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

In the matter of		
Amendment to Application of Motorola Satellite Communications, Inc. to Construct, Launch and Operate a Low Earth Orbit Satellite System	File Nos.	15-SAT-LA-95 16-SAT-AMEND-95
Amendment to Application of TRW, Inc. to Construct a Non-Geostationary Satellite System in the Mobile-Satellite Service Above 1 GHz	File Nos.	17-SAT-LA-95 18-SAT-AMEND-95

REPLY OF HUGHES COMMUNICATIONS GALAXY, INC.

Hughes Communications Galaxy, Inc. ("Hughes") hereby replies to the Consolidated Opposition to Petition to Deny and Reply Comments filed by TRW, Inc. ("TRW") in this proceeding on January 3, 1995.

I. Introduction

Hughes is filing this Reply to respond to a new procedural argument that TRW raised in response to Hughes's Comments (filed December 22, 1994) on TRW's November 1994 amendment (the "Hughes Comments"). Because TRW's pleading raises issues that affect the status of the application of Motorola Satellite Communications, Inc. ("Motorola") as well, Hughes also is compelled to address the implications for Motorola.

In its Comments, Hughes urged the Commission not to act on Motorola's and TRW's requests for conditional Ka band feeder link assignments until the Commission addressed how it would meet the spectrum needs specified in Hughes's Ka band GSO Spaceway application and the other proposed uses of the Ka band that are the subject of the

28 GHz Rulemaking Proceeding (CC Docket No 92-297). Hughes did not object to the feeder link requests of other Big LEO applicants whose applications were subject to comment, because those requests do not conflict with the pending Spaceway application.

TRW claims that Hughes has no legitimate interest in commenting on applications, like TRW's, for conditional Ka band feeder link authorizations. In particular, TRW argues that Hughes's pending Spaceway application should be given no consideration by the Commission in processing applications for conditional feeder link licenses.[1/] TRW's argument is based on the fundamentally flawed notion that the Commission cut off the filing of Ka band applications that are eligible for simultaneous consideration with TRW's and Motorola's proposals. In fact, the L band is the only spectrum requested by TRW and Motorola that was subject to a cut-off.

II. The Commission Has Not Issued a Cut-Off Notice For Ka band Satellite Applications.

It is internationally recognized and uncontested that, absent significant constraints that are not proposed here, the use of radio spectrum for MSS LEO feeder links is mutually exclusive, on the grounds of electrical interference, to use of that same spectrum for GSO satellite systems such as Hughes's Spaceway proposal.[2/] Assigning Ka band feeder link spectrum to the TRW and Motorola LEO MSS systems would foreclose use of that spectrum by GSO systems throughout the world. See Hughes Comments at 4-5. Because

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1. TRW Opposition at 14-16 & n.12 (arguing that HCG's "materially inconsistent" Spaceway application was filed two years after a cut-off for TRW's application).

2. See generally ITU-R Task Group 4/5 Contribution to the Consolidated CPM Report to the WRC-95; Informal Interim Report of the Working Group of the FCC Industry Advisory Committee for WRC-95. The Commission recognized this possibility when it deemed the Spaceway application, TRW's Odyssey application and Motorola's Iridium application to be restricted proceedings. See DA 94-358 (Released April 18, 1994) (announcing restricted adjudicative proceedings for applications at 27.5-30.0 GHz.)

neither TRW's nor Motorola's Ka band feeder link requests were subject to a cut-off, Hughes's Spaceway application is entitled to concurrent, comparative consideration under Ashbacker Radio Corp. v. FCC, 326 U.S. 327 (1945) ("Ashbacker").

TRW alleges that the Commission cut off the filing of Ka band satellite applications when it accepted TRW's 1991 LEO application for filing. TRW then argues that Hughes's pending Spaceway application need not be considered by the Commission when it considers the conditional assignment of feeder link spectrum to TRW. TRW Opposition at 14-16 & n.12. Contrary to TRW's suggestions, the Commission simply has not closed the window for filing Ka band satellite applications. This issue, which TRW has raised for the first time in its Opposition, has significant implications for Hughes's procedural standing vis-a-vis both TRW and Motorola.[3/]

In its April 1, 1991 Public Notice on Motorola's Iridium application, the Commission stated: "Pursuant to Section 25.392(b), 47 C.F.R. § 25.392(b), interested parties wishing to file applications for satellite systems to provide RDSS service in the 1610-1626.5 MHz and 2483.5-2500 MHz bands to be considered concurrently with Motorola's and Ellipsat's applications may do so on or before June 3, 1991." Public Notice, 6 FCC Rcd 2083 (1991) ("Big LEO Public Notice"). The Commission also asked for comments on Motorola's application. TRW filed an L band RDSS system application in response and the FCC put that application on notice as well.

Significantly, the Commission made no indication at any time that intended to establish a cut-off date for concurrent consideration of satellite applications in the 27.5-30.0 GHz band. Nor did it indicate that the cut-off related to applications for satellite systems other than RDSS systems at L band.

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3. If the Commission accepted TRW's arguments, they would apply with equal force to Motorola, since TRW's application was filed in response to Motorola's.

In order to provide administrative fairness, statutory notice, which is a necessary prerequisite to enforcement of the cut-off rule, must be "full and explicit notice."[4/] Indeed, as the U.S. Court of Appeals for the D.C. Circuit has stated, "the Commission may not, however inadvertently, give public notice of a cut-off date which does not fairly advise prospective applicants of what is being cut off by the notice."[5/] "When a cut-off date is fixed by public notice a potential applicant is entitled to rely on the terms of the notice." Id.

The Commission indicated only that applications for the L band were being cut off after the date indicated in the Big Leo Public Notice.[6/] The Big LEO Public Notice was silent with respect to a cut-off for the 27.7-30.0 GHz band. Therefore, the notice did not provide any warning (much less fair warning) that a cut-off was established for applications for any of the other frequency bands requested by the "Big LEO" applicants.

When it has intended to do so, the Commission has clearly established broad cut-offs for satellite applications that do not limit the scope of the cut-off protection to certain delineated frequency bands.[7/] The Commission also has the ability to impose "freezes" on

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4. Application of Central Mobile Radio Phone Service, 65 F.C.C. 2d 648, 650 (1977) (citing Radio Athens, Inc. (WATH) v. FCC, 401 F.2d 398, 404 (D.C. Cir. 1968); see also McElroy Elecs. Corp. v. FCC, 990 F.2d 1351, 1358 (D.C. Cir. 1993) (a "fair reading" of the Commission's order must apprise party of Commission's expectations).

5. Ridge Radio Corp. v. FCC, 292 F.2d 770, 773 (D.C. Cir. 1961).

6. TRW appears to argue that the fact that its LEO application (which was filed in response to the Motorola application and the Big LEO Public Notice) was placed on public notice for comments somehow provides it with cut off protection. TRW provides no support for this groundless assertion. TRW Opposition at 14-15.

7. In fact, that is the common practice. See, e.g., DS-1487 (released December 9, 1994); DS-765, FCC Rcd 4795 (1988); FCC-70-953, 25 FCC 2d 545 (1970).

the filing of new applications in a given frequency band while it resolves pending matters.[8/]

The Commission could have explicitly cut off the filing of Ka band satellite applications or imposed a freeze on Ka band applications when it closed off the L band, but it did neither. Hughes relied on the terms of the Big LEO Public Notice and the fact that the Ka band had not been cut off when it filed its Spaceway application over one year ago, long before TRW's and Motorola's Amendments were filed. Since Hughes's application is mutually exclusive to TRW's and Motorola's requests for the Ka band that have not been cut off, Hughes is entitled to concurrent and comparative consideration.[9/]

III. TRW's and Motorola's Feeder Link Requests Are Not Entitled to Cut-Off Protection.

Even assuming, for the sake of argument, that the Commission accepts TRW's argument that TRW's and Motorola's original 1991 applications had secured some sort of "cut-off" protection against Hughes's Spaceway application, that protection cannot extend to the new, expanded frequencies that each has requested in its amendment. TRW's and

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8. See, e.g., Petitions for Redesignation of the Common Carrier Point-to-Point Microwave Radio Service Frequency Band 27.5--29.5 GHz, 7 FCC Rcd 7201 (1992) (freezing terrestrial Ka band microwave applications); Processing of Pending Applications for Space Stations to Provide International Communications Service, FCC 85-296 (released June 6, 1985) (freezing Atlantic Ocean Region international satellite applications in certain bands).

9. TRW is correct in noting that the Commission may be faced with a "never-ending" parade of newcomers whose applications create conflicts with previously filed applications and are entitled to comparative consideration under Ashbacker. TRW Opposition at 15 n.12. That is why the Commission issues cut-off notices: to make clear when it will no longer accept the applications to be considered as part of a "processing round." Until that cut off explicitly occurs, the initial applicant is subject to overfiling by others. See Radio Athens v. FCC, 401 F.2d 398, 400 (D.C. Cir 1968); Ridge Radio V. FCC, 292 F.2d 770, 771 (D.C. Cir 1961).

Section 25.155 of the Commission's rules is inapplicable to this case because it was not adopted until after the Big LEO Public Notice was released and was not effective until after the June 3, 1991 L band cut-off date.

Motorola's respective amendments made fundamental changes to their pending MSS applications: (i) TRW increased its Ka band feeder link request from 101.5 MHz to 300 MHz, and (ii) Motorola increased its Ka band feeder link request from 100 MHz to 200 MHz. Since each of these applications constitutes a "major amendment," any cut-off protection purportedly accrued has been lost.[10/]

TRW originally requested about 101.5 MHz of feeder link spectrum at each of 29.9--30.0 and 20.1--20.2 GHz, and it acknowledges in its Amendment that this spectrum request has grown to 300 MHz: 29.7--30.0 and 19.8--20.1 GHz. TRW argues, however, that this increase does not constitute a major amendment because it is an "inevitable byproduct" of the changes that TRW made to its beam pattern to comply with the Commission's coverage requirements specified in the October 1994 Big LEO Order.[11/] TRW Opposition at 12-13.

Motorola indicates that it originally requested 100 MHz of feeder link spectrum in the 27.5--30.0 and 18.8--20.2 GHz bands (Motorola Opposition at 17, citing its December 1990 filing). According to that original proposal, Motorola's feeder link channel plan would have consisted of six 15 MHz channels spaced at 15 MHz intervals, which covered 100 MHz of bandwidth. The new proposed channelization plan is different: Motorola now seeks to use twelve channels, spaced at 15 MHz intervals which cover 200 MHz at 29.1--29.3 and 19.4--19.6 GHz. What Motorola has done is double its number of channels and double the bandwidth that is occupied in each channel. As set forth in the

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10. There is no need for the Commission to reach this issue unless it determines that the Big LEO Public Notice served as a cut-off for Ka band GSO FSS satellite applications.

11. Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, FCC 94-261 (released October 14, 1994) ("Big LEO Order")

Technical Statement attached as Exhibit 1, Motorola's feeder link spectrum occupancy essentially has quadrupled. Indeed, Motorola recognizes that it needs access to a full 200 MHz: "Motorola requires the authority to construct its feeder link antennas to operate across 200 MHz in each direction." Motorola Amendment, Exhibit 5 at 2.

Under Section 25.116 of the Commission's rules, an amendment to an application is major if, among other things, it increases the potential for interference or changes the frequencies to be used. 47 C.F.R. § 25.116(b)(1). A major amendment requires an application to be considered newly filed and renders it ineligible for consideration with its former processing group, unless, among other exemptions, the amendment "resolves frequency conflicts with authorized stations or other pending applications but does not create new or increased frequency conflicts." 47 C.F.R. § 25.116(c)(1).

Motorola argues that there is no significant change in its application because the band actually "occupied" by its feeder links has always remained at 100 MHz. Motorola Opposition at 17-18. This is nothing more than a sleight of hand. Motorola now intends to "occupy" 105 MHz (compared with 26.25 MHz prior to its most recent amendment), and it wants the flexibility to occupy that 105 MHz anywhere in a 200 MHz range that is chooses. As a practical matter, Motorola's change in channel plan and its requests to occupy 105 MHz and use a 200 MHz range of spectrum have increased the potential for interference by spreading that potential over another 100 MHz of spectrum that overlaps Hughes's pending request.

Hughes has an application pending to use the 27.5--30.0 and 17.7-20.2 GHz bands for a GSO satellite system. Motorola and TRW have both expanded their frequency requests to include spectrum that Hughes has requested. There can be no question that this change increases the potential for interference and creates new frequency conflicts with

respect to Hughes.[12] Assuming, arguendo, that Motorola and TRW had some sort of cut-off protection before, they have lost it now. TRW's and Motorola's amendments are major amendments, and their applications must be considered newly filed under the Commission's rules.[13]

TRW asserts that increase of its feeder link request should not be considered a major amendment because it was necessary to bring its system proposal into conformity with the Big Leo Order. [14] TRW Objection at 12-14. TRW rests this belief on the following statement by the Commission:

> We have repeatedly emphasized that MSS Above 1 GHz applicants who filed by the cut-off date will be afforded an opportunity to amend their applications, if necessary, to bring them into conformance with any requirements and policies that are adopted for satellite systems in these bands. . . . *However, a change that is not necessary to bring the application into conformance with our rules and which would increase frequency conflicts*, . . ., would render the application a newly filed application to be considered in a future processing group.

Big Leo Order, FCC 94-261, ¶ 59 (emphasis supplied).

TRW's argument is fundamentally flawed because there are ways that TRW could have designed its system to provide the required global coverage without having increased its feeder link spectrum in a manner that increases the potential for interference and

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12. TRW provides no support for its suggestion that the only conflicts that "count" for purposes of the major amendment rules are conflicts with applications that have been accepted for filing. TRW Opposition at 13 n.10. Whether an application that is on file with the Commission has been accepted for filing is totally irrelevant and beyond the control of the applicant.

13. HCG did not raise this argument in its Comments on TRW's application since HCG was not objecting to the licensing of L band spectrum to TRW. Now that TRW argues that its application is entitled to cut off protection against Spaceway, HCG is compelled to raise this argument in response.

14. Motorola does not make any such argument.

frequency conflict.[15] The Technical Statement attached as Exhibit A describes these design alternatives.

Because TRW had other means available to bring its LEO System into compliance with the Big Leo Order, its request for additional feeder link spectrum was not necessary. Rather, TRW chose an approach that created frequency conflicts. TRW must be held to that election. Its November 1994 Amendment is a major amendment and TRW must go to the beginning of the processing line.[16]

However, even if TRW had cut off protection for its initial 100 MHz of feeder link spectrum, and even if TRW were required to use 200 MHz of additional feeder link spectrum in order to comply with the Big Leo Order, TRW provides no support for the concept that the additional 200 MHz of feeder link spectrum should be entitled to cut off protection. Nor could such a concept of a "creeping cutoff" be reconciled with the requirements of Ashbacker and the Administrative Procedures Act.

As set forth above, the courts are clear that a cut off notice must be "full and explicit" in order to adequately apprise applicants of what is being cut off. Having applied for 100 MHz, TRW cannot seriously contend that any person could have imagined that TRW's request would triple four years in the future in response to the adoption of Big LEO rules. No one had notice in 1991 that additional spectrum would be claimed in the future.

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15. It is curious that TRW announced its proposal to increase its feeder link request from 100 to 300 MHz over one month before the Commission adopted the Big Leo Order. See Joint Proposal and Supplemental Comments, CC Docket No. 92-166 (filed September 9, 1994) (Joint Proposal and Settlement Agreement at 11).

16. Even if TRW's proposed feeder link spectrum increase were deemed "necessary," it still constitutes a major amendment because it actually increases frequency conflicts. The Commission's rules unambiguously state that any amendment that increases frequency conflicts will be considered a major amendment even if necessitated by unforeseen circumstances. 47 C.F.R. 25.116(c)(4). The Big Leo Order did not change this interpretation. See FCC 94-261, ¶ ¶ 58, 59.

The nearly 2.4 GHz of Ka band spectrum that TRW did not previously request cannot possibly be cut off from other claims that were filed before TRW's November 1994 Amendment.

V. Conclusion

Hughes's comments on TRW and Motorola are timely. No cut-off of Ka band applications has occurred. Hughes therefore is entitled to concurrent and comparative consideration of its Spaceway application.

Respectfully submitted,

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January 13, 1995

EXHIBIT 1

TECHNICAL STATEMENT

I. INTRODUCTION

This technical statement is provided on behalf of Hughes Communications Galaxy, Inc., for inclusion with its Reply Comments dated January 13, 1995.

II. THE Ka-BAND SPECTRUM OCCUPIED BY IRIDIUM HAS QUADRUPLED

Motorola asserts that the total occupied bandwidth of Iridium's feeder links remains at 100 MHz and that 200 MHz was requested specifically in order to provide channel tuning flexibility that will facilitate international coordination. Motorola Reply Comments at 17/18 and Motorola Amendment at Exhibit 5. To the contrary, Motorola has doubled the number of feeder link channels while doubling channel bandwidth and spacing and quadrupled the total occupied bandwidth.[1] Furthermore, only 15 MHz out of the 200 MHz requested in each direction of Ka-band transmission can be used for channel tuning flexibility.

Prior to Motorola's most recent amendment, the Iridium frequency plan clearly indicated that no more than 100 MHz was required in each direction of transmission and that the total bandwidth actually used in each direction was no more than 45 MHz.[2] Motorola's previous

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1 "Occupied" bandwidth is a term of art that is defined as follows (RR No. 147): "*Occupied bandwidth:* The width of a frequency band such that, below the lower and above the upper frequency limits, the *mean powers* emitted are each equal to a specified percentage β/2 of the total *mean power* of a given emission. Unless otherwise specified by the CCIR for the appropriate *class of emission*, the value of β/2 should be taken as 0.5%." In other words, the occupied bandwidth contains about 99% of the emission power and does not reflect receiver protection requirements. "Channel" bandwidth is never less than occupied bandwidth because it includes allowances for frequency stability tolerances; Doppler shift; and receiver filter limitations, and it often includes guardband such that channel spacing would be no less than the channel bandwidth. "Requested" bandwidth is simply what is asked for and typically consists of the product of channel spacing and the number of carriers plus one and might include additional bandwidth to provide frequency assignment flexibility (e.g., for coordination purposes).

2 The previous 100 MHz authorized bandwidth requirement is specified in the Motorola Minor Amendment dated August 8, 1992, at Tables R-A-1 and R-6 (and elsewhere). The same table indicates an occupied bandwidth of 4.375 MHz per channel and a channel spacing of 7.5 MHz, which would yield a total bandwidth of 45 MHz given the total of six feeder link channels specified in Motorola's original application (December 3, 1990), at 65 (the number of channels was not revised in the August 8, 1992 amendment). The 7.5 MHz channel spacing specified in the August 8, 1992 amendment is corroborated therein by the feeder link receiver noise bandwidth of 3.1 MHz that is specified in Table R-A-6. However,

application also specifies an occupied bandwidth of 4.375 MHz per channel and a total of six channels in each direction of transmission. In its November 15, 1994 amendment, however, Motorola specifies twelve feeder link channels in each direction of transmission requiring 15 MHz spacing and occupying 8.75 MHz each.[3] Taking Motorola's approach to focusing on "occupied" bandwidth, the total bandwidth occupied by Iridium's feeder links has grown by a factor of four, from 26.25 MHz (6 channels times 4.375 MHz per channel) to 105 MHz (12 channels times 8.75 MHz per channel).

Motorola's frequency plan provides the flexibility to shift feeder link channels upwards or downwards in frequency by only 7.5 MHz.[4] Thus, only 15 MHz of tuning flexibility is available to facilitate coordination, which does not substantiate a 200 MHz bandwidth request.

III. TRW'S TRIPLING OF FEEDER LINK SPECTRUM REQUIREMENTS WAS NOT NECESSITATED BY NEW BIG LEO RULES

TRW contends that its expansion in feeder link spectrum requirements to 300 MHz in each direction of transmission was needed for conformance with the Commission's new Big LEO rules. TRW Reply Comments, at 13. Specifically, TRW implies that it had to increase the number of L-/S-band beams in order to meet the Commission's coverage requirements. To the contrary, TRW could have avoided this dramatic increase in feeder link spectrum expansion by increasing the size of its L-/S-band beams and by parlaying the reduced L-/S-band spectrum available to CDMA systems to offset a more modest increase in the number of

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Motorola's original application specified a channel spacing requirement of 15 MHz and modulation rate of 12.5 Mbps, at 65, which with the specified six feeder link channels implies that a bandwidth of 90 MHz would be used.

3 See Tables R-8 and R-A-1 (Rev. 1) of Motorola's most recent amendment. In the latter table, the bandwidth occupied by a channel operating at a coded data rate of 6.25 Mbps is 4.375 MHz; however, the specified doubling of the coded data rate (note 1 in the table) to 12.5 Mbps yields an occupied bandwidth of 8.75 MHz per channel. The 12.5 Mbps operating rate is consistent with Motorola's original specification and its Supplemental Information, filed February 22, 1991.

4 Motorola Amendment, November 8, 1994, at Table R-8. Iridium feeder link channels can be retuned in 7.5 MHz increments. Only one such increment of upward or downward tuning flexibility exists while confining the feeder link signals within the requested frequency bands.

L-/S-band beams.[5] Furthermore, TRW could have reduced its feeder link spectrum requirements through a number of techniques, including digital frequency division multiplexing and routing; time division multiplexing reformatting; and incorporation of dual polarization and frequency reuse in conjunction with its proposed feeder link path diversity.

Digital frequency division multiplexing and routing in the satellite, as proposed by AMSC, would eliminate TRW's spectrum waste associated with reservation of feeder link channels that are cross-strapped to unused L-/S-band CDMA channels. TRW reserves feeder link spectrum for four CDMA channels per L-/S-band beam regardless of whether they are used. For example, all of the four proposed CDMA channels are not needed and cannot be powered in every L-/S-band beam. Typically, 2/3 of the beams cover ocean areas from which little traffic will be offered such that only one CDMA channel would be needed. Assuming conservatively that all other beams each need all four CDMA channels, 50% of TRW's requested feeder link spectrum could be eliminated in this example without impact on service; greater spectrum savings also are feasible.

Reformatting to time division multiplexing feeder links signals as proposed for Iridium enables use of fewer feeder link channels and eliminates guardbands used in TRW's approach. In the extreme case where only one time division multiplexed channel is used, up to 26.75 MHz of guardband could be eliminated from TRW's spectrum requirement (107 guardbands times 0.25 MHz per guardband) in addition to the spectrum savings associated with the above mentioned digital routing technique.

TRW's amended application states that feeder link path diversity will be used to mitigate rain attenuation of feeder link signals. Amendment, Attachment A, at 16. This same

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5 With the type of transponders proposed by TRW, the required amount of feeder link spectrum increases with the bandwidth used per L-/S-band beam and the number of beams. Hence, the Commission's baseline limitation of CDMA systems to 11.35 MHz of spectrum out of the 16.5 MHz of L-band spectrum assumed by TRW in its initial application presented TRW with the opportunity to either reduce feeder link spectrum by a factor of 0.69 (11.35 MHz/16.5 MHz) or increase the number of beams by a factor of 1.45 (16.5 MHz/11.35 MHz) with no increase in feeder link spectrum.

feature also compensates for depolarization and obviates TRW's argument that dual polarization cannot be used.[6] Amendment, Attachment A, at 11/12. As was recognized in the Ka-band feeder link Plan for broadcasting satellites (RR Appendix 30A), dual polarization and frequency reuse through overlapping of orthogonally polarized channels is possible even without feeder link path diversity. With TRW's proposed path diversity, greater or full overlap of orthogonally polarized Ka-band channels is possible, which would yield feeder link spectrum savings of up to 50% in addition to spectrum savings accrued through the forementioned techniques. Motorola also could incorporate polarization reuse in conjunction with its path diversity, thereby reducing its feeder link spectrum requirement by up to 50%.

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6 Depolarization of signals and the associated interference between orthogonally polarized signals increase with rain attenuation. However, path diversity minimizes or eliminates rain attenuation and depolarization. Thus, in TRW's amended system design, depolarization effects will not prevent use of dual polarization and realization of feeder link frequency reuse. In fact, TRW's cross-polarization isolation likely would exceed that achieved in Ku-band systems that do not employ path diversity.

DECLARATION

I, Thomas M. Sullivan, do hereby declare as follows:

1. I have a Bachelor of Science degree in Electrical Engineering and have taken numerous post-graduate courses in Physics and Electrical Engineering.

2. I am presently employed by Computer Sciences Corporation and was formerly employed by the IIT Research Institute, DoD Electromagnetic Compatibility Analysis Center.

3. I received in 1982 an official commendation from the Department of the Army for the establishment of worldwide frequency accommodations for mobile earth stations.

4. I am qualified to evaluate the technical information in the Reply of Hughes Communications Galaxy, Inc. I am familiar with Part 25 and other relevant parts of the Commission's Rules and Regulations and the October 14, 1994 Report and Order in FCC Docket No. 92-166.

5. I have first-hand experience in the coordination of frequency assignments for mobile satellite systems, participate in relevant ITU-R fora, and was responsible for analyses leading to use of dual polarization in the Ka-band feeder link Plan of RR Appendix 30A.

6. I have been involved in the preparation and have reviewed the Reply of Hughes Communications Galaxy, Inc. and prepared the foregoing Technical Statement. The technical facts contained therein are accurate to the best of my knowledge and belief.

Under penalty of perjury, the foregoing is true and correct.

January 13, 1995
Date

Thomas M. Sullivan

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on the 13th day of January, 1995, a true and correct copy of the foregoing Reply of Hughes Communications Galaxy, Inc. was served by first class mail, postage prepaid, upon the following:

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