

SHAW, PITTMAN, POTTS & TROWBRIDGE
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2300 N STREET, N.W.
WASHINGTON, D.C. 20037-1128
(202) 663-8000
FACSIMILE
(202) 663-8007

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JILL A. STERN
(202) 663-8380

January 6, 1992

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

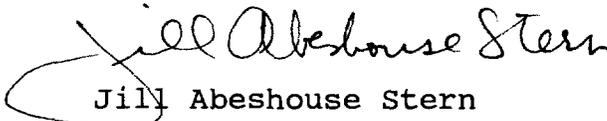
Re: ET Docket No. 92-28; RM-7771;
RM-7773; RM-7805; RM-7806; PP-29;
PP-30; PP-31; PP-32; PP-33

Dear Ms. Searcy:

On behalf of Ellipsat Corporation, I am transmitting herewith an original and four copies of its Reply Comments with respect to the Notice of Proposed Rulemaking and Tentative Decision in the above-referenced proceedings, relating to allocation of the 1610-1626.5 and 2483.5-2500 MHz bands for use by the mobile-satellite service.

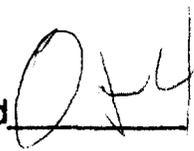
Should there be any questions concerning this matter, kindly communicate with the undersigned.

Sincerely,


Jill Abeshouse Stern

JAS:csg
Enclosures

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

JAN 6 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)	
)	
Amendment of Section 2.106 of)	ET Docket No. 92-28
the Commission's Rules to)	RM-7771 PP-29 PP-32
Allocate the 1610-1626.5 MHz)	RM-7773 PP-30 PP-33
and the 2483.5-2500 MHz Bands)	RM-7805 PP-31
for Use by the Mobile-Satellite)	RM-7806
Service, Including Non-)	
geostationary Satellites.)	

**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 to Ellipsat Corporation

January 6, 1993

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SUMMARY

In its initial comments, Ellipsat Corporation strongly supported the Commission's proposal to allocate spectrum in the 1610-1626.5 and 2483.5-2500 MHz bands for mobile satellite services, and urged the Commission to move forward expeditiously with implementation of the proposed services. Ellipsat urged the Commission, however, to allocate the spectrum exclusively to low-earth orbiting systems, in order to ensure that the public ultimately receives the benefits of the envisioned services.

Ellipsat further urged the Commission to: (1) allocate specific fixed-satellite service frequencies for LEO feeder links, or designate specific bands in which LEO feeder links will be permitted on a primary basis; (2) adopt international power flux density and EIRP limits and coordination procedures consistent with those adopted at WARC-92; (3) maintain the current earth-to-space direction in the 1610-1626.5 MHz band in order to maximize the number of systems that can be accommodated in the frequency band; and (4) finalize its tentative decision not to award a preference to any of the applicants in this proceeding. In addition, Ellipsat cautioned the Commission not to take any action that would restrict the benefits of open entry provided by spread spectrum techniques.

The opening comments submitted by other parties in this proceeding generally share Ellipsat's views. There is broad support for an exclusive allocation for LEO MSS or, at least, for

excluding consideration of AMSC's and CELSAT's geostationary systems from this proceeding. The comments further agree with Ellipsat that bi-directional operation should not be permitted in the 1610-1626.5 MHz band. In addition, the comments confirm the importance of designating specific feeder links for LEO MSS, and strongly disagree with the Commission's suggestion that international radio regulations relegate LEO feeder links to secondary status. Finally, there is persuasive evidence in the comments that spread spectrum modulation techniques will best achieve the Commission's multiple entry goals.

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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REPLY COMMENTS OF ELLIPSAT CORPORATION

Ellipsat Corporation ("Ellipsat"), by its attorneys, hereby submits its reply comments with respect to the Notice of Proposed Rulemaking and Tentative Decision (the "Notice") in the above-captioned proceeding.

I.
SUMMARY OF ELLIPSAT'S COMMENTS

In its comments, filed December 4, 1992, Ellipsat strongly endorsed the Commission's proposal in the Notice to allocate spectrum in the 1610-1626.5 and 2483.5-2500 MHz bands for mobile satellite services. Ellipsat agreed with the Commission that the proposed allocation would be consistent with the international allocation adopted at WARC-92, and would facilitate introduction of new, publicly beneficial satellite communications services. Ellipsat therefore urged the Commission to move forward as expeditiously as possible to expand the range of permissible

satellite services that can be offered in the relevant bands by adopting the proposed spectrum allocation.

Although agreeing fundamentally with the Commission, Ellipsat urged the Commission in its comments to consider and resolve a number of related issues in order to ensure timely implementation of the proposed satellite services. These issues, and Ellipsat's position with respect to each issue, may be summarized as follows:

- The Commission should allocate the 1610-1626.5 and 2483.5-2500 MHz bands exclusively for low-earth orbiting systems.
- The Commission should allocate specific fixed-satellite service frequencies for LEO feeder links, or specify specific bands in which LEO feeder links will be permitted on a primary basis. Ellipsat has identified 3600-3700 MHz (downlink) and 6425-6525 MHz (uplink) as suitable frequencies for LEO feeder links, and requests that allocation of these frequencies be addressed in this proceeding.
- The Commission should adopt the international power flux density and EIRP limits and

coordination procedures that were adopted at WARC-92.

- The Commission has correctly concluded that the public interest will be best served by multiple LEO operators. Spread spectrum techniques offer the greatest potential for operation by multiple systems, both domestic and international. The Commission should ensure that no actions are taken in this proceeding to preclude or limit the acknowledged benefits of spread spectrum techniques.
- The current earth-to-space direction in the 1610-1626.5 MHz band should be maintained in order to maximize the number of systems that can be accommodated in the frequency band. If bi-directional operation is authorized, downlink operations should be permitted only on a secondary basis.
- The Commission should finalize its decision not to award a pioneer's preference to any of the applicants in this proceeding.

II.
THE RECORD JUSTIFIES
AN EXCLUSIVE LEO ALLOCATION

The comments filed by other parties in this proceeding evidence broad support for Ellipsat's view that the proposed spectrum allocation should be designated exclusively for LEOS. As Ellipsat pointed out in its comments, unless the band is designated exclusively for LEOS, the public benefits of the new service may never be realized. Ellipsat also noted that the predominant interest in this band is for a LEO system and, in fact, international regulations, including power flux density limits, effectively preclude operation by geostationary systems.

Comments submitted by other parties share Ellipsat's view that an exclusive LEO allocation would be consistent with international intentions at WARC-92, and would facilitate introduction of innovative communications services. TRW and Loral, for example, correctly point out that international regulations adopted at WARC-92 would prevent geostationary satellite systems like AMSC's from operating in the subject bands.^{1/}

Even assuming arguendo that AMSC could conform to international regulations, Loral and TRW, among others, question whether AMSC's geostationary system could ever achieve the technological and market innovations, including personal

^{1/} See TRW Comments at 17-18.

communication services, that are proposed by LEO systems. Loral, for example, concludes that the Commission should exclude AMSC, in favor of "introduction of new systems and services, to promote new technology and to utilize spectrum to promote multiple entry."^{2/}

Other parties have emphasized that adequate spectrum is available for geostationary MSS in other bands. Motorola points out that geostationary mobile satellite systems have already been licensed with "sufficient spectrum for, at least, their first generation systems." Constellation similarly notes the current availability of 68 MHz of L-Band spectrum for geostationary MSS systems.^{3/}

The opening comments also agree with the Commission's (and Ellipsat's) assessment that "sharing of the RDSS bands by LEO and geostationary systems may require severe limits on power and frequency that could render both systems unworkable."^{4/} The comments concur that LEO and GEO MSS systems cannot readily operate in the same frequencies.^{5/}

In sum, all of the LEO applicants have urged the Commission to avoid the complexity and delay that will result from inclusion of AMSC in this proceeding. There is no reason to complicate

^{2/} See Loral Comments at 15.

^{3/} See Constellation Comments at 3-4.

^{4/} See Notice at para. 17.

^{5/} See Comments of Motorola Satellite Communications, Inc. at 5-6, 9 at n.14.

this proceeding merely to accommodate the expansion of AMSC's system -- a system that fails to conform to international regulations, to utilize the spectrum already generously allocated to it by the FCC, or to provide new, innovative services.^{6/} The Commission should therefore designate the proposed allocation exclusively for LEO use or, at a minimum, exclude AMSC from further consideration as other parties have urged.^{7/}

III.

THE COMMENTS SUPPORT ALLOCATION OF SPECIFIC BANDS FOR PRIMARY LEO FEEDER LINK OPERATIONS

In its comments, Ellipsat questioned the Commission's interpretation of international regulations with respect to LEO feeder links, and urged the Commission to clarify that feeder links for LEOS can and will be permitted on a co-primary basis in the FSS bands. Because of the importance of the feeder link

^{6/} While Celsat accuses the Commission of a "predisposition toward LEOS," the indisputable fact is that five of the six applicants have proposed LEO systems. The applications reflect market and technical judgments about the type of service that the public wants, and the Commission can and should properly accept these business judgments. It bears emphasis that Celsat has never filed any application whatsoever, and apparently wants the Commission to accept on faith the merits of its hypothetical geostationary satellite concept over the reality of five concrete LEO applications.

^{7/} See Loral Comments at 15; Motorola Comments at 10; TRW Comments at 17-18. To the extent that AMSC argues that LEOS and GEOS can co-exist in the same frequency bands, the logical extension of this argument is that LEOS should have an equal opportunity to apply for and utilize AMSC's authorized L-Band frequencies.

issue, Ellipsat strongly suggested that, alternatively, particular frequency bands should be designated for LEO feeder links. Suitable frequency bands identified by Ellipsat for this purpose were: 3600-3700 MHz (space-to-earth) and 6425-6525 MHz (earth-to-space). Ellipsat also supports use of the 5150-5216 MHz band for feeder links.

Comments filed by other parties questioned the Commission's interpretation of RR 2613. Loral, for example, disagreed with the Commission's interpretation that RR 2613 reduces the status of feeder link operations supporting non-geostationary systems to secondary. As Loral pointed out, international regulation RR 2613 is designed to deal with a specific, limited situation and does not support the Commission's overly broad interpretation about the status of LEO feeder links.^{8/} TRW similarly points out that "Radio Regulation No. 2613 does not relegate non-geostationary operation to 'secondary' status with regard to geostationary FSS operations."^{9/} In this regard, Constellation indicates that RR 2613 is, in fact, properly treated as "sharing criteria between two co-equal users of the spectrum."^{10/}

Consistent with the views expressed in the comments, the Commission should clarify that LEO feeder links are not relegated

^{8/} See Loral Comments at 19-20.

^{9/} TRW Comments at 26, n.14. See also Constellation Comments at 9-10.

^{10/} Constellation Comments at 10.

to secondary status and take appropriate steps to ensure adequate protection of LEO feeder links. While Ellipsat has proposed an exclusive allocation for LEO feeder links in the 3600-3700 MHz and 6425-6525 MHz bands, it is also amenable to TRW's suggestion that a U.S. footnote be adopted to override the impact of RR 2613 on LEO feeder links in the various FSS bands that have been designated by the applicants.^{11/} Regardless of the Commission's approach, it is imperative that applicants be provided with sufficient assurances about the availability of feeder link frequencies to proceed with system design and international coordination.

IV.
THE COMMENTS PROVIDE A BASIS FOR ADOPTION
OF THE EIRP AND PFD LIMITS AGREED TO AT WARC-92

The comments share Ellipsat's view that licensees operating in the 2483.5-2500 MHz band should be required to comply with the power flux density and EIRP limits adopted at WARC-92. TRW points out, for example, that the proposals adopted at WARC-92 should be a "reasonable means of achieving more efficient use of these bands."^{12/}

^{11/} TRW, for example, proposes to use 19.7-20.2 GHz and 29.5-30 GHz. Loral and Constellation are planning to use the 5150-5216 MHz band for feeder links.

^{12/} TRW Comments at 20-21.

In agreement with the other parties, Ellipsat fully supports the adoption domestically of the international power flux density (PFD) and EIRP limits and coordination procedures that were adopted at WARC-92. All applicants should be required to comply with the applicable PFD and EIRP requirements, and international coordination procedures as the comments recommend.

V.
THE COMMENTS ENDORSE SPREAD SPECTRUM
AS THE OPTIMAL MEANS OF ACHIEVING MULTIPLE ENTRY

In response to the Notice's invitation, a number of the comments addressed the "potential of each of the proposed access methods to support service by multiple LEO licensees in the new MSS bands." The comments broadly supported the Commission's tentative conclusion, with which Ellipsat also agreed, that the public interest will be best served by multiple MSS LEO operators.^{13/} Moreover, Ellipsat and all of the other LEO applicants (with the exception of Motorola) endorsed spread spectrum CDMA techniques as the optimal means of maximizing the number of systems that can be accommodated, domestically and internationally, in the relevant frequency bands.

Motorola continues to argue that its proposed FDMA/TDMA access methods are more spectrum efficient. However, as Ellipsat and others have repeatedly pointed out, Motorola's approach will effectively permit only one system. True efficiency is achieved

^{13/} See TRW Comments at 18-20; Loral Comments at 9-12.

through multiple entry, not where one system uses all of the available spectrum. In order to permit multiply entry through the Motorola design, the Commission would need to develop an organizational architecture that would allow participation by multiple entrants. Given the practical and legal difficulties of a joint ownership approach, and the inherent delays, as evidenced by AMSC's experience, it is clearly more desirable to use a system and technology approach which facilitates entry by multiple systems, rather than one system with multiple owners.

It bears emphasis that the "ghost of CDMA limitless spectrum sharing" to which Motorola refers (Comments at 13) is a figment only of Motorola's imagination. Ellipsat and the other CDMA applicants have repeatedly stated that CDMA is not a panacea. Nonetheless, it offers the best opportunity for harmonizing multiple systems, both international and domestic. The CDMA systems have expressed willingness to harmonize their systems to maximize system capacity and have been working diligently to develop sharing criteria and technical rules for this service which will accommodate multiple systems. Proposed rules were, in fact, jointly submitted to the Commission on January 5, 1993.

Ellipsat and the other CDMA parties have previously rebutted AMSC's arguments with respect to CDMA capacity, and shown

conclusively that AMSC's claims about CDMA capacity limitations are wholly erroneous.^{14/}

The Commission should not take any action in this proceeding that would preclude or limit the recognized benefits of spread spectrum access methods. The band segmentation approach proposed by Motorola would effectively preclude the benefits of multiple entry, and should not be given any credence or attention in this proceeding.

VI.

THE COMMENTS PROPERLY OPPOSE BI-DIRECTIONAL OPERATION IN THE 1610-1626.5 MHz BAND

In its comments, Ellipsat urged the Commission to retain the current one-way allocation scheme in the L-band in order to maximize the number of systems that can be accommodated. Ellipsat's views were shared by other parties, including Loral, TRW and Constellation.

A number of commenting parties pointed out that even secondary operation by Motorola would be difficult to achieve from a technical standpoint. For example, TRW notes that "guard bands" would be required, which would drastically reduce

^{14/} See, e.g., Response of Ellipsat Corporation, filed March 27, 1992. AMSC's arguments about CDMA limitations are highly ironic given the inefficient nature of AMSC's FDMA scheme which has been characterized as "spectrum guzzling" because it requires large amounts of frequency spectrum to provide even a few MHz of effective use.

Motorola's claimed efficiencies.^{15/} Loral concludes that radiation from the backlobes and sidelobes of satellites transmitting in the space-to-earth direction would cause harmful interference to other mobile satellites operating in the earth-to-space direction.^{16/}

The comments therefore offer additional support for Ellipsat's view that bi-directional operation should not be permitted in the 1610-1626.5 MHz band.

VII.
MOTOROLA OFFERS NO REASON FOR
REVERSING THE COMMISSION'S PREFERENCE DECISION

In the Notice, the Commission reached an initial determination not to grant a pioneer's preference to any of the applicants. In order to avoid delay in this proceeding and to further the important public interest goal of expediting new service to the public, Ellipsat supported, and continues to support, the Commission's tentative decision in this proceeding not to award a preference.^{17/}

^{15/} TRW Comments at 14. See also Constellation Comments at 5-6.

^{16/} Loral Comments at 12-13.

^{17/} Ellipsat continues to believe that, if a preference should be awarded, Ellipsat is the appropriate recipient. Ellipsat was the first to file a concrete system proposal, and its orbital constellations are the most beneficial and innovative for the consumer. Ellipsat reserves the right to

Footnote continued on next page.

With respect to the Motorola system, the Commission properly concluded that the Motorola system "does not offer a significant improvement or innovation over the state of the art." ^{18/} Ellipsat and other parties have fully documented, in their previous ET Docket No. 92-28 submissions, that the Motorola system design is based on technologies previously used or proposed by others, including DOD and NASA. In addition, the record in this proceeding also establishes the serious questions that have been raised about the economic and technical feasibility of Motorola's system.

Ellipsat believes that the Commission's tentative decision not to award a preference will provide the certainty needed to move forward with this proceeding, and to implement service to the public expeditiously. Motorola has failed to offer any reasons in its comments or elsewhere for setting aside the Commission's tentative decision. The tentative decision should therefore be finalized.

Footnote continued from previous page.

request full reconsideration of the Commission's denial of its pioneer's preference request if the circumstances should so warrant.

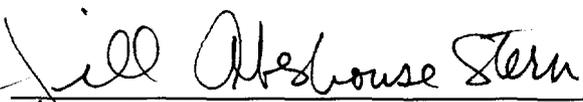
^{18/} See Notice at para. 49

VIII.
CONCLUSION

For the reasons set forth in Ellipsat's previous comments and herein, the Commission should (1) allocate spectrum in the 1610-1626.5 and 2483.5-2500 MHz bands exclusively for LEO MSS and exclude specifically AMSC and CELSAT; (2) clarify that LEO feeder links are permitted on a co-primary basis in the FSS bands or, alternatively, allocate spectrum for LEO feeder links on a primary basis in the 3600-3700 band 6425-6525 MHz bands; (3) adopt international power flux density, EIRP and coordination requirements; (4) retain the current earth-to-space direction for the 1610-1626.5 MHz band; (5) not take any action in this proceeding that would preclude or limit the benefits of spread spectrum access methods; and (6) finalize its decision not to award a pioneer's preference in light of the unique circumstances of this proceeding.

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

January 6, 1993

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 6th day of January, 1993 on the following persons:

*Chairman Alfred C. Sikes
Federal Communications Commission
Room 814
1919 M Street, N.W.
Washington, D.C. 20554

*Commissioner James H. Quello
Federal Communications Commission
Room 802
1919 M Street, N.W.
Washington, D.C. 20554

*Commissioner Sherrie P. Marshall
Federal Communications Commission
Room 826
1919 M Street, N.W.
Washington, D.C. 20554

*Commissioner Andrew C. Barrett
Federal Communications Commission
Room 844
1919 M Street, N.W.
Washington, D.C. 20554

*Commissioner Ervin S. Duggan
Federal Communications Commission
Room 832
1919 M Street, N.W.
Washington, D.C. 20554

*Thomas P. Stanley
Chief Engineer
Federal Communications Commission
2025 M Street, N.W.
Washington, D.C. 20554

*Cheryl Tritt
Chief, Common Carrier Bureau
Federal Communications Commission
Room 500
1919 M Street, N.W.
Washington, D.C. 20554

* Via Hand Delivery

*David R. Siddall, Chief
Frequency Allocation Branch
Office of Engineering and Technology
Federal Communications Commission
Room 7102
2025 M Street, N.W.
Washington, D.C. 20554

*Cecily C. Holiday, Esq.
Chief, Satellite Radio Branch
Federal Communications Commission
Room 6324
2025 M Street, N.W.
Washington, D.C. 20554

*Fern Jarmulnek, Esq.
Satellite Radio Branch
Federal Communications Commission
Room 6324
2025 M Street, N.W.
Washington, D.C. 20554

*Kristi L. Kendall, Esq.
Staff Attorney
Federal Communications Commission
Room 6334A
2025 M Street, N.W.
Washington, D.C. 20554

*Raymond LaForge
Federal Communications Commission
Room 7334
2025 M Street, N.W.
Washington, D.C. 20554

Lon Levin, Esq.
Vice President and Regulatory Counsel
AMSC
1150 Connecticut Avenue, N.W.
4th Floor
Washington, D.C. 20036

Bruce D. Jacobs, Esq.
Fisher, Wayland, Cooper & Leader
1255 23rd Street, N.W.
Suite 800
Washington, D.C. 20037

* Via Hand Delivery

Norman Leventhal, Esq.
Raul Rodriguez, Esq.
Leventhal, Senter & Lerman
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006

Robert A. Mazer, Esq.
Nixon, Hargrave, Devans & Doyle
One Thomas Circle, N.W.
Suite 800
Washington, D.C. 20005

Philip L. Malet, Esq.
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036

Veronica Haggart, Esq.
Vice President & Director
Regulatory Affairs
Motorola, Inc.
Suite 400
1350 I Street, N.W.
Washington, D.C. 20005

Leslie Taylor, Esq.
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, MD 20817-4302

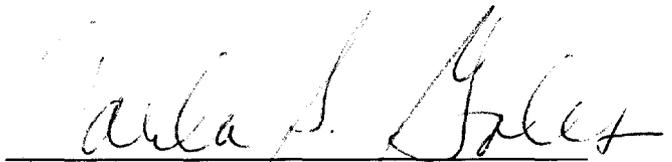
Linda Smith, Esq.
Robert M. Halperin, Esq.
Crowell & Moring
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2505

Dr. Robert L. Riemer
Committee on Radio Frequencies
National Research Council
HA-562
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Mr. Richard G. Gould
Telecommunications Systems
1629 K Street, N.W.
Suite 600
Washington, D.C. 20006

Cheryl Lynn Schneider, Esq.
COMSAT
950 L'Enfant Plaza, S.W.
Washington, D.C. 20024

Victor J. Toth, P.C.
CELSAT, Inc.
2719 Soapstone Drive
Reston, VA 22091



Carla S. Gales