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Satellite Policy Branch  
International Bureau

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

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In the Matter of	)	
	)	
FINAL ANALYSIS COMMUNICATIONS	)	File Nos. 25-SAT-P/LA-95
SERVICES, INC.	)	76-SAT-AMEND-95
	)	79-SAT-AMEND-96
Order and Authorization to Construct, Launch and	)	151-SAT-AMEND-96
Operate a Non-Voice, Non-Geostationary	)	7-SAT-AMEND-97
Mobile-Satellite System in the 148-150.05 MHZ,	)	
400.5-401 MHZ, and 137-138 MHZ Bands	)	
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COMMENTS OF ORBCOMM

Orbital Communications Corporation ("ORBCOMM") hereby comments on the Application for Clarification and Review filed by FINAL ANALYSIS COMMUNICATIONS SERVICES, INC. ("Final Analysis") concerning the International Bureau's partial grant of the application and amendments for Final Analysis' non-voice, non-geostationary satellite system.<sup>1/</sup> The *Bureau Order* granted Final Analysis' amended application in part, finding that certain of

<sup>1/</sup> *Final Analysis Communications Services, Inc.*, DA 98-616, released April 1, 1998 (hereafter cited as "*Bureau Order*"). ORBCOMM had also filed an application for review of the *Bureau Order* challenging the failure to provide adequate protection to ORBCOMM as specified in Section 25.142(a)(1) of the Commission's Rules.

the changes submitted by Final Analysis in its “conforming amendment” were “major amendments” that should not be granted in the Little LEO second processing round.<sup>2/</sup> In its Application for Clarification and Review, Final Analysis contends that the *Bureau Order* erred in failing to approve the entire amended application. As explained below, ORBCOMM disagrees with several of the claims made by Final Analysis.

As an initial matter, ORBCOMM observes that Final Analysis’ Application for Clarification and Review fails to comply with or seek a waiver of Section 25.156(b)(2) of the Commission’s Rules.<sup>3/</sup> That provision requires that a recipient of a partial grant, in order to challenge the Commission action, must file a reconsideration request that, *inter alia*, “Rejects the grant as made and explains the reasons why the application should be granted as originally requested.” Although it argues for grant of the application as amended, Final Analysis’ Application for Clarification and Review does not reject the *Bureau Order*’s partial grant of its amended application.

The Courts have upheld similar FCC rules applicable to other radio services.<sup>4/</sup> These provisions requiring the recipient of a partial grant to reject that grant in order to challenge the Commission’s decision are intended to establish procedural finality.<sup>5/</sup> In addition, such provisions promote equity. As the Court in *Capital Telephone* observed, it was logical to require

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<sup>2/</sup> *Bureau Order* at ¶¶ 46-67.

<sup>3/</sup> 47 C.F.R. § 25.156(b)(2). *See also* 47 C.F.R. § 1.110 (general provision specifying that a partial grant is considered a grant unless the licensee, within 30 days, files a written request rejecting the grant as made).

<sup>4/</sup> *E.g.*, *Central Television v. FCC*, 834 F.2d 186 (D.C. Cir. 1987); *Capital Telephone Company, Inc. v. FCC*, 498 F.2d 734 (D.C. Cir. 1974).

<sup>5/</sup> *Central Television*, 834 F.2d 186 at n. 10.

the licensee to accept the privileges along with the obligations, or to follow the procedures to seek reconsideration of the burdens accompanying the license.<sup>6/</sup> Thus, in light of Final Analysis' apparent non-compliance with Sections 1.110 and 25.156(b)(2) of the Commission's Rules, the Commission can summarily dismiss Final Analysis' Application for Clarification and Review.<sup>7/</sup>

In addition to this fatal procedural defect in its Application for Clarification and Review, Final Analysis made a number of misstatements in its challenge to the International Bureau's finding that several of the changes to its system were "major amendments" warranting denial in the second processing round. As a general matter, ORBCOMM believes that the International Bureau applied the correct standard -- an amendment that causes an increase in interference potential is a "major amendment"<sup>8/</sup> -- and that the International Bureau correctly applied that standard in determining that several of the proposed changes would increase interference. Following is a brief discussion of the particular technical issues in the Final Analysis pleading with which ORBCOMM disagrees:

1. In its summary of the arguments made in its conforming amendment and Application for Clarification and Review, Final Analysis (at p. 8) discusses the need to increase power on its uplinks to adjust to the "noisiness" of the assigned spectrum, and to increase power on the downlinks to adjust for different operational characteristics. As a general matter, ORBCOMM observes that to the extent this increase in power occurs in an uplink frequency band shared with ORBCOMM, it would, other factors being equal, increase the interference that ORBCOMM receives. With regard to increases in the downlink channels, an

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<sup>6/</sup> *Capital Telephone Company*, 498 F.2d at 740.

<sup>7/</sup> Alternatively, the Commission could treat the Application for Clarification and Review as a rejection of the partial grant. Presumably, however, Final Analysis has made clear its intentions with regard to acceptance of the partial grant pursuant to the condition in its license. See *Bureau Order* at ¶ 80; *Final Analysis Communications Services, Inc.*, DA 98-881, released May 8, 1998.

<sup>8/</sup> *Bureau Order* at ¶¶ 50-51.

increase in Final Analysis' power increases the power coupled into the adjacent bands used by ORBCOMM for service links. Although ultimately steps may be taken unilaterally or through coordination to mitigate the effects of these increases in power, Final Analysis' conforming amendment did not include protective measures. Thus, as filed, the conforming amendment increases in power represent major amendments.<sup>2/</sup>

2. Final Analysis (at p. 14) asserts that "the relevant measure of whether a proposed power increase causes increased potential interference is the resulting pfd level on the ground." While this may be true for in-band interference, it is not true for out-of-band interference. For two signals of equal pfd, one broad and one narrow, the broader signal with higher total power would produce more interference in adjacent bands than the narrower signal.
3. Final Analysis (at n. 26) claims that its use of the GMSK modulation will solve any out-of-band emissions problems. ORBCOMM observes that while GMSK modulation tends to reduce the possibility of adjacent band interference, it will still be necessary to evaluate the specific adjacent band sharing situation as part of the coordination process when specific channel frequencies, powers and bandwidths have been set for the Final Analysis satellites.
4. Final Analysis seeks reversal of the International Bureau's conclusion that the increase in the number of satellites in its constellation (from 26 to 32) and increase in the number of uplink channels on each satellite (from 12 or 14 to 40) were major amendments. In doing so, Final Analysis relies on two precedents involving ORBCOMM. With respect to the first instance, when ORBCOMM increased the number of satellites from 20 to 36, it also reduced the number (and power) of downlink transmitters, resulting in less interference to Starsys' CDMA operations. The Commission did not have to evaluate the impact of an increased number of satellites on sharing the subscriber uplink channels among DCAAS-like systems, because at that time ORBCOMM was the only such system. The Commission here correctly held that the increase in the number of satellites and

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<sup>2/</sup> In addition, ORBCOMM notes that while ORBCOMM and Final Analysis have held some preliminary discussions, no coordination has been reached with respect to either the downlinks or the uplinks. Based on the initial coordination discussions between ORBCOMM and Final Analysis, ORBCOMM believes that adequate protections could be implemented with respect to the downlinks. With regard to the uplinks, however, ORBCOMM is less optimistic. The increased Mobile Earth Station (MES) power (from 10 W to 20W (compared to the 5 W ORBCOMM subscriber communicators)) will increase the risk of interference if the Final Analysis subscribers transmit on the same or an adjacent channel being used by an ORBCOMM subscriber. Coordination of the uplinks so that Final Analysis' subscribers will avoid such overlapping transmissions has not even started, and the method of reaching a solution has not been defined, and thus it remains unclear how Final Analysis intends to protect ORBCOMM's operations.

significant increase in the number of uplink channels would increase the potential for interference in the 148-149.9 MHz band.<sup>10/</sup> With respect to the other ORBCOMM precedent cited by Final Analysis -- the slight increase in altitude -- ORBCOMM first distinguishes that precedent because that modification was submitted outside of the second processing round, and thus its characterization as “minor” or “major” was not relevant to Section 25.116© and cut-off deadlines. In addition, Final Analysis relies on an apparent misperception by the Commission, because it is not necessary for a system to be “balanced” in terms of service uplinks and downlinks. The number or capacity of service downlinks do not necessarily constrain the number of service uplinks. Rather, the number and capacity of service uplinks limits capacity, and ORBCOMM’s slight increase in elevation did not change either of those parameters.

5. Final Analysis (at p. 18) contends that its use of STARS (a DCAAS-like operation) will eliminate any interference, rendering moot the number of subscriber uplink channels on each satellite. ORBCOMM disagrees. The more subscriber uplinks there are on each Final Analysis satellite, and the higher their power (increased to 20 W, compared to 5 W for ORBCOMM), the greater the likelihood that Final Analysis will cause interference to ORBCOMM. As ORBCOMM has explained, in light of the very brief ORBCOMM subscriber transmissions (less than 450 ms), it does not believe that Final Analysis’ STARS system will be able to detect and avoid the ORBCOMM transmissions. Thus, the use of STARS does not alter the fact that the proposed increase in the number of subscriber uplinks on each satellite will increase the probability of interference, rendering the change a “major amendment.”
6. Final Analysis also states (at p. 19) that they have determined that a change in uplink power from 10W to 20W is essential, based on data presented in Appendix II. As discussed below for Appendix II, the comparison between the VHF and UHF environment is essentially based on a single data point, and therefore is not reliable. In addition, Final Analysis’ solution -- coupling the power to “burn through” the noise -- will cause greater interference to both terrestrial and satellite operators in the band. With respect to the satellite systems, increasing the Final Analysis subscriber transmit power will increase the out-of-

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<sup>10/</sup> To the extent that Final Analysis now suggests it will limit the number of activated uplink receivers (Leo One Application for Clarification and Review at p. 17), it had not clearly indicated earlier that it would adopt any such limit. Thus, the amended application sought authority for a significant increase in the number of uplink channels on each satellite, and hence was a major amendment.

In addition, an increase in the number of satellites, or changes to Final Analysis’ constellation, would raise orbital debris and disposal issues that would need to be addressed adequately by Final Analysis.

band emissions produced by the subscriber. This will adversely affect the usability of adjacent channels by other Little Leo systems.

7. In Appendix II, "Measurement of Noise Levels From FAISAT-2v Spacecraft," Final Analysis reaches the conclusion that there is a significant increase in noise between VHF and UHF channels of about 10 to 12 dB. The analysis is based on a variable Fa, which does not appear to be defined. It is therefore rather difficult to follow the analysis. As best as ORBCOMM can tell, however, the conclusion appears to be based on Table 1, which provides a summary of the statistics of Fa comparing results for the UHF band to the VHF band. The table makes clear, however, that only one set of measurements comparing UHF and VHF noise levels were made at the same time and the same place. The type of data being collected will vary both geographically and temporally, so that there is only a single data point in the table that is valid for comparison purposes. The conclusion of a 10 to 12 dB difference is based on this one measurement, taken over the Barent's Sea in the Arctic Ocean at 5:30 a.m. local time. This is far from a typical situation and cannot be the basis for a broad conclusion.<sup>11/</sup>

In sum, ORBCOMM believes that the procedural infirmity in Final Analysis'

Application for Clarification and Review warrants summary dismissal of its request.

Alternatively, even if the Commission addresses the merits of that pleading, it should uphold the International Bureau's determination that many of the proposed changes would increase the

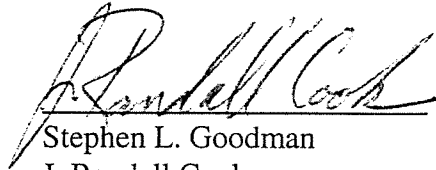
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<sup>11/</sup> Given the data in the chart, the troubling issues raised by these data are whether Final Analysis' STARS system will protect terrestrial receivers from interference as well as ORBCOMM. The data suggests that Final Analysis is unable to identify usable (temporarily unoccupied) channels across the band. If the satellite cannot detect the terrestrial transmitters and the absence thereof, they will not be able to avoid transmitting on the terrestrial channels being used (or the channels designated for use by ORBCOMM). In contrast, ORBCOMM's DCAAS system, the design of which is based on extensive frequency scanning data collected by multiple experimental and operational satellites over the last five years, permits ORBCOMM subscriber communicators reliably to close the link to the satellites using five watt transmitters. The inability of Final Analysis to identify open channels and the conclusion that 20 watt transmitters are required due to the "noisiness" of the VHF uplink band testifies to significant design flaws in the Final Analysis system. Until and unless Final Analysis (and Leo One) verify their system designs through on-orbit collection of comprehensive scanning data and demonstration of communications reliability, there is no way that either company can design a communications and interference avoidance system that protects both terrestrial users and ORBCOMM.

potential for interference and are properly classified as "major amendments," and thus not ripe for grant in the second processing round.

Respectfully submitted,

By:



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Dated: May 18, 1998

ENGINEERING CERTIFICATE

The undersigned hereby certifies that I am the technically qualified person responsible for reviewing the engineering information contained in the foregoing Comments of Orbital Communications Corporation on the Application for Clarification and Review filed by Final Analysis Communications Services, Inc. Further, I certify, under penalty of perjury, that the technical information is complete and accurate to the best of my knowledge.

Dated this 18th day of May, 1998.

By:   
Alan G. Rinker  
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CERTIFICATE OF SERVICE

I, Mary-Helen Dove hereby certify that on the 18th day of May, 1998, a true copy of the foregoing Comments of ORBCOMM was mailed, postage prepaid, to the following:

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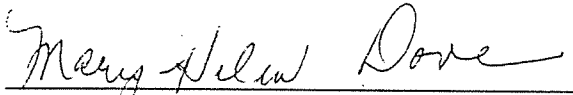
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