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1776 K STREET, N.W.
WASHINGTON, D. C. 20006
(202) 429-7000

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DAVID E. HILLIARD
(202) 429-7058

FACSIMILE
(202) 429-7049

EX PARTE OR LATE FILED

July 26, 1995

RECEIVED

JUL 26 1995

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20006
STOP CODE: 1170

Re: Ex Parte Communication in PR Docket No. 93-61

Dear Mr. Caton:

Pursuant to Section 1.1206(a)(2) of the Commission's Rules, notice is hereby given of an *ex parte* communication regarding the above-referenced proceeding.

Today, Kathleen Abernathy and William Goshay on behalf of AirTouch Teletrac, John McDonnell on behalf of MobileVision, L.P., Peter Battacan on behalf of PentaPage, and Kevin Anderson and David Hilliard on behalf of Pinpoint Communications, Inc., met with the following officials of the Wireless Telecommunications Bureau: Ms. Rosalind Allen, Chief of the Commercial Wireless Division, Ms. Sally Novak, Chief of the Legal Branch of the Commercial Wireless Division, Mr. Iba Spicer and Mr. B.C. Jackson, Jr.

The presentation emphasized the need to revise the emissions mask and the importance of proceeding with a change in the mask in order that grandfathered multilateration systems might be constructed. Copies of the materials prepared by AirTouch Teletrac and Pinpoint that were supplied to Commission personnel during the meeting are attached hereto. In making the recommendation for a change in the mask the system proponents noted that the revised mask should not inhibit the operation of non-multilateration systems and that the emissions levels outside of the multilateration

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List A B C D E

Mr. William F. Caton
July 26, 1995
Page 2

LMS sub-bands would be below energy levels permitted under Part 15 of the Commission's Rules for operation within the 902 - 928 MHz band.

Respectfully,,

A handwritten signature in black ink, appearing to read "David E. Hilliard". The signature is written in a cursive style with a large, looping initial "D".

David E. Hilliard

Attachments

cc: Attached List

Ms. Rosalind K. Allen, Chief
Commercial Wireless Division
Federal Communications Commission
2025 M Street, NW, Room 5202
Stop Code 2000C
Washington, DC 20554

Ms. Sally Novak
Chief, Legal Branch
Commercial Wireless Division
Federal Communications Commission
2025 M Street, NW, Room 5202
Stop Code 2000C2
Washington, DC 20554

Mr. Iba Spicer
Commercial Wireless Division
Federal Communications Commission
1919 M Street, NW, Room 541-A
Washington, DC 20554

Mr. Bernard C. Jackson, Jr.
Engineering Advisor to the Chief
Commercial Wireless Division
Federal Communications Commission
1919 M Street, NW, Room 644F
Washington, DC 20554

Kathleen Q. Abernathy, Esq.
AirTouch Communications
1818 N Street, NW, 8th Floor
Washington, DC 20036

John J. McDonald, Esq.
Reed, Smith, Shaw & McClay
1301 K Street, NW
Suite 1100 - East Tower
Washington, DC 20005

Peter Battacan, Esq.
Dow, Lohnes & Albertson
1255 23rd Street
Suite 500
Washington, DC 20037



COPY

Kathleen Q. Abernathy
Vice President
Federal Regulatory

AirTouch Communications
1818 N Street N.W.
Suite 800
Washington, DC 20036

Telephone: 202 293-4960
Facsimile: 202 293-4970

July 24, 1995

EX PARTE

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

RE: PR Docket 93-61, Automatic Vehicle Monitoring Systems

Dear Mr. Caton:

The attached information was provided to Jay Jackson of the FCC's Wireless Bureau on July 24, 1995. Please associate this material with the above-referenced proceeding.

Two copies of this notice were submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me at 202-293-4960 should you have any questions or require additional information concerning this matter.

Sincerely,

A handwritten signature in cursive script that reads "Kathleen Q. Abernathy". The signature is written in dark ink and includes a small initial "KQ" at the end.

Kathleen Q. Abernathy

Attachments



AirTouch Teletrac
7391 Lincoln Way
Garden Grove, CA 92641-1428

Telephone: (714) 897-0877
Fax: (714) 892-8637

July 21, 1995

Mr. J. Jackson
Federal Communications Commission
Wireless Bureau
2025 "M" Street
Washington DC 20036

RE: AirTouch Teletrac Petition for Partial Reconsideration; Docket 93-61

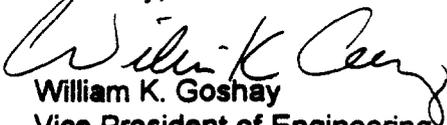
Dear Mr. Jackson:

Enclosed please find information regarding the proposed bandwidth limitation rules. I have included several charts showing the emission mask produced by the proposed rules. In each chart for the wideband segments there is also a mask showing a conservative interpretation of the interim rules (-43 dBc).

One chart, labeled "LMS Emission Mask with ATT Emissions Overlaid" shows spectrum for mobile transmissions on two of Teletrac's channels. It also shows the rule proposed by Hughes.

We appreciate your work in this proceeding. I hope this information will be useful. If you have questions, please call me at 714-890-7687.

Sincerely,


William K. Goshay
Vice President of Engineering
and Development

enc.

Effective LMS systems depend on highly accurate time of arrival measurements to develop accuracy suitable for the services provided¹.

- For example, in Teletrac's system, receivers designed to deliver time-of-arrival accuracy to within 30 nanoseconds (under non-multipath conditions).
- These time measurements are developed by processing the signals produced by the direct-sequence chipping clock.

There is significant difference between TOA and system location accuracy. This is primarily caused by Geometric Dilution of Precision (GDOP).

- The Teletrac system accuracy is 100-150 feet. If accuracy were solely dependent on TOA, accuracy of 30 feet would be possible.
- A brief description of GDOP can be found in Teletrac's petition for rulemaking filed on May 26, 1992².
- LMS providers cannot produce enough TOA or system accuracy if the chipping rates are reduced.

¹ Teletrac Petition for Rulemaking, Appendix Impact of Co-Channel Interference on 900 MHz Wideband Pulse-Ranging AVM System Performance at 2.

² Id. page 12.

TELETRAC NOTES REGARDING LMS OUT-OF-BAND EMISSIONS -- LMS PROPOSAL -- Page 2

It is impractical for LMS providers to meet public demand for location accuracy under the new bandwidth limitation.

- Chipping rate would need to be reduced significantly which would bring accuracy to unacceptable low levels.
- Teletrac's existing customers would be left with inferior service.
- The rule in the Report and Order seems more appropriate for 5 kHz channel spacing³.
- The video bandwidth specification effectively increases the amount of attenuation by up to 10 dB because noise in the measuring device adds raises the peak of the envelope.⁴

The proposed rules allow greater protection than the interim rules, while still allowing high enough chipping rates to develop suitable time-of-arrival⁵.

- The attached charts show LMS proposed out-of-band emission limitations as they would be applied across the band.
- Also included is a chart showing how two of Teletrac's channels would fit inside the emission mask⁶.
- The proposed narrowband forward link rule is based on PCS and MAS rules⁷.

³ See C.F.R. Section 90.209 (1). Also note the resolution bandwidth is 100 Hz or 10 kHz, not 100 kHz.

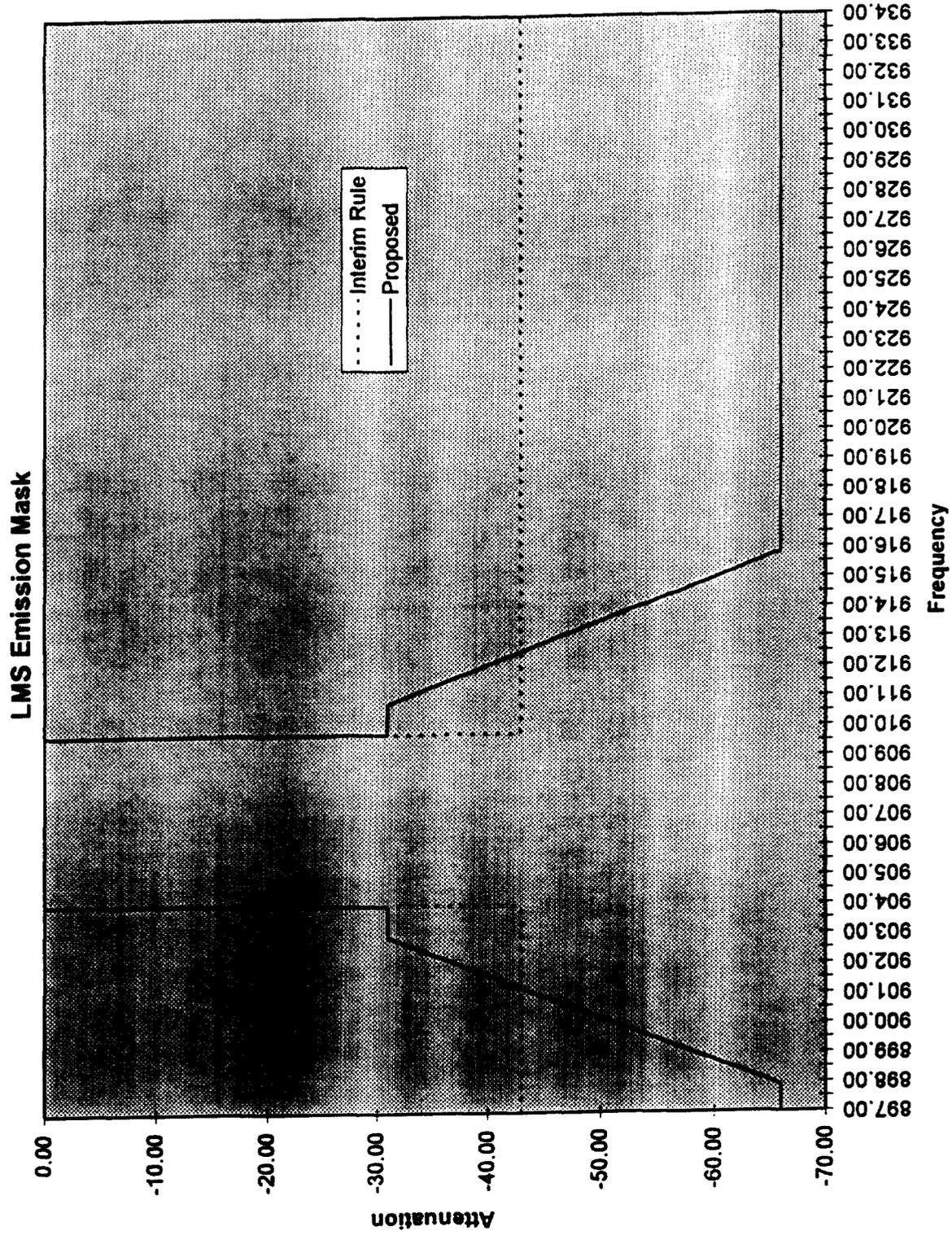
⁴ Since video bandwidth filtering is post-detection, it is perfectly acceptable to apply more filtering to reduce displayed noise which corrupts the measurement.

⁵ Teletrac Petition for Partial Reconsideration and Clarification, pages 5-8.

⁶ Under 90.209 (m), Teletrac's first side lobe attenuation would need to be approximately 62 dB.

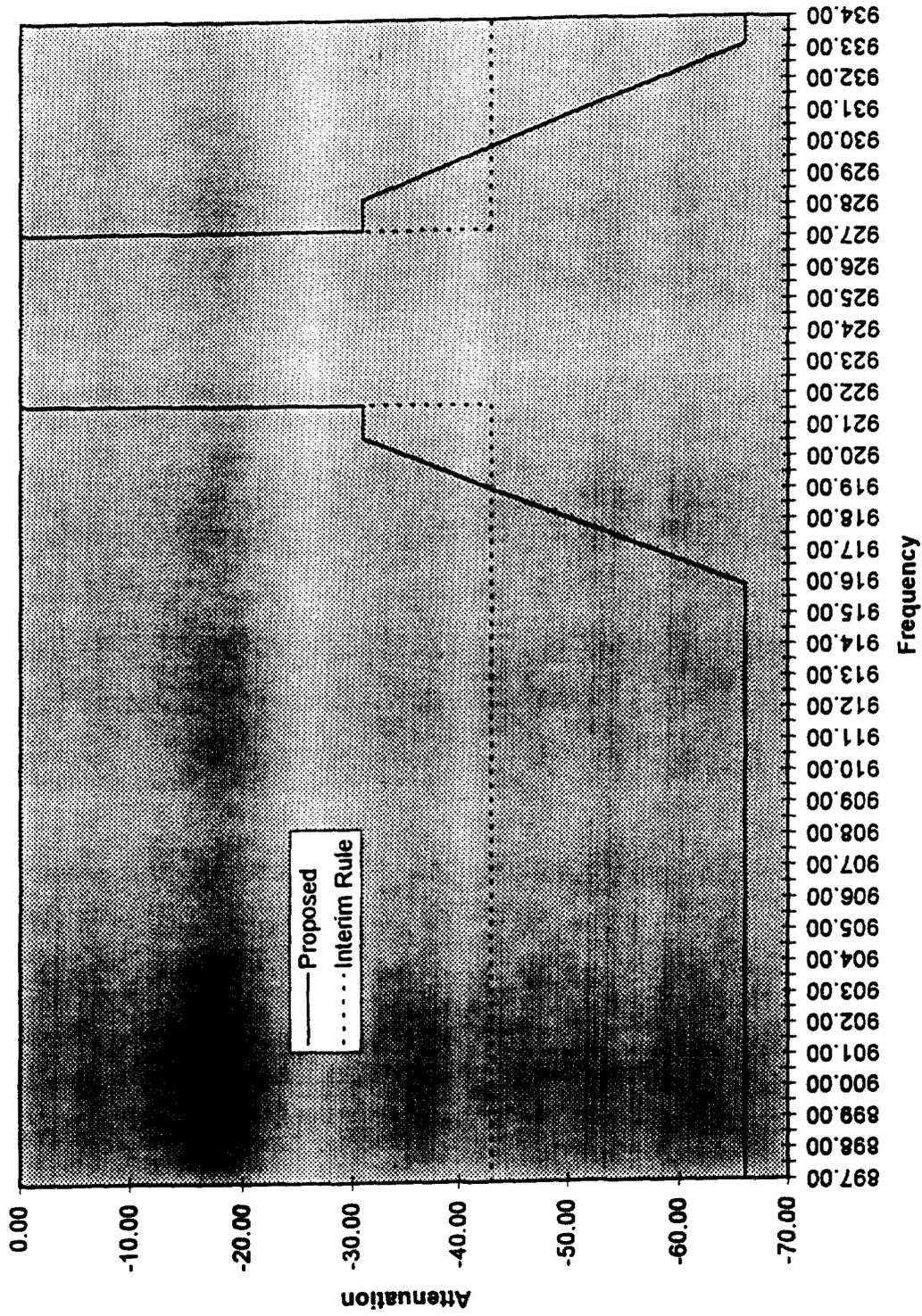
⁷ C.F.R. section 24.133 (a) (1), 94.71 (c)(4)

Multilateration Band
(904.000-909.750 MHz)



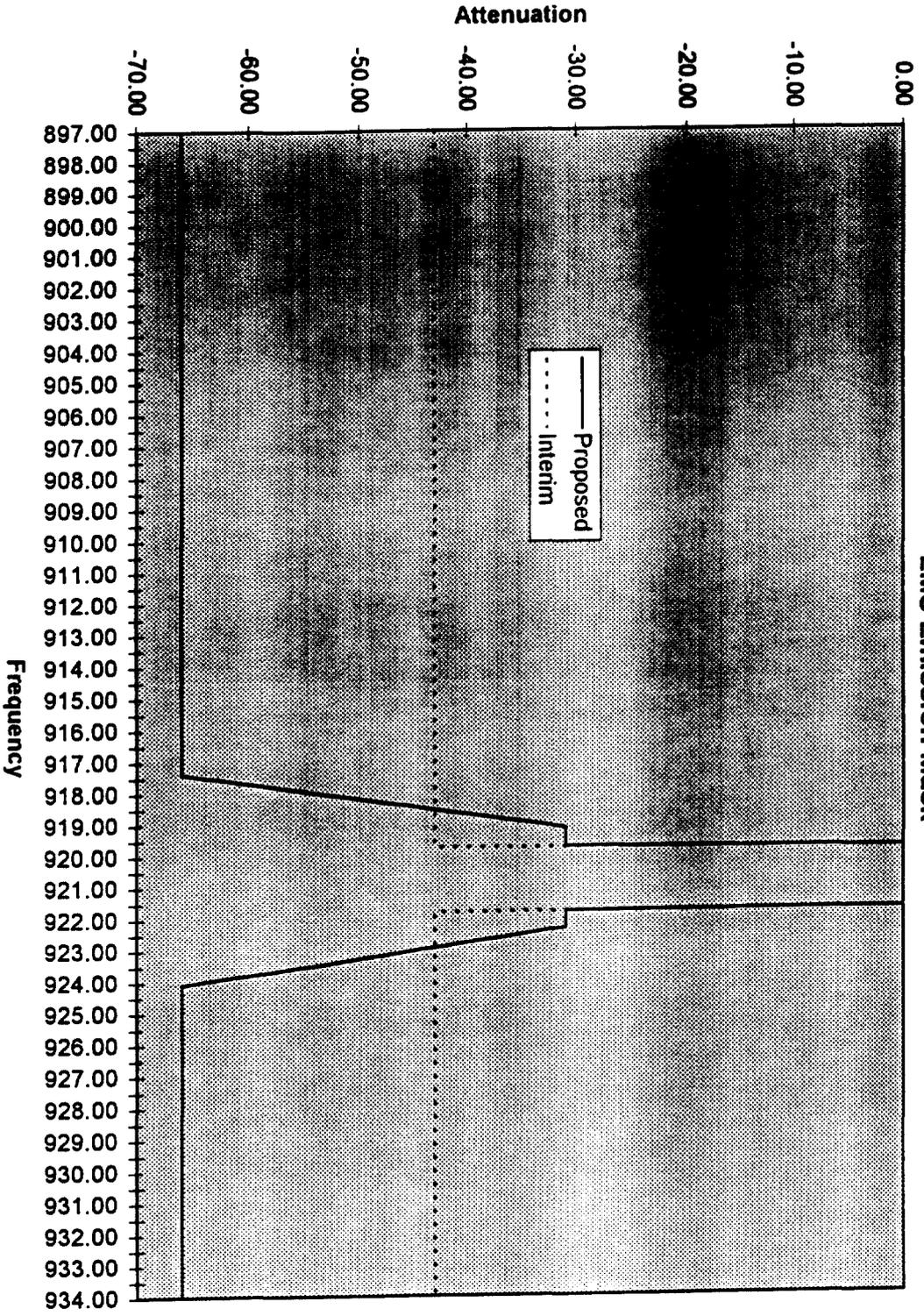
Multilateration Band
(921.750-927.25 MHz)

LMS Emission Mask



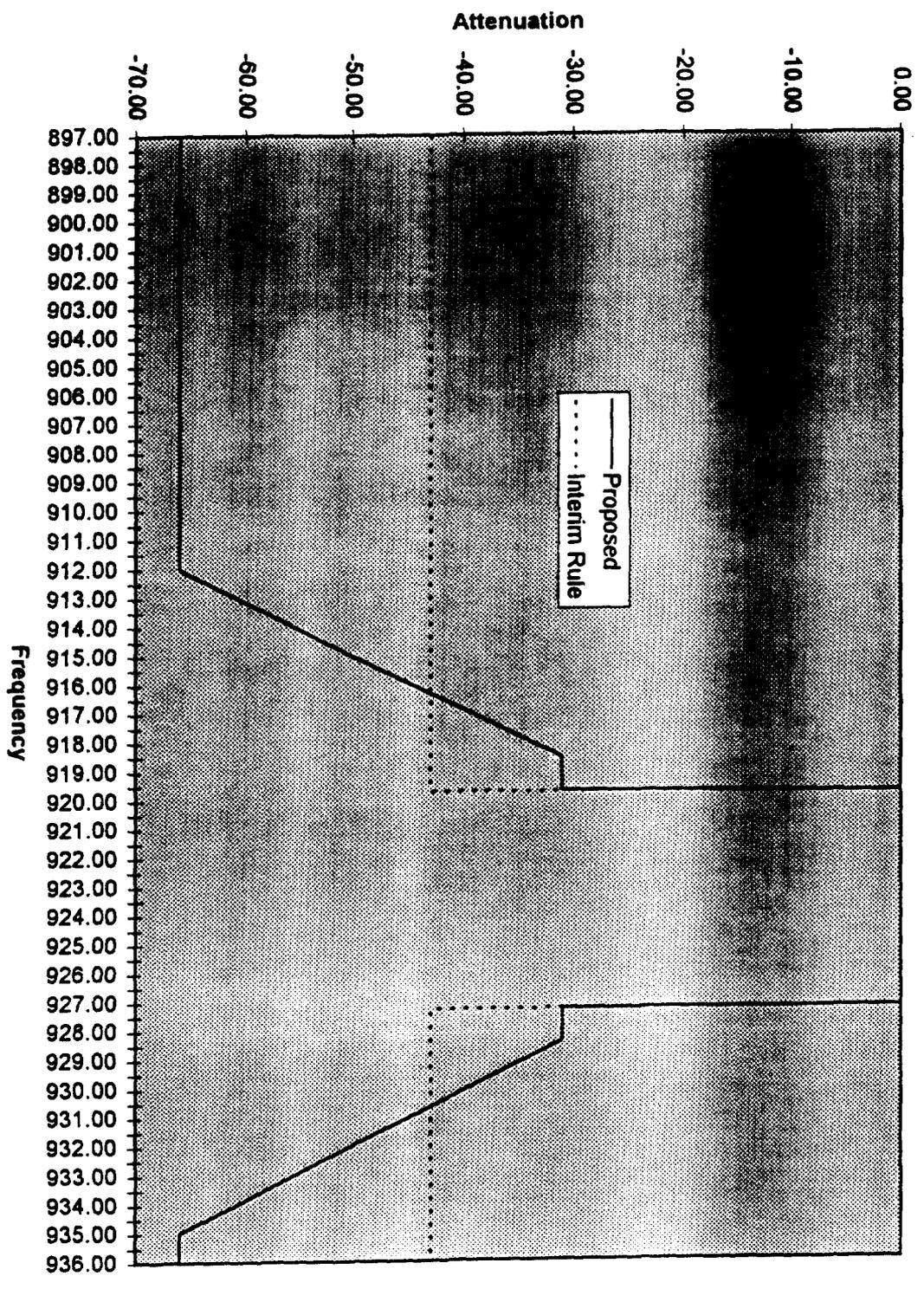
Multilateration Non-Multilateration Band
(919.750-921.750 MHz)

LMS Emission Mask



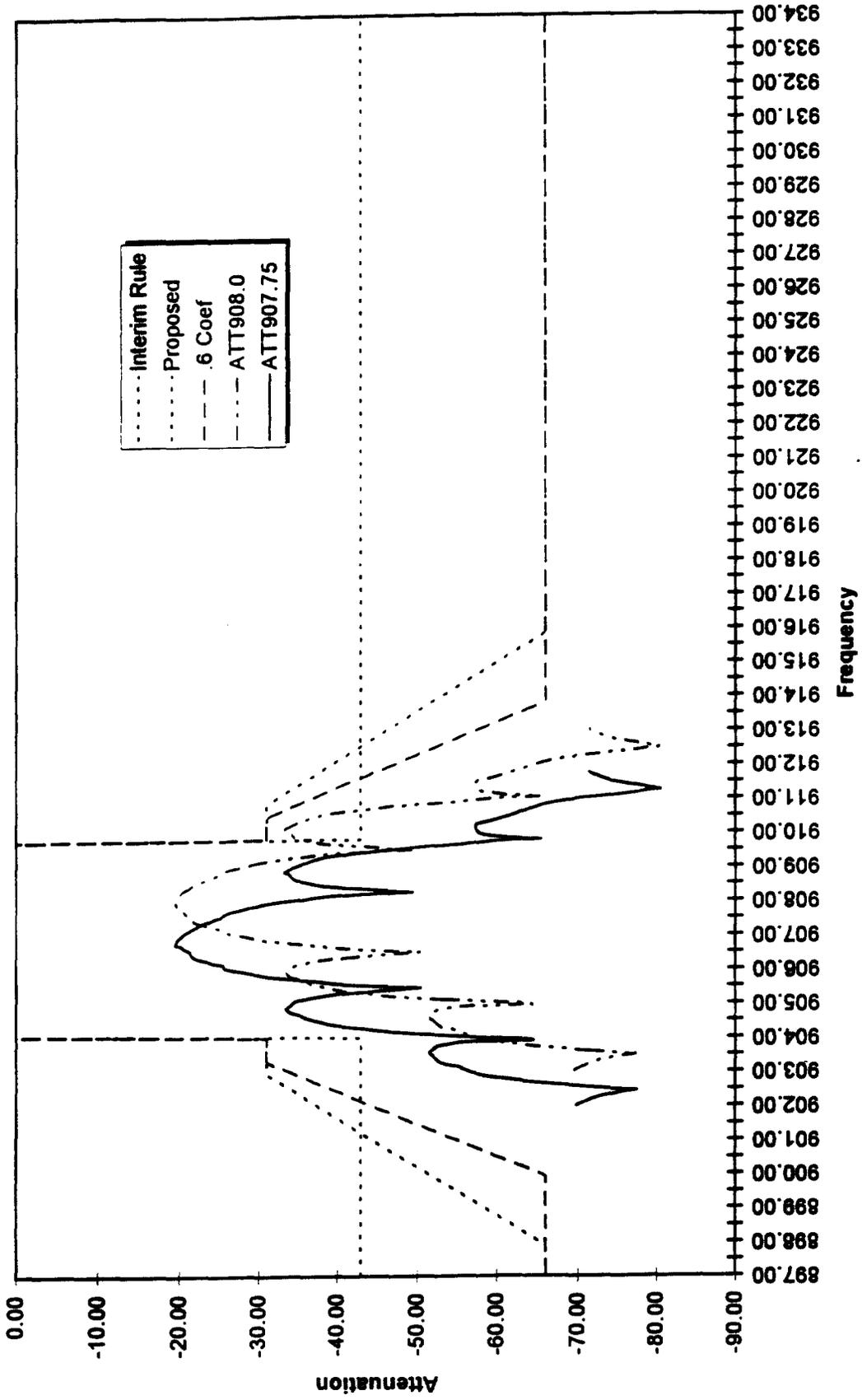
8 MHz Multilateration Band
(919.75-927.75 MHz)

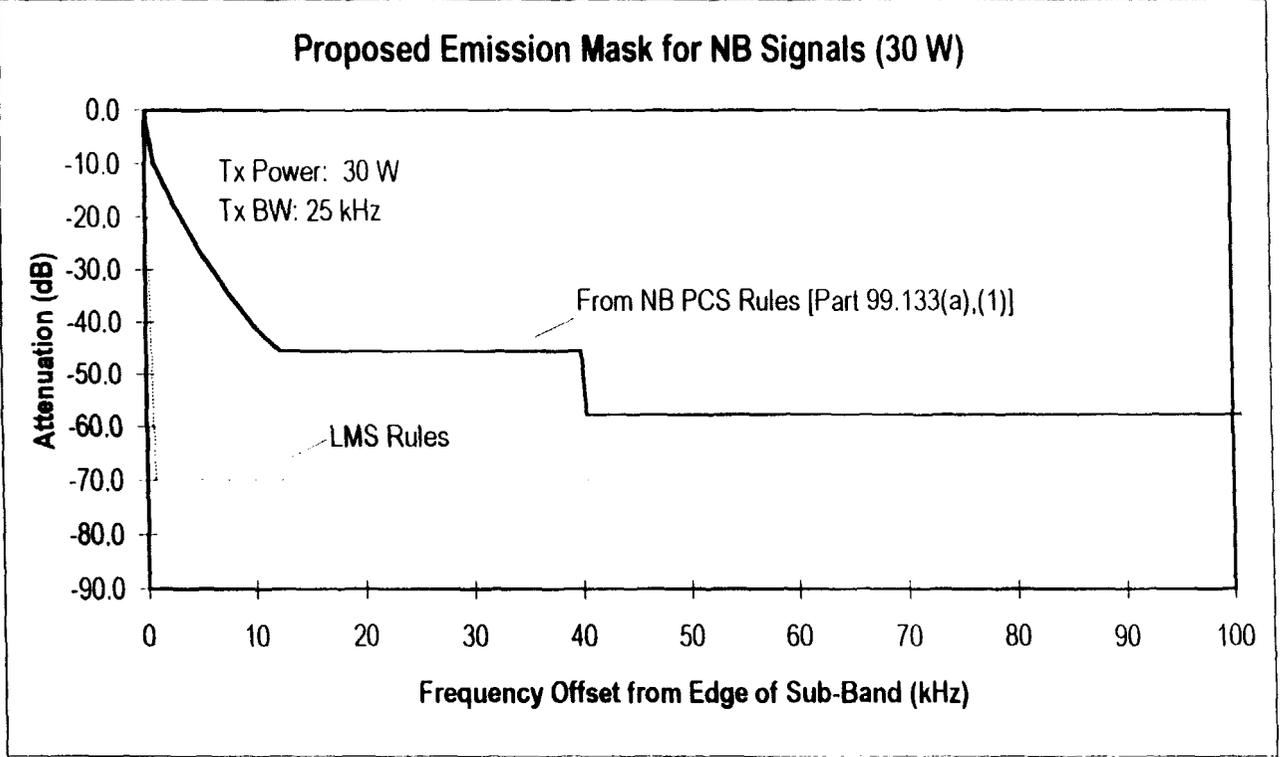
8 MHz Upper Band LMS Emission Mask



Multilateration Band
(904.000-909.750 MHz)

LMS Emission Mask
with ATT Mobile Emissions Overlaid

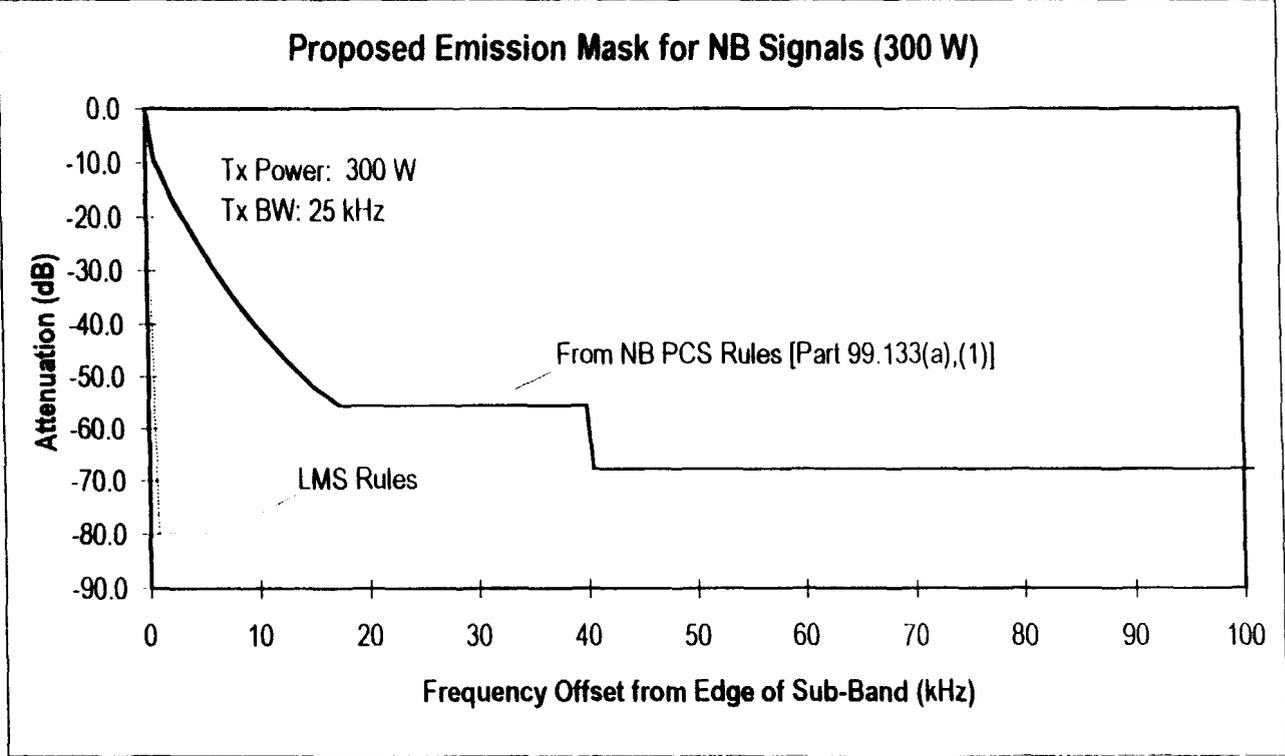




The New Emission Mask is Flawed

- The New Emission Mask Contained in the Report and Order¹ Prevents the Use of Any of the Current LMS Direct Sequence Spread Spectrum Technologies
 - LMS Licensees Would Be Forced to Redesign Their Systems to Reduce the Chipping Rates, Thereby *Significantly Impairing System Performance and Its Utility to Customers*
 - The New Mask is Therefore Fatally Flawed in that It Undermines the FCC's Asserted Goal of Encouraging the Deployment of LMS Systems that Provide a Useful Service to the Public

¹ Amendment of Part 90 Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems in PR Docket No. 93-61, FCC 95-41 (Rel. Feb. 6, 1995).



The New Emission Mask Lacks Support

- All LMS Interests in this Proceeding Opposed the Emission Mask Proposed and Adopted by the Commission
- There is a Lack of Record Support for the New Emission Mask
- This Stringent Mask is Designed, In Part, to “Protect” Non-Multilateration Systems at 909.75 - 921.75 MHz. However, *There Is No Record Evidence of Multilateration Interference to Non-Multilateration Systems*

The New Emission Mask is Far In Excess of Other Comparable Land Mobile Emission Limitations

- The Newly Adopted Specification Requires That Licensees Attenuate Their Emissions by $55 + 10\log(P)$ dB at the edges of the Specified LMS Sub-Bands¹
- For a 30 watt Mobile This Specification is Much More Strict than the Specifications for
 - General Part 15 Emissions Inside the 902-928 MHz Band²
 - Part 90 Mask Requirements³
 - The Limitation for High Speed Digital Data in Microwave Bands⁴

¹ Report and Order at Paragraph 98.

² See 47 C.F.R. 15.209 and 15.249(a).

³ See *id.* at 90.209(c)(1)(i)-(iii).

⁴ *Id.* at 21.106(a)(1).

Multilateration LMS Providers Urge the FCC to Adopt the Consensus Emission Mask

- For LMS wideband emissions, operating in the 902-928 MHz band, in any 100 kHz band, the center frequency of which is removed from the center of authorized sub-band(s) by more than 50 percent up to and including 250 percent of the authorized bandwidth: The mean power of emissions shall be attenuated below the maximum permitted output power, as specified by the following equation but in no case less than 31 dB:

$$A = 16 + 0.4 (P-50) + 10\log B \text{ (attenuation greater than 66 dB is not required)}$$

where A = attenuation (in decibels) below the maximum permitted output power level
 P = percent removed from the center of the authorized sub-band(s)
 B = authorized bandwidth in megahertz

Multilateration LMS Providers Urge the FCC to Adopt the Consensus Emission Mask (cont'd)

- For LMS narrowband forward link emissions, the power of any emission shall be attenuated below the transmitter power (P), in accordance with the following schedule:
 - on any frequency outside the authorized sub-band and removed from the edge of the authorized sub-band by a displacement frequency (fd in kHz): at least $116 \log_{10} ((fd + 10)/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 70 decibels, whichever is the lesser attenuation. A minimum spectrum analyzer resolution bandwidth of 300 Hz shall be used when showing compliance

These Limits are Realistic for Multilateration Systems