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July 15, 1994

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Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: Preparation for International Telecommunication Union World Radiocommunication Conferences, IC Docket No. 94-31

Dear Mr. Caton:

On behalf of Ellipsat Corporation, I am transmitting herewith an original and five copies of its comments in the above-referenced matter.

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

Sincerely,

Jill Abeshouse Stern

Jill Abeshouse Stern

JAS:pad

Enclosures

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Before the
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In the Matter of	)	
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Preparation for International Telecommunication Union World Radiocommunication Conferences	)	IC Docket No. 94-31

COMMENTS OF ELLIPSAT CORPORATION

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July 15, 1994

SUMMARY

In these comments, Ellipsat Corporation, an applicant for a low-Earth-orbiting (LEO) mobile satellite system, recommends that the United States make every effort, at the upcoming 1995 World Administrative Radio Conference, to focus attention on the critical remaining issues that will determine the successful implementation of the LEO MSS systems. High-priority items include (1) feeder link spectrum below 15 GHz; (2) relocation of GLONASS below 1606 MHz; (3) relaxation of PFD limits in the 2483.5 - 2500 MHz band; and (4) rapid availability of additional MSS spectrum in the 2 GHz band for system expansion.

With respect to LEO feeder links, Ellipsat supports reverse band working in the Fixed Satellite Service (FSS) Bands identified in Exhibit A to this filing. This approach, which has been deemed feasible by the ITU working groups, offers an efficient solution to the feeder link issue. Ellipsat's strong preference is to use the C-Band in a co-primary, reverse band mode, with the Ku-Band as the next preferred option. In any event, however, the Commission and the United States should support allocations and appropriate rule changes in all of the bands identified in Exhibit A to facilitate MSS feeder links and maximize flexibility. In addition, the U.S. must strongly resist any effort by other Administrations to restrict LEO MSS feeder links to the 20/30 GHz bands.

Ellipsat further urges the Commission to support revision of footnote 731E to eliminate the ambiguity concerning the degree

of protection to be afforded the GLONASS system and to take any other steps that may be appropriate to facilitate GLONASS relocation below 1606 MHz.

The Commission should also support a modest relaxation of the PFD values in Radio Regulation 2566 and the treatment of these values as triggers for coordination with terrestrial services in the 2483.5-2500 MHz band rather than absolute limits.

It is also important, at WRC-95, for the United States to support the rapid availability of MSS spectrum in the 2 GHz bands, including the allocation on a worldwide basis of the 2300-2400 and 2402-2417 MHz bands for MSS systems. This additional spectrum is critical for development of second-generation MSS systems, which could begin as early as 1996 in Ellipsat's case (assuming that licensing occurs in 1994 as expected.)

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EXHIBITS

Exhibit A: Proposed Feeder Link Spectrum

Exhibit B: Report From Chairman of DG (II) - Reverse Band Working, Document 4-5/TEMP 22-E, June 9, 1994

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

In the Matter of	)	
	)	
Preparation for International Telecommunication Union World Radiocommunication Conferences	)	IC Docket No. 94-31

COMMENTS OF ELLIPSAT CORPORATION

Ellipsat Corporation ("Ellipsat"), by its attorneys, hereby submits its comments in response to the Commission's Notice of Inquiry ("Notice") in preparation for the 1995 World Radiocommunication Conference ("WRC-95").[1/]

I. INTRODUCTION AND SUMMARY

The Notice seeks information, on a range of issues, to assist the Commission in developing U.S. proposals relating to issues on the WRC-95 agenda and in refining proposed agendas for WRC-97 and WRC-99. As an applicant for ELLIPSO™, a low-Earth-orbiting (LEO) mobile satellite system, Ellipsat has a strong interest in facilitating use of frequency bands allocated to the mobile satellite service (MSS) and in resolving various issues relevant to successful implementation of the MSS systems.

1/ Notice of Inquiry, IC Docket No. 94-31, FCC 94-96, released May 5, 1994.

The United States should make every effort to maintain the focus of WRC-95 on MSS. It is of the utmost importance that the LEOs obtain sufficient feeder link spectrum below 15 GHz on an international basis. All efforts must be made to achieve this critical objective, and to resolve other fundamental MSS implementation issues, as expeditiously as possible.

II.
THE UNITED STATES SHOULD PROPOSE ALLOCATIONS AND APPROPRIATE RULE CHANGES TO FACILITATE MSS FEEDER LINKS IN FREQUENCY BANDS BELOW 15 GHz

As well-documented in the comments of Ellipsat and other parties in CC Docket No. 92-166, relating to the Above 1 GHz MSS, sufficient feeder link spectrum must be available below 15 GHz for successful implementation of the LEO systems.[4/] In Ellipsat's view, the feeder link issue is perhaps the most critical issue, from the standpoint of MSS implementation, that must be resolved at WRC-95. In particular, feeder links in bands below 15 GHz are needed to ensure that ELLIPSO™ and other MSS systems will be able to implement their systems, as designed, and to provide the low-cost, ubiquitous telecommunications services they propose.

4/ Notice of Proposed Rulemaking, CC Docket No. 92-166, 9 FCC Rcd 1094, released February 18, 1994 ("Big LEO NPRM"). See Comments of Ellipsat Corporation, CC Docket No. 92-166, filed May 5, 1994 at 23; Reply Comments of Ellipsat Corporation, CC Docket No. 92-166, filed June 20, 1994.

In the Big LEO NPRM, the Commission acknowledged that "feeder links below 15 GHz, and particularly at 5 GHz, are an integral part of several applicants' system proposals and, if not available, would require significant design changes to these systems."[5/] As Ellipsat and other LEO applicants pointed out in Docket 92-166, the cost of modifying system design to use feeder links above 15 GHz is substantial, would ultimately raise cost of service to the public, and place a disproportionate burden on system designs which rely upon multiple ground switching networks to connect mobile users into the PSTN (in contrast to inter-satellite links.) In addition, there are serious questions about the availability of spectrum in the increasingly congested Ka-Band, which is subject to multiple, competing terrestrial and satellite uses.

As a result of these factors, a mandatory Ka-Band requirement could deny the benefits of increased service options and lower costs to the public that diverse LEO MSS systems will provide. For these reasons, the U.S. must strongly resist the efforts of other Administrations to restrict LEO MSS feeder links to the 20/30 GHz frequency bands.

The Commission should proceed within the United States to make adequate feeder link spectrum below 15 GHz available for the LEO MSS systems. At the same time, significant actions are required within the WRC-95 process to ensure availability of the

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5/ Big LEO NPRM, at para. 77.

same feeder link spectrum on a worldwide basis. Most importantly, Ellipsat recommends that the U.S. pursue co-primary allocations for MSS feeder links on a reverse band basis in all of the bands identified in Exhibit A hereto.

After reviewing the various alternatives for feeder link spectrum, Ellipsat believes that reverse band sharing of the fixed satellite bands below 15 GHz offers the best option for obtaining adequate feeder link spectrum for first-generation systems. Use of the reverse band mode in a variety of fixed satellite bands will potentially open up a large number of frequency bands for LEO feeder links with minimal impact on existing FSS operations.

In addition, the ITU working groups have concluded that reverse band sharing is feasible and will not cause harmful interference to FSS operations. See Exhibit B hereto. Task Group 4/5 concludes "the sharing between Non-GSO MSS FL's in reverse band mode and GSO/FSS systems in the forward band mode is technically feasible in the bands C, Ku and Ka (including the allotment plan bands)."

Ellipsat's strong preference is for use of the C-Band either on a co-primary or reverse band sharing basis. In this regard, Ellipsat's preference is for use of the 4500-4800 MHz (uplink) and 6725-7025 MHz (downlink) bands in the reverse band mode. The 5000-5250 MHz bands in the Earth-to-space direction are also

highly suitable for LEO use.[6/] The Ku-Band FSS frequencies identified in Exhibit A are the next preferred option if the C-Band frequencies are unavailable.

While Ellipsat's preferred options for its first generation system are noted above, the U.S. should pursue reverse band sharing of all FSS frequencies identified in Exhibit A to accommodate future MSS systems and provide maximum coordination flexibility.[7/] While the Ka-Band is unsuitable for Ellipsat's feeder link requirements, the Commission should still pursue co-primary, co-directional (with FSS) Ka-Band allocations at 17.7-18.4 GHz (700 MHz) (Earth-to-space) and 18.4-19.7 (1300 MHz) (space-to-Earth) in order to meet the diverse needs of the LEO MSS systems and to preserve the options for future feeder links.

6/ To the best of Ellipsat's knowledge, this band is not being currently used. In addition, 5150-5216 MHz is now authorized, by existing Radio Regulation 797A, for feeder links for the Radio-determination satellite service.

7/ International radio regulation 2613, should not be applicable to feeder links operating in the reverse band mode. While Ellipsat strongly opposes extension of RR 2613 to reverse band operations, the Commission should, in any event, seek international agreement that RR 2613 will not be invoked to terminate operations of non-geostationary systems unless certain conditions are met including agreement as to a level of "accepted interference" by the affected administrations.

III.
THE UNITED STATES SHOULD PROPOSE A REVISED PFD LIMIT FOR THE 2483.5-2500 MHz BAND

To facilitate MSS systems which employ low-cost and small size handheld terminals using the 2483.5-2500 MHz band on a shared basis, the PFD limit should be greater than that currently applicable to the band (RR 2566). For this reason, Ellipsat supports a modest relaxation of the PFD requirements to -139 dB (W/m2/4 kHz). Ellipsat also recommends that the PFD limits contained in Footnote 753F should be treated as a "trigger value" rather than an absolute limit.

This approach is consistent with activities of the ITU working groups, including Radiocommunication Sector Task Group 2-2.[8/] For example, Document 2-2/TEMP/1 (Rev. 5), Annex 1, provides a three-step approach for coordinating non-GSO MSS systems with terrestrial systems. Under this approach, the PFD limit would merely provide a "trigger" for determining when further steps would need to be taken to coordinate the non-GSO system. If the non-GSO MSS system met this level, no further action would be required. If the non-GSO MSS system did not meet the level, a technical examination would be undertaken, taking into account the individual system characteristics, to determine if actual interference to terrestrial systems might occur. Based on the outcome of this examination, it might be possible to

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8/ See Document 2-2/TEMP/3, Annex 1, February 3, 1994.

permit the non-GSO system to go forward without the need for coordination with numerous administrations.

The United States should endorse a modest relaxation of PFD values consistent with co-channel operation with the fixed service, as well as flexible procedures along the lines outlined above, which will minimize the possibility of time-consuming and costly coordinations for fixed service interests as well as the MSS systems.

IV.
THE UNITED STATES SHOULD PROPOSE MODIFICATION OF FOOTNOTE 731E TO ALLOW MSS SYSTEMS FULL USE OF THE 1610-1626.5 MHz BAND

The United States must propose revision of Footnote 731E regarding protection of the GLONASS system, to assure that MSS systems will have full use of the 1610-1626.5 MHz band. Elimination of the final sentence of the footnote will enable MSS to proceed with the use of this band without unnecessarily restrictive constraints on the use of the band now shared with the Russian GLONASS system.

GLONASS operations below 1606 MHz can be protected by MSS without impairing the use of the system as a part of the Global Navigation Satellite System (GNSS) which would utilize both GPS and GLONASS in aeronautical navigation, including precision landing. Revision of footnote 731E also will provide an incentive for Russia to revise its GLONASS frequency plan, aiding

in U.S. government efforts to achieve this objective, to the benefit of both MSS and radioastronomy operations.

The MSS community will continue to work with the FCC and the U.S. government to implement this strategy. In order to provide adequate incentive for Russia to enter into a written commitment to reconfigure the GLONASS frequency plan no later than 1998, Ellipsat believes that the Commission should send a strong signal, both in its adoption of domestic rules regarding MSS and GLONASS and in its U.S. proposals to WRC-95. A U.S. proposal to WRC-95 to modify Radio Regulation 731E will also send a signal to Russia as well as other administrations and incentivize Russia to revise the GLONASS frequency plan.

The Commission can and should play an important role by taking the actions outlined above, as well as by working within the U.S. government to achieve agreement of the Russian administration to revise its frequency plan and relocate GLONASS below 1606 MHz.

V.
THE UNITED STATES SHOULD PROPOSE THAT THE 2 GHz MSS BAND BE MADE AVAILABLE AS SOON AS POSSIBLE

While the Commission has proposed a sharing plan for accommodating all of the U.S. LEO applicants, it is apparent that the available L-Band spectrum is sufficient only for the proposed systems to begin operations. It is important to identify additional frequency bands for future expansion by the U.S.

systems and also to accommodate new entrants, both U.S. and non-U.S.

At WARC-92, spectrum in the 2 GHz band was allocated for use by MSS systems. Because these bands are currently used for terrestrial communications systems, the conference provided that the bands would be available for MSS at designated future dates. Ellipsat recommends that the Commission support acceleration of the date of availability of the previously-allocated 2 GHz MSS spectrum.

The long lead time needed for the planning, financing and construction of satellite systems requires that spectrum availability be determined as far in advance as possible. Following implementation of the first generation systems, planning for second generation systems will begin immediately. If licenses are granted in 1994, planning for a second generation system, in Ellipsat's case, could begin as early as 1996. For this reason, it is important for the United States to pursue expedited availability of 2 GHz MSS spectrum at WRC-95.

VI.
CONCLUSION

For the foregoing reasons, Ellipsat urges the Commission to take appropriate steps, in preparation for WRC-95 and future WRCs, to focus attention on the various issues, including feeder link spectrum, coordination, and GLONASS relocation, that must be resolved expeditiously if the LEO MSS systems are to meet the

promise they offer of providing cost-effective, innovative global communications services. Ellipsat plans to participate actively on the Commission's Industry Advisory Committee in preparation for WRC-95 and stands ready to support the Commission in its preparations for WRC-95 and future conferences.

Respectfully submitted,

ELLIPSAT CORPORATION

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July 15, 1994

EXHIBIT A

EXHIBIT A

PROPOSED FEEDER LINK SPECTRUM

Frequency band	Bandwidth	FSS Direction	MSS Feederlink Direction
4500-4800 MHz	300 MHz	space-to-Earth	Earth-to-space
5150-5216 MHz*	66 MHz	space-to-Earth	Earth-to-space
6425-6650 MHz	225 MHz	Earth-to-space	space-to-Earth
6650-6725 MHz	75 MHz	Earth-to-space	space-to-Earth
6725-7025 MHz	300 MHz	Earth-to-space	space-to-Earth
7025-7075 MHz	50 MHz	Earth-to-space	space-to-Earth
10.70-10.95 GHz	250 MHz	space-to-Earth	Earth-to-space
10.95-11.2 GHz	250 MHz	space-to-Earth	Earth-to-space
11.2-11.45 GHz	250 MHz	space-to-Earth	Earth-to-space
11.45-11.7 GHz	250 MHz	space-to-Earth	Earth-to-space
11.7-12.2 GHz	500 MHz	space-to-Earth	Earth-to-space
12.75-13.25 GHz	500 MHz	Earth-to-space	space-to-Earth
13.75-14.0 GHz	250 MHz	Earth-to-space	space-to-Earth
14.0-14.50 GHz	500 MHz	Earth-to-space	space-to-Earth

* Feeder link use of this band should be expanded to the entire 5000-5250 MHz band.

EXHIBIT B

INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS
MEETINGS OF WP 4B, TGs 4/3 & 4/5
INTELSAT HEADQUARTERS, WASHINGTON DC
31 MAY - 10 JUNE 1994

Document 4-5/TEMP/22 -E
9 June 1994
Original: English only

TASK GROUP 4/5

REPORT FROM CHAIRMAN OF DG (II) - REVERSE BAND WORKING

This DG had three meetings where the input documents 4-5/23 + Corr. 1, 25, 28, 31, 32, 39, 41, 46, 47 were considered. Two sub-drafting groups were created as follows:

(i) Satellite to Satellite Interference

-- Dr. Ramashastry, USA

(ii) Earth Station to Earth Station Interference

-- Mr. Shinonaga, Japan

These two sub-drafting groups prepared two Temp. documents, Temp 9, Rev. 1 for the Satellite to Satellite situation and Temp. 2, Rev. 2 for the ES to ES situation. These two Temp. documents were extensively discussed in the DG meetings.

Based on the assumptions used in the studies presented in the above referred input documents, it was concluded that the sharing between Non-GSO MSS FL's in reverse band mode and GSO/FSS systems in the forward band mode is technically feasible in the bands C, Ku and Ka (including the allotment plan bands). These studies assumed technical characteristics of a large number of representative GSO/FSS systems (including Allotment Plan of Appendix 30B) and those Non-GSO MSS systems currently being planned. It should be noted that while there is no information available from the ITU-R for the acceptable interference criteria of the Non-GSO MSS FL's, a number of reasonable assumptions were made in these studies.

In the two Temp. documents, some technical and operational difficulties in the use of Ka band for RBW are described. The practicalities of employing RBW in congested FSS bands are also discussed.

With regard to the calculation coordination distance for ES to ES interference it is suggested to use the ITU-R Recs. 847, 848, 849 together with some realistic parameters for the ES of Non-GSO MSS FL's. Further, to assess the need for coordination between space stations of the Non-GSO MSS FL's and GSO/FSS, two options are suggested; one option being the application of a delta T/T procedure similar to that of Appendix 29 and the second option of establishing Pfd limits at the GSO.

The WRC-95 agenda includes two primary topics: (1) review of the Radio Regulations based upon the report of the Voluntary Group of Experts (VGE), and (2) facilitating the use of frequency bands allocated to MSS.[2/] It is critical for the Commission and the U.S. to use the opportunity presented by WRC-95 to address and resolve the issues that will have a material impact on the LEO MSS systems, including issues that are raised by the VGE Report. The most important of these issues are the following.

FEEDER LINKS. Feeder link spectrum for the LEO systems should be treated as a high-priority matter by the U.S. Ellipsat strongly recommends that the U.S. support allocation of frequencies, in the C and Ku bands, and related rule changes to permit use of these bands for LEO-MSS feeder links on a reverse band sharing basis.[3/] Appropriate rule changes should be adopted to permit reverse band feeder link operations by LEO MSS systems in the C and Ku-Bands allocated to the fixed-satellite service (FSS) on a co-primary basis. This will ensure the most efficient use of the C and Ku-Band spectrum and have a minimal impact on FSS operations;

2/ Notice, para. 3, citing Final Acts of the World Radiocommunication Conference (Geneva, 1993).

3/ While Ellipsat's strong preference is for C or Ku-Band spectrum (in that order), the Commission should also pursue appropriate Ka-Band allocations for future LEO feeder link operations as more fully discussed below.

POWER-FLUX DENSITY LIMITS. Ellipsat supports a modest relaxation of the power-flux density values for the 2483.5-2500 MHz band, treatment of these values as coordination triggers rather than absolute limits, and appropriate revisions of international radio regulation 2566 to accomplish this;

GLONASS. Ellipsat urges the Commission to support revision of footnote 731E to eliminate the ambiguity concerning the degree of protection to be afforded the GLONASS system; and other appropriate steps to facilitate GLONASS relocation below 1606 MHz.

COORDINATION. The Commission should support revision of satellite coordination procedures such as the interim procedures in Resolution 46 to streamline the coordination process for MSS service and feeder links;

SPECTRUM AVAILABILITY. At WRC-95, the U.S. should support the more rapid availability of MSS spectrum in the 2 GHz bands and propose the allocation, on a worldwide basis, of the 2390-2400 MHz and 2402-2417 MHz bands for MSS systems in the Earth-to-space direction to provide additional spectrum for second generation MSS systems. As discussed herein, planning for second generation systems could begin as early as 1996, in Ellipsat's case, and it is therefore critical that MSS spectrum availability be defined at WRC-95.