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

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Federal Communications Commission
Office of Secretary

In the Matter of	)	
	)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95 RM-8811

REPLY COMMENTS OF ADVANCED RADIO TELECOM CORP.

ADVANCED RADIO TELECOM CORP.

By its Attorneys

Stephen D. Hayes
Valerie M. Furman

W. Theodore Pierson, Jr.
Of Counsel

Pierson & Burnett. L.L.P.
1667 K Street, N.W.
Suite 801
Washington, D.C. 20006

(202) 466-3044

June 3, 1997

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EXECUTIVE SUMMARY

Advanced Radio Telecom Corp. ("ART") reiterates its support for the FCC's band segmentation approach and supports the specific band plan proposed by the Commission in the *NPRM*, as well as the suggested improvements thereto included in the alternative band plan proffered by the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association ("TIA").

With little exception, the comments objected only to the amount of spectrum and the specific frequencies that would be available for satellite systems under the band segmentation scheme, and not to the fundamental conclusions that sharing is infeasible and spectrum segmentation is necessary. As such, the principle issue for decision by the Commission should not be whether segmentation is the correct approach, but rather what form the band segmentation should take.

Although the prime objection to the Commission band plan is that the proposed satellite allocations allegedly are "inadequate" to satisfy the anticipated "needs" of the satellite industry, the objecting commenters fail to offer much specificity regarding what those needs might be, nor do they offer a single alternative band plan for consideration by the Commission and the public.

The satellite companies objecting to the Commission's band plan bandy about numbers regarding the total spectrum to be allocated to terrestrial fixed and satellite services before and after the FCC's plan, without any recognition of the real benefits to

be derived by them through uncompromised use of the spectrum to which they would be entitled under the plan. The new band plan and its resulting band segmentation would allow *both FSS and FS* to utilize their allocated spectrum much more efficiently, and both services will experience a *net gain in usable spectrum* as a result. Thus, despite their protestations, the band plan is much better for the satellite industry than the current situation.

The satellite industry seemingly fails to appreciate the realities of actual spectrum *usage* around the world, and the fact that time is not on their side in this matter. Services are being licensed and operated in the bands above 36 GHz at an increasing pace. Thwarting U.S. action to preserve the ability of the satellite industry to develop in the future a sizable portion of the spectrum above 36 GHz would be contrary to the long term interests of the satellite industry. Thus. it is in the interests of all to work to find a reasonable, mutually-beneficial position that protects the remaining spectrum for viable use by terrestrial and satellite systems now and in the years ahead.

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

In the Matter of	)	
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Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95 RM-8811

To: The Commission

REPLY COMMENTS OF ADVANCED RADIO TELECOM CORP.

Advanced Radio Telecom Corp. ("ART"), by its attorneys, respectfully submits its Reply Comments in the above-captioned notice-and-comment rulemaking proceeding, pursuant to the *Notice of Proposed Rulemaking* (*"NPRM"*) released March 24, 1997, and the extension of time for filing reply comments granted on May 12, 1997.[1]

I. ART Continues to Support the Commission's Approach

In the comments filed in the captioned proceeding, substantial support was expressed for both the concept of band segmentation in the subject frequency bands, as

[1] *Order,* IB Docket No. 97-95, May 12, 1997.

well as the details of the specific segmentation plan proposed by the Commission.[2] ART supported the concept of band segmentation in its Comments and reiterates its support for this approach in these Reply Comments. Further, as discussed in greater detail below, ART supports the specific band plan proposed by the Commission in the *NPRM*, as well as the suggested improvements thereto included in the alternative band plan proffered by the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association ("TIA").[3]

Perhaps most noteworthy in the comments filed in response to the *NPRM* is not the fact that certain objections were raised to the FCC band plan (primarily by satellite industry companies or representatives) but that, with little exception, the commenters objected only to the *amount* of spectrum and the specific *frequencies* that would be available for satellite systems under the band segmentation scheme, and *not* to the

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[2] *See generally* Comments of ART, Alcatel Network Systems, BizTel, the Fixed Point-to-Point Communications Section of the Network Equipment Division of the Telecommunications Industry Association, Teledesic and WinStar Communications. See, in particular, the Comments of Teledesic, in which they endorse band segmentation to separate both ubiquitous terrestrial and satellite services, as well as GSO and NGSO satellite operations.

[3] Comments of TIA, Appendix A. Copies of both the FCC band plan and the alternative TIA band plan as presented in Appendix A of the Comments of TIA are included here for ease of reference as Attachments 1 and 2, respectively.

fundamental conclusions that sharing is infeasible and spectrum segmentation is necessary.[4]

As discussed in its Comments, ART's primary concern in the bands above 36 GHz is the continued technical integrity and economic viability of its current and future terrestrial broadband fixed service ("FS") in the 38.6 to 40.0 GHz ("38 GHz") band. The increasing ubiquity of this service in the United States and other countries around the world effectively precludes the sharing of these frequencies (and the limited expansion frequencies sought for this service) with many satellite services, especially as proposed by Motorola in its M-Star application and as suggested by some of the commenters to this proceeding. The studies that ART has commissioned, and the other evidence which ART has seen to date, have convinced us that band segmentation is a necessary precondition to the long-term viability of both its own terrestrial service and the future satellite services proposed or suggested for the bands above 36 GHz.[5] Indeed, the Commission reached the same conclusion in the *NPRM*.

Based on the comments filed in this proceeding, it is fair to conclude that the need for and wisdom of band segmentation in the 36-51 GHz bands is widely accepted. Accordingly, the principle issue for decision by the Commission should not be whether

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[4] *See generally* Comments of GE American Communications, Hughes Communications, Lockheed Martin Corporation, Motorola Satellite Systems, the Satellite Industry Association and TRW (collectively, the "Satellite Comments").

[5] Comments of ART, pp. 5-13.

segmentation is the correct approach, but rather what form the band segmentation should take.

To the extent the details of the FCC's band segmentation plan affect the specific frequencies available now, or to be made available in the future, to ART for FS in the United States, ART endorses the specifics of the plan. With regard to the remainder of the frequency bands from 36 to 51 GHz, ART largely supports the Commission's proposals, albeit with the caveats already expressed in its Comments, especially with regard to the "underlay" service concept.[6] (As discussed more fully below, TIA has offered a modification to the FCC's basic band plan which ART endorses.) The Commission's plan (and the TIA modification) attempts to accommodate the greatest number of radio services above 36 GHz, but does so within the bounds of the current and near-term *realities* in the licensing and usage of these spectrum bands under the existing domestic and international regulatory environment. In particular, the band plan reflects a realistic view of the difficulties of spectrum sharing among the services which now inhabit, or are proposed to inhabit, these frequencies.

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[6] *Id.* at pp. 15-16.

II. The TIA Alternative Band Plan Offers Useful Improvements

A number of the commenters from the satellite industry expressed their displeasure with what they view as inadequacies in the FCC's plan.[7] Yet none of these commenters offers a single alternative band plan. Indeed, the only alternative plan offered was one proposed by TIA, which has generally been an outspoken advocate for band segmentation throughout the filings, presentations and meetings preceding the issuance of the *NPRM* in this proceeding.[8] In its comments, TIA offers a slightly-revised band plan that it effectively argues would better accommodate the needs of *both* FS and satellite interests above 36 GHz by offering larger contiguous frequency blocks and greater consistency with current international allocations,[9] both of which are key issues in many of the satellite industry comments.[10]

ART believes that the TIA alternative offers improvements over the Commission's original band plan that are consistent not only with its interests but also those of the satellite industry. As such, ART endorses the TIA modifications to the FCC

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[7] *See* Satellite Comments.

[8] *See Report of the Ad Hoc Millimeter Wave Group on U.S. Proposals for Agenda Item 1.9.6 of WRC-97*, dated March 5, 1997, and the associated committee files.

[9] Comments of TIA. pp. 15-17.

[10] *See, supra,* note 4.

band plan proposal, and believes that the Commission should seriously consider the trade-offs and benefits of adopting these modifications to its own band plan.

III. The Satellite Commenters Again Fail to Offer Specifics of Their Spectrum Requirements or to Suggest Concrete, Alternative Plans

As noted, there was little objection to the FCC's proposal to segment the bands above 36 GHz. On the contrary, the prime objection to the Commission's band plan is that the proposed satellite allocations allegedly are "inadequate" to satisfy the anticipated "needs" of the satellite industry. Yet, as throughout the months of meetings and filings preceding the issuance of the *NPRM* in this proceeding, the commenters who raise these objections fail to offer much specificity regarding what those needs might be.

Since these commenters do not have operating systems in the relevant bands - and by their own admission will not have such operating systems for many years to come - it admittedly is difficult for them to provide the type of well-defined spectrum requirements that companies like ART, BizTel, WinStar and other currently-operating FS systems can provide. Nevertheless, given the impact that their spectrum "demands" will have on FS and other services, before the Commission can seriously consider their demands for huge contiguous blocks of radio spectrum, it should be necessary for these satellite companies to provide more than largely-unsupported speculation regarding their spectrum needs at some indefinite point in the future. Yet these companies have failed to provide anything approaching this needed level of specificity in defending their assertions that the proposed band plan allocations are deficient:

- Lockheed Martin, for example, states merely that the Commission's plan "does not include satellite allocations of sufficient bandwidth to enable the implementation of the multiple types of satellite services that are capable of utilizing the frequencies above 36 GHz" but offers no more detail or support.[11]

- Similarly, Motorola states that the FCC plan would "severely impair the viability of broadband satellite systems worldwide" and that the allocation of 6 GHz of spectrum "would meet the demonstrated system needs of the M-Star System and the expected demand for spectrum by other FSS system operators."[12] But the spectrum needs of the M-Star system, while stated in the M-Star application, have not been "demonstrated," nor have the "needs" of these other potential system operators.

- Without offering a shred of concrete support, GE American demands *eight gigahertz* of satellite spectrum above 36 GHz to provide for the unspecified "needs of the satellite industry now and in the immediate future."[13]

- Hughes argues that the proposed band plan "does not sufficiently anticipate the future spectrum needs for satellite services," but does not offer any specific data regarding what those needs might be. Meanwhile, Hughes would require more from others

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[11] Comments of Lockheed Martin, p. 3.

[12] Comments of Motorola Satellite Systems, pp. 5-6.

[13] Comments of GE American, p. 5.

when it complains that the FCC "threatens to move forward with reallocations or designations" in the bands above 36 GHz "while significant contingencies that affect the assumptions underlying the *NPRM* proposals remain unresolved," such as "the amount and extent of spectrum needed by government users."[14]

Despite their objections to the band plan proposed by the Commission, none of these commenters offers a single alternative band plan for consideration by the Commission and the public. It was only the Fixed Point-to-Point Section of TIA that proposed an alternative plan which attempts to better address the needs and requirements of the satellite industry. In sum, the commenters objecting to the specifics of the Commission's proposed band plan have completely failed to provide solid arguments for realistic improvements in the band segmentation scheme that would better meet their spectrum requirements, or to support those requirements.

IV. The Satellite Comments Have a Misplaced Focus on a Spectrum Count and Fail to Acknowledge the Benefits to the Satellite Industry From Band Segmentation

The satellite companies objecting to the Commission's band plan bandy about numbers regarding the total spectrum to be allocated to terrestrial fixed and satellite services before and after the FCC's plan (including percentages of reductions in "available" spectrum under the band plan), without any recognition of the real benefits to

[14] Comments of Hughes Communications, pp. 3, 10.

be derived by them through uncompromised use of the spectrum to which they would be entitled under the plan.[15]

To help clarify the true impact of the proposed band plan, and its ultimate practical benefits for the involved services, ART expands upon the discussion in its Comments of the "before and after spectrum count" resulting from the band plan, and the tangible benefits that will result from band segmentation:

- Under the current U.S. Table of Allocations, FS is allocated a total of just over 39 GHz of spectrum up through 100 GHz. Fixed satellite services ("FSS"), mobile satellite services ("MSS"), and broadcast satellite services ("BSS") combined are allocated a total of about 58 GHz, with the majority of this spectrum - almost 33 GHz - allocated to FSS. Thus, FS and FSS are currently very close in overall spectrum allocated to each other. (And the three satellite services combined have a substantially larger amount of spectrum allocated to them.) These numbers do not reveal, however, the actual "availability" or "usability" of these allocations under current licensing conditions around the world.

- Of the 5900 MHz allocated to FSS between 36 and 51.4 GHz, 4000 MHz is allocated for uplinks, but only *1900 MHz* is allocated for corresponding downlinks. As a result, under current allocations this 5900 MHz of *allocated* spectrum results in only 3800

[15] *See, e.g., id.* at pp. 1-2, Comments of GE American, p. 3, Comments of Lockheed Martin, p. 8.

MHz of *usable* paired frequencies, with the remaining *2100 MHz* being unusable for two-way services.

- Furthermore, of this 5900 MHz of FSS spectrum, 5400 MHz - or 92 percent - is co-primarily allocated to FS. (This 5400 MHz of shared spectrum amounts to 16.5 percent of all FSS spectrum up to 100 GHz.) As a result, the "usability" of this 92 percent of the FSS-allocated spectrum in the relevant bands is "compromised" through potential sharing conflicts with terrestrial services, which already have a headstart of several years. For FS, 6400 of the 9200 MHz of the spectrum allocated to the service between 36 and 51.4 GHz (or 70 percent) is currently shared with satellite services (or 16.4 percent of the total FS spectrum up to 100 GHz). As a result, the usability of this 70 percent of the FS-allocated spectrum in the relevant bands is similarly compromised through potential sharing conflicts with satellite services.

- Under the band plan proposed by the FCC, FSS will be allocated less spectrum overall - 4000 MHz (as opposed to 5900 MHz) - but an equal amount of spectrum, 2000 MHz, will be allocated for uplink and downlink channels. Importantly, none of the FSS spectrum will be shared with terrestrial services (although the FCC has proposed some new type of service underlay in these bands). FS also would be allocated less spectrum overall on a primary basis - 7800 GHz - but only 1000 MHz would be shared with satellite services.

- As a result, while FSS would experience an overall reduction in allocated spectrum (but of less than six percent) under the band plan proposal (and FS spectrum would be be reduced by 3.5 percent), *none* of the FSS spectrum will be shared with terrestrial services[16] (as opposed to 92 percent today). Thus, fully *100 percent* of the FSS spectrum will be free of increasing compromise in the years ahead from high-density terrestrial applications. For FS, only 12.8 percent of its allocated spectrum, instead of 70 percent, will be shared with satellite services.

- The reality, then, is that the new band plan and its resulting band segmentation would allow *both FSS and FS* to utilize their allocated spectrum much more efficiently, and both services will experience a *net gain in usable spectrum* as a result. Thus, despite their protestations, the band plan is much better for the satellite industry than the current situation.

V. *Moving Forward* is in the Best Interest of the Satellite Industry

The satellite industry seemingly fails to appreciate the realities of actual spectrum *usage* around the world. It is axiomatic that where several services are co-assigned to the same frequency band, operational use by one service can preclude use by a second

[16] Under the FCC's proposal, this spectrum may be subject to some form of terrestrial service "underlay." ART has substantial questions about what characteristics, rules and limitations would apply to underlay services, as expressed in its Comments. However, if the concept is adopted as the Commission appears to propose, it would seem to avoid the type of sharing issues existing in this spectrum today.

service. Time is clearly not on the side of the satellite industry with regard to preserving its ability to effectively utilize spectrum above 36 GHz.

Services are, today, being proposed, licensed and operated in the bands above 36 GHz at an increasing pace. (See the discussion of the usage of these bands in the United States and Europe, below.) The thwarting of domestic and international action *now* by the United States, which would preserve the ability of the satellite industry to develop in the future a sizable portion of the spectrum between 36 and 51 GHz, would be counter-productive to the long-term interests of the satellite industry.

As the FCC is well aware, and as the satellite industry should understand, many hundreds of licenses have been issued around the United States to provide service in the 38 GHz band in increasingly higher-density deployments.[17] Spectrum for stratospheric FS stations in the 47-48 GHz band have recently been designated by the FCC as well.[18] In Europe, high-density FS applications are licensed in many nations between 37 and 39.5 GHz pursuant to CEPT Recommendation T/R 12-01. The 40.50-42.50 GHz band has been designated for multipoint video distribution systems pursuant to CEPT Recommendation T/R 52-01, but its actual deployment is not yet widespread. In addition, the 36-37 GHz band is a harmonized NATO band for fixed and mobile systems, the 39.50-40.50 and 42.50-43.50 GHz are being eyed for possible use for broadband mobile

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[17] *See Spectrum Inventory Table,* DA96-1704, October 16, 1996.

[18] *Order,* FCC 97-153, May 2, 1997.

systems, and the 47.20-50.20 GHz may be designated in part for feeder links for 40 GHz broadcasting satellites.[19] In the rest of the world, where spectrum usage is much less well publicized, there are likely other current and potential uses being considered in these bands.

The message here is that the use of the 36-51 GHz bands around the world is not awaiting satellite industry approval. The clock cannot be stopped or turned back. Delayed action may result in the evaporation of much of the spectrum that would otherwise be usable for satellite systems. It is, therefore, in the very real interest of the satellite industry to work with the U.S. government and the other involved industries to find a reasonable, mutually-beneficial position that protects the remaining spectrum for viable use by terrestrial and satellite systems now and in the years ahead. Armed with such a position today, the United States can take a leadership role on the relevant issues in international fora. Otherwise, the United States government will be forced into a more passive position that will likely threaten the long-term interests of U.S. companies, terrestrial and satellite alike. And most assuredly, if the United States delays in developing a strong position, the continued use of the spectrum by other systems around the world would continue unabated.

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[19] *See CEPT Report Concerning the Frequency Bands 960 MHz to 105 GHz and Associated European Table of Frequency Allocations and Utilizations,* ERC Report 25, Part 5.

VI. The Commission Should Not Wait to Act on the Band Plan, Nor Should All Services Be Held Hostage to the Demands of a Single Service

The Satellite Comments generally advocate waiting until after the upcoming WRC-97 or beyond to finalize the domestic band plan because of the international issues that the proposed plan entails. Speedy action, they argue, is inimical to the interests of the satellite industry and forces them to accept too much risk. As discussed above, ART believes that delay by the Commission and the United States Government is not in the interest of any affected service, and is especially contrary to the interests of the satellite industry.

It is ironic that the Satellite Comments complain about the assumption of risk by the satellite industry, when the industry itself has so recently been quite willing to "accept" risk. ART refers, specifically, to the recent changes in the satellite licensing rules, including the authorization of pre-licensing construction by satellite companies *at their own risk,* and their unflinching assumption - indeed their virtual inviting of - such risk.[20] The true risk that should be unacceptable to these commenters in the instant proceeding is the risk of doing nothing. Inaction thwarts the ability of the United States

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[20] *See generally* the docket file in *Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures,* IB Docket No. 95-117, and especially Comments of GE American Communications, p. 3, Comments of Hughes Communications Galaxy, p. 2, Comments of Motorola Satellite Communications, pp. 2-4, Reply Comments of Hughes Communications Galaxy, pp. 1-3, Reply Comments of Motorola Satellite Communications, pp. 3-7.

government to successfully advocate a position domestically and internationally that preserves the ability of the satellite industry to operate years from now in the fast-developing bands above 36 GHz.

Regardless of the view of the satellite industry concerning the risks of proceeding versus the risks of waiting, other affected services - and especially services like ART's, which are in existence and are growing rapidly in an environment already filled with risk - should not be forced to await the final determination of every single hertz of the 36-51 GHz band before they can proceed with their businesses. As the issues related to the particular bands in which ART (and other services) operates, or in the near term desires to operate, are able to be resolved, the Commission must act to enable these services to turn to the task of building systems and satisfying consumer demands. To do otherwise would put at risk the ultimate success of every service which operates or desires to operate above 36 GHz.

VII. Conclusion

For all of the foregoing reasons, ART continues to believe that the Commission is on the right track to finding a long-term solution to the sharing issues that currently affect the bands in which ART operates, or desires to operate, and to solving these problems for other valuable services that are likely to be implemented in the future, both terrestrially

and from space. The facilitation of the licensing, construction and long-term success of all of these services is in the public interest.

Respectfully submitted,

ADVANCED RADIO TELECOM CORP.

By: _____

Stephen D. Hayes
Valerie M. Furman
Its Attorneys

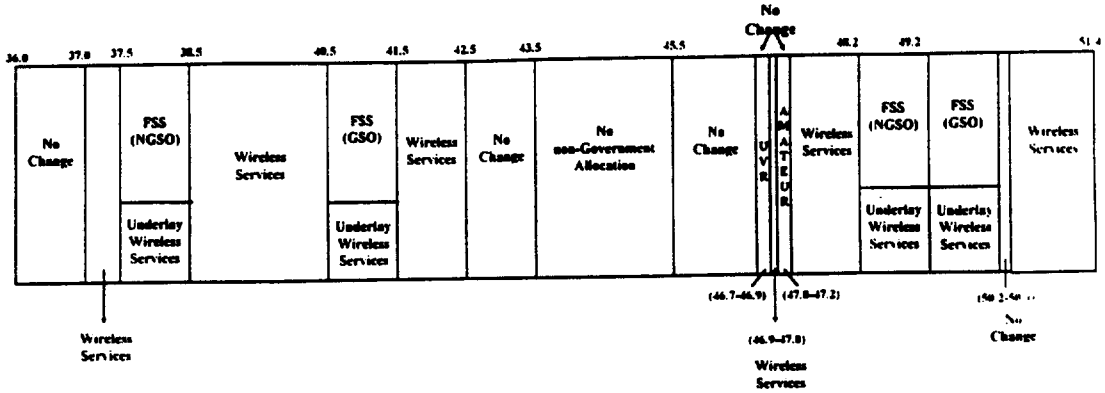
W. Theodore Pierson, Jr.
Of Counsel

Pierson & Burnett. L.L.P.
1667 K Street, N.W.
Suite 801
Washington, D.C. 20006

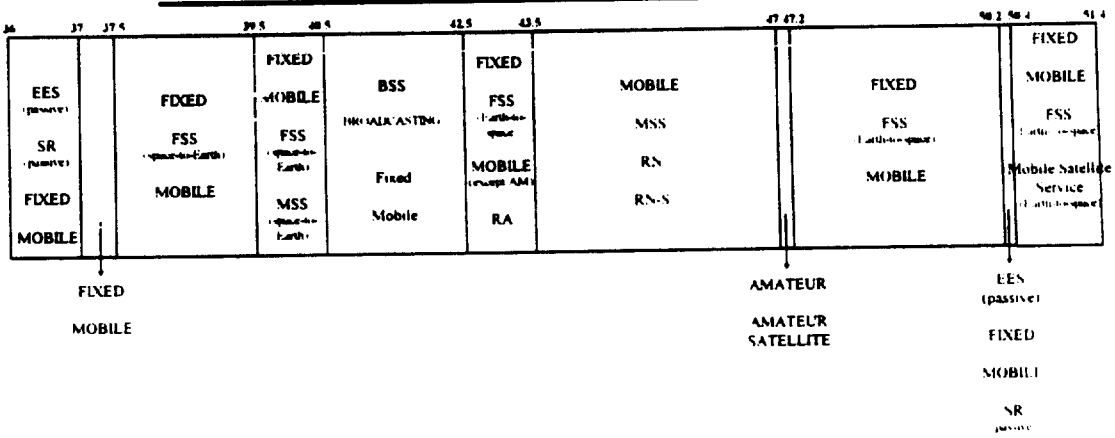
(202) 466-3044

Appendix C: CHARTS

BAND PLAN



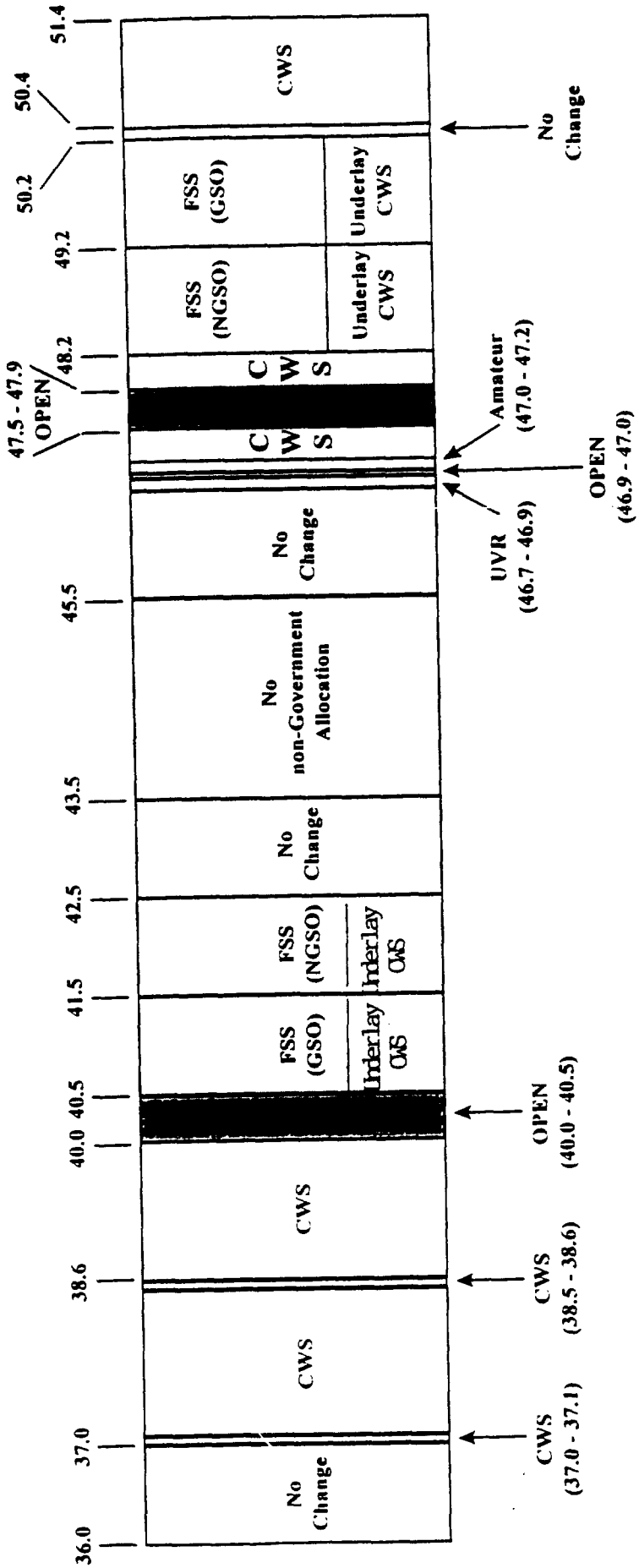
EXISTING INTERNATIONAL ALLOCATIONS*



* For Region 2

APPENDIX A

TIA Proposed Band Plan



CERTIFICATE OF SERVICE

I, Vinton M. Davis, hereby certify that I have on this 3rd day of June, 1997, caused copies of the foregoing "Reply Comments" to be delivered via regular mail, postage prepaid (except as indicated below), to the following persons:

*Chairman Reed E. Hundt
Federal Communications Commission
Room 814
1919 M Street, NW
Washington, DC 20554

*Peter Cowhey
Chief, International Bureau
Federal Communications Commission
2000 M Street, NW
Suite 800
Washington, DC 20554

*Commissioner James H. Quello
Federal Communications Commission
Room 802
1919 M Street, NW
Washington, DC 20554

*Ruth Milkman
Deputy Chief, International Bureau
Federal Communications Commission
2000 M Street, NW
Suite 800
Washington, DC 20554

*Commissioner Rachelle B. Chong
Federal Communications Commission
Room 844
1919 M Street, NW
Washington, DC 20554

*Virginia Marshall
International Bureau
Federal Communications Commission
2000 M Street, NW
Room 515
Washington, DC 20554

*Commissioner Susan B. Ness
Federal Communications Commission
Room 832
1919 M Street, NW
Washington, DC 20554

*Dan Python
Chief, Wireless Telecommunications Bureau
Federal Communications Commission
2025 M Street, NW
Room 5002
Washington, DC 20554

*via hand delivery

Timothy R. Graham
Leo I. George
Joseph M. Sandri, Jr.
Barry J. Ohlson
Winstar Communications, Inc.
1146 19th Street, NW
Washington, DC 20036

Philip L. Verveer
Michael F. Finn
C. Grace Campbell
Wilkie Farr & Gallagher
Three Lafayette Centre
1155 21st Street, NW
Washington, DC 20036

Norman P. Leventhal
Stephen D. Baruch
David S. Keir
Leventhal, Senter & Lerman
2000 K Street, NW
Suite 600
Washington, DC 20006

Scott Blake Harris
Mark A. Grannis
Gibson, Dunn & Crutcher, Llp
1050 Connecticut Avenue, NW
Washington, DC 20036

Fixed Point-to-point Communications
Section, Network Equipment Division, of
The Telecommunications Industry
Association
Denis Couillard, Chairman
Eric Schimmel, Vice President of TIA
2500 Wilson Boulevard, Suite 300
Arlington, VA 22201

Phiplip L. Speetor
Jeffrey H. Olson
Diane C. Gaylor
Paul, Weiss, Rifkind, Wharton & Garrison
1615 L Street, NW
Suite 1300
Washington, DC 20036

Lon Levin, SIA Co-Chair
Gerald Musarra, SIA Co-Chair
Satellite Industry Association
225 Reinekers Lane
Suite 600
Alexandria, VA 22314

Richard Parlow
Associate Administrator, NTIA
HCHB - U.S. Dept. of Commerce/NTIA
1401 Constitution Avenue, NW
Room 4099
Washington, DC 20230

Michael D. Kennedy
Vice President and Director
Satellite Regulatory Affairs
Motorola, Inc.
Suite 400
1350 I Street, NW
Washington, DC 20005

Philip L. Malet
James M. Talens
Brent H. Weingardt
Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
Washington, DC 20036

Gerald Musarra
Senior Director, Commercial Policy and
Regulatory Affairs
Space and Strategic Missiles Sector
Lockheed Martin Corporation
1725 Jefferson Davis Highway
Arlington, VA 22202

Ice-G, Inc. DBA International
Communications Electronics Group
Timothy E. Welch
Hill & Welch
1330 New Hampshire Avenue, NW
Suite 113
Washington, DC 20036

Scott B. Tollefsen
Vice President, General Counsel and
Secretary
Hughes Communications, Inc.
1500 Hughes Way
Long Beach, CA 90810

Gary M. Epstein
John P. Janka
Arthur S. Landerholm
LATHAM & WATKINS
1001 Pennsylvania Avenue, NW
Suite 1300
Washington, DC 20004

Philip V. Otero
Vice President and
General Counsel
GE American Communications, Inc.
Four Research Way
Princeton, NJ 08540

Peter A. Rohrbach
Karis A. Hastings
F. William LeBeau
Hogan & Hartson, LLP
555 Thirteenth Street, NW
Washington, DC 20004

Arthur Firstenberg
Chairman, Cellular Phone Taskforce
Post Office Box 100404
Vanderveer Station
Brookly, NY 11210

Biztel, Inc.
Walter H. Sonnenfeldt
Water Sonnenfeldt & Associates
4904 Ertter Drive
Rockville, MD 20852

Robert J. Miller
Emily S. Barbour
Gardere & Wynne, LLP
1601 Elm Street
Suite 3000
Dallas, TX 75201

Signature: Vinton M. Davis