BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C.

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Redesignation of the 17.7-19.7 GHz Frequency	)	Docket No. 98-172
Band, Blanket Licensing of Satellite	)	
Earth Stations in the 17.7-20.2 GHz and	)	
27.5-30.0 GHz Frequency Bands, and the	)	RM-9005
Allocation of Additional Spectrum	)	RM-9118
in the 17.3-17.8 GHz and 24.75-25.25 GHz	)	
Frequency Bands for Broadcast	)	
Satellite Service Use	)	

REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.

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SUMMARY

The record in this proceeding demonstrates that the band plan proposed by the Commission in the *Notice* does not meet the minimum spectrum requirements of Ka-band GSO/FSS licensees. Such systems need 1000 MHz of unencumbered spectrum in the 18 GHz bands.

In order to meet GSO/FSS requirements, the Commission should replace its current draft proposal with a band plan that dedicates 500 contiguous MHz of spectrum to GSO/FSS between 18.1 GHz and 18.8 GHz, in addition to maintaining the exclusive primary designation for GSO/FSS from 19.7-20.2 GHz. The Commission also should require that licensees of other services in these bands re-locate by a date certain. GE Americom's proposal will better achieve the Commission's objective in this proceeding by accommodating various services' spectrum requirements without undue disruption to existing services.

Finally, with the exception of its stance on binding coordination agreements, the Commission should adopt the results of the Blanket Licensing Working Group ("BL/WG"), which are the consensus of nearly all satellite entities. In particular, the Commission should reject attempts by a few commenters to overturn the core technical findings of the BL/WG, including the uplink effective power maximum, or attempts to resolve prematurely issues not yet addressed by the BL/WG.

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To: The Commission

REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.

GE American Communications, Inc. ("GE Americom") hereby submits its response to comments filed with regard to the *Notice of Proposed Rulemaking* in the above-captioned matter, FCC 98-235 (released September 18, 1998) ("*Notice*").

INTRODUCTION

Commenters that understand the vibrant potential of Ka-band satellites to provide efficient, point-to-point and point-to-multipoint video, audio and data transmissions in the near future uniformly agree that geostationary fixed satellite services ("GSO/FSS") systems need 1000 MHz of unencumbered spectrum in the 18 GHz bands. In the *Notice*, the Commission proposed revisions to the allocation of spectrum in the bands between 17.7-20.2 GHz in an attempt to better accommodate

such spectrum requirements, including the sensible adoption of separate allocations for bands to be used by ubiquitous satellite terminals and terrestrial systems. *See Notice* at ¶ 19.

As the comments submitted in this proceeding make clear, the draft proposal does not provide the minimum spectrum that GSO/FSS systems will require in the 18 GHz bands. In light of the ultimate benefits of versatile GSO/FSS systems, including first- and last-mile connectivity and low incremental costs, the Commission must ensure sufficient satellite-dedicated spectrum now in order to enable GSO/FSS to achieve its promise in the near future. The Commission should reject band plans that would leave GSO/FSS with less than 1000 MHz of usable downlink spectrum between 17.7 and 20.2 GHz as irredeemably short-sighted. Rather, the Commission should replace its current draft proposal with a band plan that will meet the basic needs of the future of the U.S. Ka-band satellite industry, as well as the most critical needs of other potential users of the Ka-band. Also, with the exception of its stance on binding coordination agreements, the Commission should adopt the results of the Blanket Licensing Working Group, which are the consensus of nearly all satellite entities.

I. THE COMMENTS CONFIRM THE COMMISSION'S PRIOR FINDING THAT GSO/FSS SYSTEMS NEED 1000 MHz OF UNENCUMBERED SPECTRUM IN THE 18 GHZ BANDS

In July 1996, the Commission determined that "1000 MHz of spectrum is needed to support multiple . . . GSO/FSS systems" in the Ka-band.[1] Since that time, potential demand for satellite transmission services has not diminished.[2]

Comments responding to the *Notice* confirm that GSO/FSS systems require at least 1000 MHz of usable downlink spectrum. Hughes demonstrates that 1000 MHz of paired clean spectrum is critical to the commercial viability of Ka-band satellite systems. *See, e.g.*, Hughes Comments at 4-7. TRW adds that, in light of the need for on-board processing and point-to-multipoint transmissions of new satellite services, GSO/FSS cannot have less usable downlink spectrum in these bands than it has uplink spectrum in the 28 GHz bands. *See* TRW, Inc. Comments at 4-5. Other commenters, such as PanAmSat and Lockheed Martin, concur that 1000 MHz is the minimum amount of exclusive GSO/FSS spectrum that must be allocated in the 18 GHz bands. *See* Lockheed Martin Comments at 2-4; PanAmSat Comments at 2-3.

The Commission's draft band plan falls far short of this fundamental spectrum requirement. The proposed band plan would grant only 750 MHz of exclusive

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1 *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, 11 FCC Rcd 19005, 19029 (1996) (the "*28 GHz Order*.")

2 *See, e.g.*, Comments of Hughes Electronics, Inc. ("Hughes Comments") at 5 (noting that in the past two years, there has been an "unprecedented growth in demand for broadband capacity").

downlink spectrum to GSO/FSS. Furthermore, even that spectrum is not unencumbered, because the *Notice* proposes the grandfathering of terrestrial services.

Other proposals in the initial round of comments also fail to meet this most basic GSO/FSS spectrum requirement. Most prominently, the band plan proposal of the Fixed Section of the Telecommunications Industry Association ("Fixed Section") and the Fixed Wireless Communications Coalition (the "FWCC") would deny satellite services even 750 MHz of primary spectrum in the 18 GHz bands, while ensuring that FS is primary or co-primary in 1320 MHz in these bands. *See* Fixed Section Comments at 12-13. Furthermore, that amount does not include the spectrum that these entities would grant to "grandfathered" terrestrial services already operating in the bands supposedly reserved for satellite use.[3] In short, the Fixed Section and FWCC have proposed to allocate for fixed services at least four-fifths of the 1.1 GHz of spectrum that the Commission had allocated in 1996 to GSO/FSS and FS on a co-primary basis, *see* Hughes Comments at 4, and leave GSO/FSS with a largely unusable scrap of its initial co-primary allocation.

Other proposals, though not nearly as extreme as that of the Fixed Section and the FWCC, are no more satisfactory. Suggestions that the *Notice*'s proposal be modified by exchanging the GSO/FSS exclusive primary spectrum between 18.3-18.55 GHz for the suggested co-primary GSO/FSS and FS spectrum between

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[3] In fact, the Fixed Section would give GSO/FSS services only the 240 MHz from 18.58-18.82 GHz, which not only is limited by existing power-flux density and other government-related restraints, but also already has been channelized for narrowband use (thus resulting in significant existing usage of this 240 MHz by fixed services.) *See id.* at 15.

18.55-18.8 GHz[4] still would fall short of the 1000 MHz minimum spectrum requirement for GSO/FSS systems in these bands. The proposal also would subject 250 MHz of supposedly GSO/FSS-exclusive spectrum to the technical restrictions imposed on domestic satellites by Earth Exploration Satellite and Space Research systems from 18.6-18.8 GHz. Although it is possible that these restrictions will be removed in time for satellite companies to design and deploy their satellite systems, the Commission should not ask GSO/FSS to accept the risk that these restrictions might be maintained without ensuring replacement spectrum or taking other precautionary measures.

II. THE *NOTICE*'S GRANDFATHERING AND SHARING PROPOSALS EXACERBATE THE LACK OF DOWNLINK SPECTRUM DEDICATED FOR GSO/FSS USE

The band plan in the *Notice* not only fails to provide sufficient spectrum for GSO/FSS requirements, but also proposes to protect indefinitely existing terrestrial services in what is to be "satellite" spectrum. Even FS commenters acknowledge that neither fixed services nor fixed satellites can operate in such circumstances. *See, e.g.*, Fixed Section Comments at 8; Cellular Telecommunications Industry Association Comments at 4. Specifically, FS operators are right to recognize that fixed services grandfathered in satellite-exclusive spectrum would find it virtually impossible to modify or update their systems without interfering with protected satellite operations. *See id.* Such consensus among all types of operators against grandfathering is not surprising -- the grandfathering proposal is itself an inexplicable exception to the

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4 *See, e.g.*, KaStar Satellite Communications Corp. Comments at 8-10.

Commission's objective in this proceeding of separating fixed services from satellite services whenever possible in the 18 GHz bands. As perpetual grandfathering proposals would not further this sensible approach to the 18 GHz allocations, they should be rejected.

Comments from a number of parties also establish that the current proposal to share 250 MHz between FSS and FS on a co-primary basis is based on incorrect or outdated assumptions. In the *Notice*, the Commission suggested that GSO/FSS could use the co-primary spectrum for gateway services, citing the proposal of Lockheed Martin as an example. *See Notice* at ¶ 32. But Lockheed Martin now has stated that even it does not believe that its planned system could use this mixed spectrum efficiently. *See* Lockheed Martin Comments at 3 (explaining that the "factors cited by the Commission no longer support its preliminary conclusions" that gateway systems might be able to use co-primary spectrum). Other commenters similarly reject subjecting any significant area of spectrum to co-primary sharing between space and terrestrial services. *See, e.g.*, Hughes Comments at 9-10. Accordingly, the Commission also should discard its proposal requiring FS and FSS to share 250 MHz of spectrum on a continuing co-primary basis when the more imminent need is for that additional 250 MHz to be made available for ubiquitous FSS terminals.

III. THE COMMISSION SHOULD REVISE ITS BAND PLAN TO ENSURE THAT GSO/FSS SYSTEMS HAVE ACCESS TO 1000 MHz OF USABLE SPECTRUM

Because of the shortcomings in existing proposals, GE Americom endorses the following plan for allocation of the 18 GHz bands:

- GSO/FSS would receive a sole primary designation of 500 contiguous MHz in the 18.1-18.8 GHz band, such as 18.1-18.6 GHz or 18.3-18.8 GHz.[5] In addition, GSO/FSS would maintain its exclusive primary designation from 19.7-20.2 GHz, but it no longer would be designated as co-primary from 17.7-18.1 GHz;

- FS would have exclusive primary rights up to 18.1 GHz and for spectrum not designated for GSO/FSS purposes between 18.1-18.8 GHz, as well as having co-primary rights with MSS/FL from 19.3-19.7 GHz; and

- NGSO/FSS and MSS/FL would maintain the allocations proposed in the *Notice*.

In addition, GE Americom proposes a roughly four-year transition period during which CARS or point-to-point microwave services currently located in the bands to be designated for exclusive GSO/FSS use would be required to relocate to other available spectrum. A number of frequency bands could potentially be used by these services, including at least one band currently designated for satellite use.

The advantages of this band plan are obvious. First and foremost, it guarantees GSO/FSS systems access to the 500 MHz of usable spectrum that they require between 17.8-19.7 GHz. Second, it would significantly reduce the extent to which terrestrial and space-based systems would have to share spectrum, either as co-primary services or because of permanent grandfathering. Third, it would enable FS

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[5] The Commission must designate this 500 MHz as soon as possible before GSO/FSS system designs can be finalized. An allocation from 18.1-18.6 GHz would ensure that the limitations on power-flux density in the 18.6-18.8 GHz band would not need to be lifted prior to construction of the relevant satellite systems. It is unlikely that the necessary relaxation of power-flux density restraints would occur prior to WRC-2000, and there is no guarantee that it would take place at that time. It will be much harder to identify replacement frequencies for satellites after WRC-2000. Accordingly, the Commission may wish to select a plan that does not rely on when and whether such changes occur.

systems to maintain the status quo with respect to much of the remaining spectrum designated for FS in these bands. Fourth, it would rely on a more economically rational solution than merely grandfathering as a means of transition by allowing FS licensees to select a new frequency from other available bands and to synchronize frequency changes with other necessary upgrades to their equipment.

The first advantage requires no further elaboration. GSO/FSS systems need 1000 MHz of unencumbered downlink spectrum to develop the next generation in satellite services, not 500 MHz of clean spectrum and 500 MHz of spectrum shared with fixed services on a co-primary or grandfathered basis.[6] Without sufficient downlink spectrum for ubiquitous terminals, GSO/FSS systems will not be able to make efficient use of their Ka-band spectrum allocation.

The second advantage also responds to a clear consensus of commenters: neither GSO/FSS nor FS systems can afford to share spectrum if they want to ensure the best service to their customers. Grandfathering would deprive GSO/FSS systems of access to usable spectrum because of the requirement that they protect terrestrial services that already have occupied the bands in urban areas. It also would render FS systems in GSO/FSS-primary bands unable to make the modifications or upgrades they might want while maintaining necessary protection of satellite operations.

As a third advantage, the plan makes it possible to leave spectrum allocations where most FS two-way licenses are located virtually intact, reducing the

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6 *See* GE Americom Comments at 4-9; Hughes Comments at 4-7, 9-10; PanAmSat Comments at 2-3.

need for new equipment or new transmit-to-receive split frequencies in these bands. *See* Comsearch Comments at 2. To the extent the plan may require frequency re-location of certain CARS or other licensees in the 18.1-18.8 GHz region, that effect is not substantively different from the re-locations required by the Commission's plan, which would splinter the available video point-to-multipoint band of spectrum in half.[7]

The fourth and final advantage, which already has been underscored by commenters in this proceeding, is that GE Americom's proposal would offer a means for a rational and economically efficient transition from existing spectrum use to the future plan. As Teledesic demonstrates, a permanent grandfathering of any system "is the worst possible state of affairs as far as efficiency is concerned." Teledesic, LLC, Comments at 13. The above proposal therefore suggests a framework similar to those employed by the Commission in proceedings such as digital television or the *Emerging Technologies* rule making: a transition period during which existing licensees have a temporary right to stay until some contingency happens or a fixed date is reached. Here, the Commission should set December 31, 2002, as the deadline for frequency relocation of FS systems. After that date, all remaining FS systems in GSO/FSS-specified bands will have only secondary allocations.

Such a "sunset" approach to existing terrestrial licensees in this 500 MHz of spectrum makes the most economic and common sense, as it allows terrestrial

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[7] Loral has suggested that secondary FS licensees, to the extent that such are allowed in exclusive GSO/FSS bands, should be required to perform a specific technical demonstration that their use will not cause interference to primary service users. *See, e.g.*, Loral Comments at 7-8. If the Commission actually adopts such secondary designations, it also should adopt such a technical showing requirement.

services time to move, but creates certainty as to the time satellites will be able to use their entire range of dedicated spectrum. Also, by creating incentives for CARS and other FS licensees in the 18.1-18.6 GHz bands (collectively, "CARS") to change frequencies, the sunset strategy would encourage FS systems to move to bands where they have flexibility to modify and expand their operations without causing interference to satellite operations. In addition, the approach would ensure that constructed GSO/FSS systems could not be held hostage by FS licensees that refuse to depart from the satellite-dedicated spectrum.

Nor is the requirement that CARS licensees re-locate impractical. First, a number of bands are possible alternatives for CARS re-location, including the 12.75-13.25 GHz band and the upper 21 GHz band. The former has the benefit of requiring less power and of being less subject to rain attenuation;[8] the latter has the benefit of requiring smaller ground facilities, which was cited by a number of commenters as an attractive feature of higher frequency fixed services. *See, e.g.,* Airtouch Communications, Inc. Comments at 12 n.22. GE Americom believes that such alternate bands could accommodate all of the re-located CARS facilities as necessary. Second, CARS and other video point-to-multipoint services also will be affected by the digital revolution in the next few years: as cable systems move from their heavy dependence on CARS to fiber optic lines in order to better support their digital offerings, it would be expected that CARS operations would become less prevalent or, at the very least, would

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8 It also is currently planned for GSO/FSS satellite use. As a result, the proposed change is really only a swap of spectrum, giving FS services more spectrum in the 13 GHz band in exchange for their spectrum in the 18 GHz band.

have to switch from analog to digital operations. In either case, any required departure of CARS licensees from the 18 GHz bands during the next few years can coincide with these events, which would mean that any change of frequency required by the above proposal may occur as part of these independent changes. Third, as CARS licensees periodically must replace their equipment in any case, a transition period extending into the next millennium should enable them to do so with equipment using their new frequencies as a matter of course.

This plan is not radical. In fact, it is similar to allocation plans advanced by the Telecommunications Industry Association -- Spectrum and Orbit Utilization Section ("TIA-SOUS") and TRW, each of which recognizes that GSO/FSS systems require a total of 1000 MHz of unencumbered downlink spectrum in the 18 GHz bands. *See* TIA-SOUS Comments at 4; TRW Comments at 5; *see also* Loral Comments at 4-7 (underscoring the need for a transition period for re-locating terrestrial systems, rather than grandfathering). It also adheres in major respects to the Commission's own proposal, while eliminating the need to require co-primary sharing between terrestrial and space services in the 18.6-18.8 GHz band. As a result, this plan is fully consistent with the goals of the Commission: to ensure sufficient spectrum for satellite and fixed services; to separate satellite and fixed services into different areas of the spectrum; and, insofar as possible, to minimize disruption to settled allocations. Accordingly, the Commission should adopt this proposal as its new band plan, whether as a response to the *Notice* or as its band plan proposal in a further notice in this proceeding.

IV. WITH ONE EXCEPTION, THE COMMISSION SHOULD ADOPT THE BLANKET LICENSING WORKING GROUP'S CONCLUSIONS

As noted in the Comments, U.S. Ka-band GSO/FSS applicants -- including GE Americom -- have worked since spring of 1997 to develop operational parameters for the blanket licensing of small Ka-band GSO/FSS earth stations through the Blanket Licensing Working Group (the "BL/WG"). As a result of these efforts, the BL/WG submitted a report that summarizes the issues on which the parties were largely able to come to an agreement. *See* Report of the GSO Ka-Band Blanket Licensing Industry Working Group (the "*BL/WG Report*"). The *BL/WG Report* analyzes several technical issues, including downlink power flux spectral density ("PFD") limits, uplink off-axis EIRP density limits, uplink power control, earth station antenna pointing accuracy, and earth station cross-polar performance. GE Americom continues to support the *Report*'s conclusions on each of these issues, and asks that the Commission adopt these requirements immediately with respect to GSO/FSS primary allocations between 19.7-20.2 GHz and 29.5-30.0 GHz, and as soon as possible with respect to other primary designations of GSO/FSS in these bands.

GE Americom also approves the BL/WG's conclusion that a U.S.-licensed satellite operator may exceed the blanket licensing limits if it successfully coordinates the proposed operation with all U.S.-licensed satellite networks. However, GE Americom asks that the Commission recognize that, once such a coordination agreement is reached, its duration should depend on the terms of the parties' agreement, and not whether there are changes in the usage of nearby orbital slots. As

PanAmSat notes, allowing agreements only "as long as operators who are [the initial] parties to the agreement remain . . . is not realistic and would impose an unreasonable risk on satellite operators." PanAmSat Comments at 8. Accordingly, GE Americom continues to urge the Commission to state that any new orbital assignments would be subject to existing coordination agreements under the blanket licensing rules.[9]

GE Americom disagrees with the few satellite commenters that contradict the core technical findings of the *BL/WG Report* or that would attempt to resolve issues that were not yet addressed by the BL/WG at this time. Notably, Hughes has continued to press for an uplink effective power maximum some 5 dBW/MHz less than that agreed to by the overwhelming majority of parties to the BL/WG. *See* Hughes Comments at 22-24. Such an approach does not make sense for GSO/FSS systems, some of which would not be able to operate small terminals satisfactorily with such a stringent uplink power limitation. Furthermore, for all GSO/FSS systems, the Hughes uplink power level would unnecessarily limit these systems' implementation of new technologies or their ability to cope with unexpected interference to their operations. The Commission should reject Hughes' proposal, which appears based on outdated information and incorrect assumptions, in favor of the strong BL/WG consensus, and the similar results emerging from European standards studies.

Likewise, Motorola has proposed requiring use of a satellite beacon for tuning ground antennas, automatic transmission of a station identifier by blanket-

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9 The Commission also should take steps to ensure that 1000 MHz of uplink spectrum is also available to GSO/FSS, including enabling blanket licensing of terminals in the 29.5-30.0 GHz band. *See* Hughes Comments at 24-25.

licensed ground terminals, and coordination by non-blanket licensed GSO systems within 12 degrees. *See* Motorola, Inc. Comments at 17-18. Also, Motorola has urged that the Commission establish GSO/NGSO sharing in this proceeding. *Id.* at 8. In addition, TRW suggests that the downlink pfd limit should be raised in heavy rain areas. TRW Comments at 8.

The Commission should not act on any of these proposals at this time. With respect to GSO/NGSO sharing rules, the Commission should defer any decision until such time as the ITU has completed its deliberations relating to this issue. Otherwise, the Commission should encourage continued efforts by the BL/WG to resolve these issues, and certain other matters, such as the extent to which the Commission's two-degree blanket licensing rules should apply to two U.S. licensees within two degrees of each other, but outside of the domestic arc, and issues relating to uplink power control and earth station cross-polar performance. GE Americom requests that the Commission postpone any action on these matters until the BL/WG has had an opportunity to address them fully.

CONCLUSION

GE Americom urges the Commission to adopt the above-proposed 18 GHz band plan and to take the other steps outlined above to ensure that 1000 MHz of unencumbered spectrum is available for GSO/FSS systems in the Ka-band. This action

is necessary to permit Ka-band satellite systems to perform their crucial role in providing advanced communications services to the public.

Respectfully submitted,

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