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

In the Matter of )  
 )  
Amendment of the Commission's Rules ) ET Docket No. 98-237  
with regard to the 3650-3700 MHz )  
Government Transfer Band )

COMMENTS OF COMSAT CORPORATION

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To: the Commission

**COMMENTS OF COMSAT CORPORATION**

COMSAT Corporation ("COMSAT") hereby submits its Comments in response to the Commission's Notice of Proposed Rule Making and Order ("NPRM") in the above-captioned proceeding.

**Introduction and Summary**

In its NPRM, the Commission proposes to reallocate the 3650-3700 MHz band to the Fixed Service ("FS") on a primary basis for non-government use. While existing FSS earth stations would be grandfathered, the Commission also proposes to freeze the status of this band for the FSS by no longer accepting applications for use of this band for new or major modified FSS earth station facilities.

As set forth in detail below, the proposed reallocation and freeze forecloses the expanded use of space segment

capacity that is extremely important to COMSAT, to U.S. earth station operators and U.S. service providers who must correspond with earth station operators in other countries who are now operating or plan to operate in this band in transmissions to the U.S. via the INTELSAT satellite system. We strongly support the Commission's decision to grandfather the existing U.S. earth stations licensed to operate in the band. Grandfathering will ensure that current users will not lose their services.

COMSAT strongly opposes the current freeze on FSS applications seeking to use the 3650-3700 MHz band and the Commission's proposal to prohibit any additional uses by FSS users. Further, we are concerned about any restrictions which would reduce the flexibility of the incumbent grandfathered stations to provide service. Finally, the Commission questions whether the grandfathered stations should not be required to vacate the band at some future date. The Commission should not undertake any action which would adversely affect the ability of FSS licensees to satisfy U.S. customer demand. This band is currently used in the U.S. for the reception of voice, data, and video signals from overseas operators who would have their uplink transmissions to the U.S. disrupted.

These draconian measures are unwarranted; there is no reason to further limit the operation or the flexibility of FSS in this band. Through the development and implementation of appropriate interference criteria, we believe that coordination procedures can be developed to permit shared operation between FSS and FS. U.S. users will be better served if the Commission provides flexibility for use by FSS operators that will accommodate the entry and growth of new fixed services such as Fixed Wireless Access ("FWA") in the 3650-3700 MHz band. As discussed below, COMSAT strongly urges the Commission to explore sharing arrangements between FSS and FS operators and not to limit the use of the 3650-3700 MHz frequencies by the Fixed Satellite Service.

**I. Extended C-band is integral to the provision of full FSS C-band service.**

In its NPRM, the Commission proposes to allocate the 3650-3700 MHz band to FS non-government use within the United States. Internationally, this band segment is a part of the larger band at 3400-4200 MHz which was allocated in the 1960's through the spectrum treaty process of the ITU to the FSS service in the space-to-earth direction and to the FS on a co-primary basis globally.

The C-band allocations at 6 GHz for uplinks and 4 GHz for downlinks are the work-horse bands for FSS around the world.

Additional services, including radiolocation, are allocated in various segments of the 3400-3700 MHz band on a regional basis. Within the United States, the band segment at 3400-3700 MHz historically had not been allocated to the FSS because of U.S. government radar operation in parts of the band, and was instead allocated to government radiolocation and aeronautical radionavigation. Not until 1984, did the FCC add an allocation in the 3600-3700 MHz band for the FSS (space-to-earth) on a restricted use basis under footnote U.S. 245. The 3700-4200 MHz band is heavily used on a global basis and within the United States as a major downlink FSS band. However, the use of FSS in the U.S. below 3700 MHz continues to be restricted.

At WARC-79, many countries supported efforts to reduce the status of radiolocation in the 3400-3700 MHz band to provide more spectrum for the growing FSS service. While the United States also sought additional spectrum for FSS, it was determined to preserve the status of radiolocation in the 3400-3600 MHz band. At one point during the negotiations at WARC-79, the United States proposed a footnote that would have excluded FSS from operating anywhere in the 3400-3700 MHz band within the United States. The final result, however, was a compromise to retain the status of radiolocation (for U.S. government radar) in the band, but with the intent to make

some of the band usable for FSS. A number of countries, including the United States, signed a Declaration to the effect that they would make reasonable effort to accommodate FSS in the band.

Radiolocation is a secondary service in the International Table of Frequency Allocations in the band 3400-3700 MHz, while FSS and FS are co-primary allocations. However, footnote 784 to the Table makes a segment of this band from 3400-3600 MHz a primary allocation for radiolocation in Regions 2 and 3. Nevertheless, this same footnote states that ". . . all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service."<sup>1</sup>

In 1984, in an effort to accommodate projected commercial FSS needs and to make good on the U.S. commitment, the Commission granted use of the so called "extended C-band" at 3600-3700 MHz to FSS, subject to case-by-case coordination with U.S. government use. This use of the extended C-band in the United States is in accordance with U.S. footnote 245 to the U.S. National Table of Allocations which states that the

FSS is limited to international intercontinental systems and subject to case-by-case electromagnetic compatibility analysis.

Thus, today some 65 earth stations have been licensed by the FCC to access FSS satellites using extended C-band capacity, providing a wide range of services for U.S. users. The use of this band serves to alleviate the saturation problems of the INTELSAT system, and accommodates use of the band by other countries.

**1. Existing FSS earth stations should be grandfathered.**

In its NPRM, the Commission proposes to grandfather existing FSS earth stations. COMSAT fully supports the Commission's conclusion. Grandfathering the existing stations is absolutely necessary for continuity of service to U.S. users.<sup>2</sup> If the Commission decided not to grandfather the existing stations, the result would be to seriously affect the ability of U.S. service providers to satisfy the demand in the U.S. for international downlink capacity. The result would be

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<sup>1</sup> *Radio Regulations, International Table of Frequency Allocations, Footnote 784.*

<sup>2</sup> The grandfathered licensees should retain the right to operate on any frequency within the 3650-3700 MHz band in either sense of polarization. This is necessary so that existing services can be transitioned from older satellites to replacement satellites that were designed with the intention of operating in the band in either sense of polarization.

a costly and unnecessary disruption of service. COMSAT estimates a projected five year revenue loss, from space segment alone, would be approximately \$50 million, and this does not reflect the loss to U.S. service providers utilizing this space segment for service to their customers.<sup>3</sup>

**2. There should be no freeze that would limit FSS growth in the band.**

The Commission's proposed freeze on new earth station applications and major modifications to existing stations will have serious repercussions on U.S. and foreign earth stations operators and on efficient use of the space segment.

First, this freeze would limit the flexibility of earth station operators within the United States and their ability to service new customers with expanded choices. Any U.S. earth stations not grandfathered and any new stations would not be able to access the satellite capacity assigned in transponders covering the 3650-3700 MHz band with zone and hemispherical antenna coverage for reception in the United States.

On the space segment side, expanded service planned in

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<sup>3</sup> Nor does it take into account the financial implications for overseas transmitting earth station operators.

this band to the United States could be lost, since the INTELSAT system does not have sufficient alternative C-band capacity to recover this loss. Therefore, it is economically and operationally important to not only have continued access to the extended C-band by existing U.S. earth stations, but also to have the flexibility to reconfigure at existing stations and to grow at new sites.

A number of INTELSAT satellites operating today and the INTELSAT IX series of satellites planned to replace the INTELSAT VI's have transponders which operate in the extended C-band.<sup>4</sup> Operational plans anticipate the continued use of these transponders for a range of service needs among many countries, including the U.S.; such restrictions could impair, if not foreclose the growth of consumer-attractive services like IBS and Internet via satellite.

**II. Appropriate sharing arrangements should be developed to accommodate FS and FSS use of the band.**

COMSAT believes that appropriate interference criteria and coordination procedures can be developed that would protect existing earth stations from harmful interference while allowing the FS type services to grow within the band. With proper coordination, there is no reason to expect that

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<sup>4</sup> A summary of the INTELSAT transponders affected or potentially affected by constraints on the 3550-3700 MHz band is attached hereto.

additional FSS earth stations could not be sited in particular geographical areas so that both FSS and FS could continue to share the 3650-3700 MHz band.

The Commission is well aware of the long and successful history of sharing between the FSS and terrestrial fixed microwave stations in both the 4 and 6 GHz bands. However, the Commission states that it is disinclined to apply to this band the spectrum sharing criteria now used in the adjacent 3700-4200 MHz band, noting that the high-power, fixed point-to-point operations require extremely large coordination distances to ensure identification of all potential interference cases needing more detailed analysis. The Commission foresees FS services such as FWA, which are relatively low power operations, being viable in the band because the coordination distance requirement around earth stations would be significantly reduced.<sup>5</sup>

We agree with the general sense of the Commission's observation that "more restrictive power limits" would simplify interference coordination. However, we are concerned with the suggestion that ". . . these coordination distances may unnecessarily constrain the deployment in the band of

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<sup>5</sup> See NPRM at para. 12.

fixed links that require less power,"<sup>6</sup> since coordination contours are simply a tool for making a first cut determination of potential interference paths to be further analyzed. A contour does not represent a zone where no new FS systems can be added. Furthermore, the size of the contours will depend on the maximum e.i.r.p. spectral density from the typical FS transmitters. Thus, lowering the power (e.i.r.p.) will reduce the size of the contours.

It is clear that the technical parameters associated with particular fixed services, together with the technical parameters of the earth stations receiving in the band, will determine the ease or difficulty with which FS and FSS can share. As the Commission notes, the FSS earth stations now licensed in the 3650-3700 MHz band employ highly directional antennas.<sup>7</sup>

Regarding the FWA environment, COMSAT envisions numerous low power transmitters operating in a given service area. Successful coordination of a new FSS receiving station to be located near such a FWA service area would result in a site location with adequate shielding and parameters selected so as to not be vulnerable to interference from the neighboring FWA transmitters, using planning techniques similar to those

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<sup>6</sup> NPRM at para. 12.

currently used in planning new C-band earth stations to avoid interference in the 3700-4200 MHz band. Such operations would not place undue limitations on either of the FSS or FWA operations, in our view.

The earth stations operating in the band today should be able to coordinate successfully with FWA operations. However, more study would be required to determine the parameters of the proposed "new fixed service" that would be appropriate to foster sharing.

The example parameters at paragraph 12 of the NPRM (i.e. base station height/power limit of 1640 watts peak e.i.r.p., with an antenna height above average terrain of up to 300 meters) are not consistent with the parameters one would expect for a typical low power FWA system, as exemplified by the Nortel "Proximity-1" system cited in the NPRM. The cited FWA system is a much lower power system with only 15 dBw peak e.i.r.p. per carrier and a lower tower that would represent much less of an interference threat. If sharing is to be facilitated, the FWA transmitter parameters will need to be bounded much more closely than suggested by the example in paragraph 12. Furthermore, the power limit needs an

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<sup>7</sup> See *Id.* at para. 3.

associated bandwidth or else there needs to be an explicit power spectral density limit. In any case, further work needs to be done to establish suitable reference system parameters for calculation of coordination contours and for conducting an interference analysis associated with sharing. We believe this can be accomplished.

**III. Flexible sharing between FSS and FS free of harmful interference can be achieved.**

The Commission notes that it must ensure that its decision to reallocate the 3650-3700 MHz band to FS will continue to accommodate existing earth station reception of FSS signals. As the Commission notes, these are significantly weaker than the anticipated terrestrial service signals.<sup>8</sup>

COMSAT fully understands the Commission's concern. Although we believe it is possible for the FSS and the FS to share the 3650-3700 MHz band, the ease or difficulty of sharing will, of course, depend upon the particular type of FS service that the Commission ultimately authorizes in the

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<sup>8</sup> See NPRM at paras. 6 and 12.

band.<sup>9</sup>

For example, the newer types of FS operations, such as the FWA service now contemplated by the Commission, likely may be accommodated in the band with appropriate coordination and with acceptable technical parameters for the two services to co-exist. This is not only possible, in our view, but would not be different from the situation today where any new earth station is accommodated subject to a case-by-case electromagnetic compatibility analysis. This coordination will continue for the three Government radar sites proposed to be grandfathered in the 3650-3700 MHz band by the NPRM.

Also, as the Commission points out, any new FS service in the band must be able to co-exist with extremely high-powered Government mobile radar systems in the adjacent 3300-3650 band, as well as with occasional high-powered in-band use at the three grandfathered sites in Mississippi, Florida and Maryland.<sup>10</sup> However, the issue here, we believe, is the extent to which the new FS service would restrict the expansion of

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<sup>9</sup> In response to the Commission's request for comment about a subsequent rulemaking proceeding to develop service rules for this band, we are inclined at this time to believe that a new set of service rules may be appropriate instead of using service rules adopted for LMDS or WCS. The type of fixed service and technology envisioned for use are not yet clear. In this regard, the Commission raises the issue of whether FDD or TDD technology may be viable in the band. While others are better able to address this issue, it seems clear that any assessment of the arrangements for sharing in this band would best be done once decisions on service issues are addressed by the Commission.

<sup>10</sup> See NPRM at para. 11.

FSS in the band. Further study will be needed once the Commission selects the FS type of operation to be licensed in the band.

The Commission also recognizes the need to protect adjacent band FSS earth station reception in the 3700-4200 MHz band from out-of-band emissions and requests comment on whether the out-of-band limit of  $43 + 10 \text{ Log } (P) \text{ db}$  should be applied to the proposed fixed service allocation.<sup>11</sup> This criterion appears to be much too relaxed, if the proposed new service is to be a low power FWS system like the cited Nortel "Proximity" system, since it would require only an out-of-band roll-off of about 48 db (assuming three 1-watt carriers per MHz). Adjacent band interference considerations would argue for a roll-off of at least  $60 + 10 \text{ Log } (P) \text{ db}$  as being more appropriate. The requirement should be as stringent as practicable to reduce the need for out-of-band interference coordination. This should be addressed more definitively once service rules are proposed and the technical parameters of the proposed FS operations can be assessed.

Comment is requested on whether VSATs should be precluded from operating in spectrum immediately adjacent to the new fixed service allocation at 3650-3700 MHz. This may be

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<sup>11</sup> See *Id.*

accomplished by requiring a 3.5-meter diameter minimum antenna size for earth stations to receive the 3700-3720 MHz segment of the 3700-4200 MHz band now heavily used by FSS.<sup>12</sup>

COMSAT opposes any such restrictions as premature at best, and, in our view, unnecessary. We believe that VSAT services can co-exist in adjacent bands as well as in-band with FS, if appropriate measures are taken to avoid interference. These measures should be assessed in a further rulemaking concerning the service rules for the particular FS operation to be licensed in the 3650-3700 MHz band, and further study would be required.

Finally, the Commission raises the possibility of land mobile use in the band.<sup>13</sup> However, it tentatively finds that allocating the 3650-3700 MHz band to the fixed service only, and not to the land mobile service, would better protect incumbent Government radar operations and non-Government FSS reception from harmful interference. We agree with, and support, this conclusion. The Commission has correctly noted that it has traditionally licensed satellite downlinks in bands that are not used by mobile units.

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<sup>12</sup> See *Id.*

<sup>13</sup> NPRM at para. 17.

**IV. International obligations from WARC-79 require that FSS be given favorable consideration below 3700 MHz.**

We believe that the Commission's objectives to foster the development of newer types of FS operations like FWA in the 3650-3700 MHz band need not be, and should not be, achieved at the expense of FSS. This is particularly so considering the history of the U.S. efforts with numerous other countries in the ITU at WARC-79 to find ways to make the FSS allocated band below 3700 MHz more useable for satellite services. While, to date, this has been possible only to a limited degree, we see no reason why FSS earth stations should not continue to be authorized in this band subject to appropriate coordination with Government operated radars grandfathered in the band and mobile Government radars operating in adjacent bands.

Given the transfer of the 3650-3700 MHz band for commercial operations pursuant to the Omnibus Budget Reconciliation Act of 1993 ("OBRA-93"), now is the time for the Commission to consider ways to expand FSS in the band. Government radar operations have prevented any extensive use of FSS below 3700 MHz over the years. Now that some relief from radar interference is possible, this is not the time, nor are there any reasons for the Commission to freeze FSS use of this band. To the contrary, the commitments made among countries at the 1979 WARC to find ways to use the 3400-3700

MHz band for FSS should be a strong reason for the Commission to focus now on expanding use of FSS below 3700 MHz.

We were encouraged, when in March 1996, the Commission, pursuant to OBRA-93, adopted a *Plan for Reallocated Spectrum* which indicates that the 3650-3700 MHz band could perhaps be used for additional FSS services.<sup>14</sup> Indeed, we support the Commission's proposals to reduce the potential interference from Government radars operating in the 3650-3700 MHz band. This should improve the operating climate for FSS as well as for any new FS operations in the band. Nevertheless, we have doubts about the ease with which new FS services may be able to operate satisfactorily even given the new "improved" radar environment. On the other hand, sharing between FSS and FS could be accomplished in a way that will permit both services to grow.

### **Conclusion**

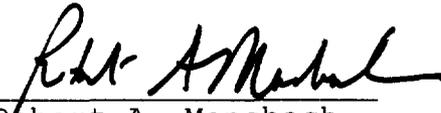
For the reasons stated above, COMSAT supports continued operation and expansion of FSS U.S. earth stations in the 3650-3700 MHz band. We believe that appropriate sharing

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<sup>14</sup> See *Plan for Reallocated Spectrum*, 11 FCC Rcd 17841 (1996). See also, NPRM at para.5.

arrangements can be developed that would permit FSS and new FS services to share and to expand on a co-primary basis in this band, in furtherance of the public interest.

Respectfully submitted,  
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February 16, 1999  
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ATTACHMENT

A summary of the INTELSAT satellite transponders affected by constraints on 3650-3700 MHz band, as well as service status on these transponders is as follows:

Satellite/ Location	Transponder Size	Affected %
IS-805/304.5E	2x36 MHz	100%
IS-601/325.5E	1x72 MHz	62%
IS-904/325.5E	2x72 MHz	70%
IS-801/328.5E	1x72 MHz	70%
IS-605/332.5E	1x72 MHz	70%
IS-603/335.5E	1x72 MHz	62%
IS-903/335.5E	2x72 MHz	70%

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Comments of COMSAT Corporation were mailed this 16<sup>th</sup> day of February 1999 to the following by U.S. mail, postage prepaid:

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