

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

In the Matter of)	
)	
Revisions to Rules Authorizing the Operation of)	WT Docket No. 08-166
Low Power Auxiliary Stations in the 698-806)	
MHz Band)	
)	
Public Interest Spectrum Coalition, Petition for)	
Rulemaking Regarding Low Power Auxiliary)	WT Docket No. 08-167
Stations, Including Wireless Microphones, and)	
the Digital Television Transition)	

REPORT OF V-COMM, L.L.C.

October 1, 2008

Dominic Villecco
President

Sean Haynberg
Director of RF Technologies

V-COMM, L.L.C.
3 Cedar Brook Drive
Cranbury, NJ 08512
(609) 655-1200

TABLE OF CONTENTS

1	Executive Summary	1
2	Introduction	2
2.1	LPAS (Wireless MIC) Background.....	2
2.2	Low Power Auxiliary Station (LPAS) Operations	3
2.3	Technical Aspects and Deployments of Wireless Microphone Systems.....	3
2.4	FCC NPRM Overview.....	5
3	Harmful LPAS Interference into CMRS/PS	5
3.1	Background	5
3.2	Interference Analysis	5
3.2.1	Link Budget Analysis	5
3.2.2	LPAS Interference to CMRS/PS Co-Channel Analysis.....	6
3.2.3	LPAS OOB and Intermodulation Interference	7
4	Examples of Actual Interference Occurring in 700 MHz Bands	8
4.1	Industry Examples	8
4.2	V-COMM First Hand Experience	9
5	NPRM Issues	10
5.1	Prohibiting the operation of LPAS in the 700 MHz spectrum after the DTV transition.....	10
5.2	Prohibiting the sale, manufacture and import of these devices.....	11
5.3	Approach for updating licenses of current licensees	11
 Appendix A Selection and Operation, Wireless Microphone Systems, Publication by Shure, Inc.		12

1 Executive Summary

V-COMM, L.L.C. is a wireless engineering consulting firm. Our principals have over 25 years of in-depth experience in wireless telecommunications engineering. We have provided our expertise to wireless operators and governmental agencies in system design, network engineering, implementation, network expansion, system performance and optimization. V-COMM's technical expertise includes assisting wireless operators in the evaluation and integration of new technology into their networks. We have considerable engineering experience in mitigating interference between adjacent band operators and co-locating wireless systems. We have experience in all commercial wireless technologies, including CDMA, TDMA, GSM and AMPS technologies, in Cellular, PCS, ESMR, Fixed Wireless, and the Broadband Wireless Industries. Further, we have experience in Public Safety wireless technologies including APCO16, APCO25 and many proprietary trunking and conventional radio networks.

The FCC is proposing (NPRM) to modify its rules such that operation of low power auxiliary stations (LPAS) will not be permitted to operate in the 700 MHz Band post the DTV transition period on February 17, 2009. The NPRM also references a petition filed by the Public Interest Spectrum Coalition (PISC) regarding unlicensed use of wireless microphone systems in this band and requested FCC to follow-up and respond to the issues identified in the petition.

V-COMM supports the proposed rules in the NPRM in regards to prohibiting LPAS operations in the 700 MHz band due to the incompatibility of the LPAS operations and the new operations for Commercial Mobile Radio Services (CMRS) and Public Safety (PS) services. The equipment used by new services to occupy the 700 MHz spectrum, both commercial and public safety, are not compatible with LPAS devices and will suffer harmful interference if LPAS services were to continue in the band. V-COMM has provided herein a detailed engineering analysis showing the extent of the harmful interference and impact of LPAS operation on the new services intended for the 700 MHz band. V-COMM further notes that due to the mobile nature of the new services that will occupy the 700 MHz spectrum, both public safety and commercial, and the intermittent use and generally nomadic nature of the LPAS operations; there can be no way for current licensed 700 MHz LPAS operators to ensure their continued operation would not be harmful to public safety and commercial users. In addition, V-COMM has direct experience with impacted operations of its client's commercial wireless systems operating in the 700 MHz band.

V-COMM agrees with the proposed rules that all LPAS operations cease to operate in the 700 MHz bands after the DTV transition date. We further concur with the Commission that it is incumbent upon them to take all steps necessary to make this spectrum effectively available both to public safety and commercial licensees at the end of the DTV transition. As noted above, we demonstrate herein that harmful interference will be caused by the operation of these LPAS

operations in the presence of public safety and commercial wireless networks operating in the 700 MHz spectrum.

2 Introduction

2.1 LPAS (Wireless MIC) Background

Entities that are eligible to operate LPAS under FCC rules (74.832) are limited to:

- licensees of AM, FM, TV, or International broadcast stations or low power TV stations;
- broadcast network entities;
- certain cable television system operators;
- motion picture and television program producers as defined in the rules;
- certain entities with specified interests in Broadband Radio Service (BRS) Educational Broadcast Service (EBS) licenses, i.e., BRS licensees (formerly licensees and conditional licensees of stations in the Multipoint Distribution Service and Multichannel Multipoint Distribution Service), or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service (formerly Instructional Television Fixed Service) licensee or permittee.

The NPRM listed 156 entities with licenses that include operation on the 700 MHz spectrum bands, and only 30 licenses that are authorized to only operate in the 700 MHz band.

However, there are non-licensed operators in the VHF and UHF spectrum; including the 700 MHz spectrum that pose a real threat to licensed 700 MHz commercial and public safety operators. The most common application for this illegal operation is wireless microphone systems. The gravity of this situation is documented in the PISC Petition under this same Rulemaking Matter. It is clear from the PISC Petition that this use has been widely advertised and solicited by the industry. These devices are readily available to the general public through established retail distribution outlets like www.wirelessmicrophones.com, www.bhphotovideo.com, www.musiciansfriend.com and other retail outlets.

These wireless microphone operations take place in public venues, and venues where one would/could expect licensed commercial and public safety 700 MHz operations to take place. One could easily envision a concert event using wireless microphone systems and the presence of Public Safety operation for crowd control, etc. Further, other public venues like theaters, schools, arenas, amusement parks, outdoor amphitheaters, houses of worship, etc. are common venues where the proliferation of these devices can be witnessed. In addition, the venues can have over 100 different microphones operating simultaneously.

2.2 Low Power Auxiliary Station (LPAS) Operations

LPAS operations are to take place on a secondary basis. These operations “*shall be operated so that no harmful interference is caused to any other class of station operating in accordance with the Commission’s rules and regulations and with the Table of Frequency Allocations*”.

For licensed operations, they are intended for use in ranges up to 100 meters to coexist in the TV band spectrum. They are permitted to operate with transmit output power up to 250 mW.

Per the PSIC Petition, the wireless microphone application is very prevalent in the UHF frequency range; and most often by unlicensed operations. These systems are location uncertain, and in fact, the manufacturers and promoters of this equipment acknowledge the “touring” nature of the systems in warning its operators of changes in TV interference environments from location to location. These warnings can be found on the aforementioned websites, and other documents supplied by the industry.

Devices that may be authorized as low power auxiliary stations are intended for such uses as wireless microphones, cue and control communications, and synchronization of TV camera signals.

2.3 Technical Aspects and Deployments of Wireless Microphone Systems

Electro-Voice, Shure, Nady Systems, Inc, Audio Ltd, Sennheiser, Lectrosonics, Samson Technologies, AKG Acoustics MIPRO and Audio-Technica are all major manufacturers of wireless microphone systems. For a description of the frequency band selection, system operation and configuration, transmitter and receiver power levels, antennas, and further reference information on wireless microphones refer to Appendix A, “*Selection and Operation, Wireless Microphone Systems*”, which is a publication by Shure, Inc.¹

When Public Safety and commercial entities were allocated 700 MHz spectrum for two-way radio communications, they anticipated the elimination of wireless microphones operating in the same spectrum. New Commercial and Public Safety 700 MHz systems are being planned and the system designers expect clear spectrum without the interference challenges from wireless microphones. V-COMM is directly involved in several of these upcoming 700 MHz system deployments that envision unencumbered spectrum after the DTV transition.

These wireless microphones are currently being sold to the general public in today’s market via the internet and standard retail outlets. A simple web search

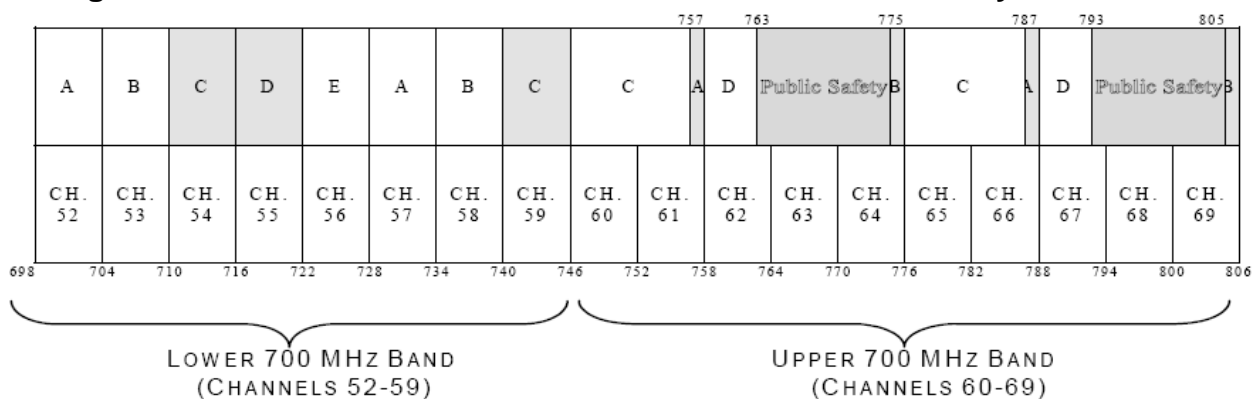
¹ This is an educational publication by Shure, Inc., which is publicly available at the www.shure.com.

for “wireless microphone” yielded hundreds of sites selling UHF-H (high band) 700 MHz wireless microphones manufactured to operate in the 698-806 band. Here are a few examples of microphones being sold today operating in 700 MHz band (698 - 806 MHz):

- Gemini UZ-1128 (740-770 MHz)
- Gemini UZ-9128 (740-770 MHz)
- RE-V Wireless Microphones Systems (614-746 MHz)
- Nady U-81 (740-806 MHz)

These wireless microphones are operating on CMRS and Public Safety spectrum, as shown in the 700 MHz spectrum chart below.

Figure 1 700 MHz Band Plan for Commercial and Public Safety Services



The ordinary user of the wireless microphone does not know that his equipment could cause interference to other entities. The user simply sets up the system to be used in the desired environment (churches, theatres, stadium, public speaking, etc...). In many cases, if your system is not operating correctly you make changes to the system to get optimal performance. These changes can include increasing the output power of the microphone, relocating antennas, switching channels, and the list goes on. Many users do not have the proper qualifications to correctly setup the system to ensure non-interference with newly licensed operators.

In addition, the more qualified and informed users will not be able to avoid interference to the 700 MHz bands as the commercial and Public Safety services are new and very different uses of the spectrum as compared to the original conventional broadcasters' use of the spectrum. Interference detection, avoidance and understanding new technologies, services, and forward-link/reverse-link uses within the 700 MHz spectrum bands will be beyond the capabilities of wireless microphone users, and it will be impossible for end users to manage the interference.

2.4 FCC NPRM Overview

The FCC is seeking to revise the Part 2 and Part 74 rules for low power auxiliary stations (LPAS) to prohibit their operation in the 700 MHz Band after the end of the DTV transition. Specifically in the NPRM the FCC:

- tentatively conclude to amend our rules to make clear that the operation of low power auxiliary stations within the 700 MHz Band will no longer be permitted after the end of the DTV transition because such operations could cause harmful interference to new public safety and commercial wireless services in the band
- tentatively conclude to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz Band
- tentatively conclude that we will modify these licenses so as not to permit such operations in the 700 MHz Band after February 17, 2009
- seek comment on issues raised by the Public Interest Spectrum Coalition (PISC) in its informal complaint and petition for rulemaking (“PISC Petition” or “Petition”).

3 Harmful LPAS Interference into CMRS/PS

3.1 Background

LPAS devices have the potential to cause substantial harmful interference to new services operating in the 700 MHz, which include Public Safety and new CMRS services. These LPAS devices can operate at similar power levels as anticipated CMRS 4G devices that will be deployed and will be strong enough to desensitize mobiles and base stations within a large area. 4G devices are expected to operate at 200 milliwatts nominally which is even lower power than the LPAS device maximum permitted levels.

3.2 Interference Analysis

3.2.1 Link Budget Analysis

Per FCC Regulation 74.861 (e)(1)(ii), Low Power Auxiliary Station’s (LPAS) are currently permitted to operate with a transmit output power up to 250 milliwatts or 24 dBm. Typical assumptions of -2 dB of LPAS antenna gain, -2 dB CMRS antenna gain, -3 dB of body loss, and 10 dB of clutter loss can be used to formulate a range of interference from these LPAS device to Commercial Mobile Radio Services (CMRS) and Public Safety (PS) systems.

The interference analysis threshold point of -100 dBm for mobile CMRS service is used as the interference noise level of the victim receivers, which causes a 3 dB increase in the operating noise floor (desense by 3 dB).² With a threshold of interference of -100 dBm at the CMRS/PS mobile receiver, we can estimate the range of co-channel and adjacent channel interference for these LPAS devices to CMRS /PS mobile devices and CMRS/PS base receiver stations.

The free space propagation model is acceptable in areas where there is clear line of site and flat regular terrain. The Egli model is a greatly simplified model that assumes "gently rolling terrain with average hill heights of approximately 50 feet" (*Land Mobile Radio Systems*, Edward N. Singer, PTR Prentice Hall, 1994, p. 196).³ Because of this assumption, no terrain elevation data between the transmit and receive facilities is needed. Instead, the free-space propagation loss is adjusted for the height of the transmit and receive antennas above ground. The following analysis assumes a base station height of 20 meters and a mobile and LPAS device height of 2 meters.

3.2.2 LPAS Interference to CMRS/PS Co-Channel Analysis

The subsequent Egli model co-channel analysis and results include a 10 dB clutter attenuation factor to account for general obstructions along the path. Using a LPAS 250 milliwatt (mW) output power and a clutter loss of 10 dB, the Egli model predicts a co-channel LPAS device would propagate at levels that could cause loss of service on CMRS or Public Safety (PS) mobiles within 220 meters (700 ft). In cases of stadiums, open space, or outdoor venues a line of site model is more appropriate. Assuming line of site propagation with the Egli model by ignoring the 10 clutter loss, the range of inference is increased to 400 meters (1300 ft). This interference range is enough to completely wipe out CMRS mobile and PS portable communications at an entire concert or professional sporting event and cause loss of service to tens of thousands of customers.

Furthermore, it could jeopardize essential public safety communications at these same events. In narrow bandwidth public safety systems the threshold of

² CMRS receiver thermal noise floor (ktb) -107 dBm, 7 dB noise figure for devices, and 4 dB noise figures for base stations are used for interference analysis purposes. Co-channel interference received at these levels (-100 dBm for mobiles, 103 dBm for BTS) will increase the noise floor of the commercial receivers by 3 dB. BTS antenna gain of 12 dBd and 3 dB cable loss are used in the interference analysis for base stations.

³ Egli Model is a terrain model for radio frequency propagation. This model predicts the total path loss for a point-to-point link. Typically used for line of sight transmission for cellular system links over smooth, plane terrain, the path loss decreases with "40 log (distance)". At closer distances, the free-space propagation model is more appropriate, and for further distances we have used the Egli model with a clutter attenuation loss to more accurately model the propagation path loss.

interference could be even lower, which would result in even larger areas of interference. This will create very large dead zones having no mobile/portable coverage in areas around these devices. Furthermore, we are using these interference levels for analysis purposes; interference may also be caused at lower levels as well.

The same co-channel argument can be justified for a LPAS interfering at a CMRS or public safety base station location. Assuming a base station height of 20 meters, 250 milliwatt LPAS output power, and a clutter loss of 10 dB, the Egli model predicts these co-channel LPAS devices will interfere with CMRS or Public Safety (PS) base stations within 1.8 km (1.1 miles). Again, with no clutter, the Egli model predicts the range of interference is increased to 3.3 km (2.1 miles). In cases where the base station is experiencing this LPAS interference, the entire coverage area of the base station becomes reduced or eliminated. In cases where the interference is very high above ground with clear line of site the interference would significantly reduce or eliminate the coverage radius and cause loss of service for CMRS/PS mobiles and portables attempting to communicate with the base station.

Based upon the analysis put forth above, we concur with the FCC's decision to revise the rules to prevent the operation of low power auxiliary stations in the 700 MHz band, and thus avoid potential disruption to new public safety and other commercial services in that band after the DTV transition.

3.2.3 LPAS OOB and Intermodulation Interference

In addition to the co-channel interference, LPAS devices have the potential to cause interference on adjacent spectrum bands due to out-of-band emissions (OOBE) and intermodulation products caused from multiple devices. These emissions have the potential to cause interference to commercial and Public Safety 700 MHz base stations and portable devices when the LPAS devices are nearby the portables and base stations that are further away from their source transmitters. For example, OOB from the LPAS devices that are close enough to CMRS base stations may strong enough to interfere with CMRS mobiles that are located further away and received at lower power levels at the base station. This is similar to the near/far problem that occurred mostly in the interleaved channels of the 800 MHz PS/SMR band.

Intermodulation (IM) products can be generated in combiner amplifier devices used for LPAS stations to combine multiple audio recording feeds, and with multiple wireless microphones operating simultaneously at the same venue.⁴ A characteristic of a non-linear amplifier circuit is that its output contains "new" signals in addition to the original signals that were applied to the circuit. These

⁴ For additional information see Appendix A, which is an educational publication from Shure, Inc. that is publicly available on its web site www.shure.com.

additional signals are called IM products and are produced within the circuit components themselves. The frequencies of IM products are mathematically related to the original transmitter frequencies

IM can occur when multiple LPAS transmitters are used in close proximity to each other. The signal from each LPAS transmitter generates IM products in the output stage of the other. These new signals are transmitted along with the original signals and can be picked up by CMRS receivers operating at the corresponding IM frequencies.

IM can also occur when transmitters are operated very close to the CMRS receivers. In this case IM products are generated in the receiver input stage which can interfere with the desired signal or be detected by the receiver if the desired signal (transmitter) is not present.

The use of multiple LPAS devices at concerts, stadiums, and sporting events is well known. Using multiple LPAS devices in a venue can create Intermodulation products transmitting on other channels and thus causing harmful interference to the CMRS or PS receivers.

4 Examples of Actual Interference Occurring in 700 MHz Bands

4.1 Industry Examples

Interference is at least an occasional problem with most types of radio equipment. The effects of interference range from being a minor annoyance to making the wireless system completely unusable. In the typical occurrence, LPAS interference is temporary and/or non-stationary. The interfering device is on/off for short periods of time or moves from place to place as the entertainment moves, therefore the interference can be highly frustrating and difficult to find. There are numerous articles that say that interference can occur, but very few documented cases. This is probably due to the nature of the wireless microphone systems; once the interference is realized, the wireless microphone system relocates to another frequency without the incident being documented by either party.

Interference can occur during large public activities where wireless microphones are used such as professional sports games (NFL, MLB, NHL, NBA, etc...), major city holidays or special parades, park attractions (Disney World, Six Flags Great Adventure), social clubs, Broadway theatre and music concerts. They are not limited to these events mentioned above. These devices are widely available to the general public via the internet; therefore the interference could happen anywhere at anytime. Here are more examples of where interference can occur: weddings, religious gathering, politically gatherings, town activities, museums, auctions, Schools, and Universities.

In one particular instance, the frequency 783.0 MHz was identified by a technician at a major wireless carrier by listening to the audio output. The signal was tracked down to a crew unloading the A/V equipment outside of a Hyatt Hotel. A microphone in the equipment was accidentally left on and was picking up stray sounds like the dogs barking and movement. This is a classic example of the omnipresence of the LPAS interference which is not limited to church services and musical performances, conferences at local hotels and other meeting venues. In this example, the equipment was apparently not based at the hotel and could be used at a different location on the next night. Identifying and stopping this kind of interference will not be easy.

4.2 V-COMM First Hand Experience

V-COMM, L.L.C. has first hand experience with the interference that can occur from LPAS transmissions in the 700 MHz band. While in Las Vegas in 2007, we were testing the operation of a new wideband service in the 700 MHz spectrum for data services.

The system utilized a 700 MHz high powered 2 kilowatt (kW) signal source transmitter located inside the radio room. The source transmitter antennas radiating at 10 kilowatts ERP were located on the roof above the transmitter and radio room. The signal in the radio room was comparatively low since the room was very well shielded from roof transmissions and beneath the beam of the transmitting high-gain narrow vertical beam width antennas.

There was a restaurant/night club below the radio room. Below the restaurant were two luxury suites used to house entertainers during their stay in Vegas. The source of the interference was in-building transmissions from a wireless microphone system in the luxury suite just below the radio room.

The wideband source signal from the commercial transmitter was measured at approximately -70 dBm and the narrowband interferer at -50 dBm using a spectrum analyzer with resolution bandwidth of 300 kHz. The interferer's bandwidth was approximately 150 kHz. Since the interferer was 20 dB higher than the source, it rendered the commercial mobile service incapable of the receiving the transmissions from the roof antenna. A power level of 250 mW is very strong when indoors and closer to mobiles as compared to base stations transmitting outdoors. This is a clear example of the co-channel interference caused by these low power auxiliary devices. In this case, the LPAS devices overpowered and caused interference to commercial mobile devices that were located in the same building of the commercial base station transmitting at 10 kW ERP.

In discussion with radio engineers in the Las Vegas user community, they have identified low power auxiliary devices such as wireless microphones as responsible for many transmission problems for in-building coverage. The LPAS

devices cause increased noise floors, radio desense, radio overload and IM products which result in interference symptoms in the Land Mobile Radio (LMR) and CMRS radio bands. In areas where entertainment venues exist, the LPAS devices can cause major problems and outages for licensed operators.

In another part the United States, we have second hand knowledge of the problems that can be caused with LPAS devices. In a major stadium for concerts, sports and entertainment within the New York/New Jersey metropolitan area the LPAS devices have caused interference problems with dead zones, no service and potential public safety issues on land mobile radio transmissions used for security and event management. Significant interference was identified by public safety personnel at these events occurring from wireless microphones operating in the upper VHF bands.

Clearly, these two services are not compatible in the same bands. The experiences above justify the elimination of the low power auxiliary devices from the 700 MHz spectrum bands.

5 NPRM Issues

5.1 Prohibiting the operation of LPAS in the 700 MHz spectrum after the DTV transition

LPAS devices have the potential to cause substantial harmful interference to new services operating in the 700 MHz bands, which include Public Safety and new CMRS services. These wireless microphones are currently being sold to the general public in today's market via the internet and other retail outlets. The general public is not properly trained to detect, prevent and eliminate interference into CMRS/PS essential services on the same spectrum.

Therefore, V-COMM agrees with the Commission that all LPAS operations cease at the DTV transition date of February 17, 2009. We further agree with the Commission that it is incumbent upon the Commission to take all steps necessary to make this spectrum effectively available both to public safety and commercial licensees at the end of the DTV transition. We demonstrate herein that harmful interference will be caused by the operation of these LPAS operations in the presence of public safety and commercial wireless networks operating in the 700 MHz spectrum, which is the basis for our agreement with the Commission's position in this NPRM.

5.2 Prohibiting the sale, manufacture and import of these devices

The equipment used by new services to occupy the 700 MHz spectrum, both commercial and public safety, is not compatible with LPAS devices and will suffer harmful interference if LPAS services were to continue in the band.

V-COMM, L.L.C. concurs with the position to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz band. We also agree that this prohibition, if adopted in this proceeding, should take effect on the date that the revised rules take effect.

5.3 Approach for updating licenses of current licensees

V-COMM agrees with the Commission, for those licensees that have obtained authorizations to operate low power auxiliary stations in spectrum that includes the 700 MHz Band beyond the end of the DTV transition, these licenses should be modified so as not to permit such operations in the 700 MHz Band after February 17, 2009.

Appendix A

Selection and Operation, Wireless Microphone
Systems, Educational Publication by Shure, Inc.

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REPLY COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

Michael F. Altschul
Senior Vice President and General Counsel

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Paul W. Garnett
Assistant Vice President, Regulatory Affairs

Brian M. Josef
Director, Regulatory Affairs

CTIA – The Wireless Association®
1400 16th Street, NW, Suite 600
Washington, D.C. 20036
(202) 785-0081

Dated: October 20, 2008

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND SUMMARY	2
II. THE COMMISSION SHOULD PROHIBIT OPERATION OF WIRELESS MICROPHONES IN THE 700 MHZ BAND	3
III. THE COMMISSION SHOULD NOT CREATE A GENERAL WIRELESS MICROPHONE SERVICE AT 2020-2025 MHZ	7
IV. TO THE EXTENT MANUFACTURERS OF UNLICENSED WIRELESS MICROPHONES HAVE VIOLATED COMMISSION RULES, THE COMMISSION SHOULD HOLD THEM ACCOUNTABLE.....	9
V. CONCLUSION.....	10

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REPLY COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

CTIA – The Wireless Association® (“CTIA”) respectfully submits these reply comments in response to the Commission’s Notice of Proposed Rulemaking and Order (“Notice”) regarding proposed amendments to its rules regarding the operation of broadcast low power auxiliary stations.¹ CTIA supports the Commission’s proposal to prohibit the operation of low power auxiliary stations in the 700 MHz band after the DTV transition.² CTIA agrees that such a rule is necessary to protect new commercial and public safety operations in the band from harmful interference caused by wireless microphones. CTIA, however, opposes the creation of a General Wireless Microphone Service (“GWMS”) at 2020-2025 MHz, as this spectrum plays an important role in the deployment of advanced wireless services (“AWS”). Finally, CTIA agrees that the Commission should hold manufacturers of wireless microphones found to be in violation

¹ Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, Notice of Proposed Rulemaking and Order, 23 FCC Rcd 13106 (2008) (“Notice”).

² *Id.* at ¶ 13.

of Commission rules accountable for their actions and responsible for remedying the situation.

I. INTRODUCTION AND SUMMARY

The Digital Television Transition and Public Safety Act of 2005 set February 17, 2009 as the deadline by which television broadcasters operating in Channels 52-69 must vacate these channels.³ The Commission has already allocated this spectrum for public safety and commercial use – indeed, much of the commercial spectrum has been successfully auctioned – and is obligated to ensure that this spectrum is available to licensees upon the completion of the DTV transition.⁴

The Commission also has permitted low power auxiliary stations to operate on a secondary basis in a variety of spectrum bands, including 614-806 MHz, and the Commission’s rules dictate that low power auxiliary devices operating in this spectrum not cause harmful interference to TV broadcast operations in the band.⁵ The Commission has long contemplated that these low power auxiliary devices would need to vacate the 700 MHz band by the date of the DTV transition, and CTIA supports the Commission’s proposal to adopt a rule to this effect.

³ *Id.* at ¶ 1.

⁴ *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 8064, at ¶ 17 (2007) (“700 MHz First Report and Order”) (“These statutory changes will effectively clear the spectrum in both the Upper and Lower 700 MHz Bands as of February 17, and consequently eliminate any uncertainty regarding when this spectrum will be available for public safety, commercial, and other wireless services.”).

⁵ 47 C.F.R. § 74.803(b) (“The selection of frequencies in the bands allocated for TV broadcasting for use in any area shall be guided by the need to avoid interference to TV broadcast reception. In these bands, low power auxiliary station usage is secondary to TV broadcasting and land mobile stations operating in the UHF-TV spectrum and must not cause harmful interference. If such interference occurs, low power auxiliary station operation must immediately cease and may not be resumed until the interference problem has been resolved.”).

The Public Interest Spectrum Coalition (“PISC”) filed an Informal Complaint and Petition for Rulemaking (“PISC Petition”) in which PISC made several proposals on which the Commission sought comment in its Notice.⁶ Specifically, PISC asked the Commission to (1) commence an investigation against wireless microphone manufacturers it alleges “willfully and knowingly market[ed] and [sold] wireless microphones to unauthorized users;” (2) grant a general amnesty to all unauthorized users of wireless microphones on the basis that they were misled by manufacturers; (3) immediately reclassify all licensed wireless microphone systems operating pursuant to Part 74, Subpart H of the Commission’s rules as secondary to commercial and public safety operations in Channels 52-69; (4) order that manufacture, sale, and advertisement of wireless microphones operating on Channels 52-69 cease immediately, and (5) create the GWMS on vacant UHF broadcast channels below Channel 52 as well as at 2020-2025 MHz.⁷ As stated below, CTIA supports PISC’s proposals for a rulemaking addressing clearance of wireless microphones from 700 MHz spectrum, but does not support creation of a GWMS at 2020-2025 MHz.

II. THE COMMISSION SHOULD PROHIBIT OPERATION OF WIRELESS MICROPHONES IN THE 700 MHZ BAND.

The Commission should prohibit the operation of low power auxiliary stations in the 700 MHz band, as the devices operating on these stations will cause significant and harmful interference to public safety and commercial systems licensed to operate in the band. The interference threat posed by the operation of wireless microphones in the 700

⁶ Notice at ¶ 13.

⁷ Informal Complaint and Petition of The Public Interest Spectrum Coalition at i-ii (filed July 16, 2008) (“PISC Petition”).

MHz band has been widely acknowledged by commenters in this proceeding and repeatedly observed by the Commission.

Commenters warned of the grave interference risk posed by wireless microphones operating at 700 MHz. Verizon Wireless stated that “[d]espite their ‘low power’ status, the interfering signals from broadcast auxiliary devices . . . would be strong enough to disrupt the operations of both mobile and base station receivers.”⁸ MetroPCS echoed Verizon Wireless’ concerns, noting that “[s]ince 700 MHz handsets will operate with very low power levels, proximate low power auxiliary stations could interfere with the reception of wireless handsets, or the ability of wireless base stations to receive wireless handset signals, all of which could cause dropped calls and degradation of call quality.”⁹

The interference caused by wireless microphones poses a particular threat to public safety operations. The Association of Public-Safety Communications Officials – International (“APCO”) expressed concern that wireless microphones “could interfere with first responders’ 700 MHz public safety radios in the vicinity.”¹⁰ Motorola confirmed that “approximately 45 public safety agencies have already deployed equipment in the upper 700 MHz band” and that “[a]ll of these users are now subject to potential interference from nearby operation of uncoordinated wireless microphones.”¹¹

V-COMM, L.L.C. (“V-COMM”) submitted a detailed technical analysis of the

⁸ Comments of Verizon Wireless, WT Docket No. 08-166, at 4 (filed Oct. 3, 2008).

⁹ Comments of MetroPCS Communications, Inc., WT Docket No. 08-166, at 3 (filed Oct. 3, 2008).

¹⁰ Comments of APCO, WT Docket No. 08-166, at 2 (filed Oct. 3, 2008).

¹¹ Comments of Motorola, Inc., WT Docket No. 08-166, at 3 (filed Oct. 3, 2008).

interference from wireless microphones to CMRS and public safety systems.¹² It predicted that a co-channel low power auxiliary device would propagate at levels that could cause loss of service on commercial or public safety mobiles within 700 feet, and that the range of interference would be even greater in the case of narrowband public safety operations or the operation of a wireless microphone at a base station location.¹³ V-COMM further found that “OOBE from the [low power auxiliary] devices that are close enough to CMRS base stations may [be] strong enough to interfere with CMRS mobiles that are located further away and received at lower power levels at the base station.”¹⁴ Finally, V-COMM noted the risk of intermodulation interference, stating that “[t]he use of multiple [low power auxiliary] devices at concerts, stadiums, and sporting events is well known. Using multiple [low power auxiliary] devices in a venue can create Intermodulation products transmitting on other channels and thus causing harmful interference to the CMRS or [public safety] receivers.”¹⁵

The FCC has stated that “[i]t is incumbent on the Commission to take all the steps necessary to make [700 MHz] spectrum effectively available both to public safety as well as commercial wireless services,”¹⁶ and it re-affirmed this obligation in the Notice.¹⁷

¹² Report of V-COMM, L.L.C., WT Docket No. 08-166 (filed Oct. 1, 2008).

¹³ *Id.* at 6-7 (“The same co-channel argument can be justified for a [low power auxiliary station] interfering at a CMRS or public safety base station location. Assuming a base station height of 20 meters, 250 milliwatt [low power auxiliary station] output power, and a clutter loss of 10 dB, the Egli model predicts these co-channel [low power auxiliary] devices will interfere with CMRS or Public Safety (PS) base stations within 1.8 km (1.1 miles). Again, with no clutter, the Egli model predicts the range of interference is increased to 3.3 km (2.1 miles).”).

¹⁴ *Id.* at 7.

¹⁵ *Id.* at 8.

¹⁶ 700 MHz First Report and Order at ¶ 2.

Prohibiting the operation of wireless microphones in the 700 MHz band is necessary to fulfill this objective. Indeed, the Commission has previously recognized the potential for interference from low power auxiliary station devices to 700 MHz operations¹⁸ and, consistent with these findings, should prohibit the use of wireless microphones in the band.

CTIA echoes the concern shared by other commenters regarding the risk of harmful interference. As CTIA has previously stated, interference protection is “necessary to provide licensees with certainty as they continue to build out networks and innovate” as well as “necessary for consumers, who purchase equipment and services in reliance on that protection.”¹⁹ The services planned for the upper 700 MHz band will enhance consumers’ wireless experience and advance public safety’s wireless communications needs. It is therefore critical that the Commission enact rules necessary to protect these systems from harmful interference.

Finally, some commenters have argued in favor of a gradual phase-out process for

¹⁷ Notice at ¶ 9.

¹⁸ *Unlicensed Operation in the TV Broadcast Bands*, First Report and Order and Further Notice of Proposed Rulemaking, 21 FCC Rcd 12266, at ¶ 2 (2006) (“We will further consider whether appropriate provisions can be developed to permit low power personal/portable devices to operate in this spectrum without causing harmful interference. To minimize the risk of interference to certain authorized services in the TV bands, we will not permit operation of TV band devices . . . on TV channels 52-69, as that spectrum has been reallocated for other services and will no longer be part of the TV bands after the digital television (DTV) transition.”); *Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78 and 101 of the Commission’s Rules*, Report and Order, 17 FCC Rcd 22979, at ¶ 155 (2002) (“Finally, WAVDs will not be allowed to use channels above 698 MHz (channel 51) in the UHF-TV band due to a recent spectrum reallocation of those channels to uses other than broadcasting. We find that these exclusions are justified to protect existing operations in these bands.”).

¹⁹ Comments of CTIA – The Wireless Association, ET Docket No. 04-186, at 2 (filed Jan. 31, 2007).

licensed wireless microphone operations in the 700 MHz band.²⁰ As stated above, the Commission has repeatedly prohibited the use of low power auxiliary devices at Channels 52-69 in anticipation of the DTV transition. The Commission therefore should adopt an expeditious timeframe for band clearance that concludes no later than February 17, 2009. A longer timeframe is unnecessary and places an inappropriate burden on 700 MHz commercial and public safety licensees to clear the spectrum and prevent interference to their operations. Interference protection, particularly where public safety is involved, is a crucial policy goal of the Commission. Consistent with this objective, the FCC should prohibit the operation of low power auxiliary stations at Channels 52-69.

III. THE COMMISSION SHOULD NOT CREATE A GENERAL WIRELESS MICROPHONE SERVICE AT 2020-2025 MHZ.

Although CTIA is generally supportive of the proposals raised in the PISC Petition, it does not support the creation of a GWMS at 2020-2025 MHz, as doing so would preclude the use of this spectrum for advanced wireless service and is not necessary to accommodate users of wireless microphones.

As CTIA has maintained in the Commission's AWS proceedings, allowing uplink

²⁰ Comments of the Association for Maximum Service Television, Inc., and the National Association of Broadcasters, WT Docket No. 08-166, at 3 (filed Oct. 3, 2008) ("Under this plan, all wireless microphone use in the 700 MHz band would end by February 17, 2012. Prior to that date, however, a commercial wireless or public safety entrant could cause operations to cease by notifying licensed users of the date on which the entrant intends to commence service. That notice would specify the frequencies on which the entrant will operate, an applicable geographic area, and the date on which service will begin (which date should not be sooner than 120 days of the date on which the notice was sent). Within sixty days prior to the date of commencement specified in the notice, the licensed wireless microphone user would cease all operations throughout the applicable geographic area on the frequency listed."). *See also* Comments of Shure Incorporated, WT Docket No. 08-166, at 6 (filed Oct. 3, 2008) ("Shure Comments") ("Shure specifically proposes that users, other than those operating in the Part 90 Safety Bands, be given 24 months from the effective date of the rules in order to 'transition' to wireless microphone operations using other spectrum.").

operations in the 2155-2175 MHz band would cause substantial interference to adjacent-band operations.²¹ CTIA has proposed, for example, that the AWS-3 block be used for downlink only or pairing a downlink-only 2155-2180 MHz block with uplink operations in the 2020-2025 MHz band.²² Allowing operation of wireless microphones in this spectrum would render sound band plans impossible.

Allowing low power auxiliary stations to operate only on channels below Channel 52 is sufficient to accommodate wireless microphone users, where such operation is permitted, and use of additional spectrum is unnecessary. As noted by the Commission, low power auxiliary stations will retain access to more than 300 MHz of spectrum even if the Commission prohibits operations in 700 MHz spectrum.²³ Use of additional

²¹ Comments of CTIA – The Wireless Association®, WT Docket No. 07-195, at 38 (filed July 25, 2008) (“The AWS-3 *Notice* is full of references recognizing that, if the Commission were to allow TDD operations in the AWS-3 band, it would have to address the significant adjacent channel interference issues given that the FCC rules require FDD downlink operations in the adjacent 2110-2155 MHz band.”); Comments of CTIA – The Wireless Association®, WT Docket 07-195, at 2-3 (filed Dec. 14, 2007) (“While recognizing the potential of these technologies, the Commission notes that allowing mobile transmissions in the 2155-2175 MHz band could create a substantial risk of interference to adjacent AWS-1 and AWS-2 operations. . . . CTIA shares the Commission’s concerns.”).

²² Comments of CTIA – The Wireless Association®, WT Docket No. 07-195, at 28 (filed July 25, 2008) (arguing that the Commission adopt one of the following band plan options: (1) the downlink-only approach it raised in the AWS-3 Notice; (2) combine the J Block with AWS-3 spectrum into a single license, with the 2020-2025 MHz block used for uplink and the 2155-2180 MHz block used for downlink; (3) reconfigure the J Block so that a 2020-2025 MHz uplink band is paired with a 2155-2160 MHz downlink band, with the AWS-3 band moving to 2160-2180 MHz; or (4) pursue a structured uplink-downlink model that protects AWS-1 licensees from harmful interference.”).

²³ Notice at ¶ 18. The Commission tentatively concluded that “given the amount of spectrum available in these other bands, prohibiting the use of low power auxiliary stations from the 700 MHz band will have minimal impact on such operations.” *Id.* The Commission should, however, address the rights and responsibilities of wireless microphone users in any order on TV White Spaces.

spectrum is therefore unnecessary.²⁴ For this reason, creating the GWMS at 2020-2025 MHz would be spectrally inefficient and would undermine the Commission's efforts to facilitate the deployment of advanced services to wireless customers – both of which would run counter to the public interest.

IV. TO THE EXTENT MANUFACTURERS OF UNLICENSED WIRELESS MICROPHONES HAVE VIOLATED COMMISSION RULES, THE COMMISSION SHOULD HOLD THEM ACCOUNTABLE.

PISC has alleged that wireless microphone manufacturers have knowingly and willingly violated the Commission's rules by marketing the microphones to ineligible users in violation of Part 74, Subpart H.²⁵ PISC has therefore proposed that the Commission order wireless microphone manufacturers to pay for the migration of users by replacing the unauthorized equipment with new equipment that will not operate in 700 MHz frequencies.²⁶

CTIA notes that the Enforcement Bureau has initiated an investigation relating to the alleged illegal marketing practices of wireless microphone manufacturers.²⁷ If the Commission finds that certain wireless microphone manufacturers have violated its rules, CTIA supports holding them accountable. Because the deployment of new wireless services in the 700 MHz band is imminent, the Commission should promptly complete this investigation and hold violating wireless microphone manufacturers responsible for

²⁴ In rare cases where many wireless microphones operate in a single location, the microphones can be engineered to avoid both local channels and the other microphones in use at that location.

²⁵ PISC Petition at 3-15.

²⁶ *Id.* at xii-xiv.

²⁷ Notice at ¶ 22.

remedying the problem of unauthorized use of wireless microphones in 700 MHz spectrum.²⁸

V. CONCLUSION

The planned commercial and public safety services in the 700 MHz band will benefit tremendously consumers and first responders. It is imperative that the Commission takes all steps necessary to ensure that these new services may operate free from harmful interference, including prohibiting the operation of wireless microphones on Channels 52-69. Even after wireless microphones lose access to 700 MHz spectrum, there will remain ample spectrum for their operation, and for this reason the Commission should not undermine its AWS policies by creating a GWMS at 2020-2025 MHz. CTIA urges the Commission to act promptly to adopt rules to ensure the clearance of the 700 MHz band by the DTV transition date, and to hold those wireless manufacturers in violation of Commission rules responsible for remedying the unauthorized use of wireless microphones in 700 MHz spectrum.

²⁸ While CTIA acknowledges that there have been instances in which new entrants may pay to relocate existing licensees, the facts here are distinguishable. Licensed, authorized users have long been on notice that these low power auxiliary devices would need to vacate the 700 MHz band by February 17, 2009, and many have taken steps accordingly. Moreover, new 700 MHz licensees should not be forced to bear responsibility for relocating the many unauthorized, unlicensed low power auxiliary device users that pose the largest potential for interference to commercial and public safety licensees. Such an obligation would merely encourage further unlawful uses of licensed spectrum.

Respectfully submitted,

By: /s/ Brian M. Josef

CTIA – The Wireless Association®
1400 16th Street, NW, Suite 600
Washington, D.C. 20036
(202) 785-0081

Brian M. Josef
Director, Regulatory Affairs

Michael F. Altschul
Senior Vice President and General Counsel

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Paul W. Garnett
Assistant Vice President, Regulatory Affairs

Dated: October 20, 2008

Its Attorneys

**Association of Public-Safety Communications Officials (APCO)
CTIA—The Wireless Association®
National Emergency Number Association (NENA)
National Public Safety Telecommunications Council (NPSTC)
Rural Cellular Association (RCA)**

November 25, 2008

Via Electronic Filing

Chairman Kevin J. Martin
Commissioner Michael J. Copps
Commissioner Jonathan S. Adelstein
Commissioner Deborah Taylor Tate
Commissioner Robert M. McDowell
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, et al., WT Docket Nos. 08-166 & 08-167*

Dear Chairman Martin and Commissioners:

The *700 MHz Wireless Microphone* proceeding¹ raises a matter of immediate and considerable public concern: wireless microphones and other low power auxiliary station (“LPAS”) devices that operate on the 700 MHz frequencies expose first responders, the public they protect, and commercial wireless subscribers to a significant risk of disrupted communications. The undersigned associations, on behalf of public safety and commercial wireless 700 MHz licensees, support the Commission’s tentative conclusion that this spectrum must be cleared of all LPAS devices. While developing and implementing a comprehensive plan for clearing the spectrum may take additional time, we ask the Commission to issue an order *by year’s end* to reduce further risk of harmful interference. Specifically, the Commission should immediately take the following steps:

- Prohibit the manufacture, import, sale, offer for sale, or shipment of LPAS devices that operate in the 700 MHz band, including wireless microphones, effective thirty (30) days after publication in the Federal Register. Expressly require retailers to remove from inventory and store shelves wireless microphones and other LPAS devices that are capable of operating on the 700 MHz frequencies (“700 MHz-capable LPAS devices”).

¹ *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, et al., WT Docket Nos. 08-166 & 08-167, Notice of Proposed Rulemaking and Order* (rel. Aug 21, 2008) (“*700 MHz Wireless Microphone NPRM*” or “*Notice*”).

- Confirm that existing rules governing authorized Part 74, Subpart H wireless microphones and other LPAS devices only permit operations on a secondary basis, and that these devices are prohibited from causing harmful interference to new commercial wireless and public safety licensed operations in the 700 MHz band.² Confirm that in the event of such interference, wireless microphones must immediately cease operations. Further, announce that the Commission will take action to ensure that any LPAS devices interfering with 700 MHz operations are shut down.
- Issue a public notice and consumer advisory to alert manufacturers, wholesalers, retailers and consumers that the manufacture and sale of 700 MHz-capable wireless microphones or other LPAS devices is prohibited.

Even with these actions, there remains a significant base of authorized *and* unauthorized wireless microphones in the 700 MHz band, posing a serious interference risk to new public safety and commercial wireless operations in the band. The Commission must devise an enforceable plan to ensure that these users migrate out of the band, but should adopt the intermediate steps described above immediately to stop the introduction of additional 700 MHz-capable LPAS devices and reaffirm that interference from existing LPAS operations will not be permitted.

Wireless Microphones and Other LPAS Devices in the 700 MHz Band Will Disrupt Public Safety and Commercial Wireless Operations. The *Notice* properly expressed the Commission’s “concern[] about the potential for harmful interference from low power auxiliary devices to 700 MHz Band public safety and commercial wireless operations.”³ The record in this proceeding demonstrates the magnitude of interference problems wireless microphones will cause to public safety and commercial operations. As APCO explained on behalf of public safety, “there is a very real danger of interference from the low auxiliary devices to public safety land mobile radio systems.”⁴ APCO also noted that public safety use of the 700 MHz band has begun in several areas, and public safety use is likely to increase significantly shortly after February 17.⁵ Indeed, the Society of Broadcast Engineers, a provider of frequency coordination for broadcast auxiliary services (“BAS”), stated that it “could not comfortably coordinate Part 74 licensed BAS operation of [LPAS] devices in the 700 MHz band once public safety operations begin in that band in earnest.”⁶ **Wireless engineering firm V-COMM analyzed the interference risk and found the following:**

² LPAS devices operating without a Part 74 license operate without authorization and are not even entitled to secondary status. The risk of interference from these devices, however, is equally troubling. As noted elsewhere, the Commission should address the disposition of these devices, but in any event interference from such devices cannot be permitted.

³ *700 MHz Wireless Microphone NPRM* at ¶ 14.

⁴ Comments of APCO at 2.

⁵ *See id.* at 2 n.1.

⁶ Comments of Society of Broadcast Engineers at 3.

[A] co-channel LPAS device would propagate at levels that could cause loss of service on CMRS or Public Safety (PS) mobiles within 220 meters (700 ft). In cases of stadiums, open space, or outdoor venues a line of site model is more appropriate.... [T]he range of interference is increased to 400 meters (1300 ft). This interference range is enough to completely wipe out CMRS mobile and PS portable communications at an entire concert or professional sporting event and cause loss of service to tens of thousands of customers.⁷

The Commission must take action to minimize the risk of such interference.

The Commission Must Prohibit Manufacture and Sale of 700 MHz-Capable Wireless Microphones and Other LPAS Devices. The Commission should adopt its tentative conclusion to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz band.⁸ Under Section 302 of the Communications Act, the Commission has authority to make reasonable regulations governing the interference potential of devices that in their operation are capable of emitting radio frequency radiation in sufficient degree to cause harmful interference to radio communications, and to require devices marketed and sold to comply with these regulations.⁹ The most sensible approach to minimizing the spread of additional LPAS devices operating in the 700 MHz band and exacerbating the interference problem is to prohibit 700 MHz-capable LPAS devices from entering the marketplace. The Commission should therefore prohibit the manufacture, import, sale, offer for sale, or shipment of any LPAS devices, including wireless microphones that are capable of operating on the 700 MHz frequencies. Because of the significant risk of harmful interference to public safety and commercial wireless systems in the 700 MHz band, the Commission should make the prohibition effective thirty (30) days after publication of the revised rules in the Federal Register. To accomplish its objective, the Commission also must expressly direct retailers to remove all 700 MHz-capable LPAS devices from store shelves and inventory.

The Commission Should Confirm that Wireless Microphones and Other LPAS Devices Operate on a Secondary Basis to 700 MHz Public Safety and Commercial Wireless Services and Will Be Shut Down in the Event of Interference. As the Notice explains, Subpart H of Part 74 governs LPAS operations, and rule provisions establish that the public safety and commercial wireless services are primary to wireless

⁷ Comments of V-COMM L.L.C. at 6.

⁸ 700 MHz Wireless Microphone NPRM at ¶ 17.

⁹ Section 302(a) of the Communications Act states that, “The Commission may, consistent with the public interest, convenience and necessity, make reasonable regulations...governing the interference potential of devices which in their operation are capable of emitting radio frequency energy...in sufficient degree to cause harmful interference to radio communications.” 47 U.S.C. § 302(a). Section 302(b) of the Communications Act states that, “No person shall manufacture, import, sell, offer for sale, or ship devices...which fail to comply with the regulations promulgated pursuant to this section.” See 47 U.S.C. § 302(b).

microphones and other LPAS operations in the 700 MHz band.¹⁰ Section 74.803(b), for example, states that “low power auxiliary station usage is secondary to TV broadcasting and land mobile stations operating in the UHF-TV spectrum and must not cause harmful interference.”¹¹ Further, Section 74.861(g) provides that LPAS devices operate “so that no harmful interference is caused to any other class of station operating in accordance with [the] Commission’s rules and regulations and with the Table of Frequency Allocations in part 2 thereof.”¹² Both commercial and public safety in the 700 MHz band will, of course, operate “land mobile stations”¹³ and will operate “in accordance with” the Part 27 and Part 90 rules, respectively, and the table of allocations in 47 C.F.R. § 2.106. Thus, under the Commission’s existing rules, wireless microphones are expressly forbidden from causing harmful interference to 700 MHz commercial wireless and public safety licensees.

The Commission should also emphasize that interference to public safety or commercial wireless operations will not be permitted, and FCC staff will force offending operations to shut down. Specifically, Section 74.803(b) states that “[i]f such interference occurs, low power auxiliary station operation must immediately cease and may not be resumed until the interference problem has been resolved.”¹⁴ The Commission should make clear that, in the event that a new 700 MHz licensee experiences interference, FCC staff will investigate interference sources and immediately take steps to end such operations. It is important to note, however, that after-the-fact remedies for interference, standing alone, are inadequate to address the LPAS interference problems that exist in the 700 MHz band. In the context of public safety communications, for example, just one instance of interference could endanger the safety of life and property. Pro-active steps are therefore necessary to *prevent* interference from occurring.

The Commission Should Issue a Public Notice and a Consumer Advisory to Publicize the Ban on the Manufacture and Sale (and Purchase) of 700 MHz-capable Wireless Microphones and Other LPAS Devices. Given the interference risks at issue here, it is not enough to adopt an order that puts parties on legal notice of new rules. Rather, the Commission should increase awareness that there is no more future for 700 MHz-capable wireless microphones and other LPAS devices. The Commission can accomplish this by issuing a public notice and consumer advisory to inform manufacturers, wholesalers, and retailers that new rules ban the manufacture and sale of

¹⁰ 700 MHz Wireless Microphone NPRM at ¶ 5.

¹¹ 47 C.F.R. § 74.803(b).

¹² 47 C.F.R. § 74.861(g).

¹³ The portable and mobile handsets and terminals that will be used in connection with 700 MHz services constitute “land mobile stations.” See 47 C.F.R. § 2.1 (definitions of “land mobile station,” “land mobile service,” “mobile station,” and “station”).

¹⁴ 47 C.F.R. § 74.803(b).

such devices, and potential customers should be alerted against acquiring new devices designed to operate in the 700 MHz bands.

Respectfully Submitted,

/s/ Robert M. Gurss

Director, Legal & Government Affairs

Association of Public-Safety Communications Officials (APCO)

/s/ Christopher Guttman-McCabe

Vice President, Regulatory Affairs

CTIA – The Wireless Association®

/s/ Dr. Brian Fontes

Executive Director

National Emergency Number Association

/s/ Ralph A. Haller

Chair

National Public Safety Telecommunications Council

/s/ Todd B. Lantor

Regulatory Counsel

Rural Cellular Association



April 17, 2009

3 Cedar Brook Drive
Cranbury, NJ 08512

Phone 609 655-1200
Fax 609 409-1927
sean.haynberg@vcomm-eng.com

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 - 12th Street, SW, Room TW-A325
Washington, DC 20554

Re: ***Ex Parte Presentation***
WT Docket No. 08-166

Dear Ms. Dortch:

V-COMM, L.L.C. is a wireless engineering consulting firm with extensive experience in wireless telecommunications engineering. In addition to having experience with a wide variety of commercial wireless technologies, we also have extensive experience in the design of public safety communications systems.

On October 1, 2008, V-COMM filed a report with the Commission that included a detailed engineering analysis showing the extent of harmful interference that would be caused to both commercial wireless systems and public safety communications systems operating in the 700 MHz band if LPAS devices were allowed to continue to operate in that band. Since that time, we have conducted extensive additional analyses on the potential for interference, including the interference to wireless microphones and other LPAS devices from the operations of commercial and public safety systems. These studies demonstrate that public safety licensees, commercial licensees, and wireless microphone users will all be substantially harmed by continued operation of LPAS devices at 700 MHz. Attached is a presentation summarizing the results of our studies.

Pursuant to Section 1.1206(b)(2) of the Commission's Rules, an electronic copy of this letter is being filed for inclusion in the above-referenced docket.

Sincerely,

A handwritten signature in black ink that reads 'Sean Haynberg'.

Sean Haynberg
Director of RF Technologies

cc: Paul Murray
Jim Schlichting
Julius Knapp



Wireless Microphone Interference Study CMRS & Public Safety in 700 MHz

April 17, 2009

Sean Haynberg
Director of RF Technologies

OVERVIEW

- **Interference to Wireless Microphone Systems in 700 MHz**
 - Study interference from CMRS and Public Safety base stations and mobiles devices
 - Use typical operating parameters to model the expected interference to Wireless Microphone systems operating in the downlink and uplink bands within 700 MHz spectrum
- **Interference to CMRS & Public Safety Services**
 - Study interference from Wireless Microphones operating in 700 MHz spectrum. Per V-COMM report filed in FCC's LPAS proceeding.
 - Use generalized model to study interference to CMRS and Public Safety base stations and devices operating in 700 MHz.
- **Observations and Assessments of Interference**
 - Address interference on the downlink and uplink spectrum bands
- **Conclusions**

700 MHz Spectrum

- Wireless microphones (MIC) are authorized pursuant to FCC Part 74 rules for Low Power Auxiliary Stations (LPAS). They operate on a secondary basis in the VHF & UHF TV spectrum, which include the entire 700 MHz spectrum bands. The 700 MHz spectrum chart is provided below. The CMRS & PS downlink and uplink bands are noted as BS Tx and MS Tx, respectively.
 - Interference impacts CMRS and Public Safety (PS) base stations and user devices. Public Safety services include narrowband voice and broadband data services operating in 700 MHz. CMRS services impacted will be 3rd and 4th Generation broadband data, multimedia, and voice services.
 - Interference also impacts Wireless MIC user stations
 - The type of interference addressed in this study is *co-channel* interference.

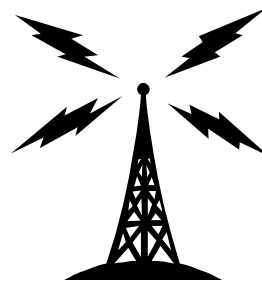
LPAS Wireless MIC Operating in 700 MHz Spectrum																		
698	704	710	716	722	728	734	740	746	752	758	764	770	776	782	788	794	800	806
CH 52	CH 53	CH 54	CH 55	CH 56	CH 57	CH 58	CH 59	CH 60	CH 61	CH 62	CH 63	CH 64	CH 65	CH 66	CH 67	CH 68	CH 69	
A	B	C	D	E	A	B	C	C	A	D	Public Safety	B	C	A	D	Public Safety	B	
Lower 700 MHz Bands								Upper 700 MHz Bands										
MS Tx	MS Tx	MS Tx	BS Tx	BS Tx	BS Tx	BS Tx	BS Tx	BS Tx		BS Tx	BS and MS Tx		MS Tx		MS Tx		MS Tx	
CMRS			CMRS (Mobile TV)		CMRS			CMRS		TBD	Broadband (BB)	Narrowband (NB)		CMRS		TBD	Broadband (BB)	Narrowband (NB)

LPAS, CMRS, and PS 700 MHz Operations

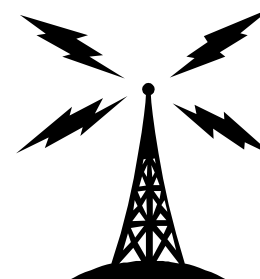
LPAS



CMRS



Public Safety



Operating Parameters of Wireless Microphone Systems

- Operating parameters of wireless microphone systems
 - While operating parameters can vary, this analysis is based on a typical system.
 - Transmit power levels vary from 10 mW to 250 mW (50 mW typical). The typical antenna is referenced to a $\frac{1}{4}$ wave length antenna with gain of 0 dBi (-2 dBd).
 - Wireless microphones use FM modulation with peak deviation of +/- 50 to 75 kHz, and receiver bandwidth of 200 kHz. Equipment thermal noise floor is -109 dBm typically, with 12 dB noise figure and thermal noise of (KTB) -121 dBm/200 kHz.
 - 6 to 10 LPAS units can operate within a single 6 MHz channel in TV spectrum. Some channels will have elevated noise floors due to TV co-channel and adjacent channel signals and other wireless microphone out-of-band signals.
 - Target operating received signal strength is -70 dBm to -80 dBm to overcome standing wave reflections, multi-path fading, inter-modulation, user body and local clutter losses, and for reliable high-quality audio performance. On-channel noise increases the target level.
 - Typical Operating Range is approximately 100 meters (330 ft) for indoor applications. (The FCC Part 74 stated intended range for LPAS is also equal to 100 meters.)
 - Examples of LPAS devices include handheld microphones, belt-pack transmitters with lapel microphones, personal monitoring devices, etc. This study analyzes the handheld case. Other cases can slightly vary results.
- Interference threshold to wireless microphone systems is a 10 dB loss in link budget and operating range. This is used in this interference study.
 - Interference threshold of -95 dBm is used for this interference study.
 - Results in operating range of 32 meters (100 ft), which is about 1/3 the intended range
 - Interference results in loss of operating range, increased dead spots, loss of margin used to mitigate signal reflections, and/or degraded audio quality & performance.

Operating Parameters of CMRS Systems

- CMRS System Parameters

- Operating parameters for wireless CMRS systems can vary. This study models a hypothetical CMRS system operating in 700 MHz that is representative of a typical system, which is used to determine the impact of interference to wireless microphones operating in 700 MHz.
- CMRS base station (BTS) and mobile devices (MS) transmit at power levels of 400 Watts ERP and 0.2 Watts (200 mW), respectively. MS antenna gain of 0 dBi (-2 dBd) and body loss of -3 dB is used in this analysis.
- The CMRS wireless technology used is 3GPP Long Term Evolution (LTE) standard. The downlink uses OFDM, and uplink uses SC-FDMA air-interface standards. The occupied carrier bandwidth for OFDM and SC-FDMA depends on the number of resource blocks used (180 kHz BW per RB).
- The approximate coverage range of a 700 MHz CMRS base station is assumed to be 2.6 km (1.6 miles) and 1.8 km (1.1 miles) for base station antenna heights of 100 ft and 50 ft AGL, respectively.

- Propagation Model Parameters

- The Egli propagation model is used -- based on 40 dB log distance propagation loss.
- Building penetration loss of 10 dB is used.
- Base station antenna heights of 100 feet and 50 feet AGL are used to model suburban and urban sites. User device antenna height used is 5 feet AGL.

Operating Parameters of Public Safety Systems

- Public Safety (PS) System Parameters

- Operating parameters for wireless PS systems can vary. This study models a hypothetical PS system operating in 700 MHz that is representative of a typical system, which is used to determine the impact of interference to wireless microphones operating in 700 MHz.
- PS base station, user vehicle-mounted, and user handheld (portable) equipment transmit at power levels of 200 Watts ERP, 30 and 3 watts, respectively. Portable radio antenna gains of 0 dBi (-2 dBd) and body loss of -3 dB are used, with vehicle-mount antenna gain of 0 dBd with 2 dB cable loss.
- The Public Safety wireless technology used in this study is the digital Project 25 (P25) Phase 1 standard for narrowband voice, having a nominal bandwidth of 12.5 kHz. (spectral efficiency of 1 user per 12.5 kHz)
- The approximate coverage range of a 700 MHz PS base station to a portable is assumed to be 4.3 km (2.7 miles) and 3.1 km (1.9 miles) for base station antenna heights of 100 ft and 50 ft AGL, respectively.

- Propagation Model Parameters

- The Egli propagation model is used -- based on 40 dB log distance propagation loss.
- Building penetration loss of 10 dB is used.
- Base station antenna heights of 100 feet and 50 feet AGL are used to model suburban and urban sites. User device antenna height used is 5 feet AGL.

Range of Interference to Wireless Microphone Systems in Downlink & Uplink 700 MHz bands

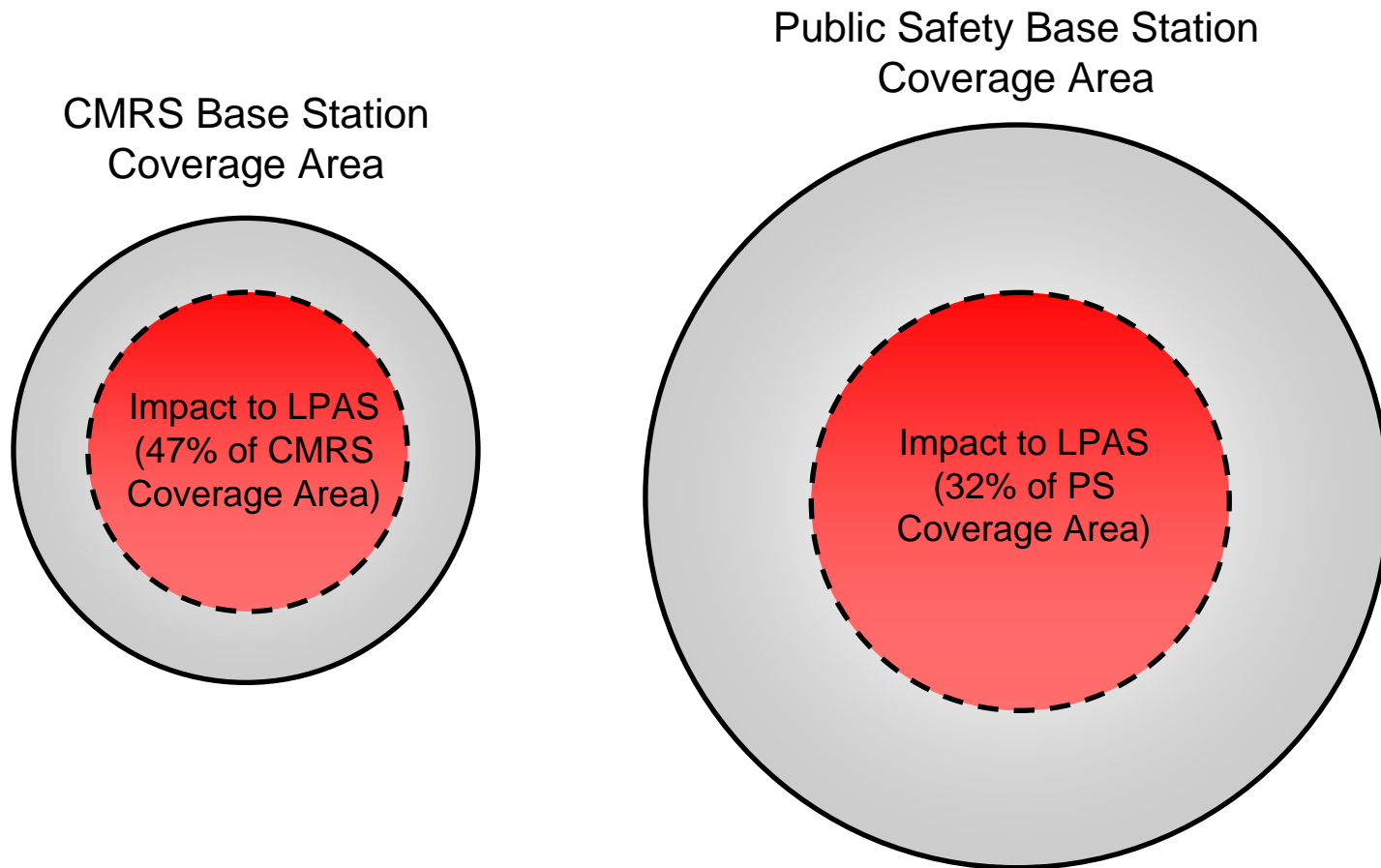
- Range of co-channel interference from CMRS and Public Safety base stations (BTS) and mobile stations (MS) to wireless microphone systems is given below. The BTS and MS cases below represent the downlink and uplink spectrum bands, respectively.

CMRS Interference	Suburban BTS (100 ft AGL)	Urban BTS (50 ft AGL)	CMRS MS
Range of Impact to LPAS MIC	1.8 km (1.1 mi)	1.3 km (0.8 mi)	79 m (260 ft)

Public Safety (PS) Interference	Suburban BTS (100 ft AGL)	Urban BTS (50 ft AGL)	PS MS (Portable)	PS MS (Vehicular)
Range of Impact to LPAS MIC	2.4 km (1.5 mi)	1.7 km (1.1 mi)	144 m (471 ft)	303 m (995 ft)

Area of Interference to Wireless Microphone Systems in Downlink 700 MHz bands

- The interference impact area to wireless microphone systems is 47% and 32% of the CMRS and Public Safety base stations coverage areas, respectively, when operating in the CMRS & Public Safety **downlink** spectrum bands.

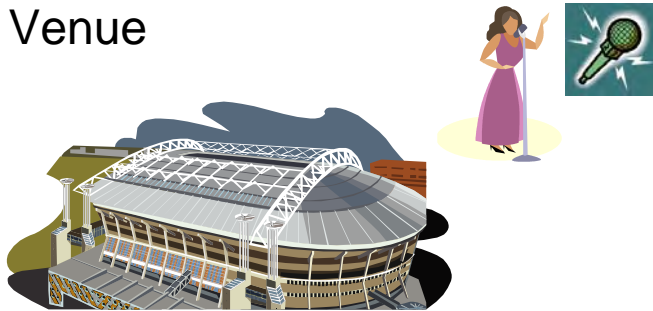


Interference to Wireless Microphone Systems in Downlink & Uplink 700 MHz bands

- Significant areas of interference will occur to wireless microphone systems operating on the **downlink** spectrum of CMRS and Public Safety 700 MHz systems, representing approximately 1/2 to 1/3 of the base station coverage areas.
 - Shaded areas within the circles represents the LPAS interference areas, which are concentrated near the center. Outer parts of the base station coverage area would not have interference.
 - Wireless microphone systems may operate on downlink spectrum in outer parts of BTS coverage areas.
- The range of interference to wireless microphone systems operating on the **uplink** spectrum from CMRS & Public Safety mobile devices will occur within the venue operating the wireless microphone system and from CMRS & PS devices used nearby.
 - Range from CMRS devices is 79 meters.
 - Range from PS vehicles and portables is 303 and 144 meters.
 - Interference on uplink spectrum bands will be intermittent, based on proximity of nearby mobile users.

Interference to Wireless Microphone Systems in Uplink 700 MHz bands

Public Venue



Operating in same area



- Interference impact to LPAS on CMRS & PS **uplink** spectrum bands
 - Generally limited to areas within and nearby venues operating wireless microphones.
 - The exception would be close to CMRS base stations when CMRS devices are powered to very low levels. In these cases, the CMRS devices can transmit at power levels below -20 dBm (10 microwatts), and the interference range is limited to within the venue and <10 m.

Observations and Assessments of Interference to Wireless Microphones operating in 700 MHz

- Many wireless microphone systems will experience significant interference from CMRS & Public Safety services operating in 700 MHz
- Impact of interference will result in degraded range and performance to the wireless microphone system
 - Poor performance; bad audio quality
 - Poor range and/or dead spots
- Some wireless microphone systems operating further away from CMRS & PS base stations on **downlink** 700 MHz spectrum bands and with shorter range requirements can continue to operate without interference
 - However, these wireless microphones can still interfere with CMRS & Public Safety mobile devices.

Observations and Assessments of Interference to Wireless Microphones operating in 700 MHz

- Wireless microphone systems operating on **uplink** 700 MHz spectrum bands can experience unpredictable, intermittent interference from *mobile* CMRS & Public Safety vehicular/portable user devices.
 - This type of “mobile”, nomadic interference will not be easily detected or identifiable, and can frustrate the Wireless Microphone users.
 - For example a wireless microphone system that is performing at peak performance during pre-system set ups for a major concert or event, may experience unexpected and significant interference from a mobile device operating in 700 MHz *during* the event or show (e.g., someone in the audience using a data device).
 - This type of “mobile” intermittent interference is different than the type of interference wireless microphone users are used to dealing with in UHF spectrum, which are “fixed” TV broadcast transmissions operating at consistent levels from fixed locations.

Interference to 700 MHz CMRS & Public Safety Systems

- V-COMM studied the interference from wireless microphones to CMRS & Public Safety systems operating in 700 MHz.
 - V-COMM's Report was filed in the FCC WT Docket No. 08-166 and 08-167 on October 1, 2008.
 - Typical operating parameters for CMRS & Public Safety systems and wireless microphone systems were utilized in the interference study.
 - The range of interference from wireless microphones to CMRS and Public Safety base stations and devices are provided in the table below, with and without 10 dB of clutter loss (i.e. typical loss of 1 wall partition).

MIC Transmit Power (mW)	BTS with 10 dB Clutter Loss (km)	BTS with No Clutter Loss (km)	Devices with 10 dB Clutter Loss (m)	Devices with No Clutter Loss (m)
250	1.8	3.3	220	400
100	1.4	2.6	175	318
50	1.2	2.2	147	267
10	0.8	1.5	98	179

Interference to 700 MHz CMRS & Public Safety Systems

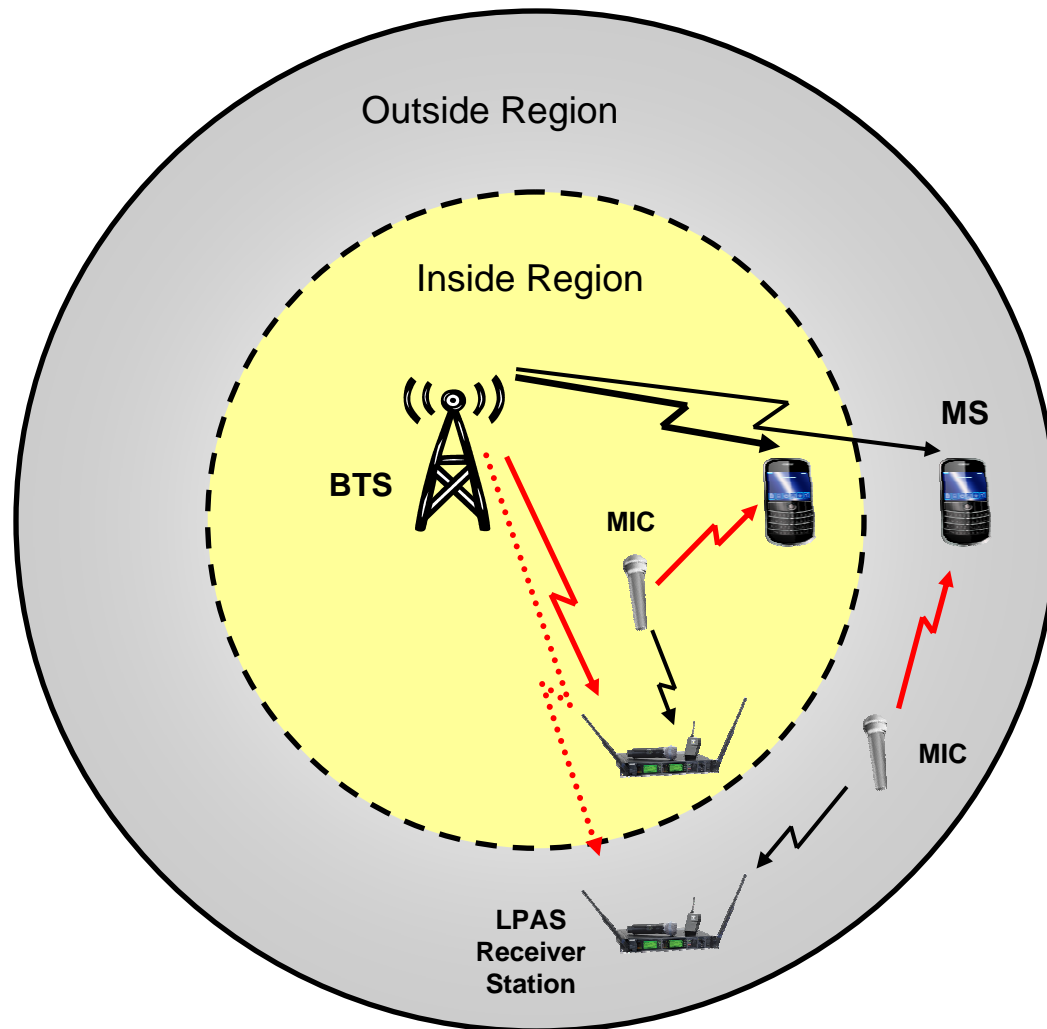
- Interference Assessment to CMRS and Public Safety services operating in 700 MHz spectrum
 - Significant interference will occur to CMRS & Public Safety operating in 700 MHz spectrum, particularly on the *uplink* spectrum bands.
 - Range of interference to CMRS and Public Safety is extensive
 - Range of uplink interference to BTS is 0.8 to 3.3 km.
 - Range of downlink interference to mobile devices is 98 to 400 meters.
 - In some cases, results in detrimental impact to licensed, primary operations
 - CMRS and PS 700 MHz system operation & quality jeopardized
 - For Public Safety, potential *life threatening* impact
 - Outdoor event locations are represented by the case without clutter losses. These include outdoor sporting arenas, concerts, shows, parades, political conventions, etc., which impact larger areas than indoor microphone uses.
- Some events and venues can operate with hundreds of microphones simultaneously (i.e. Major Shows, Sporting Events, Mega-Churches, etc.)
- Due to the above instances of harmful interference, wireless microphones, CMRS & Public Safety services are not compatible and cannot co-exist in 700 MHz spectrum; they both can suffer harmful interference if they continue to operate in the band.

Interference Between CMRS & Public Safety vs. Wireless Microphones

- Operation of wireless microphones in the same spectrum as CMRS and Public Safety will result in significant harmful interference to all parties.
 - In most cases, the interference will NOT be mutual. It will impact one user or the other user (not both at the same time). In each case, it will impact either the Wireless Microphone system or the CMRS/PS system, but not both systems at the same time. The interference depends on proximity between the systems and uplink/downlink spectrum band used.
 - Since the interference is not mutual, the wireless microphone users will not have an incentive to resolve interference caused to CMRS and Public Safety systems.

Interference Between CMRS & Public Safety vs. Wireless Microphones

Downlink Spectrum Case -- LPAS operating on CMRS/PS **downlink** band



Outside Region (Away from BTS)

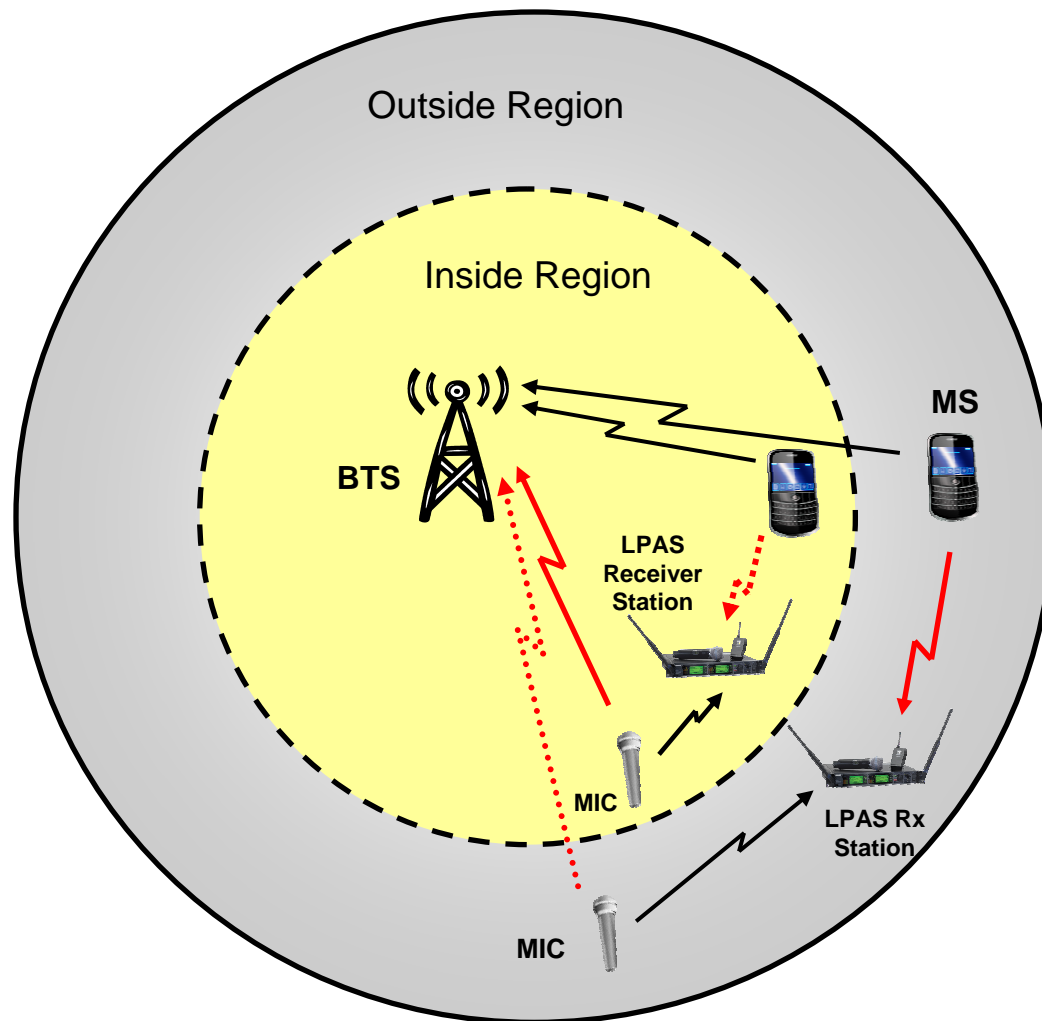
- CMRS & PS devices receive lower *desired* signals from serving BTS, and are most vulnerable to LPAS interference in these regions.
- Results in significant interference to CMRS & PS devices.
- LPAS users receive weakest interference from CMRS & PS BTS. Thus, in these regions **LPAS users can operate without any interference**.

Inside Region (Near BTS)

- LPAS users experience strongest interference from CMRS & PS BTS.
 - Some LPAS users can tune to other channels to avoid the interference
- CMRS & PS devices receive stronger desired signals, which can mitigate LPAS interference in some cases.

Interference Between CMRS & Public Safety vs. Wireless Microphones

Uplink Spectrum Case -- LPAS operating on CMRS/PS *uplink* band



Outside Region (Away from BTS)

- LPAS users receive strong interference from nearby CMRS & PS devices.
 - Some LPAS users can tune to other channels to avoid the interference
- CMRS & PS BTS receive less interference from LPAS users that are farther away from BTS.

Inside Region (Near BTS)

- CMRS & PS BTS experience strongest interference from LPAS users that are closer to BTS.
- Results in **significant interference to CMRS & PS BTS.**
- LPAS users receive weakest interference from CMRS devices, which are powered back when they are near their serving BTS.
- Thus, in these regions **LPAS users can operate without interference from CMRS devices.**

Summary of Interference between CMRS & Public Safety vs. Wireless Microphones in Downlink & Uplink 700 MHz bands

- Wireless microphone users receive the strongest interference when they are:
 - Operating in *downlink* band and closer to CMRS/PS base stations
 - Operating in *uplink* band and farther away from CMRS/PS base stations
- When this occurs, the wireless microphone system may re-tune (switch) to the other band used by either the CMRS or PS system
 - This eliminates the interference to the wireless microphone system
 - This results in the causing the strongest interference to CMRS & Public Safety systems
- Wireless microphones cause the strongest interference to CMRS and Public Safety systems (base stations or mobile devices) when they are:
 - Operating in *uplink* band and closer to CMRS/PS base stations
 - Operating in *downlink* band & farther away from CMRS/PS base stations
 - In these cases, wireless microphones can operate interference-free.

Conclusions

- Operation of wireless microphones in the same spectrum as CMRS and Public Safety will result in significant harmful interference to all parties.
 - In most cases, the interference will NOT be mutual. It will impact one user or the other user (not both at the same time). It will impact either the Wireless Microphone system or the CMRS/PS system, not both at the same time. The interference depends on proximity between the systems and uplink/downlink spectrum band used.
 - Since the interference is not mutual, there is no incentive to resolve the interference caused to the other party.
 - Both types of systems operate with sufficient power levels to cause interference to each other; they cannot co-exist on a co-channel basis in the 700 MHz spectrum.
- Wireless microphone systems must be cleared from 700 MHz to prevent interference to CMRS, Public Safety, and microphones users

APPENDIX

Link Budgets of Interference Study

V-COMM Background & Information

Link Budget of Wireless Microphone System & Interference Threshold

Description	Link Budget	Units	Notes
LPAS Transmit Output Power Level (mW)	50	milliwatts	LPAS typical output power is 50 mW (average case).
LPAS Transmit Output Power Level (dBm)	17.0	dBm	
LPAS User Body Loss (handheld MIC)	-3	dB	Handheld case is 0 to -3 dB loss (typ). Beltpack unit 0 to -10 dB loss.
LPAS Transmit Antenna Gain	-2	dBd	1/4 wavelength antenna (typical)
LPAS Receive Antenna Gain	-2	dBd	1/4 wavelength antenna (typical)
LPAS Receiver Sensitivity (nominal squelch, no fading)	-94.0	dBm	As per test results for 5 LPAS units. Rx Sens = -94 dBm on average for the nominal (medium) squelch setting. At the lowest squelch setting it was -97 dBm on average, for 30 dB SINAD.
LPAS Operating & Fade Margin (for high reliability)	14.0	dB	For high reliability and quality, to overcome multi-path fading, standing wave reflections, intermodulation, etc. in the environment.
LPAS Minimum RSSI (with fading, no environmental noise)	-80.0	dBm	
Environmental noise level elevated above equipment noise floor (indoor case)	4.0	dB	As per measurements in market. Observed noise floor elevated indoors by 4 dB (typical case) above equipment noise floor (may be due to adj. & distant co-channel analog & DTV signals in 700 MHz).
Target Signal Strength @ LPAS Rcvr to overcome fading and environment noise	-76.0	dBm	
LPAS Link Budget Path Loss (dipole antenna ref.)	86.0	dB	
Propagation Range (distance in meters) of LPAS System	100	meters	Indoor propagation at 30dB log distance at frequency of 776 MHz , includes indoor clutter losses (internal walls, structures, people loss, etc.)

Thermal Noise Floor (KTB) for 200 kHz nominal bandwidth	-121.0	dBm	
LPAS Receiver Noise Figure (typ.)	12.0	dB	Computed from equipment noise floor subtract thermal noise floor.
LPAS Receiver Equipment Noise Floor	-109.0	dBm	As per measurements on 5 LPAS units (average case).
Carrier-to-Noise ratio (C/N) for non-fading signals	15.0	dB	C/N for non-fading signals at nominal (medium) squelch setting. Non-fading C/N at minimum (lowest) squelch setting is 12 dB in the lab for 30 dB SINAD.
Environmental noise level elevated above equipment noise floor (indoor case)	4.0	dB	As measured, noise level in market -107 dBm/200kHz (typical). Added to Noise Floor -109 dBm, yeilds -105 dBm noise level (4 dB above thermal noise).
LPAS Receiver Operating Noise Level	-105.0	dBm	Operating noise level 4 dB above equipment noise floor, as measured for typical indoor systems in 700 MHz spectrum.

Interference Threshold (Reduction in LPAS System Operating Link Budget)	10.0	dB	Reduces LPAS Operating Link Budget Path Loss (i.e. from 86 dB to 76 dB).
Reduction of LPAS Operating System Range (%)	68%	%	Interference threshold reduces LPAS operating range by 68%
New LPAS Operating Range (meters)	31.7	meters	Interference threshold reduces LPAS operating range to 32 meters (104 ft)
Interference Threshold for interference analysis	-95.0	dBm	Increases LPAS Receiver Operating Noise level by 10 dB (-105 to -95 dBm). This threshold is refereneced AWGN type interference.

Link Budget of Interference from CMRS BTS to LPAS Receiver

Description	CMRS Base Station	Units	Notes
CMRS Base Station Transmit Power (ERP in Watts)	400	Watts	BTS output power of 40 Watts, 2 dB coaxial cable loss, 12 dBd antenna gain (3 sector panel antenna)
CMRS Base Station Transmit Power (ERP in dBm)	56.0	dBm	
Power reduction for 200 kHz bandwidth LPAS Rcvr	-16.5	dB	Convert occupied bandwidth signal of 9 MHz for LTE OFDM downlink carrier to 200 kHz BW.
Building Penetration Loss	-10	dB	
LPAS Receive Station Antenna Gain	-2	dBd	1/4 wavelength antenna (typical)
Interference Threshold for LPAS System	-95.0	dBm	LPAS Interference threshold. Interference from LTE signals exhibit similar impact as AWGN source.
Required Path Loss to reach Interference Threshold	122.5	dB	

Range of Interference to LPAS System from CMRS BTS (Suburban BTS, 100 ft AGL)	1.78	km	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 100 ft, LPAS 5 ft.
Range of Interference to LPAS System from CMRS BTS (Suburban BTS, 100 ft AGL)	1.11	miles	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 100 ft, LPAS 5 ft.

Range of Interference to LPAS System from CMRS BTS (Urban BTS, 50 ft AGL)	1.26	km	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 50 ft, LPAS 5 ft.
Range of Interference to LPAS System from CMRS BTS (Urban BTS, 50 ft AGL)	0.78	miles	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 50 ft, LPAS 5 ft.

Link Budget of Interference from CMRS Mobile Device to LPAS Receiver

Description	CMRS Mobile Device	Units	Notes
CMRS Mobile Device Transmit Power (ERP in mW)	126	mW	Nominal user device output power 200 mW, with -2 dBd antenna gain.
CMRS Mobile Device Transmit Power (ERP in dBm)	21.0	dBm	Nominal output power +23 dBm, -2 dBd antenna gain.
Power reduction for 200 kHz bandwidth LPAS Rcvr	-6.5	dB	Convert occupied bandwidth of 0.9 MHz for case of LTE SC-FDMA uplink carrier using 5 resource blocks.
CMRS Mobile Device, User Body Loss	-3	dB	
Building Penetration Loss	-10	dB	
LPAS Receive Station Antenna Gain	-2	dBd	1/4 wavelength antenna (typical)
Interference Threshold for LPAS System	-95.0	dBm	LPAS Interference threshold. Interference from LTE signals exhibit similar impact as AWGN source.
Required Path Loss to reach Interference Threshold	94.5	dB	

Range of Interference to LPAS System from CMRS Mobile Device	79	meters	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with Mobile Device antenna height & LPAS 5 ft.
Range of Interference to LPAS System from CMRS Mobile Device	260	feet	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with Mobile Device antenna height & LPAS 5 ft.

Link Budget of Interference from Public Safety BTS to LPAS Receiver

Description	Public Safety Base Station	Units	Notes
Public Safety BTS Transmit Power (ERP in Watts)	200	Watts	BTS output power of 100 Watts, 2 dB coaxial cable loss, 9 dBd antenna gain omni, 4 dB combiner losses
Public Safety BTS Transmit Power (ERP in dBm)	53.0	dBm	
P25 Phase 1 (12.5 kHz) Interference reduction for LPAS Receiver	-8.0	dB	As measured for P25 signal. LPAS receiver 8 dB less sensitive to P25 interference vs. AWGN dBm/200kHz.
Building Penetration Loss	-10	dB	
LPAS Receive Station Antenna Gain	-2	dBd	1/4 wavelength antenna (typical)
Interference Threshold for LPAS System	-95.0	dBm	LPAS Interference threshold (AWGN reference)
Required Path Loss to reach Interference Threshold	128.0	dB	

Range of Interference to LPAS System from Public Safety BTS (Suburban BTS, 100 ft AGL)	2.446	km	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 100 ft, LPAS 5 ft.
Range of Interference to LPAS System from Public Safety BTS (Suburban BTS, 100 ft AGL)	1.52	miles	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 100 ft, LPAS 5 ft.

Range of Interference to LPAS System from Public Safety BTS (Urban BTS, 50 ft AGL)	1.73	km	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 50 ft, LPAS 5 ft.
Range of Interference to LPAS System from Public Safety BTS (Urban BTS, 50 ft AGL)	1.08	miles	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with BTS antenna height 50 ft, LPAS 5 ft.

Link Budget of Interference from PS Mobile Devices to LPAS Receiver

Description	Public Safety Portable Unit @ 3 Watts	Public Safety Vehicle Unit @ 30 Watts	Units	Notes
Public Safety Mobile Device Tx Power (ERP in Watts)	1.9	18.9	Watts	PS Portable 3 Watts with -2 dBd antenna. PS Vehicle 30 Watts with 0 dBd antenna and 2 dB cable loss.
Public Safety Mobile Device Tx Power (ERP in dBm)	32.8	42.8	dBm	Nominal output power +23 dBm, -2 dBd antenna gain.
P25 Phase 1 (12.5 kHz) Interference reduction for LPAS Receiver	-8.0	-8.0	dB	As measured for P25 signal. LPAS receiver 8 dB less sensitive to P25 interference vs. AWGN dBm/200kHz.
Public Safety Mobile Device, User Body Loss	-3	0	dB	
Building Penetration Loss	-10	-10	dB	
LPAS Receive Station Antenna Gain	-2	-2	dBd	1/4 wavelength antenna (typical)
Interference Threshold for LPAS System	-95.0	-95.0	dBm	LPAS Interference threshold (AWGN reference)
Required Path Loss to reach Interference Threshold	104.8	117.8	dB	

Range of Interference to LPAS System from Public Safety Mobile Device	144	303	meters	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with Mobile Device antenna height & LPAS 5 ft.
Range of Interference to LPAS System from Public Safety Mobile Device	471	995	feet	Use Egli propagation (40 dB Log distance) loss at 776 MHz, with Mobile Device antenna height & LPAS 5 ft.



V-COMM is a leading provider of quality engineering and engineering consulting services to the worldwide wireless telecommunications industry with offices in Cranbury, NJ and Blue Bell, PA. V-COMM's engineering staff is experienced in Cellular, Personal Communications Services (PCS), Enhanced Specialized Mobile Radio (ESMR), Paging, Wireless Broadband Data, 2-Way radio, Microwave and Broadcast Mobile TV networks. We have provided our expertise to wireless operators in engineering, system design, implementation, performance, optimization, and evaluation of new wireless technologies.

We have extensive experience in analyzing interference in various spectrum bands including Cellular, SMR, PCS, AWS, Air-to-ground, Public Safety, and 700 MHz spectrum. We have engineering experience in all commercial wireless technologies, including HSPA, UMTS, EVDO, CDMA, GSM, MediaFLO, DVB-H and Analog technologies, and Public Safety wireless technologies including analog and digital Project 25, EDACS & Opensky, and many trunking and conventional radio networks. Further, V-COMM was selected by the FCC & Department of Justice to provide expert analysis and testimony in the Nextwave and Pocket Communications Bankruptcy cases.

For additional information, visit V-COMM's web site at www.vcomm-eng.com.



CONTACT: Nicole E. Peretti

FOR IMMEDIATE RELEASE

3 Cedar Brook Drive
Cranbury, NJ 08512
Phone: (609) 655-1200
Fax (609) 409-1927
nicole.peretti@vcomm-eng.com

**V-COMM PRESENTS ON 700 MHZ SPECTRUM TRANSITION
& INTERFERENCE ISSUES
At the National Spectrum
Management Association (NSMA) Conference**

Washington, DC (May 19, 2009) - Sean Haynberg, Director of RF Technologies for V-COMM, L.L.C., provided a technical presentation at the NSMA Conference, before members of the FCC and NTIA, wireless operators, spectrum regulators, attorneys, and other representatives from the telecommunications industry on the 700 MHz spectrum transition and related interference issues. Mr. Haynberg's presentation covered the impending DTV transition, Low-Power TV, and wireless microphone use and how they represent potential interference problems for CMRS, Public Safety and U.S. markets operating along border areas in the 700 MHz spectrum. The presentation included data from studies that industry experts from V-COMM conducted and filed with the FCC regarding the 700 MHz incumbents which will not be transitioning with full-power TV on June 12th. This presentation is available for viewing and download at our website, www.vcomm-eng.com.

V-COMM is a leading provider of integrated network engineering, radio frequency engineering, and business services. V-COMM delivers the needed expertise and cost-effective solutions to governmental agencies, and wired & wireless operators. Company executives are much sought-after expert witnesses providing testimony on telecommunications issues in local, regional, national, and international venues. V-COMM has a growing staff of engineers & professionals with offices located in Cranbury, NJ and Blue Bell, PA. For more information, visit us on the World Wide Web at www.vcomm-eng.com.

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If you would like more information about this topic, please call Nicole Peretti at (609) 655-1200 x 333 or email Nicole at nicole.peretti@vcomm-eng.com.



700 MHz Spectrum Transition & Interference Issues

Presented to the National Spectrum
Management Association

May 19, 2009

Sean Haynberg
Director of RF Technologies

OVERVIEW

- 700 MHz Spectrum – Band Plan
 - New Licensees – CMRS & Public Safety
- Incumbents – Transition & Interference Issues
 - Full-Power Broadcast TV
 - Transition date (June 12th)
 - U.S. market areas near Canada & Mexico
 - CH51 DTV issues
 - Low-Power TV (LPTV)
 - Impacts CMRS & Public Safety in 700 MHz
 - LPAS (Wireless MIC)
 - Impacts CMRS & Public Safety in 700 MHz
- Conclusions

700 MHz Spectrum – Band Plan

Lower 700 MHz Spectrum Bands								Upper 700 MHz Spectrum Bands										
CH 52	CH 53	CH 54	CH 55	CH 56	CH 57	CH 58	CH 59	CH 60	CH 61	CH 62	CH 63	CH 64	CH 65	CH 66	CH 67	CH 68	CH 69	
698	704	710	716	722	728	734	740	746	752	758	764	770	776	782	788	794	800	806
A	B	C	D	E	A	B	C	C	A	D	Public Safety	B	C	A	D	Public Safety	B	
UL	UL	UL	DL	DL	DL	DL	DL	DL	-	DL	DL	-	UL	-	UL	UL	-	
CMRS			CMRS (Mobile TV)		CMRS			CMRS	-	TBD	Broadband (BB)	Narrowband (NB)	CMRS	-	TBD	Broadband (BB)	Narrowband (NB)	-

- Previously Allocated to Broadcast TV (Upper UHF)
- New Licensees are Commercial (CMRS) & Public Safety (PS)
 - Primary Services in CH52 to CH69, per FCC Part 27 & 90 rules
 - Downlink (DL) & Uplink (UL) bands for Base to User & User to Base links
 - Public Safety includes narrowband voice and broadband data services
 - CMRS includes 4th generation broadband data, mobile TV, multimedia, messaging, machine-to-machine, and voice services
 - Licensed by various market areas: CMA, EA, EAG, REAG, MEA & Nationwide

Full-Power Broadcast TV

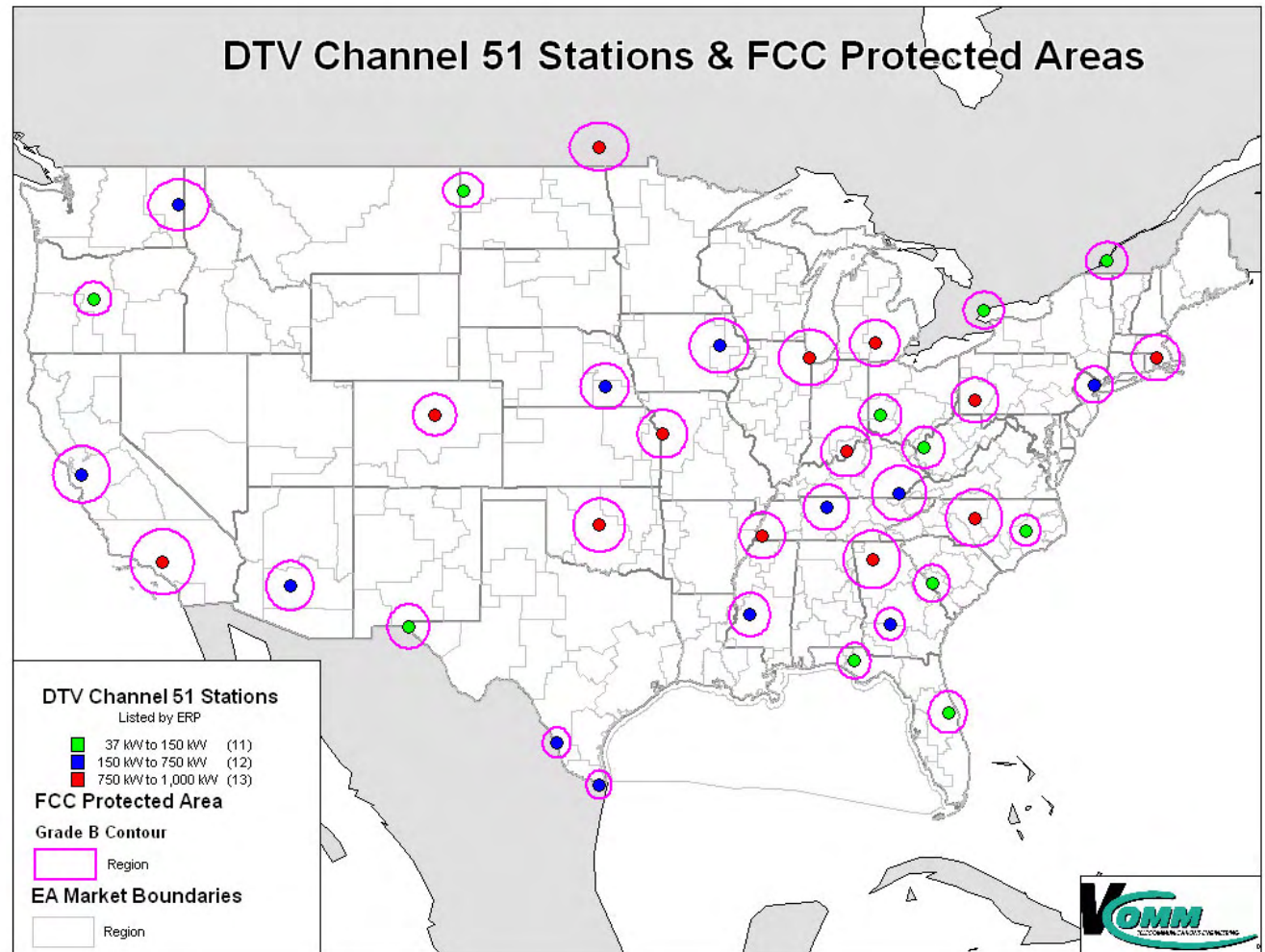
- U.S. TV Transition date is June 12th, 2009
 - All full-power stations must transition out of 700 MHz spectrum
 - Clears full-power TV stations from 700 MHz spectrum for new CMRS and Public Safety services
- Canada & Mexico TV stations
 - Continue to operate in 700 MHz – impacts utilization of spectrum near U.S. border areas
- Channel 51 digital TV stations
 - Adjacent to 700 MHz spectrum – represents adjacent channel interference issue to 700 MHz Lower A Block (channel 52)

TV Stations in Canada & Mexico

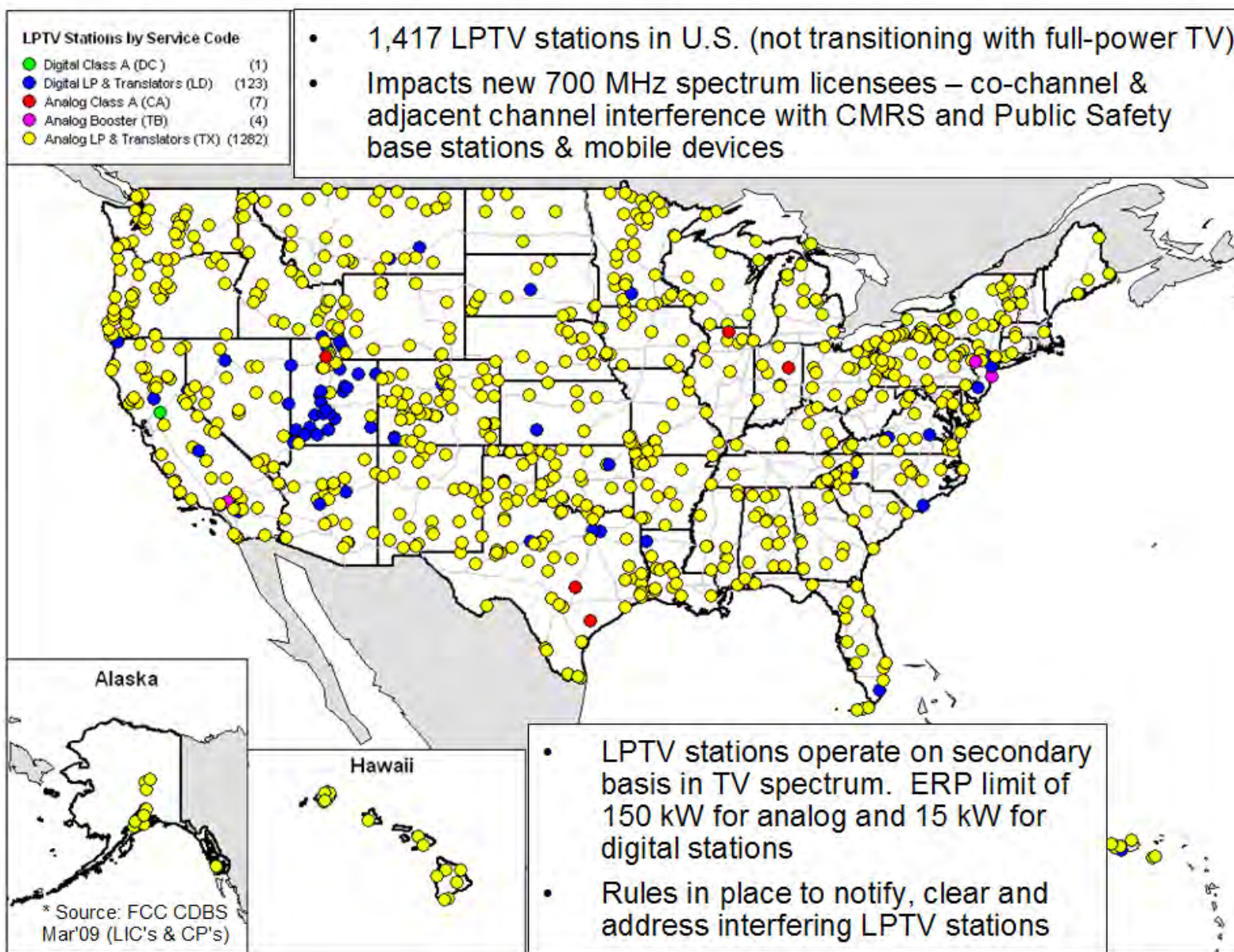
- TV transition dates (to clear TV service from 700 MHz)
 - Canada is Aug 2011 (~2 yrs after U.S.)
 - Mexico is 2021 (~12 yrs after U.S.)
 - Prior to these dates, new 700 MHz operations in some U.S. border areas likely to be problematic due late transition
 - Represent potential interference from TV stations in border areas and requirement to protect TV receivers
- Subject to U.S. treaties & agreements
 - Primarily provides interference protection for TV stations operating in border areas
 - Does not protect new 'non-broadcast' services in U.S.
 - Potential interference in border areas for co-channels and adjacent channels in 700 MHz spectrum

Channel 51 Digital TV Stations

- Operate on channels adjacent to 700 MHz spectrum – continue to operate after TV transition
- No guard band between channel 51 and Lower A block on channel 52
- Adjacent channel interference issues – potentially impacts CMRS base stations receiving on adjacent channel 52



LPTV Stations in 700 MHz Spectrum



LPAS (Wireless Microphones)

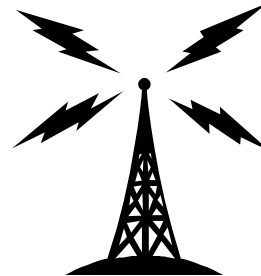
- Low Power Auxiliary Stations (LPAS) Operations
 - Operate pursuant to FCC Part 74 rules for broadcast operations
 - Secondary licensed operation in TV spectrum including the 700 MHz spectrum -- Must not interfere with primary licensed services
 - Power levels up to 250 mW (50 mW typical), bandwidths up to 200 kHz (FM)
 - Include handheld microphones, belt pack transmitters with lapel microphones, and wireless monitoring units
- Venues include a variety of locations i.e. shows, concerts, theatres, sporting events, convention centers, hotels, mega-churches, etc.
 - However, vast majority not authorized or eligible for use per Part 74 rules
 - Large venues can use hundreds of wireless microphones
- Impacts new CMRS & Public Safety Licensees in 700 MHz
 - Co-channel interference to CMRS & Public Safety
 - Impacts base stations & mobile devices on uplink & downlink bands

LPAS, CMRS, and PS 700 MHz Operations

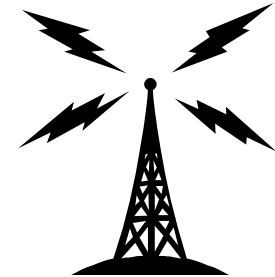
LPAS



CMRS



Public Safety



Example at NFL Sporting Event

User Group	Number of Units
Local Broadcast	142
Coaches	64
Network TV	33
Network Radio	33
NFL	27
Local Team	17
Stadium Operations	14
Visiting Radio	12
Visiting TV	10
Stadium Audio/Visual	10
Food Service	10
Security	9
Film Crews	8
CQB	4
Cleanup	3
Total Devices	396

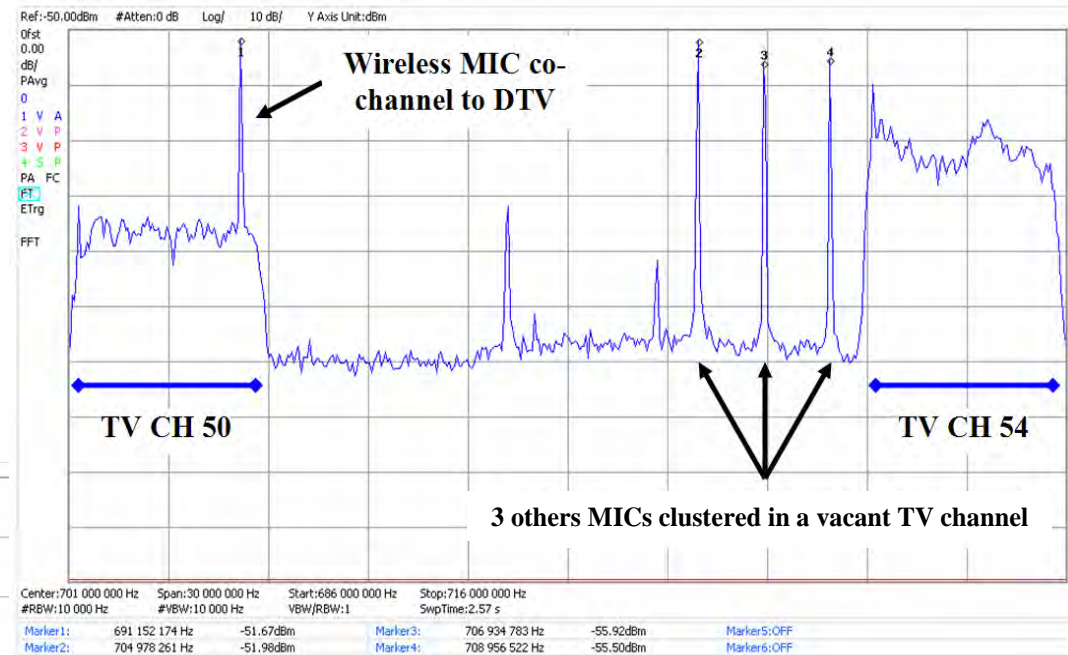
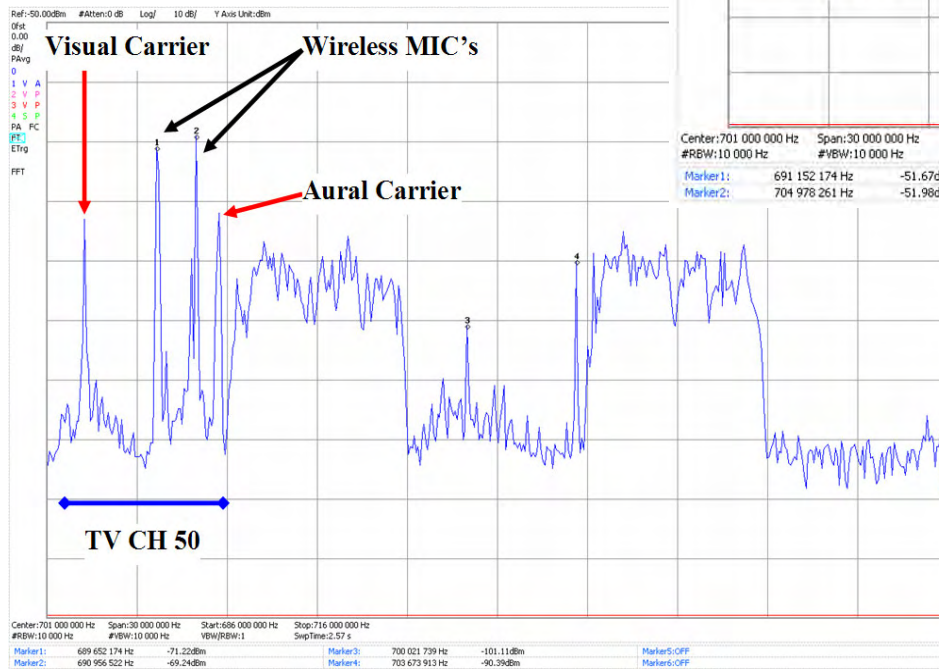
RF environment at NFL sporting events is congested with about 400 wireless devices (from SBE frequency coordinator)



V-COMM surveyed ~80 wireless microphones in 700 MHz spectrum at the NFL Superbowl 2009

Examples of Wireless Microphones on Active TV Channels

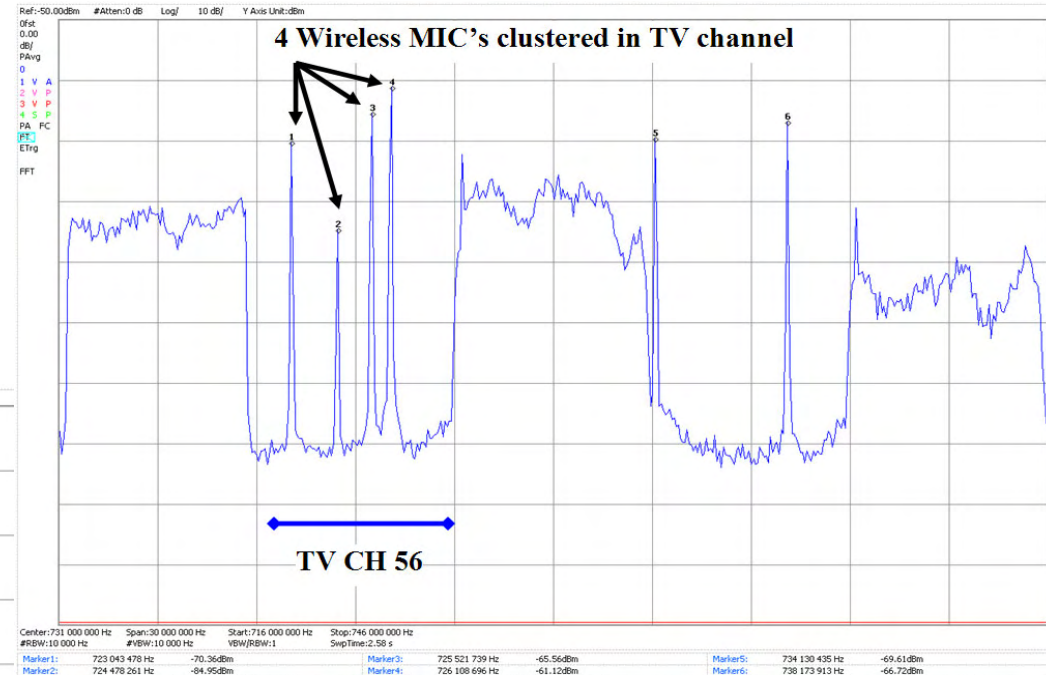
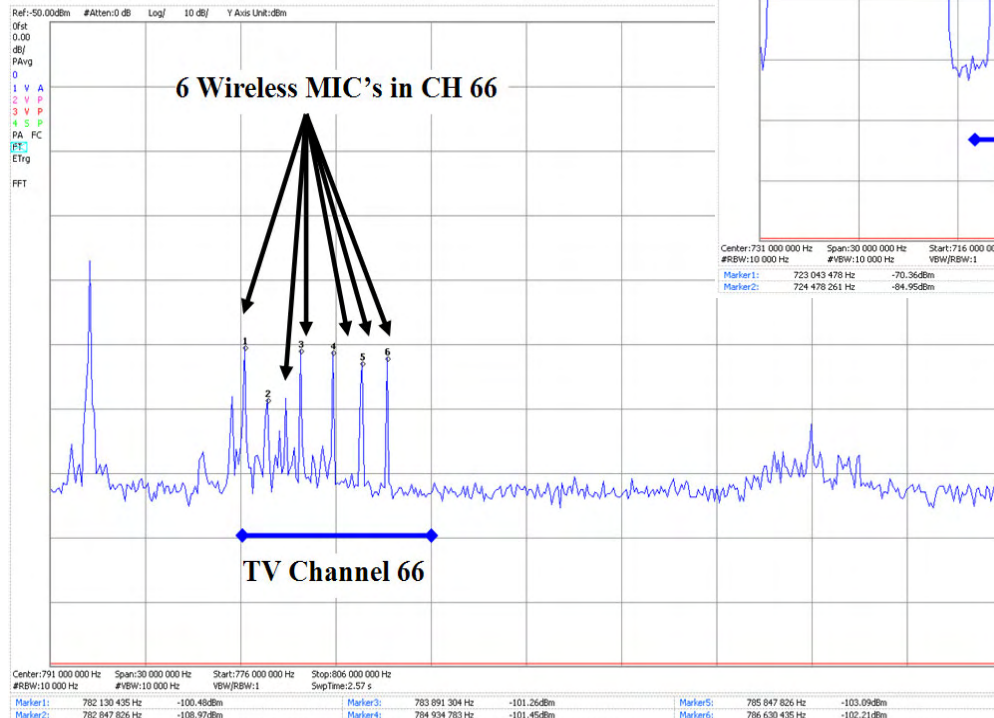
Wireless Microphones can operate on active co-channels of DTV & analog TV signals in market



Wireless Microphones could operate on active CMRS and PS channels in 700 MHz spectrum

Examples of Wireless Microphones Clustered in a Channel

Wireless Microphones tend to cluster signals within specific TV channels



This practice can increase interference impact to CMRS and PS in 700 MHz bands

Range of Interference to CMRS & Public Safety

MIC Transmit Power (mW)	BTS with 10 dB Clutter Loss (km)	BTS with No Clutter Loss (km)	Devices with 10 dB Clutter Loss (m)	Devices with No Clutter Loss (m)
250	1.8	3.3	220	400
100	1.4	2.6	175	318
50	1.2	2.2	147	267
10	0.8	1.5	98	179

- Range of co-channel interference from Wireless Microphones to CMRS & Public Safety base stations and devices operating in 700 MHz are provided above, with clutter loss of 10 dB (i.e. typical loss of 1 wall partition) and without clutter losses (i.e. for outdoor venues)
- For additional information see V-COMM's report filed in FCC's LPAS Docket (08-166 and 08-167) on October 1, 2008
 - V-COMM studied the interference from wireless microphones to CMRS & Public Safety systems operating in 700 MHz. Typical operating parameters for CMRS & Public Safety systems and wireless microphone systems were utilized in the interference study

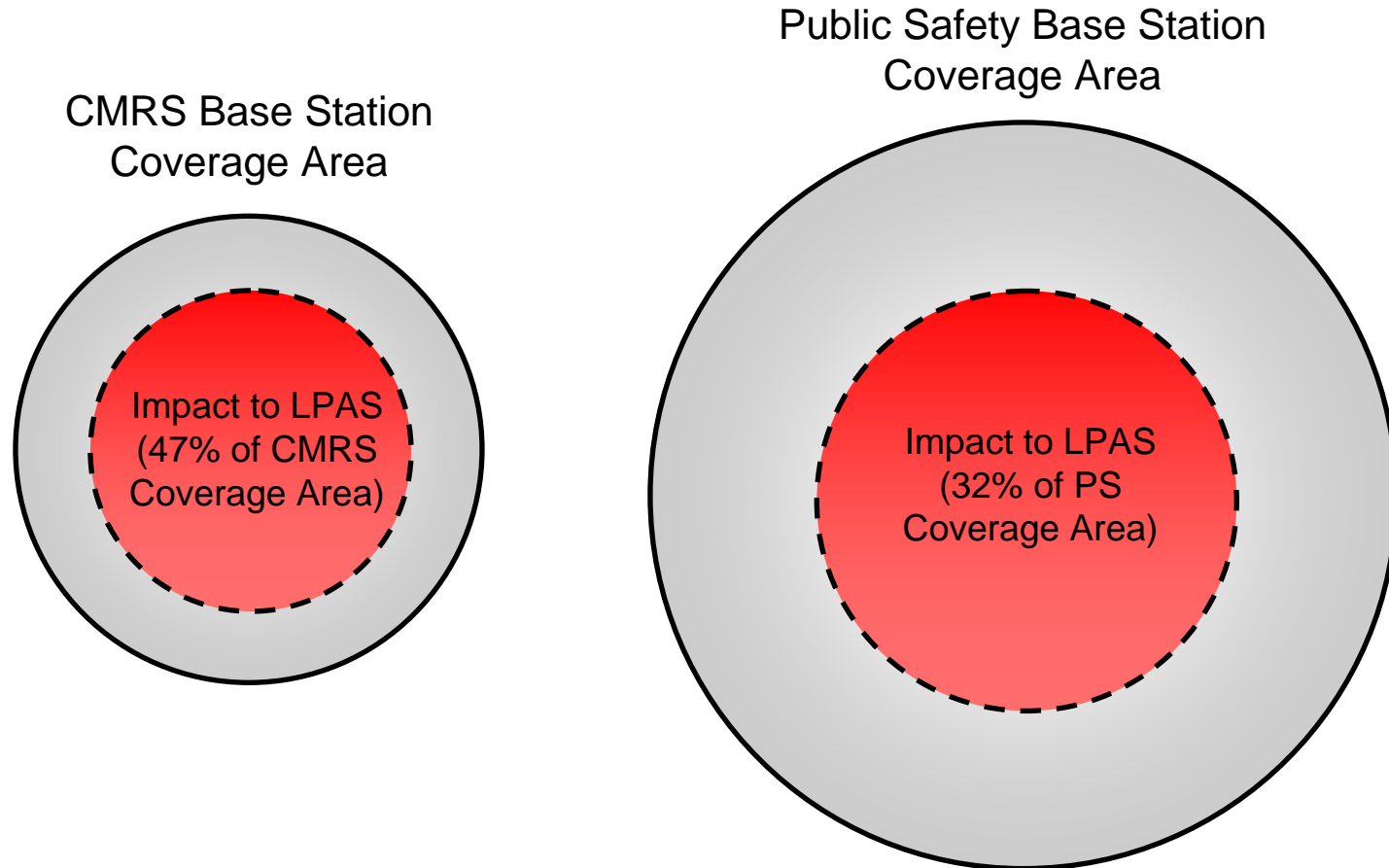
Range of Interference to Wireless Microphones

CMRS Interference	Suburban BTS (100 ft AGL)	Urban BTS (50 ft AGL)	CMRS MS
Range of Impact to LPAS MIC	1.8 km (1.1 mi)	1.3 km (0.8 mi)	79 m (260 ft)

Public Safety (PS) Interference	Suburban BTS (100 ft AGL)	Urban BTS (50 ft AGL)	PS MS (Portable)	PS MS (Vehicular)
Range of Impact to LPAS MIC	2.4 km (1.5 mi)	1.7 km (1.1 mi)	144 m (471 ft)	303 m (995 ft)

- Range of co-channel interference from CMRS & Public Safety base stations (BTS) and mobile stations (MS) to wireless microphone systems is given above
- For additional information see V-COMM's report filed in FCC's LPAS Docket 08-166 on April 17, 2009

Interference to Wireless Microphones on Downlink Bands



- Area of interference to wireless microphones is 47% and 32% of the base station coverage areas for CMRS and Public Safety, respectively, when operating in the base station **downlink** spectrum bands

Interference to Wireless Microphones on Uplink Bands

Public Venue



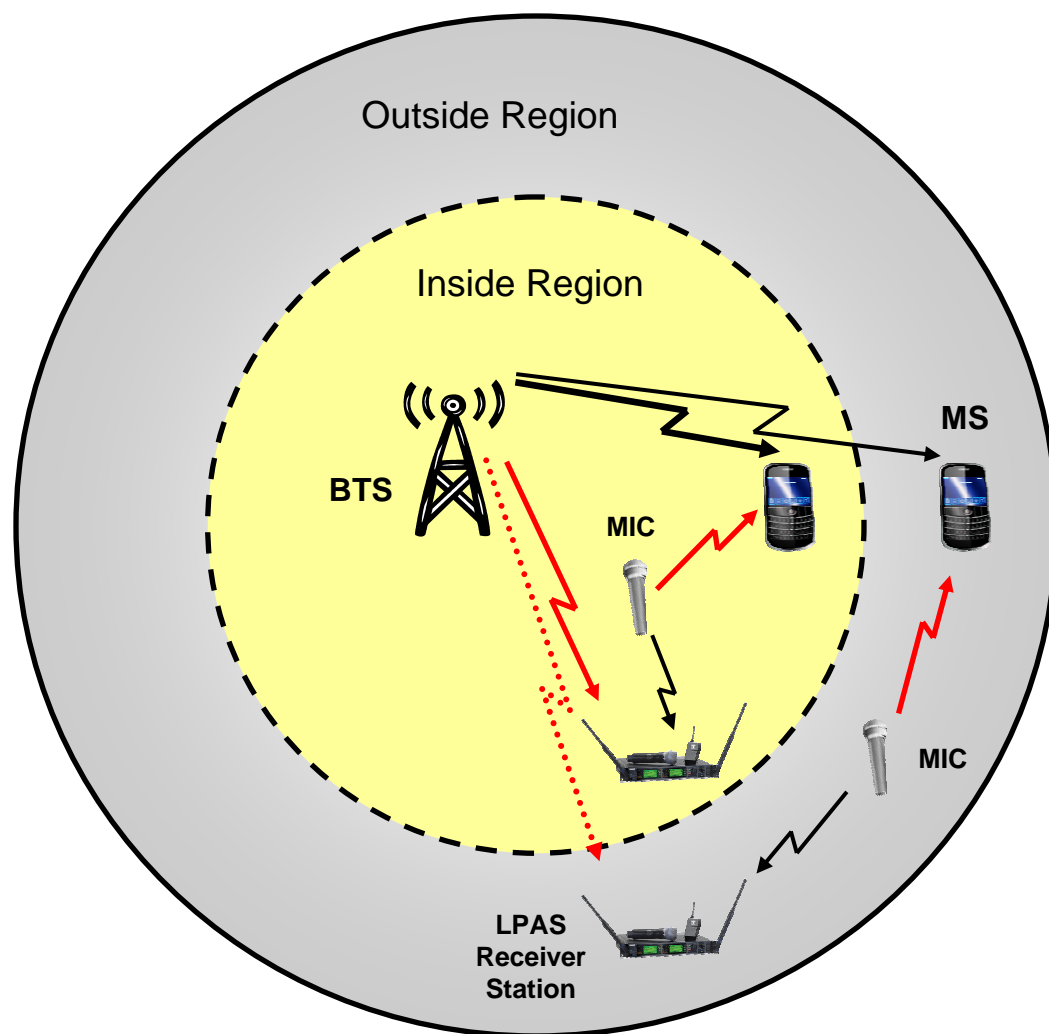
Operating in same area



- Occurs with CMRS and PS devices transmissions inside or nearby the venues
- Exception is when CMRS devices are close to their serving base stations and transmitting at low power (i.e. -20 dBm, 10 microwatts)

Interference Between CMRS & Public Safety vs. Wireless Microphones

Downlink Spectrum -- LPAS Operating on CMRS/PS **Downlink** Band



Outside Region (Away from BTS)

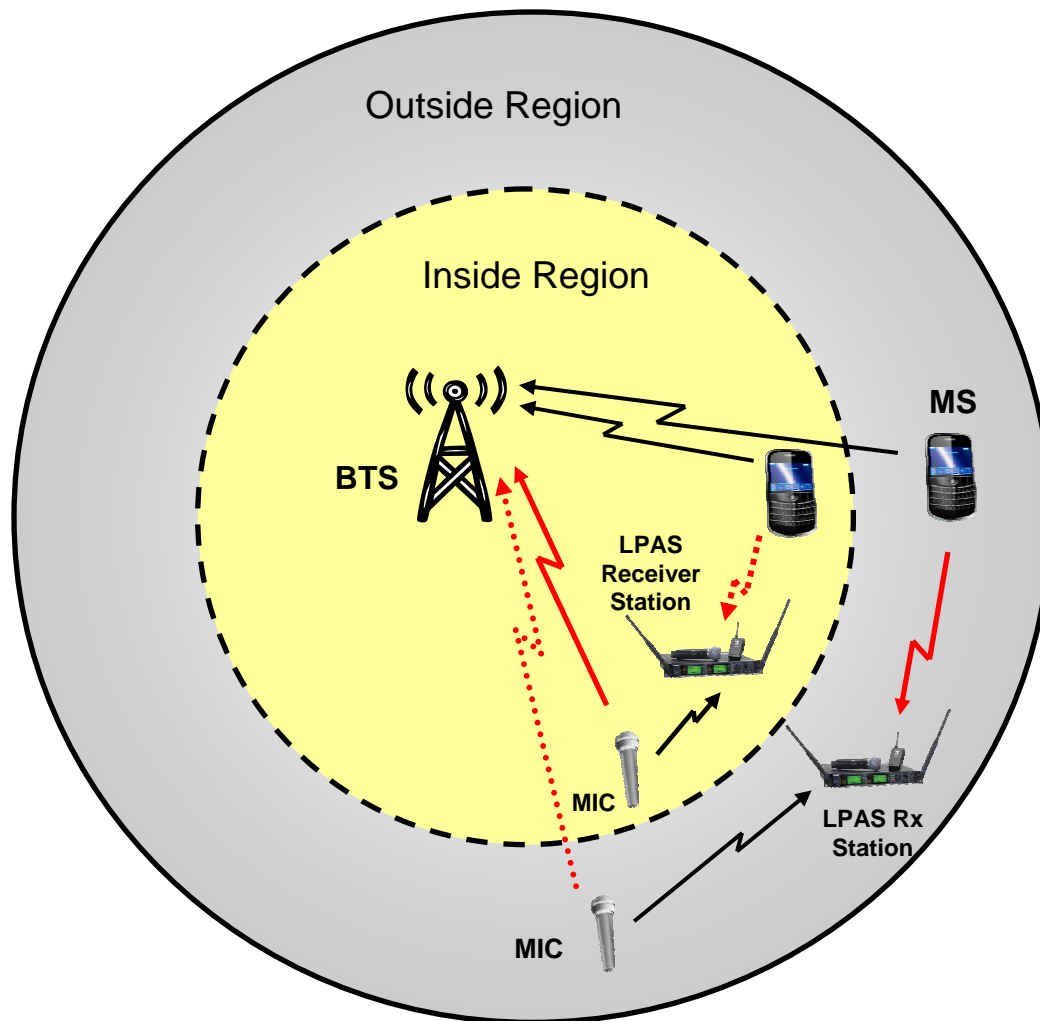
- CMRS & PS devices receive lower *desired* signals from serving BTS, and are most vulnerable to LPAS interference in these regions
- Results in significant interference to CMRS & PS devices
- LPAS users receive weakest interference from CMRS & PS BTS. Thus, in these regions **LPAS users can operate without any interference**

Inside Region (Near BTS)

- LPAS users experience strongest interference from CMRS & PS BTS
 - Some LPAS users can tune to other channels to avoid the interference
- CMRS & PS devices receive stronger desired signals, which can mitigate LPAS interference in some cases

Interference Between CMRS & Public Safety vs. Wireless Microphones

Uplink Spectrum -- LPAS Operating on CMRS/PS *Uplink* Band



Outside Region (Away from BTS)

- LPAS users receive strong interference from nearby CMRS & PS devices
 - Some LPAS users can tune to other channels to avoid the interference
- CMRS & PS BTS receive less interference from LPAS users that are farther away from BTS

Inside Region (Near BTS)

- CMRS & PS BTS experience strongest interference from LPAS users that are closer to BTS
- Results in **significant interference to CMRS & PS BTS**
- LPAS users receive weakest interference from CMRS devices, which are powered back when they are near their serving BTS
- Thus, in these regions **LPAS users can operate without interference from CMRS devices**

Conclusions

- Clear spectrum is needed in 700 MHz for CMRS & Public Safety networks to operate efficiently and without harmful interference
- Existing users in 700 MHz need to be carefully considered prior to network deployments
 - LPTV stations – there are existing rules & methods in place to address them. Eventually, these will transition from 700 MHz
 - TV stations along Canada's & Mexico's border – require updated international treaties to fully utilize spectrum along border
 - Wireless Microphones – vast number of unauthorized users represents a difficult situation. No method to clear them from 700 MHz. Open issue, needs to be addressed



V-COMM is a leading provider of quality engineering and engineering consulting services to the worldwide wireless telecommunications industry with offices in Cranbury, NJ and Blue Bell, PA. V-COMM's engineering staff is experienced in Cellular, Personal Communications Services (PCS), Enhanced Specialized Mobile Radio (ESMR), Paging, Wireless Broadband Data, 2-Way radio, Microwave and Broadcast Mobile TV networks. We have provided our expertise to wireless operators in engineering, system design, implementation, performance, optimization, and evaluation of new wireless technologies.

We have extensive experience in analyzing interference in various spectrum bands including Cellular, SMR, PCS, AWS, Air-to-ground, Public Safety, and 700 MHz spectrum. We have engineering experience in all commercial wireless technologies, including HSPA, UMTS, EVDO, CDMA, GSM, MediaFLO, DVB-H and Analog technologies, and Public Safety wireless technologies including analog and digital Project 25, EDACS & Opensky, and many trunking and conventional radio networks. Further, V-COMM was selected by the FCC & Department of Justice to provide expert analysis and testimony in the Nextwave and Pocket Communications Bankruptcy cases.

For additional information, visit V-COMM's web site at www.vcomm-eng.com.



CONTACT: Nicole E. Peretti

FOR IMMEDIATE RELEASE

3 Cedar Brook Drive
Cranbury, NJ 08512
Phone: (609) 655-1200 x 333
Fax (609) 409-1927
nicole.peretti@vcomm-eng.com

**V-COMM'S ENGINEERING EXPERTISE CITED BY THE FCC IN 700 MHZ
INDUSTRY RULING**

Washington, DC (January, 2010) - The FCC (Federal Communications Commission) adopted a ruling last week, regarding the future of the 700 MHz Band. This ruling will ensure that both public safety and commercial licensees can operate in the 700 MHz Band without interference, and it will allow those currently operating wireless microphones in the band to relocate to other bands. Sean Haynberg, Director of RF Technologies for V-COMM, has been working 700 MHz spectrum issues for a few years. He has lead a team of V-COMM's RF Engineers through experiments, testing, and analysis and has provided the results to the FCC for the commercial wireless industry, Public Safety industry, commercial and government wireless associations, and other impacted organizations. The findings demonstrate that wireless microphones have the potential to cause harmful interference to critical communications between Public Safety Officials, and to customers of commercial wireless companies operating in the 700 MHz spectrum. By this action, the FCC ruling will assist in clearing the 700 MHz spectrum bands, and enable new critical communications services for public safety and 4G broadband wireless services for consumers.

"We are proud to be a part of this process that paves the way for new services to operate effectively in the 700 MHz Spectrum," says Dominic Villecco, President and Founder of V-COMM. "This has an extremely positive impact on many of our clients as we help them design and build these new, next generation Public Safety and commercial wireless networks."

The full report is available for viewing and download at our website, www.vcomm-eng.com.

V-COMM is a leading provider of integrated network engineering, radio frequency engineering, and business services. V-COMM delivers expertise and cost-effective solutions to governmental agencies, and wired & wireless operators. Company executives are sought-after expert witnesses providing testimony on telecommunications issues in local, regional, national, and international venues. V-COMM has a growing staff of engineers & professionals with offices located in Cranbury, NJ and Blue Bell, PA. For more information, visit us on the World Wide Web at www.vcomm-eng.com.

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If you would like more information about this topic, please call Nicole Peretti at (609) 655-1200 x 333 or email Nicole at nicole.peretti@vcomm-eng.com.

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Revisions to Rules Authorizing the Operation of)	WT Docket No. 08-166
Low Power Auxiliary Stations in the 698-806)	
MHz Band)	
)	
Public Interest Spectrum Coalition, Petition for)	WT Docket No. 08-167
Rulemaking Regarding Low Power Auxiliary)	
Stations, Including Wireless Microphones, and the)	
Digital Television Transition)	
)	
Amendment of Parts 15, 74 and 90 of the)	ET Docket No. 10-24
Commission's Rules Regarding Low Power)	
Auxiliary Stations, Including Wireless)	
Microphones)	

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: January 14, 2010

Released: January 15, 2010

By the Commission: Chairman Genachowski issuing a statement.

Comment Date: [30 days after publication in the Federal Register]

Reply Comment Date: [51 days after publication in the Federal Register]

TABLE OF CONTENTS

Heading	Paragraph #
I. INTRODUCTION	1
II. BACKGROUND	5
III. REPORT AND ORDER.....	20
A. Low Power Auxiliary Station Operations in the 700 MHz Band After the End of the DTV Transition	22
B. Prohibition of the Manufacture, Import, Sale, Lease, Offer for Sale or Lease, or Shipment of 700 MHz Band Low Power Auxiliary Stations	55
C. Procedures to Modify Licenses	67
D. Unlicensed Operation of Wireless Microphones under Part 15; Waivers.....	71
E. Disclosure Requirements and Consumer Outreach.....	91
IV. FURTHER NOTICE OF PROPOSED RULEMAKING	107
A. Operation in the TV Bands	109
1. Unlicensed Operation under Part 15.....	109
2. Licensed Operation under Part 74	124
3. Marketing and Labeling Issues for Part 74 Low Power Auxiliary Stations	140
4. Possible Longer-term Solutions.....	145
B. Licensed Operation Under Part 90	150
V. PROCEDURAL MATTERS.....	152
A. Final Regulatory Flexibility Analysis	152

B. Final Paperwork Reduction Act Analysis	153
C. Initial Regulatory Flexibility Analysis	155
D. Initial Paperwork Reduction Act Analysis	156
E. Congressional Review Act	157
F. Other Procedural Matters	158
1. <i>Ex Parte</i> Presentations	158
2. Comment Filing Procedures	159
VI. ORDERING CLAUSES	162
Appendix A-Comments and Reply Comments	
Appendix B-Final Rules	
Appendix C-Final Regulatory Flexibility Analysis	
Appendix D-Part 74 Low Power Auxiliary Station Licenses with 700 MHz Authorization	
Appendix E-Proposed Rules	
Appendix F-Initial Regulatory Flexibility Analysis	

I. INTRODUCTION

1. In this Report and Order and Further Notice of Proposed Rulemaking, we take action to ensure that public safety and commercial licensees can operate in the 700 MHz Band without interference, while providing entities currently operating wireless microphones in the band with an opportunity to relocate to other bands. In particular, we ensure that these devices are cleared from the 700 MHz Band no later than June 12, 2010, consistent with the Commission's long-standing goal of making this spectrum fully available for use by public safety and commercial licensees, and the customers that they serve in the band. We also authorize, for the first time, the use of wireless microphones, on an unlicensed basis, by entities not currently eligible to obtain licenses. We do this by waiver based on our longstanding unlicensed device rules, which have proved highly successful in permitting the use of low-power wireless devices. In addition, we adopt a number of safeguards designed to ensure both that consumers understand their rights and obligations in operating wireless microphones and that wireless microphones are operated in compliance with our rules and policies. Finally, in the Further Notice we seek to refine and update our rules governing the use of wireless microphones, seeking comment on a range of issues concerning the operation of these devices in the core TV bands.

2. More specifically, in this Report and Order, we adopt the following requirements:

- We prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of wireless microphones and other low power auxiliary stations intended for use in the 700 MHz Band in the United States, effective upon the publication of the rules in the Federal Register, and adopt related marketing and other requirements.
- We require that all low power auxiliary stations, including wireless microphones,¹ cease operations in the 700 MHz Band no later than June 12, 2010, one year from the end of the DTV transition.²

¹ Low power auxiliary stations are intended to transmit over distances of approximately 100 meters for uses such as wireless microphones, cue and control communications, and synchronization of TV camera signals. 47 C.F.R. § 74.801. As a general matter, in this item the term "low power auxiliary station" is intended to include devices operated by licensees under Part 74, Subpart H of our rules as well as by users without such authorization.

² The DTV transition ended on June 12, 2009. In the DTV Delay Act, enacted on February 11, 2009, Congress extended the DTV transition deadline from February 17, 2009, to June 12, 2009. DTV Delay Act, Pub. L. No. 111-4, 123 Stat. 112 (2009) ("DTV Delay Act"). The Digital Television Transition and Public Safety Act of 2005 (continued....)

- We provide for an early clearing mechanism that, to the extent that a public safety or commercial licensee will be initiating operations in the 700 MHz Band on specified frequencies and particular markets before June 12, 2010, permits a licensee to require users of low power auxiliary stations, including wireless microphones, to cease operations 60 days after notice.
- We stress that the operations of low power auxiliary stations, including wireless microphones, in the 700 MHz Band must cease immediately if at any time users of these devices cause harmful interference to a 700 MHz public safety or commercial licensee.
- With respect to unauthorized operations of wireless microphones and other low power auxiliary stations, we waive our Part 15 rules for a limited period to permit unauthorized users of wireless microphones and other low power auxiliary stations to operate on an unlicensed basis under Part 15 pursuant to certain specified technical requirements -- in the 700 MHz Band until June 12, 2010, and in the core “TV bands”³ until the effective date of the Commission’s actions in response to the Further Notice.

3. In addition, in this Report and Order we take various actions to ensure that consumers are better informed about our rules and policies concerning wireless microphones, which should facilitate compliance with those rules:

- We establish disclosure requirements to make certain that buyers of wireless microphone equipment understand the limitations on their use of such equipment. For instance, manufacturers, dealers, distributors, and other entities that sell or lease these devices will have to display a consumer disclosure at the point of sale or lease informing consumers of the conditions that apply to the operation of wireless microphones in the core TV bands.
- As part of our consumer outreach plan, we will release consumer publications, including a Consumer Fact Sheet, that inform the public of our decisions in this Report and Order and of the need to clear the 700 MHz Band so that the spectrum can be used for the provision of new public safety and commercial services.
- We will work with organizations whose memberships include wireless microphone users so that they help us inform all affected users of our decisions in this Report and Order, particularly the need to clear the 700 MHz Band.
- We will assist consumers, including those who have previously purchased wireless microphones that operate in the 700 MHz Band, by posting information on our website and by making information available from the Commission’s consumer service representatives through a toll-free number at our call center.
- We will make available via our website and our call center information regarding which wireless microphones are 700 MHz wireless microphones, what options may be available if consumers do have 700 MHz microphones, and how to contact wireless microphone manufacturers to obtain additional information. Information concerning our decision today will be posted on our website at www.fcc.gov/cgb/wirelessmicrophones.

4. Finally, in the Further Notice, we take the following actions:

(Continued from previous page) _____

(“DTV Act”) previously had set February 17, 2009, as the end of the DTV transition. *See* Deficit Reduction Act of 2005, Pub. L. No. 109-171, 120 Stat. 4 (2006) (“DRA”). Title III of the DRA is the DTV Act.

³ For purposes of this order, the “core TV bands” consist of TV channels 2-51, excluding channel 37.

- We propose to revise our rules to provide that low power wireless audio devices, including wireless microphones, may be operated as unlicensed devices under Part 15 of the rules in the core TV bands.
- We propose technical rules to apply to low power wireless audio devices, including wireless microphones, operating in the core TV bands on an unlicensed basis under Part 15 of the rules.
- We seek comment on whether, and to what extent, eligibility for obtaining licenses to operate low power auxiliary stations, including wireless microphones, under Part 74 should be expanded, and on whether we should revise Part 90 to facilitate wireless microphone use.
- We seek comment on possible longer-term approaches for the operation of wireless microphones. Consistent with our broader efforts to manage this country's spectrum resources as effectively and efficiently as possible,⁴ we here seek comment on possible long-term reform, based in part on technological innovation such as digital technology, that would enable wireless microphones to operate more efficiently and with improved immunity to harmful interference, thereby increasing the availability of spectrum for wireless microphone and other uses.

II. BACKGROUND

5. *DTV Transition.* In 2006, the DTV Act set a firm deadline for the end of the DTV transition of February 17, 2009, at which time the spectrum in the 700 MHz Band, occupied by television broadcasters in TV Channels 52-69, would become available for wireless services, including public safety and commercial services.⁵ The DTV Act accelerated the deadline for the transition and consequently eliminated uncertainty regarding when 700 MHz Band spectrum would be available for such wireless services. On February 11, 2009, with enactment of the DTV Delay Act, the DTV transition deadline was extended from February 17, 2009, to June 12, 2009.⁶

6. With the completion of the DTV transition on June 12, 2009, only spectrum occupied by Channels 2-51 (excluding channel 37) -- the "core" TV broadcast spectrum ("TV bands") -- is needed for broadcast television service.⁷ In turn, the 700 MHz Band, which is comprised of spectrum above TV

⁴ See *infra* Section IV.A.4.; A National Broadband Plan for Our Future, GN Docket No. 09-51, *Notice of Inquiry*, 24 FCC Rcd 4342 (2009) ("*National Broadband Plan NOP*"); Data Sought on Uses of Spectrum, NBP Public Notice # 26, GN Docket Nos. 09-47, 09-51, and 09-137, *Public Notice*, DA 09-2518 (Dec. 2, 2009) ("*NBP Public Notice #26*").

⁵ See DTV Act, § 3002.

⁶ See DTV Delay Act, § 2.

⁷ See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, *Notice of Proposed Rule Making, Fourth Further Notice of Proposed Rule Making, and Second Further Notice of Proposed Rule Making*, 21 FCC Rcd 9345, 9348 ¶ 4 (2006) (700 MHz Commercial Services Notice); see also Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket 03-264, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules, WT Docket No. 06-169, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local (continued....)

Channel 51, is now available on a primary basis for new public safety and other wireless services.⁸ Accordingly, now that the DTV transition has been completed, all analog television service by full power TV stations has terminated and temporary DTV assignments on Channels 52-69 have been relocated into the core TV channels so that new wireless licensees will be able to provide unencumbered services in the 698-806 MHz Band.⁹ In adopting rules for the 700 MHz spectrum, our goals included promoting commercial access to that spectrum and the development of a nationwide, interoperable broadband network for public safety users.¹⁰ The Commission stated that “[i]t is incumbent . . . to take all the steps necessary to make . . . [the 700 MHz] spectrum effectively available to both public safety as well as commercial licensees.”¹¹

7. The Commission has auctioned licenses for commercial services in the 700 MHz Band and has issued a nationwide license for the broadband portion of the public safety spectrum in this band.¹² In addition, a number of public safety entities have authority to operate in the narrowband public safety spectrum.¹³ We also continue to consider matters relating to the upper portions of the 700 MHz Band and

(Continued from previous page) _____

Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064, 8069-70 ¶ 14 (2007) (*700 MHz First Report and Order*).

⁸ See *700 MHz Commercial Services Notice*, 21 FCC Rcd at 9348 ¶ 4; see also Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission’s Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket 03-264, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission’s Rules, WT Docket No. 06-169, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, Declaratory Ruling on Reporting Requirement Under Commission’s Part 1 Anti-Collusion Rule, WT Docket No. 07-166, *Second Report and Order*, 22 FCC Rcd 15289, 15291 ¶ 1 (2007) (*700 MHz Second Report and Order*).

⁹ *700 MHz First Report and Order*, 22 FCC Rcd at 8066 ¶ 1. The DTV Delay Act afforded the Commission discretion to allow broadcasters to complete their transitions prior to June 12, 2009, subject to such rules as the Commission finds necessary or appropriate. See Implementation of the DTV Delay Act, MB Docket No. 09-17, *Second Report and Order and Notice of Proposed Rulemaking*, 24 FCC Rcd 2526, 2527 ¶ 1 (2009).

¹⁰ See *700 MHz Second Report and Order*, 22 FCC Rcd at 15292 ¶ 3.

¹¹ *700 MHz First Report and Order*, 22 FCC Rcd at 8066 ¶ 2.

¹² See Auction of 700 MHz Band Licenses Closes, Winning Bidders Announced for Auction 73, *Public Notice*, 23 FCC Rcd 4572 (2008). Prior to Auction 73, other licenses in the 700 MHz Band were auctioned. See, e.g., Lower 700 MHz Band Auction Closes, *Public Notice*, 17 FCC Rcd 17272 (2002); Lower 700 MHz Band Auction Closes, *Public Notice*, 18 FCC Rcd 11873 (2003); Auction of Lower 700 MHz Band Licenses Closes, *Public Notice*, 20 FCC Rcd 13424 (2005). See also Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, *Order*, 22 FCC Rcd 20453 (2007).

¹³ See, e.g., Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Order*, 22 FCC Rcd 20290 (2007) (granting a waiver to the Commonwealth of Virginia to allow continued deployment outside of the consolidated narrowband channels); Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, Request for Waiver of Pierce Transit, WT Docket No. 96-86, *Order*, 23 FCC Rcd 433 (PSHSB 2008).

the appropriate means for promoting the rapid construction and deployment of a nationwide, interoperable broadband public safety network that would serve public safety and homeland security needs.¹⁴

8. *Low Power Auxiliary Service under Part 74 Subpart H of the Rules.* Over the years, the Commission has licensed broadcast low power auxiliary stations on various spectrum bands.¹⁵ Under existing rules, devices that may be authorized as low power auxiliary stations are intended for such uses as wireless microphones, cue and control communications, and synchronization of TV camera signals.¹⁶ Where authorized, these devices currently may operate on a secondary basis in spectrum that historically has comprised a total of more than 400 megahertz in twelve frequency bands. The 700 MHz Band falls within the 698-806 MHz portion of one of the twelve bands: the 614-806 MHz band (Channels 38-69).¹⁷

9. Subpart H of Part 74 of our rules governs “low power auxiliary stations” generally.¹⁸ As set forth in Section 74.801 of our rules, devices authorized as low power auxiliary stations are “intended to transmit over distances of approximately 100 meters.”¹⁹ Section 74.803 states that low power auxiliary station usage in the UHF-TV spectrum – which comprises Channels 14-69, including spectrum in the 700 MHz Band (Channels 52-69) – is “secondary to TV broadcasting and land mobile stations . . . and must not cause harmful interference” to such operations.²⁰ Section 74.861, which relates to the technical requirements for low power auxiliary stations,²¹ provides that the maximum permitted output power for

¹⁴ See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, *Third Further Notice of Proposed Rulemaking*, 23 FCC Rcd 14301 (2008).

¹⁵ See 47 C.F.R. § 74.802(a).

¹⁶ *Id.* §§ 74.801, 74.831. Low power auxiliary stations authorized under Part 74 typically are used in conjunction with Broadcast Auxiliary Service (BAS) stations. See Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78, and 101 of the Commission’s Rules, ET Docket No. 01-75, Telecommunications Industry Association, Petition for Rule Making Regarding Digital Modulation for the Television Broadcast Auxiliary Service, RM-9418, Alliance of Motion Picture and Television Producers, Petition for Rule Making Regarding Low-Power Video Assist Devices in Portions of the UHF and VHF Television Bands, RM-9856, *Report and Order*, 17 FCC Rcd 22979, 23011 n.159 (2002) (*BAS Report and Order*). As noted in the *TV White Spaces Second Report and Order*, low power auxiliary stations can include electronic news gathering crews and other media that operate on an itinerant basis. See 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, *Second Report and Order and Memorandum Opinion and Order*, 23 FCC Rcd 16807, 16862 ¶ 157 (2008) (*TV White Spaces Second Report and Order*) *recons. pending*.

¹⁷ See 47 C.F.R. § 74.802(a). Seven of these frequency bands encompass all of the VHF and UHF broadcast television spectrum (except for Channel 37). Those bands are: 54-72 MHz; 76-88 MHz; 174-216 MHz; 470-488 MHz; 488-494 MHz (except in Hawaii); 494-608 MHz; and 614-806 MHz. The five other frequency bands are: (1) 26.100-26.480 MHz (spectrum for land mobile, broadcast, maritime, and remote pickup broadcast); (2) 161.625-161.775 MHz (except in Puerto Rico or the Virgin Islands) (spectrum for land mobile and remote pickup broadcast); (3 & 4) 450-451 MHz and 455-456 MHz (spectrum for land mobile and remote pickup broadcast); and (5) 944-952 MHz (spectrum for aural broadcast auxiliary stations, public mobile, and fixed microwave). *Id.*

¹⁸ Part 74 also contains rules of general applicability to all services under the Subparts of Part 74, including Subpart H, as described therein. See 47 C.F.R. § 74.1.

¹⁹ 47 C.F.R. § 74.801.

²⁰ *Id.* § 74.803(b).

²¹ *Id.* § 74.861.

low power auxiliary stations in the 614-806 MHz band is 250 milliwatts (mW).²² That rule also states that such stations “shall be operated so that no harmful interference is caused to any other class of station operating in accordance with the Commission’s rules and regulations and with the Table of Frequency Allocations.”²³ In addition, Section 2.106, Footnote NG115 of the Table of Frequency Allocations provides that these frequencies may be used for wireless microphones and wireless video assist devices on a non-interference basis, subject to the terms and conditions set forth in Part 74.²⁴

10. Under Section 74.832, only certain entities may be issued licenses authorizing the use of low power auxiliary stations. In particular, these entities fall within the following categories: (1) licensees of AM, FM, TV, or International broadcast stations or low power TV stations; (2) broadcast network entities; (3) certain cable television system operators; (4) motion picture and television program producers as defined in the rules; and (5) certain entities with specified interests in Broadband Radio Service (BRS) and Educational Broadcast Service (EBS) licenses, *i.e.*, BRS licensees (formerly licensees and conditional licensees of stations in the Multipoint Distribution Service and Multi-channel Multipoint Distribution Service), or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service (formerly Instructional Television Fixed Service) licensee or permittee.²⁵ Cable television operations, motion picture and television program producers may be authorized to operate low power auxiliary stations only in the bands allowed for TV broadcasting.²⁶ All classes of broadcast auxiliary stations provided for in Subpart H, except wireless video assist devices (WVADs), may be operated on a short-term basis under the authority conveyed by a Part 73 license or a broadcast auxiliary license without prior authorization, subject to conditions.²⁷

11. A number of low power auxiliary station licensees have been authorized to operate on the 700 MHz Band. Our records reflect that of the 958 active low power auxiliary station licenses, 153 include the authority to operate in the 700 MHz Band. Of these 153 licenses, two authorize operation only at certain frequencies in the 700 MHz Band. Licensees also determine the geographic scope of their licenses. Some licenses authorize operation on a nationwide basis, or on a statewide basis. The geographic scope of some licenses is not mappable.²⁸ For many licenses, the geographic scope is based on specific geographic coordinates using a “radius around centerpoint” definition that ranges from 1 kilometer to 322 kilometers.²⁹ As the record indicates, a single licensee may operate multiple

²² *Id.* § 74.861(e)(1)(ii).

²³ *Id.* § 74.861(g). Additionally, the licensee of any Part 74 station that causes harmful interference to radio communications involving safety of life or protection of property is required to promptly eliminate the interference. *Id.* § 74.23(a). If the harmful interference described in Section 74.23(a) of the Rules cannot be promptly eliminated, “the operation of the offending equipment shall temporarily be suspended and shall not be resumed until the harmful interference has been eliminated or the threat to the safety of life or property has passed.” *Id.* § 74.23(b).

²⁴ *Id.* § 2.106 NG115.

²⁵ *See id.* § 74.832(a)(1)-(6).

²⁶ *Id.* § 74.832(d).

²⁷ *Id.* § 74.24.

²⁸ Some licenses are not “mappable” because the description provided is not easily or readily translated to a particular geographic area. *See* Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, WT Docket No. 08-166, Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition, WT Docket No. 08-167, *Notice of Proposed Rulemaking and Order*, 23 FCC Rcd 13106, 13109 ¶ 7 & n.19 (2008) (*Notice and Order*, respectively).

microphones.³⁰

12. As a general matter, wireless microphones operate in a relatively narrow bandwidth and may choose a frequency from multiple vacant channels available for operation.³¹ Many wireless microphones are used “regularly and predictably, such as at major sporting events facilities, movie studio lots, and television studios.”³² The nature of wireless microphones and their use is such that they operate for relatively short periods of time at various times (which may, however, sometimes be frequent and scheduled), and “the specific frequencies they use for operation often change from time to time, even at locations such as major event venues.”³³

13. *Wireless Microphone Use under Part 90 and Part 15 of Our Rules.* In addition to authorization under Part 74, wireless microphone use may be authorized on a licensed basis under Part 90 of our rules and on an unlicensed basis under Part 15 of our rules. Under Part 90, entities eligible for an Industrial/Business Pool license may operate a low power wireless microphone on certain frequencies between 169.445 and 171.905 MHz. Eligible entities are those engaged in (i) operation of a commercial activity, (ii) operation of educational, philanthropic or ecclesiastical institutions, (iii) clergy activities, or (iv) operation of hospitals, clinics or medical associations.³⁴ The output power of Part 90 wireless microphones may not exceed 50 milliwatts,³⁵ and the wireless microphone licensees are “unprotected from interference from other licensed operations in the band.”³⁶ In addition, “[i]f any interference from wireless microphone operation is received by any Government or non-Government operation, the wireless microphone must cease operation on the frequency involved.”³⁷ There also are unlicensed wireless microphone uses under Part 15 of our rules. Sennheiser notes that unlicensed wireless microphone products are available in the 49 MHz, 902-928 MHz, and 2.4 GHz bands but states that they are generally unsuited to professional applications.³⁸

14. *Notice of Proposed Rulemaking (Notice) and the 700 MHz Freeze Order (Order).* In the *Notice* adopted in August 2008, the Commission sought comment on a number of matters relating to the operation of broadcast low power auxiliary stations in the 700 MHz Band. First, the Commission
(Continued from previous page) _____

²⁹ Licenses with a radius around centerpoint have an area of operation defined by a set of geographic coordinates (latitude and longitude) which define the center point of the area of operation and a radius that extends out from that center point. *Notice*, 23 FCC Rcd at 13110 ¶ 7 & n.20. The two licenses that are authorized to operate only at frequencies in the 700 MHz Band are licensed on the “radius around centerpoint” basis.

³⁰ Audio-Technica in its Comments states that “[a] single wireless microphone system generally consists of as many as 8-10 microphones, although for large event productions the number of microphones could be in excess of 40.” Audio-Technica Comments at 18. In addition, a single licensee “may operate any number of wireless microphone systems.” *Id.* at 19.

³¹ See *TV White Spaces Second Report and Order*, 23 FCC Rcd at 16843, 16844 ¶¶ 93, 95.

³² *Id.* at 16883 ¶ 220.

³³ *Id.* at 16876 ¶ 197.

³⁴ 47 C.F.R. § 90.35(a).

³⁵ *Id.* § 90.265(b)(2).

³⁶ *Id.* § 90.265(b)(4).

³⁷ *Id.*

³⁸ See Sennheiser Comments at 8. Sennheiser states that “[t]he low available power and high interference levels” make these wireless microphones unreliable, while “the narrow bandwidth of most units impairs audio quality.” *Id.*; see also Shure Reply Comments at 11-12 (Part 15 spectrum bands are heavily occupied by “a wide variety of incompatible devices that would interfere with wireless microphones, notably Wi-Fi and Bluetooth”).

tentatively concluded to amend our rules to make clear that the operation of low power auxiliary stations within the 700 MHz Band would no longer be permitted after the end of the DTV transition because such operations could cause interference to new public safety and commercial wireless services in the band.³⁹ The Commission also tentatively concluded to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz Band, effective after publication of the revised rules in the Federal Register.⁴⁰ For those licensees that have obtained authorizations to operate low power auxiliary stations in spectrum that includes the 700 MHz Band beyond the end of the DTV transition, the Commission tentatively concluded to modify these licenses so as not to permit such operations in the 700 MHz Band after the end of the DTV transition which, at that time, was February 17, 2009.

15. The Commission also sought comment on issues raised by PISC in its informal complaint and petition for rulemaking.⁴¹ Specifically, PISC requested that the Commission: (1) “[b]egin an investigation against Shure, Inc., and the other manufacturers” listed in its informal complaint, “for willfully and knowingly marketing and selling wireless microphones to unauthorized users for ineligible purposes in violation of Part 74, Subpart H, and for engaging in deceptive advertising practices designed to persuade ineligible users such as houses of worship, theaters, corporate event venues, and members of the general public” that they could “legally purchase and operate wireless microphones operating on vacant broadcast UHF Channels without a license and for purposes prohibited by the Commission;” (2) “[g]rant a general amnesty to all unauthorized users of wireless microphones deceived by the illegal and deceptive marketing of manufacturers, permit use of the illegal equipment on a going forward basis until the Commission authorizes” the new General Wireless Microphone Service (GWMS) proposed by PISC, and require those manufacturers that “engaged in illegal marketing to migrate the unauthorized users of Part 74, Subpart H equipment to the new GWMS by replacing equipment authorized for Part 74, Subpart H;” (3) “[i]mmediately reclassify all licensed wireless microphone systems operating pursuant to Part 74, Subpart H as secondary” to all commercial and public safety wireless systems “authorized to operate on television Channels 52-69 following the shut off of analog television transmission;” (4) “[o]rder that manufacture, sale, and advertisement for sale of wireless microphone systems operating on channels 52-69 cease immediately;” and (5) “[c]reate a new ‘General Wireless Microphone Service’ . . . licensed by rule pursuant to Section 307(e) to operate on vacant broadcast UHF channels below Channel 52 on a secondary basis to broadcast licensees and individually licensed wireless microphone systems,” and authorized “on a primary basis to operate on the 2020-[20]25 Band currently authorized for broadcast auxiliary service (BAS) and under consideration for reallocation in Docket Nos. WT 07-195, WT 04-356 (“AWS-2/AWS-3 Proceeding”).”⁴²

16. The Commission included, in conjunction with the *Notice*, an *Order* that imposed a freeze, effective August 21, 2008, on the filing of new license applications that seek to operate on any 700 MHz Band frequencies after the end of the DTV transition.⁴³ In the *Order*, the Commission also imposed a freeze on granting any request for equipment authorization of low power auxiliary stations that would operate in any of the 700 MHz Band frequencies. In addition, the Commission held in abeyance, until the

³⁹ *Notice*, 23 FCC Rcd at 13113 ¶ 14.

⁴⁰ *Id.* at 13114 ¶ 17.

⁴¹ See *Id.* at 13114-15 ¶¶ 20-22; see also Complaint of Public Interest Spectrum Coalition (PISC) Against Shure, Inc., Nady Systems, Inc., VocoPro, Audio2000, Sennheiser Electronic Corporation, Audix Microphones, Electro Voice, Hisonic International, Inc., Pyle Audio, *et al.*; Petition To Create a General Wireless Microphone Service (GWMS), *Informal Complaint and Petition for Rulemaking* (filed July 16, 2008) (“PISC Petition” or “Petition”).

⁴² PISC Petition at i-ii.

⁴³ See *Order*, 23 FCC Rcd at 13115-16 ¶¶ 23-24.

conclusion of this proceeding, any pending license applications and equipment authorization requests that involve operation of low power auxiliary stations on frequencies in the 700 MHz Band after the end of the DTV transition.

17. The deadline for comments on the *Notice* was October 3, 2008, and the deadline for reply comments was October 20, 2008. Both of these dates preceded the Commission's adoption of the *TV White Spaces Second Report and Order* (discussed below) and the enactment of the DTV Delay Act that extended the DTV transition deadline from February 17, 2009, to June 12, 2009. Nineteen comments and 11 reply comments were filed in response to the *Notice*. A list of commenters and reply commenters can be found in Appendix A.

18. *TV White Spaces Second Report and Order*. In the *TV White Spaces Second Report and Order* adopted on November 4, 2008, the Commission adopted rules to allow unlicensed radio transmitters to operate in the TV "white spaces," which is the broadcast television spectrum at locations where that spectrum is not being used by licensed services, provided that these unlicensed devices ("TV Band Devices") comply with various technical requirements set forth in Part 15, Subpart H.⁴⁴ In addition, the Commission afforded a number of protections to licensed wireless microphone users in the *TV White Spaces Second Report and Order*. It found that licensees using wireless microphones authorized under Part 74, which can operate at higher power limits than the unlicensed TV Band Devices, can be adequately protected under an approach that provides for registration of sites and times where such microphones are operated and where the unlicensed TV Band Devices have a spectrum sensing capacity to provide protection in addition to the registration system.⁴⁵

19. In the *TV White Spaces Second Report and Order*, the Commission also considered the need to ensure that channels remain available for use by wireless microphones authorized under Part 74. The Commission stated that it is not practical for licensed wireless microphones that operate on an itinerant basis, such as those used by electronic news gathering crews and other media activities, to register with the database.⁴⁶ Accordingly, the Commission determined that channels from 2 – 20 will be restricted to fixed unlicensed TV Band Devices and anticipated that this "will generally ensure that an adequate number of UHF channels are available for interference free operation of these important itinerant wireless microphone uses."⁴⁷ In addition, in 13 major markets where certain channels between 14 and 20 are used for land mobile operations, the Commission decided to leave two channels between 21 and 51 free of new unlicensed TV Band Devices and therefore available for wireless microphone use by licensed entities.⁴⁸

⁴⁴ See *TV White Spaces Second Report and Order*, 23 FCC Rcd at 16808 ¶ 1.

⁴⁵ *Id.* at 16876 ¶ 198. Noting that some wireless microphone users licensed under Part 74 may operate anywhere in their service area and choose a frequency from multiple vacant channels available for operation, the Commission concluded that it was not practical to require that the locations of the wireless microphones employed by these users be included in the database. *Id.* at 16843 ¶ 93. In these instances, the Commission determined that spectrum sensing was "the most reasonable and appropriate approach for detecting the presence of TV band services that operate on an intermittent basis or are not in the database," and it required that all unlicensed TV band devices incorporate a spectrum sensing capability to detect unregistered wireless microphones and to use that capability in determining the available channels in their area. *Id.*

⁴⁶ See *id.* at 16862 ¶ 157.

⁴⁷ *Id.*

⁴⁸ *Id.* at 16808-09, 16862 ¶¶ 1, 157.

III. REPORT AND ORDER

20. In this Report and Order, we establish a firm deadline of June 12, 2010 (one year from the end of the DTV transition) for wireless microphones and other low power auxiliary stations to cease operation in the 700 MHz Band. We also adopt an early clearing mechanism by which 700 MHz public safety and commercial licensees can provide notice that they are initiating operations in the 700 MHz Band. The operators of wireless microphones and other low power auxiliary stations must clear the band within 60 days after such notice. In addition, we prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of wireless microphones and other low power auxiliary stations intended for use in the 700 MHz Band.

21. With regard to users who are not eligible for, or who do not hold Part 74, Subpart H license authorizations, we waive our Part 15 rules for a limited period to permit all such users to operate on an unlicensed basis subject to a number of conditions in the 700 MHz Band until June 12, 2010 and in the core TV bands while we consider issues raised in the Further Notice. In addition, we adopt certain disclosure requirements under which manufacturers, dealers, distributors, and other entities that sell or lease these devices must display a consumer disclosure at the point of sale or lease informing consumers of the conditions that apply to the operation of wireless microphones and other low power auxiliary stations.

A. Low Power Auxiliary Station Operations in the 700 MHz Band After the End of the DTV Transition

22. Background. Entities licensed to operate low power auxiliary stations currently may operate those devices on a secondary basis in twelve frequency bands that are specified in our rules: (1) 26.100-26.480 MHz; (2) 54-72 MHz; (3) 76-88 MHz; (4) 161.625-161.775 MHz (except in Puerto Rico or the Virgin Islands); (5) 174-216 MHz; (6) 450-451 MHz; (7) 455-456 MHz; (8) 470-488 MHz; (9) 488-494 MHz (except in Hawaii); (10) 494-608 MHz; (11) 614-806 MHz; (12) 944-952 MHz.⁴⁹ The 700 MHz Band (698-806 MHz) falls within a portion of one of these twelve bands, the 614-806 MHz band (Channels 38-69). In the *Notice*, the Commission tentatively concluded to amend our rules to clarify that low power auxiliary stations would not be permitted to operate within the 700 MHz Band after the end of the DTV transition, and to modify existing licenses that authorize such operations in the 700 MHz Band so as not to permit their operation in that band past February 17, 2009, which at that time was scheduled to be the end of the DTV transition.⁵⁰

23. *Need to Clear the Band.* Most commenters agree that low power auxiliary stations should not be allowed to continue to operate on the 700 MHz Band indefinitely. A number of commenters, including public safety interests, commercial wireless service providers and related trade organizations, an engineering firm, an organization representing engineering interests, and a state governmental body, generally support our tentative conclusion to revise our rules to prohibit the operation of such devices in the 700 MHz Band after the end of the DTV transition.⁵¹ Groups, including wireless

⁴⁹ See 47 C.F.R. § 74.802(a).

⁵⁰ *Notice*, 23 FCC Rcd at 13113-14 ¶¶ 14-16.

⁵¹ See APCO Comments at 1-2; AT&T Reply Comments at 2; CTIA Reply Comments at 1; St. Clair Comments at 1-2; MetroPCS Comments at 2-3; Motorola Comments at 3; NPSTC Comments at 1, 4-6; State of California Comments at 1; **V-COMM Comments at 1**, 10; Verizon Wireless Comments at 1, 5-8; SBE Comments at 2-3; see also White Spaces Coalition Comments at 2 (supporting the determination that channels 52-69 should be fully available for public safety as well as commercial wireless services at the end of the DTV transition). As explained elsewhere in this Report and Order, WCA and PISC support the ban, but also suggest that a waiver procedure may be appropriate. WCA Comments at 1 & n.2; PISC Reply Comments at 5-7.

service providers, public safety groups, and public service organizations, in *ex parte* filings, support preventing low power auxiliary stations' operations in the 700 MHz Band.⁵²

24. A number of commenters express concern with interference from the operation of low power auxiliary stations in the 700 MHz Band.⁵³ Public safety commenters and the State of California contend that the use of low power auxiliary stations poses a danger of interference with radios used for public safety operations.⁵⁴ SBE argues, and St. Clair agrees, that there is a potential incompatibility between wireless microphone operations and the commencement of public safety communications.⁵⁵ V-COMM states that low power auxiliary stations have the potential to cause substantial harmful interference to new services operating in the 700 MHz Band.⁵⁶ V-COMM notes that low power auxiliary

⁵² See, e.g., Letter from John Marinho, Vice-President, Global Government & Public Affairs, Alcatel-Lucent, Robert M. Gurss, Director, Legal and Government Affairs, APCO, Jeanine A. Poltronieri, Executive Director, External Affairs, AT&T Services, Inc., Ronald R. Smith, Authorized LLC Representative, Bluegrass Wireless, LLC, Eric Graham, Director, Government Relations, Cellular South, Jouett Brenzel, Corporate Counsel, Cincinnati Bell Wireless, Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, Mark A. Stachiw, Executive Vice President, General Counsel & Secretary, MetroPCS, Steve Sharkey, Senior Director, Regulatory & Spectrum Policy, Motorola, Dr. Brian Fontes, Executive Director, National Emergency Number Association, Harold Feld, Senior Vice President, Media Access Project on behalf of PISC, Dean R. Brenner, Vice President, Government Affairs, QUALCOMM Inc., Todd B. Lantor, Regulatory Counsel, Rural Cellular Association, Grant Spellmeyer, Director – Regulatory Affairs, U.S. Cellular, Donald C. Brittingham, Assistant Vice President – Wireless/Spectrum Policy, Verizon Wireless, to Kevin J. Martin, Chairman, Michael J. Copps, Commissioner, Jonathan S. Adelstein, Commissioner, Deborah Taylor Tate, Commissioner, Robert M. McDowell, Commissioner, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Nov. 13, 2008) (“Alcatel-Lucent, et al. Nov. 13 *Ex Parte*”); see also Letter from Brian M. Josef, Director, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Nov. 13, 2008) (“CTIA Nov. 13 *Ex Parte*”) (*ex parte* by CTIA only); Letter from Alex Curtis, Director of Policy and New Media, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 and ET Docket No. 04-186, on behalf of PISC (filed Apr. 22, 2009) (“PISC et al. Apr. 22 *Ex Parte*”) (*ex parte* of Public Knowledge, New America Foundation, and PISC); Letter from Jef Pearlman, Equal Justice Works Fellow and Staff Attorney, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 and ET Docket No. 04-186 (filed Apr. 15, 2009) (“Public Knowledge et al. Apr. 15 *Ex Parte*”) (also on behalf of Public Knowledge and New America Foundation urging prohibition of wireless microphones and other low power devices that operate in the 700 MHz Band); Letter from Chris Fischer, President, APCO, Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, Dr. Brian Fontes, Executive Director, National Emergency Number Association (NENA), and Ralph A. Haller, Chair, NPSTC, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Apr. 7, 2009) (“APCO et al. Apr. 7 *Ex Parte*”) at 2 (require all wireless microphones and other low power auxiliary station devices to cease operation in the 700 MHz Band); Letter from John T. Scott, Vice President & Deputy General Counsel, Regulatory Law, Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 (filed Apr. 15, 2009) (“Verizon Wireless Apr. 15 *Ex Parte* meeting with Acting Chairman Copps”) at 1 (urging the Commission to clear operation of wireless microphones and other low power auxiliary station devices from the 700 MHz Band).

⁵³ See AT&T Reply Comments at 2-4; V-COMM Comments at 1-2, 5-10; Performing Arts Alliance Comments at 1-2; Verizon Wireless Comments at 3-5; MetroPCS Comments at 2-3; CTIA Reply Comments at 3-7; WCA Comments at 2-6; Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in PS Docket No. 07-287, GN Docket No. 09-51, WT Docket Nos. 09-30, 08-166 and 08-167, WC Docket No. 07-52, CC Docket No. 94-102 (filed Aug. 5, 2009), Attachment: Overview of Key Public Safety & Homeland Security Regulatory Issues (“CTIA Aug. 5 *Ex Parte*”) at 11.

⁵⁴ See APCO Comments at 2; NPSTC Comments at 4-5; State of California Comments at 2.

⁵⁵ See SBE Comments at 2-3; St. Clair Comments at 1-2. Motorola adds that the wireless microphone operations are incompatible with wide area wireless networks and should be prohibited. Motorola Comments at 3.

⁵⁶ V-COMM Comments at 5. V-COMM states that it is an engineering firm specializing in providing “expertise to wireless operators and governmental agencies in system design, network engineering, implementation, network (continued....)”

stations “can operate at similar power levels as anticipated CMRS 4G devices that will be deployed and will be strong enough to desensitize mobiles and base stations within a large area,” and that 4G devices “are expected to operate at 200 milliwatts nominally which is even lower power than the . . . [low power auxiliary station] device maximum permitted levels [of 250 milliwatts].”⁵⁷ In an *ex parte* filing, V-COMM presents data showing a range of interference from wireless microphones to CMRS and public safety base stations and devices, based upon varying power levels employed by the wireless microphones, and contends that because of such harmful interference, wireless microphones, CMRS, and public safety services are not compatible and cannot co-exist in the 700 MHz Band.⁵⁸ V-COMM provides analyses of co-channel, OOB, and intermodulation interference from low power auxiliary stations to public safety and commercial wireless systems.⁵⁹ V-COMM also points to one instance of actual measured interference related to wireless microphone operations.⁶⁰ In its *ex parte* filing, V-COMM also addresses interference from commercial and public safety operations to wireless microphone systems.⁶¹

25. Conversely, two wireless microphone manufacturers suggest that the threat of interference to new 700 MHz operations from low power auxiliary station licensees in the band after the DTV transition may be low.⁶² Shure comments that the *Notice* did not cite any instances of actual interference,⁶³ that most wireless microphones do not use the full power permitted by the rules and do not pose a serious interference threat to new wireless services, and that low power and Class A TV stations will operate in the band for a time with kilowatts, not milliwatts, of power.⁶⁴ SBE notes that commercial broadband is not necessarily in the same category as public safety in terms of interference susceptibility.⁶⁵

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expansion, system performance and optimization.” *Id.* at 1.

⁵⁷ *Id.* at 5.

⁵⁸ Letter from Sean Haynberg, Director of RF Technologies, V-COMM, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket No. 08-166 (filed Apr. 17, 2009), Attachment: Wireless Microphone Interference Study CMRS & Public Safety in 700 MHz (“V-COMM Apr. 17 *Ex Parte*”) at 14, 15, 20. A filing by CTIA, made also on behalf of APCO and several commercial wireless service providers, notes a range in the impact area for interference from wireless microphones based on varying power levels. Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Jan. 30, 2009), on behalf of CTIA, APCO, AT&T, U.S. Cellular, and Verizon Wireless, Attachments: Interference Between Mobile Radio Systems and Wireless Microphones, Interference with Mobile System Uplink, Interference with Mobile System Downlink (“CTIA et al. Jan. 30 *Ex Parte*”). V-COMM has included data of wireless microphone transmit outward power ranging from 10 milliwatts to 250 milliwatts. V-COMM Apr. 17 *Ex Parte* at 14-15. The comments of two manufacturers, Shure and Nady, suggest that most wireless microphones are designed for, or are used at, lower power levels. See Shure Reply Comments at 13 (commenting that most wireless microphones operate with 10-50 milliwatts of power); Nady Comments at 7-8 (commenting that in practice, wireless microphones’ actual output is generally only a maximum of 15 milliwatts).

⁵⁹ V-COMM Comments at 5-8.

⁶⁰ *Id.* at 8-10.

⁶¹ See V-COMM Apr. 17 *Ex Parte* at 3-13.

⁶² See Nady Comments at 7-8; Audio-Technica Comments at ii, 7-8. Audio-Technica also claims the proposal to move licensees out of the band lacks empirical support of interference threats to new operations. *Id.* at 7-10.

⁶³ See Shure Comments at 4.

⁶⁴ See Shure Reply Comments at 6.

⁶⁵ See SBE Comments at 3. SBE comments that low power auxiliary station devices operate at relatively low power levels and low field strengths, making interference to commercial broadband less likely, but also notes that it is very difficult to coordinate two disparate mobile services operating in the same spectrum and in the same area. *Id.*

26. *Timing for Clearing of the Band.* A number of commenters oppose delaying the ban on the use of low power auxiliary stations in the 700 MHz Band beyond the end of the DTV transition. In their comments, APCO and NPSTC note the importance of February 17, 2009 (formerly the date of the end of the DTV transition) as the date that additional public safety deployments may commence.⁶⁶ SBE comments that February 17, 2009, is a reasonable date for low power auxiliary stations to cease operating in the 700 MHz Band.⁶⁷ CTIA comments that interference protection, especially involving public safety, is a Commission policy goal, and comments that a delay is inappropriate and places an unnecessary burden on 700 MHz licensees.⁶⁸

27. Some commercial licensees in the 700 MHz Band assert that delaying the ban would adversely affect the ability of licensees to meet their build-out obligations. AT&T claims that, with the 700 MHz build-out requirements, any potential delay runs contrary to public policy and the Commission's goals, that 700 MHz commercial users should not have to justify interference, and that public safety users should not have to slow their deployment.⁶⁹ MetroPCS comments that a delay would negatively affect the build-out of the 700 MHz Band.⁷⁰ It also states that users of low power auxiliary stations have been well aware of the time the DTV transition was coming and that a timely implementation of the prohibition will help to clear unauthorized users from the band.⁷¹ MetroPCS further contends that a delay would constitute a *de facto* modification of licenses won in Auction No. 73.⁷² With respect to its planned use of the spectrum to deploy 4G services, Verizon Wireless has stated that "it will launch commercial service using [Long Term Evolution] technology in the 700 MHz band in 30 cities in mid-year 2010, and limited testing and operation of the technology is occurring in some markets already."⁷³

28. In an *ex parte* filing, a group of public safety organizations and CTIA state that they would prefer that all wireless microphones and other low power auxiliary stations cease operations in the 700 MHz Band coincident with the DTV transition, but they are willing to support a limited period of low power auxiliary station operations in the band, subject to two conditions.⁷⁴ They note that the Commission must act quickly to set a date certain for when the operation of such devices will cease, but

⁶⁶ See APCO Comments at 2; NPSTC Comments at 4.

⁶⁷ See SBE Comments at 3.

⁶⁸ CTIA Reply Comments at 7.

⁶⁹ See AT&T Reply Comments at 4. MetroPCS claims that allowing low power auxiliary users to operate in the 700 MHz Band would "unnecessarily and unfairly frustrate the expectations of 700 MHz bidders." MetroPCS Comments at 3; see also MetroPCS Reply Comments at 3-4 (commenting that new licensees should not have to alter their testing procedures to determine interference from low power auxiliary users when they build-out).

⁷⁰ MetroPCS Reply Comments at 2-4.

⁷¹ *Id.* at 4-5.

⁷² *Id.* at 5-6. MetroPCS also opposes arguments that considerations relating to the transition for low power television support a phase out for low power auxiliary station operations, and comments that if a delay is adopted for low power auxiliary station operation in the band then additional time should be provided for build-out by 700 MHz licensees. *Id.* at 6-8.

⁷³ Letter from Adam D. Krinsky, Counsel to Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 02-380 and 04-186 (filed Sept. 16, 2009) ("Verizon Wireless Sept. 16 *Ex Parte*") at 1 (citing to Verizon Wireless Aug. 14, 2009 press release). See also Verizon Wireless Comments at 2 n.2 (commenting that it plans to begin testing in 2009 and continue with wide-scale commercial deployment in 2010).

⁷⁴ APCO et al. Apr. 7 *Ex Parte* at 2-3.

that it should not extend beyond February 18, 2010 (one year after the original DTV transition deadline), and the Commission should ensure that any public safety or commercial systems deployed prior to the deadline can operate free of interference from wireless microphones or other low power auxiliary stations.⁷⁵ In an *ex parte* filing, Verizon Wireless states that it would prefer that “wireless microphones and other devices cease operations in the 700 MHz Band at the end of the DTV transition,” but also supports the position taken by the public safety organizations and CTIA for “adoption of a limited extension but under no circumstances should continuing operations in the band extend beyond February 18, 2010.”⁷⁶ Motorola indicates support for adoption of the Commission’s tentative conclusion in the *Notice*, but also expresses support for a firm deadline for low power auxiliary stations in the 700 MHz Band to cease operation.⁷⁷

29. By contrast, a number of other commenters – particularly those who argue that there is not a significant interference concern – argue that the prohibition on operation in the 700 MHz Band should not occur until some significant time after the DTV transition (originally February 17, 2009) to allow for a reasonable transition or phase-out. Some proposals include, for example, elements reflecting the Commission’s treatment of LPTV and Class A stations, and TV translators, or some other method.⁷⁸ Shure proposes a 24-month transition period,⁷⁹ and the Professional Audio Manufacturers Alliance

⁷⁵ *Id.*

⁷⁶ See Letter from Adam D. Krinsky, Counsel to Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 and ET Docket Nos. 02-380 and 04-186 at 2 (filed May 13, 2009) (footnote omitted) (“Verizon Wireless May 13 *Ex Parte*”); see also Letter from Adam D. Krinsky, Counsel to Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 02-380 and 04-186 (filed July 27, 2009) (“Verizon Wireless July 27 *Ex Parte*”) at 1 (reiterating support for a deadline no later than February 18, 2010, which is “a compromise date first proposed by public safety and commercial wireless representatives in light of the existing and near-term deployments in the band”).

⁷⁷ See Letter from Kimberly M. Baum, Director, Spectrum and Telecommunications Regulation, Motorola, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166, 08-167, and 06-150, WP Docket No. 07-100, PS Docket No. 06-229, ET Docket Nos. 04-186, 02-380, and 03-201 (filed Mar. 6, 2009) (“Motorola Mar. 6 *Ex Parte*”) at 1 & n.2. Motorola expresses support for a firm deadline proposed by CTIA and other parties, and states that “an earlier deadline would be necessary in cases where a public safety or commercial licensee is already initiating service.” See *id.* at 1 (noting Letter from Steve Largent, President and CEO, CTIA, Dr. Brian Fontes, Executive Director, NENA, Chris Fischer, President, APCO, and Ralph A. Haller, Chair, NPSTC, to Michael Copps, Acting Chairman, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Feb. 23, 2009) (“CTIA et al. Feb. 23 *Ex Parte*”)).

⁷⁸ For example, Audio-Technica proposes that in the absence of any demonstrated incidence of harm, low power auxiliary stations should be allowed to transition out of the band on the same schedule that the Commission ultimately adopts for other users like LPTV stations. Audio-Technica Comments at 7-8. Nady calls for a gradual transition, and a “fair and equitable” sharing of frequencies by new services and the existing services currently using the frequencies, and/or relocation of existing uses to other frequencies, suggesting a procedure which involves negotiation of voluntary relocation agreements by emerging technology providers and existing users, with those parties having co-primary status during the transition. See Nady Comments at 7, 8-10. Another commenter, Thomas Smith, supports a transition period which need not run longer than a year and a half in rural areas and perhaps 3-6 months in major markets. Thomas Smith Comments at 3. Sennheiser comments that a more flexible schedule, perhaps excluding channels 63-64 and 68-69, can be adopted. Sennheiser Comments at 20.

⁷⁹ Shure opposes the Commission’s proposal and recommends that users operating in the 700 MHz Band, other than users operating in the public safety bands at 763-775 MHz and 793-805 MHz, be given a 24-month transition period. See Shure Comments at 2, 5-14; see also Letter from Catherine Wang, Counsel to Shure, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket No. 04-186 at 1 (filed May 28, 2009) (“Shure May 28 *Ex Parte*”) at 2 (recommending a two-year transition period).

(PAMA), an organization that includes several commenters, requests a minimum two-year transition period.⁸⁰ In its most recent filing, MSTV proposes that, at a minimum, licensed wireless microphones should be allowed to continue operating in the 700 MHz band until the earlier of: (1) notification to the licensee that wireless service will commence operations within 30 - 60 days, or (2) February 10, 2011.⁸¹ MSTV also proposes that stations cease operating wireless microphones on channels devoted to public safety (channels 63, 64, 68 and 69) earlier, if required by the Commission.⁸² In addition, MSTV has proposed that unauthorized wireless microphone operations cease by February 17, 2010, unless the user is within one of the new classes of eligible users it proposes and has applied for a Part 74 license by that date.⁸³ MSTV proposes that, for users in the newly eligible classes, “applicants will be transitioned out of the 700 MHz band under the same phase-out plan described above for existing wireless microphone licensees.”⁸⁴

30. Some commenters claim that we have not given sufficient advanced notice that wireless microphone operations would be prohibited in the band.⁸⁵ For example, Shure argues that the Commission did not propose to amend its rule until the *Notice* and that it continued to authorize equipment prior to issuance of the *Notice*.⁸⁶ Shure and another wireless microphone manufacturer, Nady,

⁸⁰ *Ex Parte* Comments of Professional Audio Manufacturers Alliance in WT Docket Nos. 08-166 and 08-167 (filed Jan. 5, 2009) (“PAMA Jan. 5, 2009 *Ex Parte* Comments”) at 6-8. PAMA states that its members include Audio-Technica, Sennheiser, and Shure. *Id.* at 1 n.2.

⁸¹ Letter from David L. Donovan, President, Maximum Service Television, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in ET Docket Nos. 02-380 and 04-186; WT Docket Nos. 08-166 and 08-167 (filed January 5, 2010) (“MSTV Jan. 5, 2010 *Ex Parte*”) at 1.

⁸² *Id.*

⁸³ *Id.*, Attachment at 2 (recommending that the classes of users eligible to use wireless microphones in the core TV bands under Part 74 be expanded to include theaters, live music producers, government bodies, and houses of worship).

⁸⁴ *Id.* In previous filings, including comments and reply comments filed jointly with NAB, MSTV proposed a transition plan for licensed as well as currently-unauthorized wireless microphones that could extend as long as February 17, 2012. See Letter from David L. Donovan, President, Maximum Service Television, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 02-380 and 04-186 (filed August 25, 2009) (“MSTV Aug. 25 *Ex Parte*”), Attachment: “A Balanced Plan for Transitioning Wireless Microphones Out of the 700 MHz Band” at 1; MSTV/NAB Comments at 2; MSTV/NAB Reply Comments at 2; Fox Television Stations Reply Comments at 1-2 (supporting MSTV/NAB). MSTV/NAB argued that its proposed phase-out is consistent with precedent, and is more conservative than the transition for LPTV stations, Class A stations, and TV translators because its proposal includes a firm end-date. See MSTV/NAB Comments at 6-7. In reply comments, MSTV/NAB proposed that the notice would specify the date on which service will begin, which date should be no sooner than 120 days before the date when the notice was sent. The licensed wireless microphone user would then be required to cease all operations in the applicable geographic area on that frequency within 60 days before the date service begins. MSTV/NAB Reply Comments at 5. Verizon Wireless argues that MSTV’s proposal for a transition period that could extend until February 17, 2012, subject to market-by-market clearing, would do away with a nationwide “date certain” for wireless microphones to vacate the 700 MHz Band and “instead would create a splintered, market-by-market transition as public safety entities and commercial wireless providers across the country are engaging in and preparing for deployments well in advance of February 2012.” Verizon Wireless July 27 *Ex Parte* at 1.

⁸⁵ See MSTV/NAB Comments at 7-9; Audio-Technica Comments at 5-7; Sennheiser Reply Comments at 3; Shure Comments at 3-5; MSTV Aug. 25 *Ex Parte*, Attachment at 2; Letter from David L. Donovan, President, Maximum Service Television, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in ET Docket Nos. 02-380 and 04-186; WT Docket Nos. 08-166 and 08-167 (filed Sept. 5, 2009) (“MSTV Sept. 25, 2009 *Ex Parte*”) at 3.

⁸⁶ Shure Comments at 5.

rely on prior Commission decisions to argue that there must be a balanced transition process involved in relocating incumbent services.⁸⁷ Shure also argues that the Commission has allowed longer transition periods and has balanced the need for a new service to avoid disruption to users and minimize stranded investment.⁸⁸

31. Some of these commenters also claim that implementation of the prohibition should be delayed to prevent disruption. Shure alleges that “significant 700 MHz use and equipment exists and a transition will be complex, costly and disruptive.”⁸⁹ MSTV/NAB and Shure claim that unnecessary costs will be incurred to replace equipment.⁹⁰ Some commenters also assert that wireless microphone use will decrease with attrition over time,⁹¹ that no real interference is shown,⁹² and that many manufacturers have already stopped manufacturing 700 MHz equipment.⁹³ Audio-Technica and Thomas Smith note that the 700 MHz D Block has not been auctioned,⁹⁴ and they and another commenter argue that build-out by new licensees in the 700 MHz Band will be gradual.⁹⁵ In an *ex parte* filing, MSTV urges the Commission to reject proposals to “ban wireless microphones without regard to the timing of entry into the 700 MHz band by new licensees” and asserts that the Commission’s performance requirements “do not require commercial 700 MHz licensees to meet *any* buildout benchmark until February 2013.”⁹⁶

32. Some parties propose that, for a period of time following the DTV transition, the Commission should require licensees operating low power auxiliary stations to cease operations pursuant to certain notification procedures. For example, as described above, MSTV proposes that “*licensed* wireless microphones be allowed to continue operating in the 700 MHz band until the earlier of the following events: (1) notification to the station that wireless service will commence operations within 30

⁸⁷ See *id.* at 7; Shure Reply Comments at 3-5; Letter from Catherine Wang, Counsel to Shure, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket No. 04-186 at 1 (filed July 27, 2009) (“Shure July 27 *Ex Parte*”) at 1; Nady Comments at 8-10.

⁸⁸ See Shure Comments at 7; Shure Reply Comments at 3-5; Shure July 27 *Ex Parte* at 1; Nady Comments at 8-10.

⁸⁹ See Shure Comments at ii; see also *id.* at 7-10 (commenting that a “longer transition timeframe is critical to address a range of practical issues”). PAMA does “not oppose the eventual transition of secondary wireless microphone operations out of the 700 MHz band but does object to proposals that will cause unnecessary harm to wireless microphone manufacturers and users.” PAMA Jan. 5, 2009 *Ex Parte* Comments at 3-4 (footnote omitted).

⁹⁰ MSTV/NAB asserts that “[r]e-tuning equipment to cease operation in the 700 MHz band will cost on average \$50,000 to \$75,000 per station.” MSTV/NAB Comments at 4; see also MSTV Aug. 25 *Ex Parte*, Attachment at 2 (wireless microphones are purchased “with the expectation that they will work for three to five years”; the Commission’s Notice was not issued until August 2008, “after many existing licensees had purchased new wireless microphones”). Shure claims that “[r]eplacing dozens or hundreds of wireless audio channels with new gear can mean an average expenditure of \$50,000 to \$250,000 or more,” and also asserts that it is “aware of large users who stand to incur expenses of several million dollars in order to replace 700 MHz equipment.” Shure Comments at 8.

⁹¹ See Nady Comments at 8.

⁹² See Audio-Technica Comments at 7; Sennheiser Comments at 15-16.

⁹³ See Shure Comments at ii; Audio-Technica Comments at 5, 8-9. PAMA states that some manufacturers “ceased development in this band, yet legacy wireless still exists in the field despite action initiated 10 years ago.” PAMA Jan. 5 *Ex Parte* at 4.

⁹⁴ See Audio-Technica Comments at 9; Thomas Smith Comments at 3.

⁹⁵ See MSTV/NAB Comments at 5; Audio-Technica Comments at 9; Thomas Smith Comments at 3; see also MSTV Aug. 25 *Ex Parte* at 2 (“[t]he FCC’s performance requirements do not require commercial 700 MHz licensees to meet *any* buildout benchmark until February 2013”).

⁹⁶ MSTV Aug. 25 *Ex Parte*, Attachment at 1.

- 60 days, or (2) February 10, 2011.”⁹⁷ The group of public safety organizations, together with CTIA, suggests that the Commission “establish a 60-day notification process for any public safety or commercial operations occurring prior to February 18, 2010, and require that all 700 MHz wireless microphone and other . . . [low power auxiliary station] device operations in that particular market cease within the 60-day period.”⁹⁸ CTIA subsequently clarified its position that “in the event that a 700 MHz licensee intends to operate in the band prior to the nationwide hard date for vacating the band, CTIA supports a 60-day notification to the affected low power auxiliary station licensees.”⁹⁹ Verizon Wireless notes that low power auxiliary station licensees operate on a secondary basis and must not cause harmful interference, but also states that “a 700 MHz commercial wireless licensee should notify [low power auxiliary station] licensees in a particular market if it intends to initiate operations in that market prior to the Commission-adopted nationwide deadline to cease [low power auxiliary station] operations in the 700 MHz band. [Low power auxiliary station] licensees would in turn be required to cease 700 MHz operations in that market within 60 days.”¹⁰⁰

33. *Other Arguments.* PISC and WCA argue against any delay in implementation of the ban, but suggest that a waiver procedure, if subject to certain limitations, could be appropriate. PISC argues that such waivers, which would be available only for licensed systems, would be available for good cause shown, especially where the 700 MHz licensee has not raised any objection, but that the operation of these systems under a waiver should continue for no more than the two years, and preferably less.¹⁰¹ PISC comments that any waiver must include a clear designation of the systems as secondary to the new 700 MHz licensees, and include a requirement that the low power auxiliary station licensee cease operations if the 700 MHz licensee has deployed a functioning system. In arguing that its waiver proposal should be available to licensees, PISC states that “[s]ystems operating without a license have no entitlement to protection” and “have no legal standing to demand protection.”¹⁰² WCA proposes that a waiver should be available if the licensee can demonstrate either that due to unique or unusual factual circumstances, the application of a deadline would be unduly burdensome, or that the applicant has no reasonable alternative to using the 700 MHz Band for such a short period of time.¹⁰³ WCA notes that in either case, the waiver applicant should be required to establish that none of the 700 MHz licensees will

⁹⁷ MSTV Jan. 5, 2010 *Ex Parte*. See also MSTV/NAB Reply Comments at 2 (proposing that licensed wireless microphone operations cease upon the earlier of sixty days prior to the date on which the 700 MHz licensee intends to begin service, “per a notice sent to the affected wireless microphone licensees,” or February 17, 2012); Fox Television Stations Reply Comments at 1-2 (supporting MSTV/NAB).

⁹⁸ APCO et al. Apr. 7 *Ex Parte* (filing for APCO, CTIA, NENA, and NPSTC) at 2. Earlier *ex parte* filings proposed the use of notification procedures. See CTIA et al. Jan. 30 *Ex Parte* (attachment: “Revisions to Rules Authorizing the Operation of LPAS Devices in the 700 MHz Band”); Letter from Brian M. Josef, CTIA, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed February 19, 2009) (“CTIA February 19 *Ex Parte*”) (attachment: “Revisions to Rules Authorizing the Operation of LPAS Devices in the 700 MHz Band”); see also CTIA et al. Feb. 23 *Ex Parte*.

⁹⁹ Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167, and ET Docket Nos. 04-186 and 02-380 (filed May 15, 2009) (“CTIA May 15 *Ex Parte*”).

¹⁰⁰ Letter from Adam D. Krinsky, Counsel to Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Apr. 23, 2009) (“Verizon Wireless Apr. 23 *Ex Parte*”) at 1-2.

¹⁰¹ PISC Reply Comments at 6. PISC states that “[n]eedless to say, this waiver policy should apply exclusively to licensed systems.” *Id.*

¹⁰² *Id.* at 6-7.

¹⁰³ WCA Comments at 1 n.2.

be operating in the geographic area for which the waiver is sought during the duration of the waiver, or that they consent to the issuance of the waiver.

34. Several commenters also express concern about the availability of spectrum other than 700 MHz Band spectrum for wireless microphone use. For instance, some commenters, including SBE, Audio-Technica, and Shure, argue that additional spectrum outside of the 700 MHz Band should be made available for wireless microphone use.¹⁰⁴ Audio-Technica argues that the amount of broadcast spectrum available is reduced by the digital transition and operation of other entities, including low power television.¹⁰⁵ SBE contends that “the loss of a significant amount of spectrum that was formerly available” for wireless microphones will “inevitably force (and in fact already has forced) . . . [low power auxiliary station] incumbents into other bands, most especially the television broadcast channels below Channel 52, and has intensified the uses of those channels to the extent that there is insufficient spectrum for licensed [low power auxiliary station] operation going forward.”¹⁰⁶ Shure claims that “[m]ost of the spectrum in the core TV bands is occupied or unsuitable for wireless microphone operations, and the availability of ‘white space’ spectrum in the remainder of the core TV bands is threatened by the possible introduction of interfering uses.”¹⁰⁷ Sennheiser comments that “[t]here is no adequate substitute for the UHF TV-band frequencies.”¹⁰⁸ Motorola suggests that the TV White Spaces proceeding and a future proceeding could address this issue.¹⁰⁹ Thomas Smith, an individual who asserts that he has experience as a broadcast technician and has been involved with frequency coordination, comments that we should encourage greater use of the 900 MHz and 2.4 GHz Bands, although that alone would not address the issue of sufficient spectrum.¹¹⁰ SBE comments that, while more spectrum is needed for existing wireless microphone licensees, “there is ample Part 15 spectrum at 902-928 MHz and 2.4 GHz for unlicensed

¹⁰⁴ See SBE Comments at 4, 8; Audio-Technica Reply Comments at 2-3; Shure Reply Comments at ii, 4-5, 9-12. SBE argues that replacement spectrum should be provided for licensed low power auxiliary operations, and not for unlicensed operations. SBE Comments at 8. Shure and SBE do not agree with the Commission’s statement in the *Notice* that low power auxiliary stations will continue to have access to more than 300 megahertz of spectrum under the rules. See Shure Comments at 11; SBE Comments at 4. SBE argues that for some of this spectrum, the amount that will be available for low power auxiliary station device operations “will be minimal” due to distance separations required under the Commission’s rules. SBE Comments at 4-5. For other portions of the spectrum, SBE claims that there are “few, if any, options for WMs and LP Aux facilities displaced from the 700 MHz band, because . . . there are other uses that effectively preclude WM operation in these bands.” *Id.* at 5. Shure contends that “there is very little useable spectrum to support users’ wireless audio needs.” Shure Comments at 11. Shure claims that many of the spectrum bands are occupied by the primary user, many bands have long wavelengths which render those bands unsuitable for hand-held or body-worn operations, other bands are only small portions of spectrum that cannot support low power auxiliary station device operations, and some bands are subject to interference. *Id.* Shure argues that after removing the 700 MHz Band spectrum, “a total of 264 MHz remains available by rule for wireless microphone use,” but that “it is fallacious to conclude that wireless microphones have the full use of this spectrum.” *Id.*

¹⁰⁵ See Audio-Technica Comments at 6-7.

¹⁰⁶ SBE Comments at 3-4 (footnote omitted); see also *id.* at 3-6, 8-9.

¹⁰⁷ Shure Reply Comments at ii. See *id.* at 9-12; Shure Comments at ii, 11-14.

¹⁰⁸ See Sennheiser Comments at 8.

¹⁰⁹ Motorola Comments at 4-5. Motorola’s comments were filed before the *TV White Spaces Second Report and Order* was released. A subsequent Motorola proposal includes recommendations for operation of wireless microphones in the TV bands. See Letter from Steve B. Sharkey, Senior Director, Regulatory and Spectrum Policy, Motorola, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket 08-166 and ET Docket 04-186 (filed Aug. 6, 2009) (“Motorola Aug. 6 *Ex Parte*”), Attachment: “Motorola Recommendations on Wireless Microphones.”

¹¹⁰ Thomas Smith Comments at 6.

[wireless microphones] to be used by unlicensed, non-technical persons.”¹¹¹ Audio-Technica disagrees with the assertion that there is ample spectrum for unlicensed wireless microphones, claiming that those spectrum bands only support unlicensed operations such as cordless phones, children’s toys, and microwave ovens.¹¹² Sennheiser comments that unlicensed wireless microphones that operate in the 49 MHz, 902-928 MHz, and 2.4 GHz bands are not suitable for professional use.¹¹³ In *ex parte* filings, the Coalition of Wireless Microphone Users (“CWMU”), which includes operators of theatres, notes the reduction of available spectrum for wireless microphone use by the dedication of the 700 MHz Band for other services, and proposes to expand the list of entities eligible for a Part 74 low power auxiliary station license that would permit operation on spectrum outside of the 700 MHz Band.¹¹⁴

35. Other commenters assert that there is sufficient spectrum available in other bands for wireless microphone use. CTIA argues that allowing low power auxiliary stations to operate only on channels below Channel 52 is sufficient to accommodate wireless microphone users, where such operation is permitted, and use of additional spectrum is unnecessary.¹¹⁵ CTIA and MetroPCS refer to the Commission’s statement in the *Notice* that more than 300 megahertz of spectrum is available.¹¹⁶ CTIA concludes that users of low power auxiliary stations will therefore retain access to this amount of spectrum if the Commission prohibits operations in the 700 MHz Band.¹¹⁷ The White Spaces Coalition takes the position that the availability of 300 megahertz for licensed low power auxiliary station operations is adequate, but not if the rules are expanded to include “the large numbers of currently unauthorized wireless microphone systems.”¹¹⁸

36. Discussion. In order to make the 700 MHz Band fully available to public safety and commercial licensees, we are revising our rules to clarify that low power auxiliary stations, including wireless microphones, will no longer be allowed to operate in the 700 MHz Band except under the specified conditions, and for the limited time period, as adopted herein. Specifically, we establish a “hard” date of June 12, 2010 – one year from the date of the DTV transition¹¹⁹ – by which all operations

¹¹¹ SBE Comments at 8.

¹¹² Audio-Technica Reply Comments at 4.

¹¹³ Sennheiser Comments at 8.

¹¹⁴ See Letter from Charlotte St. Martin, Executive Director, The Broadway League, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Feb. 13, 2009) (filed on behalf of the Coalition of Wireless Microphone Users) (“CWMU Feb. 13 *Ex Parte*”) at 2-5; see also Letter from Antoinette Cook Bush, Counsel to the Coalition of Wireless Microphone Users, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Mar. 17, 2009) (“CWMU Mar. 17 *Ex Parte*”); Letter from Antoinette Cook Bush, Counsel to the Coalition of Wireless Microphone Users, to Marlene Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Apr. 16, 2009) (“CWMU Apr. 16 *Ex Parte*”). The African Methodist Episcopal Church (“AMEC”) has joined CWMU. Letter from Dr. Richard Allen Lewis, CFO of AMEC, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 and ET Docket Nos. 04-186 and 02-380 (filed June 10, 2009) (“AMEC June 10 *Ex Parte*”).

¹¹⁵ CTIA Reply Comments at 8.

¹¹⁶ See *id.* at 8-9; MetroPCS Comments at 3 & n.7. In the *Notice*, the Commission notes that “[l]ow power auxiliary stations are also authorized for use in over 300 megahertz of spectrum in 11 other frequency bands ranging from 26 MHz to 950 MHz.” *Notice*, 23 FCC Rcd at 13114 n.51.

¹¹⁷ CTIA Reply Comments at 8-9 (citing *Notice*, 23 FCC Rcd at 13114 ¶ 18).

¹¹⁸ White Spaces Coalition Comments at 3-4. The Coalition also argues that other options exist for wireless microphone operations, including under Parts 15 and 90 of the Commission’s rules. *Id.* at 10-11.

¹¹⁹ See DTV Act § 3002; DTV Delay Act § 2.

of such devices by all users (including unauthorized users) must have ceased in the band. In addition, we will require that operations of these devices cease earlier than that date, pursuant to certain notification procedures, in those areas where 700 MHz public safety or commercial licensees are or will be entering and operating in the band prior to June 12, 2010. Finally, we underscore that, if at any time users of low power auxiliary stations cause harmful interference to a 700 MHz public safety or commercial licensee, those users must cease operations in the band immediately. We find that this approach best balances the interests of public safety and commercial licensees to operate without interference while providing entities currently operating low power auxiliary stations in the 700 MHz Band with a reasonable amount of time to remove their operations from the band and relocate them to other bands. In addition, we outline below our consumer outreach plan to provide users with information concerning their use of low power auxiliary station devices as they transition from the 700 MHz Band.

37. *Need to Clear the Band.* Based on the record, we find that we need to be establishing expeditious time frames and procedures for clearing wireless microphones from the 700 MHz band on our path to providing an interference-free environment for new services in the 700 MHz Band, especially public safety services that are used to protect safety of life, health, or property. We find that low power auxiliary stations could interfere with public safety and commercial base and mobile receivers. Such interference raises the potential for a disruption of vital public safety services and commercial services. As V-COMM comments, low power auxiliary stations can operate at similar power levels, and are authorized at even higher power levels (250 milliwatts), compared with the power levels at which public safety devices are expected to operate (200 milliwatts).¹²⁰ These power levels employed by the respective devices pose a significant risk of co-channel interference and would be strong enough to disrupt the operations of both public safety and commercial mobiles and base station receivers in the 700 MHz Band.¹²¹ The risk of interference also is present to commercial and public safety systems when the wireless microphones and other low power auxiliary stations are operated at lower power levels, including as low as 10 milliwatts.¹²² This risk of interference supports our determination to prohibit operation of low power auxiliary stations in the 700 MHz Band. In addition, interference from low power auxiliary stations would lead to relatively large “dead zones” around such devices, resulting in effective loss of coverage to commercial and public safety mobiles and portable devices.¹²³ We find the potential for such a result raises a significant threat of interference, which is particularly disturbing when considering that this could occur in public safety spectrum while being used to protect the safety of life, health, or property.¹²⁴ In addition, we note the potential for interference to wireless microphone and other low power auxiliary station operations by commercial and public safety operations.¹²⁵

¹²⁰ See V-COMM Comments at 5; 47 C.F.R. § 74.861(e)(1)(ii).

¹²¹ See V-COMM Comments at 5-7.

¹²² See V-COMM Apr. 17 *Ex Parte* & Attachment at 14, 15, 20; CTIA et al. Jan. 30 *Ex Parte* (Attachments: Interference with Mobile System Uplink, Interference with Mobile System Downlink).

¹²³ V-COMM Comments at 6-7.

¹²⁴ CTIA et al. Jan. 30 *Ex Parte* (Attachments: Interference Between Mobile Radio Systems and Wireless Microphones; Interference with Mobile System Uplink; Interference with Mobile System Downlink).

¹²⁵ See *id.*; V-COMM Apr. 17 *Ex Parte* at 3-13.

38. In addition to co-channel interference,¹²⁶ the record indicates that low power auxiliary stations have the potential to cause additional interference, such as adjacent band interference, due to out-of-band emissions (OOBE) and intermodulation interference caused by emissions from multiple devices.¹²⁷ These emissions and intermodulation products may potentially be strong enough to cause interference to commercial and public safety base stations and mobile devices.¹²⁸ Intermodulation interference can occur when multiple low power auxiliary station transmitters are combined or used in close proximity with each other. Thus, commercial or public safety operations can receive interference at venues where multiple low power auxiliary station transmitters are used, such as at concerts or sporting events.¹²⁹ V-COMM, for example, indicates that interference can occur in a wide variety of settings, and also discusses its own experience with co-channel interference in the 700 MHz Band caused by low power auxiliary stations.¹³⁰ This potential for interference further supports prohibiting the operation of such devices, including wireless microphones, in the 700 MHz Band.

39. Clearing the 700 MHz Band is consistent with the Commission's previous findings relating to use of the 700 MHz Band in connection with the DTV transition.¹³¹ When the Commission in 2001 adopted rules for commercial services in a portion of the 700 MHz Band, it declined to grant a request filed by SBE that the Commission "afford continued secondary status to Part 74 low power broadcast auxiliary devices (such as wireless microphones) operating in the Lower 700 MHz Band, and to establish a new service in Part 95 of our Rules to accommodate their use."¹³² The Commission observed that insofar that the "Lower 700 MHz Band will host extensive broadcast use throughout the DTV transition, it is unlikely that new licensees will rapidly occupy the band to the extent that users of the low power broadcast auxiliary devices of the type SBE discusses will have to immediately cease all operation."¹³³ Thus, it contemplated that low power broadcast auxiliary devices would be losing their secondary status and would have to vacate the band upon completion of the DTV transition in a particular local market.¹³⁴

40. In addition, the Commission in 2002 expressly excluded from the 700 MHz Band

¹²⁶ While V-COMM's analysis references co-channel interference, it actually applies to all interference which substantially falls within the pass band of the public safety or commercial receiver. We also note that in a given event there can be multiple microphones, *see* Nady Comments at 11, which can increase the likelihood of interference.

¹²⁷ *See* V-COMM Comments at 7-8.

¹²⁸ *Id.* at 7.

¹²⁹ *See id.* at 7-8.

¹³⁰ *Id.* at 8-10.

¹³¹ *See* CTIA Reply Comments at 6 & n.18, 7 (commenting that the Commission has "repeatedly prohibited the use of low power auxiliary devices at Channels 52-69 in anticipation of the DTV transition").

¹³² *See* Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, *Report and Order*, 17 FCC Rcd 1022, 1037 ¶ 33 & n.105 (2002) (footnote omitted; citing SBE Comments at 4-5, GN Docket 01-74, May 14, 2001).

¹³³ *Id.* at 1038 ¶ 33.

¹³⁴ Prior to the DTV Act, analog broadcasters were required to cease operations by December 31, 2006, but the Commission was to extend the end of this transition in certain circumstances. Extensions were to be granted at the request of broadcast licensees on a market-by-market basis if one or more of the four largest network stations or affiliates were not broadcasting in digital, if digital-to-analog converter technology was not generally available, or if 15 percent or more of television households were not receiving a digital signal. *See* 47 U.S.C. § 309(j)(14)(A)-(B) (2005).

wireless video assist devices, which are another type of Part 74, Subpart H low power auxiliary station device, because of the reallocation of TV Channels 52-69 to wireless services, including public safety services.¹³⁵ The Commission stated that “[wireless video assist devices] will not be allowed to use . . . [Channels 52-69] in the UHF-TV band due to a recent spectrum reallocation of those channels to uses other than broadcasting.”¹³⁶ Also, in 2006 the Commission determined in the TV White Spaces proceeding that the new low power, unlicensed devices under consideration there will not be permitted to operate on TV Channels 52-69.¹³⁷ The Commission stated that the spectrum “ha[s] been reallocated for services other than broadcast television and will no longer be part of the TV bands after the transition.”¹³⁸

41. We conclude that parties have had time to know, and reason to believe, that authorized low power auxiliary stations would not be allowed to operate in the 700 MHz Band at the end of the DTV transition. The DTV Act was enacted over three years ago, and the Commission, as noted above, has on various occasions indicated that the 700 MHz Band would not be a permanent home for low power auxiliary stations, including wireless microphones.¹³⁹ Further, a number of manufacturers warned their customers on their websites that, after the end of the DTV transition, frequencies in the 700 MHz Band will no longer be available for wireless microphone use under the Commission’s rules.¹⁴⁰ There has been adequate lead time for low power auxiliary station users, including wireless microphone users, and equipment manufacturers to anticipate and take measures to prepare for the reasonably anticipated consequences resulting from the end of the DTV transition, including the availability of the spectrum for public safety and other uses and the need for entities operating low power auxiliary stations to vacate the 700 MHz Band. Moreover, the need to ensure interference-free operations in the 700 MHz Band as soon as is practicable, particularly for public safety operations, compels us to act to prohibit further use of the band for these wireless microphone and other low power auxiliary station users. Nevertheless, as we discuss below, a short transition period may prevent unnecessary disruption of wireless microphone operations and allow an orderly transition to other spectrum. Our determination in this Report and Order balances the requirements of those using low power auxiliary stations in the 700 MHz Band with the needs of new 700 MHz licensees to access the spectrum in a timely fashion.

42. *Transition Date.* In order to provide current low power auxiliary station users a reasonable opportunity to remove their systems from the 700 MHz band, we find that allowing them to continue to operate in the 700 MHz Band for a limited period of time under certain conditions serves the

¹³⁵ See *BAS Report and Order*, 17 FCC Rcd at 23037 ¶ 155.

¹³⁶ *Id.* That 2002 order is the last in which the Commission adopted significant revisions to the Commission’s Part 74, Subpart H rules addressing low power auxiliary stations. See generally *BAS Report and Order*, 17 FCC Rcd 22979. In addressing petitions for reconsideration in 2003, the Commission only made minor changes to the rules governing the frequency bands that can be used by WVADs. See *Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78, and 101 of the Commission’s Rules*, ET Docket No. 01-75, Telecommunications Industry Association, Petition for Rule Making Regarding Digital Modulation for the Television Broadcast Auxiliary Service, RM-9418, Alliance of Motion Picture and Television Producers, Petition for Rule Making Regarding Low-Power Video Assist Devices in Portions of the UHF and VHF Television Bands, RM-9856, *Memorandum Opinion and Order*, 18 FCC Rcd 21828 (2003).

¹³⁷ *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, *First Report and Order and Further Notice of Proposed Rule Making*, 21 FCC Rcd 12266, 12267 ¶ 2, 12275 ¶ 21 (2006).

¹³⁸ *Id.* at 12275 ¶ 21.

¹³⁹ See *Notice*, 23 FCC Rcd at 13111-13 ¶¶ 11-12.

¹⁴⁰ *Id.* at 13112 ¶ 11 & n.40.

public interest. We find that all entities currently operating low power auxiliary stations in the 700 MHz Band must vacate the band by June 12, 2010. This deadline of June 12, 2010, coupled with the obligation to cease operations earlier pursuant to notice, as described below, strikes the best balance between the needs of public safety and commercial licensees to operate without interference in the 700 MHz Band with the concern that entities currently operating low power auxiliary station devices in the 700 MHz Band have sufficient time to remove their operations from the band and relocate them to other bands.

43. With respect to the timing for requiring that users of low power auxiliary stations cease operating in the 700 MHz Band, our revised rules provide that entities operating low power auxiliary stations may continue those operations in the 700 MHz Band as late as June 12, 2010, subject to the conditions set forth in this Report and Order. In setting June 12, 2010, as the latest possible date for these entities to transition from the 700 MHz Band under the conditions adopted in this Report and Order, we recognize that low power auxiliary station users should have a short period to transition their operations not already transitioned out of the 700 MHz Band, which should prevent unnecessary disruption of wireless microphone operations. The record supports a transition period for users of low power auxiliary stations to remove their operations out of the 700 MHz Band, but commenters differ on the length of this period.¹⁴¹

44. We find that the transition period and process that we adopt, which terminates on June 12, 2010, is a reasonable period for those parties that may need to continue to operate in the band and will ensure that this spectrum is cleared on a timely and orderly basis for use by public safety and commercial wireless services. We also find that these requirements, coupled with the notice procedures described herein, will adequately address any concerns that the operation of low power auxiliary stations in the 700 MHz Band will cause interference to public safety and commercial 700 MHz Band licensees with the end of the DTV transition.¹⁴² Although entities operating low power auxiliary stations will have until June 12, 2010 to complete their exit from the band and their migration to other bands where they would be authorized to operate, subject to the conditions we adopt herein, we nevertheless encourage such users to cease operations in the 700 MHz Band as soon as possible. In addition, we find that the public interest is served by applying the transition procedures that we adopt in this Report and Order to users of low power auxiliary stations that do not hold a license. This finding is based upon our determination that the public interest will be served by allowing this use in this limited context for the limited duration discussed herein.¹⁴³

¹⁴¹ See MSTV/NAB Comments at 2-3, 6-7; Shure Comments at 2, 5-14; PAMA Jan. 5, 2009 *Ex Parte* at 6-8; Motorola Aug. 6 *Ex Parte*, Attachment; Verizon July 27 *Ex Parte* (arguing that wireless microphone operators vacate the 700 MHz frequencies no later than February 18, 2010); APCO et al. Apr. 7 *Ex Parte* (arguing that they prefer that wireless microphone and low power auxiliary station device use in the 700 MHz Band should cease coincident with the end of the DTV transition, but that a February 18, 2010, deadline provides sufficient time for users to transition out of the band); MSTV Jan. 5, 2010 *Ex Parte* (arguing that “licensed wireless microphones be allowed to continue operating in the 700 MHz band until the earlier of the following events: (1) notification to the station that wireless service will commence operations within 30 - 60 days, or (2) February 10, 2011”); MSTV Aug. 25 *Ex Parte* (arguing that licensed wireless microphones must vacate the band sixty days before commencement of operations by a 700 MHz entrant, or February 17, 2012, whichever comes first); Shure July 27 *Ex Parte* at 1 (restating Shure’s support for “a reasonable two-year transition period”); Motorola Aug. 6 *Ex Parte*, Attachment (proposing that the use of wireless microphones in channels 52-69 be prohibited effective June 12, 2010).

¹⁴² See, e.g., California Comments at 2; Motorola Comments at 3; APCO Comments at 2; AT&T Reply Comments at 2-4; CTIA Reply Comments at 3-7; **V-COMM Comments at 1-2, 5-10**; Verizon Wireless Comments at 3-5; Performing Arts Alliance Comments at 1-2; NPSTC Comments at 4-5.

¹⁴³ We discuss more fully below our decision to permit users that do not hold a low power auxiliary station license a temporary authorization to operate in the 700 MHz Band, during the transition period adopted herein.

45. While we agree with MSTV/NAB that low power auxiliary station licensees authorized to operate in the 700 MHz should be afforded some opportunity to migrate out of the band,¹⁴⁴ we cannot agree with the time frame they suggest, given the potential for interference with public safety and commercial broadband licensees and the clear determination in Congress's enactment of the DTV Act of 2005 that the 700 MHz band would no longer be a broadcast band in the near term. In addition, we are not persuaded that low power auxiliary station licensees, many of which are associated with high-power broadcast stations that have had significant notice of the need to vacate the 700 MHz band on a timely basis, should have a different and longer timeframe to vacate the 700 MHz Band than other users in the band, as proposed by MSTV. In addition to the need to clear the band because of the potential for interference, we are concerned that adding another layer of complexity -- establishing a different set of band clearing rules for a particular subset of users -- is likely to add significantly to consumer confusion, as well as to undermine our efforts to clear the 700 MHz Band. On this issue, our judgment is that keeping a single, uniform nationwide date, rather than adopting two separate transition dates, is essential to clearing the 700 MHz Band in a timely, orderly, and effective fashion in a manner that is equitable to all the affected parties. We also are not persuaded of the need for a shorter timeframe, such as a February 18, 2010, hard date as suggested by CTIA, Verizon Wireless, and several public safety groups.¹⁴⁵ As discussed above, we are placing operating limitations on low power auxiliary station users and adopting notification procedures that enable new 700 MHz licensees to clear the band of low power auxiliary station users in markets in which they will be operating. Further, we note that, based on the record before us and publicly available information, it is anticipated that there will be only limited rollout of new commercial services in the 700 MHz Band prior to mid-year 2010.¹⁴⁶ To the extent that spectrum in the 700 MHz Band needs to be clear of low power auxiliary station use for the initiation of new operations, which includes system testing or trials, we are adopting a clearing mechanism that provides for a 60-day notification process. Accordingly, we find the additional one-year period after the end of the DTV transition during which these low power auxiliary station users may continue to operate in the 700 MHz Band provides a reasonable amount of time for those entities to migrate from the band, yet also allows for the new 700 MHz licensees to access the spectrum in order to provide new services to the public.

46. *Early Clearing.* In addition to setting June 12, 2010, for the clearing of the 700 MHz Band by wireless microphones, we also provide procedures for clearing low power auxiliary station operations in the 700 MHz Band prior to that time to the extent that a public safety or commercial licensee has initiated, or will be initiating, operations in the 700 MHz Band in particular market(s) before that date.¹⁴⁷ Wireless microphones will be required to cease operations before June 12, 2010, only after

¹⁴⁴ See MSTV/NAB Comments at 2-4; MSTV Jan. 5, 2010 *Ex Parte*; see also Shure Comments at ii (wireless microphone users "will face difficult financial, technical and logistical issues and it is not reasonable to expect these users to 'turn on a dime' and cease 700 MHz operations virtually overnight"); PAMA Jan. 5, 2009 *Ex Parte* at 7 (wireless microphone users face "significant practical problems that would make an immediate prohibition unreasonable").

¹⁴⁵ See APCO et al. Apr. 7 *Ex Parte*.

¹⁴⁶ In terms of its planned use of the spectrum to deploy 4G services, Verizon Wireless indicated in its comments that it plans to begin testing in 2009 and continue with wide-scale commercial deployment in 2010. Verizon Wireless Comments at 2 n.2. In an *ex parte* filing, Verizon Wireless states that it "will launch commercial service using LTE technology in the 700 MHz band in 30 cities in mid-year 2010, and limited testing and operation of the technology is occurring in some markets already." Verizon Wireless Sept. 16 *Ex Parte* at 1 (citing to Verizon Wireless Aug. 14, 2009 press release). To date, no other carrier has commented in this proceeding on its plans to deploy commercial services in the 700 MHz Band prior to 2010.

¹⁴⁷ The record supports adoption of an early clearing mechanism pursuant to a notification procedure. For example, MSTV, as a part of its proposal, suggests that "licensed wireless microphones be allowed to continue operating in the 700 MHz band until the earlier of the following events: (1) notification to the station that wireless service will (continued....)

they have been provided 60 days' advance notification, as set forth below.

47. The notification process will work as follows. During the transition period, which will end on June 12, 2010, a 700 MHz commercial or public safety licensee may notify the Commission that it will be initiating operations on specified frequencies in particular market(s). The wireless operations initiated by the public safety or 700 MHz commercial licensees can include system testing or trials. Upon such notification, the Wireless Telecommunications Bureau or the Public Safety and Homeland Security Bureau will issue a public notice that will be available on the Commission's website and that identifies the affected market area(s). Users of low power auxiliary stations, including wireless microphone users, in those areas must cease operation within 60 days of the release of the notice.¹⁴⁸ The Commission's website will provide a central location for the low power auxiliary station users to find information on markets in which 700 MHz licensees are beginning operations prior to June 12, 2010. In addition, any 700 MHz commercial or public safety licensee may, at its option, notify any entity operating low power auxiliary stations of its intention to initiate operations on specified frequencies in the market in which the low power auxiliary station user is operating. Upon receipt of such notice, the low power auxiliary station user in the affected market area must cease operation within 60 days. For entities that have already initiated such operations, these entities may, upon the effective date of this order, follow the same notifications procedures, triggering the same 60-day cessation obligation for users of low power auxiliary stations.

48. In the event that both of these notice provisions are used to provide notice to a particular user of a low power auxiliary station(s), the user will be required to cease operations in the market(s) in accordance with whichever notice provides for earlier termination of such operations. This process should place only a limited burden on public safety and commercial licensees, which have the primary rights to use 700 MHz Band spectrum. Further, as noted above, notwithstanding any early clearing mechanisms adopted herein, low power auxiliary station users that cause harmful interference to a 700 MHz commercial or public safety licensee must cease operations immediately consistent with the Commission's rules for secondary use.¹⁴⁹ We also intend to be in continuous communication with the public safety community to ascertain the extent of public safety use of the 700 MHz Band to help ensure that public safety agencies are able to operate free from harmful interference.

49. *Other Arguments.* We are not persuaded by certain commenters that we should delay the transitioning of low power auxiliary stations and discontinue our efforts to clear the 700 MHz Band of

(Continued from previous page) _____
commence operations within 30 - 60 days, or (2) February 10, 2011)." MSTV Jan. 5, 2010 *Ex Parte*. See also MSTV/NAB Reply Comments at i, 2, 3 (recommending a notice procedure that would require the licensed wireless microphone user to cease all operations throughout the applicable geographic area on the frequency within 60 days before the date service begins). CTIA supports a 60-day notification to affected low power auxiliary station licensees; these licensees, in turn, would be required to vacate the band within the 60-day period. CTIA May 15 *Ex Parte*. In addition, CTIA and other parties propose that low power auxiliary station licensees be required to cease operations within 60 days of receiving notice that a public safety or commercial licensee will be initiating or changing operations. See CTIA et al. Jan. 30 *Ex Parte* (Attachment: "Revisions to Rules Authorizing the Operation of LPAS Devices in the 700 MHz Band"); CTIA Feb. 19 *Ex Parte* (attachment: "Revisions to Rules Authorizing the Operation of LPAS Devices in the 700 MHz Band"); CTIA et al. Feb. 23 *Ex Parte*; APCO et al. Apr. 7 *Ex Parte* at 2. Verizon Wireless suggests that the Commission provide a 60-day notification process whereby new licensees can notify wireless microphone and other low power auxiliary station device users in a particular market of the need to vacate the 700 MHz band. Verizon Wireless Mar. 18 *Ex Parte* at 1.

¹⁴⁸ In providing for this central location for low power auxiliary station device users to find information on markets in which 700 MHz licensees are initiating operations, we will establish a specific webpage, accessible through the Commission's website, where the 700 MHz notification public notices will be posted.

¹⁴⁹ See 47 C.F.R. §§ 74.803(b), 74.861(g).

wireless microphones for public safety and commercial use because some LPTV stations, TV translators, and Class A stations are continuing to operate in the 700 MHz Band after the transition.¹⁵⁰ We need to establish expeditious time frames and procedures for clearing wireless microphones from the 700 MHz band on our path to providing an interference-free environment for new services in the 700 MHz Band, especially public safety services that are used to protect safety of life, health, or property. Considerations affecting broadcast services other than full-power television broadcast operations should not delay the clearing of wireless microphones.

50. We also decline to adopt Nady's proposal that our transition plan should provide for the negotiation of relocation.¹⁵¹ As stated above, entities currently operating low power auxiliary stations, including wireless microphones, may continue to operate in the 700 MHz Band until June 12, 2010, subject to the conditions set forth in this Report and Order. Accordingly, we are allowing them to operate in the 700 MHz Band for some time during the transition period. These operators, however, must accept interference from other licensees in the band and must not cause interference to 700 MHz licensees during this transition period, and also are subject to the other conditions we adopt herein, including the requirement to cease operations under the early clearing notification procedures.

51. We deny as well the requests by WCA and PISC that we not provide a transition but adopt a waiver procedure for licensed wireless microphone operations in the 700 MHz Band after the end of the DTV transition. We find that the waiver procedures requested by these parties are not necessary. First, parties may always request a waiver under the general waivers provisions in our rules.¹⁵² Second, we do not find that a separate waiver provision is warranted because of our determination to allow a limited transition period during which users may operate low power auxiliary stations. We are making clear in our rules that entities operating low power auxiliary stations, including wireless microphones, in the 700 MHz Band may continue to operate on those frequencies until June 12, 2010, subject to the conditions adopted herein. Some operations by low power auxiliary station users in the band may be required to end prior to that time under the 60-day notice procedure that we are adopting. We therefore deny their requests that we adopt a waiver procedure for authorized wireless microphones and other low power auxiliary stations operating in the 700 MHz Band.

52. Furthermore, we find that the steps we are taking in this order sufficiently address arguments raised by some parties that there is insufficient spectrum for wireless microphone users outside of the 700 MHz Band, or that replacement spectrum should be made available for wireless microphone operations. As explained elsewhere in this Report and Order, we are adopting an approach that will permit wireless microphone operations to continue on a temporary basis in the 700 MHz Band and in the core TV bands while we consider final rules on the issues addressed in the Further Notice. Under the first step for moving ahead under this approach, we are waiving our Part 15 rules to permit unauthorized wireless microphone users to operate in the 700 MHz Band on an unlicensed basis until June 12, 2010, and to permit operation of wireless microphones in the core TV bands on the same unlicensed basis until the effective date of the rules that will be adopted in response to the Further Notice. Under the next step, we propose and seek comment in the Further Notice on specific rules for operation of wireless

¹⁵⁰ The transition timing for low power, translator and Class A stations will be addressed in a separate proceeding. See Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion To Digital Television, MB Docket No. 07-91, *Report and Order*, 23 FCC Rcd 2994, 2996 ¶ 3 & n.5 (2007) (citing Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations, MB Docket No. 03-185, *Report and Order*, 19 FCC Rcd 19331, 19336 ¶ 12 (2004)).

¹⁵¹ See Nady Comments at 7, 8-10.

¹⁵² See 47 C.F.R. § 1.925.

microphones under Part 15 of our rules in the TV bands, and we seek comment on some expansion of the licensee eligibility for Part 74 low power auxiliary stations. We also seek comment on possible revisions to our Part 90 rules for licensed operation of wireless microphones. The Further Notice will allow us to consider the use of certain spectrum outside of the 700 MHz Band by wireless microphones, and provides a reasonable and efficient path forward to examine the future of wireless microphone operations.

53. Finally, we conclude that the steps we have taken in this Report and Order are sufficient to address concerns that the presence of low power auxiliary station users operating in the 700 MHz Band would impede the ability of 700 MHz commercial licensees to comply with their build-out requirements such that they should be granted additional time to meet these requirements.¹⁵³ Given that the steps we take enable these 700 MHz licensees to begin operating in areas in the band based on the licensees' own timetables, we find that these licensees' ability to meet their build-out obligations will not be hampered by interference from low power auxiliary stations, and we reject proposals to delay implementation of 700 MHz construction requirements. For these same reasons, we also reject MetroPCS's argument that a delay in clearing the band could constitute a *de facto* modification of its licenses.¹⁵⁴

54. The rules adopted in this Report and Order with respect to the clearing of the 700 MHz Band by June 12, 2010 and the early clearing procedures will take effect upon the publication of a summary of this Report and Order in the Federal Register. We find that there is good cause for departure from the 30-day delay in the effective date under the Administrative Procedure Act. In this Report and Order, we are taking steps to expedite the availability of unencumbered spectrum for public safety and new commercial licensees, in order that such licensees will be able to operate without interference in the 700 MHz Band.¹⁵⁵ We find that under these circumstances, a further delay in the effective date of the clearing procedure rules would be contrary to the public interest.

B. Prohibition of the Manufacture, Import, Sale, Lease, Offer for Sale or Lease, or Shipment of 700 MHz Band Low Power Auxiliary Stations

55. Background. In the *Notice*, the Commission sought comment on its tentative conclusion to prohibit the manufacture, import, sale, offer for sale, or shipment of low power auxiliary stations that operate in the 700 MHz Band, and to have the prohibition take effect on the effective date of the revised rules.¹⁵⁶ The Commission stated that such a prohibition would facilitate the DTV transition by "helping address possible concerns about significant unauthorized operation of wireless microphones in the 700 MHz Band, and therefore help minimize the likelihood that additional unauthorized use would occur after the end of the DTV transition."¹⁵⁷

56. Shure states that it no longer manufactures equipment that operates in the 700 MHz Band for use in the United States, and Audio-Technica says it no longer develops new 700 MHz products.¹⁵⁸

¹⁵³ See MetroPCS Reply Comments at 7-8; see also AT&T Reply Comments at 3-4 (commenting that constructing new network already has significant challenges). PAMA does "not object to the prohibition of further manufacture of 700 MHz wireless microphone equipment so long as the prohibition only applies to *U.S. domestic distribution* on the DTV transition date." PAMA Jan. 5, 2009 *Ex Parte* at 4 n.6.

¹⁵⁴ See MetroPCS Reply Comments at 5-6.

¹⁵⁵ See 5 U.S.C. § 553(d)(3) (good cause exception to APA 30-day delay requirement); see also 47 C.F.R. § 1.427(b) (for good cause, Commission rules may be made effective within less than 30 days from publication in the Federal Register).

¹⁵⁶ *Notice*, 23 FCC Rcd at 13114 ¶ 17.

¹⁵⁷ *Id.*

¹⁵⁸ Shure Comments at ii; Audio-Technica Comments at 5.

WCA supports the Commission's proposal due to the risk of interference to public safety and commercial operations from low power auxiliary stations operating in the 700 MHz Band.¹⁵⁹ Verizon Wireless supports the prohibition particularly because of the authorized and unauthorized use on the spectrum,¹⁶⁰ and in an *ex parte* urges the Commission to "ban the domestic manufacture and sale of wireless microphone and other [low power auxiliary station] devices capable of operating in the 700 MHz band" and to adopt appropriate labeling requirements for devices manufactured for export.¹⁶¹ In connection with other recommendations concerning the use of wireless microphones, Motorola proposes that the Commission "[p]rohibit the manufacture, sale and importation of . . . [wireless microphones] in . . . [channels] 52-59 for domestic use effective immediately."¹⁶² Other commenters also support the prohibition, including the State of California, MSTV/NAB, Nady, and V-COMM.¹⁶³ SBE discusses the extent of unauthorized operation of devices that are certificated for use under Part 74, and comments that we should "prohibit the marketing, sale or shipment of 700 MHz [low power auxiliary station] devices at some point after the DTV transition is completed satisfactorily."¹⁶⁴ In addition, in *ex parte* filings, a group including wireless service providers, public safety groups, and public service organizations supported this prohibition.¹⁶⁵ Public Knowledge, in an *ex parte* filing, urges the Commission to "stop the sale of devices to unauthorized users as soon as possible."¹⁶⁶ In another *ex parte* filing, CTIA, APCO, NENA, and others jointly propose specific steps that the Commission should take that would help in preventing new low power auxiliary stations from being sold and available for use in the 700 MHz Band. These steps include: prohibiting the manufacture, import, or shipment of such devices that operate in the 700 MHz Band and are intended for domestic use by rules effective 30 days after publication in the Federal Register; prohibiting the domestic display, marketing or sales of existing non-conforming devices; and requiring all non-conforming devices manufactured solely for foreign/export sales to include labeling on the device and in marketing materials stating that the device is not authorized for sale or operation in the United States.¹⁶⁷

57. Sennheiser agrees that the sales of the equipment should stop, but asserts that we should reconsider the timing of placing the ban into effect.¹⁶⁸ Sennheiser argues that the *Notice* in this instance is far shorter than for the discontinuation of any product, and that the Commission should rethink the timing of its prohibition. Sennheiser contends that when the Commission has prohibited the marketing of a previously lawful product, even one that caused actual, harmful interference, a longer time was provided

¹⁵⁹ WCA Comments at 5.

¹⁶⁰ Verizon Wireless Comments at 6-7.

¹⁶¹ Verizon Wireless Mar. 18 *Ex Parte* at 1.

¹⁶² Motorola Aug. 6 *Ex Parte*, Attachment.

¹⁶³ See State of California at 1; MSTV/NAB Comments at 3 n.5; Nady Comments at 3; V-COMM Comments at 11.

¹⁶⁴ See SBE Comments at 6-7, 9.

¹⁶⁵ See Alcatel-Lucent, et al. Nov. 13 *Ex Parte*; CTIA Nov. 13 *Ex Parte*; see also APCO et al. Apr. 7 *Ex Parte* at 4 (position of APCO, CTIA, NENA, and NPSTC).

¹⁶⁶ Letter from Harold Feld, Legal Director, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 and ET Docket No. 04-186 (filed June 18, 2009) ("Public Knowledge June 18 *Ex Parte*") at 1.

¹⁶⁷ APCO et al. Apr. 7 *Ex Parte* at 4-5. This *ex parte* also asserts that these steps would be consistent with other actions taken by the Commission to protect consumers during the DTV transition, as well as with other Commission actions. *Id.* at 5-6.

¹⁶⁸ See Sennheiser Comments at 14-16.

to continue sales.¹⁶⁹ Sennheiser claims that except for public safety operations in the upper part of the 700 MHz Band, a February 17, 2009, deadline (which was formerly the scheduled end of the DTV transition) would be unnecessarily harmful to the industry and to the users of the equipment.¹⁷⁰

58. Sennheiser and Shure both assert that the Commission should not ban the manufacture of wireless microphones for export.¹⁷¹ They argue that the Commission lacks the authority to direct such a ban against products intended for export, and Shure comments that banning exports would be contrary to the public interest in several respects, including strengthening the position of U.S. companies in foreign markets.¹⁷² In response, several parties, including CTIA and public safety organizations, have indicated in *ex parte* filings that they would not object to the manufacture or shipment solely for low power auxiliary station equipment destined for non-U.S. markets.¹⁷³

59. Discussion. We revise our rules to prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of low power auxiliary stations for operation in the 700 MHz Band in the United States, effective upon the publication of a summary of this Report and Order in the Federal Register. We find that this prohibition serves the public interest because it will provide greater assurance that the 700 MHz Band will be made available to public safety and new commercial licensees.

60. The Communications Act of 1934, as amended, authorizes the Commission “consistent with the public interest, convenience, and necessity, [to] make reasonable regulations . . . governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio communications” and these regulations “shall be applicable to the manufacture, import, sale, offer for sale, or shipment of such devices . . . , and to the use of such devices.”¹⁷⁴ The Act further provides that “[n]o person shall manufacture, import, sell, offer for sale, or ship devices . . . , or use devices, which fail to comply with regulations promulgated pursuant to this section.”¹⁷⁵

61. Our decision to prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of low power auxiliary stations that operate in the 700 MHz Band is necessary to ensure that new services in this valuable spectrum will be provided without interruption to benefit all Americans.¹⁷⁶

¹⁶⁹ *Id.* at 3, 14-16.

¹⁷⁰ *Id.* at 3.

¹⁷¹ See Sennheiser Reply Comments at 3-4; Shure Comments at 14; Shure Reply Comments at 13-15; *see also* Motorola Aug. 6 *Ex Parte*, Attachment (noting, in connection with other proposals, that the manufacture of these devices should be allowed for export).

¹⁷² See Shure Comments at iii, 14; Shure Reply Comments at iii, 14-15; Sennheiser Reply Comments at 3-4. *See also* Letter from Catherine Wang, Counsel to Shure, to Michael Copps, Acting Chairman, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Mar. 2, 2009) (“Shure Mar. 2 *Ex Parte*”); PAMA Jan. 5, 2009 *Ex Parte* Comments at 4 n.6 (objecting to any prohibition on the manufacture and distribution of 700 MHz equipment for export).

¹⁷³ See Letter from Robert M. Gurss, Director, Legal & Government Affairs, APCO, Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, Dr. Brian Fontes, Executive Director, NENA, and Ralph A. Haller, Chair, NPSTC, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Mar. 9, 2009) (“APCO et al. Mar. 9 *Ex Parte*”) at 1-2 & n.4; *see also* APCO et al. Apr. 7 *Ex Parte* at 4 (recommending the prohibition apply to LPAS devices that operate in the 700 MHz Band and are intended for domestic use).

¹⁷⁴ 47 U.S.C. § 302a(a).

¹⁷⁵ *Id.* § 302a(b).

¹⁷⁶ *Id.*; *see also* 47 C.F.R. § 2.803(a) (stating that no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship, or distribute for the purpose of selling or leasing or offering for sale or (continued....))

Public safety agencies are already making use of the 700 MHz Band, and deployment of additional public safety systems is expected to proceed at a rapid pace. Commercial wireless providers are currently preparing to deploy advanced systems that will support new and faster wireless broadband services, once the spectrum is available at the conclusion of the DTV transition.¹⁷⁷

62. This prohibition is a reasonable corollary to our decision in this Report and Order to prohibit the operation of low power auxiliary stations in the 700 MHz Band permanently after June 12, 2010, subject to conditions that would require their operation to cease at an earlier date. Since low power auxiliary station equipment will no longer be allowed to operate in the 700 MHz Band after June 12, 2010, we must also prohibit the manufacture, sale, and all other steps that would make wireless microphones available for use in the 700 MHz Band. The prohibition on manufacture, sale, and lease of devices addresses concerns about the potential for increased interference to 700 MHz licensees, including public safety users, by decreasing the number of devices available for use in the band. For the same reason, it also addresses concerns about the proliferation of unauthorized uses in the band. We note that Shure, one of the largest manufacturers of wireless microphone equipment,¹⁷⁸ states that it no longer manufactures 700 MHz equipment for use in the U.S.,¹⁷⁹ and that Audio-Technica, another large manufacturer of wireless microphones, ceased development of new 700 MHz equipment approximately eight years ago.¹⁸⁰ In addition, allowing the sale or lease of devices that can operate in the 700 MHz Band is inconsistent with our goal of taking all steps necessary to make this spectrum available both to public safety and commercial licensees.

63. We reject Sennheiser's argument that we delay the implementation of the ban on the marketing of devices.¹⁸¹ We neither agree that the lead time for implementation of the ban is unreasonable, nor that we must wait for actual interference to occur. As we discuss in this section, in adopting the ban we are particularly concerned with the use of the spectrum at a time when the spectrum is to be available for new licensees and new services. Moreover, contrary to Sennheiser's assertions, and as we discuss elsewhere in this Report and Order,¹⁸² we find that sufficient notice was provided indicating that the use of the 700 MHz Band by wireless microphones and other low power auxiliary stations would no longer be authorized. Elsewhere in this Report and Order, we find that entities operating low power auxiliary stations in the 700 MHz Band must cease operations of those devices in the band after June 12, 2010, subject to the early clearing conditions set forth in this Report and Order. Therefore, it would not serve the public interest to permit the manufacturing and marketing of equipment that can be used in the 700 MHz Band beyond June 12, 2010, and earlier where the clearing mechanisms we are adopting are utilized.

64. Consistent with the arguments of Shure and Sennheiser, we do not prohibit manufacturers

(Continued from previous page) _____

lease, any radio frequency device unless such device has been authorized by the Commission in accordance with the Commission's rules).

¹⁷⁷ See Alcatel-Lucent, et al. Nov. 13 *Ex Parte*.

¹⁷⁸ "FCC Set to Test White Spaces Devices at FedExField" News Release, Shure Pro Audio, Aug. 6, 2008 at http://www.shure.com/ProAudio/PressRoom/PressReleaseArchive/2008PressReleases/usPro_pr_ws_2008_fedex_field.

¹⁷⁹ See Shure Comments at ii.

¹⁸⁰ See Audio-Technica Comments at 5.

¹⁸¹ See Sennheiser Comments at 14-16. Sennheiser concurs that sales of the equipment should cease, but not with the schedule proposed in the *Notice*. *Id.* at 4, 14-16.

¹⁸² See *supra* Section III.A.

from manufacturing low power auxiliary stations, including wireless microphones, for export.¹⁸³ The provisions of Section 302 of the Act, as amended, which addresses, among other matters, the prohibition of the manufacture, import, sale, offer for sale, or shipment of devices, are not applicable to “devices or home electronic equipment and systems manufactured solely for export”¹⁸⁴ Accordingly, we clarify that our decision today to prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of low power auxiliary stations that operate in the 700 MHz Band is not applicable to devices manufactured solely for export.¹⁸⁵ Finally, we revise our rules to require that any person who manufactures, sells, leases, or offers for sale or lease low power auxiliary stations, including wireless microphones, that are destined for non-U.S. markets and that are capable of operating in the 700 MHz Band¹⁸⁶ shall include labeling in all sales, marketing, and packaging materials, including online materials, related to such devices. The labeling must make clear that the devices cannot be used in the United States.¹⁸⁷ We find that this rule is consistent with the public interest, convenience, and necessity.

65. To protect consumers in the United States, and to help ensure that no wireless microphones and other low power auxiliary stations that operate in the 700 MHz Band continue to be made available for use in contravention of our efforts to remove those devices from the band in the United States, we require retailers to remove from display (including online display) any low power auxiliary stations, including wireless microphones, that can operate in the 700 MHz Band, as well as any marketing material that does not comply with the requirements adopted herein.

66. The rules relating to the prohibition on the manufacture, import, sale, lease, offer for sale or lease, or shipment of low power auxiliary stations that operate in the 700 MHz Band will take effect upon the publication of a summary of this Report and Order in the Federal Register, except the labeling requirement for devices manufactured solely for export. We find that there is good cause for departure from the 30-day delay in the effective date under the Administrative Procedure Act. In this Report and Order, we are taking steps to expedite the availability of unencumbered spectrum for public safety and new commercial licensees consistent with the Commission’s long-standing goal of making the spectrum fully available for those licensees.¹⁸⁸ Under these circumstances, we find that a delay in the effective date of the prohibition would be contrary to the public interest. With respect to the labeling requirement for devices manufactured solely for export, we find that this requirement should take effect 90 days after release of this Report and Order (*i.e.*, April 15, 2010). This period provides sufficient time for entities that manufacture, sell, lease, or offer for sale or lease low power auxiliary stations that are destined for non-U.S. markets and that are capable of operating in the 700 MHz Band to comply with this labeling requirement.

¹⁸³ See Shure Comments at 14; Shure Reply Comments at 13-15; Sennheiser Reply Comments at 3-4.

¹⁸⁴ 47 U.S.C. § 302a(c).

¹⁸⁵ See *id.*; see also Review of Part 15 and other Parts of the Commission’s Rules, ET Docket No. 01-278, *First Report and Order*, 17 FCC Rcd 14063, 14068-69 n.45 (2002) (noting that equipment manufactured in this country solely for export is exempt from compliance with the requirements promulgated under Section 302 of the Communications Act); 47 C.F.R. § 2.807 (exempting radiofrequency devices manufactured “solely for export” from the provisions of 47 C.F.R. § 2.803).

¹⁸⁶ By the phrase “capable of operating in the 700 MHz Band,” we intend to include devices that a user can reprogram, pursuant to the user manual or instructions, to operate in the 700 MHz Band.

¹⁸⁷ CTIA and a number of public safety entities support such labeling requirements. See APCO et al. Apr. 7 *Ex Parte* at 4; APCO et al. Mar. 9 *Ex Parte* at 2.

¹⁸⁸ See 5 U.S.C. § 553(d)(3) (good cause exception to APA 30-day delay requirement); see also 47 C.F.R. § 1.427(b) (for good cause, Commission rules may be made effective within less than 30 days from publication in the Federal Register).

C. Procedures to Modify Licenses

67. Background. In the *Notice*, the Commission sought comment on its tentative conclusion to modify existing licenses that allow the operation of low power auxiliary stations in spectrum that includes the 700 MHz Band so as not to permit them to operate on the 700 MHz Band past February 17, 2009, which at that time was the scheduled end of the DTV transition.¹⁸⁹ The Commission stated that those individual licenses would continue to allow use of all frequencies currently included in those licenses other than the 700 MHz Band through the end of their existing term, and licensees could seek to amend their licenses to include additional frequencies permitted under Part 74, Subpart H if they chose to do so. The Commission further stated that the purpose for this tentative conclusion was its concern that continued use of the 700 MHz spectrum by existing licensees of low power auxiliary stations may be disruptive to new public safety and other wireless operations in the 700 MHz Band, and noted the ready availability of other means that those licensees have under the rules for obtaining access to various other spectrum frequencies in which to operate low power auxiliary stations.¹⁹⁰

68. Verizon Wireless, V-COMM, and the State of California support adoption of the Commission's proposal to modify the licenses.¹⁹¹ The State of California argues that this action would assist in significantly reducing the number of sources of interference to first responder agencies relying on public safety spectrum in the 700 MHz Band after what was then the end of the DTV transition, February 17, 2009.¹⁹² Audio-Technica objects to the modification of licensees' 700 MHz Band authority in connection with the proposal to prematurely end existing operations in the 700 MHz Band.¹⁹³

69. Discussion. For the reasons set forth above, we conclude that the public interest would be best served by clarifying that entities operating low power auxiliary stations, including wireless microphones, in the 700 MHz Band may continue to operate in that band until June 12, 2010, but only under the conditions adopted in this Report and Order. Accordingly, through this rulemaking proceeding, we hereby modify the licenses of all low power auxiliary stations that authorize operation in the 700 MHz Band (*i.e.*, 698-806 MHz), to delete the authorization to operate on this particular spectrum, effective June 12, 2010.¹⁹⁴ In the event that any low power auxiliary station must cease operations prior to June 12, 2010 under the clearing mechanisms we adopt in the Report and Order, then the license relating to that low power auxiliary station will be modified automatically without Commission action to delete the authorization to operate on the 700 MHz Band effective on the date that operations are required to cease in the band. In taking this action, we implement our decisions to ensure that the effective use of the 700 MHz Band by public safety and commercial licensees at the end of the DTV transition is not compromised, and that these new licensees will be able to operate free from interference by low power auxiliary stations operating in the 700 MHz Band.

70. Most low power auxiliary station licensees that are authorized to operate in the 700 MHz Band are also authorized to operate in a number of other bands that are specified in Section 74.802 of the Commission rules.¹⁹⁵ These multiple band licensees may continue to operate in other bands identified in

¹⁸⁹ See *Notice*, 23 FCC Rcd at 13113-14 ¶ 16.

¹⁹⁰ *Id.*

¹⁹¹ See Verizon Wireless Comments at 3; V-COMM Comments at 11; State of California Comments at 1.

¹⁹² See State of California Comments at 2.

¹⁹³ See Audio-Technica Comments at 5-6.

¹⁹⁴ See *Committee for Effective Cellular Rules v. FCC*, 53 F.3d 1309 (D.C. Cir. 1987); 47 U.S.C. § 316(a)(1).

¹⁹⁵ Appendix D lists all low power auxiliary station licenses under Part 74, Subpart H that include authorizations to operate on frequencies in the 700 MHz Band, according to the Commission's records.

their licenses without further Commission action. Those licensees, however, whose current authorization limits them in whole or in significant part to operations in the 700 MHz Band can be accommodated with the use of spectrum from the core TV bands that are available for low power auxiliary station operations under Section 74.802 of the rules. Such licensees may wish to consult with a local Society of Broadcast Engineers (SBE) coordinator to identify suitable spectrum from other spectrum bands that are available for low power auxiliary station operations under Section 74.802 of the rules. Once replacement spectrum has been identified, as a matter of administrative convenience, the licensee should file an application to modify its authorization to include the identified frequencies. This will enable the Wireless Telecommunications Bureau (Bureau) to modify the affected license in conformance with the revised rules adopted in this order.

D. Unlicensed Operation of Wireless Microphones under Part 15; Waivers

71. Background. In the *Notice*, the Commission sought comment on issues raised in PISC's Petition relating to the operation of low power auxiliary stations by users that are not licensed under Part 74. PISC asserted in its Petition that unauthorized use of wireless microphones by ineligible users has become widespread.¹⁹⁶ PISC proposed that the Commission address unauthorized wireless microphone use by, among other things, creating a "General Wireless Microphone Service" (GWMS) that would be licensed by rule under Section 307(e) of the Communications Act, and would operate on a secondary basis in the TV bands below the 700 MHz Band and on a primary basis in the 2020-2025 MHz band.¹⁹⁷ PISC also proposed that GWMS wireless microphones operate on a "co-equal" basis with TV Band Devices.¹⁹⁸

72. The record does not indicate how many unauthorized wireless microphones are operating in the 700 MHz Band. In its Petition, PISC cited an "industry author" who estimated that in 2006, there were 400,000 wireless microphones in use in the United States.¹⁹⁹ PISC noted that there are fewer than 1,000 active licenses for low power broadcast auxiliary service under Part 74 and asserted that the current number of unlicensed wireless microphones "may well exceed one million."²⁰⁰ Audio-Technica responds that the article cited by PISC does not provide any source for this number and "does not state how many of the 400,000 wireless microphones which it claims were in use were licensed versus unlicensed."²⁰¹ Audio-Technica also asserts that the estimate refers to the total number of microphones in use, but a "single wireless microphone system generally consists of as many as 8-10 microphones, although for large event productions the number of microphones could be in excess of 40."²⁰² Audio-Technica states that "even if all 400,000 of the microphones whose existence is postulated by the article were unlicensed (a point which A-T does not concede and which is contradicted elsewhere in the article) the number of unlicensed wireless microphone systems would be some fraction of that number."²⁰³ Audio-Technica

¹⁹⁶ See PISC Petition at iv-vi, 16.

¹⁹⁷ See *id.* at ii, 27-33.

¹⁹⁸ See *id.* at 32; PISC et al. Apr. 22 *Ex Parte* at 1; see also State of California Comments at 2 (supporting PISC's proposal for a GWMS licensed by rule).

¹⁹⁹ See PISC Petition at vi (quoting Paul D. Lehrman, "Can You Hear Me Now? The Wireless Crunch Is Coming," *Mix Magazine*, May 1, 2006, available at http://mixonline.com/mag/audio_hear_2/index.html (last visited July 9, 2008)).

²⁰⁰ *Id.*

²⁰¹ Audio-Technica Comments at 18 (footnote omitted).

²⁰² *Id.*

²⁰³ *Id.* at 18-19.

also asserts that the number of Part 74 licensees is likely much smaller than the number of wireless microphone systems used by these licensees: “BAS operations are licensed on a geographic basis which, in some cases, is nationwide. A single user may operate any number of wireless microphone systems within its licensed geographic area, meaning there are far fewer users than systems.”²⁰⁴

73. The Commission received numerous comments relating to use of wireless microphones by currently unauthorized users, and how best to address the issues raised in this proceeding. We note that many of the comments include discussion of the *TV White Spaces Second Report and Order*, where the Commission adopted certain rules applicable to the TV bands and the operation of TV Band Devices on an unlicensed basis under Part 15.

74. A number of parties urge the Commission to authorize wireless microphones in a manner that affords them protection from interference from unlicensed TV Band Devices in the core TV bands. Wireless microphone users, MSTV, and Motorola assert that the Commission should expand eligibility for Part 74 licenses to varying degrees.²⁰⁵ The Coalition of Wireless Microphone Users (CWMU) states that its members are seeking protection from interference by TV Band Devices and that this protection can most effectively come from “eligibility for Part 74 Subpart H licenses and from the inclusion of Wireless Microphone uses in the proposed White Spaces database.”²⁰⁶ CWMU proposes expanding eligibility to include “[p]roducers of live performing arts, cultural presentations (including religious presentations), professional or amateur sporting events, conventions or trade shows, or the owners or

²⁰⁴ *Id.* at 19 (footnote omitted).

²⁰⁵ See, e.g., CWMU Feb. 13 *Ex Parte* at 3; MSTV Sept. 25 *Ex Parte* at 2; Motorola Aug. 6 *Ex Parte*, Attachment; see also AMEC June 10 *Ex Parte* (supporting CWMU and stating that houses of worship should be eligible for Part 74 licenses and should be permitted to register in the TV white spaces database); Letter from John Connolly, Executive Director, Actors’ Equity Association, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed June 24, 2009) (“Actors Equity June 24 *Ex Parte*”) (supporting CWMU with respect to expansion of Part 74 license eligibility; Actors’ Equity is “the labor union representing Actors and Stage Managers in the legitimate theatre”); Letter from Andrea Snyder, Chair, Performing Arts Alliance; Teresa Eyring, Executive Director, Theatre Communications Group; Ann Meier Baker, President and CEO, Chorus America; Sandra Gibson, President and CEO, Association of Performing Arts Presenters; Joanne Hubbard Cossa, CEO, American Music Center; Jesse Rosen, President and CEO, League of American Orchestras; Kathy Evans, Executive Director, National Alliance for Musical Theatre; Marc Scorca, President and CEO, OPERA America, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 (filed Feb. 27, 2009) (“Performing Arts Alliance Feb. 27 *Ex Parte*”) at 1 (supporting CWMU’s request that the Commission “recognize the performing arts as eligible users of Subpart H frequencies”); MSTV/NAB Comments at 9 (urging Commission to expand Part 74 eligibility); Fox Television Stations Reply Comments at 2 (supporting MSTV/NAB comments). PSAV Presentation Services asserts that it is “imperative to identify an adequate number of protected channels in each market that wireless microphones could operate on free from white space device interference” and that “[t]hese protected channels are necessary to support the significant daily use of smaller numbers of wireless microphone channels that requires flexibility that make up the majority of our daily meeting events.” See Letter from Annette M. Moody, SVP, Product Management, PSAV Presentation Services, to Chairman Martin and Commissioners Adelstein, Copps, McDowell, and Tate, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket 04-186 (filed Oct. 28, 2008) (“PSAV Oct. 28 *Ex Parte*”). Thomas Smith states that “change[s] in the rules could be made to allow churches, bands, theatres and others” to use wireless microphones in the TV bands and suggests an automated online registration system rather than formal licensing for these users. Thomas Smith Comments at 4-5.

²⁰⁶ Letter from David H. Pawlik, counsel to The Coalition of Wireless Microphone Users, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 04-186 and 02-380 (filed Aug. 28, 2009) (“CWMU Aug. 28 *Ex Parte*”) at 2.

operators of venues where such events take place; or government or educational entities.”²⁰⁷ CWMU argues that placing wireless microphones on equal footing with TV Band Devices or Part 15 devices “would essentially provide no protection at all from the technology most likely to interfere with Wireless Microphone performance” because “temporary interference would not have the same devastating [effect] on TVBDs that it would have on Wireless Microphones.”²⁰⁸ As a result, TV Band Device operators “would begin any interference negotiation with much less to lose and thus a significant advantage.”²⁰⁹ This, CWMU argues, “would make it impossible to secure investor backing for high-quality Broadway productions while simultaneously subjecting communications at major sporting events, churches and college classrooms to untenable interference.”²¹⁰

75. MSTV asserts that the Commission should expand license eligibility to include “theaters, live music producers, government bodies, and houses of worship” and that these uses occur in a controlled environment that is “not typically in close proximity to television reception equipment.”²¹¹ MSTV asserts that wireless microphones need protection from the new TV Band Devices that “may flood the broadcast spectrum in the coming years” and that “[p]roviding them with only ‘co-equal’ status to TV Band Devices would be the end of the road for many wireless microphones.”²¹² MSTV also asserts that by licensing these wireless microphones, “the Commission will subject them to the coordination requirements of Part 74 and thereby greatly reduce the risk of interference to television reception.”²¹³ Motorola, in a proposal that includes a number of measures related to the operation of wireless microphones and TV Band Devices, suggests that the Commission modify Part 74 of the rules to authorize licensed use of vacant channels between 37 and 51 in support of “live broadcast or professional

²⁰⁷ See CWMU Feb. 13 *Ex Parte* at 3. CWMU also proposes a limited 60-day amnesty period during which existing wireless microphone users could apply for licenses to cover their grandfathered uses of the television broadcasting spectrum; following the termination of the amnesty period, the Commission could issue additional authorizations by waiver to ensure that only those entities that need wireless microphones using Part 74 spectrum are licensed, while reserving spectrum resources for use by TV Band Devices. Letter from Antoinette Cook Bush, Counsel to The Coalition of Wireless Microphone Users, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 04-186 and 02-380 (filed June 25, 2009) (“CWMU June 25 *Ex Parte*”) at 2. In addition, CWMU suggests clarifying that licenses should not be available for users that are not serving groups and/or can use a wired microphone. *Id.*

²⁰⁸ CWMU June 25 *Ex Parte* at 4.

²⁰⁹ *Id.*

²¹⁰ *Id.* CWMU also states that its members appreciate the importance of clearing the 700 MHz Band and have purchased new equipment to do so. “Given this commitment and expense, it would be manifestly unfair” for the Commission to require co-equal status for wireless microphones with other Part 15 devices. See *id.* at 3. CWMU also asserts that “failure to protect Wireless Microphones would be a reversal of the FCC’s position in the White Spaces order, which made clear that Wireless Microphones could be included in the database and protected against interference from [TV Band Devices].” *Id.* at 3-4; see also Letter from Chuck Wilson, Executive Director, National Systems Contractors Association, to The Hon. Julius Genachowski, Chairman, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket No. 04-186 (filed July 24, 2009) (“NSCA July 24 *Ex Parte*”) at 1, 2 (NSCA is “the leading not-for-profit association representing the commercial electronic systems industry”; co-equal operation of wireless microphones and TV Band Devices would mean that “any of the new electronic devices being developed would be able to interfere with wireless microphone systems” and would “ruin the experience for anyone using the microphones”).

²¹¹ MSTV Aug. 25 *Ex Parte* at 3.

²¹² *Id.*

²¹³ *Id.*

entertainment venues.”²¹⁴

76. Wireless microphone manufacturers generally support PISC’s proposal for licensing by rule but oppose its proposal that these microphones operate on a co-equal basis with TV Band Devices.²¹⁵ Sennheiser states that co-equal status for wireless microphones and TV Band Devices would require them to accept one another’s interference and that in practice, this would “greatly impair wireless microphones while leaving [TV Band Devices] almost unaffected.”²¹⁶ Shure supports expanded eligibility for licenses under Part 74, with licensing by rule for the remaining wireless microphone users.²¹⁷ Shure also states that wireless microphones cannot tolerate interference from TV Band Devices and that while it may be possible for the user of a TV Band Device to pinpoint potential interference arising from a wireless microphone operating in a nearby location, “the reverse is not true as wireless microphone users will not be able to identify the interfering [TV Band Device] user in a crowd, across the street from a church, or in a business conference.”²¹⁸ In addition, Shure asserts that wireless microphone users typically operate at power levels well below those allowed for TV Band Devices and that “during inevitable incidents of co-channel interference, the outcome would almost always favor the more powerful [TV Band Device].”²¹⁹

77. On the other hand, a number of parties urge the Commission not to allow substantial numbers of unauthorized wireless microphones to operate in the core TV bands with protection from potential interference from TV Band Devices. Google, Dell, and Microsoft, which are members of the White Spaces Coalition,²²⁰ oppose any substantial expansion of Part 74 eligibility on the ground that it

²¹⁴ Motorola Aug. 6 *Ex Parte*, Attachment. Motorola also proposes that “[o]ther than temporary use, e.g., for [electronic news gathering], license entries in the [white spaces] database must be location and channel specific.” *Id.*

²¹⁵ See Sennheiser Comments at 11-14 (opposing co-equal status for wireless microphones and white spaces devices and proposing that Part 74 licensed operation be permitted on channels 14-51, excluding 37, while GWMS operation would be limited to channels 14-36 and would be secondary to Part 74 licensed operations); Nady Comments at 10 (previously unlicensed wireless microphones should be licensed by rule for operation in the TV bands below 700 MHz; “[a]ll wireless microphone use in the white spaces will require protection from interference by the emerging technology commercial devices being considered by the Commission in [the white spaces proceeding]”); see also Audio-Technica Comments at 13 (stating that PISC’s proposal for a GWMS is a creative solution to address the problem of unauthorized wireless microphone use).

²¹⁶ Letter from Mitchell Lazarus, Counsel to Sennheiser, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 04-186 and 02-380 at 2 (filed July 7, 2009) (“Sennheiser July 7 *Ex Parte*”) at 2 (footnote omitted). Sennheiser also asserts that wireless microphones are “entitled to retain their long-held interference protection from unlicensed devices, including [TV Band Devices.]” *Id.* at 4.

²¹⁷ See Shure Reply Comments at iii, 17-18.

²¹⁸ See “Ex Parte Comments of Shure Incorporated,” *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket No. 04-186 (filed June 29, 2009) (“Shure June 29 *Ex Parte* Comments”) at 5.

²¹⁹ *Id.* (footnote omitted). Shure also asserts that adoption of a licensing by rule regime without interference protection for wireless microphones would be inconsistent with the purpose of Section 307(e) and with Commission precedent, see *id.* at 2-4, and that “[d]emoting wireless microphones to ‘co-equal’ status with Part 15 TVBDs fundamentally conflicts with the Commission’s long-standing mandate to protect *all* incumbent operators -- including wireless microphones -- in the core TV bands from interference created by new entrants.” *Id.* at 8 (footnote omitted).

²²⁰ See Letter from Edmond J. Thomas, Senior Technology Policy Advisor, Harris, Wiltshire & Grannis LLP, on behalf of White Space Coalition, *Ex Parte* in ET Docket Nos. 04-186 and 02-380 (filed July 16, 2007) (“White Spaces Coalition July 16 *Ex Parte*”). The White Spaces Coalition states in this filing that its members include Dell, Inc., EarthLink, Inc., Google, Inc., Hewlett-Packard Co., Intel Corp., Microsoft Corp., and Philips Electronics North America Corp.

could greatly undermine the operation of TV Band Devices.²²¹ Google states that it supports PISC's Petition and that any "considerable expansion" of the Part 74 eligibility rules could have a "hugely detrimental impact" on the use of TV Band Devices.²²² Microsoft and Dell assert that expanding Part 74 eligibility to include non-broadcast wireless microphones "will dramatically increase the number of white space database 'keep out' zones. It could mean that every karaoke club, corporate boardroom, theater, or meeting hall in the United States could receive the same protection as Yankee Stadium. As a result, the use of white space devices would be restricted in large areas of the country, and there would be many portions of densely populated areas where no white space devices could function at all."²²³ In a separate *ex parte* filing, Microsoft asserts that "any post hoc authorization of currently unauthorized wireless microphones that the Commission determines is necessary should be narrow, well defined, and limited" and that "currently unauthorized microphones should not be licensed by rule given current white spaces rules."²²⁴

78. PISC, Verizon, and Public Knowledge argue that wireless microphones should be authorized to operate in the core TV Bands, but only on a co-equal basis with TV Band Devices.²²⁵

²²¹ See Letter from Richard S. Whitt, Esq., Washington Telecom and Media Counsel, Google Inc., to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket No. 04-186 (filed Apr. 24, 2009) ("Google Apr. 24 *Ex Parte*") at 1-2; Letter from Kerry Murray, Senior Counsel for Global Public Policy, Dell Inc., and Paula Boyd, Regulatory Counsel, Microsoft Corp., to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167, ET Docket Nos. 04-186 and 02-380 (filed May 6, 2009) ("Dell and Microsoft May 6 *Ex Parte*") at 1-2. In comments filed before release of the *TV White Spaces Second Report and Order*, the White Spaces Coalition proposed a narrow expansion of Part 74 license eligibility and opposed a GWMS that would allow wireless microphone users to operate in the spectrum at channels 21-51. White Spaces Coalition Comments at 2-3, 8-11. In a subsequent *ex parte* filing, Dell and Microsoft assert that the Coalition initially proposed a limited expansion of Part 74 under the assumption that these microphone uses would be protected using only spectrum sensing technology. In light of the "stringent" wireless microphone protection rules adopted in the *TV White Spaces Second Report and Order*, however, "any expansion of Part 74 now represents a critical problem for the availability of white spaces devices." Dell and Microsoft May 6 *Ex Parte* at 2 n.5.

²²² See Google Apr. 24 *Ex Parte* at 1-2.

²²³ Dell and Microsoft May 6 *Ex Parte* at 2 (footnote omitted); see also Dane Ericksen Reply Comments at 5 (Commission should not expand Part 74 eligibility at a time when the frequencies available to low power auxiliary stations are decreasing as a result of the DTV transition). CTIA does not take a position on whether currently-unauthorized wireless microphones should operate on a co-equal basis with TV Band Devices but argues that the Commission must allow these users to "transition into alternative spectrum readily available for such operations – the TV bands." CTIA May 15 *Ex Parte* at 1.

²²⁴ Letter from Edmond J. Thomas, Senior Technology Policy Advisor, Harris, Wiltshire & Grannis LLP, on behalf of Microsoft Corp., *Ex Parte* in WT Docket Nos. 08-166 and 08-167, ET Docket Nos. 04-186 and 02-380 (filed Apr. 17, 2009) ("Microsoft Apr. 17 *Ex Parte*") at 1.

²²⁵ See PISC et al. Apr. 22 *Ex Parte* at 1; Letter from Adam D. Krinsky, Counsel to Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167; ET Docket Nos. 02-380 and 04-186 (filed July 16, 2009) ("Verizon Wireless July 16 *Ex Parte*") at 2 n.7 (citing Letter from John T. Scott, III, VP and Deputy General Counsel, Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, *Ex Parte*, in WT Docket Nos. 08-166, 08-167 and ET Docket Nos. 02-340, 04-186 (filed June 8) ("Verizon Wireless June 8 *Ex Parte*") at 3-5); Letter from Harold Feld, Legal Director, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167, ET Docket No. 04-186 (filed June 18, 2009) ("Public Knowledge June 18 *Ex Parte* at 1. See also Google Apr. 24 *Ex Parte* at 2 (suggesting that it may be an option to establish "a 'license by rule' that gives wireless microphones no greater protection outside the 700 MHz bands than has been granted to [TV Band Devices], and granting the wireless microphones a permanent safe harbor in every market, at the first two available channels outside Channel 37").

According to PISC, allowing a significant number of new users to be licensed as Part 74 low power auxiliary stations and then included in the database of licensed station devices that must be protected against harmful interference would effectively eliminate the channels available for TV Band Devices in a number of major cities, crippling the viability of these devices and making national network offerings an impossibility.²²⁶ PISC also suggests that, to the extent a limited set of wireless microphone users can make a showing of actual harmful interference to wireless microphones from TV Band Devices and thus the need for additional licensed protection under Part 74, the Commission could consider such requests pursuant to waiver requests.²²⁷ Verizon Wireless proposes that the Commission permit currently unauthorized wireless microphone users to operate lawfully in the TV band spectrum “pursuant to either Section 307(e) authorization by rule or Part 15, with co-equal status to the TV Band Devices.”²²⁸ Public Knowledge proposes “[i]n addition to licensing by rule, . . . authorizing wireless microphones pursuant to Part 15. Entities qualifying for licenses under Part 74 would still receive them, and be entitled to protection as licensed users. Members of the public would be able to legally use wireless microphones (operating below Channel 52) as well, subject to the usual restrictions on the use of unlicensed devices.”²²⁹

79. A number of parties raise procedural arguments with respect to unauthorized wireless microphones. Dell and Microsoft argue that any matter related to wireless microphones that will affect white spaces technologies should be decided in the white spaces proceeding or, at a minimum, should be decided only once the open issues in that proceeding have been resolved.²³⁰ Dell and Microsoft also assert that under the Administrative Procedure Act and the Commission’s rules, “most or all of these matters must be subject to a separate public notice in any event.”²³¹ Shure argues that “[n]ew proposals to revise the regulation of wireless microphones in the core TV bands would be unexpected, and not ‘consistent with the issues and questions posed in the notice[s]’ in the underlying proceedings.”²³² Verizon Wireless, on the other hand, argues that the Commission has provided sufficient notice to adopt a Part 15 regime for currently-unauthorized wireless microphones.²³³ Verizon Wireless and Shure also suggest that the Commission at this stage of the proceeding could adopt measures allowing wireless microphones to transition out of the 700 MHz Band and then could consider additional rules for wireless

²²⁶ See PISC et al. Apr. 22 *Ex Parte* at 1.

²²⁷ *Id.*

²²⁸ Verizon Wireless July 16 *Ex Parte* at 2 n.7 (citing Verizon Wireless June 8 *Ex Parte* at 3-5).

²²⁹ Public Knowledge June 18 *Ex Parte* at 1; see also Letter from Michael Weinberg, Law Clerk, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167, ET Docket No. 04-186, MB Docket Nos. 08-82 and 97-80, and WC Docket No. 08-7 (filed Sept. 16, 2009) (“Public Knowledge Sept. 16 *Ex Parte*”) (suggesting that “one way to resolve the wireless microphone issue would be to reclassify devices under Part 15”).

²³⁰ Dell and Microsoft May 6 *Ex Parte* at 3; see also Google Apr. 24 *Ex Parte* at 2 (asserting that “any issues surrounding granting more expansive rights to wireless microphones in the TV White Spaces bands properly should be decided in [the white spaces proceeding]”).

²³¹ Dell and Microsoft May 6 *Ex Parte* at 3 n.8 (citing 5 U.S.C. § 553(b)(3) and 47 C.F.R. § 1.413(c)).

²³² Shure June 29 *Ex Parte* Comments at 8-9 (footnote omitted).

²³³ Verizon Wireless June 8 *Ex Parte* at 5 (footnote omitted) (asserting that “there can be no doubt that a Part 15 regime, with wireless microphone operations subject to the technical rules of Part 74 LPAS devices in the TV Bands, is a ‘logical outgrowth’ of the NPRM”) (footnote omitted); see also CTIA May 15 *Ex Parte* at 3 (the Commission “clearly has provided sufficient notice to transition licensed and unauthorized wireless microphone services out of the 700 MHz bands and into the TV bands”) (footnote omitted).

microphones in a subsequent step.²³⁴

80. In its Petition, PISC also requested that the Commission grant a “general amnesty” to all unauthorized users of wireless microphones “deceived by the illegal and deceptive marketing of manufacturers,” and permit such users to operate on a going forward basis until the Commission authorizes them under the proposed GWMS.²³⁵ PISC also requested that the Commission require those manufacturers that PISC alleges “engaged in illegal marketing” to migrate the unauthorized users of Part 74, Subpart H equipment to the new GWMS by replacing equipment, and begin an investigation against Shure, Inc., and the other manufacturers listed in its informal complaint for their marketing, selling, and advertising practices.²³⁶ In the *Notice*, the Commission noted that its Enforcement Bureau last year initiated an investigation relating to the marketing practices of various manufacturers of wireless microphones.²³⁷

81. Discussion. We conclude that it serves the public interest to waive two of our Part 15 rules, to permit unauthorized users of low power auxiliary stations, including wireless microphones, to operate on an unlicensed basis under Part 15 pursuant to certain specified technical requirements, in the 700 MHz Band until June 12, 2010 and in the core TV bands until the effective date of Commission action taken in response to the Further Notice.²³⁸ Accordingly, we waive Sections 15.201(b) and

²³⁴ See Verizon Wireless July 16 *Ex Parte* at 2-3 n.7, 4 (the Commission should allow currently unauthorized wireless microphone users to operate lawfully in the TV bands “pursuant to either Section 307(e) authorization by rule or Part 15, with co-equal status to the TV Band Devices,” and “could then engage in a follow-on proceeding to assess whether some subset (or all) of the currently unauthorized wireless microphone users should be entitled to interference protections from TV Band and other devices through Part 74 LPAS licensing or some other means”) (citing Verizon Wireless June 8 *Ex Parte* at 3-5); Verizon Wireless July 27 *Ex Parte* at 2 (the Commission should “initiate a follow-on proceeding to address interference protection rights, to be concluded well before TV Band devices are introduced into the marketplace”) (footnote omitted); Letter from Catherine Wang, Counsel to Shure, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167, and ET Docket No. 04-186 (filed May 20, 2009) (“Shure May 20 *Ex Parte*”) (meeting with Acting Chairman Copps’ staff) at 1 (the Commission “can issue an order appropriately addressing the principal issue in the proceeding -- that is, whether and on what terms and conditions secondary low power auxiliary service devices, including wireless microphone systems, should migrate out of the 700 MHz band -- without addressing other issues collateral to the proposed migration including whether and how to reclassify various uses of wireless microphones under the Commission’s Part 74 rules”); Shure July 27 *Ex Parte* at 1 (the Commission should identify the date by which wireless microphone operations must transition out of the 700 MHz Band but need not delay that step while it considers other issues, “including whether and how to reclassify various uses of wireless microphones under the Commission’s Part 74 rules”).

²³⁵ See PISC Petition at i-ii.

²³⁶ See *id.*; see also Public Knowledge et al. Apr. 15 *Ex Parte* at 1 (wireless microphone manufacturers should offer trade-in programs for unlicensed users who purchased these devices). Public Knowledge in a subsequent *ex parte* filing argues that the current refund programs offered by some manufacturers under which unauthorized users exchange equipment for a discount on new equipment “constitute an unjust enrichment to the manufacturers whose illegal marketing practices created this problem in the first place.” Public Knowledge June 18 *Ex Parte* at 1. Public Knowledge argues that the Commission should address this by requiring “a mandatory recall and replacement by manufacturers with equipment operating on permitted channels.” *Id.*

²³⁷ *Notice* at ¶ 22.

²³⁸ We anticipate that such unlicensed operations in the core TV bands pursuant to waiver will remain in place only for a short period of time, as we intend to act expeditiously on our proposal to promulgate final rules.

15.209(a)²³⁹ of our Part 15 technical rules. These waivers will permit entities that operate wireless microphones in the 700 MHz Band without the required license to continue those operations subject to the band clearing mechanisms that we adopt in this Report and Order,²⁴⁰ and permit them to relocate their operations to the core TV bands on the same Part 15 unlicensed basis. The waivers also will permit operation of wireless microphones outside of the 700 MHz Band without the required authorization. The operation of wireless microphones in the 700 MHz Band under these limited term waivers will be subject to the band clearing mechanisms we adopt in this Report and Order. Thus, all entities may continue operating wireless microphones in the 700 MHz Band until June 12, 2010, unless they must cease operations sooner under the early band clearing mechanisms discussed above. During the temporary waiver period, any entity that chooses to operate a wireless microphone under these waivers must comply with the waiver conditions, including compliance with specified technical requirements that are identical to those we are proposing in the Further Notice for the operation of wireless microphones under Part 15.²⁴¹

82. Under these waivers, wireless microphones may be operated as Part 15 devices without a license in the 700 MHz Band under the conditions adopted in this Report and Order, and they can also operate in the core TV bands. Operation under these waivers is subject to the following conditions. First, the wireless microphones must comply with specified technical requirements under Part 15, which are the same technical rules that we are proposing in the Further Notice for wireless microphone operations under Part 15 (as set forth in Appendix E, below). Second, the devices must be certificated under the rules applicable to certification under our Part 74, Subpart H rules. Third, the devices shall not cause harmful interference and must accept any interference received pursuant to Section 15.5 of our Rules.²⁴² Finally, users operating in the 700 MHz Band must comply with the conditions for continued operation in that band during the transition period, including the early clearing procedures discussed above.²⁴³ The waivers will be effective upon the release of the Report and Order.

83. Section 1.3 of the Commission's rules provides that "[a]ny provision of the rules may be waived by the Commission on its own motion or on petition if good cause therefor is shown" subject to the provisions of the APA and its own rules.²⁴⁴ Waiver is appropriate when "particular facts would make strict compliance inconsistent with the public interest."²⁴⁵ A waiver cannot undermine the purposes of the

²³⁹ 47 C.F.R. §§ 15.201(b), 15.209(a). Section 15.201 requires intentional radiators operating under Part 15 to be certificated for operation under this part. Section 15.209(a) prohibits operation of Part 15 devices in the TV bands and at field strengths greater than specified in the table unless specifically permitted elsewhere in Part 15.

²⁴⁰ See *supra* Section III.A. Under those procedures, entities currently operating Part 74 low power auxiliary devices, including wireless microphones, in the 700 MHz Band may continue to operate in the 700 MHz Band until June 12, 2010, subject to the conditions set forth in this Report and Order.

²⁴¹ See *infra* Appendix E. Cf. Amendment of Part 101 of the Commission's Rules to Accommodate 39 Megahertz Channels in the 6525-6875 MHz Band; Amendment of Part 101 of the Commission's Rules to Provide for Conditional Authorization on Additional Channels in the 21.8-22.0 GHz and 23.0-23.2 GHz Band; Fixed Wireless Communications Coalition Request for Waiver, *Notice of Proposed Rulemaking and Order* in WTB Docket No. 09-114 and RM-11417, at paras. 23-24 (released Jun. 29, 2009) (granting request for waiver of Section 101.31(b)(vii) to allow for conditional authority under conditions that were proposed as rule changes in the *NPRM* portion of the decision).

²⁴² 47 C.F.R. §§ 15.5(b) and 15.5(c). The operator of a wireless microphone shall be required to cease operation upon notification by a Commission representative that the device is causing harmful interference.

²⁴³ See *supra* Section III.A.

²⁴⁴ 47 C.F.R. § 1.3.

²⁴⁵ *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.²⁴⁶ As discussed below, we find that good cause exists to waive Sections 15.201(b) and 15.209(a)²⁴⁷ of our Part 15 technical rules in order to allow operation of wireless microphones in the 700 MHz Band and the core TV bands for a limited period.

84. We are allowing operation of wireless microphones under these waivers to use a power of up to 50 milliwatts.²⁴⁸ The waivers should allow wireless microphones to operate outside of the 700 MHz Band in a manner that is largely consistent with their current operations. While Part 74 rules permit wireless microphones to operate on VHF TV channels with a power level to the antenna of 50 milliwatts and on UHF channels with a power level of 250 milliwatts,²⁴⁹ two equipment manufacturers indicate that the actual power levels for most wireless microphones operating in the 700 MHz Band are in the 10-50 milliwatts range.²⁵⁰ We also note that a large majority of wireless microphones are certificated to operate with a power level of 50 milliwatts or less. These appear to be the most popular devices because the 50 milliwatts or less is sufficient for most uses and extends battery life. While some wireless microphones operate at power levels of 250 milliwatts, it appears most of these devices are used for professional applications requiring a longer operating range with a short duration of operation, such as electronic news gathering or movie production users that hold Part 74 authorizations. In this regard, we note that devices authorized under Part 74 as low power auxiliary stations are “intended to transmit over distances of approximately 100 meters”²⁵¹ and may operate with a power level of 250 milliwatts. We anticipate that wireless microphones operating up to 50 milliwatts under the terms of this waiver would transmit over a shorter distance.²⁵² Therefore, we believe that the operations that we are allowing under the waivers will effectively accommodate users that are currently unauthorized. We are not extending the waiver to permit these wireless microphone users to operate at power levels higher than 50 milliwatts because, unless operated on a licensed basis pursuant to Part 74 requirements, use of these devices generally poses a greater interference risk to TV band licensees.²⁵³

85. We recognize, however, that there may be instances where operation at a power level higher than 50 milliwatts may be needed and can be allowed without causing interference.²⁵⁴ We find that such instances should be evaluated based on their individual facts and circumstances to ensure that interference will not occur. We therefore are granting delegated authority to our Office of Engineering and Technology and Wireless Telecommunications Bureau to modify the limited waiver of the Part 15 rules on a case-by-case basis to permit entities to operate wireless microphones at power levels higher than 50 mW where it can be shown there is no significant risk of harmful interference to other users of the

²⁴⁶ *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

²⁴⁷ 47 C.F.R. §§ 15.201(b), 15.209(a).

²⁴⁸ See *infra* Appendix E.

²⁴⁹ See 47 C.F.R. §74.861(e)(1).

²⁵⁰ See Shure Reply Comments at 13; see also Nady Comments at 7-8 (commenting that in practice, wireless microphones’ actual output is generally only a maximum of 15 milliwatts).

²⁵¹ See 47 C.F.R. § 74.801 (definition of “low power auxiliary station”).

²⁵² Transmit distance, *i.e.*, service range, would be affected by a number of conditions, but we expect that the transmit distance would typically extend to about 50 meters.

²⁵³ Only Part 74 licensees are permitted to operate their devices at power levels higher than 50 milliwatts.

²⁵⁴ Letter from Catherine Wang, Counsel to Shure, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 08-166 and 08-167 (filed Jan. 14, 2010).

spectrum, particularly to TV broadcast service.

86. We find that good cause for a limited waiver exists in this particular case, given the totality of the circumstances including the short-term nature of these waivers and the need to facilitate clearing of the 700 MHz band for use by the public safety and commercial licensees.²⁵⁵ We also find that it serves the public interest to provide access to other spectrum for entities that are operating wireless microphones in the 700 MHz Band while this rulemaking is pending.²⁵⁶ Our primary goal in this proceeding is to clear all wireless microphones from the 700 MHz Band, thereby simplifying the process of making this spectrum fully available for public safety and commercial broadband licensees. In order to attain that goal, we intend to have any wireless microphone user, authorized or not, transition out of the 700 MHz band and onto other available frequencies no later than June 12, 2010. Granting these waivers will allow currently unauthorized users that vacate the 700 MHz Band to operate in the 700 MHz Band temporarily under the umbrella of unlicensed Part 15 operation. At the same time, the conditions we impose serve the public interest intent behind each of the two specific Part 15 rules being waived, which is to prevent interference to authorized radio services. The power limits, minimum co-channel TV broadcast station distance provisions, specific frequency operation, and out-of-band emissions limits²⁵⁷ established herein provide safeguards to ensure that the policy objectives served by Sections 15.201(b) and 15.209(a) are met. Finally, we note that any operation of wireless microphones pursuant to the waivers is subject to the Section 15.5 interference restrictions.²⁵⁸ Taken together, these safeguards ensure that any operation done pursuant to the waivers will not undermine the purposes of, and public interest protected by, Sections 15.201(b) and 15.209(a).

87. The record in this proceeding includes a number of comments that describe the need for and the significance of wireless microphones in providing quality audio technology for performances and programs in theaters, classrooms, lecture halls, houses of worship, stadiums, and other venues.²⁵⁹ We find that temporarily waiving these two rules in order to permit the continued operation of wireless microphones, including wireless microphones that are used for these purposes, pending our final

²⁵⁵ For the same reasons that we find good cause exists for granting this waiver, as discussed in this Report and Order, we have determined that there would be good cause under Section 553(b)(3)(B) of the APA, 5 U.S.C. § 553(b)(3)(B), for establishing interim rules that permit the same range of operations as the waiver.

²⁵⁶ See CTIA May 15 *Ex Parte* at 1 (suggesting that “unauthorized wireless microphone users be licensed by rule in the TV bands with co-equal status to approved TV band devices”); Verizon Wireless June 8 *Ex Parte* at 4-5 (noting use of Part 15).

²⁵⁷ See *infra* Appendix E (proposed rules 15.3 and 15.238).

²⁵⁸ 47 C.F.R. § 15.5.

²⁵⁹ For example, Nady comments that wireless microphones “are an essential part of audio recordings, houses of worship, political town-hall meetings, live music concerts, courthouses, television broadcasts, film productions, live theatrical performances, business presentations, teaching hospitals and sports events to name a few.” Nady Comments at 3. Shure comments that the activities at which wireless microphones are used “are socially, culturally, and economically important to the public interest in the United States.” Shure Comments at 3. The African Methodist Episcopal Church states that “[h]ouses of worship rely upon these microphones almost daily and the freedom of movement and crisp sound afforded by modern systems is absolutely essential for our sermons, lectures and musical celebrations.” AMEC June 10 *Ex Parte* at 2. CWMU states that “theatre organizations . . . regularly employ wireless microphones in their presentations to the public.” CWMU March 17 *Ex Parte* at 1. In addition, a number of parties have pointed out that wireless microphones provide significant safety benefits for performers and event staff. See, e.g., CWMU Feb. 13 *Ex Parte* at 2 n.1 (wireless microphones “creat[e] a far safer work environment for performers and presenters by providing the freedom to move about safely and quickly through stage environments and other settings”); Nady Comments at 3 (use of wireless microphones “has reduced the incidence of electric shock to performers and tripping over cords”).

decisions of the issues raised in the Further Notice will provide this Commission with the opportunity to develop a full and balanced record before it adopts final, comprehensive rules that address the operation of wireless microphones by those entities that lack the required license. In addition, we note that some entities will be acquiring new wireless microphone equipment to operate in bands outside of the 700 MHz Band to replace their existing equipment, while some equipment that operates in the 700 MHz Band may be capable of being modified to operate in the core TV band spectrum. The waivers permitting operations will allow at least some of these users to make informed decisions with respect to new equipment purchases, or where applicable the modification of existing equipment, until the issues raised in the Further Notice are resolved. We emphasize that there are a variety of unique facts surrounding grant of this waiver, and we do not anticipate that we will soon encounter such a convergence of factors as these to warrant the type of accommodation afforded here.

88. While we find good cause for granting the limited term waivers, as discussed above, we stress that these waivers are temporary and that the granting of these waivers will not prejudice the outcome of this proceeding or otherwise limit the Commission's choices therein. Under this approach, we will be able to compile a record and consider more fully the issues and proposals in response to the Further Notice concerning currently unauthorized users of wireless microphones, including whether to expand eligibility for licenses under Part 74.

89. In order to address the potential for interference from the operation of wireless microphones in the core TV Bands, we require that all wireless microphones operating under the waivers are subject to the same technical limitations that we are proposing in the Further Notice for the operation of "Wireless Audio Devices" under Part 15. These technical rules provide for distances from existing co-channel TV broadcast stations, specific frequency operation, power limits, and out-of-band emissions.²⁶⁰ In addition, the unlicensed operators of wireless microphones that operate under the waivers will be subject to the restrictions in Part 15 of the rules.²⁶¹ The immediate and potential future harm to current TV band licensees of continued widespread use of previously unauthorized wireless microphones appears to be negligible, in light of the conditions we are imposing on the waivers, including that the wireless microphones must comply with the specified technical requirements (consistent with those proposed for Part 15 wireless microphone operations in the core TV bands, as set forth in Appendix E) and that they must not cause harmful interference to licensed TV band users.²⁶² We note that licensees that operate low power auxiliary devices under Part 74 authorization will still receive interference protection with respect to wireless microphones that will be operating through these temporary waivers as unlicensed devices.

90. Given the actions we are taking today, we do not adopt PISC's remaining proposals, including that we provide a "general amnesty" to certain unauthorized wireless microphone users. We find that various steps that we are taking today appropriately address, on a going forward basis, the issues relating to the proliferation and use of wireless microphones that have not heretofore been authorized.²⁶³ Finally, we do not rule at this time on PISC's proposal to create a General Wireless Microphone Service

²⁶⁰ See *infra* Appendix F (proposed rules 15.3 and 15.238).

²⁶¹ See, e.g., 47 C.F.R. § 15.5(b) (providing that the operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator).

²⁶² TV band licensees include full service TV stations, Class A TV stations, low power TV stations, TV translator and booster stations, broadcast auxiliary stations and private land mobile and commercial mobile radio service stations.

²⁶³ We do not address at this time questions relating to the unauthorized use of wireless microphones prior to our actions today.

that would be licensed by rule pursuant to Section 307(e) of the Act.²⁶⁴ We instead seek to address its concerns in the order that considers the issues set forth in the Further Notice.

E. Disclosure Requirements and Consumer Outreach

91. Background. In its Petition, PISC asserted that wireless microphone manufacturers knowingly marketed and sold wireless microphones to unauthorized users.²⁶⁵ PISC stated that as a result of this conduct, unauthorized users unknowingly purchased and used wireless microphones in violation of the Commission's rules.²⁶⁶ The Commission sought comment on this allegation in the PISC Petition.²⁶⁷

92. The record includes a number of comments and *ex parte* filings about the scope of the Commission's existing labeling requirements for wireless microphones and other low power auxiliary stations, and whether the Commission should adopt additional labeling requirements. In response to PISC's arguments about deceptive marketing by manufacturers, Audio-Technica asserts that the Commission's rules do not require manufacturers to label their products in a way that informs purchasers of the Commission's license requirement.²⁶⁸ Dane Ericksen states that manufacturers are correct that, so long as a product has received equipment certification as a Part 74 device, "marketing and selling that device to ineligible and/or unlicensed parties is not illegal."²⁶⁹ Dane Ericksen asserts that one solution would be for the Commission to require a plainly visible warning label for non-Part 15 wireless microphones. The label would warn buyers that an FCC license is required before the microphone can legally be used and that there are eligibility requirements associated with such a license.²⁷⁰ As noted above, CTIA, APCO, NENA, and others jointly urge the Commission to adopt labeling requirements for 700 MHz wireless microphones bound for export so that consumers will understand that they cannot use these products in the United States.²⁷¹

93. Some manufacturers of wireless microphone equipment and Verizon Wireless also note that manufacturers have made voluntary efforts to inform consumers about the use of the 700 MHz Band. PAMA notes in an *ex parte* filing that customer education efforts have been made concerning operation in the 700 MHz Band.²⁷² PAMA states that "[m]any manufacturers have devoted significant time and effort to guide customers to equipment using alternative frequency ranges and have restricted selling or made 700 MHz equipment available only on a special order basis."²⁷³ In addition, we note that some manufacturers implemented rebate programs for the trade-in of 700 MHz Band wireless microphone

²⁶⁴ See PISC Petition at i-ii.

²⁶⁵ *Id.* at i, iv-vi, 5-15.

²⁶⁶ *Id.* at viii-ix, 4, 18-19. PISC also proposed that the Commission adopt rules relating to the operation of wireless microphones by users who are currently unauthorized in the core TV spectrum below Channel 52. *Id.* at 22, 27-33.

²⁶⁷ See Notice, 23 FCC Rcd at 13114-15 ¶¶ 20-22.

²⁶⁸ See Audio-Technica Comments at 17.

²⁶⁹ Dane Ericksen Reply Comments at 6.

²⁷⁰ *Id.*

²⁷¹ See APCO et al. Apr. 7 *Ex Parte* at 4-5; see also Verizon Wireless Mar. 18 *Ex Parte* at 1 (Commission should ban the domestic manufacture and sale of wireless microphones and other devices capable of operating in the 700 MHz Band "with appropriate labeling requirements for any devices manufactured for export").

²⁷² PAMA Jan. 5 *Ex Parte* at 2-3.

²⁷³ *Id.* at 3 n.5.

equipment.²⁷⁴ Verizon Wireless also states that wireless microphone manufacturers are engaged in educational efforts to alert their customers, or potential customers, of “the need to cease operations in the 700 MHz Band,” and asserts that these efforts, as well as education and rebate information, “could serve as an effective complement to the FCC’s consumer education program.”²⁷⁵

94. Verizon Wireless, CTIA, and other organizations urge the Commission to issue a consumer advisory to alert the public of the need to clear the 700 MHz Band as a part of the DTV transition.²⁷⁶ Verizon notes the importance of a consumer advisory “to alert all wireless microphone users, including those not authorized by the Commission, that as part of the DTV transition, the 700 MHz band must be cleared of TV stations *and* all other operations, including wireless microphone usage.”²⁷⁷ CTIA notes that the consumer advisory also could be used to disseminate information concerning steps consumers may take to address the use of low power auxiliary stations in bands other than the 700 MHz Band.²⁷⁸ CTIA and public safety organizations state that a consumer advisory can also be used to notify equipment manufacturers and other parties of any prohibition on the manufacture, sale, or marketing of wireless microphones for use in the 700 MHz Band in the United States.²⁷⁹

95. Discussion. Based on this record, we adopt certain measures, including point-of-sale disclosure requirements, to address concerns regarding a lack of consumer awareness of our rules, so that we can best ensure the operation of wireless microphones and other low power auxiliary stations in conformance with the relevant policies and rules. Specifically, we adopt a disclosure requirement for anyone selling, leasing, or offering for sale or lease wireless microphones or other low power auxiliary stations that operate in the core TV spectrum. Under this requirement, manufacturers, dealers, distributors, and other entities that sell or lease these devices will have to display a Consumer Disclosure, at the point of sale or lease, informing consumers of the conditions that apply to the operation of wireless microphones in the core TV bands during the temporary waiver period. This disclosure requirement will apply until the effective date of the final rules addressing the issues raised in the Further Notice. In addition, we will implement a comprehensive consumer outreach program that will include a Consumer Fact Sheet and other consumer publications, as well as other steps on the part of the Commission, to complement the expected outreach and education efforts on the part of low power auxiliary station manufacturers.

96. Disclosure Requirement. We require anyone selling, leasing, or offering for sale or lease wireless microphones or other low power auxiliary stations that operate in the core TV bands to provide

²⁷⁴ See, e.g., 700 MHz Wireless Trade-In Program, Trade-in & Trade-up Your Wireless Offer, Valid: December 1, 2008 through December 31, 2009, Rebate Offer Form, Shure, at http://www.shure.com/stellent/groups/public/@gms_gmi_web_us_pro/documents/web_resource/us_pro_700mhz_rebate_r2.pdf; 700 MHz Band Rebate Program for Wireless Systems, Sennheiser Electronic Corporation, at http://www.sennheiserusa.com/press_archive_12162008 (noting that rebate claims must have been postmarked no later than December 15, 2009, and received by December 31, 2009 by Sennheiser). See also <http://www.audio-technica.com/cms/news/9e4d4409a39b3a99/index.html> (Audio-Technica’s program requiring that discontinued products must have been turned in by September 30, 2009, for rebates that are good through December 31, 2009).

²⁷⁵ Verizon Wireless Apr. 23 *Ex Parte* at 2; see also Shure May 20 *Ex Parte* at 2 (discussing providing an update on its efforts to educate wireless microphone users and dealers about the Commission’s proposed rule changes).

²⁷⁶ Verizon Wireless Apr. 23 *Ex Parte*; Verizon Wireless July 27 *Ex Parte* at 3-4; APCO et al. Apr. 7 *Ex Parte*; CTIA May 15 *Ex Parte*; CTIA Feb. 19 *Ex Parte*.

²⁷⁷ Verizon Wireless Apr. 23 *Ex Parte* at 2.

²⁷⁸ CTIA Feb. 19 *Ex Parte*.

²⁷⁹ APCO et al. Apr. 7 *Ex Parte*.

certain written disclosures to consumers. These entities must display the Consumer Disclosure, the text of which will be developed by Commission staff, at the point of sale or lease,²⁸⁰ in a clear, conspicuous, and readily legible manner. In addition, the Consumer Disclosure must be displayed on the website of the manufacturer (even in the event the manufacturer does not sell wireless microphones directly to the public) and of dealers, distributors, retailers, and anyone else selling or leasing the devices.

97. We take this step in recognition that a significant number of currently unauthorized users of wireless microphones and other low power auxiliary stations in the 700 MHz Band may have to purchase new equipment to transition into the core TV bands pursuant to our temporary waivers. Our intention in requiring display of the Consumer Disclosure is to make certain that these users understand their rights and obligations regarding the use of low power auxiliary stations in the core TV bands. For example, wireless microphone purchasers will need to know that they must not operate the device at a power level in excess of 50 milliwatts or in situations where it may cause harmful interference, and that they must accept any interference received from other devices. This Consumer Disclosure should help assure that purchasers of low power auxiliary stations operate their devices in a manner in compliance with our rules and policies and thereby do not cause interference to authorized radio services in the core TV bands.

98. We find that the only practicable way to ensure that users receive this information is to require clear disclosure at the point of sale or lease, and on manufacturer and distributor websites. A number of parties in comments and *ex parte* filings have urged the Commission to adopt labeling requirements so that users of wireless microphones and other low power auxiliary stations will be aware of eligibility requirements and other restrictions for the use of those devices.²⁸¹ We agree with these parties that disclosure requirements are necessary to ensure compliance with our rules and to help consumers operate the equipment in a manner that does not cause interference.²⁸²

99. We delegate authority to the Wireless Telecommunications Bureau and the Consumer and Governmental Affairs Bureau to prepare the specific language that must be used in the Consumer Disclosure and publish it in the Federal Register.

100. There is more than one way in which the point-of-sale Consumer Disclosure may be provided to potential purchasers or lessees of wireless microphones, but, as discussed above, each of them must satisfy all the requirements set out above, including that the disclosure be provided in writing at the point of sale in a clear, conspicuous, and readily legible manner. One way to fulfill this disclosure requirement would be to display the Consumer Disclosure in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill the disclosure requirement would be to display the text immediately adjacent to each low power auxiliary station offered for sale or lease and clearly associated with the model to which it pertains. For wireless microphones offered online or via direct mail or catalog, the disclosure must be prominently displayed in close proximity to the images and descriptions of each wireless microphone.

²⁸⁰ By “point of sale or lease” we mean the place where wireless microphones and other low power auxiliary stations are displayed or offered for consumers to purchase or lease.

²⁸¹ See Dane Erickson Reply Comments at 6 (suggesting a label on non-Part 15 wireless microphones to warn consumers of license eligibility requirements); APCO et al. Apr. 7 *Ex Parte* at 4-5 (urging the Commission to adopt a labeling requirement for 700 MHz wireless microphones manufactured for export); Verizon Wireless Mar. 18 *Ex Parte* at 1 (Commission should adopt “appropriate labeling requirements” for 700 MHz devices manufactured for export).

²⁸² As noted above, we are adopting rules requiring the labeling of low power auxiliary stations, including wireless microphones, that are capable of operating in the 700 MHz Band and are destined for non-U.S. markets. See *supra* Section III.B.

This requirement will remain in effect until the effective date of final rules adopted in response to the Further Notice.

101. We will require manufacturers, dealers, distributors, and other entities that sell or lease wireless microphone devices for operation in the core TV bands to comply with the disclosure requirements no later than February 28, 2010, and we encourage these entities to provide consumers with the required information earlier.²⁸³ In this Report and Order, we are taking steps to ensure that low power auxiliary stations, including wireless microphones, are cleared from the 700 MHz Band no later than June 12, 2010, so that public safety and commercial licensees will be able to operate without interference in the band. As noted above, many currently unauthorized users of wireless microphones and other low power auxiliary stations in the 700 MHz Band will have to purchase or lease new equipment to transition into the core TV bands, and the consumer disclosure will provide information on the operation of those devices in the core TV bands. We find that delaying the effective date of the disclosure rules until some later time would be contrary to the public interest.

102. *Consumer Outreach.* In addition, we find that several means should be employed to provide as much notice as possible to users of the need to clear the 700 MHz Band of low power auxiliary stations, including wireless microphones.

103. We will release consumer publications, including a Consumer Fact Sheet and answers to Frequently Asked Questions (FAQs), that inform the public of our decisions in this Report and Order. Specifically, the Consumer Fact Sheet will serve the public interest by explaining the need to clear the 700 MHz Band in order that the spectrum can be used for the provision of new public safety and commercial services. The Consumer Fact Sheet will explain that entities currently operating low power auxiliary stations, including wireless microphones, may continue to operate in the 700 MHz Band until June 12, 2010, subject to the conditions set forth in this Report and Order, including the early clearing mechanisms. The Consumer Fact Sheet will provide information concerning the early clearing mechanisms for the 700 MHz Band that we are adopting in this Report and Order. It will also inform the public how to use the Commission's website to view public notices that identify the markets in which 700 MHz licensees are initiating operations. In addition, the Consumer Fact Sheet will provide information concerning our decision to prohibit the manufacture, import, sale, lease, offer for sale or lease, or shipment of low power auxiliary stations for operation in the 700 MHz Band in the United States. We also will provide on our website answers to FAQs relating to this proceeding.

104. Commission staff also will identify and contact organizations that represent entities that are known to be users of low power auxiliary stations, including wireless microphones in the 700 MHz Band, including groups that represent theaters, houses of worship, and sporting venues. We will inform these entities of our decisions in this Report and Order, particularly the need to clear the 700 MHz Band in order that the spectrum can be used for the provision of new public safety and commercial services.

105. Further, we expect all manufacturers of wireless microphones and other low power auxiliary stations to make significant efforts to ensure that all users of such equipment capable of operating in the 700 MHz Band are fully informed of the decisions in this Report and Order. Specifically, we expect these manufacturers, at a minimum, to ensure that these users are informed of the need to clear the 700 MHz Band in order that the spectrum can be used for the provision of new public safety and commercial services. Manufacturers also should inform users of wireless microphones and other low power auxiliary stations that they may continue to operate in the 700 MHz Band until June 12, 2010, but

²⁸³ This disclosure requirement requires approval from the Office of Management and Budget (OMB) as a new information collection under the Paperwork Reduction Act (PRA). We anticipate approval of the requirement shortly following publication of a summary of this Report and Order in the Federal Register, sufficiently in advance of February 28, 2010.

only subject to the conditions set forth in this Report and Order, including the early clearing mechanisms. Further, we expect all manufacturers to contact dealers, distributors, and anyone else who has purchased wireless microphones and other low power auxiliary stations, and inform them of our decisions in this Report and Order to help clear the 700 MHz Band. Manufacturers should also provide information on the decisions in this Report and Order to any users that have filed warranty registrations for 700 MHz Band equipment with the manufacturer. We also expect manufacturers to post this information on their websites and include it in all of their sales literature.

106. In addition, we urge all manufacturers to extend their rebate offers and trade-in programs for any 700 MHz Band low power auxiliary stations, including wireless microphones, and widely publicize these programs to ensure that all users of wireless microphones are fully informed. To the extent manufacturers do not offer a rebate or trade-in program for 700 MHz Band low power auxiliary stations, we strongly encourage them to create or re-establish such programs. In contacting dealers and distributors, we expect manufacturers to inform these entities that they should: (1) inform all customers who have purchased low power auxiliary stations, including wireless microphones, that are capable of operating in the 700 MHz Band of our decision to clear the 700 MHz Band of such devices; (2) post such information on their websites; (3) include this information in all other sales literature; and (4) provide information in sales literature, including on their websites, on the availability of any manufacturer rebate offerings and trade-in programs related to low power auxiliary stations operating in the 700 MHz Band; and that they must comply with the disclosure requirements that we are adopting in this Report and Order.

IV. FURTHER NOTICE OF PROPOSED RULEMAKING

107. In this Further Notice, we address the use of wireless low power auxiliary stations, including wireless microphones that operate on the TV bands by entities that are not eligible for a Part 74 low power auxiliary station license. In light of the important functions that these types of devices provide to the public, we propose that we should revise our rules to permit the use of wireless microphones and other low power audio devices in the core TV bands on an unlicensed basis under Part 15 of the rules by entities that are not currently eligible for licensing under Part 74, Subpart H of the rules. We also propose to adopt technical rules for such operation under Part 15. In addition, we seek comment on whether to provide for some expansion of the eligibility under Part 74, Subpart H of the rules to create additional categories of licensed use of wireless microphones or other low power auxiliary stations. We also seek comment on the adoption in our rules marketing and labeling requirements, including possible requirements pertaining to Part 74 low power auxiliary stations that could help ensure that ineligible entities do not obtain such devices. Consistent with our broader efforts to manage spectrum as effectively and efficiently as possible, we also seek comment on possible long-term reform, based in part on technological innovation such as digital technology, that would enable wireless microphones to operate more efficiently and with improved immunity to harmful interference, thereby increasing the availability of spectrum for wireless microphone and other uses. Finally, we seek comment on whether there are any changes we could make to other rule parts, including Part 90, that would address the needs of wireless microphone users.

108. As discussed in the Report and Order, there are several reasons why this is an appropriate time for the Commission to examine, in a comprehensive fashion, the rules for wireless microphones in the TV bands. In addition to those discussed above, the Commission adopted rules in November 2008 in the *TV White Spaces Second Report and Order* to permit new types of devices to operate on an unlicensed basis in vacant “white spaces” spectrum in the TV bands. These “TV Band Devices” are regulated under Part 15 of the Commission’s rules.²⁸⁴ The rules require TV Band Devices to protect licensed operations in the TV bands, including wireless microphones and other Part 74 low power auxiliary stations. A

²⁸⁴ See 47 C.F.R. §§ 15.701-15.717.

number of petitions for reconsideration of the *TV White Spaces Second Report and Order* raise issues related to the protections afforded wireless microphones in that order. Although the issues in these petitions for reconsideration and the proposals in this Further Notice are related, we do not address herein the specific issues raised in the petitions for reconsideration of the rules regarding wireless microphone operations and TV Band Devices. Rather, the proposals and other issues in this Further Notice are intended to balance the needs of various wireless microphone users, in particular, with other important uses of the spectrum, including new unlicensed devices that can be used for broadband and other applications in portions of the TV bands.

A. Operation in the TV Bands

1. Unlicensed Operation under Part 15

109. Background. As various parties have noted, and as discussed in the Report and Order, many entities have been operating Part 74 wireless microphones in the TV bands on an unauthorized basis. As discussed above, several commenters have proposed either that currently unauthorized wireless microphone users operate in the TV bands on a “co-equal” basis with unlicensed TV Band Devices or on an unlicensed basis under Part 15.²⁸⁵

110. Discussion. We seek comment on allowing wireless microphones to operate on an unlicensed basis in the TV bands under Part 15 of the rules generally, the technical proposals discussed herein, and the other specific proposals that commenters and other interested parties have made in the record with respect to permitting wireless microphones to operate under Part 15 of the Commission’s rules.²⁸⁶

111. Many users may need only a single or a small number of wireless microphones operating simultaneously, and only one or two vacant TV channels may be required for such users. Even with TV Band Devices operating in the TV bands, the rules that the Commission adopted in the “white spaces” proceeding are designed to ensure that there will be one or more TV channels available for wireless microphones at most locations. Specifically, only fixed TV Band Devices may operate on channels below 21, and fixed TV Band Devices are not permitted to operate adjacent to occupied TV channels, whereas wireless microphones may do so. Thus, at any given location some TV channels cannot be used by TV Band Devices and should be available for wireless microphones. In addition, in the 13 metropolitan areas where the Private Land Mobile and Commercial Mobile Radio Services are permitted to operate on channels 14-20, TV Band Devices are not permitted to operate on the first vacant TV channel above and below channel 37, thus leaving them available for wireless microphones. We seek comment on these assumptions and whether allowing wireless microphones to operate on a non-licensed basis in the TV bands under Part 15 of the rules may meet the needs of the vast majority of wireless microphone users.

112. In addition, we propose technical rules for the operation of wireless microphones as unlicensed devices under Part 15 of the rules. We propose to adopt the term “Wireless Audio Devices” for such devices and to define them as intentional radiators used to transmit voice, music or other audio material over short distances. Under this proposal, transmissions would be allowed to use either analog or digital modulation techniques. To ensure that such devices are used only for their intended purpose of transmitting audio material, we propose to prohibit data transmissions except for short data strings such as recognition codes necessary to ensure the functionality of a system. We also propose to prohibit

²⁸⁵ See PISC Petition at 32; PISC et al. Apr. 22 *Ex Parte* at 1; Verizon Wireless July 16 *Ex Parte* at 2 n.7 (citing Verizon Wireless June 8 *Ex Parte* at 3-5); Public Knowledge June 18 *Ex Parte* at 1.

²⁸⁶ See, e.g., Motorola Aug. 6 *Ex Parte*; Verizon Wireless July 16 *Ex Parte*; Verizon July 27 *Ex Parte*; Verizon Wireless June 8 *Ex Parte*; Public Knowledge June 18 *Ex Parte*.

transmission of audio material to the public switched telephone network and private and commercial wireless systems and networks to prevent Wireless Audio Devices from being used for applications such as wireless headsets for use with cellular phones, cordless phones and similar devices. Devices that transmit data or operate as telephones can operate under the Part 15 TV band device rules or other rule parts, *e.g.*, Section 15.247 or 15.249. We seek comment on our definition and the proposals. In particular we seek comment on whether our proposed definition of Wireless Audio Devices is overly broad and could enable a proliferation of devices in the TV bands that already have suitable provisions to operate in other bands. If so, we seek comment on whether we should specifically limit the applicability of the rules to wireless microphones and how precisely they should be defined. Additionally, we seek comment on whether any other specifications or restrictions are needed, such as limiting devices to one-way operation.

113. We are not proposing to allow operation under the Part 15 rules of unlicensed video devices similar in fashion to those used by motion picture and television producers as an aid in composing camera shots under the Part 74 Wireless Assist Video Devices rules. No party has indicated that there is a need to permit the operation of similar devices by parties other than those eligible for licensing under Part 74. Further, Part 15 already allows devices to operate with sufficient bandwidth to transmit video in a number of bands, albeit at a lower power level or with different technical requirements from Part 74, including the 902-928 MHz and 2400-2483.5 MHz bands.²⁸⁷ In addition, Part 15 allows devices to operate in the TV bands under the TV Band Device rules.²⁸⁸ We invite comment.

114. The technical rules we are proposing for unlicensed Wireless Audio Devices are in many respects similar to the technical rules applicable to wireless microphones licensed under Part 74 as low power auxiliary stations. We are making this proposal because these Part 74 rules have been used in the development of a wide variety of wireless microphones that consumers have found useful and that apparently are capable of operating in the TV bands without interference. Further, by modeling the proposed Part 15 rules after the technical features of the Part 74 rules, we expect that most manufacturers will be able to obtain approval for equipment with few or no modifications from currently available designs. We are proposing to place the technical requirements for Wireless Audio Devices in a new section in Part 15, Subpart C, which contains the rules for intentional radiators (*see* Appendix E).

115. We propose to allow Wireless Audio Devices to operate in the core TV bands spectrum on channels 2-51 (excluding channel 37, which is allocated for non-broadcast purposes nationwide). We propose to prohibit operation of Wireless Audio Devices on channel 17 in Hawaii, which is allocated for non-broadcast purposes. To prevent interference to co-channel TV stations, we propose to prohibit operation of Wireless Audio Devices co-channel to operating TV stations at the following distances, which are the same separation distances required for Part 74 wireless microphones.²⁸⁹

- Channels 2-4 (54-72 MHz) and 5-6 (76-88 MHz)
 - Zone I: 105 km (65 miles)
 - Zones II and III: 129 km (80 miles)
- Channels 7-13 (174-216 MHz)
 - Zone I: 97 km (60 miles)
 - Zones II and III: 129 km (80 miles)

²⁸⁷ See 47 C.F.R. §§ 15.247 and 15.249. Section 15.247 allows operation with a power level up to 1 watt, but the device must employ frequency hopping or digitally modulated transmissions. Section 15.249 permits any type of transmissions, but the operating power under this section is significantly lower than what Part 74 permits for Wireless Assist Video Devices.

²⁸⁸ See 47 C.F.R. Part 15, subpart H.

²⁸⁹ See *id.*

- Channels 14-36 (470-608 MHz) and 38-51 (614-698 MHz)
 - All zones: 113 km (70 miles)

116. We propose to permit Wireless Audio Devices to operate with a power level to the antenna of up to 50 milliwatts in both the VHF and UHF TV bands. We note that the Part 74 rules permit wireless microphones to operate on VHF TV channels with a power level to the antenna of 50 milliwatts and on UHF channels with a power level of 250 milliwatts.²⁹⁰ However, most wireless microphones currently operate at a lower power level to increase battery life and because higher power is not necessary for most applications. For example, Shure has indicated that the majority of wireless microphones operate with a power level between 10 and 50 milliwatts.²⁹¹ Therefore, our proposed power level may be appropriate for most users, particularly because we expect that parties using Part 15 wireless microphones will typically be entities operating in smaller venues that do not require the longer range operation that higher power allows. In this regard, we note that devices authorized under Part 74 as low power auxiliary stations are “intended to transmit over distances of approximately 100 meters”²⁹² and may operate with a power level of 250 milliwatts. We anticipate that wireless microphones operating up to 50 milliwatts would transmit over a shorter distance. We seek comment on this proposal. We also seek comment on whether the equipment certification rules should prevent component parts such as amplifiers from being attached after market to a microphone and whether the rules should specify a maximum field strength or other emission limits for equipment.

117. We propose to require Wireless Audio Devices to comply with the same channelization, frequency stability, and bandwidth requirements as permitted under the technical rules for Part 74 wireless microphones.²⁹³ Specifically, we propose to require that operation be offset from the upper or lower channel edge by 25 kHz or an integral multiple thereof and that the operating frequency tolerance be 0.005%. We also propose to specify that one or more adjacent 25 kHz segments within a TV channel may be combined to form an operating channel with a maximum bandwidth not to exceed 200 kHz. Consistent with the measurement requirements for other Part 15 transmitters, we further propose to require that the frequency tolerance be maintained over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, for a variation in the supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C, and that battery operated equipment be tested using a new battery.²⁹⁴ We expect that the proposed 25 kHz offset requirement would prevent wireless microphones from operating at the edge of a TV channel where they could interfere with TV stations on adjacent channels, and the proposed frequency tolerance requirement would ensure that devices do not drift from the designated frequencies. The limit on the bandwidth that a wireless microphone may occupy will leave room for multiple microphones within a channel. We seek comment on these proposals.

118. We propose to require that out-of-band emissions from Wireless Audio Devices comply with the same emission limits that apply to Part 74 wireless microphones.²⁹⁵ Specifically, we propose to require that the mean power of out-of-band emissions comply with the following:

²⁹⁰ See *id.* § 74.861(e)(1).

²⁹¹ See Shure Incorporated Comments to the *Notice of Proposed Rule Making* in ET Docket Nos. 04-186 and 02-380 (filed Nov. 30, 2004) at 8.

²⁹² Transmit distance, *i.e.*, service range, would be affected by a number of conditions, but we expect that the transmit distance would typically extend to about 50 meters.

²⁹³ See 47 C.F.R. § 74.802(c).

²⁹⁴ See *id.* §§ 15.225(e), 15.229(d) and 15.231(d).

²⁹⁵ See *id.* § 74.861(e)(6).

- On any frequency removed from the operating frequency by more than 50% and up to 100% of the authorized bandwidth: at least 25 dB;
- On any frequency removed from the operating frequency by more than 100% and up to 250% of the authorized bandwidth: at least 35 dB;
- On any frequency removed from the operating frequency by more than 250% of the authorized bandwidth: $43 + 10 \log P$ dB where P is the mean output power in watts.

We seek comment on whether these out-of-band emission levels are appropriate. We also seek comment on whether we should apply the Section 15.209 limits outside the TV channel where a wireless microphone operates. Furthermore, we seek comment on whether these out-of-band emissions are adequate to protect both land mobile systems operating in the TV bands and new services operating on or within TV channel 52, 698 – 704 MHz, and on other frequencies in the 700 MHz Band.

119. We seek comment on whether we should prohibit Wireless Audio Devices from operating on co-channel basis with land mobile stations.²⁹⁶ We also seek comment on whether we should adopt any other technical rules to prevent interference to land mobile systems operating in the TV bands. In addition, we seek comment on whether we need to adopt isolation distances from the land mobile operations, similar to those proposed to protect TV stations. In addition, we seek comment on whether we need to adopt similar rules to protect new services operating on or within Channel 52 (698-704 MHz), or on other frequencies in the 700 MHz Band.

120. We seek comment on our assessment that the rules adopted for TV Band Devices are not likely to be suitable for Wireless Audio Devices. For example, TV Band Devices are required to have geolocation capability and the ability to connect to the Internet to register with a central data base. If wireless microphone “features” were to be added to these devices, it might result in a substantial increase in costs for these devices. Certain features currently required for TV Band Devices, such as periodic sensing of the airwaves for other devices, may also be incompatible with the operation of a real-time always-on device such as a wireless microphone. In addition, we observe that there are similarities between the rules we are proposing for wireless audio devices and the rules that were adopted for TV Band Devices. For example, the Commission allowed TV band personal/portable devices operating on an adjacent TV channel to use a power of up to 40 mW, whereas we are proposing to allow wireless audio devices to use a power of up to 50 mW. These similarities mean that, from a power and spectrum sharing standpoint, one type of device should not have a significant advantage over the other.²⁹⁷ We invite comment on this assessment.

121. We propose to require devices that have already been certificated under the procedures established for Part 74 devices and that will be marketed for operation under Part 15 to obtain a new equipment authorization to ensure compliance with whatever rules we may adopt in this proceeding. The nature of the filings, such as whether new test data may need to be submitted, will depend on whether the technical rules we adopt are identical to or different from Part 74.

122. If the Commission were to adopt technical rules for operation under Part 15 that are different from the existing Part 74 rules, we propose to allow a transition period where the existing equipment could be marketed and operated under Part 15 before obtaining a new equipment authorization. Typically design and manufacturing cycles take 1 to 2 years. We invite comment on whether there should be a transition period and, if so, what should be the length of the transition period?

²⁹⁶ See *id.* § 74.709.

²⁹⁷ In the White Spaces proceeding, some parties requested that the Commission reconsider certain protection requirements for wireless microphones, including the requirement for TV Band Devices to sense for wireless microphones. These issues will be addressed in the White Spaces proceeding and will not be addressed herein.

We also seek comment on whether we should apply the transition to the date after which a product is marketed, a date after which the product is manufactured or imported, or some other measure.

123. Finally, we seek comment on whether any other technical requirements need to be specified for Wireless Audio Devices. For example, the Part 74 rules for low power auxiliary stations have additional requirements for wireless microphones including a maximum frequency deviation specification when frequency modulation is used.²⁹⁸ Additionally, Part 74 states that a transmitter may be either frequency synthesized or crystal controlled.²⁹⁹ We seek comment on whether these or any other requirements should be incorporated into the Part 15 rules for Wireless Audio Devices.

2. Licensed Operation under Part 74

124. Background. Operation of Part 74 low power auxiliary stations is permitted by licensed entities on the TV bands.³⁰⁰ Only entities that fall within the following categories are eligible for a Part 74 license: (1) licensees of AM, FM, TV, or International broadcast stations or low power TV stations; (2) broadcast network entities; (3) certain cable television system operators; (4) motion picture and television program producers as defined in the rules; and (5) certain entities with specified interests in Broadband Radio Service (BRS) and Educational Broadcast Service (EBS) licenses, *i.e.*, BRS licensees, or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service licensee or permittee.³⁰¹ When two or more low power auxiliary service licensees need to operate in the same area, they must endeavor to select frequencies or schedule operation in such manner as to avoid mutual interference.³⁰²

125. Use of the TV bands for wireless low power auxiliary stations, including wireless microphones, by AM, FM, and TV broadcasters has long been recognized by the Commission as necessary and beneficial to broadcast productions. The Commission has occasionally expanded the list of entities eligible for a Part 74 license over time, most notably in 1977 when it modified its rules to include motion picture and television producers and certain cable television operators.³⁰³ The Commission reasoned that these entities had requirements similar to those of broadcast licensees, and it stated that it would consider on a case-by-case basis license applications by “other groups such as live entertainment program producers, etc.” whose needs are similar to those of broadcast licensees.³⁰⁴ Consistent with the decision to limit license eligibility to certain types of users, the Part 74 rules for low power auxiliary stations limit the scope of service and permissible transmissions to broadcasting, filming, and recording activity.³⁰⁵

²⁹⁸ See *id.* § 74.861(e)(3).

²⁹⁹ See *id.* § 74.861(e)(2).

³⁰⁰ See *id.* § 74.802. Operation is not permitted on channel 17 in Hawaii because that channel is assigned for non-broadcast purposes there.

³⁰¹ See *id.* § 74.832(a)(1)-(6).

³⁰² See 47 C.F.R. § 74.803(a).

³⁰³ Amendment of Part 2 and Subpart D, Part 74 of the Commission’s Rules and Regulations with Respect to the Use of Wireless Microphones, *Report, Memorandum Opinion and Order*, 63 FCC 2d 535 (1977).

³⁰⁴ *Id.* at ¶ 31.

³⁰⁵ 47 C.F.R. § 74.831 (“The license for a low power auxiliary station authorizes the transmission of cues and orders to production personnel and participants in broadcast programs and motion pictures and to the preparation therefore, the transmission of program material by means of a wireless microphone worn by a performer and other participants (continued....)”).

126. As discussed above, several commenters have argued for the need to expand eligibility for Part 74 low power auxiliary station licenses in the TV bands for certain operators, which would include producers of live performing arts (e.g., theater, opera, symphonies), cultural presentations (including religious presentations), professional or amateur sporting events, conventions or trade shows, owners or operators of venues where such events take place, or governmental or educational entities.³⁰⁶ Other commenters, however, strongly oppose expansion of eligibility under Part 74, contending that the interference protections afforded licensees of wireless microphones, including the protections associated with the database, would undermine the promise of unlicensed TV Band Devices in the TV bands.³⁰⁷

127. Discussion. Certain users of wireless microphones that are not currently eligible for a low power auxiliary station license under Part 74 may have needs that are similar to existing eligible licensees and may have a need for the interference protection that a license affords. In this section, we seek comment on whether to revise our rules and provide for a limited expansion of eligibility that would permit such users to hold a Part 74 license in the TV bands. We also seek comment on whether license eligibility should be expanded to permit the use of low power auxiliary stations inside nuclear power plants. In examining whether to expand licensee eligibility, we must balance the needs of the different users of the TV band spectrum.

128. We seek comment on the extent to which Part 74 eligibility for licensing should be expanded, if we decide to do so. For example, should such eligibility be limited to include large theaters, entertainment complexes, sporting arenas, and religious facilities, because these large venues may require multiple vacant TV channels to accommodate all of the wireless microphones needed and they may need the additional protections afforded Part 74, Subpart H licensees in the TV bands?³⁰⁸ We seek comment on whether to revise our rules in this manner, and how best to specify which particular entities, and under what circumstances, they should be eligible for a license. As discussed above, a number of commenters and other parties have urged the Commission to expand eligibility for Part 74 licenses to varying degrees, and we seek comment as well on those expanded eligibility proposals.³⁰⁹

129. Some wireless microphone operators, such as certain producers of live professional arts, entertainment, and sporting events, may require multiple vacant TV channels to accommodate all of the wireless microphones needed.³¹⁰ Many of these events are broadcast or recorded, and thus producers of

(Continued from previous page) _____
in a program or motion picture during rehearsal and during the actual broadcast, filming or recording, or the transmission of comments, interviews and reports form the scene of a remote broadcast.”).

³⁰⁶ See, e.g., CWMU Feb. 13 *Ex Parte*; CWMU Apr. 16 *Ex Parte*; see generally Sec. III.D., *supra*.

³⁰⁷ See Dell and Microsoft May 6 *Ex Parte* at 1-3.

³⁰⁸ This is in contrast to the current rules, under which applicants may specify a metropolitan area in which the broadcast licensee serves or the usual area within which motion picture and television producers are operating. See 47 C.F.R. § 74.832(f).

³⁰⁹ See, e.g., MSTV/NAB Comments at 9; Letter from Andrea Snyder, Chair, Performing Arts Alliance, to Marlene H. Dortch, Secretary, FCC, *Ex Parte* in WT Docket Nos. 88-166, 88-167 (filed Apr. 8, 2009) (“Performing Arts Alliance Apr. 8 *Ex Parte*”) at 1-2; CWMU Feb. 13 *Ex Parte* at 3; AMEC June 10 *Ex Parte*; Actors’ Equity Association June 24 *Ex Parte*; MSTV Sept. 25 *Ex Parte* at 2; Motorola Aug. 6 *Ex Parte*, Attachment.

³¹⁰ For example, see Letter from Charlotte St. Martin, Executive Director, The Broadway League, to Chairman Kevin J. Martin, *Ex Parte* in ET Docket No. 04-186 (filed June 10, 2008); Letter from Sports Technology Alliance to Chairman Kevin J. Martin, *Ex Parte* in ET Docket Nos. 04-186, 02-380 (filed Aug. 21, 2008). The Sports Technology Alliance consists of Major League Baseball, the National Basketball Association, the National Collegiate Athletic Association, the National Football League, the National Hockey League, the PGA Tour and ESPN.

these events may already be eligible for a Part 74 license. On the other hand, some of these events that rely on numerous wireless microphones are live programs that will not be broadcast or recorded, and thus producers of these live events are not currently eligible for a Part 74 license, but yet may have the same wireless microphone requirements. Live programs of professional arts, entertainment, and sporting events that require multiple vacant TV channels to accommodate numerous wireless microphones may be sufficiently analogous to the uses now permitted by Part 74 as to be a reasonable basis for expanding licensee eligibility. Moreover, such operations may warrant the interference protection that can only be assured under a license. For example, our provisions for TV Band Devices provide for licensed low power auxiliary stations to be registered in a data base to assure protection against harmful interference. We recognize, however, that some of these live arts, entertainment, and sporting events may only require the use of a few wireless microphones and thus have greater flexibility to select TV band channels that are free of interference. Events that use only a few wireless microphones may not require the assurance of interference protection afforded by a license.

130. Certain other wireless microphone uses, such as those at services conducted by religious organizations, may also warrant provisions for licensed operation under Part 74 because they bear important similarities to the uses now permitted by Part 74. For example, some events at venues used for religious purposes also may require multiple vacant TV channels to accommodate all of the wireless microphones needed. While it is not clear from the record currently before us, in some cases religious organizations may already be eligible for a Part 74 license if they broadcast or record events at religious venues and they hold a recognized broadcast license or qualify as television or motion picture producers under the rules. In other cases, as with theatrical productions and sporting events, some events at religious facilities are live programs that will not be broadcast or recorded, and thus producers of these live events are not currently eligible for a Part 74 license, but yet have the same wireless microphone requirements. In contrast, it may be that at many religious facilities services are conducted using only a few wireless microphones and may have greater flexibility to select TV channels that are free of interference. These religious facilities may not require the assurance of interference protection afforded by a license.

131. We seek comment on whether to authorize licensed wireless microphone use by the entities discussed above, at large theaters, entertainment complexes, sporting arenas, and religious facilities, and whether there is a need by these entities for the additional protections afforded Part 74, Subpart H licensees in the TV bands. In this regard, we seek comment on how the Commission could more completely and precisely define the types of additional entities eligible for licensing so that we can easily implement the licensing criteria that we adopt for entities that merit licensee status while also ensuring that such status is limited to only eligible entities. For example, how should we define professional arts, entertainment, or sporting events or eligible religious facilities? Should we, for instance, base the eligibility on the size of the venue, such as specifying a minimum seating capacity? Should we base eligibility on a minimum number of wireless microphones that the entities use on a regular basis, and if so, what should that number be? Should we establish criteria for determining which specific users are eligible for a license and simply leave it, for example, to the religious organization or producer of live events to determine whether they need the interference protection of a license? What other characteristics of the entities that potentially could be licensed if eligibility is expanded should be specified in the rules? Should licensing be limited to the owner or operator of a theater or stadium or religious facility or should we allow a performing group or sports team or religious organization to hold the license for a specific venue at a specific time? Should it make a difference if the use is permanently housed at the venue (e.g., the home team at a specific stadium)? If we were to expand license eligibility, we also seek comment on what modifications we should make to the rules regarding scope of service and permissible transmissions.

132. We also invite comment on the impact of expanding Part 74 licensing to include additional entities on the availability of spectrum for use by TV Band Devices. Would limiting these new

licensees' use to certain venues—such as large theaters, entertainment complexes, sporting arenas, and religious facilities—protect microphone use only at locations that can easily be identified and included in the TV Band Device database and only for particular dates/times and frequencies coinciding with actual use? We ask that commenters address the practicability of producers of live arts, sporting events, and religious organizations providing up-to-date information on venues and times of operation to the TV Band Device database on an ongoing basis, and how best to ensure that they do so. We are particularly concerned that licensees may find it impractical to maintain the database with up-to-date information and instead may call for interference protection on all channels on a continuous basis, which could completely block access by TV Band Devices and therefore may lead to less efficient use of the spectrum. We invite comment on this analysis.

133. We also seek comment on whether we should modify the eligibility requirements for a Part 74 license to include other entities that use wireless microphones, such as those operating at convention or trade shows, certain other cultural events, or governmental or educational institutions. Do these or other additional entities need interference protection from TV Band Devices that is afforded to Part 74, Subpart H licensees? Or would, instead, the operation of wireless microphones by these and other users effectively be accommodated were they to operate on an unlicensed basis under Part 15, similar to the TV Band Devices? To the extent that commenters propose that these or other entities be eligible for Part 74 licensing, we seek comment on which particular entities merit protection. We also seek comment on how, precisely, the Commission should define any additional class of entity that should be eligible to hold a license and the protections afforded by the database. As discussed above, we seek comment on whether wireless microphone use would be protected at locations that can easily be identified and included in the TV Band Device database and only for particular dates/times and frequencies coinciding with actual use. Commenters should address the practicality of whether any additional entities would provide up-to-date information on venues and times of operation to the TV Band Device database on an ongoing basis, such that they would only have database protection at times of use and not otherwise block access to the spectrum for use by TV Band Devices, which could lead to inefficient use of the TV bands spectrum.

134. We seek to balance the needs of potential new classes of wireless microphone licensees with other users of the TV bands. We note that, while some commenters have advocated for changes in the eligibility requirements to allow particular groups of users to operate wireless microphones in the TV bands, no commenter has advocated allowing anyone who desires to operate a wireless microphone to apply for or obtain a Part 74 license and associated terms and conditions.³¹¹ If we were to expand Part 74, Subpart H to include all of the existing users and applications, the eligibility would be expanded so extensively that virtually anyone would be eligible for a license. We are concerned that such an approach may not be viable. Because Part 74 licensees have protection against interference from unlicensed Part 15 devices, such a broad expansion of eligibility could seriously reduce the amount of spectrum available for unlicensed TV Band Devices. This could be particularly true in heavily populated places, where there might be significant demand for operation of TV Band Devices as well. This expansion would significantly increase the number of Part 74 licensees submitting information for inclusion in the TV Band Device database, thus increasing the cost and complexity of operating the database. We invite comment on this analysis and the impact of expanding eligibility on the viability of TV Band Devices.

135. We note that any expansion of the Part 74 license eligibility will have an impact on the primary users of the TV bands (*e.g.*, TV broadcasting stations) as well as on unlicensed wireless microphones and TV Band Devices that will be introduced in the future. Is it practical for newly eligible users to comply with all of the Part 74 requirements that apply to existing eligibles, such as the requirement to coordinate frequencies? How might an expansion of eligibility affect the viability of

³¹¹ See, *e.g.*, MSTV/NAB Comments at 2; White Spaces Coalition Comments at 6; Shure Comments at 23.

frequency coordination for all of the existing eligible users? Should we place any additional requirements or limitations, for example, on the amount of spectrum that can be used in a given location by the newly eligible users? Consistent with the current Section 74.832(d) rule, which limits operation of low power auxiliary stations by non-broadcast entities to frequencies in the TV bands, we seek comment on whether any expanded Part 74 eligibility cover operations in only the TV bands and not the non-TV band frequencies listed in Section 74.802(a).³¹²

136. We underscore that irrespective of whether we revise the eligibility requirements under Part 74, entities that use wireless microphones would be permitted to operate wireless microphones under our proposed Part 15 rules, and also under Part 90 which is discussed below. In short, even if we do not significantly expand eligibility under Part 74, we note that users would still be able to operate wireless microphones under our proposed Part 15 rules or under the Part 90 rules.

137. *License Terms.* We seek comment on the length of initial and renewal license terms for authorizations issued to entities that obtain licenses under any expanded eligibility categories that we adopt under Part 74 of the Commission's rules. Under Section 74.15 of the rules, low power auxiliary station licensees have license terms that either run concurrently with the license of the associated broadcast station, or for a period running concurrently with the normal licensing period for broadcast stations located in the same area of operation.³¹³ Broadcast or low power TV station licensees are issued low power auxiliary station licenses with a term that runs concurrently with the license term of the associated broadcast station. Broadcast network entities, cable television system operators, motion picture producers, and television program producers have license terms that run concurrently with the normal licensing period for broadcast stations located in the same area of operation.³¹⁴ This results in an initial term that is no more than eight years but may be substantially less than eight years, because low power auxiliary station licenses may be obtained in the middle of the license terms of broadcast stations located in the same area of operation.

138. In this Further Notice, we are seeking comment on a limited expansion of the eligibility provisions for Part 74, Subpart H licenses. In the event that there is an expansion in eligibility, we seek comment on whether the license terms for any new classes of eligible users of low power auxiliary stations should be the same as the license terms that currently apply to Part 74, Subpart H licensees, as discussed above. We also seek comment on whether some other license term should apply to these new eligible users in the event that we revise the eligibility categories. We note that if we were to apply the existing rules governing license terms for low power auxiliary stations, their license terms would run concurrently with the normal licensing period for their local broadcast stations. In some cases, this would result in a license term that would be substantially less than the local broadcaster's term of eight years, because some low power auxiliary station licensees may obtain their licenses in the middle of their local broadcaster's license term. We invite comment on whether some other license term should apply to parties that would be eligible under revised rules. For example, should licenses obtained by a newly eligible person or organization be issued for a term not to exceed ten years from the date of initial

³¹² See 47 C.F.R. § 74.802(a). In addition to the TV bands, this section specifies the frequency bands 26.100-26.480 MHz, 161.625-161.775 MHz (except in Puerto Rico or the Virgin Islands), 450.000-451.000 MHz, 455.000-456.000 MHz, and 944.000-952.000 MHz.

³¹³ See 47 C.F.R. § 74.15(b).

³¹⁴ Section 307(c)(1) of the Communications Act provides that licenses granted for operating broadcast stations "shall be for a term not to exceed 8 years." Under Part 73, initial licenses for broadcast stations were ordinarily issued for a period running until a specified date which may differ based on the state or territory in which the station is located. See 47 C.F.R. § 73.1020(a). Licenses for broadcast stations will ordinarily be renewed for eight year periods, unless the Commission determines that a lesser term should apply.

issuance or renewal or should some other period be adopted and, if so, what should be the length of the license term? We note that the Commission's rules generally provide for a license term of ten years for wireless licenses.³¹⁵

139. *Nuclear Energy Institute and Utilities Telecom Council Petition for Waiver.* We note that the Nuclear Energy Institute and Utilities Telecom Council (NEI/UTC) has recently petitioned the Commission for a waiver of the "allocation and licensing provisions" of the Part 2 and 90 rules to permit "Power Licensees" as defined in Section 90.7 of the Commission's rules to obtain licenses under Part 90 for the use of certain equipment certificated for use under Subpart H of Part 74 of the rules, inside nuclear power plants.³¹⁶ We seek comment on whether it would serve the public interest to extend the license eligibility under Subpart H of Part 74 of the rules to permit the use of low power auxiliary stations inside nuclear power plants. How should we define eligibility for such licenses? Are there any specific concerns associated with permitting operations under Subpart H of Part 74 inside commercial nuclear power plants or any special conditions that should apply to any license for such use? To the extent we may decide to expand license eligibility to include users in commercial nuclear power plants, we seek comment on the spectrum bands that should be made available for this category of users. We also seek comment on whether any other modification to the Part 74 rules would be necessary to accommodate such use inside commercial nuclear power plants.³¹⁷

3. Marketing and Labeling Issues for Part 74 Low Power Auxiliary Stations

140. Background. The Commission's rules require that Part 74 low power auxiliary stations and Part 15 intentional radiators be authorized under the certification procedure and labeled with an FCC identification number before they can be legally marketed within the United States.³¹⁸ Part 15 intentional radiators must also be labeled with a statement indicating that they may not cause harmful interference and must accept any interference received.³¹⁹ In addition, the user manual for a Part 15 intentional radiator must contain a statement advising the user that unauthorized modifications could void the user's authority to operate the device.³²⁰ The Commission's rules, however, do not require any additional labeling or any user manual information for Part 74 low power auxiliary stations and have no additional marketing requirements specific to these devices.³²¹

141. Discussion. We seek comment on issues related to the marketing of Part 74 low power

³¹⁵ See e.g., 47 C.F.R. §§ 24.15, 27.13.

³¹⁶ See Wireless Telecommunications Bureau Seeks Comment on Request by Nuclear Energy Institute and Utilities Telecom Council for Waiver to Permit the Use of Part 74 Two-Way Wireless Headsets and Intercom Devices Inside Nuclear Power Plants, WT Docket No. 09-176, *Public Notice*, 24 FCC Rcd 12387 (2009); Petition for Waiver (Expedited Action Requested), Nuclear Energy Institute and Utilities Telecom Council (filed Sept. 23, 2009) (NEI/UTC Petition).

³¹⁷ We note that NEI/UTC's waiver sought authority to operate in frequency bands 174-216 MHz, 470-608 MHz, and 614-806 MHz. In the Report and Order, however, we are revising Section 74.802(a) of the rules to provide that frequency band 614-698 MHz, and not 614-806 MHz, will be available for operations under Part 74, Subpart H of the rules. See *infra* Appendix B.

³¹⁸ See 47 C.F.R. §§ 74.851, 15.201(b), 2.925 and 2.803.

³¹⁹ *Id.* § 15.19(a)(3).

³²⁰ See *id.* § 15.21.

³²¹ In the *Report and Order*, we are adopting marketing and labeling requirements designed to prevent the continued sale and distribution of low power auxiliary devices, including wireless microphones, that operate in the 700 MHz Band. See *supra* Report and Order, Section III.B.

auxiliary stations that could help ensure that entities that are not eligible to operate these devices do not purchase them. We expect that some devices will be certificated to operate under only Part 74 of the rules, either because the output power level exceeds the Part 15 limits or simply because the manufacturer chose not to obtain a Part 15 certification. In seeking comment, we recognize that, under our proposed dual regulatory approach for operating wireless microphones in the TV bands, it is possible that some devices could meet the technical requirements in both Parts 15 and 74 of the rules and be certificated to operate under both of those parts. Such devices could be operated by any party without a license, and by eligible parties that have obtained a Part 74 license.

142. We seek comment on whether a marketing restriction should be imposed on manufacturers with respect to equipment that is certificated for use by Part 74 licensees. For example, we seek comment on whether we should adopt a rule requiring that the marketing of equipment certificated under Part 74, Subpart H of our rules be directed solely to parties eligible to operate the equipment. We also seek comment on whether, as a part of such a rule, that we provide that marketing of such equipment in any other manner may be considered grounds for revocation of the grant of certification issued for the equipment.³²² In addition, we seek comment on whether some other restriction, or additional restrictions, should be adopted, including record keeping requirements for manufacturers to track to whom their products are marketed, or to ensure that these devices are marketed in a manner that is consistent with the restrictions on their use.

143. We seek further comment on whether any rules are necessary to ensure that purchasers of low power auxiliary stations that are certificated under only Part 74 of the rules are made aware of the Part 74 licensing requirements. For example, should manufacturers be required to provide a label visible at the time of purchase advising of the requirement to obtain a license? Should there be a label on the device itself indicating that a license is required? Should the instruction manual contain advisory information about the licensing requirements? What labeling or advisory information should be required?

144. Similarly, we seek comment on any responsibility that manufacturers, retailers, and distributors should have to notify customers about the licensing requirements or steps they could take ensure that low power auxiliary stations are not marketed to ineligible users. Should there be some form of responsibility or accountability placed upon one or more of these entities at the point of sale and, if so, what should it be? We seek comment, for example, on whether we should prohibit manufacturers, retailers and distributors from selling or distributing low power auxiliary stations, including wireless microphones unless such sale is to a party that has committed in writing that the party is a bona fide reseller or a party eligible to be a low power auxiliary station licensee pursuant to Part 74 of the Commission's rules. We also seek comment on whether manufacturers, importers, and retailers should be required to retain records of such written commitments for at least two years from the date of sale of the device. We also seek comment on whether manufacturers, retailers, or distributors could require a facility identification number associated with a Commission license, or some other form of identification which shows that the purchaser is a licensee. Another alternative would be for the manufacturer, retailer, or distributor to cross-check a purchaser against information, perhaps in a database provided by the Commission, to determine whether a purchaser is an eligible user. We seek comment on whether any of these alternatives should be adopted in order to provide a sufficient level of responsibility or accountability at the point of sale, or whether some variation or some other method should be adopted instead.

4. Possible Longer-term Solutions

145. Background. As the Commission seeks to address the operation of wireless microphones

³²² See 47 C.F.R. §§ 15.507, 2.909 (rule concerning marketing of ultra-wideband (UWB) equipment; rule defining "responsible party" with respect to UWB rule).

in the core TV bands, we face tradeoffs and difficult choices concerning the competing uses of different devices that consumers will employ in this spectrum. As indicated above, the issues raised include which entities are eligible to operate wireless microphones, how to balance the spectrum needs of wireless microphone users with other spectrum users of the TV bands, and what interference protection rights, if any, different users of the TV bands should have.

146. Discussion. We invite comment on additional changes we should consider that could help ensure that a variety of wireless microphone uses can best be accommodated with other uses in the bands over the longer term, and that spectrum is used efficiently and effectively by wireless microphones. Efficient wireless microphone operations should increase spectrum availability for other uses, including the continued development of wireless broadband. In this Further Notice we propose to allow wireless microphones to operate on an unlicensed basis in the TV bands under Part 15 of the rules. Under this proposal, wireless microphones would share spectrum with TV band devices, and we seek comment on the extent to which wireless microphones can operate more efficiently in order to make spectrum available for other uses.

147. We note that the majority of wireless microphones currently in use are frequency modulated analog devices that operate with a bandwidth of up to 200 kHz. For various reasons, such as the need to avoid intermodulation interference among the devices, the maximum number of wireless microphones that operate simultaneously in a 6 megahertz TV channel may be as few as six or eight. In other words, only 1.2 – 1.6 megahertz of the 6 megahertz TV channel may only be used while the remainder is effectively left fallow. In locations where many wireless microphones are being used simultaneously, this can result in inefficient use of valuable spectrum. We seek comment on this use of spectrum by wireless microphones, and on what steps the Commission can take to ensure that wireless microphones are using spectrum more efficiently.

148. We note that most other radio communications services have shifted from analog to digital technology to improve spectrum efficiency and resistance to interference. We seek comment on the state of technological developments that could similarly enable wireless microphones to operate more efficiently and/or improve their immunity to harmful interference, which could make more spectrum available for other users. What steps could the Commission take that would encourage the use of new digital technology or other equipment that would allow more microphones to be used in a single channel? We also seek comment on whether there are devices currently available that would provide for such operations, on the length of time it may take to transition to such technology, and on what incentives the Commission could adopt to facilitate this transition.

149. Finally, we seek comment on any other steps that the Commission should take in the long term to encourage technological improvements with the goal of ensuring that the core TV spectrum, which is shared by many users, is more efficiently used and thus more available to a range of users for new and innovative products and services.³²³ Are there approaches to spectrum management, such as authorizing a band manager, that would achieve the efficient use of spectrum by these devices?³²⁴

B. Licensed Operation Under Part 90

³²³ See *National Broadband Plan NOI*; *NBP Public Notice #26*.

³²⁴ We note that in the United Kingdom, the Office of Communications (OfCom), which is in the process of transitioning wireless microphones out of the 800 MHz Band, decided to award most of the spectrum for wireless microphones to a single licensee, who will act as a band manager. The band manager will allow wireless microphone users to access the spectrum on a market-based approach, so long as the band manager meets reasonable demand from such users on fair, reasonable, and non-discriminatory terms. See <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf>; <http://www.ofcom.org.uk/consult/condocs/bandmanager09/bandmanager09.pdf>.

150. Background. Entities holding an Industrial/Business Pool license may operate a Part 90 wireless microphone. The Part 90 rules permit wireless microphones to be operated on the following eight frequencies: 169.445 MHz, 170.245 MHz, 171.045 MHz, 171.845 MHz, 169.505 MHz, 170.305 MHz, 171.105 MHz and 171.905 MHz.³²⁵ Operation on these frequencies is permitted at a power level of 50 milliwatts, with an emission bandwidth not to exceed 54 kilohertz. The entities eligible for such licenses include users not authorized to obtain a Part 74 license, including commercial entities in general; educational, philanthropic or ecclesiastical institutions; clergy and hospitals, clinics or medical associations. While the eligibility for licensing is broader under Part 90 than it is for Part 74, it appears that relatively few parties operate wireless microphones under the Part 90 rules. Wireless microphone licensees are not protected from interference from other licensed operations in the band.³²⁶

151. Discussion. We seek comment on steps the Commission should take to revise the Part 90 wireless microphone rules to make them more useful to wireless microphone users. In particular, we seek comment on why relatively few entities operate under the current Part 90 rules. For example, are too few frequencies available under Part 90? Does the narrower bandwidth permitted under Part 90 (54 kHz) as compared to Part 74 (200 kHz) affect the audio quality of Part 90 wireless microphones? Does the Part 90 eligibility or licensing requirements discourage use of Part 90 wireless microphones by some parties? Are Part 90 wireless microphones readily available to entities that wish to purchase them? What rule Parts other than Part 90 and Part 74 should we consider for licensing wireless microphones?

V. PROCEDURAL MATTERS

A. Final Regulatory Flexibility Analysis

152. As required by the Regulatory Flexibility Act of 1980 (“RFA”),³²⁷ the Commission has prepared a Final Regulatory Flexibility Analysis (“FRFA”) relating to this Report and Order. The FRFA is set forth in Appendix C. Although Section 213 of the Consolidated Appropriations Act 2000 provides that the RFA shall not apply to the rules and competitive bidding procedures for frequencies in the 746-806 MHz Band,³²⁸ we nevertheless believe that it would serve the public interest to analyze the possible significant economic impact of the policy and rule changes in this band on small entities. Accordingly, the FRFA in Appendix C of this Report and Order includes an analysis of this impact in connection with all spectrum that falls within the scope of the Report and Order, including spectrum in the 746-806 MHz Band.

B. Final Paperwork Reduction Analysis

153. The Report and Order contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, pursuant to the Small Business Paperwork Relief

³²⁵ See 47 C.F.R. § 90.265(b).

³²⁶ *Id.* § 90.265(b)(4).

³²⁷ See 5 U.S.C. § 604. The RFA, *see* 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (“SBREFA”), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996). The SBREFA was enacted as Title II of the Contract With America Advancement Act of 1996 (“CWAAA”).

³²⁸ In particular, this exemption extends to the requirements imposed by Chapter 6 of Title 5, United States Code, Section 3 of the Small Business Act (15 U.S.C. 632) and Section 3507 and 3512 of Title 44, United States Code. Consolidated Appropriations Act 2000, Pub. L. No. 106-113, 113 Stat. 2502, Appendix E, Sec. 213(a)(4)(A)-(B); *see* 145 Cong. Rec. H12493-94 (Nov. 17, 1999); 47 U.S.C.A. 337 note at Sec. 213(a)(4)(A)-(B).

Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we seek specific comment on how we might “further reduce the information collection burden for small business concerns with fewer than 25 employees.”

154. We find that there is good cause to seek emergency OMB approval in order that the new information collections adopted in this Report and Order may take effect as soon as possible. The procedures under which public safety and commercial licensees may provide notice of their intention to initiate wireless operations constitute a new information collection under the PRA. The labeling requirements for 700 MHz Band equipment destined for non-U.S. markets also constitute a new information collection under the PRA. In addition, the consumer disclosure requirements for anyone selling, leasing, or offering for sale or lease low power auxiliary stations that operate in the core TV bands constitute a new information collection under the PRA. We are submitting a request to OMB for approval of these rules under the emergency clearance provisions of the PRA. Accordingly, the information collections adopted in this Report and Order will become effective as follows. The information collections associated with the procedures for early clearing of the 700 MHz Band will become effective upon publication of a summary of this Report and Order in the Federal Register or upon OMB approval, whichever is later. The labeling requirements for 700 MHz Band equipment destined for export will become effective 90 days after release of this Report and Order (*i.e.*, April 15, 2010), subject to OMB approval, and the consumer disclosure requirements will become effective on February 28, 2010, subject to OMB approval.

C. Initial Regulatory Flexibility Analysis

155. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 603, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules proposed in this document. The IRFA is set forth in Appendix F. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments filed in response to this Further Notice of Proposed Rule Making as set forth in Section V.F.2. below and have a separate and distinct heading designating them as responses to the IRFA.

D. Initial Paperwork Reduction Act Analysis

156. The Further Notice does not contain proposed information collection(s) subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain any new or modified information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

E. Congressional Review Act

157. The Commission will include a copy of this Report and Order and Further Notice of Proposed Rulemaking in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

F. Other Procedural Matters

1. *Ex Parte* Presentations

158. The rulemaking shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.³²⁹ Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations

³²⁹ 47 C.F.R. §§ 1.200 *et. seq.*

and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented generally is required.³³⁰ Other requirements pertaining to oral and written presentations are set forth in Section 1.1206(b) of the Commission's rules.³³¹

2. Comment Filing Procedures

159. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/> or the Federal eRulemaking Portal: <http://www.regulations.gov>.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- Effective December 28, 2009, all hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

160. People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

161. For further information regarding the Further Notice of Proposed Rule Making, contact Hugh L. Van Tuyl, Office of Engineering and Technology, (202) 418-7506, e-mail Hugh.VanTuyl@fcc.gov or Paul D'Ari, Wireless Telecommunications Bureau, (202) 418-1550, e-mail Paul.Dari@fcc.gov.

VI. ORDERING CLAUSES

162. Accordingly, IT IS ORDERED, pursuant to Sections 1, 2, 4(i), 4(j), 301, 302, 303, 304, 307, 308, 309, 316, 332, 336, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§

³³⁰ See 47 C.F.R. § 1.1206(b)(2).

³³¹ 47 C.F.R. § 1.1206(b).

151, 152, 154(i), 154(j), 301, 302a, 303, 304, 307, 308, 309, 316, 332, 336, and 337, that this REPORT AND ORDER in WT Docket No. 08-166 and WT Docket No. 08-167 IS ADOPTED, that Parts 2, 15, and 74 of the Commission's rules, 47 C.F.R. Parts 2, 15, and 74 ARE AMENDED as set forth in Appendix B, and that the requirements of this REPORT AND ORDER and the amended rules SHALL BECOME EFFECTIVE upon the publication of a summary of the REPORT AND ORDER in the Federal Register, except as follows with respect to the information collections: § 74.802(e) in Appendix B shall become effective upon publication of a summary of the REPORT AND ORDER in the Federal Register; § 15.216 in Appendix B shall become effective on February 28, 2010; § 74.851(h) in Appendix B shall become effective 90 days after release of this REPORT AND ORDER (*i.e.*, April 15, 2010), and these information collections are subject to OMB approval.³³² With respect to information collections subject to OMB approval, the Commission will issue a public notice announcing the date upon which these provisions shall become effective following receipt of such approval.

163. IT IS FURTHER ORDERED that, pursuant to authority in Section 1.3 of the Commission's rules, 47 C.F.R. § 1.3, and Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(e), and 303(r), Sections 15.201(b) and 15.209(a) of the Commission's rules, 47 C.F.R. §§ 15.201(b), 15.209(a), ARE WAIVED, consistent with the terms of this Report and Order. This action is effective upon release of this Report and Order.

164. IT IS FURTHER ORDERED that, pursuant to Section 5(c) of the Communications Act of 1934, as amended, 47 U.S.C. § 155(c), the Wireless Telecommunications Bureau, Public Safety and Homeland Security Bureau, and Consumer and Governmental Affairs Bureau ARE GRANTED DELEGATED AUTHORITY to implement the policies set forth in this REPORT AND ORDER and the rules, as revised, set forth in Appendix B hereto.

165. IT IS FURTHER ORDERED that, pursuant to Section 5(c) of the Communications Act of 1934, as amended, 47 U.S.C. § 155(c), the Wireless Telecommunications Bureau and Consumer and Governmental Affairs Bureau ARE GRANTED DELEGATED AUTHORITY to prepare the specific language that must be used in the Consumer Disclosure, as set forth in this REPORT AND ORDER and the rules in Appendix B, and publish it in the Federal Register.

166. IT IS FURTHER ORDERED that, pursuant to Section 5(c) of the Communications Act of 1934, as amended, 47 U.S.C. § 155(c), the Office of Engineering and Technology and the Wireless Telecommunications Bureau ARE GRANTED DELEGATED AUTHORITY to address requests to modify the limited waiver of Sections 15.201(b) and 15.209(a) of the Commission's rules, 47 C.F.R. §§ 15.201(b), 15.209(a), as set forth in this REPORT AND ORDER, on a case-by-case basis to permit entities that are operating without a license authorization to operate low power auxiliary stations at power levels higher than 50 milliwatts.

167. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this REPORT AND ORDER, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

168. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this REPORT AND ORDER and FURTHER NOTICE OF PROPOSED RULEMAKING in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

³³² *See* 5 U.S.C. § 553(d)(3) (“[t]he required publication or service of a substantive rule shall be made not less than 30 days before its effective date, except . . . as otherwise provided by the agency for good cause found and published with the rule”); *see also* 47 C.F.R. §§ 1.103(a), 1.427(b).

169. IT IS FURTHER ORDERED pursuant to Sections 4(i), 302, 303(e), 303(f), 303(r) and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 302, 303(e), 303(f), 303(r) and 307 that this FURTHER NOTICE OF PROPOSED RULEMAKING in WT Docket No. 08-166, WT Docket No. 08-167 and ET Docket No. 10-24 IS ADOPTED.

170. IT IS FURTHER ORDERED that pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on the FURTHER NOTICE OF PROPOSED RULEMAKING on or before 30 days after publication in the Federal Register and reply comments on or before 51 days after publication in the Federal Register.

171. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this FURTHER NOTICE OF PROPOSED RULEMAKING, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A**Comments and Reply Comments****Comments:**

Association of Public-Safety Communications Officials-International, Inc. (“APCO”)
Association for Maximum Service Television, Inc. and the National Association of Broadcasters (“MSTV/NAB”)
Audio-Technica U.S., Inc. (“Audio-Technica”)
Association of Performing Arts Presenters, Dance/USA, League of American Orchestras, OPERA America, Theatre Communications Group, Chorus America, and National Alliance for Musical Theatre (“Performing Arts Alliance”)*
Emergency Telephone Systems Board of St. Clair County, Illinois (“St. Clair”)
MetroPCS Communications, Inc. (“MetroPCS”)
Motorola, Inc. (“Motorola”)
Nady Systems, Inc. (“Nady”)
National Public Safety Telecommunications Council (“NPSTC”)
New ICO Satellite Services G.P. (“ICO”)
Sennheiser Electronic Corporation (“Sennheiser”)
Shure Incorporated (“Shure”)
Society of Broadcast Engineers, Incorporated (“SBE”)
State of California, Department of General Services, Telecommunications Division (“State of California”)
Thomas C. Smith (“Thomas Smith”)
V-COMM, L.L.C. (“V-COMM”)
Verizon Wireless (“Verizon Wireless”)
White Spaces Coalition (“White Spaces Coalition”)
Wireless Communications Association International, Inc. (“WCA”)

Reply Comments:

MSTV/NAB
AT&T Inc. (“AT&T”)
Audio-Technica
CTIA – The Wireless Association (“CTIA”)
Dane E. Ericksen, P.E., CSRTE, CBNT, Broadcast Engineer (“Dane Ericksen”)
Fox Television Stations, Inc. and Fox Television Stations of Philadelphia, Inc. (“Fox Television Stations”)
MetroPCS
Public Interest Spectrum Coalition (“PISC”)
Sennheiser
Shure
White Spaces Coalition

* Comments filed in WT Docket No. 08-167 only.

APPENDIX B**Final Rules**

Parts 2, 15, and 74 of Title 47 of the Code of Federal Regulations are amended as follows:

1. The authority citation for Part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Section 2.106, Table of Frequency Allocations, is amended by revising footnotes NG115 and NG159 to read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

* * * * *

NG115 In the bands 54–72 MHz, 76–88 MHz, 174–216 MHz, 470–608 MHz, and 614–698 MHz, wireless microphones and wireless assist video devices may be authorized on a non-interference basis, subject to the terms and conditions set forth in 47 CFR part 74, subpart H.

* * * * *

NG159 Any full-power television licensee that holds a television broadcast license to operate between 698 and 806 megahertz (TV channels 52–69) shall be entitled to protection from harmful interference through June 12, 2009, and may not operate at that frequency after June 12, 2009. Auxiliary broadcast stations other than low power auxiliary stations (i.e., low-power TV stations, translator stations, booster stations, and TV auxiliary (backup) facilities) may continue to operate indefinitely in the band 698–806 MHz on a secondary basis to all other stations operating in that band.

* * * * *

3. The authority citation for Part 15 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, 304, 307, 336, and 544a.

4. Part 15 is amended by adding a new Section 15.216 to read as follows:

§ 15.216 Disclosure Requirements for wireless microphones and other low power auxiliary stations capable of operating in the core TV bands.

(a) Any person who manufactures, sells, leases, or offers for sale or lease, low power auxiliary stations capable of operating in the core TV bands (channels 2-51, excluding channel 37) is subject to the following disclosure requirements:

(1) Such persons must display the consumer disclosure text, as specified by the Wireless Telecommunications Bureau and the Consumer and Governmental Affairs Bureau, at the point of sale or lease of each such low power auxiliary station. The text must be displayed in a clear, conspicuous, and readily legible manner. One way to fulfill the requirement in this section is to display the consumer disclosure text in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill this requirement is to display the text immediately adjacent to each low power auxiliary station offered for sale or lease and clearly associated with the model to which it pertains.

(2) If such persons offer such low power auxiliary stations via direct mail, catalog, or electronic means, they shall prominently display the consumer disclosure text in close proximity to the images and descriptions of each such low power auxiliary station. The text should be in a size large enough to be clear, conspicuous, and readily legible, consistent with the dimensions of the advertisement or description.

(3) If such persons have websites pertaining to these low power auxiliary stations, the consumer disclosure text must be displayed there in a clear, conspicuous, and readily legible manner (even in the event such persons do not sell low power auxiliary stations directly to the public).

* * * * *

5. The authority citation for Part 74 is revised to read as follows:
AUTHORITY: 47 U.S.C. 154, 302a, 303, 307, 336(f), 336(h) and 554.
6. Section 74.802 is amended by revising paragraphs (a) and (b)(3), and by adding new paragraph (e), to read as follows:

§ 74.802 Frequency assignment.

(a) * * *

614.000 – 698.000 MHz
944.000 – 952.000 MHz

* * *

(b) * * *

(3) 470.000 – 608.000 MHz and 614.000 – 698.000 MHz.

All zones 113 km (70 miles)

* * *

(e) *Clearing mechanisms for the 700 MHz Band.* This subsection sets forth provisions relating to the transition of low power auxiliary stations operating at 698-806 MHz (700 MHz band).

(1) Any low power auxiliary station that operates at frequencies in the 700 MHz band while transitioning its operations out of that band must not cause harmful interference and must accept interference from any commercial or public safety wireless licensees in the 700 MHz band.

(2) Any low power auxiliary station that operates at frequencies in the 700 MHz band will have until no later than June 12, 2010 to transition its operations completely out of the 700 MHz band, subject to the following. During this transition period, any commercial or public safety licensee in the 700 MHz band may choose one or both of the following voluntary methods to notify low power auxiliary stations:

(i) Any commercial or public safety licensee in the 700 MHz band may notify the Commission that it has initiated or will be initiating operations on specified frequencies in a particular market(s) in the 700 MHz band. The wireless operations initiated by the commercial or public safety 700 MHz licensees may include system testing or trials. Following receipt of the notification, the Commission will issue a public notice providing that operators of low power auxiliary stations, including wireless microphones, in the 700 MHz band in those market(s) will be required to cease operations within 60 days after the Commission's notice is released.

(ii) Any commercial or public safety licensee in the 700 MHz band may notify any low power auxiliary station users operating in the 700 MHz band that it has initiated or will be initiating operations on specified frequencies in the market in which the low power auxiliary station is operating. The wireless operations initiated by the commercial or public safety 700 MHz licensees may include system testing or trials. Upon receipt of such notice, the low power auxiliary station in the affected market area must cease operation within 60 days.

(iii) In the event that both of these notice provisions in subsections (2)(i) and (ii) are used with respect to a particular low power auxiliary station, the low power auxiliary station will have to cease operations in the market(s) in accordance with whichever notice provides for earlier termination of its operations.

(3) Notwithstanding this 60 day notice requirement, any low power auxiliary station that causes harmful interference to any commercial or public safety 700 MHz licensee must cease operations immediately, consistent with the rules for secondary use.

7. Section 74.851 is amended by revising the heading and adding new paragraph (g), (h), and (i) to read as follows:

§ 74.851 Certification of equipment; prohibition on manufacture, import, sale, lease, offer for sale or lease, or shipment of devices that operate in the 700 MHz Band; labeling for 700 MHz band equipment destined for non-U.S. markets; disclosure for the core TV bands.

* * * * *

(g) No person shall manufacture, import, sell, lease, offer for sale or lease, or ship low power auxiliary stations that are capable of operating in the 700 MHz band (698-806 MHz). This prohibition does not apply to devices manufactured solely for export.

(h) Any person who manufactures, sells, leases, or offers for sale or lease low power auxiliary stations, including wireless microphones, that are destined for non-U.S. markets and that are

capable of operating in the 700 MHz band shall include labeling and make clear in all sales, marketing, and packaging materials, including online materials, relating to such devices that the devices cannot be operated in the U.S.

(i) Any person, whether such person is a wholesaler or a retailer, who manufactures, sells, leases, or offers for sale or lease low power auxiliary stations that operate in the core TV bands (channels 2-51, excluding channel 37) is subject to the disclosure requirements in § 15.216 of this chapter.

* * * * *

8. Section 74.861 is amended by revising paragraph (e)(1)(ii) to read as follows:

§ 74.861 Technical requirements.

* * * * *

(e) * * *

(1) * * *

(i) * * *

(ii) 470 – 608 and 614 – 698 MHz bands—250 mW

* * * * *

APPENDIX C

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Federal Communications Commission (Commission) included an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities of the policies and rules considered in the *Notice* in WT Docket No. 08-166 and WT Docket No. 08-167.² The Commission sought written public comment on the *Notice*, including comment on the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.

2. Although Section 213 of the Consolidated Appropriations Act of 2000 provides that the RFA shall not apply to the rules and competitive bidding procedures for frequencies in the 746-806 MHz Band,³ the Commission believes that it would serve the public interest to analyze the possible significant economic impact of the proposed policy and rule changes in this band on small entities. Accordingly, this FRFA contains an analysis of this impact in connection with all spectrum that falls within the scope of the *Report and Order*, including spectrum in the 746-806 MHz Band.

A. Need for, and Objectives of, the Rules

3. As noted in the *Report and Order*, the DTV Act set a firm date by which the 700 MHz Band (698-806 MHz), currently occupied by television broadcasters in TV Channels 52-69, must be vacated to allow for use of the spectrum by public safety and commercial wireless services. In the DTV Delay Act, which was enacted on February 11, 2009, Congress extended the DTV transition deadline from February 17, 2009, to June 12, 2009.⁴ In the *Report and Order*, the Commission takes several actions relating to the operation of low power auxiliary stations, including wireless microphones, in the 700 MHz Band, that are designed to ensure that these devices are cleared from the 700 MHz Band in order that, consistent with the Commission's long-standing goals,⁵ this spectrum is made fully available

¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. §§ 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, WT Docket No. 08-166, Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition, WT Docket No. 08-167, *Notice of Proposed Rulemaking and Order*, 23 FCC Rcd 13106 (2008) (“*Notice*” and “*Order*,” respectively).

³ In particular, this exemption extends to the requirements imposed by Chapter 6 of Title 5, United States Code, Section 3 of the Small Business Act (15 U.S.C. § 632) and Sections 3507 and 3512 of Title 44, United States Code. Consolidated Appropriations Act of 2000, Pub. L. No. 106-113, 113 Stat. 2502, App. E, Sec. 213(a)(4)(A)-(B); see 145 Cong. Rec. H12493-94 (Nov. 17, 1999); 47 U.S.C.A. § 337 note at Sec. 213(a)(4)(A)-(B).

⁴ DTV Delay Act, Pub. L. No. 111-4, 123 Stat. 112 (2009) (“DTV Delay Act”).

⁵ The Commission has stated that “[i]t is incumbent . . . to take all the steps necessary to make . . . [the 700 MHz] spectrum effectively available to both public safety as well as commercial licensees as of the end of the DTV transition.” See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket 03-264, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules, WT Docket No. (continued....)

for use by the public safety and commercial licensees, and the customers that they serve, in the band following the DTV transition.

4. In the *Report and Order*, the Commission determines that entities currently operating Part 74 low power auxiliary stations, including wireless microphones, in the 700 MHz Band will not have the right to operate on those frequencies except pursuant to certain specified conditions and only for a limited transition period of no more than one year from end of the DTV transition (June 12, 2010). In adopting this transition period, the Commission seeks to balance the needs of public safety and commercial licensees to operate without interference in the 700 MHz Band with the concern that entities currently operating low power auxiliary stations in the 700 MHz Band have sufficient time to remove their operations from the band and relocate to other bands. Furthermore, in certain areas, it may be necessary to end the transitional operations of low power auxiliary stations in the 700 MHz Band prior to that time, where public safety and commercial licensees are entering the 700 MHz Band. Specifically, to the extent that a 700 MHz public safety or commercial licensee chooses to notify the Commission that it will be initiating operations on specified frequencies in particular market(s), the Commission will issue a public notice to inform users of low power auxiliary stations in the 700 MHz Band in those market(s) that they will be required to cease operations within 60 days after such notice is issued. Alternatively, any 700 MHz public safety or commercial licensee may, at its option, notify any user of low power auxiliary stations of its intention to initiate operations on specified frequencies in the market in which the low power auxiliary station user is operating. Upon receipt of such notice, the entity operating low power auxiliary stations in the affected market area must cease operation within 60 days. Finally, the *Report and Order* underscores that if, at any time during this transition period, users of low power auxiliary stations cause harmful interference to a 700 MHz public safety or commercial licensee, those users must cease operations in the band immediately.

5. Through this determination in the *Report and Order*, the Commission is acting to ensure that these low power auxiliary stations are cleared from the 700 MHz Band in order to make this spectrum fully available for use by the public safety and commercial licensees.⁶ This determination respecting operation of wireless microphones in the 700 MHz Band also is consistent with the Commission's previous concerns about the potential for interference in the band because low power auxiliary stations could interfere with public safety and commercial base and mobile receivers. Such interference raises the potential for a disruption of vital public safety services and commercial services.

6. Consistent with the Commission's goal of ensuring that 700 MHz Band spectrum is available for public safety and commercial users following the DTV transition, the *Report and Order* prohibits the manufacture, import, sale, offer for sale, or shipment of low power auxiliary stations designed to operate in the 700 MHz Band in the United States at any time following the publication of a summary of the *Report and Order* in the Federal Register. The *Report and Order* adopts additional marketing and labeling requirements designed to prevent the continued sale and distribution of low power auxiliary stations that operate in the 700 MHz Band. This prohibition is not applicable to devices manufactured solely for export.⁷ The prohibition on manufacture, import, sale, and shipment of low

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06-169, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064, 8066 ¶ 2 (2007) (*700 MHz First Report and Order*).

⁶ See *Report and Order*, para. 1.

⁷ See 47 U.S.C. § 302a(c); see also Review of Part 15 and other Parts of the Commission's Rules, ET Docket No. 01-278, *First Report and Order*, 17 FCC Rcd 14063, 14068-69 n.45 (2002) (noting that equipment manufactured in this country solely for export is exempt from compliance with the requirements promulgated under Section 302 of (continued....))

power auxiliary stations designed to operate in the 700 MHz Band in the United States serves the public interest by providing greater assurance that the 700 MHz Band will be made available to public safety and new commercial licensees. The Commission finds that good cause exists to have this prohibition take effect on less than 30 days notice in order to expedite the availability of unencumbered spectrum for public safety and new commercial licensees consistent with the statutory directive that the DTV transition end as of June 12, 2009.⁸

7. The *Report and Order* also modifies the licenses of all low power auxiliary station licensees that currently are authorized to operate in the 700 MHz Band, removing any part of the authorization pertaining to the band, subject to the condition that if a licensee is unable to cease operations in the band by that date, it may continue to operate under its existing authorization within the transition limitations adopted in the *Report and Order*. The Commission takes this action to ensure that the effective use of the 700 MHz Band by public safety and commercial licensees after the end of the DTV transition is not compromised, and that these new licensees will be able to operate free from interference by low power auxiliary stations operating in the 700 MHz Band. The Commission also adopts procedures whereby existing low power auxiliary station licensees currently operating in the 700 MHz Band can have their licenses modified should it be necessary to add to their authorizations other spectrum bands that are available for low power auxiliary station operations under the rules.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

8. Nady Systems, Inc. (Nady) indicates that its comments also address the IRFA. In its comments, Nady addresses the suggestion by PISC that the Commission should order all wireless microphone manufacturers that engaged in illegal marketing to pay the cost of replacing microphone systems for those wireless microphone operators required to cease operation in the 700 MHz Band after the end of the DTV transition.⁹ Nady comments that a gradual migration of wireless microphone users out of the 700 MHz Band strikes a reasonable balance that protects competing interests, and comments that the Commission should provide a transition that includes voluntary negotiations between parties.¹⁰ According to Nady, the majority of wireless microphone manufacturers are “small entities” which “would go bankrupt if they had to finance migration of all wireless microphones operating in the 700 MHz Band.”¹¹ Nady also comments that wireless microphones will be migrating to the “white spaces” below the 700 MHz Band, and that these microphones require protection from interference by emerging technologies in the white spaces. A number of commenters, including Nady, argue that a delay in the effective date of the ban is needed to prevent unnecessary disruption of operations and costs,¹² and the Commission has adopted a short time period for low power auxiliary station users to transition their operations out of the 700 MHz Band. Many commenters addressed issues regarding the use of wireless microphones without the required license.

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the Communications Act); 47 C.F.R. § 2.807 (exempting radiofrequency devices manufactured “solely for export” from the provisions of 47 C.F.R. § 2.803).

⁸ See 5 U.S.C. § 553(d)(3); see also 47 C.F.R. §§ 1.103(a), 1.427(b).

⁹ Nady Comments at 9-10.

¹⁰ Nady Comments at 7-10.

¹¹ *Id.* at 9. Audio-Technica also claimed in comments to the *Notice* that PISC’s proposal for enforcement proceedings against manufacturers and to impose relocation costs on small manufacturing companies would have “serious negative financial consequences for small companies like A-T.” Audio-Technica Comments at 21; see also Audio-Technica Reply Comments at 7 n.3.

¹² See, e.g., MSTV/NAB Comments at 3-7; Fox Television Stations Reply Comments at 1; Shure Comments at 7-10; Shure Reply Comments at 2-7; Audio-Technica Comments at 6-8; Nady Comments at 8-9.

C. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

9. The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted.¹³ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”¹⁴ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.¹⁵ A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).¹⁶

10. When identifying small entities that could be affected by the Commission’s new rules, this FRFA provides information describing the number of small entities that currently hold low power auxiliary station licenses, as well as estimates of the number of small entities that currently manufacture low power auxiliary stations. In order to analyze the total number of potentially affected small entities, the Commission estimates the number of small entities that may be affected by the rule changes adopted in the *Report and Order*.

11. Nationwide, there are a total of approximately 29.6 million small businesses, according to the SBA.¹⁷ A “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁸ Nationwide, as of 2002, there were approximately 1.6 million small organizations.¹⁹ The term “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”²⁰ Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States.²¹ We estimate that, of this total, 84,377 entities were “small governmental jurisdictions.”²² Thus, we estimate that most governmental jurisdictions are small.

12. In the *Report and Order*, the Commission concludes that low power auxiliary stations

¹³ 5 U.S.C. § 603(b)(3).

¹⁴ *Id.* § 601(6).

¹⁵ *Id.* § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

¹⁶ 15 U.S.C. § 632.

¹⁷ See SBA, Office of Advocacy, “Frequently Asked Questions,” <http://web.sba.gov/faqs/faqindex.cfm?areaID=24> (revised Sept. 2009).

¹⁸ 5 U.S.C. § 601(4).

¹⁹ Independent Sector, *The New Nonprofit Almanac & Desk Reference* (2002).

²⁰ 5 U.S.C. § 601(5).

²¹ U.S. Census Bureau, *Statistical Abstract of the United States: 2006*, Section 8, page 272, Table 415.

²² We assume that the villages, school districts, and special districts are small, and total 48,558. See U.S. Census Bureau, *Statistical Abstract of the United States: 2006*, section 8, page 273, Table 417. For 2002, Census Bureau data indicate that the total number of county, municipal, and township governments nationwide was 38,967, of which 35,819 were small. *Id.*

authorized under Part 74 of our rules – including wireless microphones – will not be permitted to operate in the 700 MHz Band after the DTV transition. The Commission also concludes to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz Band, effective upon the publication of a summary of the *Report and Order* in the Federal Register. Under Section 74.832 of the Commission’s rules, only certain entities may be issued licenses authorizing the use of low power auxiliary stations. In particular, these entities fall within the following categories: (1) licensees of AM, FM, TV, or International broadcast stations or low power TV stations; (2) broadcast network entities; (3) certain cable television system operators; (4) motion picture and television program producers as defined in the rules; and (5) certain entities with specified interests in Broadband Radio Service (BRS) Educational Broadcast Service (EBS) licenses, i.e., BRS licensees (formerly licensees and conditional licensees of stations in the Multipoint Distribution Service and Multi-channel Multipoint Distribution Service), or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service (formerly Instructional Television Fixed Service)²³ licensee or permittee.²⁴

13. **Radio Stations.** This Economic Census category “comprises establishments primarily engaged in broadcasting aural programs by radio to the public. Programming may originate in their own studio, from an affiliated network, or from external sources.”²⁵ The SBA has established a small business size standard for this category, which is: such firms having \$7.0 million or less in annual receipts.²⁶ According to Commission staff review of BIA Publications, Inc.’s *Master Access Radio Analyzer Database* on March 31, 2005, about 10,840 (95%) of 11,410 commercial radio stations had revenues of \$6 million or less. Therefore, the majority of such entities are small entities.

14. We note, however, that in assessing whether a business concern qualifies as small under the above size standard, business affiliations must be included.²⁷ In addition, to be determined to be a “small business,” the entity may not be dominant in its field of operation.²⁸ We note that it is difficult at times to assess these criteria in the context of media entities, and our estimate of small businesses may therefore be over-inclusive.

15. **Television Broadcasting.** The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and

²³ In July 2004, the Commission renamed Multipoint Distribution Service as the Broadband Radio Service and renamed Instructional Television Fixed Service as the Educational Broadcast Service. See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, WT Docket No. 03-66, *Report and Order and Further Notice of Proposed Rulemaking*, 19 FCC Rcd 14165, 14169 ¶6 (2004) (*BRS/EBS Report and Order*).

²⁴ See 47 C.F.R. § 74.832(a)(1)-(6).

²⁵ U.S. Census Bureau, 2002 NAICS Definitions, “515112 Radio Stations”; <http://www.census.gov/epcd/naics02/def/NDEF515.HTM>. A separate census category for “Radio Networks” “comprises establishments primarily engaged in assembling and transmitting aural programming to their affiliates or subscribers via over-the-air broadcasts, cable, or satellite. The programming covers a wide variety of material, such as news services, religious programming, weather, sports, or music.” *Id.* (NAICS code 5155111).

²⁶ 13 C.F.R. § 121.201, NAICS code 515112.

²⁷ “Concerns and entities are affiliates of each other when one controls or has the power to control the other, or a third party or parties controls or has the power to control both. It does not matter whether control is exercised, so long as the power to control exists.” 13 C.F.R. § 121.103(a)(1) (an SBA regulation).

²⁸ 13 C.F.R. § 121.102(b) (an SBA regulation).

transmission of programs to the public.”²⁹ The SBA has created a small business size standard for Television Broadcasting entities, which is: such firms having \$14.0 million or less in annual receipts.³⁰ The Commission has estimated the number of licensed commercial television stations to be 1,379.³¹ In addition, according to Commission staff review of the BIA Publications, Inc.’s *Master Access Television Analyzer Database* on March 30, 2007, about 986 of an estimated 1,374 commercial television stations (or approximately 72 percent) had revenues of \$13 million or less.³² We therefore estimate that the majority of commercial television broadcasters are small entities.

16. We note, however, that in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations³³ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. In addition, an element of the definition of “small business” is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply does not exclude any television station from the definition of a small business on this basis and is therefore possibly over-inclusive to that extent.

17. In addition, the Commission has estimated the number of licensed noncommercial educational (NCE) television stations to be 380.³⁴ These stations are non-profit, and therefore considered to be small entities.³⁵ There are also 2,295 low power television stations (LPTV).³⁶ Given the nature of this service, we will presume that all LPTV licensees qualify as small entities under the above SBA small business size standard.

18. **Cable Television Distribution Services.** Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: “This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.”³⁷ The SBA has developed a small business size standard for this category, which is: all such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services we must, however, use

²⁹ U.S. Census Bureau, 2002 NAICS Definitions, “515120 Television Broadcasting” (partial definition); <http://www.census.gov/epcd/naics02/def/NDEF515.HTM>.

³⁰ 13 C.F.R. § 121.201, NAICS code 515120.

³¹ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

³² We recognize that BIA’s estimate differs slightly from the FCC total given *supra*.

³³ “[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both.” 13 C.F.R. § 21.103(a)(1).

³⁴ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

³⁵ See generally 5 U.S.C. §§ 601(4), (6).

³⁶ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

³⁷ U.S. Census Bureau, 2007 NAICS Definitions, “517110 Wired Telecommunications Carriers” (partial definition); <http://www.census.gov/naics/2007/def/ND517110.HTM#N517110>.

current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: all such firms having \$13.5 million or less in annual receipts.³⁸ According to Census Bureau data for 2002, there were a total of 1,191 firms in this previous category that operated for the entire year.³⁹ Of this total, 1,087 firms had annual receipts of under \$10 million, and 43 firms had receipts of \$10 million or more but less than \$25 million.⁴⁰ Thus, the majority of these firms can be considered small.

19. **Cable Companies and Systems.** The Commission has also developed its own small business size standards, for the purpose of cable rate regulation. Under the Commission's rules, a "small cable company" is one serving 400,000 or fewer subscribers, nationwide.⁴¹ Industry data indicate that, of 1,076 cable operators nationwide, all but eleven are small under this size standard.⁴² In addition, under the Commission's rules, a "small system" is a cable system serving 15,000 or fewer subscribers.⁴³ Industry data indicate that, of 7,208 systems nationwide, 6,139 systems have fewer than 10,000 subscribers, and an additional 379 systems have 10,000-19,999 subscribers.⁴⁴ Thus, under this second size standard, most cable systems are small.

20. **Cable System Operators.** The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000."⁴⁵ The Commission has determined that an operator serving fewer than 677,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed \$250 million in the aggregate.⁴⁶ Industry data indicate that, of 1,076 cable operators nationwide, all but ten are small under this size standard.⁴⁷ We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million,⁴⁸ and therefore we are unable to estimate

³⁸ 13 C.F.R. § 121.201, NAICS code 517110.

³⁹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, Table 4, Receipts Size of Firms for the United States: 2002, NAICS code 517510 (issued November 2005).

⁴⁰ *Id.* An additional 61 firms had annual receipts of \$25 million or more.

⁴¹ 47 C.F.R. § 76.901(e). The Commission determined that this size standard equates approximately to a size standard of \$100 million or less in annual revenues. Implementation of Sections of the 1992 Cable Act: Rate Regulation, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393, 7408 (1995).

⁴² These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, "Top 25 Cable/Satellite Operators," pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, "Ownership of Cable Systems in the United States," pages D-1805 to D-1857.

⁴³ 47 C.F.R. § 76.901(c).

⁴⁴ Warren Communications News, *Television & Cable Factbook 2006*, "U.S. Cable Systems by Subscriber Size," page F-2 (data current as of Oct. 2005). The data do not include 718 systems for which classifying data were not available.

⁴⁵ 47 U.S.C. § 543(m)(2); *see* 47 C.F.R. § 76.901(f) & nn. 1-3.

⁴⁶ 47 C.F.R. § 76.901(f); *see* Public Notice, *FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, DA 01-158 (Cable Services Bureau, Jan. 24, 2001).

⁴⁷ These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, "Top 25 Cable/Satellite Operators," pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, "Ownership of Cable Systems in the United States," pages D-1805 to D-1857.

⁴⁸ The Commission does receive such information on a case-by-case basis if a cable operator appeals a local (continued....)

more accurately the number of cable system operators that would qualify as small under this size standard.

21. **Motion Picture and Video Producers.** This economic census category comprises “establishments primarily engaged in producing, or producing and distributing motion pictures, videos, television programs, or television commercials.”⁴⁹ The SBA has developed a small business size standard for firms within this category, which is: firms with \$27 million or less in annual receipts.⁵⁰ According to Census Bureau data for 2002, there were 7,772 firms in this category that operated for the entire year.⁵¹ Of this total, 7,685 firms had annual receipts of under \$25 million and 45 firms had annual receipts of \$25 million to \$49,999,999.⁵² Thus, under this category and associated small business size standard, the majority of firms can be considered small.

22. **Broadband Radio Service (formerly Multipoint Distribution Service) and Educational Broadband Service (formerly Instructional Television Fixed Service).** Multichannel Multipoint Distribution Service (MMDS) systems, often referred to as “wireless cable,” transmit video programming to subscribers using the microwave frequencies of the Multipoint Distribution Service (MDS) and Instructional Television Fixed Service (ITFS).⁵³ In its BRS/EBS Report and Order in WT Docket No. 03-66, the Commission comprehensively reviewed its policies and rules relating to the ITFS and MDS services, and replaced the MDS with the Broadband Radio Service and ITFS with the Educational Broadband Service in a new band plan at 2495-2690 MHz.⁵⁴ In connection with the 1996 MDS auction, the Commission defined “small business” as an entity that, together with its affiliates, has average gross annual revenues that are not more than \$40 million for the preceding three calendar years.⁵⁵ The SBA has approved of this standard.⁵⁶

23. In addition, the SBA has developed a small business size standard for Cable and Other Program Distribution, which is: all such firms having \$13.5 million or less in annual receipts.⁵⁷ According to Census Bureau data for 2002, there were a total of 1,191 firms in this category that operated

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franchise authority’s finding that the operator does not qualify as a small cable operator pursuant to § 76.901(f) of the Commission’s rules. *See* 47 C.F.R. § 76.909(b).

⁴⁹ U.S. Census Bureau, 2007 NAICS Definitions, “512110 Motion Picture and Video Production”; <http://www.census.gov/naics/2007/def/ND512110.HTM#N512110> (this definition is unchanged from the 2002 NAICS definition).

⁵⁰ 13 C.F.R. § 121.201, NAICS code 512110.

⁵¹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, “Establishment and Firm Size (Including Legal Form of Organization),” Table 4, NAICS code 512110 (issued Nov. 2005).

⁵² *Id.* An additional 42 firms had annual receipts of \$50 million or more.

⁵³ Amendment of Parts 21 and 74 of the Commission’s Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act – Competitive Bidding, MM Docket No. 94-131 and PP Docket No. 93-253, *Report and Order*, 10 FCC Rcd 9589, 9593 ¶ 7 (1995) (*MDS Auction R&O*).

⁵⁴ *See BRS/EBS Report and Order*.

⁵⁵ 47 C.F.R. § 21.961(b)(1).

⁵⁶ *See* Letter to Margaret Wiener, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, from Gary Jackson, Assistant Administrator for Size Standards, Small Business Administration, dated March 20, 2003 (noting approval of \$40 million size standard for MDS auction).

⁵⁷ 13 C.F.R. § 121.201, NAICS code 517510.

for the entire year.⁵⁸ Of this total, 1,087 firms had annual receipts of under \$10 million, and 43 firms had receipts of \$10 million or more but less than \$25 million.⁵⁹ Thus, under this size standard, the majority of firms can be considered small.

24. **Low Power Auxiliary Device Manufacturers: Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.** The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.”⁶⁰ The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.⁶¹ According to Census Bureau data for 2002, there were a total of 1,041 establishments in this category that operated for the entire year.⁶² Of this total, 1,010 had employment of less than 500, and an additional 13 had employment of 500 to 999.⁶³ Thus, under this size standard, the majority of firms can be considered small.

25. **Low Power Auxiliary Device Manufacturers: Other Communications Equipment Manufacturing.** The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing communications equipment (except telephone apparatus, and radio and television broadcast, and wireless communications equipment).”⁶⁴ The SBA has developed a small business size standard for Other Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.⁶⁵ According to Census Bureau data for 2002, there were a total of 503 establishments in this category that operated for the entire year.⁶⁶ Of this total, 493 had

⁵⁸ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, Table 4, Receipts Size of Firms for the United States: 2002, NAICS code 517510 (issued November 2005).

⁵⁹ *Id.* An additional 61 firms had annual receipts of \$25 million or more.

⁶⁰ U.S. Census Bureau, 2002 NAICS Definitions, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing”; <http://www.census.gov/epcd/naics02/def/NDEF334.HTM#N3342>.

⁶¹ 13 C.F.R. § 121.201, NAICS code 334220.

⁶² U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334220 (released May 26, 2005); <http://factfinder.census.gov>. The number of “establishments” is a less helpful indicator of small business prevalence in this context than would be the number of “firms” or “companies,” because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 929.

⁶³ *Id.* An additional 18 establishments had employment of 1,000 or more.

⁶⁴ U.S. Census Bureau, 2002 NAICS Definitions, “334290 Other Communications Equipment Manufacturing”; <http://www.census.gov/epcd/naics02/def/NDEF334.HTM#N3342>.

⁶⁵ 13 C.F.R. § 121.201, NAICS code 334290.

⁶⁶ U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334290 (released May 26, 2005); <http://factfinder.census.gov>. The number of “establishments” is a less helpful indicator of small business prevalence in this context than would be the number of “firms” or “companies,” because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the (continued....)

employment below 500, and an additional 7 had employment of 500 to 999.⁶⁷ Thus, under this size standard, the majority of firms can be considered small.

26. **Radio, Television, and Other Electronics Stores.** The Census Bureau defines this economic census category as follows: “This U.S. industry comprises: (1) establishments known as consumer electronics stores primarily engaged in retailing a general line of new consumer-type electronic products; (2) establishments specializing in retailing a single line of consumer-type electronic products (except computers); or (3) establishments primarily engaged in retailing these new electronic products in combination with repair services.”⁶⁸ The SBA has developed a small business size standard for Radio, Television, and Other Electronics Stores, which is: all such firms having \$8 million or less in annual receipts.⁶⁹ According to Census Bureau data for 2002, there were 10,380 firms in this category that operated for the entire year.⁷⁰ Of this total, 10,080 firms had annual sales of under \$5 million, and 177 firms had sales of \$5 million or more but less than \$10 million.⁷¹ Thus, the majority of firms in this category can be considered small.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

27. The Report and Order adopts transition procedures for entities that have not been able to migrate their operations of low power auxiliary stations out of the 700 MHz Band by the effective date of the new rules. During a one-year transition period from the end of the DTV transition, to the extent that a 700 MHz public safety or commercial licensee chooses to notify the Commission that it will be initiating operations on specified frequencies in particular market(s), the Commission will issue a public notice providing that users of low power auxiliary stations in the 700 MHz Band in those market(s) will be required to cease operations within 60 days after such notice is issued. Alternatively, any 700 MHz commercial or public safety licensee may, at its option, notify any user of low power auxiliary stations of its intention to initiate operations on specified frequencies in the market in which the low power auxiliary station user is operating. Upon receipt of such notice, the entity operating low power auxiliary stations in the affected market area must cease operation within 60 days.

28. To protect consumers in the United States, and to help ensure that no wireless microphones and other low power auxiliary stations that operate in the 700 MHz Band continue to be made available for use in the United States, the Report and Order requires retailers to remove from display (including online display) any low power auxiliary stations, including wireless microphones, that can operate in the 700 MHz Band, as well as any marketing material that does not comply with the requirements adopted herein.

29. Current licensees with authority under Part 74, Subpart H to operate low power auxiliary stations in the 700 MHz Band whose current authorization limits them in whole or in significant part to

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numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 471.

⁶⁷ *Id.* An additional 3 establishments had employment of 1,000 or more.

⁶⁸ U.S. Census Bureau, 2002 NAICS Definitions, “443112 Radio, Television, and Other Electronics Stores”; <http://www.census.gov/epcd/naics02/def/NDEF443.HTM>.

⁶⁹ 13 C.F.R. § 121.201, NAICS code 443112.

⁷⁰ U.S. Census Bureau, 2002 Economic Census, Industry Series: Retail Trade, Table 4, Sales Size of Firms for the United States: 2002, NAICS code 443112 (issued November 2005).

⁷¹ *Id.* An additional 123 firms had annual sales of \$10 million or more. As a measure of small business prevalence, the data on annual sales are roughly equivalent to what one would expect from data on annual receipts.

operations in the 700 MHz Band can be accommodated with the use of spectrum from other spectrum bands that are available for low power auxiliary station operations under Section 74.802 of the rules. Once replacement spectrum has been identified, as a matter of administrative convenience, the licensee should file an application to modify its authorization to include the identified frequencies.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

30. The RFA requires an agency to describe any significant, specifically small business alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) and exemption from coverage of the rule, or any part thereof, for small entities.”⁷²

31. In the *Report and Order*, the Commission adopts a single set of rules for all operators and manufacturers of low power auxiliary stations (including those operators and manufacturers that are small entities). The Commission decides on a single set of rules in accordance with its objective of limiting potential interference on the 700 MHz Band to ensure that it is available for public safety and commercial wireless services as of June 12, 2009. In the *Report and Order*, the Commission concludes to amend its rules to make clear that none of the entities currently operating low power auxiliary stations, including wireless microphones, within the 700 MHz Band will have the right to do so after the end of the DTV transition because such operations could cause harmful interference to new wireless services in the band, particularly public safety operations.⁷³ To adopt a separate set of rules for small entities could undermine the Commission’s objective of establishing an unencumbered 700 MHz Band for use by public safety and commercial wireless services after the end of the DTV transition.

32. The rules adopted in the *Report and Order* may have a significant economic impact on a substantial number of small entities. For example, the Commission has determined to amend its rules to provide that low power auxiliary stations licensed under Part 74 of the rules (including those operated by small entities) no longer have a right to operate in the 700 MHz Band after the effective date of the rules adopted in the *Report and Order*. The Commission modifies the licenses of all low power auxiliary station licensees that currently are authorized to operate in the 700 MHz Band to remove this part of the authorization and prohibit such operations in the 700 MHz Band after the effective date of the new rules, as conditioned in the *Report and Order*. The Commission also concludes to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz Band, effective upon publication of a summary of the *Report and Order* in the Federal Register.⁷⁴ This ban includes the manufacture, import, sale, offer for sale, or shipment of such devices by small entities, and the requirements for complying with these rules would be the same for both large and small entities. To the extent that small entities feel this compliance burden more, we have, as noted herein in Section D and below, provided a transition period to lessen this burden.

33. In the *Report and Order*, the Commission takes several steps to minimize the economic impact of its rules on operators of low power auxiliary stations in the 700 MHz Band (including those operators which are small entities). For example, the Commission recognizes that not all entities operating low power auxiliary stations in the 700 MHz Band may succeed, despite their best efforts, in

⁷² 5 U.S.C. §§ 603(c)(1)-(c)(4).

⁷³ *Report and Order* at ¶¶ 29, 34.

⁷⁴ *Id.* at ¶ 50.

removing their operations from the band by the date of the new rules and finds that a transition period is appropriate for these users. This limited right terminates one year from the end of the DTV transition, subject to the transition procedures. All users of low power auxiliary stations must cease operations in the band immediately if they cause harmful interference to 700 MHz public safety and commercial licensees. To the extent that a 700 MHz public safety or commercial licensee chooses to notify the Commission that it will be initiating operations on specified frequencies in particular market(s), the Commission will issue a public notice providing that users of low power auxiliary stations in the 700 MHz Band in those market(s) will be required to cease operations within 60 days after such notice is issued. Alternatively, any 700 MHz commercial or public safety licensee may, at its option, notify any user of low power auxiliary stations of its intention to initiate operations on specified frequencies in the market in which the low power auxiliary station user is operating. Upon receipt of such notice, the entity operating low power auxiliary stations in the affected market area must cease operation within 60 days. Alternative procedures that the Commission did not adopt include a longer transition period that may have had an impact on small entities.

34. These transition procedures will apply both to licensed low power auxiliary stations and users of low power auxiliary stations in the 700 MHz Band that did not obtain the required license. By making the procedures available to entities that have not had the required license, it is likely that many small entities will be provided with authority to operate on a limited basis, which has not previously been made available to them. We also conclude that it serves the public interest to waive two of our Part 15 rules, to permit unauthorized users of low power auxiliary stations, including wireless microphones, to operate on an unlicensed basis under Part 15 pursuant to certain specified technical requirements, in the 700 MHz Band until June 12, 2010 and in the core TV bands until the effective date of the rules that will be adopted in response to the Further Notice.

35. In addition, the Commission finds that those licensees whose current authorization limits them in whole or in significant part to operations in the 700 MHz Band can be accommodated with the use of spectrum from other spectrum bands that are available for low power auxiliary station operations under Section 74.802 of the rules. The *Report and Order* notes that such licensees may wish to consult with a local Society of Broadcast Engineers (SBE) coordinator to identify suitable spectrum from other spectrum bands that are available for low power auxiliary station operations under the rules. Once replacement spectrum has been identified, as a matter of administrative convenience the licensee should file an application to modify its authorization to include the identified frequencies. This will enable the Wireless Telecommunications Bureau to modify the license in conformance with the revised rules adopted in the *Report and Order*.

36. The *Report and Order* rejects an alternative proposal for a general amnesty for unauthorized wireless microphone users. The Commission permits wireless microphone users currently operating in the 700 MHz Band, which include many currently unauthorized users, to remain in the band for a limited period of time subject to specific transition procedures, while also permitting many currently unauthorized users the opportunity, on a going-forward basis, to locate wireless microphone operations in the TV band spectrum. In addition, the *Report and Order* declines to pursue the investigation requested by PISC.

F. Report to Congress

37. The Commission will send a copy of the *Report and Order*, including this FRFA, in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act.⁷⁵ In addition, the Commission will send a copy of the *Report and Order*, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *Report and Order* and FRFA (or

⁷⁵ See 5 U.S.C. § 801(a)(1)(A).

summaries thereof) will also be published in the Federal Register.⁷⁶

⁷⁶ *Id.* § 604(b).

APPENDIX D

Part 74 Low Power Auxiliary Station Licenses With 700 MHz Authorization

Listed below are low power auxiliary station licenses under Part 74, Subpart H, that include authorization to operate on frequencies in 698-806 MHz.

Call Sign	Licensee
BLP00398	WTVG, INC.
BLP00545	FOX TELEVISION STATIONS, INC.
BLP00556	GRAY TELEVISION LICENSEE, INC.
BLP00582	INDIANA BROADCASTING, LLC
BLP00749	MEDIA GENERAL COMMUNICATIONS HOLDINGS, LLC
BLP00753	MULTIMEDIA HOLDINGS CORPORATION
BLP00764	RADFORD STUDIO CENTER INC
BLP00766	KGO TELEVISION, INC.
BLP00794	WLS TELEVISION, INC.
BLP00813	ABC HOLDING COMPANY, INC.
BLP00822	MEREDITH CORPORATION
BLP00874	BONNEVILLE HOLDING COMPANY
BLP00910	POST-NEWSWEEK STATIONS, FLORIDA, INC.
BLP00930	TRIBUNE TELEVISION COMPANY
BLP00989	NATIONAL CABLE SATELLITE CORPORATION dba C-SPAN
BLP00998	WTVD TELEVISION, LLC
BLP01002	CBS RADIO HOLDINGS INC.
BLP01004	POST-NEWSWEEK STATIONS, SAN ANTONIO, INC.
BLP01005	AMERICAN BROADCASTING COMPANIES, INC
BLP01052	LOCAL TV TENNESSEE LICENSE, LLC
BLP01068	NBC TELEMUNDO LICENSE CO.
BLP01077	TOTAL RF MARKETING, INC.
BLP01080	WMC LICENSE SUBSIDIARY, LLC
BLP01083	KING BROADCASTING COMPANY
BLP01095	KSBY COMMUNICATIONS, INC.
BLP01096	KRCA LICENSE LLC
BLP01102	ESPN PRODUCTIONS INC
BLP01108	TRIBUNE TELEVISION COMPANY
BLP01111	SARKES TARZIAN, INC.
BLP01115	WTNH BROADCASTING, INC.
BLP01123	KSAZ LICENSE, INC.
BLP01124	NEXSTAR BROADCASTING, INC.
BLP01125	NORTHERN CALIFORNIA PUBLIC BROADCASTING, INC.
BLP01129	MIDWEST TELEVISION, INC.
BLP01130	LOCAL TV ARKANSAS LICENSE, LLC
BLP01135	KIRO-TV, INC.
BLP01140	KGO TELEVISION, INC.
BLP01154	COMMUNITY TELEVISION OF WISCONSIN LICENSE, LLC
BLP01156	TOTAL RF MARKETING INC
BLP01157	WBNS-TV, INC.

BLP01158	EAST TENNESSEE PUBLIC COMMUNICATIONS CORP.
BLP01159	AMERICAN BROADCASTING COMPANIES INC
BLP01167	WLKY HEARST-ARGYLE TELEVISION, INC.
BLP01169	CBS BROADCASTING INC.
BLP01170	FRESNO, CITY OF
BLP01171	WKYC-TV, INC.
BLP01173	OHIO/OKLAHOMA HEARST- ARGYLE TELEVISION
BLP01178	RANDY HERMES PRODUCTION INC dba AERIAL VIDEO SYSTEMS
BLP01195	RADIO LICENSE HOLDING IV, LLC
BLP01204	CAPITOL BROADCASTING COMPANY, INC.
BLP01215	KING BROADCASTING COMPANY
BLP01216	GREATER BOSTON RADIO, INC.
BLP01222	WXII HEARST-ARGYLE TELEVISION, INC.
BLP01223	FOX TELEVISION STATIONS, INC.
BLP01373	WLOS LICENSEE, LLC
BLP01384	FREEDOM BROADCASTING OF FLORIDA LICENSEE, L.L.C.
BLP01411	KTLA INC.
BLP01502	QVC INC
BLP01505	COMMUNITY EDUCATIONAL TELEVISION, INC.
BLP01506	WIRELESS VIDEO INC
BLP01509	ESPN INC
BLP01510	NFL PRODUCTIONS LLC
BLP01512	GRAY TELEVISION LICENSEE, INC.
BLP01515	MIDCOM, INC.
BLP01517	NATIONAL FOOTBALL LEAGUE
BLP01519	KSWB INC.
BLP01520	ICI/GLOBAL UNIVERSITY
BLP01524	WAITT BROADCASTING, INC.
BLP01525	WABASH VALLEY BROADCASTING CORPORATION
BLP01529	STANFORD UNIVERSITY
WPMK337	KVVU BROADCASTING CORPORATION
WPPG800	GOODYEAR TIRE & RUBBER COMPANY
WPRS457	KING BROADCASTING COMPANY
WPRT657	CBS RADIO EAST INC.
WPRY410	PIKES PEAK TELEVISION, INC.
WPTA510	UNIVERSITY OF CINCINNATI
WPTA512	UNIVERSITY OF MICHIGAN, FOOTBALL OFFICE
WPTA515	UNIVERSITY OF OKLAHOMA FOOTBALL
WPTA547	UNIVERSITY OF MIAMI ATHLETIC DEPARTMENT (FOOTBALL)
WPTA560	UNIVERSITY OF ARKANSAS, MEN'S ATHLETICS
WPTA566	UNIVERSITY OF WASHINGTON, ATHLETICS DEPARTMENT
WPTA981	OHIO STATE UNIVERSITY
WPTA982	PENN STATE UNIVERSITY INTERCOLLEGIATE ATHLETICS
WPTA986	NASHVILLE PUBLIC TELEVISION, INC.
WPTA991	UNIVERSITY OF MARYLAND
WPTB546	VIRGINIA TECH, ATHLETIC DEPARTMENT
WPTB548	NOTRE DAME UNIVERSITY
WPTB550	UNIVERSITY OF CALIFORNIA, BERKELEY
WPTB551	MICHIGAN STATE UNIVERSITY
WPTB557	BOARD OF REGENTS UNIVERSITY OF WISCONSIN SYSTEM

WPTI807	THE UNIVERSITY OF TEXAS AT AUSTIN
WPTS554	TEXAS A&M UNIVERSITY, ATHLETIC DEPARTMENT
WPUL328	WALT DISNEY WORLD CO.
WPVL464	IMMERSION ENTERTAINMENT, LLC
WPVX572	FLORIDA STATE UNIVERSITY, ATHLETIC DEPARTMENT
WPWA802	CBS RADIO STATIONS INC.
WPWA803	CBS RADIO STATIONS INC.
WPWA805	WILKS LICENSE COMPANY-KANSAS CITY LLC
WPWA806	WILKS LICENSE COMPANY-KANSAS CITY LLC
WPWA809	TEXAS CBS RADIO BROADCASTING L.P.
WPWE243	WFIE LICENSE SUBSIDIARY, LLC
WPWF637	UNIVERSITY OF LOUISVILLE
WPWF650	SAN JOSE STATE UNIVERSITY
WPWT842	BOARD OF TRUSTEES FOR SAN DIEGO UNIV.
WPWT854	UNIVERSITY OF MONTANA
WPXA849	ENTRAVISION HOLDINGS, LLC
WPXW291	KJLA, LLC
WPXY539	VIACOM INTERNATIONAL, INC.
WPYE310	NBC TELEMUNDO LICENSE CO.
WPYM958	UNIVERSITY OF HOUSTON
WPYP773	FOX TELEVISION STATIONS, INC.
WPYQ913	ARENA FOOTBALL LEAGUE, LLC
WPYR934	EDUCATIONAL BROADCASTING CORPORATION
WPYR946	EDUCATIONAL BROADCASTING CORPORATION
WPYR948	MISSISSIPPI STATE UNIVERSITY, BULLDOG CLUB, INC.
WPYY596	INDIANA, STATE OF – PURDUE UNIVERSITY - W LAF
WPYY613	STATE OF OHIO, YOUNGSTOWN STATE UNIVERSITY
WPYY643	SONY PICTURES ENTERTAINMENT
WPZA303	FOX TELEVISION STATIONS, INC.
WPZK735	STATION VENTURE OPERATIONS, LP
WQAB582	FOX TELEVISION STATIONS OF PHILADELPHIA, INC.
WQAC462	ODS TECHNOLOGIES, L.P.
WQAE263	LOCAL TV VIRGINIA LICENSE, LLC
WQAE302	UNIVERSAL CITY STUDIOS LLLP
WQBE979	BLACK ENTERTAINMENT TELEVISION LLC
WQBV562	AUBURN UNIVERSITY
WQCK457	SLC TV LICENSEE CORP.
WQCT290	SACRAMENTO TELEVISION STATIONS INC.
WQCT920	UNIVERSITY OF OREGON
WQDA545	CBS CORPORATION
WQDH542	CBS STATIONS GROUP OF TEXAS L.P.
WQDU966	THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ALABAMA
WQEF500	CBS BROADCASTING INC.
WQEP917	RF FILM, INC.
WQER925	NORTHERN CALIFORNIA PUBLIC BROADCASTING, INC.
WQEW826	AF2, LLC
WQFB893	WGAL HEARST-ARGYLE TELEVISION, INC.
WQFF540	THE BOEING COMPANY
WQFH685	BROADCAST SPORTS, INC.
WQFS290	UNIVERSITY OF CENTRAL FLORIDA

WQGB468	KING BROADCASTING COMPANY
WQGH513	UNIVERSITY OF CONNECTICUT
WQGJ552	UNIVERSITY OF IOWA, FOOTBALL OFFICE
WQGL952	OHIO/OKLAHOMA HEARST-ARGYLE TELEVISION, INC
WQGW680	MEDIA GENERAL COMMUNICATIONS HOLDINGS, LLC
WQHA394	THE WALT DISNEY COMPANY
WQHQ645	CBS TELEVISION STATIONS INC.
WQHQ691	THE BOEING COMPANY
WQIH757	CBS CORPORATON
WQIJ473	RF TECHNOLOGY, LLC
WQIY392	THE BOEING COMPANY
WQJB800	WDAF LICENSE, INC.
WQJE713	WMBF LICENSE SUBSIDIARY, LLC

APPENDIX E

Proposed Rules

Part 15 of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

1. The authority citation of Part 15 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302, 303, 304, 307, 336, and 544A.

2. Section 15.3 is revised by adding a new paragraph (hh) to read as follows:

§ 15.3 Definitions.

* * * * *

(hh) *Wireless Audio Device.* An intentional radiator that is used to transmit voice, music or other audio material over a short distance. Transmissions may be either analog or digital. Data transmissions are not permitted except for short strings such as recognition codes necessary to ensure the functionality of a system. Transmission of audio material to the public switched telephone network and private and commercial wireless systems and networks is not permitted.

3. A new Section 15.238 added to read as follows:

§ 15.238 Operation in the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz.

(a) Operation under this section is limited to wireless audio devices as defined in § 15.3(hh).

(b) Operation is limited to locations removed from existing co-channel TV broadcast stations by not less than the following distances. See §73.609 for zone definitions.

(1) 54.000–72.000 MHz and 76.000–88.000 MHz:

Zone I 105 km (65 miles)

Zones II and III 129 km (80 miles)

(2) 174.000–216.000 MHz

Zone I 97 km (60 miles)

Zones II and III 129 km (80 miles)

(3) 470.000–608.000 MHz and 614.000–698.000 MHz.

All zones 113 km (70 miles)

(c) Specific frequency operation is required as follows.

(1) The frequency selection shall be offset from the upper or lower band limits by 25 kHz or an integral multiple thereof.

(2) One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

(3) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

(d) The unmodulated carrier power at the antenna input may not exceed 50 mW.

(e) The mean power of out-of-band emissions must comply with the following:

(1) On any frequency removed from the operating frequency by more than 50% and up to 100% of the authorized bandwidth: at least 25 dB.

(2) On any frequency removed from the operating frequency by more than 100% and up to 250% of the authorized bandwidth: at least 35 dB.

(3) On any frequency removed from the operating frequency by more than 250% of the authorized bandwidth: $43 + 10 \log P$ dB where P is the mean output power in watts.

APPENDIX F**Initial Regulatory Flexibility Analysis**

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this Further Notice of Proposed Rule Making (Further Notice). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Notice provided in Section V.F.2. of the item. The Commission will send a copy of the Further Notice, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the Further Notice and IRFA (or summaries thereof) will be published in the Federal Register.³

A. Need for, and Objectives of, the Proposed Rules

2. The Further Notice addresses the use of wireless low power auxiliary stations, including wireless microphones that operate on TV channels 2-51, excluding channel 37, (“the TV bands”) by entities that are not eligible for a Part 74 license. In light of the important functions that these types of devices provide to the public, the Commission believes that developing rules to provide for the unlicensed use of wireless low power auxiliary stations, including wireless microphones, in the TV bands would serve the public interest. While wireless microphones are available for use on an unlicensed basis in the 49 MHz, 902-928 MHz and 2.4 GHz bands and on a licensed basis by some entities under Part 90 in the 170 MHz band, many entities are using wireless microphones designed for use in the TV bands on an unauthorized basis. The reasons for the use of TV band wireless microphones are varied including, for example, the amount of spectrum that is available for their use in the TV bands can accommodate multiple microphones at one venue and the sound fidelity that is achieved by TV bands microphones is much higher than that of microphones that operate in other bands.

3. Certain users of wireless microphones that are not currently eligible for a low power auxiliary station license under Part 74 may have needs that are similar to existing eligible licensees and may have a need for the interference protection that a license affords. The Further Notice seeks comment on whether to revise the Commission’s rules to provide for a limited expansion of eligibility that would permit such users to hold a Part 74 license in the TV bands. For example, the Further Notice seeks comment on whether to expand eligibility for licensing under Part 74, Subpart H of the rules to include large theaters, entertainment complexes, sporting arenas, and religious facilities. The Further Notice also seeks comment on whether we should modify the eligibility requirements for a Part 74 license to include other entities that use wireless microphones, such as those operating at convention or trade shows, certain other cultural events, or governmental or educational institutions.

B. Legal Basis

4. The proposed action is authorized under Sections 4(i), 301, 302, 303(e), 303(f), 303(r), 304 and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302,

¹ See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See 5 U.S.C. § 603(a).

³ See 5 U.S.C. § 603(a).

303(e), 303(f), 303(r), 304 and 307.

C. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

5. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.⁴ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁵ In addition, the “small business” has the same meaning as the term “small business concern” under the Small Business Act.⁶ A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operations; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).⁷

6. Nationwide, there are a total of approximately 29.6 million small businesses, according to the SBA. A “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.” Nationwide, as of 2002, there were approximately 1.6 million small organizations. The term “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.” Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States. We estimate that, of this total, 84,377 entities were “small governmental jurisdictions.” Thus, we estimate that most governmental jurisdictions are small.

7. In the Report and Order, the Commission concludes that low power auxiliary stations authorized under Part 74 of our rules – including wireless microphones – will not be permitted to operate in the 700 MHz Band after the DTV transition. The Commission also concludes to prohibit the manufacture, import, sale, offer for sale, or shipment of devices that operate as low power auxiliary stations in the 700 MHz Band, effective upon the publication of a summary of the Report and Order in the Federal Register. Under Section 74.832 of the Commission’s rules, only certain entities may be issued licenses authorizing the use of low power auxiliary stations. In particular, these entities fall within the following categories: (1) licensees of AM, FM, TV, or International broadcast stations or low power TV stations; (2) broadcast network entities; (3) certain cable television system operators; (4) motion picture and television program producers as defined in the rules; and (5) certain entities with specified interests in Broadband Radio Service (BRS) Educational Broadcast Service (EBS) licenses, i.e., BRS licensees (formerly licensees and conditional licensees of stations in the Multipoint Distribution Service and Multi-channel Multipoint Distribution Service), or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service (formerly Instructional Television Fixed Service) licensee or permittee.

8. **Radio Stations.** This Economic Census category “comprises establishments primarily

⁴ See 5 U.S.C. § 603(b)(3).

⁵ 5 U.S.C. § 601(6).

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

⁷ 15 U.S.C. § 632.

engaged in broadcasting aural programs by radio to the public. Programming may originate in their own studio, from an affiliated network, or from external sources.”⁸ The SBA has established a small business size standard for this category, which is: such firms having \$7.0 million or less in annual receipts.⁹ According to Commission staff review of BIA Publications, Inc.’s *Master Access Radio Analyzer Database* on March 31, 2005, about 10,840 (95%) of 11,410 commercial radio stations had revenues of \$6 million or less. Therefore, the majority of such entities are small entities.

9. We note, however, that in assessing whether a business concern qualifies as small under the above size standard, business affiliations must be included.¹⁰ In addition, to be determined to be a “small business,” the entity may not be dominant in its field of operation.¹¹ We note that it is difficult at times to assess these criteria in the context of media entities, and our estimate of small businesses may therefore be over-inclusive.

10. **Television Broadcasting.** The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public.”¹² The SBA has created a small business size standard for Television Broadcasting entities, which is: such firms having \$14.0 million or less in annual receipts.¹³ The Commission has estimated the number of licensed commercial television stations to be 1,379.¹⁴ In addition, according to Commission staff review of the BIA Publications, Inc.’s *Master Access Television Analyzer Database* on March 30, 2007, about 986 of an estimated 1,374 commercial television stations (or approximately 72 percent) had revenues of \$13 million or less.¹⁵ We therefore estimate that the majority of commercial television broadcasters are small entities.

11. We note, however, that in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations¹⁶ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. In addition, an element of the definition of “small business” is that the entity not be dominant in its field of operation.

⁸ U.S. Census Bureau, 2002 NAICS Definitions, “515112 Radio Stations”; <http://www.census.gov/epcd/naics02/def/NDEF515.HTM>. A separate census category for “Radio Networks” “comprises establishments primarily engaged in assembling and transmitting aural programming to their affiliates or subscribers via over-the-air broadcasts, cable, or satellite. The programming covers a wide variety of material, such as news services, religious programming, weather, sports, or music.” *Id.* (NAICS code 5155111).

⁹ 13 C.F.R. § 121.201, NAICS code 515112.

¹⁰ “Concerns and entities are affiliates of each other when one controls or has the power to control the other, or a third party or parties controls or has the power to control both. It does not matter whether control is exercised, so long as the power to control exists.” 13 C.F.R. § 121.103(a)(1) (an SBA regulation).

¹¹ 13 C.F.R. § 121.102(b) (an SBA regulation).

¹² U.S. Census Bureau, 2002 NAICS Definitions, “515120 Television Broadcasting” (partial definition); <http://www.census.gov/epcd/naics02/def/NDEF515.HTM>.

¹³ 13 C.F.R. § 121.201, NAICS code 515120.

¹⁴ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

¹⁵ We recognize that BIA’s estimate differs slightly from the FCC total given *supra*.

¹⁶ “[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both.” 13 C.F.R. § 21.103(a)(1).

We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply does not exclude any television station from the definition of a small business on this basis and is therefore possibly over-inclusive to that extent.

12. In addition, the Commission has estimated the number of licensed noncommercial educational (NCE) television stations to be 380.¹⁷ These stations are non-profit, and therefore considered to be small entities.¹⁸ There are also 2,295 low power television stations (LPTV).¹⁹ Given the nature of this service, we will presume that all LPTV licensees qualify as small entities under the above SBA small business size standard.

13. **Cable Television Distribution Services.** Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: “This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.”²⁰ The SBA has developed a small business size standard for this category, which is: all such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services we must, however, use current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: all such firms having \$13.5 million or less in annual receipts.²¹ According to Census Bureau data for 2002, there were a total of 1,191 firms in this previous category that operated for the entire year.²² Of this total, 1,087 firms had annual receipts of under \$10 million, and 43 firms had receipts of \$10 million or more but less than \$25 million.²³ Thus, the majority of these firms can be considered small.

14. **Cable Companies and Systems.** The Commission has also developed its own small business size standards, for the purpose of cable rate regulation. Under the Commission’s rules, a “small cable company” is one serving 400,000 or fewer subscribers, nationwide.²⁴ Industry data indicate that, of 1,076 cable operators nationwide, all but eleven are small under this size standard.²⁵ In addition, under

¹⁷ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

¹⁸ See generally 5 U.S.C. §§ 601(4), (6).

¹⁹ See *FCC News Release*, “Broadcast Station Totals as of December 31, 2007,” dated March 18, 2008; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

²⁰ U.S. Census Bureau, 2007 NAICS Definitions, “517110 Wired Telecommunications Carriers” (partial definition); <http://www.census.gov/naics/2007/def/ND517110.HTM#N517110>.

²¹ 13 C.F.R. § 121.201, NAICS code 517110.

²² U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, Table 4, Receipts Size of Firms for the United States: 2002, NAICS code 517510 (issued November 2005).

²³ *Id.* An additional 61 firms had annual receipts of \$25 million or more.

²⁴ 47 C.F.R. § 76.901(e). The Commission determined that this size standard equates approximately to a size standard of \$100 million or less in annual revenues. Implementation of Sections of the 1992 Cable Act: Rate Regulation, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393, 7408 (1995).

²⁵ These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, “Top 25 Cable/Satellite Operators,” pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, “Ownership of Cable Systems in the United States,” pages D-1805 to D-1857.

the Commission's rules, a "small system" is a cable system serving 15,000 or fewer subscribers.²⁶ Industry data indicate that, of 7,208 systems nationwide, 6,139 systems have fewer than 10,000 subscribers, and an additional 379 systems have 10,000-19,999 subscribers.²⁷ Thus, under this second size standard, most cable systems are small.

15. **Cable System Operators.** The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000."²⁸ The Commission has determined that an operator serving fewer than 677,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed \$250 million in the aggregate.²⁹ Industry data indicate that, of 1,076 cable operators nationwide, all but ten are small under this size standard.³⁰ We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million,³¹ and therefore we are unable to estimate more accurately the number of cable system operators that would qualify as small under this size standard.

16. **Motion Picture and Video Producers.** This economic census category comprises "establishments primarily engaged in producing, or producing and distributing motion pictures, videos, television programs, or television commercials."³² The SBA has developed a small business size standard for firms within this category, which is: firms with \$27 million or less in annual receipts.³³ According to Census Bureau data for 2002, there were 7,772 firms in this category that operated for the entire year.³⁴ Of this total, 7,685 firms had annual receipts of under \$25 million and 45 firms had annual receipts of \$25 million to \$49,999,999.³⁵ Thus, under this category and associated small business size standard, the majority of firms can be considered small.

²⁶ 47 C.F.R. § 76.901(c).

²⁷ Warren Communications News, *Television & Cable Factbook 2006*, "U.S. Cable Systems by Subscriber Size," page F-2 (data current as of Oct. 2005). The data do not include 718 systems for which classifying data were not available.

²⁸ 47 U.S.C. § 543(m)(2); *see* 47 C.F.R. § 76.901(f) & nn. 1-3.

²⁹ 47 C.F.R. § 76.901(f); *see* Public Notice, *FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, DA 01-158 (Cable Services Bureau, Jan. 24, 2001).

³⁰ These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, "Top 25 Cable/Satellite Operators," pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, "Ownership of Cable Systems in the United States," pages D-1805 to D-1857.

³¹ The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to § 76.901(f) of the Commission's rules. *See* 47 C.F.R. § 76.909(b).

³² U.S. Census Bureau, 2007 NAICS Definitions, "512110 Motion Picture and Video Production"; <http://www.census.gov/naics/2007/def/ND512110.HTM#N512110> (this definition is unchanged from the 2002 NAICS definition).

³³ 13 C.F.R. § 121.201, NAICS code 512110.

³⁴ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 4, NAICS code 512110 (issued Nov. 2005).

³⁵ *Id.* An additional 42 firms had annual receipts of \$50 million or more.

17. **Broadband Radio Service (formerly Multipoint Distribution Service) and Educational Broadband Service (formerly Instructional Television Fixed Service).** Multichannel Multipoint Distribution Service (MMDS) systems, often referred to as “wireless cable,” transmit video programming to subscribers using the microwave frequencies of the Multipoint Distribution Service (MDS) and Instructional Television Fixed Service (ITFS).³⁶ In its BRS/EBS Report and Order in WT Docket No. 03-66, the Commission comprehensively reviewed its policies and rules relating to the ITFS and MDS services, and replaced the MDS with the Broadband Radio Service and ITFS with the Educational Broadband Service in a new band plan at 2495-2690 MHz.³⁷ In connection with the 1996 MDS auction, the Commission defined “small business” as an entity that, together with its affiliates, has average gross annual revenues that are not more than \$40 million for the preceding three calendar years.³⁸ The SBA has approved of this standard.³⁹

18. In addition, the SBA has developed a small business size standard for Cable and Other Program Distribution, which is: all such firms having \$13.5 million or less in annual receipts.⁴⁰ According to Census Bureau data for 2002, there were a total of 1,191 firms in this category that operated for the entire year.⁴¹ Of this total, 1,087 firms had annual receipts of under \$10 million, and 43 firms had receipts of \$10 million or more but less than \$25 million.⁴² Thus, under this size standard, the majority of firms can be considered small.

19. **Low Power Auxiliary Device Manufacturers: Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.** The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.”⁴³ The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.⁴⁴ According to Census Bureau data for 2002, there were a total of 1,041 establishments in this category that operated for the entire year.⁴⁵ Of this total, 1,010 had

³⁶ Amendment of Parts 21 and 74 of the Commission’s Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act – Competitive Bidding, MM Docket No. 94-131 and PP Docket No. 93-253, *Report and Order*, 10 FCC Rcd 9589, 9593 ¶ 7 (1995) (*MDS Auction R&O*).

³⁷ See *BRS/EBS Report and Order*.

³⁸ 47 C.F.R. § 21.961(b)(1).

³⁹ See Letter to Margaret Wiener, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, from Gary Jackson, Assistant Administrator for Size Standards, Small Business Administration, dated March 20, 2003 (noting approval of \$40 million size standard for MDS auction).

⁴⁰ 13 C.F.R. § 121.201, NAICS code 517510.

⁴¹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, Table 4, Receipts Size of Firms for the United States: 2002, NAICS code 517510 (issued November 2005).

⁴² *Id.* An additional 61 firms had annual receipts of \$25 million or more.

⁴³ U.S. Census Bureau, 2002 NAICS Definitions, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing”; <http://www.census.gov/epcd/naics02/def/NDEF334.HTM#N3342>.

⁴⁴ 13 C.F.R. § 121.201, NAICS code 334220.

⁴⁵ U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by (continued....)

employment of less than 500, and an additional 13 had employment of 500 to 999.⁴⁶ Thus, under this size standard, the majority of firms can be considered small.

20. Low Power Auxiliary Device Manufacturers: Other Communications Equipment Manufacturing. The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing communications equipment (except telephone apparatus, and radio and television broadcast, and wireless communications equipment).”⁴⁷ The SBA has developed a small business size standard for Other Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.⁴⁸ According to Census Bureau data for 2002, there were a total of 503 establishments in this category that operated for the entire year.⁴⁹ Of this total, 493 had employment below 500, and an additional 7 had employment of 500 to 999.⁵⁰ Thus, under this size standard, the majority of firms can be considered small.

21. Radio, Television, and Other Electronics Stores. The Census Bureau defines this economic census category as follows: “This U.S. industry comprises: (1) establishments known as consumer electronics stores primarily engaged in retailing a general line of new consumer-type electronic products; (2) establishments specializing in retailing a single line of consumer-type electronic products (except computers); or (3) establishments primarily engaged in retailing these new electronic products in combination with repair services.”⁵¹ The SBA has developed a small business size standard for Radio, Television, and Other Electronics Stores, which is: all such firms having \$8 million or less in annual receipts.⁵² According to Census Bureau data for 2002, there were 10,380 firms in this category that operated for the entire year.⁵³ Of this total, 10,080 firms had annual sales of under \$5 million, and 177

(Continued from previous page)

Employment Size, NAICS code 334220 (released May 26, 2005); <http://factfinder.census.gov>. The number of “establishments” is a less helpful indicator of small business prevalence in this context than would be the number of “firms” or “companies,” because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 929.

⁴⁶ *Id.* An additional 18 establishments had employment of 1,000 or more.

⁴⁷ U.S. Census Bureau, 2002 NAICS Definitions, “334290 Other Communications Equipment Manufacturing”; <http://www.census.gov/epcd/naics02/def/NDEF334.HTM#N3342>.

⁴⁸ 13 C.F.R. § 121.201, NAICS code 334290.

⁴⁹ U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334290 (released May 26, 2005); <http://factfinder.census.gov>. The number of “establishments” is a less helpful indicator of small business prevalence in this context than would be the number of “firms” or “companies,” because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 471.

⁵⁰ *Id.* An additional 3 establishments had employment of 1,000 or more.

⁵¹ U.S. Census Bureau, 2002 NAICS Definitions, “443112 Radio, Television, and Other Electronics Stores”; <http://www.census.gov/epcd/naics02/def/NDEF443.HTM>.

⁵² 13 C.F.R. § 121.201, NAICS code 443112.

⁵³ U.S. Census Bureau, 2002 Economic Census, Industry Series: Retail Trade, Table 4, Sales Size of Firms for the United States: 2002, NAICS code 443112 (issued November 2005).

firms had sales of \$5 million or more but less than \$10 million.⁵⁴ Thus, the majority of firms in this category can be considered small.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

22. The Further Notice seeks comment on whether to expand the eligibility to operate wireless microphones under Part 74 of the rules, and to allow wireless microphones to operate in the TV bands under Part 15 of the rules.

23. Parties operating low power auxiliary stations in the TV bands under Part 74 of the rules are required to be licensed. Only entities that fall within the following categories are currently eligible for a Part 74 license: (1) licensees of AM, FM, TV, or International broadcast stations or low power TV stations; (2) broadcast network entities; (3) certain cable television system operators; (4) motion picture and television program producers as defined in the rules; and (5) certain entities with specified interests in Broadband Radio Service (BRS) Educational Broadcast Service (EBS) licenses, i.e., BRS licensees, or entities that hold an executed lease agreement with a BRS licensee or conditional licensee or entities that hold an executed lease agreement with an Educational Broadcast Service licensee or permittee. The Further Notice seeks comment on whether to revise the Commission's rules to provide for a limited expansion of eligibility that would permit such users to hold a Part 74 license in the TV bands. For example, the Further Notice seeks comment on whether to expand the eligibility for licensing to allow the use of wireless microphones or other low power auxiliary audio devices in large theaters, entertainment complexes, sporting arenas, and religious facilities. The Further Notice also seeks comment on whether we should modify the eligibility requirements for a Part 74 license to include other entities that use wireless microphones, such as those operating at convention or trade shows, certain other cultural events, or governmental or educational institutions. If license eligibility is expanded, the additional entities eligible for licensing would have to apply for a license in the same manner as currently eligible parties.

24. Most non-licensed transmitters are required to be authorized under the Commission's certification procedure as a prerequisite to marketing and importation. The Further Notice proposes to allow wireless microphones to operate in the TV bands on a non-licensed basis under Part 15 of the rules, and the proposed new types of wireless microphones would be subject to the same certification requirement. Operation of Part 15 wireless microphones would not be limited to a defined group of eligible entities, so parties that are not eligible to operate wireless microphones on a licensed basis under Part 74 of the rules would be able to operate these devices under Part 15. The proposed technical requirements for Part 15 wireless microphones are very similar to those for Part 74 wireless microphones, except that the proposed maximum output power for Part 15 wireless microphones is lower to reduce the risk of interference. The proposed power level is 50 milliwatts, while Part 74 wireless microphones are permitted to operate with 50 milliwatts in the VHF band and 250 milliwatts in the UHF band.

25. The Further Notice seeks comment on whether a marketing restriction should be imposed on manufacturers with respect to equipment that is certificated for use by Part 74 licensees. For example, the Further Notice seeks comment on whether the Commission should adopt a rule requiring that the marketing of equipment certificated under Part 74, Subpart H of the Commission's rules be directed solely to parties eligible to operate the equipment.

26. The Further Notice seeks further comment on whether any rules are necessary to ensure that purchasers of low power auxiliary stations that are certificated under only Part 74 of the rules are made aware of the Part 74 licensing requirements. For example, the Further Notice seeks comment on whether manufacturers should be required to provide a label visible at the time of purchase advising of

⁵⁴ *Id.* An additional 123 firms had annual sales of \$10 million or more. As a measure of small business prevalence, the data on annual sales are roughly equivalent to what one would expect from data on annual receipts.

the requirement to obtain a license? Similarly, the Further Notice seeks comment on any responsibility that manufacturers, retailers, and distributors should have to notify customers about the licensing requirements or steps they could take ensure that low power auxiliary stations are not marketed to ineligible users. Should there be some form of responsibility or accountability placed upon one or more of these entities at the point of sale and, if so, what should it be? The Further Notice seeks comment, for example, on whether the rules should prohibit manufactures, retailers and distributors from selling or distributing low power auxiliary stations, including wireless microphones unless such sale is to a party that has committed in writing that the party is a bona fide reseller or a party eligible to be a low power auxiliary station licensee pursuant to Part 74 of the Commission's rules. In addition, the Further Notice seeks comment on whether manufacturers, retailers, or distributors could require a facility identification number associated with a Commission license, or some other form of identification which shows that the purchaser is a licensee. Another alternative would be for the manufacturer, retailer, or distributor to cross-check a purchaser against information, perhaps in a database provided by the Commission, to determine whether a purchaser is an eligible user.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

27. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance, rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.”⁵⁵

28. The Commission is considering the extent to which it should expand eligibility to allow more parties to obtain a license to operate wireless microphones under Part 74. It seeks comment on whether to expand eligibility to permit parties operating large theaters, entertainment complexes, sporting arenas and religious facilities to obtain Part 74 licenses because these applications are similar to others which are currently permitted under Part 74. The Commission also seeks comment on whether it should modify the eligibility requirements for a Part 74 license to include other entities that use wireless microphones, such as those operating at convention or trade shows, certain other cultural events, or governmental or educational institutions. The Commission is considering whether the expansion should be limited, because a broad expansion in eligibility for licensing under Part 74 could significantly reduce the amount of spectrum available for Part 15 TV band devices, which have to protect licensed Part 74 operations.

29. The Commission considered and decided to propose allowing wireless microphones to operate in the TV bands on a non-licensed basis under Part 15 of the rules. The proposed technical requirements are consistent with the current Part 74 technical requirements for wireless microphones, meaning that manufacturers should be able to certify equipment under Part 15 with few or no changes from currently available designs, thus minimizing the economic burden on manufacturers. This proposed approach would allow parties such conference and special events centers; schools and other educational facilities; Federal, state and local government agencies; tour guides; a variety of small entertainment venues, clubs and other social organizations, meeting and gathering places that are not currently eligible to operate wireless microphones in the TV bands to legally operate them. The proposed approach places Part 15 wireless microphones on a more equal footing to TV band devices in terms of interference protection.

⁵⁵ 5 U.S.C. § 603(c)(1) – (c)(4).

30. In seeking comment on whether any rules are necessary to ensure that purchasers of low power auxiliary stations that are certificated under only Part 74 of the rules are made aware of the Part 74 licensing requirements, the Commission will carefully consider alternatives that would mitigate the impact that such rules may have on small entities. Similarly, to the extent the Commission considers rules that would impose responsibilities on manufacturers, retailers, and distributors to notify customers about the licensing requirements or steps they could take ensure that low power auxiliary stations are not marketed to ineligible users, the Commission will seek to examine alternatives that would not be burdensome on small entities. The Commission seeks comment on whether there should be some form of responsibility or accountability placed upon manufacturers, retailers, or distributors, and it is considering a number of alternatives, such as requiring that (1) sales of equipment only be made to a party that has committed in writing that the party is a bona fide reseller or a party eligible to be a low power auxiliary station licensee pursuant to Part 74 of the Commission's rules; (2) a facility identification number associated with a Commission license, or some other form of identification shows that the purchaser is a licensee be developed; and (3) requiring a manufacturer, retailer, or distributor to cross-check a purchaser against information, perhaps in a database provided by the Commission, to determine whether a purchaser is an eligible user.

F. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rule

31. None.

**STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI**

Re: *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band*, WT Docket No. 08-166; *Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition*, WT Docket No. 08-167; *Amendment of Parts 15, 74 and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, ET Docket No. 10-24.

Today the Commission is taking necessary and essential action to complete the digital television transition, by requiring wireless microphone users to exit the 700 MHz Band by June 12, 2010. Our decision will accelerate the buildout of 4G wireless networks, and will prevent interference with first responders who rely on the 700 MHz Band for mission-critical communications.

In order to ensure that existing microphone users are aware of the June 12 deadline and their role in the transition, the Commission will also implement a major consumer outreach program, including a consumer-friendly Commission webpage on wireless microphones. The Commission is also requiring—for the first time—that manufacturers and retailers of wireless microphones provide clear notice to consumers about the basic terms and conditions under which they may use wireless microphones and how they may find out more information. Finally, the Commission is seeking comment on the long-term status of wireless microphones and other low-power auxiliary stations.

I thank my colleagues and their staff, as well as the staff of the Commission's Wireless Telecommunications Bureau, the Office of Engineering and Technology, and the Consumer and Governmental Affairs Bureau for their hard work on this important item.