

RECEIVED

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

AUG - 5 1991

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of:

ELLIPSAT CORPORATION

Application for Authority to
Construct an Elliptical Orbit
Satellite System for Operation
in the RDSS Band.

File No. 11-DSS-P-91(6)

RECEIVED

AUG 7 1991

DEPT. OF COMMERCE
SATELLITE RADIO BRANCH

RESPONSE TO OPPOSITION
AND REPLY COMMENTS

MOTOROLA SATELLITE
COMMUNICATIONS, INC.

Veronica Haggart
Rob Frieden
Motorola, Inc.
1350 I Street, N.W., Suite 400
Washington, D.C. 20005
(202) 371-6900

Philip L. Malet
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-6239

Its Attorneys

Dated: August 5, 1991

TABLE OF CONTENTS

	<u>Page</u>
I. ELLIPSAT'S APPLICATION IS DEFECTIVE AND MUST BE DISMISSED BY THE COMMISSION	2
A. RDSS Applications Must Be Substantially Complete in Order to be Accepted for Filing	3
B. Ellipsat's Application Is Not Substantially Complete	6
C. Ellipsat's Power Flux Density Exceeds the International Radio Regulation Requirements	9
II. ELLIPSAT IS NOT QUALIFIED TO BE AN RDSS LICENSEE	10
A. There Are Basic Flaws in Ellipsat's Proposed System	10
B. Ellipsat Is Not Financially Qualified	15
III. CONCLUSION	19

SUMMARY

Motorola Satellite Communications, Inc. ("Motorola") hereby responds to the opposition and reply comments submitted with respect to the application of Ellipsat Corporation ("Ellipsat") for authority to construct an elliptical orbit, mobile satellite system using the RDSS service bands. In its Opposition, Ellipsat essentially concedes there are several errors and omissions in its application. As set forth in the petitions of Motorola and others, Ellipsat's application is patently deficient in several material respects, including its failure to comply with numerous application processing requirements in Section 25.114 of the Rules. Absent such basic information about Ellipsat's system, the Commission cannot include this application in the current RDSS processing group.

Moreover, Ellipsat has failed to address, in any significant manner, the serious technical deficiencies of its satellite system design, such as its inability to offer any meaningful RDSS to the public. Despite the exaggerated claims made in its application, Ellipsat now admits that coverage of the Continental United States would be intermittent, at best, utilizing ELLIPSO I. Ellipsat has not adequately refuted Motorola's analysis which indicated that its proposed RDSS service only could be used by potential subscribers about 2% of each day.

Nor has Ellipsat provided any competent response to the serious technical questions raised by Motorola and others

concerning its unacceptable link budgets, excessive power flux density levels in violation of international Radio Regulations, and impossible spacecraft antenna patterns. These technical flaws are not petty or insignificant as claimed by Ellipsat; but rather call into question Ellipsat's technical competence and qualifications to become a satellite licensee in the RDSS bands.

Based upon the numerous errors, omissions and internal inconsistencies in its application, Ellipsat cannot be found technically qualified to become a satellite radio licensee. Motorola is not asking the Commission to dismiss an applicant because of some minor defects or omissions in an application, or because that application is not letter perfect. Motorola does contend, however, that an application so inconsistent, replete with errors and lacking in the basic information required by the Commission evidences an inability of the applicant to understand the technical requirements for constructing, launching, and operating a low earth orbit satellite system. Ellipsat's application, therefore, should not be accepted for filing or considered along with serious proposals made by fully qualified applicants. This is not a case where the Commission can rely upon the expertise of the applicant to modify its system in order to take advantage of newer technologies as they are developed. Ellipsat's system as currently proposed simply will not work. While some of these problems may be correctable, Ellipsat has not shown the capability to undertake the total system redesign that is necessary. Under these circumstances, the Commission cannot continue to process Ellipsat's technically deficient application.

Ellipsat has also failed to demonstrate its financial qualifications. The additional letters attached to Ellipsat's Opposition add nothing of substance to its previously inadequate financial showing. Under any reasonable interpretation of the Commission's application standards, Ellipsat is not financially qualified to construct, launch and operate its proposed satellite system. Ellipsat does not have sufficient internal resources to build and launch its first generation of satellites, nor does it have any reasonable assurance of obtaining the requisite amount of financing to proceed with construction. It still has not submitted a detailed business plan as required by the RDSS rules.

In summary, the Commission should dismiss or deny the Ellipsat application on any one of three grounds, i.e., noncompliance with the Commission's rules regarding the provision of essential information; lack of technical qualifications; and totally inadequate financial qualifications.

RECEIVED

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

AUG - 5 1991

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of:
ELLIPSAT CORPORATION
Application for Authority to
Construct an Elliptical Orbit
Satellite System for Operation
in the RDSS Band.

File No. 11-DSS-P-91(6)

**RESPONSE TO OPPOSITION
AND REPLY COMMENTS**

Motorola Satellite Communications, Inc. ("Motorola"), through its attorneys, hereby responds to the Opposition and Reply Comments of Ellipsat Corporation ("Ellipsat") and the reply comments of several other parties to the petitions filed against the above-captioned application for authority to construct an elliptical orbit satellite system operating in the RDSS frequency bands.^{1/}

Ellipsat has not corrected by amendment any of the errors, omissions and inconsistencies identified by Motorola in its Petition to Dismiss and/or Deny ("Petition"). Instead, Ellipsat's comments in its Opposition attempt to belittle the substantial technical and financial deficiencies in its

^{1/} Petitions or comments were filed against Ellipsat's application by Motorola, Constellation Communications, Inc. ("Constellation"), American Mobile Satellite Corporation ("AMSC"), the Committee on Radio Frequencies of the National Academy of Sciences ("CORF"), Communications Satellite Corporation ("COMSAT"), GTE Spacenet Corporation ("GTE"), and RDSS Inc. In addition, reply comments were filed with respect to Ellipsat's application by AMSC, TRW, Inc., Aeronautical Radio, Inc. ("ARINC"), and Constellation.

application, and rely upon unnamed experts who allegedly have been contacted to confirm the viability its system design. Based upon the lack of technical and financial information in Ellipsat's application and the concessions contained in its pleadings, the Commission must dismiss Ellipsat's application as defective. In the alternative, the Commission should find that Ellipsat's failure to address the serious flaws identified with respect to its proposed system design and its lack of financing makes it unqualified to become an RDSS satellite licensee.^{2/}

I. ELLIPSAT'S APPLICATION IS DEFECTIVE
AND MUST BE DISMISSED BY THE COMMISSION

In its Petition, Motorola pointed out numerous defects in Ellipsat's application, including major informational omissions in the technical characteristics of its proposed system, internal inconsistencies, provision of basic RDSS service only two percent of the time, and excessive power flux density ("PFD") levels. See Petition at 8-14. Any one of these defects would be sufficient to dismiss Ellipsat's application without a hearing or further processing. Taken as a whole, they conclusively demonstrate Ellipsat's lack of qualifications to become an RDSS licensee.

^{2/} Motorola primarily responds herein to the ELLIPSO I Application, as amended, submitted by Ellipsat prior to the April 1, 1991 Public Notice. Motorola reserves the right to comment on or petition the Commission to deny the ELLIPSO II Application if the Commission issues a public notice accepting it for filing.

A. RDSS Applications Must Be Substantially Complete in Order to be Accepted for Filing

As noted in Motorola's Petition, both the Commission's rules and the Public Notice establishing the cut-off for additional RDSS applications warn that defective applications will be returned as unacceptable for filing.^{3/} An acceptable application must include "a concrete, comprehensive proposal . . . describing in detail all pertinent technical and operational aspects of the system and its ability to proceed expeditiously with construction and launch."^{4/} Ellipsat has failed to met this test. The Commission has repeatedly warned that "[a]pplications not containing all required information will be returned as unacceptable for filing."^{5/} Only such detailed proposals provide the Commission with sufficient information to evaluate applicants' technical, financial, and legal qualifications.^{6/}

^{3/} See Petition at 4-7 and accompanying notes.

^{4/} Public Notice, Report No. DS-1068 (Apr. 1, 1991).

^{5/} Amendment to the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to, a Radiodetermination Satellite Service, 104 F.C.C.2d 650, 667 (1986) (emphasis added). See also Satellite Syndicated Sys., Inc., 99 F.C.C.2d 1369, 1385-86 (1984) (DBS application contained insufficient information to be considered minimally acceptable for filing); Advance, Inc., 88 F.C.C.2d 100, 109 (1981) (four DBS applications rejected for incompleteness). Cf. Richard P. Bott II, 3 F.C.C. Rcd. 6063, 6063 (1988) (FM radio application may be tendered only if it includes "all of the critical elements required for the processing of the application").

^{6/} Section 25.141(a) of the Commission's recodified Rules states that each applicant must affirmatively demonstrate its
(continued...)

The Commission's requirement that comprehensive applications be submitted within the prescribed time period is no mere matter of administrative convenience. The public interest in increased speed and efficiency demands that the Commission and interested parties focus their resources on applications submitted in a condition fit for review, rather than wasting time attempting to fill in the gaps of inadequately prepared applications.^{7/} This ability to review applications in an orderly and effective fashion is especially important in the satellite industry, given the high level of technological understanding and the long lead times required to construct and operate a system.^{8/} In addition, consideration of substantially incomplete applications would prejudice those applicants which have met the Commission's processing standards.^{9/}

Ellipsat has acknowledged that it was obliged to provide a substantially complete application, sufficiently

^{6/} (...continued)
 technical, legal, and financial qualifications. See Amendment of Part 25 of the Commission's Rules and Regulations, 6 F.C.C. Rcd. 2806, 2823 (1991).

^{7/} See Amendment of Part 25 of the Commission's Rules and Regulations, 6 F.C.C. Rcd. at 2818. Cf. Bott, 3 F.C.C. Rcd. at 6064 ("consideration of flawed proposals can inordinately delay the initiation of new service").

^{8/} See Processing of Pending Space Station Applications in the Domestic Fixed-Satellite Service, 93 F.C.C.2d 832, 843-44 (1983) (hereinafter "GTE Satellite Corp.").

^{9/} Cf. GTE Satellite Corp., 93 F.C.C.2d at 841-42 (processing group closed without notice to avoid hasty filing of speculative applications).

detailed that it would not "make processing a futile gesture."^{10/} This "substantially complete" standard, however, requires considerably more information than is included in Ellipsat's application. Merely mentioning an informational requirement without providing any useful description or detail is not sufficient to meet an applicant's obligation under the rules to provide a complete and comprehensive proposal for Commission consideration.

In this regard, the lack of concrete and meaningful information in Ellipsat's application is strikingly similar to a DBS application rejected by the Commission as incomplete in Satellite Syndicated Systems, 99 F.C.C.2d at 1385-86. There, the Commission returned an application after it went on public notice because it provided only "minimal information about the technical characteristics of the proposed system" ^{11/} Id. at 1385. All of this information was "necessary for analysis of the acceptability of an applicant's proposal, as well as its basic qualifications. . . ." ^{12/} Id. Moreover, the Commission indicated

^{10/} Opposition of Ellipsat Corporation to Petitions, and Reply to Comments ("Opposition"), at 10-11 (July 3, 1991) (quoting K&L Communications, Inc., 70 F.C.C.2d 1987, 1989 (1979)).

^{11/} In particular, the rejected DBS application failed to specify fundamental EIRP coverage characteristics, the power output and footprint design, power density figures, power budget analysis, or other information with which to permit assessment of the efficacy of the proposed system. The applicant further indicated that it did not know the redundancy it would require or the extent of its intended eclipse protection capacity. Satellite Syndicated Systems, 99 F.C.C.2d at 1385-86. Much of the same basic information is missing from Ellipsat's application.

^{12/} Cf. Industrial Communications, 53 R.R.2d (P & F) 38, 41-43 (1983) (in DPLMRS context, failure to comply with antenna

(continued...)

that the lack of such information "casts doubt on the extent of [the applicant's] own consideration of its DBS plans." Id. at 1385-86 (footnote omitted). As indicated in Motorola's Petition, there is "a nearly complete lack of information in several essential areas" in Ellipsat's application.^{13/} Advance, Inc., 88 F.C.C.2d at 111-12.

B. Ellipsat's Application Is Not Substantially Complete

Ellipsat's application lacks too much essential information to permit the Commission and interested parties to determine its system's feasibility or its compatibility with other licensed or proposed systems.^{14/} See Petition at 5.

^{12/} (...continued)

height/power rules prevented application from being substantially complete); 62 Broadcasting, Inc., 3 F.C.C. Rcd. 4429, 4448 (1988) (in broadcast television context, failure to assure site availability rendered application substantially incomplete).

^{13/} Ellipsat's proclaimed diligence in responding to the Commission's Appendix B requirements and general waiver request to the extent it has not complied with all applicable requirements are irrelevant to a determination of whether its application is acceptable for filing. Ellipsat's ignorance of, or failure to understand, the Commission's application requirements is no excuse for submitting incomplete applications, regardless of any good faith intention to comply with the rules. See Satellite Syndicated Systems, 99 F.C.C. 2d at 1385-86. Moreover, "the sweeping and general language of [a] waiver request, seeking an 'exception to any possible defects in the applications,'" does not demonstrate the special circumstances warranting an exception to the rules. Columbia Communications Corp. v. FCC, 832 F.2d 189, 192-93 (D.C. Cir. 1987).

^{14/} Ellipsat's interference analyses also are lacking in several material respects. Both the ELLIPSO I and ELLIPSO II applications include exhibits that are purported to be analyses which demonstrate that these satellite constellations will not cause harmful interference to compliant RDSS systems. For example, the ELLIPSO II Application claims at Exhibit C that
(continued...)

Ellipsat does not dispute the existence of several of the application defects identified by Motorola. Thus, it concedes that there were errors in its link budgets, that its coverage of the United States utilizing ELLIPSO I would be intermittent at best, and that the power flux density levels in its application were incorrect. See Opposition at 13-18 & Exhibit A, p. 1.

Ellipsat still maintains, however, that its application "fully satisfied the informational requirements for domestic satellite applications. . . ." See Opposition at 8. It claims that Motorola failed to identify any substantial omissions in its application and that "meaningful responses" were provided to all of the Commission's informational requirements. Id. at 9. In support of this claim, Ellipsat attaches an exhibit to its Opposition which allegedly contains a point-by-point refutation of each of the deficiencies identified by Motorola. Id. at Exhibit A.

In fact, Ellipsat's exhibit demonstrates the lack of "meaningful" information in its system application. As the Commission is well aware, Appendix B to the Space Station

^{14/} (...continued)

Ellipsat will avoid causing harmful interference to a Geostar-type system through use of "opposite circular polarization." However, ELLIPSO II proposes to use both senses of circular polarization.

Moreover, neither the ELLIPSO I nor ELLIPSO II Application presents an analysis showing the self-interference effect of its proposed direct sequence CDMA communications system. Self-interference is the major capacity limiting factor in spread spectrum systems. Ellipsat relies instead on the myth of spread spectrum limitless capacity. This is particularly inappropriate for the ELLIPSO II system, where it is claimed that three or more satellites can simultaneously provide coverage of the same area. Without a valid, thorough self-interference analysis the Commission cannot accept such claims.

Application Filing Procedures, 93 F.C.C.2d 1260, 1265 (1983), sets forth the basic information required for every domestic satellite application, including all RDSS applications.^{15/}

Motorola has prepared in an attachment to this Response a comparison of the Appendix B requirements with the references provided by Ellipsat to its application for several critical informational items. This comparison reveals the lack of completeness of Ellipsat's application in many important areas.^{16/}

For example, Ellipsat incorrectly claims that its superficial representation of the Earth with a single untitled contour satisfies the Commission's informational requirements with respect to the depiction of space segment coverage contours. The Commission requires at least eight contours of several characteristics for each antenna beam. See Attachment I hereto. Moreover, Ellipsat has provided absolutely no information concerning the variations of these patterns as a function of spacecraft orbital position. Id. Similarly, Ellipsat's assertion that the provision of information in its application about the size of its satellites is sufficient for purposes of

^{15/} These requirements recently were codified into Section 25.114 of the Rules. See Amendment of Part 25 of the Commission's Rules and Regulations, 6 F.C.C. Rcd. at 2818.

^{16/} Motorola also pointed out several internal inconsistencies in Ellipsat's application, including many contradictory claims as to possible coverage of Hawaii, Puerto Rico and the U.S. Virgin Islands. Petition at 11-12. Ellipsat continues its pattern of obfuscation in its most recent filing by now claiming that domestic offshore points "which are on similar latitudes to locations in the U.S. will experience similar coverage to those locations in the U.S." See Opposition at Exhibit A, p. 3. In fact, as Ellipsat should know, there are no locations in the contiguous United States on the same latitudes as the main Hawaiian Islands, Puerto Rico or the U.S. Virgin Islands.

establishing required mass and power budgets illustrates Ellipsat's lack of technical capability. The failure to provide such critical information concerning the feasibility of its system cannot be excused by Ellipsat's simplistic view that "budgetary numbers for weight continually change during the satellite construction process. . . ." See Opposition at Exhibit A, p. 1. Nor has Ellipsat addressed its failure to provide a functional block diagram of its satellite communications subsystem and switching capabilities. As the Commission has stated:

An applicant for a radio license who either ignores or fails to understand the Commission's clear and valid application requirements assumes a risk that its application will not be accepted and the Commission need not accept an application that fails in major and material respects to provide information it has determined necessary to a consideration of its merit in the public interest.

Satellite Syndicated Systems, Inc., 99 F.C.C.2d 1369, 1386 (1984) (citing Ranger v. FCC, 294 F.2d 240, 242 (D.C. Cir. 1961)).

C. Ellipsat's Power Flux Density Exceeds the International Radio Regulation Requirements

In its Petition, Motorola noted that the power flux density ("PFD") set forth in Ellipsat's application for both its ELLIPSO I and II spacecraft exceed the limits of the international Radio Regulations. See Petition at 13-14. Ellipsat now claims that it incorrectly stated its PDF for ELLIPSO I at 5° elevation angles by 6.7 dB. See Opposition at 17-18. However, this new Ellipsat claim is not supported by any calculation or indication of technical assumptions. The

PF D OF ELLIPSO I DOWNLINK AT 5 DEGREE ELEVATION

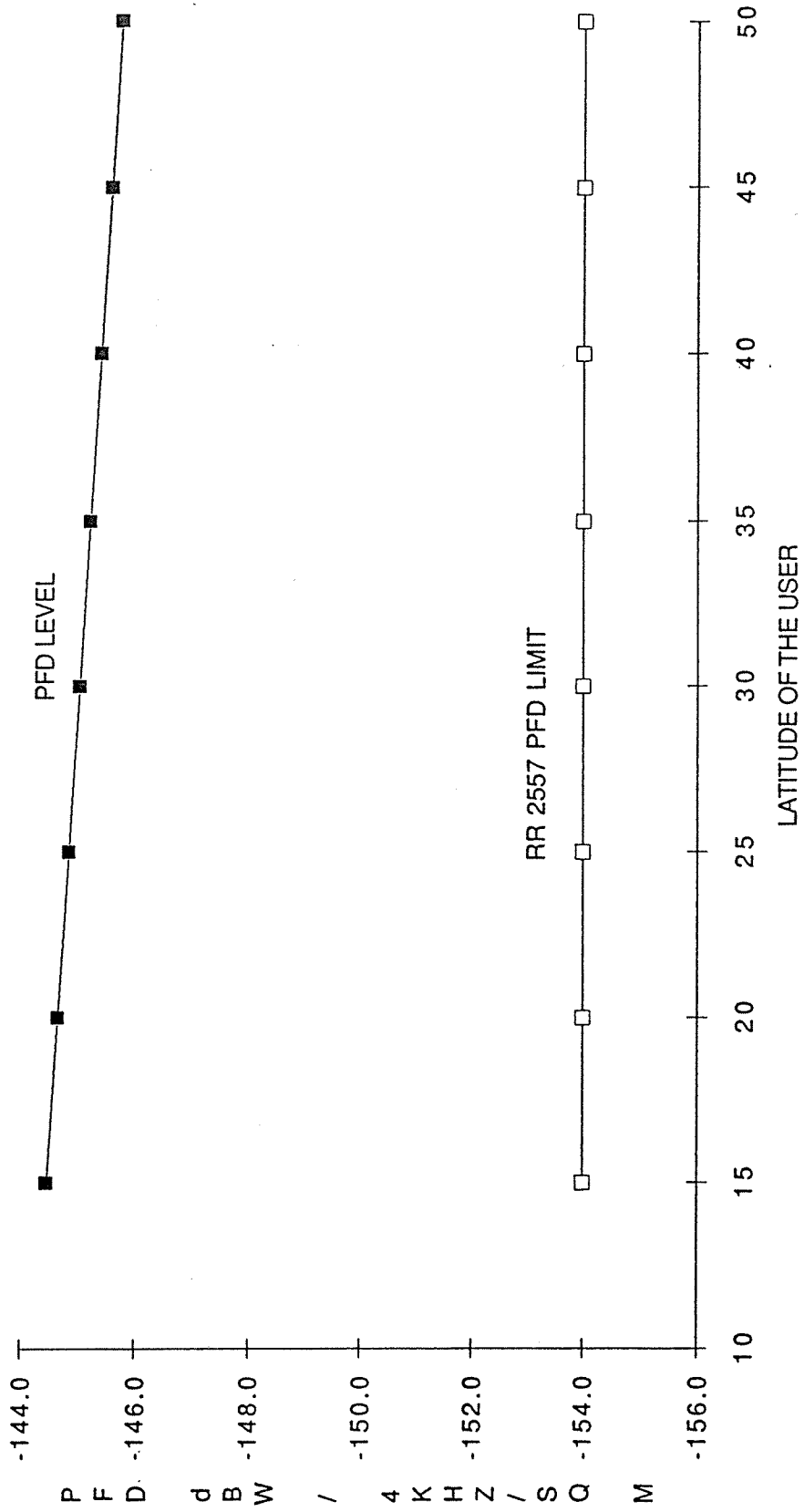


FIGURE 1

Commission cannot accept the bald assertions that the value originally presented by Ellipsat in its application was in error and that a different value now somehow exactly meets the international Radio Regulations.^{17/}

Based upon the limited information set forth in Ellipsat's application, Motorola has evaluated the ELLIPSO I PFD at 5° elevation angle for several user latitudes. Figure 1 shows that the ELLIPSO I maximum PFD ranges from 8.5 to 9.5 dB higher than the applicable limits of the international Radio Regulations. Ellipsat apparently has failed to take into account the fact that its downlinks will transmit to the edge of its antenna coverage regardless of user location.^{18/}

II. ELLIPSAT IS NOT QUALIFIED TO BE AN RDSS LICENSEE

A. There Are Basic Flaws in Ellipsat's Proposed System

Motorola further demonstrated that Ellipsat was not technically qualified to become an RDSS licensee. Ellipsat's satellites were shown to be inadequately designed, its

^{17/} Ellipsat makes no attempt to explain how ELLIPSO II spacecraft with 10 dB higher EIRP's than ELLIPSO I will keep within these PFD limits. Ellipsat claims that the ELLIPSO II satellites do not exceed the applicable limits; however, it has failed to include all the requisite factors in its calculations. See ELLIPSO II Application at Appendix C, p. 4. Ellipsat bases its PFD calculations on a channel segment EIRP of 22 dBW. However, Ellipsat neglects the fact that ELLIPSO II employs frequency reuse with two channel segments occupying the same bandwidth. Thus, the EIRP of two downlink segments must be considered in the PFD calculation.

^{18/} It should be noted that the PFD limit at 5° elevation angle is appropriate regardless of the minimum operational elevation angle for the system.

transmission link budgets were found to be unable to maintain reliable communications links, and its ability to provide RDSS was shown to be almost nonexistent.^{19/} See Petition at 15-17.

Ellipsat refers to these matters as "various minor criticisms" of its technical design. See Opposition at 11. In fact, Ellipsat's proposed system simply will not work as currently designed.^{20/}

Ellipsat is also wrong to suggest that the Commission should not analyze an applicant's technical design in order to determine whether its proposed system is feasible. See Opposition at 12. While the Commission chose not to mandate specific RDSS system parameters or coding schemes and adopted the minimal technical standards necessary to ensure the implementation of multiple entry,^{21/} it did not abdicate its responsibility under the Communications Act to make findings as to the technical qualifications of licensees.^{22/} As outlined in

^{19/} The ELLIPSO II Application also raises serious questions as to Ellipsat's understanding that it needs an ability to control its satellites. Ellipsat proposes to operate its ELLIPSO I and ELLIPSO II satellites at different elliptical orbits such that there would be intersecting points where the satellites might collide.

^{20/} Ellipsat repeatedly claims throughout its Opposition that its proposed system conforms to the spread spectrum transmission design set forth in the RDSS rules. See Opposition at 3-4, 23 n.49, 26. In fact, Ellipsat's FDMA/CDMA design is not in compliance with the RDSS rules because it does not propose to spread transmission signals over the entire 16.5 MHz RDSS uplink and downlink bands. See RDSS Licensing Order, 104 F.C.C.2d 650, 660 (1986). As the Commission has already found, "[t]he Ellipsat application provides an FDMA/CDMA modulation architecture that was not originally envisioned for the RDSS where the CDMA signal occupied the entire 16.5 megahertz. . . ." Supplemental Notice of Inquiry in Gen. Docket No. 89-554, 6 F.C.C. Rcd. 1914, 1917 (1991).

^{21/} See RDSS Licensing Order, 104 F.C.C.2d at 661-62.

^{22/} See 47 U.S.C. § 309(a) (1988).

Motorola's Petition, there are several basic flaws in Ellipsat's proposed system which involve more than mere quibbling with technical assumptions.^{23/} Ellipsat has failed to respond, in any substantive manner, to the significant technical problems associated with its system design.^{24/}

First, Motorola identified major coverage gaps with Ellipsat's proposed orbits and system design, revealing through its computer simulation analysis that ELLIPSO I could only offer RDSS with two satellites covering one location an average of only 35 minutes per day. See Petition at 12-13. Ellipsat now claims that only one satellite is necessary to provide RDSS using MIT's Geobeacon technology. See Opposition at 14 n.29. However, both the ELLIPSO I and more recently filed ELLIPSO II applications clearly state that a pair of satellites will be used to make these measurements.^{25/} Ellipsat further asserts that coverage issues are not relevant to its basic qualifications. See Opposition at 13-14. An applicant, however, cannot profess to provide RDSS and claim to be technically qualified to do so, when in fact, its proposed system is not capable of offering the intended services. Motorola is not simply questioning Ellipsat's

^{23/} In Geostar Corp., 60 R.R.2d (P & F) 1725, 1727-28 (1986), a case primarily relied upon by Ellipsat, the Commission recognized that such "basic flaws" in a proposed system would constitute grounds for denial of an application.

^{24/} Other parties also raised serious technical flaws with Ellipsat's system design. For, example, both Constellation and TRW questioned Ellipsat's use of the RDSS mobile communications bands for its feeder links. See Comments of Constellation at 7-8 (June 3, 1991); Reply Comments of TRW at 14-15 (July 3, 1991). Motorola shares these concerns as well.

^{25/} See ELLIPSO I Application at 19; ELLIPSO II Application at 17 (Figure 4). See also U.S. Patent No. 4,912,476, at 4-6.

coverage claims, but its ability to provide RDSS in any meaningful manner.

Second, Motorola pointed out that Ellipsat has no real plan for accommodating TT&C functions on its spacecraft to ensure proper maintenance and control. Its "preference" for using the L and S-bands for TT&C and willingness to consider other communications bands shows a complete lack of awareness of the complexities of satellite system design. Spacecraft of the size and capabilities of ELLIPSO I would have virtually no flexibility to utilize other bands for TT&C functions. Such an inability to make basic design decisions further evidences Ellipsat's lack of technical qualifications and "casts doubt on the extent of [its] consideration of its . . . plans."^{26/} Satellite Syndicated Sys., Inc., 99 F.C.C.2d at 1385-86.

Third, Ellipsat's service link was shown to be insufficient to maintain transmissions for much of the areas it claims to be able to serve.^{27/} See Petition at 15-16.

^{26/} In addition, Motorola noted that a figure in Ellipsat's application appeared to show that the S-band antenna's view of the Earth was blocked by the body of the ELLIPSO I spacecraft. See Petition at 16. Ellipsat now maintains that its drawing of the satellite was upside down and not shown to scale; however, it concedes that there still might be blockage from the satellite body. See Opposition at 16 & n.33. Furthermore, it would appear from Ellipsat's drawing that if its spacecraft was shown to be upside down, then its L-band antenna would similarly be blocked by the body of the satellite. ELLIPSO I Application at 15 (Figure 10).

^{27/} Motorola also pointed out that Ellipsat did not provide link budgets for its signalling channels. Ellipsat now claims that its signalling channels "are included within the communications link, and are less controlling than the communications link budget." Opposition at Exhibit A, p. 1. However, Ellipsat's application, as amended, clearly depicts separate "narrow band" signalling channels (see ELLIPSO I

(continued...)

Ellipsat's proposed elliptical orbits have the distinct property of causing both Earth coverage and transmission path lengths to be dependent upon geographical latitude. Motorola has undertaken an analysis of the ELLIPSO I orbit which demonstrates the significance of this interrelationship between the user elevation angle, coverage and link performance. Figure 2 plots the extent of ELLIPSO I's coverage of the contiguous United States as a function of latitude and user elevation angle. From this figure, it can be readily determined that the choice of user elevation angles has a major impact upon the operational coverage of ELLIPSO I. Based upon the coverage claims made by Ellipsat for this system, it is apparent that Ellipsat is anticipating minimum user elevation angles of 5 degrees.^{28/}

Figure 3 shows the effects of elevation angles and latitude of the user on ELLIPSO I's link performance. It is significant to note that without making any of the corrections previously identified by Motorola in its Petition, Ellipsat's link budget margins for elevations angles of below 11 degrees will be negative for all the contiguous United States. The link budgets, however, must be adjusted further to include the characteristics of the spacecraft antenna, CDMA self-interference, intermodulation, multi-path, and fading due to

^{27/} (...continued)

Application at 10-11) which would need to establish their own service links. Absent such basic information, neither the Commission nor Motorola can determine whether Ellipsat will be able to close its signalling link or whether that link will meet the PFD limits for the S-band.

^{28/} Ellipsat claims coverage of CONUS between 26 and 50 percent which almost exactly matches the 5 degree elevation curve in Figure 2. See Opposition at 15.

ELLIPSO I COVERAGE VS. LATITUDE

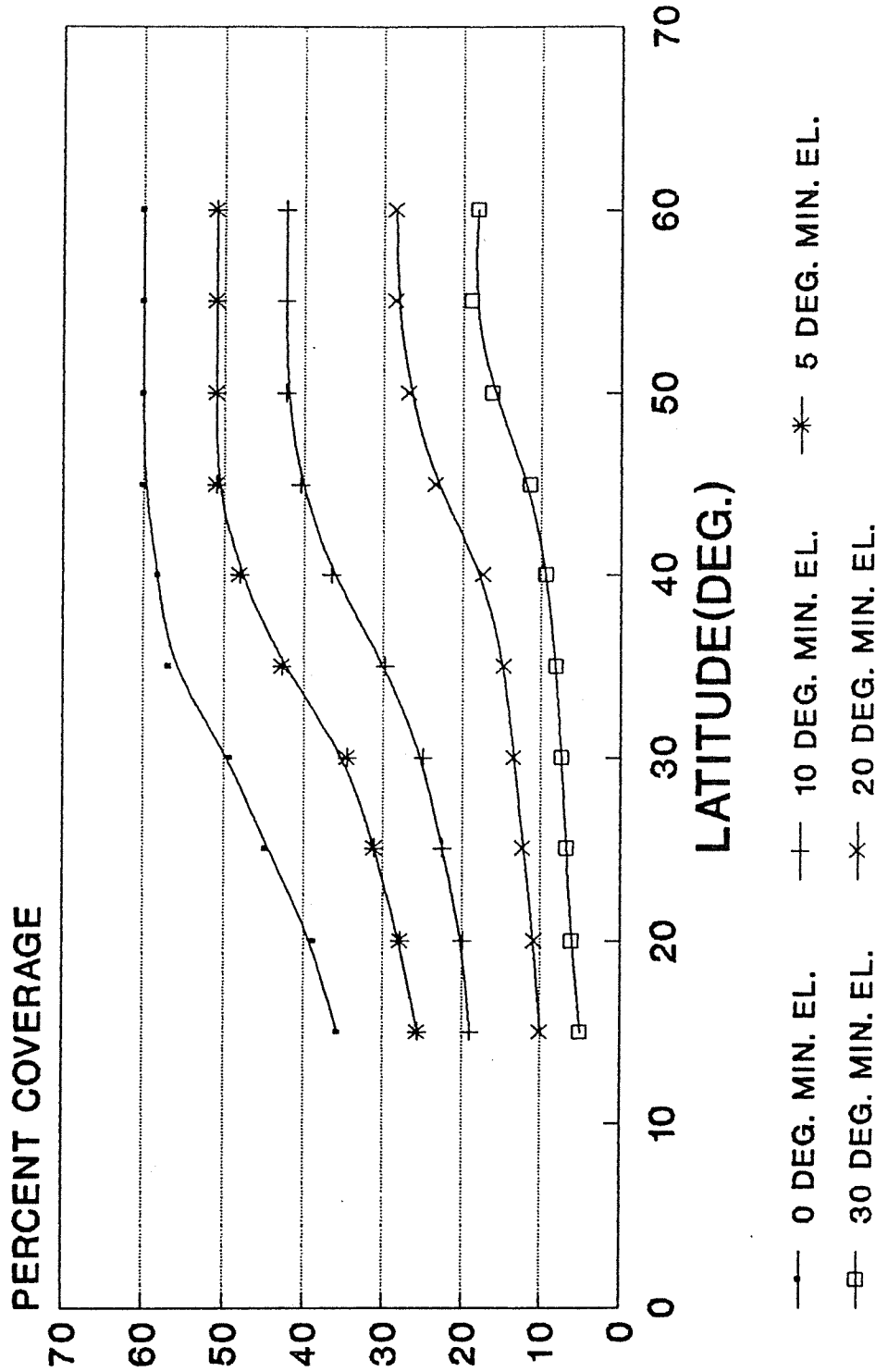


FIGURE 2

ELLIPSO 1 LINK MARGINS

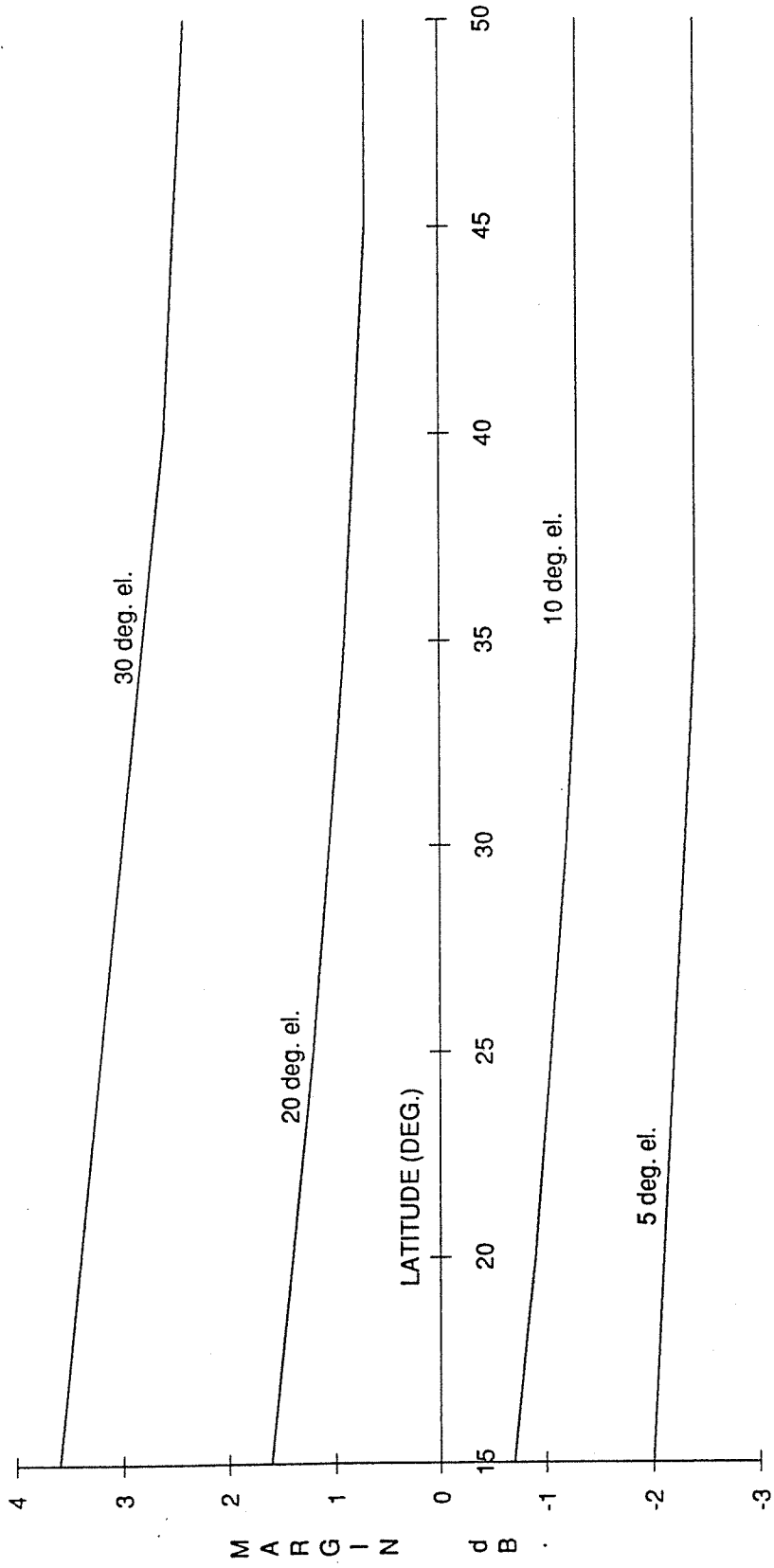


FIGURE 3

foliage.^{29/} Therefore, even at higher elevation angles, Ellipsat will encounter negative link margins whenever these conditions are experienced.

B. Ellipsat Is Not Financially Qualified

Ellipsat's application also was shown to be lacking in any meaningful information concerning its financial qualifications. See Petition at 17-21. All RDSS applicants are required to demonstrate their financial preparedness to construct and operate proposed satellite systems for one year. In its Second Report and Order in the RDSS licensing proceedings, the Commission required that:

applicants . . . submit complete financial information and a detailed business plan with well-defined milestones for construction, documenting their claims that they are prepared to proceed with construction and launch of their proposed systems immediately upon Commission grant.

Amendment to the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to, a Radiodetermination Satellite Service, 104 F.C.C.2d at 663
(footnote omitted).

^{29/} Ellipsat now claims that its physically impossible spacecraft antenna pattern could be accomplished by forming two separate beams and that this antenna pattern will be a system requirement placed on its satellite manufacturer. See Opposition at 17. Each beam, however, would require the equivalent of an independent feed which, in turn, would cause the output power of the final amplifier to be divided. It is not technically possible to obtain the indicated gain for both beams while utilizing the total RF power of the ELLIPSO I satellites. Thus, Ellipsat's "system requirement" is unattainable, and for this reason alone, it is not technically qualified.

Ellipsat claims that it has complied with these requirements by submitting a pro forma balance sheet and operating statement, schedules of investment and operating costs, estimates of annual revenue requirements, and letters from two venture capital groups. See Opposition at 18-22. None of this information, however, establishes Ellipsat's financial qualifications.^{30/}

As the Commission has stated when it adopted stringent financial qualifications standards for domestic fixed satellite systems:

Nothing less than a showing of current financial capability is acceptable in the domestic fixed-satellite industry under current conditions. . . . Although more lenient approaches may be used for some radio services, our experience with the domestic fixed-satellite industry warrants the conclusion that stricter requirements are necessary. . . . Any lessening of our traditional standard requiring licensees to be financially capable of proceeding immediately to construct, launch and operate their systems would impair the provision of service to the public."^{31/}

^{30/} Ellipsat also asserts incorrectly that "scrutiny of financial qualifications has been eliminated or deemphasized in other services . . . with no apparent adverse effects," (citing Amendment of Part 25 of the Commission's Rules and Regulations, 6 F.C.C. Rcd. at 2810). The recent elimination of financial qualification requirements applies only to earth station applications, not to space station applications. Due to the enormous investments required to initiate service, "[f]inancial qualifications must still be demonstrated by applicants for space stations in the domestic fixed-satellite service, the Radiodetermination Satellite Service, separate international satellite systems, and in the Mobile Satellite Service." Id. at 2810 (citations omitted).

^{31/} In re Licensing Space Stations in the Domestic Fixed-Satellite Service, 58 R.R.2d (P & F) 1267, 1270-71 (1985) (footnotes omitted).

Ellipsat, as well as the other RDSS applicants, should equally be required to provide financial data sufficient to allow the Commission to make a firm judgment as to whether they can meet the sizable start-up costs of their proposed systems.^{32/}

Ellipsat contends that Commission precedent permits new companies, like itself, to rely on planned debt or equity financing in lieu of current assets to establish financial qualifications. See Opposition at 20. Ellipsat's assertion that it intends to use debt and/or equity financing, coupled with unsupported opinions from various venture capital groups do not even approach the kind of showing the Commission has required in the past for other services.^{33/}

^{32/} See, e.g., Columbia Communications Corp., 832 F.2d 189 (D.C. Cir. 1987) (upholding Commission's dismissal of satellite license application for failing to satisfy financial requirements, when company lacked assets and offered merely a marketing plan for sale of transponders); Satellite Syndicated Sys., 99 F.C.C.2d at 1386 (application rejected as inadequate where limited information on costs was not supported and there was no clear plan or basis for expectation of financing).

^{33/} The case primarily relied upon by Ellipsat, in fact, demonstrates the insufficiency of Ellipsat's financial showing. In Advanced Mobile Phone Service, Inc., 91 F.C.C.2d 512 (1982), the applicant's proposal to rely on equity financing was accompanied by two letters from E.F. Hutton, an experienced investment bank, offering to act as managing underwriter for \$200 million in equity financing through a public offering. The Commission found these letters acceptable based on three specific findings: (1) that E.F. Hutton had successfully completed three prior equity financing for the applicant over the past few years; (2) that E.F. Hutton, an experienced investment bank, had carefully examined the applicant's financial position and future business plans and had affirmed its professional judgment that the applicant was capable of fulfilling its business plan; and (3) that the applicant had already arranged for \$200 million in debt financing with seven banks. Id. at 517. Ellipsat's application and its two venture capital group letters do not rise to the level of the showing made in Advanced Mobile Phone Service, Inc. and should be rejected. See Equatorial Communications Servs., 103 F.C.C.2d 631, 633 (1986) (letters from
(continued...)

Ellipsat has not accomplished or even planned an equity offering. Nor has it executed or negotiated a loan agreement. Given the defects and inconsistencies in its business plan,^{34/} it is, at best, uncertain that Ellipsat could ever complete such financing. Accordingly, Ellipsat has not shown, as required of all RDSS applicants, that it is "prepared to proceed with construction and launch of [its] proposed system[] immediately upon Commission grant." Amendment to the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to, a Radiodetermination Satellite Service, 104 F.C.C.2d at 663 (footnote omitted) (emphasis added). Because there is no assurance that Ellipsat will be able to obtain sufficient debt or equity financing promptly upon grant of the Commission's authorization, and because other fully qualified

^{33/} (...continued)

two investment banks indicating belief that equity financing can be arranged rejected as insufficient assurance that necessary funds would be obtained); American Lo-Power TV Network, Inc., 103 F.C.C.2d 4, 12-13 (1986) (rejecting a showing falling short of Advanced Mobile Phone); Cellular Communications of Cincinnati, Inc., 53 R.R.2d (P & F) 827, 830 (1983) (rejecting two letters from investment banks containing bare statements of belief that sufficient funds could be raised through equity placements). Likewise, Ellipsat has not made a sufficient showing of available debt financing. See, e.g., Scioto Broadcasters, 5 F.C.C. Rcd. 5158, 5159-60 (1990), aff'd, 6 F.C.C. Rcd. 1893 (1991); Global Information Technologies, Inc., 5 F.C.C. Rcd. 3385, 3386-87 (1990) (rejecting as insufficient lender statement that it was "seriously interested in exploring" a potential loan); Boedker, 5 F.C.C. Rcd. 2855, 2859 (1990) (affirming disqualification of applicant who obtained bank letter which merely stated that bank "has an interest" in financing proposed facility); American Low-Power TV Network, Inc., 103 F.C.C.2d at 10 (rejecting bank's statement that it would "welcome an opportunity to participate as lender").

^{34/} See Petition at 20-21.


applicants exist,^{35/} the public interest will not be served by continuing to process Ellipsat's application.

III. CONCLUSION

For the foregoing reasons, the Commission should dismiss and/or deny Ellipsat's RDSS application.

Respectfully submitted,

MOTOROLA SATELLITE
COMMUNICATIONS, INC.



Philip L. Malet
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-6239

Its Attorneys

Veronica Haggart
Rob Frieden
Motorola, Inc.
1350 I Street, N.W.
Suite 400
Washington, D.C. 20005
(202) 371-6900

Dated: August 5, 1991

^{35/} Ellipsat's suggestion, see Opposition at 21 n.45, that Motorola's application might fail to demonstrate Motorola's financial qualifications is incorrect. Motorola clearly has sufficient current assets to construct, launch and operate IRIDIUM™. See Licensing Space Stations in the Domestic Fixed-Satellite Service, 101 F.C.C.2d 223, 233 (1985).

ATTACHMENT I

COMPARISON OF SELECTED APPENDIX B REQUIREMENTS WITH
INFORMATION PROVIDED IN ELLIPSAT APPLICATION

Mass and Power Budgets

Appendix B Requirements (Section II.D.5.a.)

Weight and dimensions of spacecraft, including drawings (when available), detailed mass (on ground and in orbit) and power (beginning and end of life) budgets.

Ellipsat's Application (Appendix A)

While basic information is provided in Appendix A on the weight, dimensions, solar power and transmitter power of its space stations, no data is included detailing any mass or power budgets.

Solar Noise Outages and Eclipse Conditions

Appendix B Requirements (Section II.F.9)

Systems reliability, redundancy and link availability:

* * * *

- (c) solar noise outages
- (d) eclipse conditions

Ellipsat's Application (Exhibit I, p. 2)

"NiCad batteries for eclipse operation and to achieve transmitter power over the service area."

Comment

No information is included in the application concerning operations during solar noise outages. Also no information is included on thermal control of the satellites and its subsystems during eclipse operations. For example, the battery and altitude control subsystems will be particularly vulnerable to cold temperatures.

Non-Common Carrier Marketing Information

Appendix B Requirements (Section II.L)

A clear and detailed statement of whether the space station is to be operated on a common carrier basis, or whether noncommon carrier transactions are proposed Where

noncommon carrier transactions are proposed, the information specified in Domestic Fixed-Satellite Transponder Sales, 90 F.C.C.2d 1238 (1982), must be supplied.

Ellipsat's Application (p. 36)

". . . Ellipsat proposes to structure its service offerings on a private carrier or shared private network basis to meet the needs of individual customers, specifically the Value Added Partners of the ELLIPSO service described above."

Comment

Absolutely no information is set forth in the Application which addresses the information specified in the Transponder Sales decision.

Space Station Coverage Contours

Appendix B Requirements (Section III.E)

Predicted space station coverage contour(s) for each antenna beam and nominal orbital location requested, displaying the following space station technical parameters:

1. Receiving antenna gain
2. Transmitting antenna gain
3. Receiving system sensitivity (G/T ratio)
4. Saturation power flux density
5. Effective isotropically radiated power
6. Identification of transponders with antenna beam(s), including a functional block diagram of the satellite communication system and switching capabilities.

It is desirable that these contour(s) be plotted on an area map at 2 dB intervals down to 10 dB below the peak value of the parameter and at 4 dB intervals between 10 dB and 20 dB below the peak values. . . .

Ellipsat's Application (p. 7)

Figure 3 of Ellipsat's Application is represented to be a "typical footprint" over the United States.

Comment

Ellipsat provides none of the detailed information listed above.

Saturation Power Flux Densities

Appendix B Requirement (id.)

Ellipsat's Application

Ellipsat does not reference any information in its Application but now claims that its proposed system will not operate at saturation and that, therefore, data is not required.

Functional Block Diagram of Satellite Communications Subsystem

Appendix B Requirement (id.)

Ellipsat's Application

Ellipsat does not reference this required diagram in its Application or its Opposition.

Electrical Energy System Description

Appendix B Requirement (Section III.F.)

5. Electrical energy system description, including provision, if any, for operation during eclipse conditions.

Ellipsat's Application (Exhibit I at p. 2)

Electrical Energy System Description

- Primary and Secondary Power Systems
- 4 solar array panels/side, per 35% eclipse capability
- Combined Output 22 Watts at End of Life (&% duty cycle)
- NiCad batteries for eclipse operation and to achieve transmitter power over the service area
- Power Control through computer-controlled Battery Control Regulation Module

Comment

Electrical power budget was not provided from which one could determine whether end-of-life power would be sufficient to operate the spacecraft and provide stated 100 channels of communications capability.

Telemetry, Tracking and ControlAppendix B Requirements

Arrangements for tracking, telemetry, and control, including proposed operating frequencies, polarization, bandwidth, power into the antenna(s), antenna beams(s), and earth stations. (Section II.F.11)

Radio frequency and polarization plan (including beacon, telemetry and telecommand functions), center frequency and polarization of transponder or TT&C function (both receiving and transmitting frequencies), . . . identification of which antenna beams are connected or switchable to each transponder and TT&C function (Section III, c)

Ellipsat's Application (pp. 30-31)

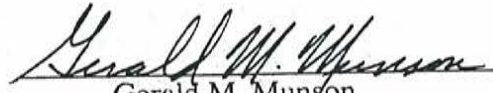
"The TT&C system consists of redundant telemetry, tracking and control capabilities both on the spacecraft and on the ground. Two command receivers and decoder/encoders are contained on each satellite. Although Ellipsat prefers to locate TT&C in the L-band and S-band frequencies used for uplink and downlink operations, TT&C will be accommodated in whatever frequency bands are designated by the FCC for that purpose"

Comment

No frequency plan is provided, nor has Ellipsat submitted required information on bandwidth, power into the antenna, beacon characteristics, or link performance.

Declaration

I hereby declare under penalty of perjury that I have read the foregoing Response to Opposition and Reply Comments relating to the application of Ellipsat Corporation; that I have also read the previously filed Petition to Dismiss and/or Deny relating to the same application; that I have prepared or reviewed the engineering and technical information contained in this Response as well as the previously filed Petition to Dismiss and/or Deny; that I am familiar with the aforementioned application; that I am knowledgeable with respect to Part 25 of the Commission's Rules; and, that the information contained in the Response and Petition is true and correct to the best of my knowledge, information and belief.


Gerald M. Munson

Title: Spectrum Utilization Manager
Motorola Satellite Communications

Date: August 5, 1991

CERTIFICATE OF SERVICE

I, Philip L. Malet, hereby certify that the foregoing Response to Opposition and Reply Comments was served by first-class mail, postage prepaid, this 5th day of August, 1991 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. 10554

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.
Room 7002
Washington, D.C. 20554

William Torak
Deputy Chief
Spectrum Engineering Division
Federal Communications Commission
Room 7130
2025 M Street, N.W.
Washington, D.C. 20554

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

Wendell R. Harris
Assistant Bureau Chief
Common Carrier Bureau
Federal Communications Commission
Room 6010
2025 M Street, N.W.
Washington, D.C. 20554

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

James R. Keegan
Chief, Domestic Facilities Division
Common Carrier Bureau
Federal Communications Commission
2025 M Street, NW, Room 6010
Washington, DC 20554

Thomas Tycz
Deputy Chief
Domestic Facilities Division
Common Carrier Bureau
Federal Communications Commission
Room 6010
2025 M Street, N.W.
Washington, D.C. 20554

*Fern J. Jarmulnek
Satellite Radio Branch
Federal Communications Commission
2025 M Street, NW, Room 6324
Washington, DC 20554

Lon C. Levin
Glenn S. Richards
Gurman, Kurtis, Black & Freedman
1400 16th Street, N.W.
Suite 500
Washington, D.C. 20036
(Counsel for AMSC)

Gary M. Epstein
James F. Rogers
Kevin C. Boyle
Latham & Watkins
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, D.C. 20004
(Counsel for Hughes Aircraft)

E. William Henry
Henry M. Rivera
Ginsburg, Feldman and Bress
Chartered
1250 Connecticut Ave., N.W.
Washington, D.C. 20036
(Counsel for RDSS Inc.)

Bruce L. Bucklin
Acting Chief
Technical Operations Section
Drug Enforcement Administration
U.S. Department of Justice
Washington, D.C. 20537

Bruce D. Jacobs
Fisher, Wayland, Cooper & Leader
1255 23rd Street, N.W.
Suite 800
Washington, D.C. 20037
(Counsel for AMSC)

Michael Yourshaw, Esq.
Wiley, Rein and Fielding
1776 K Street, NW
Washington, DC 20006
(Counsel for Geostar)

Robert A. Mazor
Albert Shuldiner
Nixon, Hargrave, Devans & Doyle
One Thomas Circle, NW, Suite 800
Washington, DC 20005
(Counsel for Constellation)

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

Norman R. Leventhal
Raul R. Rodriguez
Stephen D. Baruch
Leventhal, Senter & Lerman
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006-1809
(Counsel for TRW, Inc.)

Terri B. Natoli
Regulatory and Industry
Relations Manager
GTE Spacenet
1700 Old Meadow Road
McLean, VA 22102

Tedson J. Myers
Reid & Priest
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(Counsel for AfriSpace, Inc.)

Jill Abeshouse Stern
Miller & Holbrooke
1225 19th Street, N.W.
Washington, D.C. 20036
(Counsel for Ellipsat)

Leslie Taylor
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, MD 20817-4302
(Counsel for Norris Satellite)

Cheryl Lynn Schneider, Esquire
Communications Satellite Corp.
950 L'Enfant Plaza, S.W.
Washington, D.C. 20024

John L. Bartlett
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006
(Counsel for ARINC)


Philip L. Malet

*By Hand