

"squeeze" all available spectrum allocated for FSS in other bands where comparable services could be provided. Not surprisingly, none of the FSS users even provide anything resembling a business plan or comparable blueprint for how they would use the additional spectrum. Until such proof is provided, FSS user spectrum demands must be factored down considerably.⁵⁰

The simple fact that 14 different satellite companies are all proposing to offer competing FSS in 1.25 GHz of spectrum in the Ka band⁵¹ (which is less than half of what Motorola seeks in the 36-51.4 GHz band), raises serious questions concerning requests from certain carriers, in their comments on the NPRM, for even additional spectrum. If so many carriers could provide FSS in the relatively limited amount of spectrum available at 18/28 GHz, there is no discernable reason why additional spectrum is needed in the 36-51.4 GHz band. It is exactly this approach by FSS users that necessitates better spectrum management.

Complicating the Commission's efforts to establish a workable band plan is the FSS industry's denigration of FS users in their comments on the NPRM. Not only are the FSS users falsely pleading poverty to bolster their attempt at convincing the Commission that additional spectrum is needed, they are distorting the record by unfairly characterizing FS user needs.

⁵⁰The Commission should take into account the finite nature of the radio frequency spectrum, noting it must satisfy the requirements of all users of radio. Over the past few years, inordinate amounts of spectrum have been made available to multiple satellite services, with a substantial concomitant reduction in spectrum available to all other services. The time has come when the satellite services should be required to develop technology that increases the efficient use of spectrum allocated for their use. For example, the terrestrial mobile services already have gone through channel splitting over the years and still further channel splitting recently has been required by the Commission whereby 25 kHz land mobile channels will be split four (4) times to create four 6.25 kHz channels. See Report and Order and Further Notice of Proposed Rule Making, PR Dkt. No. 92-235, 10 FCC Rcd 10076 (1995).

⁵¹Of the 14 applicants, Lockheed, HCI and GE Americom are among the FSS users requesting additional spectrum herein.

To justify their demand for more spectrum, FSS users have crafted a myth supporting their superior claim to spectrum in the 36-51.4 GHz band.⁵² If the FSS industry "spin" were to be believed, it should be accorded special treatment because it: (i) needs longer developmental and roll-out time than FS users, which must be recognized when evaluating spectrum requirements; (ii) provides services that are more global in nature than services that FS users provide; (iii) employs technologies that are more state-of-the-art and integral to the GII than technologies FS users employ; and (iv) experiences more demand for services than FS users.

Nothing could be further from the truth. Indeed, it is time that this myth is debunked. There is no evidence in the record of this NPRM, or in any other Commission proceeding, justifying FSS user claims for superiority or for their continued, unchecked assault on spectrum.⁵³ As detailed below, FS users have equally justifiable rights to the 36-51.4 GHz band. Moreover, FS users historically have squeezed everything possible out of their increasingly limited spectrum by employing well-established spectrum management and efficiency techniques. Without doubt, the same can not be said for FSS users.

No less than 14 global FSS systems are being proposed for launch in much less spectrum at 18/28 GHz. Most of these applicants propose offering services that are no different than those proposed in the 36-51.4 GHz band by yet another five (5) FSS companies. Can the U.S. market

⁵²See Lockheed at 8, where it makes the bald and unjustified assertion that "[t]he band plan is . . . weighed [sic] heavily in favor of terrestrial interests at the expense of the U.S. satellite industry."

⁵³All FSS users can rely upon to prove their need for spectrum is their "[belief] that there is a great commercial potential" for such services. Motorola at 4 (emphasis added). However, these users are unable to document this potential and must resort to requesting that the Commission solicit applications for satellite authorization to validate their claims. See e.g., Motorola at 6, 12-13; TRW at 5. If such pent-up demand exists, this request would be unnecessary. The market would have forced the issue.

realistically support 19 competing satellite access providers? Similar services are now also being proposed at 11 GHz (Skybridge) and at 47 GHz (Sky Station). How much more can the market bear?

A. FSS User Attempts to Justify Increased Spectrum Are Unavailing.

Throughout their comments on the NPRM, FSS users make several claims to justify Commission designation of more spectrum for their needs than for FS user needs. These claims are merely "red herrings" to disguise the FSS users' inability to document demand.

1. Longer roll-out

Several FSS users argue that they should be treated differently than FS users because of the "inherent developmental differences between terrestrial and satellite services -- differences that manifest themselves both in terms of the timetable for commercial roll-out and in the magnitude of the investment of resources that is required."⁵⁴ Specifically, the FSS users claim that this "developmental difference" really means that greater demand exists for their services even though such demand is not as identifiable as demand for FS:

The Commission should adjust its approach to identifying spectrum needs and service development opportunities to take into account the inherent developmental differences between terrestrial and satellite services as well. Because of the long lead times inherent in developing satellite systems, it is inevitable that proponents of such systems will lag behind those desiring to make terrestrial use of bands that are allocated to both satellite and terrestrial services on a co-primary basis. Based on this inescapable reality, it would be unreasonable for the Commission to premise long-term spectrum planning decisions upon the initial service proposals that come before it; those proposals will inevitably come from the terrestrial side, even as satellite companies are well along in their plans to make commercial use of the shared FSS bands. The Commission must be more balanced and forward looking in exercising its spectrum policy functions, and act to ensure that sufficient spectrum resources are available to promote future growth of space-based

⁵⁴Lockheed at 4. See also HCI at 9-10; GE Americom at 4.

telecommunications.⁵⁵

There is no dispute that FSS users require a longer developmental cycle than FS users. However, this difference in developmental requirements does not entitle FSS users to greater latitude in justifying their spectrum requests. Nor is it a substitute for documenting that demand exists for their services or that they require more spectrum than FS users require.

Given the stakes involved, such speculation will not suffice. The FS industry has a long tradition of designing system architecture and network capacity based upon documented demand. Moreover, the FS industry has ensured that its systems employ spectrum-efficient antenna standards, loading requirements, and bandwidth criteria and that its users strictly avoid spectrum warehousing by promptly commencing service on authorized frequencies. These essential ingredients in FS system design are missing from the FSS users' menu because they do not utilize spectrally-efficient equipment and because they typically allow authorized frequencies to lie fallow for prolonged periods. Thus, the FSS users' argument, that they should be accorded more latitude in proving up spectrum needs due to their longer developmental requirements, must be ignored.

2. Global harmonization

The FSS users also attempt to tilt the axis towards having the Commission designate additional spectrum for their needs by arguing that it is necessary to achieve true global harmonization. GE Americom declares:

Operating satellites exist in a vacuum, but the Commission's spectrum assignments for satellite services do not. An international allocation without a matching domestic assignment does not advance the ability of prospective satellite providers to serve the United States. Similarly, a domestic assignment that requires a change in an international allocation is relatively worthless unless that international allocation occurs. Although other services

⁵⁵TRW at 4-5.

may enjoy certain lower operating costs as a result of consistent global spectrum allocations, consistent global allocations for satellites are *essential* to permit integrated satellite systems capable of providing worldwide communications capabilities.⁵⁶

To further minimize the importance of FS users, the satellite industry also mischaracterizes the importance of global harmonization for terrestrial systems:

While global allocations of spectrum may also be desirable for terrestrial systems, they are not essential; with terrestrial systems, it is more of a question of economies of scale than it is of economic and technological viability. By contrast, global and regional satellite systems are inherently dependent upon harmonized allocations to achieve global/regional coverage; moreover, the same economies of scale that are desirable for terrestrial systems are no less desirable for the satellite systems' ground and satellite equipment.⁵⁷

The record of this proceeding totally contradicts these FSS arguments. As detailed in several comments in the NPRM, FS users also provide essential services integral to implementation of the GII, and are not, as FSS users claim, merely an "off-the-shelf" technology.⁵⁸

Promoting global harmonization for FS users clearly is in the public interest:

Consistency between domestic and international allocations is absolutely essential. While "[m]ost of the 36-51.4 GHz band spectrum is allocated internationally and domestically on a co-primary basis to the fixed, mobile, FSS, and mobile-satellite services," any decision the Commission makes with respect to the proposals in the NPRM will reverberate in international markets.

* * * * *

Compelling reasons exist for the Commission to conform its 36-51.4 GHz band allocation with international allocations. If the Commission intends

⁵⁶GE Americom at 10 (footnote omitted). See also TRW at 6-11; HCI at 1-2, 12-14; SIA at 2.

⁵⁷Lockheed at 3-4. See also TRW's presumptuous statement at 4 ("although preferable for the purpose of achieving greater economies of scale, it is not essential for terrestrial services to have common allocations throughout the world").

⁵⁸TRW at 12.

opening foreign markets for devices operating in these bands, it must allow interoperability with international standards. Microwave systems are natural platforms for new technology development. Successful exploitation of U.S. microwave technology is linked directly to harmonization with European and other international allocation standards.

* * * * *

Conformity with international allocations thus would have myriad benefits. Equipment standardization would be promoted. Access to global markets, which is essential for U.S. technologies and economic development, would be improved. Export of U.S.-made telecommunications equipment, including FS and HDFS systems, would increase. Innovation would be encouraged, which would help justify high costs incurred in developing millimeter wave equipment and other new technologies. Domestic manufacturers would remain competitive with overseas manufacturers. Equipment costs would be reduced.

* * * * *

Taking action that could make the U.S. the sole dissident to otherwise global standards must be avoided by the Commission. In the NPRM, the Commission recognizes the value of harmonizing its band plan with international allocations. Otherwise, by requiring different sets of procedures, export opportunities for domestic companies would be jeopardized and manufacturing costs would be increased.

* * * * *

Under these circumstances, it is especially necessary that the Commission's actions in this proceeding reflect the importance that FS networks are accorded internationally.⁵⁹

BizTel agrees:

[m]aximizing worldwide harmonization of spectrum use while limiting deployment restrictions and regulatory complexity in bands above 30 GHz will promote more efficient utilization, and contribute to lower equipment and system implementation costs for all affected services. Each of these results is critical to the successful ongoing implementation of terrestrial and satellite

⁵⁹TIA at 19-21 (footnotes omitted). See also ITU Working Party 1B, An Overview of U.S. Millimeter Wave Activities, Doc. No. USSG 1/14 (July 7, 1995) at 9.

services by United States companies.⁶⁰

Recognizing that FS users benefit from international harmonization will have a significant impact on the GII. The high frequency microwave bands (i.e., above 30 GHz) will be used to provide the latest in U.S. radio technologies (i.e., MMIC, super high frequency solid state equipment, and phase-array antennas). Civilian use of the millimeter wave band is exploding as long-established military use of these frequencies is being de-classified. Moreover, with more than \$700 million already having been invested in military millimetric wave technology, the U.S. millimetric radio industry is well positioned to maintain its world leadership in the future.

Furthermore, facilitating FS operations overseas would have significantly greater benefits for the U.S. economy than FSS operations could generate. Most revenues from FS will stay in the U.S. because domestic manufacturers are involved in all phases of production. By contrast, most revenues from FSS manufacturing will stay overseas because earnings predominantly are generated through the sale of mobile units, which typically are produced in other countries.

⁶⁰BizTel at 8. See also Alcatel at 3.

B. FSS Users Must Demonstrate Demand For Any Additional Spectrum In The 36-51.4 GHz Band.

Traditionally, the FS industry has relied upon specific spectrum management tools to ensure that it optimizes use of assigned frequencies. With the reallocation of the 2 GHz band for PCS, and the subsequent erosion of the replacement bands above 3 GHz, such spectrum management has become a critical necessity.

A similar fear over potential spectrum shortage now seems to be striking FSS users. In their comments, several FSS users indicate that they may be going through a "change in culture," from not worrying about available spectrum as they consume more frequency blocks to recognizing, for the first time, that spectrum is a limited resource and that the Commission's largesse in designating frequencies for their needs might be coming to an end.

[S]atellite technology has developed to the point where the amount of possible capacity is no longer primarily constrained by spacecraft hardware. To the contrary, today's spacecraft are capacity constrained principally by the amount of spectrum that is allocated for them to use. Thus, larger satellite spectrum allocations facilitate the development of higher capacity system, which, in turn, reduce the ultimate cost of service to the end user, and increase the competitiveness of satellite services.⁶¹

Before the Commission can consider designing additional frequencies to satisfy the FSS users' "phantom" demand, it must be convinced that the spectrum is actually needed.⁶² The need for such a demonstration of demand is highlighted by how the satellite industry has attempted to monopolize the higher bands without being accountable for the amount of spectrum it requests. A multitude of

⁶¹HCI at 2.

⁶²Satellite users historically have avoided demonstrating that need exists for their service before additional frequencies are assigned. This "exemption" from showing need has resulted in a grossly inefficient allocation of resources. For example, satellite users, which swallowed up the 4 GHz band and made it unusable for FS users, only serve 30-40% of their available capacity.

FSS companies recently were authorized to operate at 18/28 GHz. This is the "first" generation of satellite operations in the higher bands. Yet, years before these 18/28 GHz FSS systems become operable and years before all the Ka band spectrum has been used, the satellite industry greedily wants more. It is trying to reserve the 37/38 GHz band for a second generation broadband FSS systems — however, substantial portions of this band are already heavily used by FS in the United States and in Europe, and apparently soon will come into use in Canada as well as in a number of Asian countries.

Warehousing a vast quantity of spectrum for a second generation of FSS systems, well in advance of when the first generation is deployed, makes no sense. The FSS users' efforts are especially troublesome in light of the fact that, as even the satellite industry finally acknowledges, available spectrum is shrinking and is not unlimited. Having 14 potential global satellite providers in the 18/28 GHz band and reserving excessive amounts of spectrum in the 36-51.4 GHz band at the expense of existing FS operations and near-term FS expansion requirements simply is unjustifiable and does not encourage efficient use of a dwindling resource -- radio spectrum. Thus, before FSS users can obtain additional spectrum in the 36-51.4 GHz band, they must document that there are no other available frequencies to satisfy demand.

**TIA HAS DEVELOPED A SECOND COMPROMISE
ALTERNATIVE TO SATISFY FS AND FSS DEMANDS**

In its comments, TIA proposed a band plan (Attachment B) that differed from the Commission's proposal:

If adopted, the Commission's band plan would: (i) maintain the 38 GHz Band for FS; (ii) implement the Region 2 FSS downlink 37.5-38.5 GHz allocation by adding it to the domestic table in Section 2.106 of its rules; (iii) adopt a new allocation for FSS downlinks at 40.5-41.5 GHz; and (iv) upgrade the status of FS and mobile services in the 40.5-42.5 GHz band to primary. While maintaining the 38 GHz Band for FS is in the public

interest, this proposal does not otherwise promote efficient spectrum utilization and does not fairly meet FS and FSS needs because it would: (i) establish uneven portions of non-contiguous spectrum for FS and for other users; (ii) conflict with allocations for ITU Regions 1-3, and with all existing 38 GHz Band usage outside the U.S. and Canada; (iii) leave 100 MHz (46.9-47.0 GHz) without any paired channels; and (iv) create undesirable large transmit/receive ("T/R") spacings between the paired 37.0-37.5 and 40.0-40.5 GHz bands, which also could create undesirable asymmetric link performance.

* * * * *

To avoid these critical problems, TIA proposes that the Commission consider [an] alternative band plan [It] suggests an approach which supports its original proposal to provide technical rules permitting expansion of FS to bands below 38.6 GHz. TIA . . . also requests that satellite users move to frequencies above their current allocation. Under this proposed framework, FS and FSS users will have sufficient spectrum without being handicapped by unnecessary band sharing constraints.

* * * * *

TIA's proposals build on the economies of existing frequency allocations. They would create a match between allocation bandwidth and appropriate channel T/R spacings. Terrestrial and satellite services would be separated into contiguous bands. Retention of existing allocations would allow for immediate exploitation of allocations using existing or planned technology. The new allocations would satisfy the demonstrated need for growth in both the FS and satellite service. At the same time, open spectrum would be identified for auction.⁶³

TIA still believes that this initial proposal is the best achievable scenario. Indeed, this proposal:

- Maximizes the likelihood of obtaining international harmonization in consolidating spectrum for fixed terrestrial applications in bands where 50,000 FS systems have just been deployed and in consolidating FSS where other service deployment is almost non-existent.
- Consolidates GSO and NGSO FSS spectrum in a contiguous allocation to maximize satellite usage flexibility.⁶⁴

⁶³TIA at 15-16 (footnotes omitted).

⁶⁴See HCI at 19.

- Opens bands for future FS/FSS/MSS/BSS expansion by designating 2 x 500 MHz of spectrum.
- Respects Sky Station's plans for the establishment of new stratospheric communication facilities at 47 GHz.

However, based on the uncertainty surrounding proposals to establish new FSS allocations at WRC-97, TIA considers it appropriate to provide more than one solution to the Commission (Attachment C). Faced with the necessity of protecting incumbents and on-going deployment, the 38 GHz band must remain a CWS allocation.⁶⁵ The 37.5-38.5 GHz band and the 40.0-41.0 GHz band would be allocated to FSS, thus satisfying Motorola's claim for lower frequency satellite spectrum.⁶⁶ As before, 2 x 500 MHz would remain open at 37-37.5/46.9-47.0/47.5-47.9 GHz for future FSS, MSS or BSS usage.

TIA would favor such a scenario if the following two conditions are met:

- Based upon European MVDS⁶⁷ applications and upon Canadian discussions to propose FS in the 40.5-42.5 GHz band, the 41-42.5 GHz band would be upgraded to a primary international FS allocation at WRC-97.
- A replacement of the 37 GHz band for HDFS point-to-point applications in a band below 40 GHz is supported by a corresponding initiative of WRC-97.

It is, however, quite doubtful that FSS users ever will be able to obtain a uniform worldwide

⁶⁵Several FSS users argue that the 39.5-40.0 GHz band should be designated for their use because it is not designated for HDFS in Europe. See TRW at 9; Lockheed at 17; Motorola at 9. This claim must be rejected. Operations by FS users in the 38 GHz band have proven that this entire band is needed to meet existing and documented future demand. The fact that the 39.5-40 GHz band is not used for HDFS in Europe is of no consequence for this domestic allocation, especially since no conflicts would result. Instead, TIA proposes designating the 40.0-41.0 GHz band for FSS because it could provide needed capacity and because such a designation would not conflict with international allocations.

⁶⁶Motorola at 9 (footnote omitted). See also Lockheed at 8-9; TRW at 7-8.

⁶⁷European MVDS is similar to our LMDS, but it is exclusively used for video distribution purposes, taking advantage of an existing terrestrial broadcast service allocation.

designation in the 37-40 GHz band due to the extensive deployment of incompatible FS systems. However, it may be possible to obtain regional FSS designations in this range of spectrum. Meanwhile, the 40.5-42.5 GHz does present some good potential for new FSS allocations.⁶⁸ Thus, TIA still recommends that its initial proposal should be favored as a base for identifying a solution.

**COMMISSION ACTION ON THESE PLANS
SHOULD NOT BE DEFERRED UNTIL AFTER WRC-97**

The proximity of WRC-97 has resulted in several parties requesting that the Commission defer action on the NPRM until that proceeding is completed.⁶⁹ TIA disagrees. To ensure that the U.S. position at WRC-97 is successful at promoting FS and FSS interests, the issues raised herein command prompt Commission attention. The Commission must use these proposals in guiding U.S. policy at WRC-97 and in implementing future allocations.

CONCLUSION

A change in the criteria the Commission uses to designate spectrum must be made. Band segmentation must be used instead of band sharing. Needs of FS users must be accommodated to support emerging global technologies. Speculative claims of spectrum shortage by FSS users must be rejected, and such users should be required to prove need before additional spectrum is designated.

⁶⁸See Lockheed at 15 and 16 n.23.

⁶⁹HCI at 17; Motorola at 14; TRW at 5, 16-18; SIA at 2; GE Americom at 11-13; Lockheed at 13-14.

The record of this NPRM supports these changes. More importantly, adoption of these changes will benefit the public interest by making the Commission, FSS users and FS users accountable for the spectrum assigned.

Respectfully submitted,

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June 2, 1997

292876/gw03

ATTACHMENT A

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Alcatel Network Systems, Inc. ("Alcatel")

BizTel, Inc. ("BizTel")

Cellular Phone Task Force ("Taskforce")

GE American Communications, Inc. ("GE Americom")

Hughes Communications, Inc. ("HCI")

ICE-G, Inc. dba International Communications Electronics Group ("ICE-G")

Lockheed Martin Corporation ("Lockheed")

Motorola Satellite Systems, Inc. ("Motorola")

National Telecommunications and Information Administration ("NTIA")

Satellite Industry Association ("SIA")

Skybridge L.L.C. ("Skybridge")

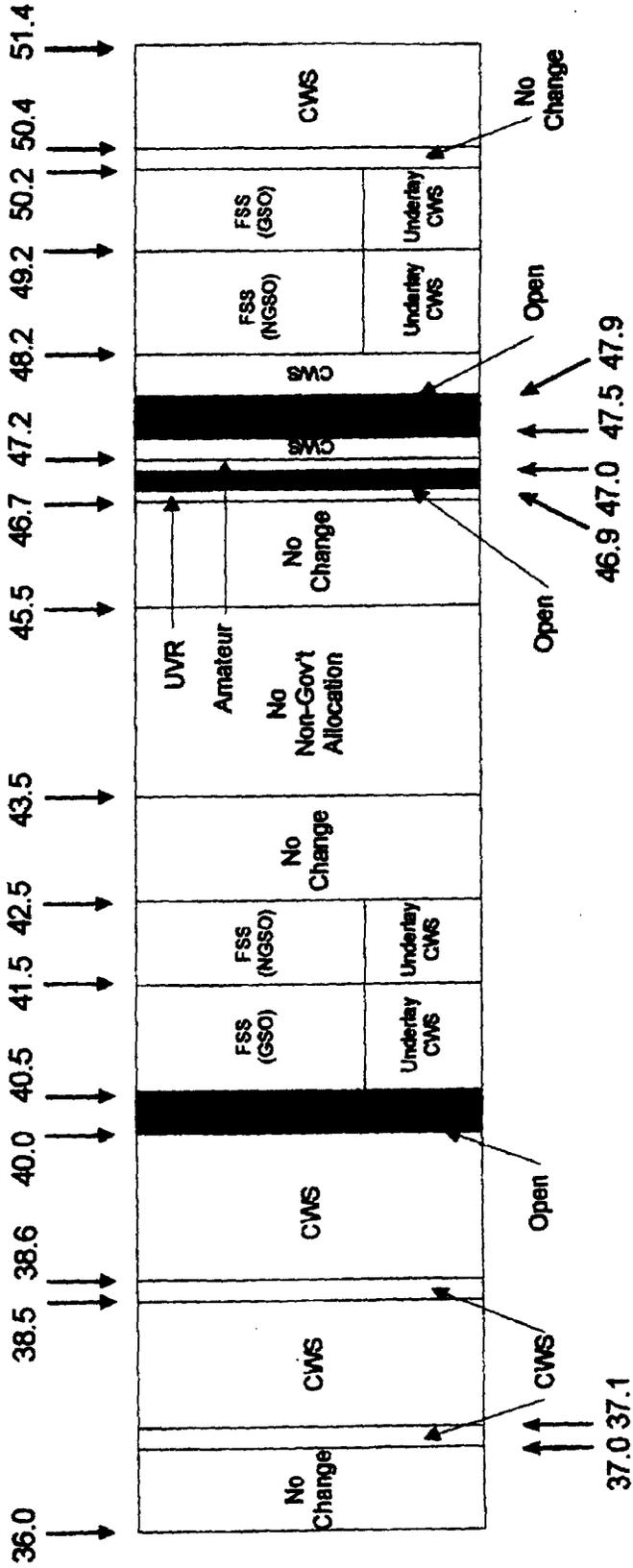
Teledesic Corporation ("Teledesic")

TRW Inc. ("TRW")

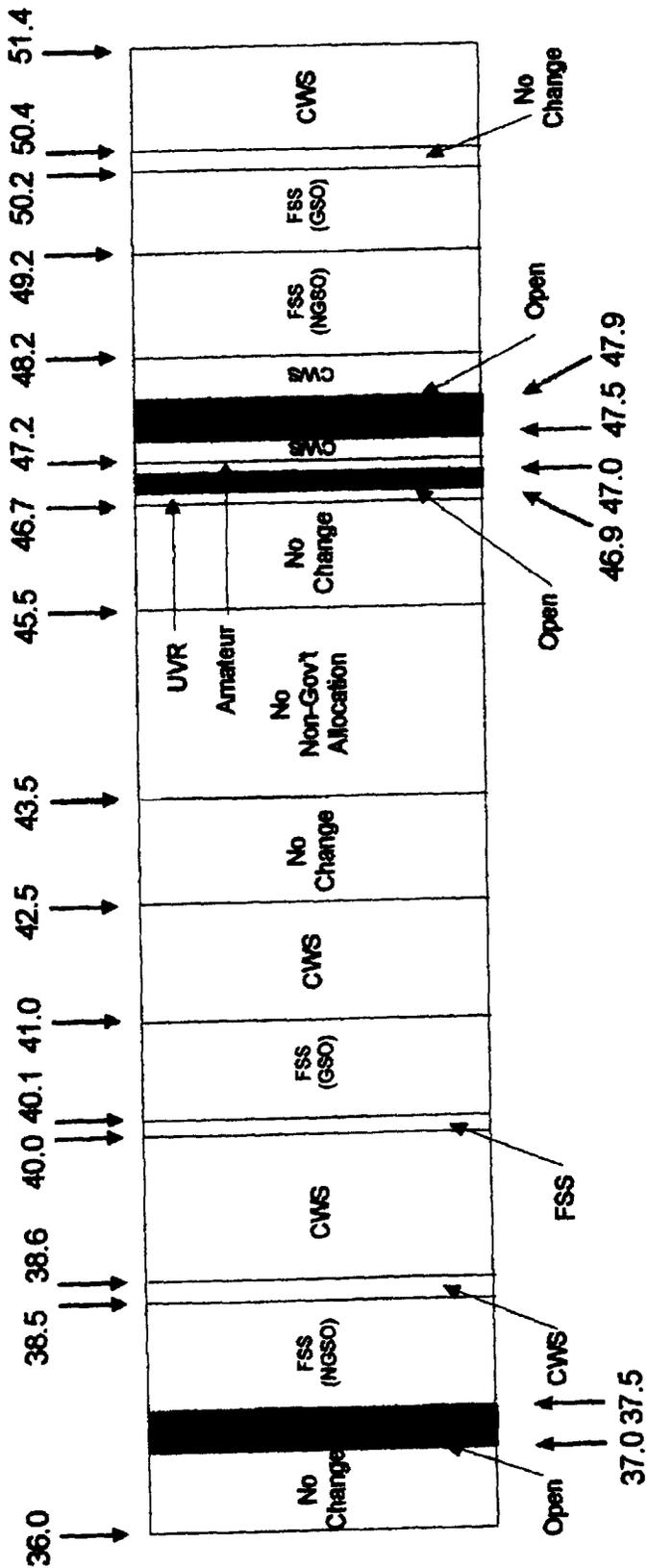
WinStar Communications, Inc. ("WinStar")

ATTACHMENT B

TIA Proposed Band Plan
(May 5, 1997)



TIA Alternative Band Plan (alternative to its favored May 5th proposal)



CERTIFICATE OF SERVICE

I, Deborah Mashburn, hereby certify that a true and correct copy of the foregoing Reply Comments was sent this 2nd day of June, 1997, via first class mail, postage prepaid, to the following parties:

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