Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	

OPPOSITION TO PETITIONS FOR RECONSIDERATION

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SUMMARY

The Commission should deny the Petitions for Reconsideration of Motorola Solutions, the Joint Petitioners, and the Wi-Fi Alliance. These Petitions ask the Commission to revisit technical issues that were fully considered and addressed in the *2008 Report and Order* in this proceeding and were not modified in the *Memorandum Opinion and Order* that is the subject of the Petitions. Therefore, they are late-filed Petitions unsupported by any justification for why were not filed 30 days after the *2008 Report and Order* was published in the Federal Register. Moreover, grant of the Petitions would erode or eliminate the interference protections that the Commission properly has determined are necessary to protect the primary users in the television bands and the important service to the public that they provide.

The Commission should not relax the out-of-band emissions limits and mask as requested by the Petitioners. The 2010 *Memorandum Opinion and Order* made no substantive changes to these requirements, which were adopted in the *2008 Report and Order*. In addition, these requests lack technical merit and would compromise protection for licensed services and the consumers who rely on them. Nor are the requested relaxations of these protections needed in order to produce practical and cost-effective devices. In fact, as Adaptrum has demonstrated, the rule can be satisfied with existing technology.

The Commission should reject the Wi-Fi Alliance's request to permit fixed television band devices ("TVBDs") to operate on adjacent channels in urban and suburban environments, with fixed devices permitted to operate indoors with the same power and spectral power density limits as personal/portable devices at the same indoor locations. Not only is the Wi-Fi Alliance's Petition on this point untimely, but granting this request would undermine the requirement that low power devices used at fixed locations include geolocation capability.

MSTV and NAB do not oppose the Joint Petitioners' request to allow a maximum antenna height above average terrain ("HAAT") of 250 meters, as opposed to the 76 meter HAAT limit currently specified in the rules, if such a change is accompanied with corresponding amendments to the required co-channel and adjacent-channel distance separation values. However, the Commission should maintain the maximum antenna height above ground level ("AGL") limit of 30 meters. With a HAAT of 250 meters, fixed base stations would have much larger service areas and greater potential to cause interference. Thus, it is important for the Commission to maintain effective limits on TVBD antenna height AGL to avoid interference and to foster efficient frequency re-use by TVBDs. Additionally, because this increase in HAAT would permit fixed base stations to have much larger service areas, MSTV and NAB recommend that the rules be modified to prohibit such fixed base stations from communicating with Mode I devices and providing such devices with available channel lists. Mode I devices do not have geolocation capability and will rely on the location of the fixed base station for the list of available channels. Such an approach becomes increasingly inaccurate with the expanded communications range made possible with an increase of HAAT from 76 to 250 meters, increasing the interference risk that Mode I devices pose to protected operations in the television bands.

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OPPOSITION TO PETITIONS FOR RECONSIDERATION

The Association for Maximum Service Television, Inc. ("MSTV")[1] and National Association of Broadcasters ("NAB")[2] file this Opposition to three of the five Petitions for Reconsideration filed in the above-referenced proceedings. The Commission should deny the Petitions of Motorola Solutions, the Joint Petitioners, and the Wi-Fi Alliance,[3] which encourage the Commission to revisit technical issues that were fully considered and addressed in the *2008 Report and Order*[4] and were not modified in the *Memorandum Opinion and Order* that is the

[1] MSTV is a nonprofit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system.

[2] NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the Courts.

[3] *See* Petitions of Motorola Solutions, Inc. ("Motorola Solutions"); the Wireless Internet Service Providers Association, the Federation of Internet Solution Providers of the Americas, the Native American Broadband Association, Spectrum Bridge, Inc., Comsearch, Carlson Wireless Technologies Inc., and Wireless Strategies, Inc. (collectively, the "Joint Petitioners"); and the Wi-Fi Alliance; all filed January 5, 2011.

[4] *Second Report and Order and Memorandum Opinion and Order*, ET Docket Nos. 04-186 and 02-380, 23 FCC Rcd 16807 (rel. Nov. 14, 2008) ("*2008 Report and Order*").

subject of the Petitions.[5] These Petitions are intended to, and would, erode or eliminate the interference protections that the Commission properly has determined are necessary to protect the primary users in these bands, and the important service to the public that they provide. The Petitions lack justification for the changes sought, and are procedurally deficient as well. As the Commission has previously stated, its rules should provide for the operation of unlicensed TV band devices ("TVBDs") "without disrupting the incumbent television and other authorized services that operate in the TV bands."[6]

This has been a prolonged proceeding. Because of the unprecedented nature of this proceeding and the potential for white space device operation to cause interference to the public's reception of local television service, it is appropriate that the Commission has taken care to get it right. The Petitioners are now advocating changes in the long-debated balance of considerations and reasoning that resulted in the present set of rules, including rules that were adopted several years ago. But they have not provided adequate justification for their proposed changes other than that the changes would tilt the balance in their direction, without regard for the impact of their changes on the public's television service. In fact, Petitioners are quite candid in justifying their proposals for diluting these protections on the basis of their desire to reduce their costs.

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[5] *Second Memorandum Opinion and Order*, ET Docket Nos. 04-186 and 02-380, FCC 10-174 (rel. Sept. 23, 2010), 75 Fed. Reg. 75814 ("*Memorandum Opinion and Order*").

[6] *2008 Report and Order* at para. 2.

I. RELAXATION OF THE OUT-OF-BAND EMISSIONS LIMITS WILL SUBSTANTIALLY ERODE THE INTERFERENCE PROTECTION PROVIDED TO THE PRIMARY USERS OF THE BAND AND TO THE PUBLIC.

The Wi-Fi Alliance, Motorola Solutions, and the Joint Petitioners propose that the Commission relax the out-of-band emissions ("OOBE") limits for unlicensed TVBDs. The Wi-Fi Alliance argues that compliance with the OOBE mask would increase the cost of TVBDs and proposes to relax the mask for both fixed and personal/portable devices.[7] Motorola Solutions "recommends that the Commission modify the rules for adjacent channel OOBE as they apply to fixed TVBDs."[8] It also argues that compliance with the OOBE limits would increase the cost of offering TVBDs and proposes that a relaxation of the OOBE mask, coupled with increased distance separation requirements, would provide equivalent protection to primary television broadcasting operations.[9] The Joint Petitioners support Motorola Solutions' request for relaxation of the spectral mask for fixed TVBDs.[10] These requests are flawed and contrary to the public interest, and the Commission should reject them.

As an initial matter, these requests do not seek reconsideration of the 2010 *Memorandum Opinion and Order*, which made no substantive changes to the OOBE limit and emissions mask. The Petitions seek reconsideration of the *2008 Report and Order*, which adopted the OOBE limit and emissions mask. They are too late in doing so and provide no

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[7] Wi-Fi Alliance Petition at 2-3.

[8] Motorola Solutions Petition at 2. It suggests that relaxing the OOBE limits by 25 dB for the first adjacent channel would be "more consistent with other industry technologies" and thereby more cost effective. *Id.* at 6. Alternatively, Motorola Solutions proposes two separate masks for fixed TVBD operations: the mask currently provided for in the rules, and a less stringent mask that would apply to TVBDs operating at an increased separation distance from the contour of the adjacent channel television station.

[9] *Id.* at 6.

[10] Joint Petitioners Petition at 2.

justification for re-opening the issue over two years after the rules were adopted. It is procedurally deficient and inappropriate to use Petitions for Reconsideration filed in 2011 to seek changes to rules adopted in 2008 and not modified in the recent *Memorandum Opinion and Order*, which is the proper and only subject for reconsideration at this stage of the proceeding. Accordingly, the Commission should dismiss these requests.[11]

Even if the proposals to relax OOBE limits were not procedurally defective, the Commission should reject them because they lack technical merit and would compromise protection for licensed services and the consumers who rely on them. The Wi-Fi Alliance proposes that the Commission adopt an emissions limit at a level of -25.8 dBm/100 kHz where the TVBD's transmitted power is 100 mW or less,[12] but provides no support for its conclusory assertion that "licensed operators will be protected" if the Commission were to adopt such a change.[13] A claim that relaxing the OOBE limit by more than 25 dB[14] will not undermine necessary interference protections requires a compelling technical analysis; the Wi-Fi Alliance provides none.

In fact, the proposed relaxation will gut the interference protections established by the Commission in 2008. The -25.8 dBm/100 kHz value proposed by the Wi-Fi Alliance translates to an adjacent-channel "Undesired" signal level (U) equivalent to -8 dBm across 6

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[11] *See* 47 C.F.R. § 1.429(d), requiring Petitions for Reconsideration in rulemaking proceedings to be filed within 30 days from the date of public notice of such action. Accordingly, the Petitions have been submitted nearly two years past the filing deadline for the relevant order. *See also Memorandum Opinion and Order* at para. 88 (declining to modify OOBE limitations adopted in the *2008 Report and Order*).

[12] Wi-Fi Alliance Petition at 4.

[13] *Id.* at 5.

[14] Under the existing OOBE requirements, the value for a 100 mW (+20 dBm) TVBD should be -52.8 dBm/100 kHz, and the value for a 40 mW (+16 dBm) TVBD that can operate on an adjacent channel should be -56.8 dBm/100 kHz.

MHz. The Commission adopted a Desired-to-Undesired (D/U) signal ratio of -33 dB to protect television viewers receiving adjacent-channel television signals.[15] Therefore, interference will occur wherever the Desired TV signal (D) is less than -41 dBm (D = -33 – 8)—in other words, in the vast majority of a television station's service area. Thus, according to the Commission's own standards, the Wi-Fi Alliance's proposal would cause substantial interference to the public's free, over-the-air, and primary television service.

All three Petitions have a stated rationale of seeking to reduce costs, with little regard for the risks that their proposals would create for licensed users of the television bands and for the services that these licensees provide to the public. For example, Motorola Solutions asserts that "the need to protect incumbent services from interference" must be "balanced against" the desire to promote "cost-effective broadband TVBD technologies."[16] Protecting primary broadcast television stations and the viewers that rely upon their services is a necessity, not an interest to be compromised away to reduce the costs of unlicensed TVBDs. The public interest principle on which the Communications Act rests requires nothing less, and the Commission should not alter its 2008 decision on the rationale set forth in the Petition.

Indeed, claims that compliance with the OOBE mask would be difficult and costly are unfounded. For example, they are undermined by a recent *ex parte* filing by

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[15] In doing so, the Commission cited the protection afforded by strict OOBE limitations. *See Memorandum Opinion and Order* at para. 81 ("We find that assuming a TV receiver can reject adjacent channel signals at a -33 dB D/U ratio is reasonable because many receivers tested by the Commission have better performance than this, and because *TV bands devices will comply with the stringent emission limits in the rules out-of-band emissions*, which will limit emissions in the adjacent channel that could cause overload interference") (emphasis added).

[16] Motorola Solutions Petition at 2; *see also id.* at 5 (citing costs of complying with OOBE limits adopted in the *2008 Report and Order*; Joint Petitioners Petition at 2 and 7-8 (similar); Wi-Fi Alliance Petition at 2.

Adaptrum, Inc. ("Adaptrum").[17] Adaptrum stated that the current mask "can be realized using innovative RF and baseband technologies. In fact, the demonstrated Adaptrum radio system *meets and exceeds* the mask requirement specified in the current rules."[18] The current constraints on OOBE are technology neutral, are achievable, and do not inhibit innovation or operational flexibility.

Motorola Solutions recommends that the Commission permit adjacent channel spectral mask requirements for *fixed* TVBDs to be -47.8 dBr/100 kHz, a 25 dB relaxation, and proposes that devices operating under the relaxed spectral mask be required to operate at greater separation distances from the contour of adjacent channel television stations, in order to offset the increased emissions.[19] Given the recent Adaptrum filing showing that the current mask requirement can be satisfied with existing technology, and in light of the advantages of having a single common mask for both fixed and mobile operation—including uniformity, simplicity, ease of enforcement, and economies of scale—Motorola Solutions' proposal is neither warranted nor necessary. Higher power fixed operations have few physical restrictions regarding size and weight, simplifying compliance with the OOB emission limits. And, as mentioned above, Adaptrum, a small start-up with fewer resources than Motorola Solutions, already has demonstrated that the requirements are not unduly burdensome and can be met with existing technology.

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[17] *See Ex Parte Notice*, ET Docket No. 04-186 (Jan. 4, 2011).

[18] *Id.* at 1 (emphasis added) (discussing demonstration of Adaptrum's first generation TVBD system, and noting that "clean out-of-band emission protects licensed operation in the TV band and also reduces interference between whitespace radios").

[19] Motorola Solutions Petition at 7.

Further, regulatory relaxation of the mask for fixed devices could result in a real-world relaxation of the mask for personal/portable devices as well. Manufacturers could modify a device approved as a fixed device so that it could operate as a personal/portable device. As a result, consumers could use the device (operating with a relaxed OOBE mask) without meeting the increased spacing requirements that would apply to fixed devices. The proposal also would complicate the FCC's device certification process and the administration of the TV bands database program and increase the probability of interference in areas or on channels that may warrant further protection, as identified in the Petitions of Cellular South and NCTA.[20]

Finally, any relaxation of the current § 15.709 emission restrictions for fixed or personal portable devices would not only threaten the public's reception of UHF television stations, but also would seriously endanger VHF television broadcasts and inhibit the use of channels reserved for wireless microphone operations by television stations and other wireless microphone operators. As the Commission has recognized, reception of VHF channels is particularly vulnerable to emissions from electronic devices.[21] The Commission currently is seeking comment on ways to reduce noise levels in the VHF bands. Unlicensed TVBDs will exacerbate the interference problem by increasing transmissions in the TV band (previously,

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[20] *See* Cellular South, Inc. Petition for Partial Reconsideration (arguing that additional protections are required in order to protect Lower 700 MHz Band operators from interference caused by TVBDs operating on Channel 51); Petition for Reconsideration of the National Cable & Telecommunications Association (explaining need to protect cable headends from detrimental interference and other threats).

[21] *See Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, Notice of Proposed Rulemaking, ET Docket No. 10-235, FCC 10-196 (rel. Nov. 30, 2010), at para. 42 ("the propagation characteristics of these channels allow undesired signals and noise to be receivable at relatively farther distances"); para. 46 ("reception problems are posing problems for use of the VHF channels"); para. 47 ("[o]ne of the problems with indoor VHF reception is noise from nearby… consumer electronics equipment").

television frequencies were "restricted" bands in which Part 15 operations were prohibited). To mitigate the risk of interference from TVBD operations, the Commission has adopted a three-pronged approach: (1) an OOBE mask; (2) distance separation requirements; and (3) a prohibition on operation on adjacent channels by certain devices. Relaxation of the OOBE mask would undermine a key means of avoiding interference to primary operations, including VHF television operations and licensed wireless microphone operations.

II. THE COMMISSION SHOULD REJECT THE WI-FI ALLIANCE REQUEST CONCERNING OPERATION OF FIXED DEVICES.

The Wi-Fi Alliance proposes that the Commission permit fixed TVBDs to operate on adjacent channels in urban and suburban environments and that fixed devices be permitted to operate indoors with the same power and spectral power density limits as personal/portable devices at the same indoor locations. The Commission should deny this request.

The transparent intent of the Wi-Fi Alliance's request is to circumvent the requirement that low power devices used at fixed locations include geolocation capability. The Wi-Fi Alliance argues against the need for these devices to include geolocation capability and check every 60 seconds for changes in location. First, the Commission adopted this requirement in the *2008 Report and Order*. Thus, the request is clearly untimely and a Petition for Reconsideration with respect to a second order that did not alter this earlier requirement is not an appropriate vehicle to seek to change this requirement. Second, eliminating this requirement would eviscerate the policies and rules adopted by the Commission to protect against the harmful effects of TVBD operations. The unstated alternative would be to require such low power devices to be professionally installed and to be registered with the TV bands database. That approach would be impractical, unreliable, and more expensive and burdensome than simply including a geolocation capability (such as GPS) in the device. In practice, the expense

associated with professional installation and database registration would lead to these requirements being circumvented on a widespread basis.[22] Third, there is no problem in need of a solution here because there is no prohibition on operating Mode II personal/portable devices at fixed, indoor locations. Grant of the Wi-Fi Alliance's request would, in effect, allow all devices to be built without geolocation capability and would undermine the interference-avoidance measures that the Commission has developed and adopted in this proceeding.

III. MSTV AND NAB DO NOT OBJECT TO A MAXIMUM HAAT OF 250 METERS, BUT THE COMMISSION SHOULD MAINTAIN THE 30 METER LIMIT ON ANTENNA HEIGHT ABOVE GROUND LEVEL.

The Joint Petitioners seek to relax the antenna height restrictions, replacing the current 76 meter height above average terrain ("HAAT") limitation and the current maximum antenna height above ground level ("AGL") of 30 meters with a single restriction that would impose a maximum of 250 meters HAAT. They assert that "many large hilly and rural areas of the country precluded from white space service under the existing rules" would be able to deploy white space devices with the proposed rule change.[23] The Joint Petitioners submitted an exhibit suggesting that in some areas of the country, terrain could be a factor in limiting white space device operations.

MSTV and NAB recognize these terrain limitations and agree that the current HAAT limitation of 76 meters may be too restrictive. Thus, they do not oppose the request to

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[22] Having users input location data is not a viable solution. Users of Wi-Fi devices have the ability to enter the device's location but virtually never do so. Thus, the device's location, by default, often is the place of manufacture (often Singapore, China, or Taiwan). Users also could simply identify their location as a rural one that is distant from television station operations, in order to obtain a bigger list of available channels.

[23] Joint Petitioners Petition at 1-2.

allow a maximum HAAT of 250 meters (subject to corresponding adjustments to the required co-channel and adjacent-channel distance separation values) for areas of hilly or rugged terrain.

However, the Commission should maintain the maximum AGL limit of 30 meters to prevent the installation of very tall towers in areas without hilly or mountainous terrain. The use of very tall towers would eliminate the efficient reuse of frequencies by TVBDs, as contemplated by the Commission in adopting the 30 meter limit, and would be inconsistent with the interference predictions used by the FCC. While we do not oppose increasing HAAT to 250 meters, such an increase has the potential to expand broadly the communications range of TVBDs, increasing the risk of interference from Mode I devices. Fixed devices may provide available channel information to Mode I devices. In such cases, a Mode I device (which lacks geolocation capability) is presumed to be operating at the same location as the fixed device. With a HAAT of 250 meters, however, fixed base stations would have much larger service areas. The difference in location between the fixed device and the Mode I device (which may be at the edge of the service area) could be substantial. Mode I devices at the edge of an expanded service area may not meet the distance separations necessary to avoid interference to primary broadcast operations. Therefore, if it permits the higher HAAT, the Commission should prohibit high power fixed stations from providing channel lists to Mode I devices. Such an approach would not unduly burden TVBD operations: wireless internet service provider operations are primarily high power base stations for high power customer premises equipment, used to provide broadband services, while low power Mode I devices mostly likely will be used to communicate with low power Mode II devices.

CONCLUSION

For the foregoing reasons, MSTV and NAB respectfully request that the Commission reject the Petitions seeking to relax out-of-band emissions limits, reject the proposal of the Wi-Fi Alliance concerning the operation of fixed TVBDs in indoor, urban and suburban environments, and maintain effective limits on TVBD antenna height AGL.

Respectfully submitted,

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February 24, 2011

CERTIFICATE OF SERVICE

I, Kathryn Bowers, a secretary at the law firm of Covington & Burling LLP, do hereby certify that on this 24th day of February, 2011, I caused a copy of the foregoing "Opposition to Petitions for Reconsideration" to be sent via first-class U.S. Mail, postage prepaid, to the following:

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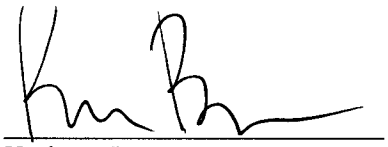

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