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

In the Matter of)

)
Amendment of the Commission's Rules)
to Establish Rules and Policies)
Pertaining to a Non-Voice,)
Non-Geostationary Mobile Satellite Service)

CC Docket No. 92-76

REPLY COMMENTS

OF

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May 26, 1993

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SUMMARY

dbX Corporation supports the FCC's efforts to expeditiously implement the Non-Voice, Non-Geostationary Mobile Satellite Service. Nonetheless, dbX continues to harbor concerns about the competitive environment envisioned by the Commission's proposed rules. Although all the parties to this proceeding support competition in theory, no one has attempted to create concrete proposals to ensure a competitive NVNG MSS environment. In response, dbX is filing proposed rules designed to promote competition and a technical analysis demonstrating that frequency assignments can be crafted to permit additional entry without creating undue burdens on the proposed operations of the existing NVNG MSS applicants.

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REPLY COMMENTS

dbX Corporation ("dbX"), by counsel, hereby submits its Reply Comments in the above-captioned proceeding.¹ As explained in its April 26, 1993 comments, dbX is not an applicant for a Non-Voice, Non-Geostationary Mobile Satellite Service ("NVNG MSS") license nor has it participated in the Commission's Negotiated Rulemaking Proceeding ("NRM"). Nonetheless, dbX expects to be actively involved in the NVNG MSS "as a purchaser of channels, a reseller or in some other capacity to be determined in the future."²

dbX applauds the FCC for the creative and expeditious manner in which it has undertaken to establish the NVNG MSS. It believes that the regulatory approach the Commission has proposed will allow the public to reap the tremendous

¹ On April 26, 1993, seven parties, including dbX, submitted comments on the Commission's Notice of Proposed Rulemaking in this proceeding. Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile-Satellite Service, CC Docket 92-76, (FCC 93-28) Notice of Proposed Rulemaking (released February 10, 1993) ("Notice").

² In this regard, dbX is in negotiation with LEO ONE Corporation regarding a possible business relationship relating to the NVNG MSS.

benefits offered by the NVNG MSS. In this regard dbX supports most of the comments filed in this proceeding. Nevertheless, dbX continues to have some concerns about the competitive environment that is likely to ensue from the Commission's proposals that were supported in the comments. As a potential user of NVNG MSS services, dbX filed in its April 26, 1993 comments to emphasize the importance of structuring any rules for this service to promote competition. In this regard, dbX included the following concrete proposals to promote competition in the NVNG MSS:

- Assign licensees the minimum frequency necessary to ensure that sufficient channels are available to develop economically viable NVNG MSS systems.
- Require a NVNG MSS licensee to demonstrate that, on average, 70% of its available capacity has been filled during two consecutive utilization reporting periods before it can become eligible to obtain additional spectrum.
- Mandate that utilization reports be submitted on uniform reporting dates, specifying the number of kilobits per second ("Kbs") actually delivered on a daily basis and the total number of Kbs that potentially could be delivered on a daily basis for each day of the reporting period.
- Condition each NVNG MSS license on the requirement that the licensee negotiate in good faith with any new applicants seeking authorization for NVNG MSS licenses.

These proposals were designed to protect the interests of users of NVNG MSS services by facilitating the entrance of new service providers, thereby

dbX's review of the NRM, the Notice and the comments filed on April 26th, it concludes that while all the parties support competition in theory, no one has attempted to create concrete proposals that will ensure a competitive NVNG MSS service. Instead, the record in this proceeding indicates that the Commission is moving toward the implementation of rules which will foster the de facto creation of a national duopoly for commercial NVNG MSS services. Creation of such a closed market structure cannot be in the public interest³ and is contrary to the Commission's "open skies" policies for satellite services.⁴ In order to prevent this situation dbX has included with these reply comments proposed rules to promote competition and a technical analysis demonstrating that frequency assignments can be crafted to permit additional entry without creating undue burdens on the proposed operations of the existing NVNG MSS applicants.

I. The Comments and the Notice Support Multiple Entry and Competition

At every juncture in this proceeding, the Commission and the applicants have blessed the historic underpinnings of the U.S. "Open Skies" satellite policy -- competition and multiple entry. Unfortunately, no party has advanced practical proposals for attaining these policy goals. The Work Program of the Below 1 GHz LEO Negotiated Rule Making Committee urged that the NVNG MSS rules be developed "to promote multiple entry." The Committee's Report made salutary

³ See Concerns about Competition in the Cellular Telephone Service Industry, United States General Accounting Office, (July 1992) ("GAO Report") for a review of the competitive implications of a duopoly.

⁴ Domestic Communications Satellite Service, 22 FCC 2d 86 (1970) (Domsat I).

Statement of _____

entry ought to be encouraged, because the resulting competition will minimize the need for regulatory oversight, and ensure that customers can obtain service at the lowest price and highest quality. In addition, competition will spur innovation by the competitors, to the benefit of the customers."⁸ dbX wholeheartedly supports this statement. However, it knows that platitudes do not necessarily translate into concrete rules and policies.

II. The Current Regulatory Proposals Will Not Promote Competition

A review of the Committee Report, the Notice, the NRM and the comments reveals no method for promoting competition. The Commission cannot claim that licensees will be pressured to respond to users' needs due to fear of new entrants⁹ because the frequency assignment plan proposed in the NRM, and likely to be implemented by the Commission,¹⁰ permits the pending applicants to utilize almost all the available spectrum. Under this scheme, there will be virtually no frequency left

⁸ ORBCOMM Comments at 5.

⁹ The GAO Report concludes that "generally accepted economic principals imply that the fewer the number of producers in a market the less likely that they will set competitive prices. Since a duopoly has only two producers, it is likely that these producers can find a way to act noncompetitive than would be the case if there were, for example, five or six producers." GAO Report at 20.

¹⁰ NRM Document LEOAC-15 ("NRM Assignment Plan"). The Commission in the Notice concludes that room appears to exist for future entrants. It bases this conclusion on the NRM Report discussion on multiple entry (See Notice at n. 14). Although the NRM Report discusses two sharing proposals, only the ORBCOMM/STARSYS/VITA sharing plan described in LEOAC-15 is viable since the FCC has already concluded it will not dedicate all of the available spectrum to a CDMA modulation scheme.

to accommodate any additional FDMA systems, and it remains unclear how any additional CDMA systems could be accommodated.

Appendix A to these comments contains a detailed technical analysis of spectrum use under the NRM Assignment Plan. This technical analysis demonstrates that under the plan, there will be little spectrum available for future systems. STARSYS' power requirements in the 137-138 MHz band essentially preclude any additional commercially viable CDMA systems.¹¹ Similarly, ORBCOMM's frequency requirements in the 137-138 MHz and the 148-149.9 MHz bands preclude any additional commercially viable FDMA systems.¹² Moreover, the UHF frequency bands (399.9-400.5 and 400.15-401 MHz) are for all practical purposes unusable for communication links. This is because these frequencies are sufficiently removed from the VHF frequency bands that there would be significant cost impacts in designing and manufacturing a mobile terminal that would be operating with a hybrid (VHF and UHF)

¹¹ STARSYS' proposed power flux density of $-150 \text{ dBW/M}^2/4 \text{ kHz}$ occupies almost the entire power budget for CDMA systems in this band.

¹² There is a total of 547 kHz of non-contiguous spectrum available in the 137-138 MHz band. ORBCOMM indicates that it needs 320 kHz leaving only 227 kHz of spectrum available for future use. In practice the available spectrum for future use is even less than 227 kHz because the residual spectrum is divided into at least six non-contiguous segments, some of which are not large enough to support even a single channel. In the 148-149.9 MHz band, ORBCOMM requires 740 kHz from the available 855 kHz proposed in the NRM. This leaves only 115 kHz for future use which is clearly insufficient capacity for viable future FDMA systems.

LEO satellite system.¹³ Additionally, there are very limited opportunities for the establishment of additional narrow band feeder link channels in any of the allocated

Given these ground rules, existing licensees will be in position to be completely intransigent and at the same time be fully compliant with the Commission's Rules. This will allow NVNG MSS licensees to use the coordination process to block future entry. It would be naive for anyone to conclude that a licensee would not use this lax regulatory regime for competitive purposes.¹⁵

III. The Commission Must Implement Policies that Facilitate Competition

As is demonstrated above, if there are no specific rules and policies to promote multiple entry and competition, a duopoly will develop for the commercial NVNG MSS. If this is to be the case, the Commission should demonstrate that a duopoly can be supported by the record and will serve the public interest. The GAO Report clearly described the dangers associated with a duopoly market:

Generally accepted economic principles
imply that a market with only two producers,

¹⁵

dbX finds this laissez faire approach to LEO coordination quite puzzling especially when compared to the Commission's regulation of geostationary systems. LEO systems present a much more difficult coordination problem than that presented by geostationary satellites because LEOs use multiple satellites and omni-directional mobile terminal antennas. On the other hand, geostationary satellites are assigned specific frequencies at specific orbit positions and use directional earth station antennas. Further assistance is provided to geostationary system operators through the Commission's detailed technical standards contained in Part 25 of the Commission's Rules and the International Radio Regulations. No corresponding standards exist or are proposed for NVNG MSS systems. Therefore, NVNG system operators will be free to implement systems with almost any technical specifications and little regard to any existing or future systems. This situation can only result in a complicated and unproductive coordination process between existing and new licensees. The issues presented by the coordination of LEO systems are elaborated on further in Appendix B to these comments

known as a duopoly market, is unlikely to have a competitively set price that is at or near the cost of production. In addition, restricted entry and the current lack of substitutes for service provide little chance for further competition.¹⁶

dbX believes that this situation can be avoided for the NVNG MSS and competition can be protected if the Commission undertakes the following: (1) assigns frequency in an equitable manner to ORBCOMM, STARSYS and VITA; (2) reserves frequency for future entrants, and (3) implements rules that facilitate additional entry. In this regard, dbX elaborates below on its proposals to promote competition.

A. The Commission should assign frequency to pending applicants in a manner that provides opportunities for additional entry

To further preserve competition for new entrants, dbX encourages the Commission to adopt a system for incremental assignment of frequency. If the Commission fails to establish a frequency plan and leaves frequency assignments up to the licensees, as suggested by ORBCOMM,¹⁷ the Commission will permit ORBCOMM and STARSYS to divide among themselves all the available spectrum resulting in an effective duopoly. As dbX stressed above, formation of a duopoly will only encourage market inefficiencies.

dbX proposes that each licensee be granted a minimal frequency assignment for the initial implementation of its system. Only after licensees have

¹⁶ GAO Report at 4.

¹⁷ ORBCOMM Comments at pp. 8-9.

established sufficient load to warrant assignment of additional frequencies, will additional spectrum be made available. As is detailed below, existing licensees should be required to demonstrate 70% average load with 90% usage during peak periods before becoming eligible to be assigned additional spectrum.

This incremental approach to frequency assignments is consistent with past Commission policies for other mobile services. Under Rule 22.516 and Rule 90.627, licensees in the public land mobile service and in the specialized mobile radio ("SMR") service must demonstrate sufficient load prior to receiving additional channel assignments.¹⁸ In the case of SMRs, the licensee must demonstrate 100% load, not merely 70%, before any additional channels will be assigned.¹⁹ The dbX proposal would simply apply this Commission precedent for mobile communications systems to a new service and insure that spectrum remains available for future competitive entry.

Even just the possibility of competitive entry will drastically change the behavior of existing licensees. In this regard, dbX believes an opportunity should be provided for the introduction of at least one additional viable FDMA system and one additional viable CDMA system. As Appendix A to these reply comments demonstrates, such an opportunity can be provided in this proceeding without impairing the economic viability of any of the proposed systems. For instance, in the 137-138 MHz band, the Commission can accommodate a future CDMA entrant simply by limiting STARSYS' power flux density to -164 dBW/m²/4 kHz and requiring that

¹⁸ See 47 C.F.R. §§ 22.516 and 90.627.

¹⁹ See FleetCall, Inc., 6 FCC Rcd. 1533 (1991).

CDMA systems use compatible codes.²⁰ Operating at a lower power level would increase the power efficiency of the STARSYS downlink significantly, albeit at a slightly reduced capacity. Although, it is likely that additional CDMA systems can be accommodated in the 148-149.9 MHz band it would be prudent for the Commission to

access the same common pool of channels without performance impairing conflicts.

Either approach will only marginally effect ORBCOMM's capabilities.²¹

should come from each of the licensees rather than from just the one licensee with a system based on the same modulation scheme.

B. **The Commission should establish procedures that promote**

obligation to successfully coordinate must be imposed. Additionally, the Commission must eliminate the language in the proposed § 25.142(b)(3)(i) that protects licensees from re-engineering a system in order to accommodate new entrants. Otherwise, the licensee will not only have a license to operate but also a license to thwart competition. Second, the FCC should indicate that, if requested, it would be prepared to provide informal assistance in the coordination process. Certainly, the FCC has significant experience in the process and is in the best position to interpret any domestic and international (e.g., CCIR) technical standards. Third, in order to move the coordination process forward, it would be useful if the licensees were required to file a written progress report to the Commission every three months. This will encourage the parties to resolve any coordination difficulties in an expeditious fashion. Fourth, once the coordination is concluded, the coordination agreement must be submitted to the FCC. The purpose of this requirement is not to allow the public to comment on the agreement but rather to insure information in the agreement is made available to interested parties planning to become involved in the NVNG MSS. Given the complexity and regulatory uniqueness of NVNG MSS systems, it is imperative that this information be made available to future entrants. Otherwise, a future applicant would have to design its systems without a complete picture of the existing interference environment. Finally, if the Commission chooses not to provide in its assignment scheme a clear opportunity for additional competition, and coordination agreements between existing and new licensees cannot be reached, the rules should impose defaults on the existing licensees. In particular, CDMA operators should be

required to default to -164 dBW/m²/4 kHz in the 137-138 MHz band and 140 dBW/m²/4 kHz in the 148-150.5 MHz band. A FDMA/TDMA licensee should be required to automatically reduce the number of assigned channels by approximately 20% in both the uplink and downlink bands. This mechanism will pressure the existing licensee to accommodate new entrants. Collectively, the proposals described above will ensure that new entrants are given equitable opportunity to utilize the spectrum resource and implement additional NVNG MSS systems. As ORBCOMM stated in its comments in this proceeding, this result will surely serve the public interest.

IV. OTHER ISSUES

A. Spectrum utilization

In order to assess system capacity, the Commission should require all NVNG MSS licensees to file semi-annual utilization reports on specific dates each year with uniform quantifiable information. These reports will be crucial to the Commission's ongoing efforts to judge the efficiency of the NVNG MSS systems. Similar reporting requirements have been used to judge load for the beginning stages of other services.²⁶ Moreover, the Commission has been able to compile these types of statistics for numerous services without revealing sensitive business information.²⁷

²⁶ See e.g. Amendment of the Commission's Rules Relative to Allocation of the 849-851/894-896 MHz Bands, 5 FCC Rcd 3861, 3864 (1990)(air-to-ground telephone); Domestic Fixed-Satellite Service - Orbit Deployment Plan, 84 FCC 2d 584, 611-612 (domestic satellites).

²⁷ The ARMIS reporting requirements imposed on Tier 1 local exchange carriers are but one example of this type of filing requirement.

Consequently, given the minimal intrusion these proposals will make on the operation of NVNG MSS systems and the great public benefit to be derived from any steps which will promote multiple entry and competition, the proposed dbX rules on frequency assignment and reporting of capacity should be adopted.

The information described above should be used to determine whether an existing licensee should be assigned additional spectrum. Specifically, before an existing licensee could become eligible to obtain access to additional spectrum, it must demonstrate that at least 70% of system capacity on average and 90% during peak periods is utilized. However, new applicants must be given priority to obtain a spectrum assignment whenever spectrum becomes available for the NVNG MSS. Additionally, more efficient systems should be given favorable consideration in the assignment process based on data throughput/per hertz.²⁸

B. Processing of pending applications

In the Notice, the FCC proposes to require that the applicants now on file be permitted only 90 days in which to bring their applications into conformity with the technical and service rules being adopted by the Commission. STARSYS, in its comments,²⁹ argues that 90 days "may not be enough time for all applicants in the current processing group to accomplish all of the steps that must precede the securing

²⁸ For instance, a system that transmits at 4 bits per hertz per second should be given a priority in obtaining access to additional frequency over a system that transmits 1 bit per hertz per second. This will provide system operators with an incentive to be more efficient.

²⁹ STARSYS Comments at 4.

of the firm financial commitments the Commission is proposing to require." dbX disagrees. The pending applicants have known for sometime that they would receive an authorization to operate a NVNG MSS system. Therefore, it is unclear why STARSYS or any of the other current applicants needs nine months to put an application in order. This is vastly different from the situation that will exist under the proposed rules for future entrants. They will have no idea whether they will receive a NVNG MSS license until the actual license is issued. For those applicants, additional time may be warranted.

V. Conclusion

Based on the foregoing, dbX encourages the Commission to adopt the proposed rules contained in Appendix C hereto. These rules will minimize the possibility of creating a duopoly, will promote competition and will serve the public interest. As ORBCOMM indicated in its comments, it is only in a competitive environment that "customers can obtain service at the lowest price and highest

quality.ⁿ³⁰ The addition of the proposals described herein will ensure that the public reaps all the benefits promised by the NVNG MSS.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert A. Mazer", is written over a horizontal line.

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May 26, 1993

TECHNICAL DECLARATION

I, Richard Barnett, hereby certify that I am a technically qualified and experienced consulting engineer. I have reviewed the foregoing "Reply Comments of dBX Corporation", and prepared the Technical Appendices A and B, and certify that the technical information presented is complete and accurate to the best of my knowledge, information, and belief.

Dated this 25th day of May 1993

By: Richard Barnett

Richard Barnett

APPENDIX A

TECHNICAL ANALYSIS

2.1 137 - 138 MHz Band

The proposed sharing in this band assumes that STARSYS and ORBCOMM will be operating cross-polar with respect to each other, as shown in Figure A-1.

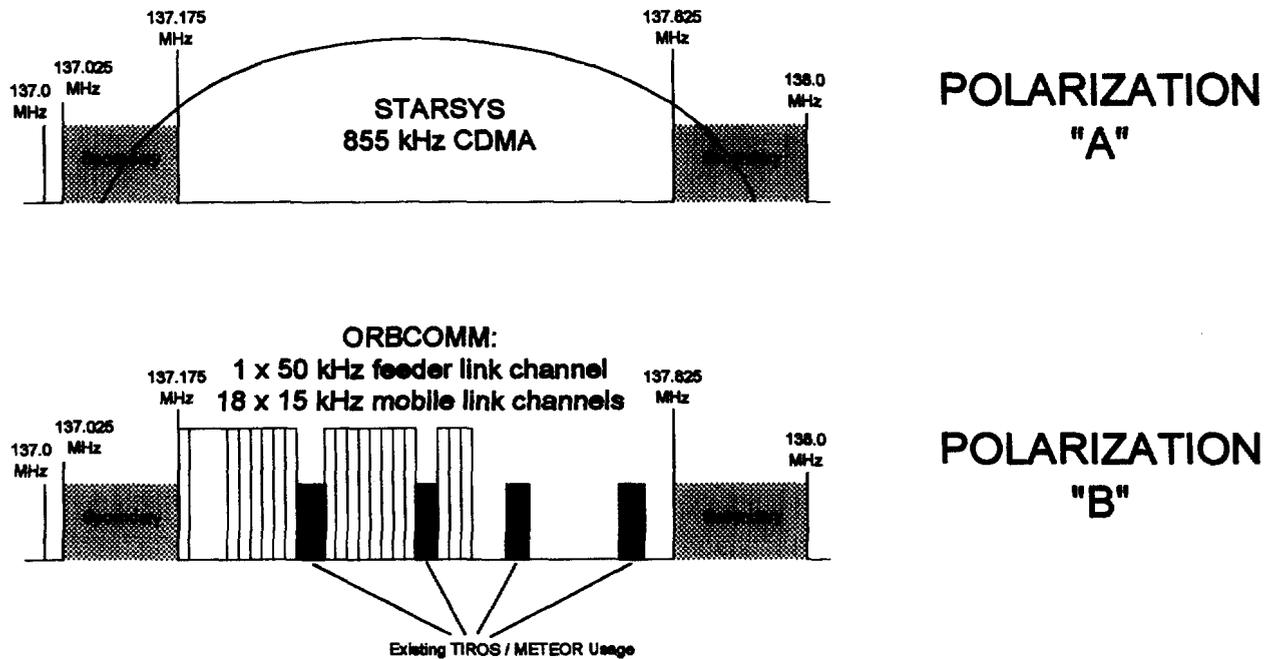


Figure A-1 - The "LEOAC-15" Spectrum Sharing Plan for the 137-138 MHz Band

The proposed STARSYS usage consists of a single 855 kHz satellite-to-mobile CDMA carrier which spans almost the entire 1 MHz bandwidth in one of the two polarizations (the STARSYS space-to-Earth feeder link is accommodated in the 400.15 - 401 MHz band). The ORBCOMM usage consists of a single 50 kHz bandwidth space-to-Earth feeder link channel and eighteen 15 kHz satellite-to-mobile channels. These ORBCOMM channels have to be interspersed across the band in order not to conflict with parts of the existing TIROS/METEOR usage of the spectrum (amounting to a total of 128 kHz) or the regions of the spectrum allocated internationally to MSS on a Secondary basis to METSAT/SPACE OPERATIONS (amounting to a total of 350 kHz).

Let us first consider the possibility of an additional CDMA system which would effectively share the 855 kHz band proposed for use by STARSYS. The degree to which spectrum can be shared between multiple systems using a CDMA access technique is dependent