12, 2002

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: ET Docket No. 98-206, Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range
Ex Parte Communication

Dear Mr. Caton:

Pursuant to Section 1.1206(a)(1) of the Commission's Rules, on behalf of the Fixed Wireless Communications Coalition (FWCC), I am electronically filing this written ex parte communication in the above-referenced proceeding.*

The FWCC submits the attached outline of a plan to provide point-to-point service in the 12.2-12.7 GHz band, while protecting DBS from harmful interference.

So that the FWCC may advance this plan in the future, we ask the Commission not to take any action in the docket that would foreclose point-to-point operation at 12.2-12.7 GHz.

---

* The Fixed Wireless Communications Coalition is a coalition of equipment manufacturers and users interested in terrestrial fixed microwave communications. Its membership includes manufacturers of microwave equipment, licensees of terrestrial fixed microwave systems and their associations, and communications service providers and their associations. Its membership also includes railroads, public utilities, petroleum and pipeline entities, public safety agencies, the broadcast industry, and/or their respective associations, telecommunications carriers, landline and wireless, local, and interexchange carriers, and others. A list of members is attached as Appendix A.

If there are questions about this submission, please call me at the number above.

Respectfully submitted,

Mitchell Lazarus
Counsel for the Fixed Wireless
Communications Coalition

cc:

Chairman and Commissioners
Chairman Michael Powell
Commissioner Kathleen Q. Abernathy
Commissioner Michael J. Copps
Commissioner Kevin J. Martin

Commissioners' Staff
Peter Tenhula, Chairman Powell's Office
Bryan Tramont, Comm'r Abernathy's Office
Paul Margie, Comm'r Copps's Office
Monica Desai, Comm'r Martin's Office

Wireless Telecom. Bureau
Thomas J. Sugrue
Kathleen Ham
Barry J. Ohlson
Ramona Melson
James Bennett
Michael Pollak

International Bureau
Donald Abelson
Richard B. Engelman
Tom Tycz
Rosalee Chiara
Anna M. Gomez
Paul Locke
Chris Murphy

Office of Engineering and Technology
Edmond J. Thomas
Julius P. Knapp
Bruce A. Franca
Geraldine A. Matise
Ira R. Keltz
Thomas P. Derenge
Gary Thayer

A Proposed Point-to-Point Service to Co-exist with DBS at 12.2 - 12.7 GHz

Fixed Wireless Communications Coalition

to the FCC

February 12, 2002

Introduction

• A new concept has been devised for providing high-speed, point-to-point, two-way service over 1- to 5-mile paths, without harmful interference to DBS.

• Using a novel mix of antenna processing, modulation and coding, OC-12, Gb Ethernet, OC-24 or OC-48 can be transmitted with high reliabilities.

• Using a combination of automatic transmit power control, state-of-the-art antenna designs, careful path engineering and spreading of the spectrum over 500 MHz, any significant interference impact to DBS users is eliminated.

•Engineered point-to-point system will protect existing DBS and avoid possible DBS locations.

• A strong plus for point-to-point service: Engineering the path for reliable transmission coincides with eliminating significant impact to DBS.

• The concept would increase utilization of the spectrum and provide public service opportunities without discernible degradation in incumbent DBS use.

Proposed New System

- Point-to-Point
- High Speed Data
  - Gbit Ethernet
  - OC-12: 622 Mbit/sec to
  - OC-48: 2.488 Gbit/sec
- Short Distances (up to 2 - 5 miles)
- Two Way Communications
  - Time Division Duplex (TDD)
  - Single channel carries information in both directions
- Interference issues with DBS eliminated by design rules that require sighting and aiming point-to-point dishes away from DBS receivers

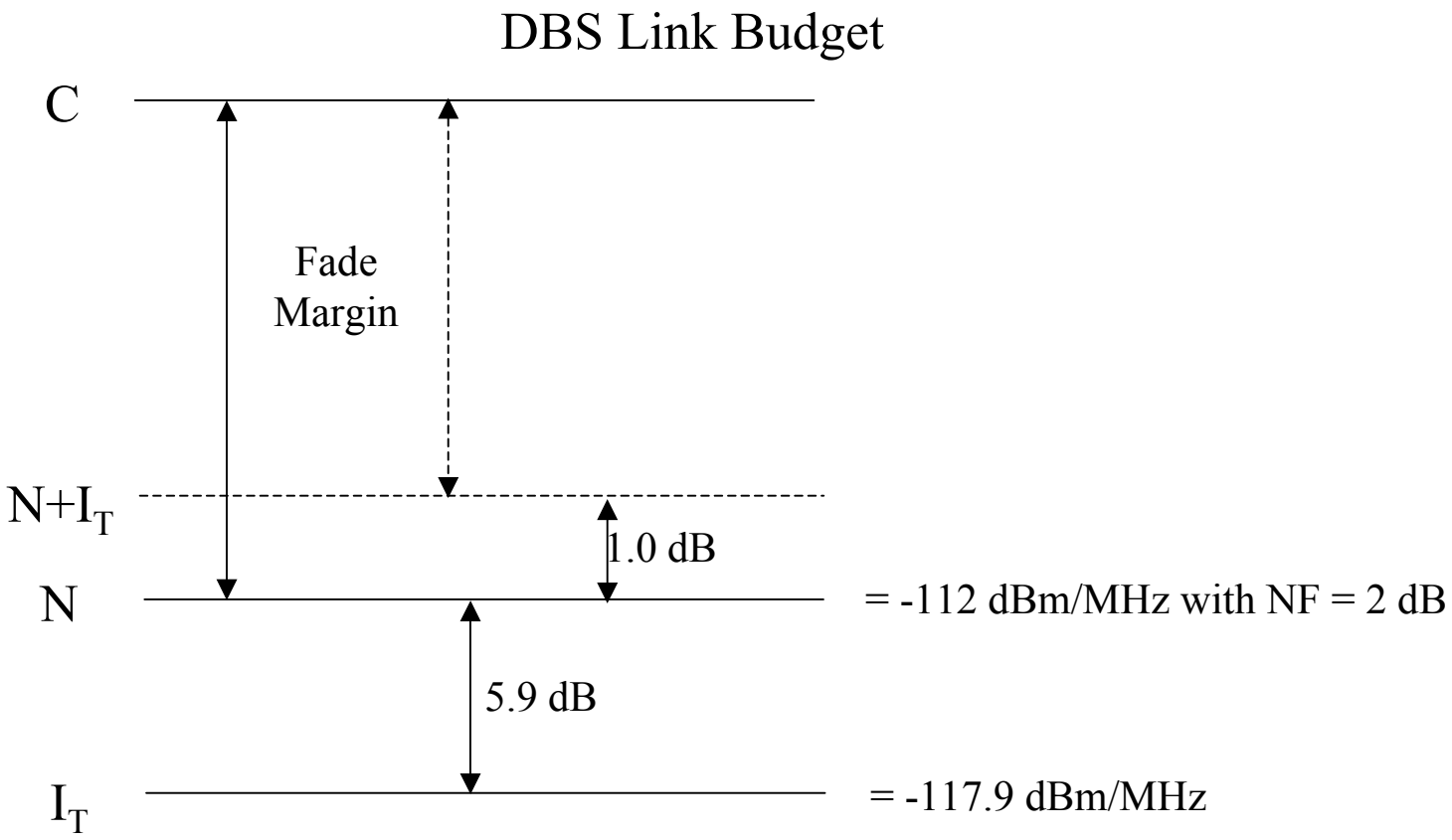
DBS Interference Issues Can Be Successfully Resolved

Two critical questions must be addressed in order to allow another service to co-exist with the DBS service:

- What is an acceptable interference level into DBS?
- How can interference be limited to below this level?

Interference Calculation

For No More Than 1 dB Degradation in DBS Fade Margin:



C = Carrier level I_T = Interference Threshold N = Noise

ITU-R P.618 Availability Model Applied to DBS

Denver			
Margin [dB]	outage [%]	minutes	hours
0.5	0.1797	945.3	15.8
1.0	0.0583	306.4	5.1
1.5	0.0280	147.4	2.5
2.0	0.0160	84.0	1.4
2.5	0.0100	52.6	0.9
3.0	0.0067	35.0	0.6
3.5	0.0046	24.3	0.4
4.0	0.0033	17.4	0.3
4.5	0.0024	12.8	0.2
5.0	0.0018	9.5	0.2
5.5	0.0014	7.2	0.1
6.0	0.0010	5.5	0.1
6.5	0.0008	4.2	0.1
7.0	0.0006	3.3	0.1
7.5	0.0005	2.5	0.0
8.0	0.0004	2.0	0.0
8.5	0.0003	1.5	0.0
9.0	0.0002	1.2	0.0
9.5	0.0002	0.9	0.0
10.0	0.0001	0.7	0.0
10.5	0.0001	0.5	0.0
11.0	0.0001	0.4	0.0
11.5	0.0000	0.2	0.0
12.0	0.0000	0.2	0.0
12.5	0.0000	0.1	0.0

Seattle			
Margin [dB]	outage [%]	minutes	hours
0.5	0.5884	3094.8	51.6
1.0	0.2075	1091.6	18.2
1.5	0.1066	560.8	9.3
2.0	0.0644	338.6	5.6
2.5	0.0426	224.0	3.7
3.0	0.0299	157.1	2.6
3.5	0.0218	114.9	1.9
4.0	0.0165	86.6	1.4
4.5	0.0127	66.9	1.1
5.0	0.0100	52.6	0.9
5.5	0.0080	42.0	0.7
6.0	0.0065	33.9	0.6
6.5	0.0053	27.7	0.5
7.0	0.0043	22.8	0.4
7.5	0.0036	18.9	0.3
8.0	0.0030	15.8	0.3
8.5	0.0025	13.3	0.2
9.0	0.0021	11.2	0.2
9.5	0.0018	9.5	0.2
10.0	0.0015	8.0	0.1
10.5	0.0013	6.8	0.1
11.0	0.0011	5.8	0.1
11.5	0.0009	5.0	0.1
12.0	0.0008	4.2	0.1
12.5	0.0007	3.6	0.1
13.0	0.0006	3.1	0.1
13.5	0.0005	2.6	0.0
14.0	0.0004	2.2	0.0
14.5	0.0004	1.9	0.0
15.0	0.0003	1.6	0.0
15.5	0.0003	1.4	0.0
16.0	0.0002	1.2	0.0

ITU-R P.618 Availability Model Applied to DBS

Washington D.C.			
Margin [dB]	outage [%]	minutes	hours
0.5	1.2959	6815.9	113.6
1.0	0.4799	2523.9	42.1
1.5	0.2557	1345.0	22.4
2.0	0.1593	837.8	14.0
2.5	0.1084	570.0	9.5
3.0	0.0781	410.6	6.8
3.5	0.0585	307.9	5.1
4.0	0.0452	237.9	4.0
4.5	0.0358	188.1	3.1
5.0	0.0288	151.5	2.5
5.5	0.0235	123.8	2.1
6.0	0.0195	102.5	1.7
6.5	0.0163	85.7	1.4
7.0	0.0137	72.3	1.2
7.5	0.0117	61.5	1.0
8.0	0.0100	52.6	0.9
8.5	0.0086	45.3	0.8
9.0	0.0074	39.2	0.7
9.5	0.0065	34.0	0.6
10.0	0.0056	29.7	0.5
10.5	0.0049	26.0	0.4
11.0	0.0043	22.8	0.4
11.5	0.0038	20.1	0.3
12.0	0.0034	17.8	0.3
12.5	0.0030	15.7	0.3
13.0	0.0027	13.9	0.2
13.5	0.0024	12.4	0.2
14.0	0.0021	11.0	0.2
14.5	0.0019	9.8	0.2
15.0	0.0017	8.7	0.1
15.5	0.0015	7.8	0.1
16.0	0.0013	7.0	0.1

Miami			
Margin [dB]	outage [%]	minutes	hours
0.5	3.6674	19288.9	321.5
1.0	1.4373	7559.4	126.0
1.5	0.7984	4199.1	70.0
2.0	0.5148	2707.9	45.1
2.5	0.3612	1899.8	31.7
3.0	0.2676	1407.6	23.5
3.5	0.2060	1083.7	18.1
4.0	0.1632	858.5	14.3
4.5	0.1322	695.3	11.6
5.0	0.1090	573.1	9.6
5.5	0.0911	479.2	8.0
6.0	0.0771	405.6	6.8
6.5	0.0659	346.8	5.8
7.0	0.0569	299.1	5.0
7.5	0.0494	259.9	4.3
8.0	0.0432	227.3	3.8
8.5	0.0380	200.0	3.3
9.0	0.0336	176.9	2.9
9.5	0.0299	157.2	2.6
10.0	0.0267	140.2	2.3
10.5	0.0239	125.6	2.1
11.0	0.0215	112.8	1.9
11.5	0.0193	101.7	1.7
12.0	0.0175	91.9	1.5
12.5	0.0158	83.3	1.4
13.0	0.0144	75.7	1.3
13.5	0.0131	68.9	1.1
14.0	0.0120	62.9	1.0
14.5	0.0109	57.4	1.0
15.0	0.0100	52.6	0.9
15.5	0.0092	48.2	0.8
16.0	0.0084	44.3	0.7

From MITRE Report - MTR01W0000024

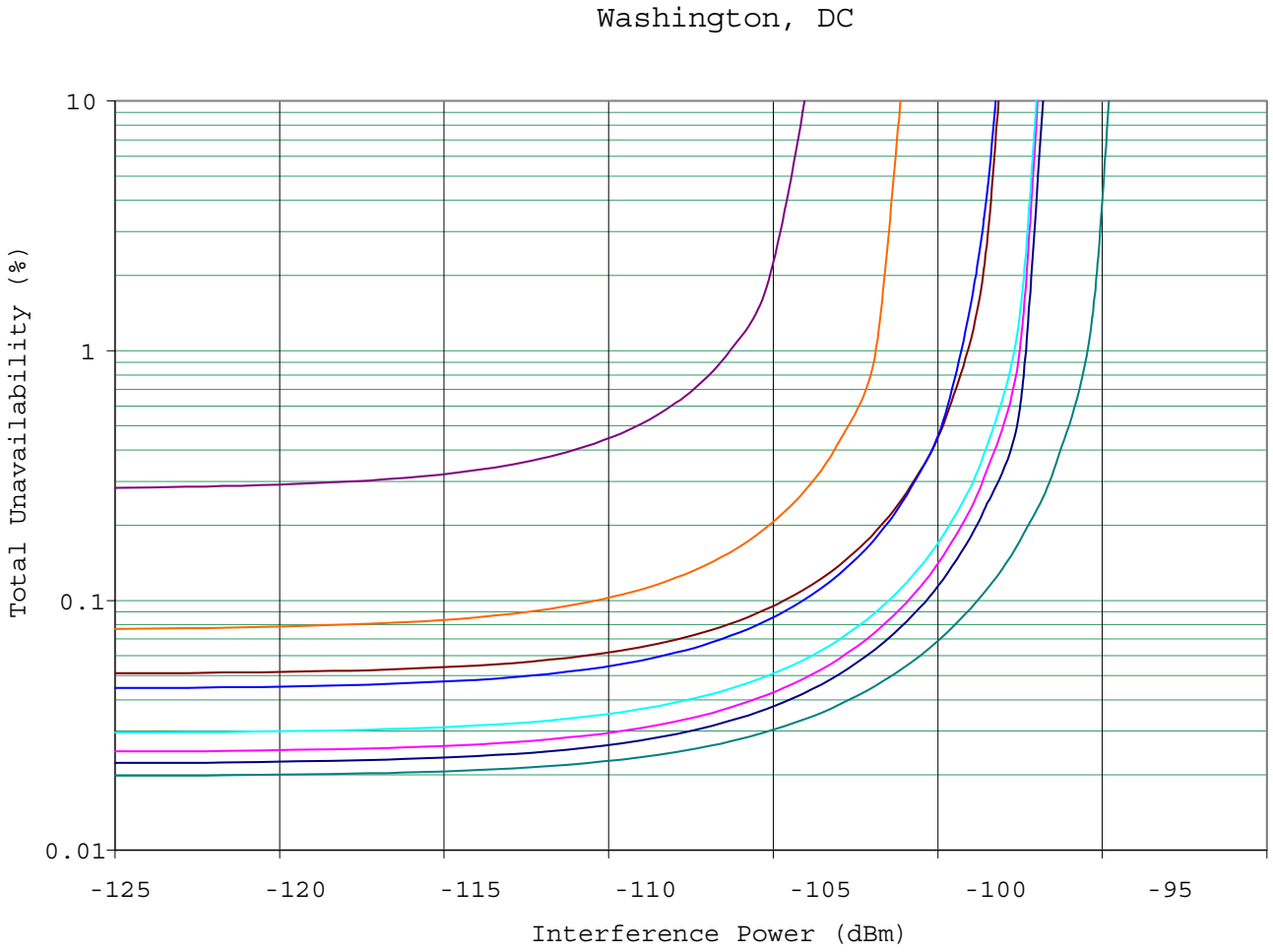


Figure 5-5. Total Unavailability for Washin

Based on Video Quality 6

Curves represent eight different satellites

Interference Calculation

Maximum Allowable Interference Power Flux Density to DBS Antenna:

$$S_{\mathrm{MAX}} = I_T - G_{DBS}(\theta,\phi) + 11 - 20\log(\lambda)$$

If interfering transmit antenna is not in DBS main beam:

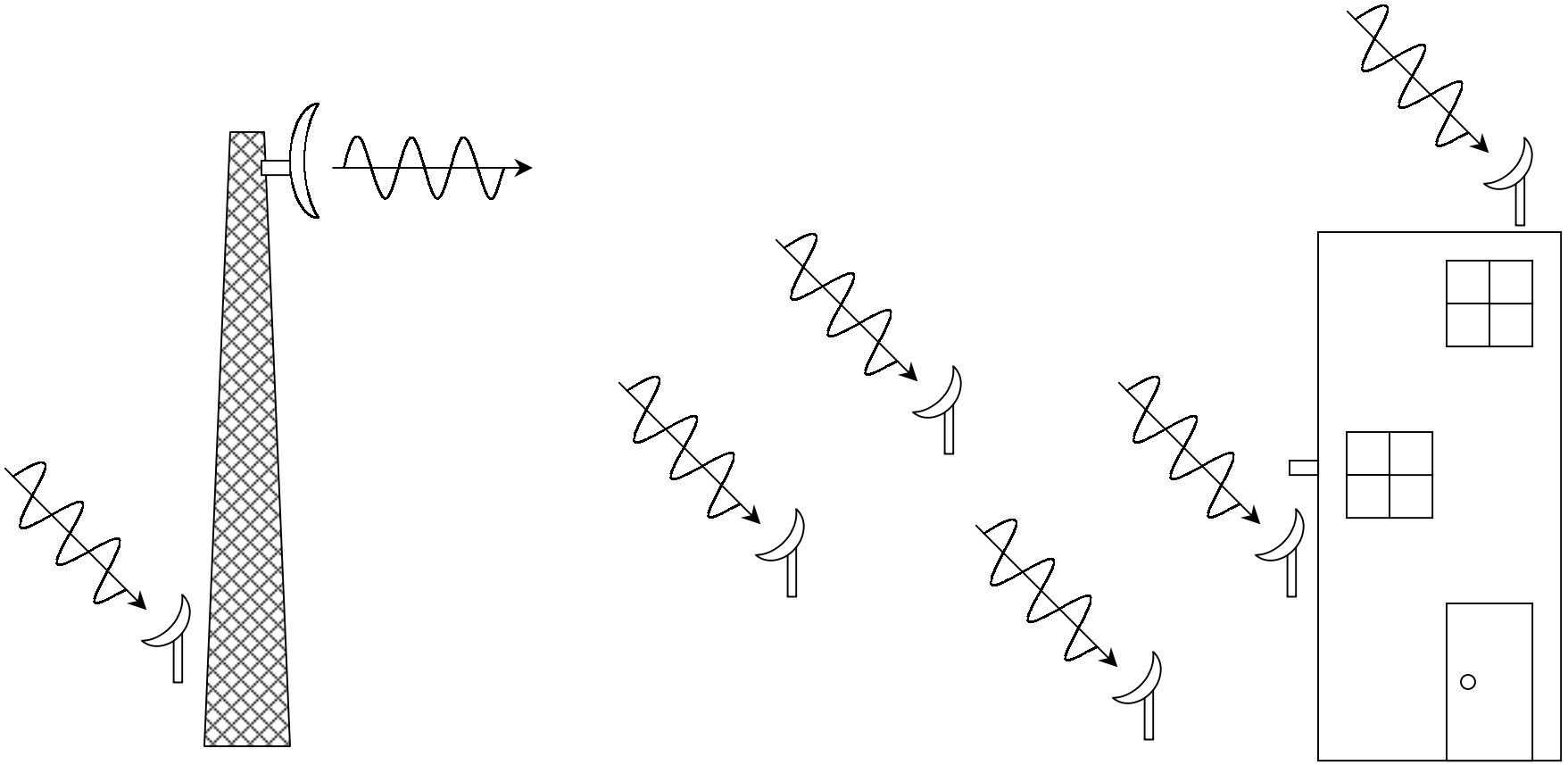
$$G_{DBS}(\theta,\phi) \le 0\ \mathrm{dBi}$$

Based on the four types of DBS antennas measured in MITRE report:

$$S_{\mathrm{MAX}} = I_T + 43.4\ \mathrm{dBm/MHz/m^2}$$

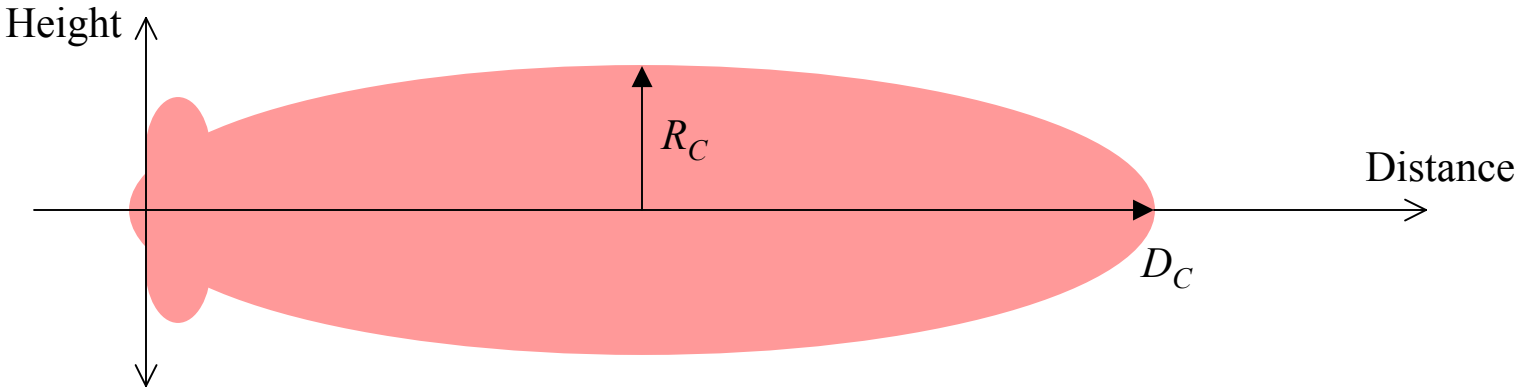
I_T = Interference Threshold G_{DBS} = gain of DBS Antenna

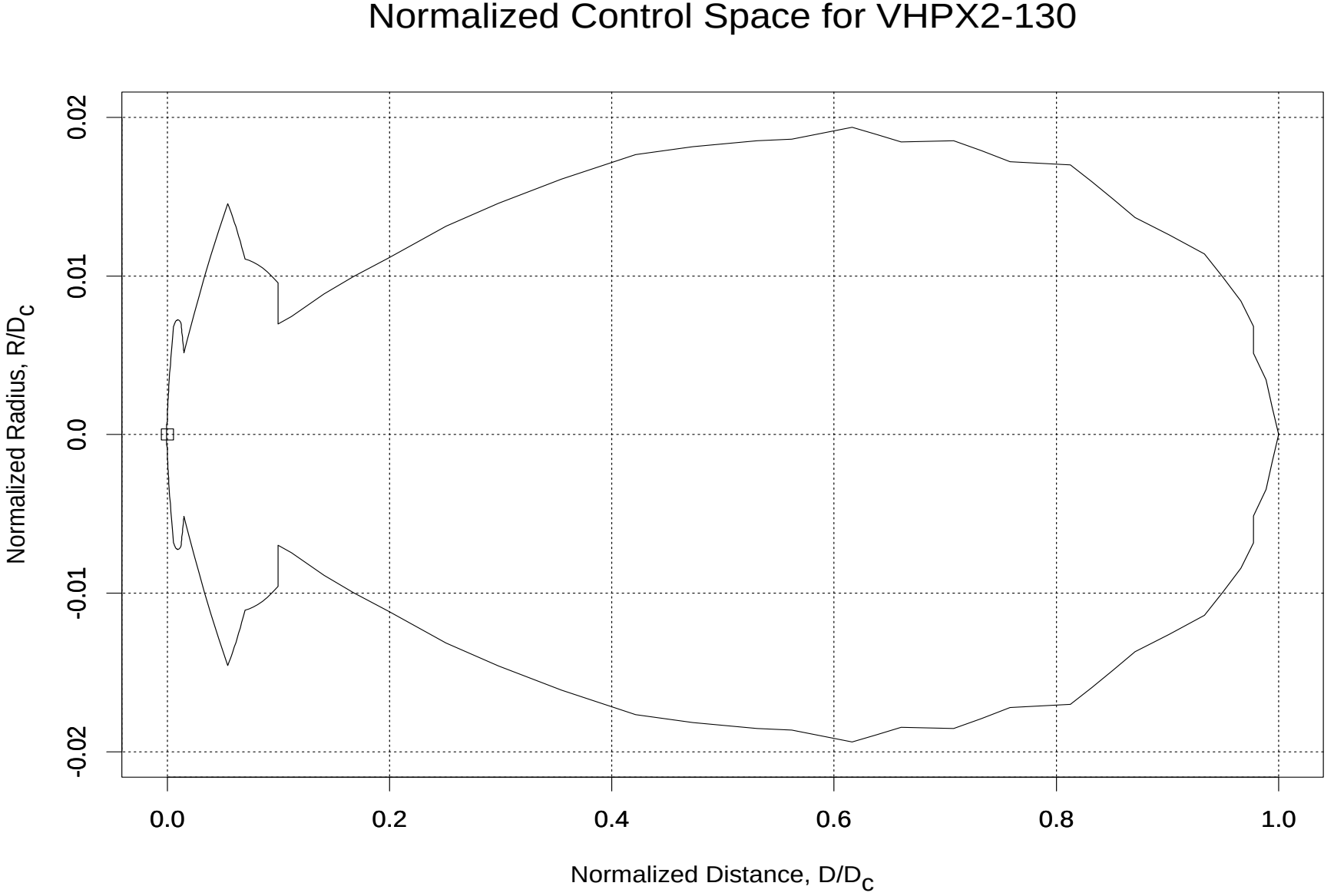
DBS Receiver Very Unlikely to Aim at Point-to-Point Antenna



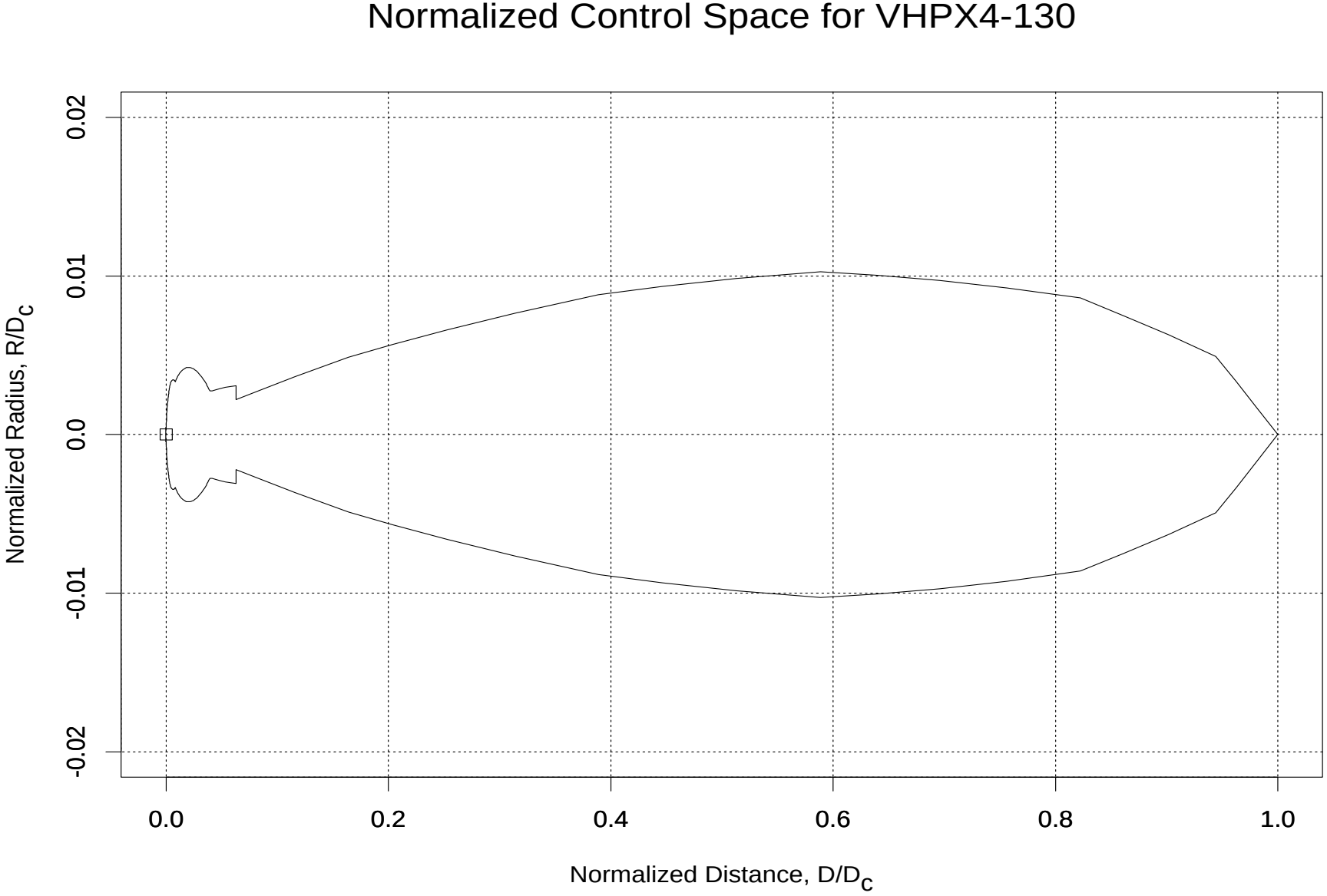
Control Space

- There is a region of space around our transmit antenna where $S > S_{MAX}$
- This region of space will be known as the *control space*
- No DBS receive antennas may exist in the control space
- The shape of the control space depends only on the TX antenna pattern
- The size of the control space depends only on the TX EIRP
- The path must be engineered so that the control space occupies a region inappropriate for DBS installation, such as in open air
- The control distance, D_C, is typically less than the path length
- The control radius, R_C, must be small enough not to intersect structures likely to support DBS antennas.

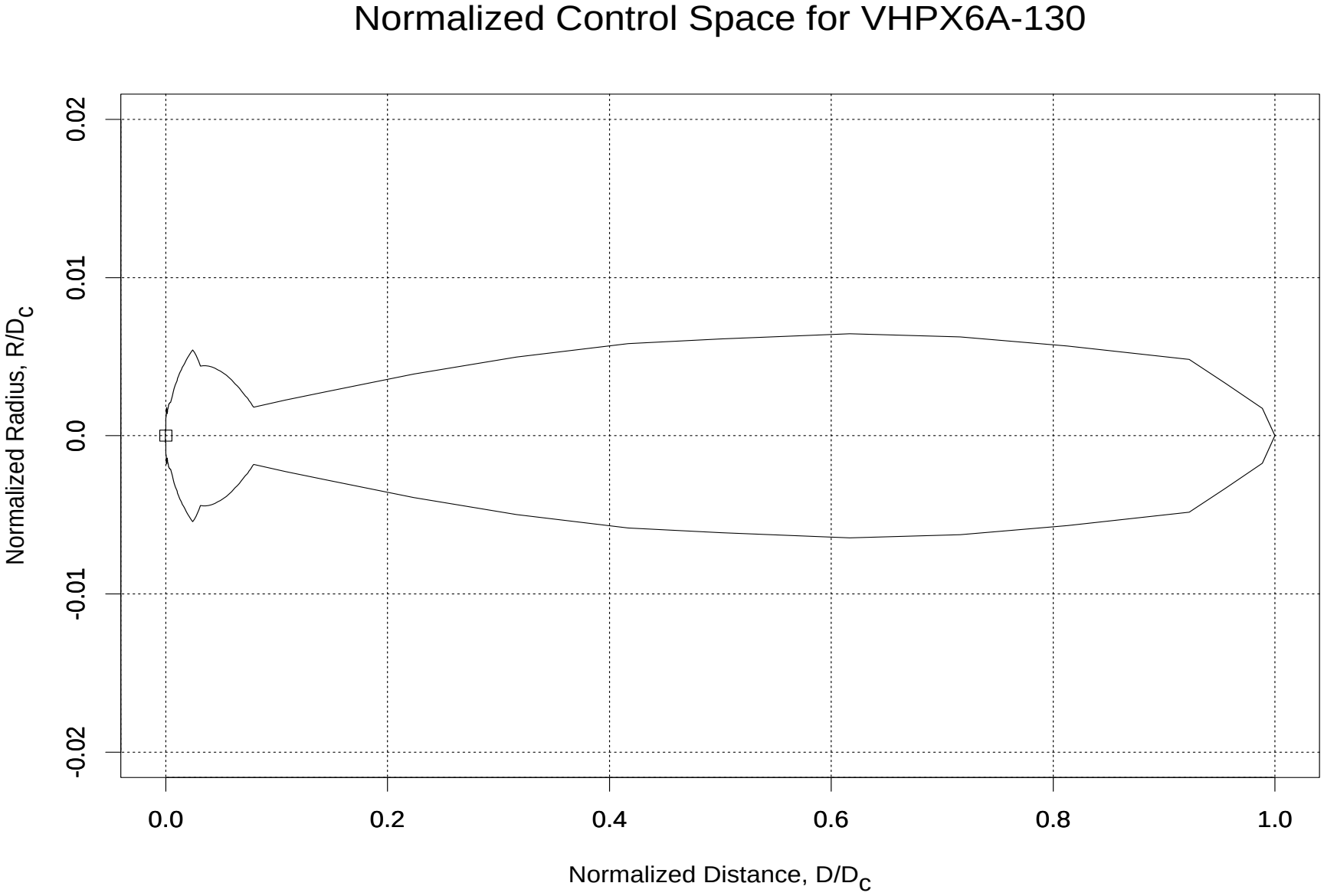




2 ft. Diameter Point-to-Point Antenna



4 ft. Diameter Point-to-Point Antenna



6 ft. Diameter Point-to-Point Antenna

Control Space

- TX EIRP limit a function of achievable control space
- EIRP limit determines data rate and path length (along with climate, RX antenna gain, noise figure)

Some Services Possible with Control Radius < 10 meters

City	Antenna Diameter [ft]	TX EIRP [dBm]	Distance [mi]	Data Rate
Miami	4	22.6	2	OC-24
Miami	6	24.6	2	OC-48
Washington	4	13.7	1	OC-48
Washington	4	16.6	2	OC-24
Washington	4	22.7	3	OC-24
Seattle	4	22.9	4	OC-24
Seattle	2	17.2	1	OC-48
Phoenix	6	26.8	5	OC-48
Phoenix	2	16.9	1	OC-48
Denver	2	10.6	1	OC-24
Denver	4	20.9	4	OC-24
Denver	6	25.8	5	OC-48

Conclusion

• A new concept has been devised for providing high-speed, point-to-point, two-way service over 1- to 5-mile paths, without harmful interference to DBS.

• Using a novel mix of antenna processing, modulation and coding, OC-12, Gb Ethernet, OC-24 or OC-48 can be transmitted with high reliabilities.

• Using a combination of automatic transmit power control, state-of-the-art antenna designs, careful path engineering and spreading of the spectrum over 500 MHz, any significant interference impact to DBS users is eliminated.

•Engineered point-to-point system will protect existing DBS and avoid possible DBS locations.

• A strong plus for point-to-point service: Engineering the path for reliable transmission coincides with eliminating significant impact to DBS.

• The concept would increase utilization of the spectrum and provide public service opportunities without discernible degradation in incumbent DBS use.

Appendix A -- List of Members

FIXED WIRELESS COMMUNICATIONS COALITION

The Fixed Wireless Communications Coalition was formed by terrestrial fixed microwave users and suppliers to assure that adequate spectrum resources are available for current and future terrestrial fixed microwave communications. Such action is necessary because spectrum allocation and re-allocation actions currently under consideration at the FCC require fixed microwave interests to speak with a common voice. Additionally, the Coalition works for a regulatory climate both at the FCC and the ITU that permits the manufacture, operation, and use of terrestrial fixed microwave systems.

MEMBERS

USERS

Association of Public-Safety Communications Officials
UTC - The Telecommunications Association
National Association of Broadcasters
American Petroleum Institute
Wireless Communications Association International
Personal Communications Industry Association
Independent Multi-Family Communications Council
BellSouth
SBC Communications, Inc.
People's Choice TV
Association of American Railroads
WINSTAR Communications Inc.
DIVEO Broadband Networks
XO COMMUNICATIONS

MANUFACTURERS

Harris Corporation -- Microwave Communications Division
Alcatel Network Systems Inc.
DMC STRATEX Networks
Tadiran Microwave Networks
MOTOROLA Inc.
Nortel Networks
P-Com, Inc.
LUCENT Technologies
Adaptive Broadband Inc.

CO-CHAIRS

Andrew Kreig
President, Wireless Communications
Association International
1140 Connecticut Avenue, N.W.
Suite 810
Washington, D.C. 20036-4001

Mitchell Lazarus
Fletcher, Heald & Hildreth, PLC
1300 North 17th Street, 11th Floor
Arlington, VA 22209
703-812-0440