

BEFORE THE

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Federal Communications Commission APR 25 1995
WASHINGTON, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
The Non-Voice, Non-Geostationary)
Mobile Satellite Service)
Applications of)
)
CTA Commercial Systems, Inc.)
)
E-Sat, Inc.)
)
Final Analysis Communication)
Services, Inc.)
)
GE American Communications, Inc.)
)
Leo One USA Corporation)
)
Orbital Communications Corporation)
)
Volunteers In Technical Assistance)

Received

APR 27 1995

File No. 23-SAT-P/LA-95 Satellite and
Radiocommunications Division
International Bureau
File No. 24-SAT-P/LA-95
File No. 25-SAT-P/LA-95
File No. 26-SAT-P/LA-95
File No. 27-SAT-AMEND-95
File No. 28-SAT-MP/ML-95
File No. 29-SAT-AMEND-95

To: Chief, International Bureau

RESPONSE OF STARSYS GLOBAL POSITIONING, INC.

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Summary

STARSYS has petitioned to deny each of the second round NVNG MSS applications based on their individual frequency conflicts with STARSYS's proposed first-round system and their aggregate impact on the frequency sharing environment that will be established by the first round systems. Because the Commission's Rules require new system applicants to protect all prior NVNG MSS systems from harmful interference, second round applicants will be unable to demonstrate that they will comply with Section 25.142(a)(1) of the Commission's rules until all first round applications have been processed. Once the first round is complete, each new applicant will bear the burden of demonstrating that its operation will not cause harmful interference to those systems previously licensed.

Some second-round applicants have asserted that STARSYS is not entitled to the protection of Section 25.142(a)(1) because its first-round application remains pending. In so doing, they are attempting to take unreasonable advantage of the fact that the Commission accorded them a break by taking the unusual step of accepting their applications before all first-round applications were processed. Each second-round applicant -- including Orbcomm and VITA -- must nonetheless satisfy Section 25.142(a)(1) with respect to STARSYS once STARSYS is licensed.

It should be noted that one principal cause of the current spectrum constraint in the 137-138 MHz band that will make the second round applicant's showings more difficult is the substantial change in the character of Orbcomm's use of this band *since the first-round applicants entered into their Joint Sharing Agreement*. The expanded Orbcomm system has already absorbed much of the initially anticipated sharing margin in the 137-138

MHz band, without even taking into account Orbcomm's most recent modification request of November 16, 1994.

Thus far, only two applicants (GE and E-Sat) have taken up the challenge of demonstrating compatibility with STARSYS. On the other hand, Final Analysis has simply attempted to invoke "cross polarization," as if this technique by itself would necessarily avoid harmful interference. In fact, Final Analysis must demonstrate that cross polarization is an effective means of avoiding interference taking into account its specific system characteristics. Similarly, CTA's broad assertion that its recently filed "Erratum and/or Amendment" moots all of the issues STARSYS raised concerning CTA's interference potential is fundamentally inaccurate; significant interference concerns remain.

Finally, VITA's continued assertion that its recently filed second-round application should be considered a "minor amendment" to its first-round application is an obvious attempt to abuse the Commission's processes. Now, VITA has gone one step further by filing another major amendment to this application that makes additional wholesale changes to its proposal, including a nearly 45% increase in the satellite output power and substantial alterations in the proposed channelization schemes both in the lower portion of the 148.0-149.9 MHz band and in the 137-138 MHz band. These major changes to the VITA system violate both the Joint Sharing Agreement among the first round applicants and the Commission's rules. VITA should be considered to have effectively removed itself from consideration in either the first or the second processing round for the NVNG MSS service, and its application should be dismissed accordingly.

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To: Chief, International Bureau

RESPONSE OF STARSYS GLOBAL POSITIONING, INC.

STARSYS Global Positioning, Inc. ("STARSYS"), by counsel, hereby responds to various oppositions and comments concerning STARSYS's Consolidated Petition to Deny the above-captioned applications for authority to construct non-voice, non-geostationary mobile-satellite service ("NVNG MSS") systems. The thrust of STARSYS's Petition is that, because the Commission's Rules require new system applicants to protect all existing NVNG MSS systems from harmful interference, second round applicants will be unable to demonstrate that they will comply with this

rule until processing of all first round applications is complete. Because all of the second round applications are unavoidably deficient in this regard, STARSYS was compelled to petition to deny each application, based upon both their individual frequency conflicts with STARSYS's proposed first-round NVNG MSS system and their aggregate impact on the frequency sharing environment that will be established by the first round systems.

I. Each Second Round Applicant Must Demonstrate That It Will Not Interfere With Any Of The Systems Licensed In The Initial NVNG MSS Processing Round.

The responses of the various second round applicants to STARSYS's Petition reflect some confusion concerning the applicants' status as second round applicants, and the responsibilities that status entails. Three applicants mistakenly maintain that they need not demonstrate that their proposed systems will avoid interference to STARSYS because STARSYS remains an applicant for an NVNG MSS license, and therefore is not a "previously authorized system" under Section 25.142(a) of the Commission's rules.^{1/} The fact is, however, that the disposition of STARSYS's application is a necessary condition precedent to the consideration of any of the second round applications. Moreover, the technical specifications for the authority that STARSYS has requested had been on file with the Commission for more than six months at the time most of the second round applications were filed. Given

^{1/} See Final Analysis' Consolidated Opposition at 5 n.5; LEO One Consolidated Opposition at 7; E-Sat Consolidated Reply at 14.

these known facts, the new applicants would have been well-advised to premise their applications on a showing of compatibility with the STARSYS system.

To the extent that several second-round applicants point to the pendency of STARSYS's first-round application as support for their view that Section 25.142(a)(1) does not apply,^{2/} they are taking improper advantage of the fact that the Commission has already given them a break by taking the unusual step of accepting their applications before all three first round applications were fully resolved.^{3/} While such an acceleration makes reasonable sense as part of the Commission's effort to secure additional spectrum for world-wide NVNG MSS use at WRC-95, it cannot give these applicants an unearned and unprecedented procedural edge in the domestic process. Each second-round applicant -- including Orbcomm and VITA -- must satisfy Section 25.142(a)(1) with respect to STARSYS once STARSYS is licensed.

In making the showing required by Section 25.142(a)(1), the burden is squarely upon each new applicant to demonstrate that its particular system design will not cause harmful interference to those systems previously licensed. Specific techniques used by first round applicants may prove successful in avoiding interference, but they may not simply be invoked as if they were talismans of non-interference. Rather, each applicant will need to show that use of a specific means of

^{2/} See Footnote 1; 47 C.F.R. § 25.142(a)(1) (1994).

^{3/} Indeed, CTA acknowledges this unusual procedure. See CTA Consolidated Opposition at 4.

sharing is compatible with its particular system design, and will be sufficient to protect first-round licensees.

Thus, for example, the flaw in Final Analysis' proposal to use cross-polarization in its system is not that "STARSYS did not specifically consent to allow it" (see Final Analysis Consolidated Opposition at 6), but that *Final Analysis did not specifically show how it would work* based upon its system's particular characteristics, including its satellite output power, the proximity of its downlink channels to the STARSYS center frequency at 137.5 MHz, and the number of channels it will use simultaneously.^{4/} Indeed, Final Analysis appears to concede that its proposed NVNG MSS system, as currently designed, would cause unacceptable interference to STARSYS -- and therefore violate Section 25.142(a)(1). Specifically, Final Analysis claims that its recently-filed amendment has the effect of "greatly decreasing the potential for harmful interference" in the 137-138 MHz band (see Final Analysis Consolidated Opposition at 7), thereby admitting both that the original design would have had "great" potential for interference, and that the amendment has merely "decreased," but not eliminated, the harmful interference Final Analysis proposed system would cause.^{5/}

^{4/} When Orbcomm first increased its channel usage in the 137-138 MHz band, it took two complementary steps in order to mitigate interference to STARSYS. First, it agreed not to operate on a co-polarized basis in the main beam of STARSYS ground station antenna. Second, it moved its channels to the edges of the band in order to minimize interference to the STARSYS spread spectrum signal.

^{5/} In this regard, STARSYS notes that it filed comments on Final Analysis's February 24, 1995 Amendment on April 5, 1995. In those Comments, STARSYS called for
(continued...)

One principal cause of the current spectrum constraint in the 137-138 MHz band (and a cause that requires modification of the initial conclusion that the first-round applicants' sharing plan leaves room for future entry by multiple systems) is the substantial alteration in the character of Orbcomm's use of this band as a result of its December 1993 amendment -- *i.e.*, the amendment Orbcomm filed *after the first-round applicants had entered into their Joint Sharing Agreement and the Negotiated Rulemaking had been completed*. Although STARSYS and Orbcomm were able, with the Commission's participation, to reach an accommodation about the impact of Orbcomm's December 1993 changes on the STARSYS system, the fact remains that the expanded Orbcomm system did absorb much of the "margin" in the 137-138 MHz band that, under the Joint Sharing Agreement, would have permitted other systems meaningful access to this spectrum. In effect, viewed from the perspective of the originally negotiated sharing agreement, Orbcomm's spectrum usage, even without regard to its second-round application, currently makes it the equivalent of two NVNG MSS systems in this band.^{6/} To the extent that there now

^{5/}(...continued)

the rejection of Final Analysis's application, as amended, because, *inter alia*, Final Analysis's revised downlink channel plan for the 137-138 MHz band would cause increased interference to STARSYS by virtue of the fact that its channels are now creeping closer to the sensitive center frequency of 137.5 MHz. STARSYS Comments on Final Analysis Amendment at 2.

^{6/} For this reason, Orbcomm's facially inaccurate assertion that STARSYS will not be able to share with "even one additional spread spectrum NVNG satellite system" is particularly gratuitous. Orbcomm Consolidated Response at 11 n.24. Orbcomm dredges up STARSYS's 1991 assessment that up to seven spread spectrum systems could have co-existed in the NVNG spectrum. In so doing, Orbcomm ignores the

(continued...)

is dramatically less NVNG MSS spectrum available for usage by future systems -- as compared with the amount that should have been available under the Joint Sharing Agreement -- the discrepancy can be traced solely to the increased usage generated by Orbcomm's December 1993 amendment.^{7/}

In any event, Orbcomm's proposed modification of license must be rejected as inconsistent with both the Joint Sharing Agreement and the provisions of Rule 25.142(a) because it fails to protect STARSYS from harmful interference. Orbcomm's conclusory and unsubstantiated contention that it has "explained why it concluded there would be minimal impact on STARSYS" resulting from the modification is a wholly insufficient response. See Orbcomm Consolidated Response at 11-12. What is required under the Commission's rules is a full demonstration that earlier-filed systems will not suffer harmful interference. Thus far, Orbcomm has failed to provide such a showing, and the burden remains upon it to do so.

Similarly inadequate is CTA's Opposition, which is devoid of any meaningful response to the technical deficiencies identified by STARSYS. Instead of

^{6/}(...continued)

following facts: in 1991, STARSYS was proceeding upon the assumption that there would be only spread spectrum CDMA systems in the 148-149.9 MHz and 137-138 MHz bands (i.e., band segmentation between FDMA and CDMA systems was not yet an option); and the STARSYS assessment was a best-case scenario that did not consider the constraints that have had to be accepted to accommodate existing government users of the bands. In other words, Orbcomm's attack on CDMA techniques and systems is not only gratuitously pejorative, it is far too stale to be of any probative value. The assumptions then relied upon were long ago overtaken by events.

^{7/} In its own second-round application, Orbcomm attempts to usurp nearly all of the remaining capacity at 137-138 MHz.

attempting to respond, CTA has characterized all challenges to its technical proposal as centering on "certain minor typographical and clerical errors" and claimed that its "Erratum and/or Amendment," filed one month ago, "effectively moots the comments of the other parties." CTA Consolidated Opposition at 16. This characterization is absolutely false.

CTA's frequency plan is fundamentally flawed because it would cause substantial interference to STARSYS's, as detailed in STARSYS's initial Petition.

Specifically, the following discrepancies remain in CTA's application:

- Table I.A-3, as revised, continues to indicate nine channels in the 137-138 MHz band. More significantly, the table still indicates that CTA intends to operate downlink channels using both left- and right-hand circular polarization, despite the fact that such co-polarized operation would cause harmful interference to STARSYS.
- Table I.B-3, as revised, reflects a reduction in power, but the maximum power flux density has been incorrectly computed. The correct maximum pfd value at nadir exceeds the limit of $-125 \text{ dB (W/m}^2/4 \text{ kHz)}$ applicable to these bands.
- Table II.A-2, as revised, appropriately deletes the CTA channel in the 137-138 MHz band that was directly over the STARSYS center frequency, but retains the channel at 137.0125 MHz that is in direct conflict with the STARSYS telemetry channel.
- CTA continues to propose FDMA operation in the 148-148.905 MHz spread spectrum band, which would cause harmful interference to STARSYS.
- CTA continues to propose operation in the 150-150.05 MHz band, directly on top of STARSYS's critical feeder uplink channel.

There is no question that these multiple, fundamental conflicts with STARSYS remain unresolved and are more than mere "typographical" or "clerical" errors.

On the other hand, two of the second round applicants, E-Sat and GE Americom have largely resolved the problems raised by STARSYS concerning their applications; although some concerns remain.^{8/} For example, E-Sat appears to acknowledge that it will need to modify its application to effect compliance with Footnote US323. In addition, E-Sat has agreed to decrease its transmission power level in the downlink band in order to achieve compatibility with STARSYS and permit the two systems to share the 137-138 MHz band. See E-Sat Consolidated Reply at 13. It is noted, nonetheless, that E-Sat will still need to employ a filter at the satellite in order to avoid retransmitting non-system signals to the ground at a level higher than the intra-system transmissions.

Each of the applicants that has failed even to attempt a proper demonstration that it will protect STARSYS appears simply to be relying on the fact that there is no certainty that the remaining applicants in the first round will receive licenses. This merely illustrates the fact that no further action can be taken with respect to any of the second round applications until the initial processing round is completed and the baseline sharing environment established by the Joint Sharing Agreement is confirmed. Once this occurs, each new applicant will bear the burden of demonstrating that its operation will not cause harmful interference to the existing

^{8/} The chief concern with respect to GE Americom is its alternative proposal to use unspecified downlink frequencies in the 400.15-401.0 MHz band (instead of at 137-138 MHz). See GE Americom Opposition at 8. Because STARSYS will use 50 kHz of this spectrum (400.595-400.645 MHz) for satellite-to-terminal downlinks, its concern would be that GE Americom's use of this spectrum avoid any interference to that channel.

licensees. Because the Commission's rules preclude grant of any additional applications until these showings have been made, the calls of some applicants for "prompt" or near-term grant of their applications are misplaced, and cannot be considered.^{9/}

II. VITA's Application Should Be Dismissed.

VITA's Opposition to the petitions lodged against its application was filed simultaneously with an additional amendment to the underlying application which makes wholesale changes to its proposal, including a nearly 45% increase in the satellite output power and major alterations in the proposed channelization scheme in the lower portion of the 148.0-149.9 MHz band and in the 137-138 MHz band. These substantial changes to its system violate both the Joint Sharing Agreement among the first round applicants, and the Commission's rules.^{10/} With this additional major amendment to its application, VITA should be considered to have effectively removed itself from consideration in either the first or the second

^{9/} See Leo One Consolidated Opposition at 1 & 7; GE Americom Opposition at 1 & 13. Compare E-Sat Consolidated Reply at 3 ("E-Sat respectfully suggests that the Commission defer further action on the second processing round until the conclusion of WRC-95").

^{10/} Because it remains as difficult as ever to hit a moving target, STARSYS will not attempt to catalog at this time the many revisions that VITA seeks to make. There is no question, however, that the modifications VITA seeks would result in harmful interference to STARSYS. The amendment contemplates major changes in frequency use in the 137-138 MHz band and in the 148.0-148.905 MHz portion of the uplink band. For example, the satellite output power in the 137-138 MHz band would cause a 2.2 dB degradation to the STARSYS link budget, effectively shutting STARSYS down for the duration of every VITA satellite pass.

processing round for this service.^{11/} Suffice it to say that VITA's attempt to have its second-round filing treated as a minor, first-round amendment is patently absurd.

From the initiation of the second processing round, VITA has taken fundamentally inconsistent positions concerning the treatment of its "amended application." First, VITA maintains that its amendment, filed November 16, 1994, should be treated as if it were part of the first processing round -- with priority over the second round applicants. See Consolidated Opposition at 7. At the same time, however, VITA contradictorily asserts that it is not bound by the Joint Sharing Agreement among the first round applicants, and should be treated as a later entrant in relation to Orbcomm and STARSYS. See Consolidated Opposition at 8. The Commission should not tolerate this sort of slippery effort to manipulate its processes.

Contrary to VITA's assertions, the current changes to its proposal are in no way "necessitated by changes in Orbcomm and STARSYS's band plans, and by operating conditions imposed by NTIA in December, 1994." VITA Consolidated Opposition at 5. Neither STARSYS nor Orbcomm made frequency use changes in April 1994 that impacted VITA, and VITA's current plan does not appear to avoid interference to fixed and mobile users in the 148-149.9 MHz band, as required by the

^{11/} STARSYS does not revisit in this pleading each and every issue concerning VITA's attempts to manipulate the Commission's application process, which have been appropriately raised by other applicants here. STARSYS has already briefed these matters in prior pleadings. See, e.g., STARSYS's Opposition to VITA Amendment, File Nos. 33-DSS-AMEND-94 and CSS-91-007(3) at 2-13 (filed June 20, 1994). STARSYS's silence here should not be construed as an abandonment of these other valid arguments for dismissal of VITA's first-round application.

NTIA agreement. See STARSYS Consolidated Petition at 23-24.^{12/} Instead, there can be little doubt that VITA's frequent system changes are necessitated by the desire to convert it substantially to commercial use.^{13/}

VITA's attempt to abrogate the Joint Sharing Agreement following the grant of the initial first round license thus cannot be treated as anything other than a major amendment. Accordingly, because VITA has determined that it does not wish to abide by the agreement that resolved mutual exclusivity in the first round, its changes to its system contrary to that agreement should result in its dismissal from the initial processing round.

Moreover, VITA's eligibility for consideration even in this second round is suspect on two counts. Not only is the current amendment a post cut-off major amendment to VITA's second round application, but VITA has still provided no reasonable explanation for failing to pay required application fees for either its initial major amendment incorporating CTA's commercial use of the VITA system, or its

^{12/} It is equally ludicrous for VITA to maintain that it is the beneficiary of "a more flexible standard" relating to LEO application amendments "in light of the changes that first round applicants have made to their systems in order to address potential frequency conflicts and refine their system proposals." VITA Consolidated Opposition at 4. Such conforming changes were due ninety days following the adoption of service rules for the NVNG MSS -- exactly one year ago -- but VITA has proceeded to substantially change its system *twice* since that deadline. Moreover, rather than reducing frequency conflicts, VITA's modifications actually increase them.

^{13/} For example, in its Consolidated Opposition, VITA observes casually that its transceiver units, previously described as "man portable," are now designed to be "stationary, portable, or mobile." VITA Consolidated Opposition, Exhibit B at 17.

most recently filed major amendment, which apparently proposes a satellite dedicated to commercial operation.^{14/}

III. Conclusion

STARSYS's comments, along with others, illustrate the need for the Commission to complete the initial NVNG processing round on an expedited basis. Only when this step is completed will the second round applicants be in a position to finalize their system proposals for Commission evaluation. It is nonetheless clear at

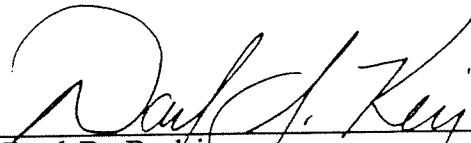
^{14/} VITA continues to rely on a waiver granted by the Managing Director's Office for VITA's initial application, and explicitly premised on the fact that the system's services "will be provided on a strictly non-profit basis." VITA Consolidated Opposition at 2 citing Letter from Andrew S. Fishel, Managing Director, Federal Communications Commission, to Henry R. Norman, President, VITA (dated December 22, 1993). VITA subsequently amended its application substantially to convert it to commercial use, yet it continues to rely on a waiver explicitly conditioned upon its system's former non-profit character. Its justification for this action is that the Managing Director's Office has not yet informed VITA that the initial waiver is no longer valid. Given the clear conditions placed on the waiver, however, the Managing Director's silence can hardly be construed as acquiescence to VITA's creative interpretation.

this point that VITA's proposal should be dismissed from both rounds for submission of multiple post-cut-off major amendments.

Respectfully submitted,

STARSYS GLOBAL POSITIONING, INC.

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TECHNICAL CERTIFICATE

I, Kenneth E. Newcomer, hereby certify, under penalty of perjury, that I am the technically qualified person responsible for the preparation of the technical information contained in the foregoing "Response of STARSYS Global Positioning, Inc.," and that this information is true and correct to the best of my knowledge and belief.

By: 
Kenneth E. Newcomer
Chief Engineer
STARSYS Global Positioning, Inc.

Dated: April 25, 1995

CERTIFICATE OF SERVICE

I, Kaigh K. Johnson, hereby certify that true and correct copies of the foregoing "Response of STARSYS Global Positioning Inc." were sent by first-class, postage prepaid mail, this 25th day of April, 1995, to the following:

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