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JILL A. STERN
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June 12, 1992

Ms. Donna Searcy
Secretary
Federal Communications Commission
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Washington, D.C. 20554

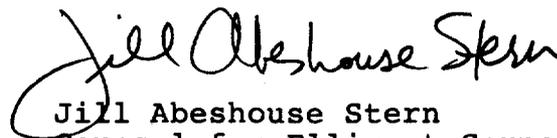
Re: Motorola Satellite Communications, Inc.
Supplement to Request for Pioneer's
Preference; ET Docket No. 92-28; PP-32

Dear Ms. Searcy:

On behalf of Ellipsat Corporation, I am transmitting here-
with an original and four copies of "Reply Comments of Ellipsat
Corporation" relating to the above-referenced supplemental
materials.

Should there be any questions concerning this matter, kindly
communicate with the undersigned.

Sincerely,



Jill Abeshouse Stern
Counsel for Ellipsat Corporation

JAS:csg

Enclosures

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JUN 12 1992

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of:)

MOTOROLA SATELLITE)
COMMUNICATIONS, INC.)

ET Docket No. 92-28

PP-32

Request for Pioneer's Preference)
to Establish a Low-Earth Orbit)
Satellite System in the 1610-)
1626.5 MHz Band.)

To: Office of Engineering and Technology

REPLY COMMENTS OF ELLIPSAT CORPORATION

Jill Abeshouse Stern
SHAW, PITTMAN, POTTS & TROWBRIDGE
2300 N Street, N.W.
Washington, D.C. 20037
(202) 663-8000

Counsel for Ellipsat Corporation

June 12, 1992

SUMMARY

In these reply comments, Ellipsat provides its views with respect to Motorola's late-filed comment information in the pioneer's preference proceeding. Having reviewed Motorola's supplemental materials, confidential and otherwise, Ellipsat can confidently state that nothing in the materials alters its prior assessment that Motorola's preference request must be denied. Motorola has not submitted any new evidence relevant to its preference claim. To the contrary, even assuming that the materials relate to Iridium (which is not entirely clear), the Motorola supplemental materials, at most, involve system implementation decisions that have no bearing on the Commission's preference decision.

Development of all of the low earth orbit satellite systems -- ELLIPSO™, Iridium, Globalstar, Aries or Odyssey -- will require the design of proprietary components in the course of system implementation. Such implementation decisions and proprietary component designs are necessarily unique to each system, but do not amount to the kind of broad-based innovation contemplated by the pioneer's preference. Clearly, Motorola should not receive any credit for its system design decisions that result, in large part, from the excessive and useless complexity of its system.

Motorola's misuse of patent materials in this proceeding is particularly troublesome. The Commission has plainly stated that

the patent process is entirely separate from the pioneer's preference, and does not raise the same issues. Nonetheless, Motorola submits a ream of patent materials without indicating the relevance of these materials to the subject proceeding. By way of illustration, the patent for a multiple beam antenna that Motorola submits may be interesting from a technical standpoint, but has no apparent relation to the Iridium project.

Moreover, there is no indication in the confidential appendix whether the alleged patent materials relate to actual patent applications, and, if so, when and whether the applications were filed by Motorola, whether the applications are pending, or even whether the applications relate to the Iridium system at all. It is impossible to answer these questions from the fragments provided.

Not only must the supplemental materials be discarded, but the Commission should carefully consider Motorola's motives in submitting voluminous materials -- with no clear relevance to the proceedings -- at the "eleventh hour." The time and expense involved in responding to the Motorola submission placed a heavy burden on scarce Commission and private resources. The Commission should not allow Motorola to divert attention from the primary issues in the subject proceeding. These issues include the technical and economic feasibility of the Motorola system, and the optimal means of accommodating the maximum number of systems in the available frequencies.

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

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In the Matter of:)

MOTOROLA SATELLITE)
COMMUNICATIONS, INC.)

Request for Pioneer's Preference)
to Establish a Low-Earth Orbit)
Satellite System in the 1610-)
1626.5 MHz Band.)

ET Docket No. 92-28

PP-32

To: Office of Engineering and Technology

REPLY COMMENTS OF ELLIPSAT CORPORATION

Ellipsat Corporation ("Ellipsat"), by its attorneys, submits its reply comments with respect to the late-filed comment information submitted on April 10, 1992 by Motorola Satellite Communications, Inc. ("Motorola"). As detailed below, nothing in the supplemental materials, confidential or otherwise, alters Ellipsat's prior conclusion that Motorola's preference claim must be denied. None of the materials submitted by Motorola, including the supplement, demonstrates eligibility or entitlement to a preference.

I.
BACKGROUND AND SUMMARY

On April 10, 1992, Motorola filed a "Supplement to Request for Pioneer's Preference" which included a confidential appendix. The public portion of the filing consisted primarily of

news announcements about the Iridium system during the June 26-July 2, 1990 time frame and two U.S. patents, one for a multiple beam deployable antenna and the second for a doppler compensating device. The confidential appendix, which has been reviewed by Ellipsat pursuant to a protective order,^{1/} contains excerpts from alleged patent "materials" and propagation test results.

Motorola's supplemental materials were filed after the initial comment date in this proceeding. The other LEO applicants therefore sought to strike the Motorola filing or, at a minimum, to establish new comment dates for evaluation of the supplemental materials. Motorola's request for confidential treatment was also vigorously opposed by the other parties on the grounds that the parties should be permitted to evaluate and comment upon any materials that might be considered in a preference situation.^{2/} Freedom of information (FOI) requests were filed by Ellipsat, among others. The Commission subsequently decided to treat the Motorola supplement as late-filed comment information, and established a reply comment date of June 12, 1992.^{3/} The FOI requests were granted in part and Motorola's confidential materials, as

^{1/} Protective Order, DA 92-674, FOIA Control No. 92-83, 92-88, 92-86, released May 28, 1992.

^{2/} See Motion to Strike Supplement to Request for Preference or, Alternatively, to Establish New Comment Dates, ET Docket No. 92-28, File No. PP-32, filed April 21, 1992 by Ellipsat Corporation. See also Opposition to Request for Confidential Treatment, filed April 21, 1992 by Ellipsat Corporation.

^{3/} Public Notice, No. 23328, released May 29, 1992.

redacted by Motorola, were made available to the parties for review under a protective order.

Ellipsat and its technical consultants have reviewed all of the supplemental materials, confidential and otherwise, and can confidently state that nothing in the materials changes its earlier position that Motorola's preference request must be denied. Motorola has not submitted any new evidence relevant to its preference claim. To the contrary, even assuming that the materials relate to Iridium (which is not entirely clear), the Motorola supplemental materials, at most, involve system implementation decisions, and should be disregarded for that reason.

Motorola has not provided any new information that is relevant to the central issue in this pioneer's preference proceeding, namely, whether Motorola has proposed an innovative technology or service that merits a preference. To the contrary, Motorola has merely demonstrated the obvious: development of any low earth orbit satellite system -- ELLIPSO™, Iridium, Globalstar, Aries or Odyssey -- will require design of proprietary components in the course of system implementation. Such implementation decisions and proprietary component designs are necessarily unique to each system, but clearly do not warrant a pioneer's preference, contrary to Motorola's contentions.

All of the low-earth orbit satellite systems will need to develop proprietary system components in implementing diverse system designs. Every system is necessarily innovative and

unique in how it chooses to meet the myriad design decisions, including power management and TT&C, that accompany a satellite project. Such innovation is not, however, the type of broad-based innovation that the Commission seeks to reward with a pioneer's preference. Motorola's supplemental information should not be allowed to mislead the Commission or to divert the proper focus of this proceeding.

Motorola's misuse of patent materials is particularly troublesome. The Commission has plainly stated that the patent process is entirely separate from the pioneer's preference, and does not raise the same issues. Nonetheless, contrary to the Commission's clear desires, Motorola submitted a ream of patent materials without indicating the relevance of these materials to the present proceeding. It is revealing that the Motorola patent for a multiple beam antenna appears to have no relation whatsoever to the Iridium project. Similarly, in the confidential appendix, Motorola fails to indicate whether these materials are actual patent applications. Even assuming that the materials relate to patent applications, no pertinent details are provided. For example, it is not clear whether the applications were filed by Motorola, when they may have been filed, whether the applications are pending, whether the claims have been questioned by the Patent Office or even whether the materials relate to the Iridium system at all.

For these reasons not only must the supplemental materials be disregarded, but the Commission should carefully consider Motorola's motives in submitting these questionable materials at a late stage in the proceeding, and in wasting the scarce Commission and private resources required to address these materials. Motorola should not be permitted to divert attention from the primary issues in this proceeding, and the legitimate questions that have been raised about the technical and economic feasibility of Iridium.

II.
THE RECORD IN THIS PROCEEDING COMPELS
DISMISSAL OF MOTOROLA'S PREFERENCE REQUEST

In the prior comments, filed on April 8, 1992 and April 23, 1992 in this proceeding, unanimous opposition was directed against Motorola's pioneer's preference request. Ellipsat, Loral, TRW and Constellation, among others, characterized the Motorola system as inefficient, overly complex, and prohibitively expensive. The parties stressed the importance of considering the preference in a real-world context, in order to ensure that a particular technology or service is feasible, technically and economically before a preference is awarded.

The comments and oppositions detail the serious questions that have been raised about Iridium's technical and economic feasibility, and there is no need to duplicate that extensive discussion here. It is sufficient to note that the legitimate

technical issues relating to the Iridium design have not been answered by the supplemental materials or elsewhere. For example, Motorola has never conclusively demonstrated that the on-board switching capability proposed by Iridium can be achieved within the mass and power constraints imposed by the proposed satellite concept (low-cost satellite and low-cost launch).

Nor do the supplemental materials address the substantial market issues that surround Iridium. No one, other than Motorola, believes that uniform global coverage is necessary or desirable for cost-effective mobile communications. Motorola provides the same traffic capacity over the South Pole as it does over the U.S. This is an extremely inefficient use of limited satellite resources.

While Motorola's supplement again touts the efficiency of Iridium, its claims of efficiency are misleading, at best. True efficiency is not achieved where only 2.5% of Iridium's global capacity (40 cells or 6,000 simultaneous conversations) will be available for the entire continental United States and southern Canada.^{4/} This limited availability in the U.S. is particularly striking in light of Motorola's efforts to exclude all of the

^{4/} This information is based on Dr. Leopold's paper attached to the supplemental filing.

other LEO applicants, and to obtain exclusive use of the limited radio frequency spectrum.^{5/}

Motorola's claims of high frequency reuse are similarly flawed. The "200 times frequency reuse" claim is based on the false assumption that all 1600 of the Iridium cells will be used world-wide at all times, including the North Pole, Communist China, Western Samoa and other remote areas. Frequency reuse, of course, requires that the available spectrum is actually used (and reused.) It is not clear that such a condition will exist anywhere outside of the United States. If the spectrum is not used, then the actual frequency reuse will be much lower.

Equally important, Iridium's lack of novelty was stressed by the other parties, who pointed out that Iridium is not innovative within the meaning of the pioneer's preference rules. As documented in the prior comments, Iridium repackages existing technology, including technologies developed for DoD's Milstar satellite system and NASA's TDRSS system.^{6/} TRW, for example,

^{5/} Motorola's market (and technical) approach involves coverage of the globe uniformly with cells, regardless of land mass distribution and without regard to usage patterns, in contrast to other market approaches, like that of the ELLIPSO™ system which tailors capacity to demand. Given the existence of the largest potential market for mobile communications in the U.S., it is unclear how the Iridium system will support the estimated 100 million subscribers that are required to justify the \$3-6 billion system cost.

^{6/} See Opposition of Ellipsat Corporation to Pioneer's Preference Request of Motorola Satellite Communication, Inc., filed April 8, 1992 at 11-15. Response to Oppositions and

Footnote continued on next page.

characterized Iridium as an "amalgamation of advances pioneered by others."^{7/}

The voluminous record in this proceeding also details the compelling public interest reasons against a preference award to Motorola, even if the system were to be deemed innovative contrary to the clear evidence. All of the other LEO applicants have raised serious concerns that a preference to Motorola would create a monopoly, because Motorola's system cannot technically share the available spectrum with any of the other applicants, or with any other international systems including GLONASS. As a result, only Motorola could be licensed and new, diverse services would be precluded contrary to long-standing Commission policies favoring competitive provision of satellite services.

The other LEO applicants have also emphasized the adverse and prejudicial impact on their due process rights, and on the public interest, if a preference should be granted to Motorola without full consideration of the relevant technical and policy issues raised by the big LEO proposals. Absent compelling evidence (or, indeed, any evidence) of innovation, these public

Footnote continued from previous page.

Reply to Comments, filed April 23, 1992 at 11-13. See also TRW Opposition at 11-13; Loral Opposition at 4-5; Constellation Opposition at 8; AMSC Opposition Technical Statement at 3-4.

^{7/} TRW Opposition at 13.

interest (and constitutional) concerns must necessarily outweigh a preference award to Motorola.^{8/}

III.
MOTOROLA HAS NOT PROVIDED ANY NEW
INFORMATION RELEVANT TO THE PIONEER'S PREFERENCE

In its supplemental submission, Motorola fails to provide any new information relevant to the pioneer's preference. Nothing in the Motorola supplement counters the definitive showings, by Ellipsat and the other applicants, that the Motorola system is derivative in nature, and essentially involves a repackaging of previously developed technologies. Nor does Motorola submission assuage the legitimate concerns about Iridium's lack of technical and economic feasibility.

In opposing Motorola's request for confidential treatment of its supplemental materials, Ellipsat contended that the Motorola submission constituted an improper ex parte communication. In this regard, Ellipsat pointed out that Motorola, by claiming confidentiality, improperly created an impression that Motorola had

^{8/} "[E]ach applicant has a significant burden to persuade us that its proposal is innovative, has merit, and that the applicant is the original developer or proponent of the innovation at issue." Low-Earth Orbit Satellite System (Pioneer's Preference), 70 R.R.2d 467, 469 (1992).

developed proprietary information relevant to the preference proceedings.^{9/}

Having now reviewed the confidential materials, Ellipsat has confirmed that its concerns were indeed justified. The impression created by the mere fact of submission of confidential materials has more value than the materials themselves. Motorola's supplemental materials have no relevance to the Commission's primary considerations and objectives in awarding a preference, and must be disregarded.

A. The Patent Materials Do Not Clearly Pertain to the Iridium System

While Motorola submits various patent-related materials, these materials have no relevance to the subject preference proceedings. To cite one example of Motorola's misleading use of patent materials, one need only look at Motorola's patent for a multiple beam deployable space antenna system which was appended to the April 10 submission. This patent does not, on its face, relate to or reference the Iridium system. In fact, Motorola does not propose to use a multiple beam deployable antenna as described in the patent application (or any antenna that remotely resembles the one described in the patent.) This is because the

^{9/} See Opposition to Request for Confidential Treatment, ET Docket No. 92-28, pp. 32, filed April 21, 1992 at 4. TRW expressed the same view in its Opposition.

patented antenna would involve immense development costs and risks.

The referenced patent is for an inflatable antenna consisting of a number of inflatable horns mounted in a hemispherical position. The longest horns would require an aperture of approximately 4 meters in length. If Motorola managed to overcome the alignment and fabrication problems associated with the manufacture of this antenna, the drag associated with 37 inflatable horns sprouting from a LEO satellite would be enormous. The ballistic coefficient of such a satellite would be so low that orbital decay would be rapid (or station-keeping fuel would be quite high.)

Based on brochures and other literature distributed by Motorola, it plans to use a well-established phased array antenna technology for its satellites. These fixed (non-scanning) planar array antennas could be obtained from Harris Corporation or Ball Aerospace, which have both developed similar phased array antennas. Other satellite constellations (LEO and GEO) may also use similar phased array antennas, which are not proprietary to Motorola. As Ellipsat previously noted, DoD's Milstar satellite system will use phased array antennas.

The patent materials submitted by Motorola in its confidential appendix are similarly misleading. These "confidential" materials appear, in large part, to parallel materials that were publicly released in Motorola's December 1990 application to the

Commission. Other materials consist of meaningless fragments, in some cases, mere one-sentence title pages.

The patent materials submitted in the confidential appendix are not described in meaningful fashion, or placed in any context that demonstrates why the materials are relevant to the present proceedings. There is no discussion, for example, of "prior art," which patent applicants are required to describe in order to indicate what the claimed invention actually contributes. There is no evidence as to whether the materials are actually part of a patent application, whether an application was ever submitted by Motorola, and if so, when the application or applications may have been filed, or even whether an application is still pending. There is no information as to whether the Patent Office has challenged or questioned Motorola's claims. Nor do the patent materials clearly relate to the Iridium system. Thus, there is no basis for evaluating the significance of these materials, even if it is conceded for the sake of argument that the patent process has any relevance to these proceedings.

In short, the significance or relevance of the supplemental materials is not readily apparent. The examples provided above highlight the misleading and irrelevant nature of the patent materials submitted by Motorola in this proceeding, and underscore the reason why these materials must be disregarded by the Commission.

B. The Motorola Materials Merely Reflect
System Implementation Decisions Common
to All LEO Systems

In creating a pioneer's preference, the Commission properly distinguished the patent process from the pioneer's preference. The Commission made clear, in adopting the pioneer's preference, that the preference "serves communications goals that stand independent of the patent laws."^{10/} As the Commission explained, patents typically apply to equipment and specific services, while the preference addresses "broad-based radio services" which are not patentable.^{11/} For this reason, the Commission correctly recognized that patent applications have no relevance to preference entitlement.

Motorola's supplemental materials illustrate the distinction, correctly noted by the Commission, between the patent process and the pioneer's preference. Motorola's patent materials involve system components and designs related to system implementation, not "broad-based radio services," and therefore have no bearing on this preference proceeding.

Motorola has apparently sought patents for specific features of its system, including its power management system, telemetry,

^{10/} Report and Order, GEN Docket No. 90-217, 6 FCC Rcd 3488, 3490 (1991) (hereinafter "Pioneer's Preference Order.")

^{11/} Pioneer's Preference Order at 3492.

tracking and control, and cell-to-cell hand-offs.^{12/} These features represent system design decisions that may be unique to Motorola. However, all of the LEO systems have unique system features and will need to develop proprietary component designs in implementing their systems. Patents serve the purpose of protecting the particular innovations and inventions that may be entailed in these system implementation decisions.

For example, all of the LEO systems (in fact, all satellite systems) require tracking, telemetry and control. Each system will need to address TT&C in system design. Motorola's approach to TT&C or Doppler correction may be individual, but it is not pioneering within the meaning of the preference rules. Similarly, each system will require power management. Power management cannot be seriously claimed by Motorola as an innovative feature.

Indeed, as Ellipsat previously pointed out, the claimed "innovations" in the Motorola system are, in fact, attempts to compensate for and accommodate inefficiencies and complexities in the Iridium system design. Motorola's power management approach is a direct consequence of its inefficient polar orbits which cause satellite coverage to be much more dense near the poles than near the equator. As a result, Motorola is required to

^{12/} The items contained in the confidential appendix were thus described in a publicly available letter from Motorola's counsel to David Siddall, Chief of the FCC's Frequency Allocation Branch, on May 11, 1992.

"shut off" unwanted channels in the polar regions to avoid wasting capacity in Antarctica, and to prevent interference with other satellites as they approach the poles. More satellites are required to provide global coverage because all of the satellites cannot be fully utilized.

Each Iridium satellite must be over-designed by approximately 74 percent in order to make the constellation work properly. The Motorola approach similarly requires increases in the cost and complexity of the handsets which must be more powerful (in order to burst at a high rate) and more intelligent (in order to avoid interference with other handsets).^{13/} Motorola's patents and system design decisions are thus directly related to the excessive and useless complexity of its system.

Neither system implementation decisions nor innovative responses to an impractical system design are entitled to reward by the Commission. The Motorola supplement underscores the dangers and impropriety of even considering patent materials in the pioneer's preference context, without a "reality check." Motorola's supplemental materials are not relevant to the present proceeding, and should be disregarded.

^{13/} The Iridium configuration for hand-held units is impractical according to its own studies. Attempting to deploy the system using the proposed technique would result in satellite size and growth greater than already experienced. This will also severely limit the service available from the use of a significant portion of the RDSS frequency band.

IV.
MOTOROLA'S CONFIDENTIAL SUBMISSION
BORDERS ON ABUSE OF COMMISSION PROCESSES

Review of Motorola's confidential materials has confirmed Ellipsat's concern that submission of the confidential appendix was primarily a public relations event, devoid of any substance. Ellipsat has noted the lack of relevance of the materials to these proceedings in its detailed comments above.

Given the lack of significance of these materials, the submission raises questions about the propriety of Motorola's conduct. Ellipsat notes the large amount of time and resources, both public and private, that were required to oppose Motorola's supplemental filing, to file and consider freedom of information requests to review the materials, to negotiate and draft a protective order and, ultimately, to review and comment upon the confidential materials. These unnecessary, and onerous, burdens took agency and private attention away from the primary issues in this proceeding, which relate to Motorola's efforts to reverse existing technical and licensing policies in the RDSS bands. Motorola should not be permitted to divert the focus, and to "wear down" the other applicants with frivolous submissions of this sort.

Apart from the burden on Commission and private resources created by Motorola's filing, Ellipsat continues to be concerned about the misleading and erroneous impression that Motorola

created merely by filing confidential materials. This impression may have already tainted these proceedings. The burden has been effectively and unfairly placed on the other applicants to dispel this misimpression, instead of being properly placed on Motorola to justify the relevance of its materials.

V.
CONCLUSION

The Commission should disregard the supplemental materials submitted by Motorola as irrelevant to the subject pioneer's preference proceeding. Motorola has not demonstrated entitlement to a preference and nothing in the supplemental materials, including the confidential appendix, suggests otherwise. The Commission should promptly deny Motorola's request for preference.

Ellipsat urges the Commission to proceed carefully in evaluating Motorola's preference request which, as extensively discussed by various parties to these proceedings, raises unique dangers to the public interest. The Commission can and should ensure full and fair consideration of the diverse system proposals now before the Commission, and not take premature steps that might foreclose such consideration.

Respectfully submitted,

ELLIPSAT CORPORATION

By:



Jill Abeshouse Stern

SHAW, PITTMAN, POTTS & TROWBRIDGE
2300 N Street, N.W.
Washington, D.C. 20037
202-663-8000

Its Attorney

June 12, 1992

AFFIDAVIT

I, David Castiel, being duly sworn, hereby declare and state as follows:

1. I am the Chairman and Chief Executive Officer of Ellipsat Corporation.

2. I have reviewed the foregoing "Reply Comments of Ellipsat Corporation."

3. All of the facts contained in the foregoing Reply Comments, except those as to which official notice may be taken, are true and correct to the best of my knowledge, information and belief.



David Castiel

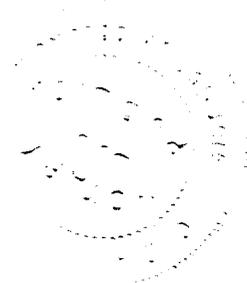
District of Columbia) ss:

I, C. Dianne Williams, a Notary Public in and for the District of Columbia, do hereby state that on this 12th day of June, 1992, David Castiel personally appeared before me and attested that the above information is true and correct to the best of his knowledge and belief.

C. Dianne Williams
Notary Public

My Commission Expires:

C. Dianne Williams
Notary Public, District of Columbia
My Commission Expires Aug. 31, 1994



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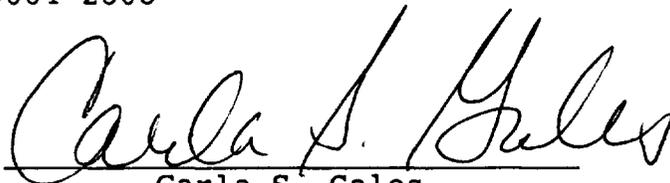
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Carla S. Gales

CERTIFICATE OF SERVICE

I, Carla S. Gales, hereby certify that a copy of the foregoing document was served by first-class mail, postage prepaid, this 12th day of June, 1992 on the following persons:

*Chairman Alfred C. Sikes
Federal Communications Commission
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1919 M Street, N.W.
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*Commissioner James H. Quello
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