



Talking Points

Title VI of H.R. 5252, *The Wireless Innovation Network Act*, Should Be Deleted or Significantly Revised.

On Feb. 17, 2009, an Act of Congress is turning off an analog television system that has served America for over 50 years. By then, all involved anticipate that it will be seamlessly replaced by the new and improved digital television system. That is our common goal.

America's broadcasters are doing all in their capacity to make that happen. Unfortunately, the Senate Bill, HR 5252, presently being considered which will govern this enormous change-over includes permission to allow technologies to operate within the broadcast spectrum-untested technologies-that most likely will cause interference to the new system.

More than twenty years of planning and testing, billions of dollars already invested are placed at risk to allow unproven and untested commercial users free entry. Please examine the issue. Do the right thing. Insure that the digital transition occurs seamlessly.

I. The Legislation Authorizes Millions of “Certified” Unlicensed Devices to Operate in the TV Band (Channels 2-51) in 270 Days.

Untested Technology: None of these unlicensed devices have been tested in the television band for interference. Spectrum sensing technology, that is supposed to prevent these devices from operating on an occupied TV channel, has *never* been tested in the TV band. Interfering signals will go through walls and may cause interference for miles.

Harms the DTV Transition: Interference occurs at a viewer's television set. Consumers will be spending billions of dollars purchasing new digital equipment between now and 2009. These unlicensed devices will cause interference to new digital TV sets and government-subsidized digital-to-analog converter boxes.

Harms Live News Reporting: The devices will interfere with licensed wireless microphones that are used by news departments to cover live, local news and sports events.

II. Bill Fails to Require Basic Testing *Before* Devices are Legally Authorized to Enter the Band. Government Should Not Legislate Entry Within 270 Days.

The bill gives legal status to unlicensed devices in 270 days without conducting foundational testing as to whether they should be placed in the band. The bill circumvents the traditional FCC process and ignores the scientific work being performed by IEEE, the leading engineering organization in the world. It tries to force the laws of physics by government fiat.

III. The Legislation's Proposed Certification Program Will Not Prevent Interference in the TV Band.

In an effort to avoid interference, the legislation requires that unlicensed devices be "certified" by the FCC. Relying on the certification process will not prevent millions of interfering devices from entering the marketplace.

Certification Will Not Prevent Interfering Devices From Entering the Market:

Manufacturers will simply sell products that do not comply with the rules. For example, NAB tested purportedly certified unlicensed devices used by consumers to transmit audio signals from their satellite radio or MP3 player to their in-dash car radios. Their tests showed that 13 of the 17 wireless devices (76%) exceeded power limits set by the FCC. Six of those devices exceeded the FCC field limit by 2,000%. One device transmitted a signal that was 20,000% stronger than allowed by FCC rules. Despite a certification program, millions of these interfering devices are now in the hands of consumers. The FCC has no ability to find or recall them.

Bill Fails to Require Independent Certification and Field Testing: The bill does not *require* testing that is independent of the manufacturer. Under the bill, the FCC *may* use independent testing. The FCC only tests approximately 10% of all the unlicensed devices used today. Most testing involves self-certification by the device manufacturers. Finally, the legislation fails to mandate that these devices be field tested before reaching the market.

Remote Shut Off Capability Must Be In Every Device: The bill requires that devices have remote shut off capability where they cause harmful interference. However, under the bill, determinations of harmful interference can only be made after the device enters the market. By then it's too late. All devices should have remote shut off capability.

Identification Codes Needed: The bill appears to recognize that the devices must include a means of disabling or modifying the device remotely. However, before a device can be disabled or modified, it must first be found. Accordingly, some form of identifier must be built in to each device.

IV. The Legislation Places Impossible Burdens on Consumers and Broadcasters to Detect and Prevent Interference.

Interference will disrupt TV reception in the home. *However, consumers are not eligible to file complaints under the legislation.* Moreover, it is impossible for consumers to know who or what is causing interference. And, those using unlicensed devices will have no idea they are causing interference.

To file an interference complaint, broadcasters must identify and track down millions of interfering devices throughout the areas they serve. This is an impossible task and will require an army of engineers and resources.

Interference to wireless microphones during live newscasts is problematic. There is no time to track down and correct interference during a live interview, especially during emergency situations.

V. The Legislation Fails to Prohibit Unlicensed Operation on Channels Next to Operating TV Channels (No First Adjacent Channel Operation).

Operating unlicensed devices on the first channel adjacent to an occupied TV channel will cause interference over a wide geographic area (up to 2500 feet). To protect consumers' television sets from interference, unlicensed devices must be prohibited from operating on the first adjacent channel.

VI. The Legislation Should Be Limited to Rural Broadband

While the legislation is justified based on the perceived need for unlicensed rural broadband services, it allows all types of unlicensed devices to operate in all TV markets. This legislation allows *any* type of device, from toys to wireless laptops, to operate in the television band. A \$29 toy will interfere with a \$1000 DTV set.

There is sufficient spectrum in rural areas to provide for unlicensed rural broadband services without causing interference to television sets. The FCC should examine and set aside spectrum for rural broadband services on a market-by-market basis.

CONSUMERS AND TELEVISION STATIONS ARE IN THE MIDDLE OF A VERY DIFFICULT AND EXPENSIVE TRANSITION TO DIGITAL. NOW IS NOT THE TIME TO INTRODUCE MILLIONS OF INTERFERING DEVICES INTO THE TELEVISION BAND. TITLE VI OF H.R. 5252 SHOULD BE DELETED OR SIGNIFICANTLY REVISED.



Detailed Briefing Paper

TITLE VI OF HR 5252: “WIRELESS INNOVATION NETWORKS ACT” SHOULD BE ELIMINATED OR SIGNIFICANTLY REVISED

I. HARMING THE DTV TRANSITION: UNLICENSED DEVICES WILL INTERFERE WITH DIGITAL TELEVISION SETS AND GOVERNMENT SPONSORED CONVERTER BOXES

A. Interference Undermines the DTV Transition

- Consumers have spent billions of dollars on new TVs and digital equipment. This amount will grow to the tens of billions of dollars in the next few years, as consumers prepare for the day that analog television broadcasts are terminated in 2009.
- The key challenge to the digital transition is to get consumers to accept the transition and purchase new digital televisions or digital-to-analog converter boxes. Interference to these receivers may result in consumers returning digital sets to the stores, which undermines the DTV transition.
 - Interference occurs to the *TV set in the home*. Even low powered (100 Mw) devices can overpower or interfere with a DTV receiver.
 - Because digital television is an “all or nothing” service, the impact of interference is dramatic. The picture freezes and the sound goes off. The signal is overwhelmed by the interfering signal and the picture cannot be watched.

B. Interference Will Undermine the Government’s Converter Box Program

- The federal government has allocated \$1.5 billion to subsidize over-the-air digital-to-analog converter boxes. A key objective is to keep the price of these boxes down. Unlicensed devices will interfere with these converter boxes, thereby undermining a key government program.

II. INTERFERENCE COVERS A WIDE GEOGRAPHIC AREA

- Unlicensed device proponents want broadcast channels because they have terrific coverage and the signals can go through walls. The same is true of interference from these devices. Interference, even from low powered portable devices, will extend over a wide area.
 - **Co-channel interference**: If an unlicensed device transmits on a channel being used for TV service, the **interference can range from 2 miles (indoor TV antenna) to 10 miles (outdoor TV antenna)**.
 - **Adjacent channel interference**: A low powered, 100 Mw portable device operating on the first adjacent channel could cause **interference up to 2500 feet from a television set in areas where there is a weak TV signal**.
 - **Out-of-band interference**: A study commissioned by MSTV and conducted by the *Canadian Research Centre* demonstrated that interference could occur up to **78 feet**. For a video demonstration of this study see: <http://www.mstv.org/static.html>.
- Harm Is Significant: Approximately, 19.6 million homes rely exclusively on over-the-air television signals; 73 million television sets are not connected to cable or satellites services; 6-8 million DTV sets with off-air tuners have entered the market.

III. PROPOSED TECHNIQUES TO AVOID INTERFERENCE ARE UNPROVEN

A. Spectrum-Sensing Technology Has Never Been Tested in the Television Band

- Proponents argue that spectrum-sensing technology, which allows the unlicensed device to find vacant channels, will solve the interference problem. This technology does not yet exist and has not been tested in the broadcast television band.
- IEEE, the world's leading engineering organization, is looking at this problem in the context of a fixed unlicensed service for rural areas. It will be testing a "fixed" broadband system this year. Because of technical complexities, IEEE has not developed standards for portable unlicensed devices.
- The Consumers Electronics Association study found that sensing the presence of a DTV signal inside a house on the first floor with an omni-directional indoor antenna *may not be feasible*.

- Devices with spectrum-sensing techniques will not be able to detect weaker broadcast signals, and will incorrectly assume that a channel is vacant even if it is actually occupied. This will lead to widespread interference.
- Other protection methods will not work. For a GPS system to work it must be able to see the satellites. An indoor device cannot see the satellites and therefore, standing alone, cannot effectively prevent operation on a used television channel. Channel location and mapping depends on “mapping” out the used television channels in each market. However, the list of used channels will not be fully known until the end of the digital transition.

B. Spectrum-sensing Technology Developed for Military Radar in the 5 GHz Band is Not Applicable to the TV Broadcast Band

- The spectrum-sensing technology developed for sharing with military radar cannot be readily applied in the TV broadcast band (channels 2-51). It took several years to develop technology for military radar, not 270 days.
- Compared to signals from military radar, broadcast signals are much weaker and difficult to detect. There is *no* evidence that spectrum-sensing technology designed for sharing with military radar systems can detect broadcast signals, especially indoors or where the broadcast signal is weak. Moreover, there is no evidence to suggest that this technology can detect low powered signals from wireless microphones.
- *Under the FCC rules for authorizing equipment, spectrum-sensing devices used to detect military radar frequencies need only be 80% effective. (The government wanted 90%, but that could not be achieved.)* Thus, for every million operating hours, 20% of the time (200,000 hours) these devices will be operating on an “occupied” channel. This may be acceptable for military radars, which are designed to be able to operate even when they’re being jammed. However, this level of interference to consumers’ television sets is unacceptable.
- With military radar, the transmitter and the receiver occupy the same location. Thus, sensing the radar signal tells the unlicensed device how far away it is from the military transmitter and the *radar’s receiver*. Broadcasting is different because TV sets are located in consumers’ homes throughout a market. Spectrum-sensing will not tell the unlicensed device its location relative to a consumer’s *TV receiver*. However, the location of the unlicensed device relative to the TV receiver is the key to resolving interference issues.

IV. TITLE VI, THE “WIN ACT,” DOES NOT PROVIDE SUFFICIENT PROTECTION TO AVOID INTERFERENCE TO DTV SETS

A. The Certification Process Will Not Prevent Interference

- The legislation relies on the Commission’s Part 15 equipment certification process to ensure interfering devices will not enter the marketplace. Once interfering devices enter the marketplace there is no realistic way to retrieve them.
- Certification will not prevent interfering devices from entering the market. Manufacturers will simply sell products that do not comply with the rules. For example, the NAB tested purportedly certified unlicensed devices used by consumers to transmit audio signals from their satellite radio or MP3 player to their in-dash car radio. These tests showed that 13 of the 17 wireless devices (76%) exceeded power limits set by the FCC. Six of those devices exceeded the FCC field limit by 2,000%. One device transmitted a signal that was 20,000% stronger than allowed by FCC rules. Despite a certification program, millions of these interfering devices are now in the hands of consumers. The FCC has no ability to find or recall them.
- If the “WIN Act” is enacted in its current form, it will be the first time the government has allowed millions of unlicensed devices to operate in a band where there are hundreds of millions of existing consumer receivers, *i.e.*, TV sets. Additional protections are necessary to protect consumers:
 - Independent testing should be required: A laboratory that is independent of the device manufacturer must conduct certification testing. The legislation states that the FCC *may* require independent testing. This should be made a requirement.
 - Field-testing must be required: Laboratory tests are necessary but not sufficient to ensure there is no interference. The bill does not require field tests. Field tests must be a requirement.
 - Identification codes needed: The bill appears to recognize that the devices must include a means of disabling or modifying the device remotely. However, before devices can be modified, they must be found. Accordingly, some form of identifier must be built into each device.
 - Remote shut off capability must be in every device: The bill requires that devices have remote shut off capability where they cause harmful interference. However, under the bill, determinations of harmful interference can only be made after the device enters the market. By then it’s too late. All devices should have remote shut off capability.

B. No Unlicensed Operation on First Adjacent Channels

- Operating an unlicensed device on a channel adjacent to an operational television channel can interfere with a TV set if it is operated up to 2500 feet of the television set. This is more than enough to cause interference throughout a neighborhood. *Unlicensed devices must be prohibited from operating on the first adjacent channel to full service stations, Class A stations, LPTV and translator stations.*

C. The Legislation Imposes an Impossible Burden on Consumers and Television Stations to Detect and Police Interference

- As drafted, only licensees may file interference complaints with the FCC. *Consumers may not file complaints.* Because unlicensed transmissions will interfere with a consumer's television set, the bill should be modified to allow consumer complaints against unlicensed device manufacturers and operators.
- Moreover, to file a complaint, "actual" harmful interference must be verified in the field. This seems to imply that a broadcaster must conduct some type of engineering analysis before the FCC can accept a complaint. This imposes an impossible burden on television stations. Consumers simply will not know where the interference is coming from and when it will occur. Licensees lack the resources to track down millions of interfering devices throughout their service area at all hours of the day or night.

D. FCC's Revocation Authority Must Be Extended

- Once a device is certified, the FCC has a 30-day window to receive petitions for reconsideration. If a mistake is made, the FCC can revoke the certification without a hearing during this 30-day period. After 30 days, the FCC can only revoke the certification after a hearing, and the hearing may take months or years. Given the potential harm, the FCC's authority to revoke the certification without a hearing should be extended well beyond the 30-day period.

V. PROMOTING RURAL BROADBAND IS NOT THE FOCUS OF THE LEGISLATION

- The provisions of Title VI go far beyond facilitating unlicensed rural broadband services. This bill allows *any* type of unlicensed device to be placed in the television band, including radio-controlled toys. The potential for millions of these devices to operate in the TV band makes it more difficult to police interference. A \$29 toy can interfere with a \$1000 TV set.

Moreover, if these devices enter the band first, they could harm subsequent deployment of devices that are designed for rural broadband services.

- There is TV spectrum in rural areas that, if managed properly, could be used for unlicensed wireless broadband without causing interference to TV viewers. With careful planning, this spectrum can be made available for rural broadband use without endangering television reception.

VI. GROUPS EXPRESSING CONCERN WITH THE UNLICENSED DEVICE PROPOSAL

A. Eight Leading Consumer Electronics Manufacturers Express Interference Concerns About Unlicensed Devices:

Sony Electronics, Inc; Panasonic Corporation of North America; JVC Americas Corp; Thomson, Inc; LG Electronics USA, Inc; Hitachi Home Electronics (America), Inc; TTE Corporation; and Samsung Electronics.

B. Trade Associations

National Religious Broadcasters: The key trade association representing all religious broadcasters has written to the committee expressing concern about interference to television sets and wireless microphones used in religious productions.

National Association of Broadcasters: The key trade association representing all broadcasters has expressed interference concerns.

Association of Public Television Stations: The trade association representing public television stations throughout the country has registered its concerns.

National Translator Association: The trade association representing television translators in rural areas throughout the country has registered its opposition and concern about placing unlicensed devices in the television band.

Community Broadcasters Association: The trade association representing the Class A low power television industry has registered its concern about interference from placing unlicensed devices in the TV band.

C. Engineering Organizations

IEEE: In filings before the FCC on this issue, the leading engineering standard-setting organization in the world has expressed concern about interference in the television band. The IEEE 802.22 working group is

working on a fixed broadband solution to facilitate the deployment of a rural broadband service.

Society of Broadcast Engineers: The leading professional society of broadcast engineers has filed a letter registering its opposition to placing unlicensed devices in the television band. SBE is concerned about interference to television receivers and interference to wireless microphones. SBE coordinates the use of licensed wireless microphones for newscasts, news events, and emergency situations throughout the United States.

D. News and Production Organizations

Radio and Television News Directors Association: This leading trade association of news directors registered its concern regarding interference to wireless microphones. These microphones are essential in providing live local news coverage as well as coverage during emergency situations.

News, Sports and Entertainment Production Coalition: *This coalition is made up of the major news and sports organizations in the country.* It includes the major professional sports leagues and the NCAA. The coalition's primary concern is the negative impact unlicensed devices will have on the ability to use wireless microphones and wireless video assist devices in the production of live news and sports programming.

E. Additional Parties Expressing Concern

Coalition for Spectrum Integrity: This coalition made of various trade associations and television broadcasters has registered concern with the FCC about placing unlicensed devices in the television band.

Univision: Spanish language broadcasters are uniquely affected by the proposal to place unlicensed devices in the television band. As a general matter, Hispanic audiences rely more on over-the-air television broadcasting to receive video programming. As a result, they are very concerned about interference to digital television receivers.

QUALCOMM: QUALCOMM has acquired the rights to operate on channel 55 throughout the United States. However, its operations are limited until the end of the digital transition. It is concerned that the interference caused by unlicensed devices will slow down the digital transition.

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June 21, 2006

The Honorable Ted Stevens
Chairman
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United States Senate
522 Hart Senate Office Building
Washington, DC 20510-0201

The Honorable Daniel Inouye
Co-Chairman
Committee on Commerce, Science and Transportation
United States Senate
722 Hart Senate Office Building
Washington, DC 20510-1102

Dear Chairman Stevens and Co-Chairman Inouye:

Let me take this opportunity to congratulate you on S. 2686, the "Communications, Consumers' Choice, and Broadband Deployment Act of 2006." Reshaping the Nation's communications landscape is a difficult task. The complexities of this legislation are enormous and your leadership is most appreciated.

Unfortunately, one part of the legislation, Title VI, the "Wireless Innovation Networks Act," will have the unintended consequence of creating significant interference to digital television receivers. Consumer confidence in digital television reception is a key element in moving forward with the digital transition. We are concerned that the potential for interference to newly acquired digital television sets, and the government-subsidized digital-to-analog converter boxes may place this progress in jeopardy.

The purpose of Title VI is to facilitate the deployment of wireless broadband services in underserved rural areas. The television broadcast industry supports the goal of bringing broadband to those in underserved rural America. We are willing to work with the Committee to craft solutions to this problem, without endangering reception to free over-the-air digital television. There is sufficient spectrum in rural areas to facilitate the deployment of broadband services without jeopardizing the ability of television viewers to receive digital television signals.

Unfortunately, the provisions of Title VI go far beyond promoting rural broadband. As drafted, the bill would allow *any* type of unlicensed use including radio-controlled toys, cordless telephones, and wireless game controllers in all markets across America. In many instances, these unlicensed "toy" devices are likely to significantly

increase interference with television receivers. Ironically, once deployed, these same ubiquitous unlicensed “toy” devices may make it more difficult to use the spectrum for the very broadband operations sought by the legislation.

Interference to consumers’ digital television receivers is our primary concern. Unlicensed devices will be placed in the permanent core TV band, channels 2-51, that local stations will use *after* the digital transition. As a matter of physics, any device transmitting energy in the TV band has the potential to interfere with both digital television sets and the government subsidized digital-to-analog converter boxes. The key issue is whether the legislation effectively prevents such interference from occurring. Despite the best intentions, the legislation as drafted will not prevent or effectively remedy interference.

The legislation relies on the FCC’s certification process to prevent interfering devices from entering the marketplace. Unfortunately, this process is far from perfect. In point of fact, the FCC itself approves less than 10% of all equipment, with the vast amount of equipment approved by industry laboratories. ***Ironically, the legislation does not require independent laboratory testing. It does not even require field-testing.*** These critical components are discretionary under the bill.

In other contexts a significant number of the unlicensed devices certified by the FCC have been found to be non-compliant and transmitting at power levels far in excess of authorized limits. Most recently, numerous complaints have been filed with the FCC about interference caused by unlicensed radio devices previously certified by the FCC that are used in connection with satellite radio services. However, millions of these devices are already in the hands of consumers, and it is impossible to reclaim or to turn them off. There are many other similar examples of where inappropriate equipment was allowed into the market under this “rigorous” certification program. This problem merely foreshadows what will happen in the TV band.

The reality is that proponents of unlicensed devices have not undertaken the scientific work to test such unlicensed devices and show that they will not cause interference to licensed broadcast operations. American consumers and broadcasters are merely expected to take it on faith that such non-interfering devices can be built without first testing them and determining that they in fact will work. This is the first time the government will have authorized higher powered unlicensed devices to operate on frequencies already occupied by hundreds of millions of consumer devices, *i.e.*, television sets.

While proponents would have the Committee believe otherwise, in fact, ***research and development and laboratory and field-testing ought to precede the establishment of technical rules by the FCC.*** Billions of dollars were spent by the academic, broadcast, and electronics industries on the testing and research and development that went into the DTV standard *before* the FCC had rules in place for its use. Significant research by the FCC and the TV industry took place before the FCC established rules for cellular radio,

low power FM, MVDDS, and many other services. There is no reason to sidestep this deliberate, scientific approach. However, the legislation does just that -- authorizing unlicensed devices to enter the band in 270 days, and then relying upon the FCC's certification process in the hope of avoiding interference.

The leading engineering standards body in the world, the IEEE, has been pursuing the potential of using the "white spaces" for the provision of broadband services. Leading members of the electronics and communications industry, including Motorola, Thomson, Philips, Samsung, France Telecom, and ETRI, have developed a proposed standard, and the IEEE is currently evaluating and testing this standard to ensure that it will both provide adequate broadband service and not cause interference to licensed operations. This valid and sound engineering approach to developing appropriate unlicensed rules and regulations should be allowed time to do the necessary testing of this broadband technology, and should not be circumvented by allowing unproven unlicensed toys and other devices into the broadcast band in 270 days before testing is complete.

As drafted, the legislation's enforcement process is insufficient to resolve interference problems. Consumers receiving interference on their TV sets are unlikely to know the source of interference, and those consumers using unlicensed devices will not realize they are causing interference. As a result, interference will often be impossible to detect and police. In this regard, the legislation's enforcement provisions are inadequate. The following highlights some of the major problems:

- **Consumers Are Not Eligible to File Interference Complaints:** Despite the fact that interference will occur on television sets in the home, only "licensees" may file an interference complaint.
- **Impossible Enforcement Burden Placed on Incumbent Licensees:** The bill requires that all complaints be verified in the field. Unlicensed devices can continue to operate until "harmful" interference is verified in the field. In other words, licensees must identify and track down millions of interfering devices. This is an impossible task for broadcasters or any other licensees. It will require an army of engineers and resources.
- **No Identification Codes:** The legislation does not require each unlicensed device to transmit an identification code, making it impossible to track down an offending device.
- **Remote Shut Off Not Required for All Devices:** The bill requires a device to contain a "remote shut off" only if it is determined that the device will cause interference. Depending on the location of its use, any device can cause interference. However, the legislation seems to contemplate that certain devices will not need a remote shut off. In these situations interference determinations will be made after the device has entered the market. By then it's too late.

- **No Operation of First Adjacent Channels:** Operating unlicensed devices on the first adjacent channel next to an operating TV channel will cause interference to surrounding TV receivers over a wide area. The legislation does not preclude unlicensed devices from operating on these channels.

The federal government has mandated the transition from analog to digital TV. This transition has required broadcasters to spend billions of dollars converting their stations from analog to digital transmissions. Consumers will spend even more -- tens of billions of dollars on new DTV receivers. For example, if the over 100 million television households spend an average of \$500 on new DTV receivers, this amounts to an investment of over \$50 billion by consumers. This federally mandated investment must be protected from interference from unproven unlicensed technology and should not be jeopardized so that a few large companies can sell chips to be used in toys and games.

Ensuring that the United States is a global leader in the provision of broadband services is a worthy goal. We believe, this goal can be accomplished, especially in rural markets, without causing interference to new digital television receivers and converter boxes. Unfortunately, the legislation goes far beyond promoting rural broadband. It will lead to interference in all markets. Jeopardizing the important benefits of a successful DTV transition to permit unlicensed toys and games is not an appropriate public interest trade off.

I respectfully request that you consider making significant changes to the legislation as the bill moves forward. Significant, additional real world testing is required before unlicensed operations should be authorized to enter the TV band. Further, given the lack of research activity by the proponents of these devices, broadcasters do not believe that it is unreasonable to request waiting until after the DTV channel allotment process is completed by the FCC, and the actual frequency assignments that must be protected are known.

Our desire is to find a solution that will bring broadband to underserved Americans while ensuring that consumers' and broadcasters' investments in the DTV transition are protected. We look forward to working with you and members of the Committee. Together we can find solutions to facilitate rural broadband deployment, while proceeding with the engineering work necessary to avoid interfering with consumers' digital television receivers.

Sincerely,

/s/ David Donovan

David L. Donovan
President

CC: Members of the Senate Committee on Commerce, Science and Transportation



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August 2, 2006

The Honorable Bill Frist
Senate Majority Leader
S-230 Capitol Building
Washington, DC 20510-7010

The Honorable Harry Reid
Senate Minority Leader
S-221 Capitol Building
Washington, DC 20510-7020

Dear Majority Leader Frist and Minority Leader Reid:

On behalf of the more than 20,000 members represented by the National Academy of Recording Arts & Sciences, I am writing you to express our serious concerns with one section of the pending Senate telecommunications legislation (H.R. 5252) as reported by the Senate Committee on Commerce, Science, and Transportation. Title VI (Wireless Innovation Networks) would have a significant negative impact on our members' ability to continue to deliver high quality concert experiences to their fans. While we applaud the efforts of the telecom act and hope it will be brought to the Senate floor, we urge the Senate to strike Title VI until further study can resolve the impact to the arts community.

As a membership organization dedicated to advancing the lives of music makers, the Academy goes to great lengths to cultivate the cultural life of the nation. Music creators and their fans deserve a top-shelf audio experience as part of the overall concert production. Wireless microphones are a central component in our efforts to deliver consumer satisfaction in this area.

As an Academy of arts *and sciences*, our reliance on technology is a major reason why we are concerned about Title VI in H.R. 5252. As currently drafted, the proposed section would allow millions of new and potentially interfering devices to operate in the TV spectrum band (where wireless microphones currently operate) in a mere nine months from the date of enactment – despite the complete lack of any field tests to demonstrate that such devices will not interfere with wireless microphones, or even over-the-air television broadcasts. As Illinois Senator Richard J. Durbin said recently “the FCC and other technical experts ... [must be] allowed sufficient time to thoroughly study and resolve serious interference issues before new services are allowed to be turned on.”

Moreover, the Senate language provides only the thinnest of interference protections for incumbent services like wireless microphones. An “after-the-fact” FCC complaint process

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is, at best, unworkable and would expose our industry to significant new risks of low-or-no quality audio due to new "wireless audio congestion."

Based on all of the aforementioned reasons, the Recording Academy urges the Senate to strike Title VI from H.R. 5252 and revisit the issue in a later Congress when the engineering experts have had sufficient opportunity to iron out all of the potential interference-related issues.

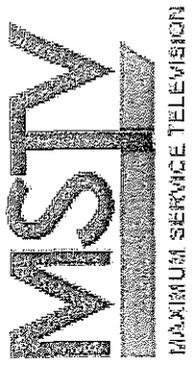
Kind regards,



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Unlicensed Devices in the Television Band

April 12, 2006

Problem

- Interference is caused to consumers' **TV receivers**
- Can't control locations of unlicensed devices or TV receivers
- Can't prevent an unlicensed device from being too close to **TV receiver**

Potential Interference

- **Out-of-band interference**
 - §15.209 limits not sufficient to protect TV operations
 - CRC measurements show **interference at 78 feet**
- **Adjacent channel interference**
 - §73.623 adjacent channel protection limits also required for portable devices
 - 100 mW portable device could cause **interference at distances of 2500 feet**
- **Co-channel interference**
 - If unlicensed device inadvertently transmits on a channel being used for TV service – **interference range of 2 miles (indoor TV antenna) to 10 miles (outdoor TV antenna)**
 - Intel “maximum interference protection range” for 100 mW portable device is 8 km (5 miles). In other words, a potential **interference area of 75 sq. miles!**

Why Can't Adjacent Channels Be Used

- Let's look at a simple model
 - Required adjacent channel protection is D/U of -26 dB (§73.623)
 - DTV service contour is 41 dBu (§73.625)
 - Assume unlicensed device at 100 mW (much less than FCC proposed)
 - Free space propagation model

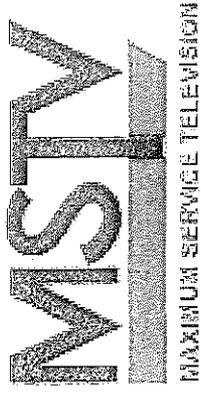
100 mW unlicensed device can cause interference to adjacent channel DTVs up to 780 meters away!



1st Adjacent Channels Can't be Used Without Causing Interference

Unlicensed Device Power	DTV Signal Strength	Interference to DTV Reception
100 mW	41 dBu	780 meters
	59 dBu	100 meters
	69 dBu	30 meters
400 mW (portable device limit with antenna gain)	41 dBu	1560 meters
	59 dBu	200 meters
	69 dBu	60 meters

Note: Grade B signal is 41 dBu and signal required for community of license is 48 dBu.



Spectrum Sensing

Comparison Between 5 GHz and TV Band

5 GHz Spectrum Sensing

- 5 GHz unlicensed devices are only required to detect **strong** radar signals (-62 to -64 dBm)
 - signals are well above receiver sensitivity level and 1000s of times greater than needed to protect TV
- Radar receiver and transmitter are co-located
 - sensing transmitter signal protects receiver
- 5 GHz unlicensed device is required to **detect** radar signal **only 80% of the time**
- **Sensing standards thoroughly tested before devices authorized**

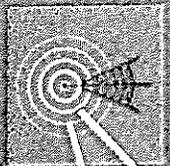
TV Band Spectrum Sensing

Protecting TV reception is fundamentally different technical problem than 5 GHz

- Need to protect consumers TV receivers
- Need to detect at very low levels
 - Receiver performance differences of TV and unlicensed device
 - Hidden Node problem
- Need to detect correctly 100% of time
 - Every failure potentially can cause 75 square miles or more of interference!

Worst Case Hidden Transmitter Scenario

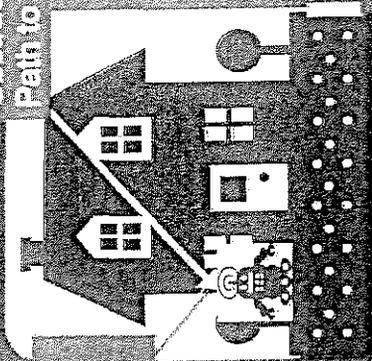
Low probability for detection of occupied channel



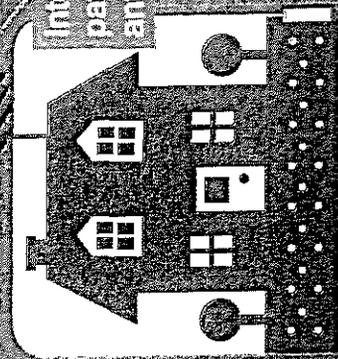
Broadcast Station

Unobstructed path to TV -10 dB antenna

Heavily Obstructed Path to CR



Interference path to TV antenna



Co channel avoidance

- DTV D/U ratio -23dB gives moderate interference range therefore detect and avoid
- Detect some feature of Broadcast TV signal
 - Pilot tone, frame sync (DTV)
 - Video carrier, line sync (NTSC)
- Indoor CR scenario (*Hidden Transmitter Problem*)
 - Low antenna gain (0 versus 10 dB)
 - Low antenna height (2 versus 10 m)
 - Building losses (Average 5.7, SD 8.6dB)
 - Multipath (4 to 19 dB)

intel

Low detection threshold

6



Let's Use Intel's Example

Minimum Useable DTV Signal Strength	-83 dBm	
Required Protection Ratio (dB)	-23 dB	
Difference in Antenna Gain (dB)	-10 dB	
	Intel's "very conservative" proposal	Numbers from Intel's slide example
Difference in Antenna Height (dB)	-23 dB	-7 dB
Building Losses (dB)		-5.7dB (8.6 dB SD)
Multipath Losses (dB)		-19 dB
Detection Signal Level	-118 dBm	-126.7 to -135.3 dBm

TV Band Spectrum Sensing

- Sensing will **not** reliably tell you where you are!
- -118 dBm provides only 18 dB of margin for all signal degradation effects
 - Usable DTV signal (-83 dBm) & (-17 dB antenna gain and height differences)
 - Clearly **Not** sufficient for hidden node problem
- Intel proposal of -118 dBm for sensing **will result in** unlicensed devices operating on non-vacant channels and causing **significant interference to TV viewers**

What Does Intel Say If Sensing Is Wrong?

- Intel states:
 - “Free space interference range (of a 100 mW low power unlicensed device) outside of the Grade B service contour is 8 km (5 miles)” (Intel comments)
 - “maximum interference range required for operation of new wireless “personal/portable” devices is 8 kilometers, resulting in exclusion ranges far less than those of high power “fixed/access” services. (Intel replies 7-8)
- **A potential interference area of more than 75 square miles!**

Future Objectives-Technical

- **Field evaluation of detection reliability**
- **Reduce false detection**
- **Alternative TV detection techniques**
- **Detection techniques for other waveforms**
- **Develop requirements for international TV bands**
 - **Channel Spacing**
 - **OFDM for DTV**
 - **Legacy PAL, Secam & NTSC systems**

intel

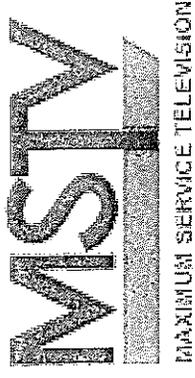
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TV Band Spectrum Sensing

- After two years, no “sensing” technology **field studies** or proof have been submitted to FCC showing that “feature detector” or other technology can reliably detect TV signals even at these unacceptable levels
- IEEE 802.22 evaluation and testing of fixed broadband system to start this year

Technical Bottom-line

- **FCC unlicensed approach not ready**
 - Actual interference performance of DTV sets have not been measured
 - Can't use adjacent channels for fixed or portable unlicensed devices
 - FCC out-of-band limits needs to be tightened
- **Sensing in TV band needs to be tested and proven**
 - No field tests of appropriate sensing levels
 - No testing of sensing reliability
- **Can't legislate a technical solution**
 - Probability of a mistake is high



Proposed Legislative Language for S-2332

Proposed Changes to S2332

- Limited use to wireless broadband devices on a non-interference basis after the DTV transition (Feb. 17, 2009)
- Fully protect licensed services
 - No operation on 1st adjacent
 - Tighten out-of-band emissions
- Promptly remedy complaints by modifying or disabling unlicensed devices
- Unlicensed devices must include the capability of being disabled remotely by manufacturer
- Require FCC certification and field testing of all unlicensed devices prior to deployment

From sportsvideo.org

TOP STORIES

DC legislation to allow unlicensed devices threatens wireless audio, video industry

By Ken Kerschbaumer
Apr 6, 2006, 04:58 PM

DC legislation to allow unlicensed devices threatens wireless audio, video industry
Apr 6, 2006, 04:58 PM

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During the past 30 years the broadcast sports, news, and entertainment industries have come to rely on wireless audio and video technologies to tell more compelling stories and keep the public informed of emergency situations. Without wireless ENG the world would never have seen live aerial images of the devastation of Hurricane Katrina or on-the-street reports from lower Manhattan on Sept. 11.

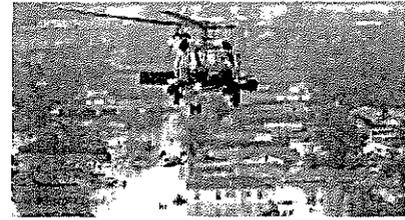
But a flurry of recent bills proposed in both the Congress and the Senate are looking to allow unlicensed wireless devices to be used in "White Spaces" threaten the future of not only wireless ENG but any other service that relies on wireless transmission. In the sports industry, for example, live video from in-car cameras during a NASCAR race, shots from a blimp flying over a stadium, or even a simple interview with a fan in the stands would become a thing of the past if any of the bills are passed.

And that's only the beginning. Professionals who need reliable wireless communication, from a football quarterback, to a security guard, or a football referee, will need to find other means to communicate.

"It would be like the wild, wild west," says Glenn Adamo, VP of media operations for the National Football League of the prospect of unlicensed devices being added to the mix. "We would prefer frequencies be coordinated and we have coordinators in each city who maximize the number of users on the spectrum even though there isn't enough to go around. The last thing any league would want is for unlicensed devices to be allowed."

There are currently three pieces of legislation on the books. In February 2006 Senator Ted Stevens (R-AK) introduced the American Broadband for Communities Act (S. 2332) and Senator George Allen (R-VA) offered up the Wireless Innovation Act of 2006 (S. 2327). Both bills require the FCC to issue an order within 180 days of enactment to allow unlicensed devices to operate in unused broadcast channels. And just this week Congress got into the act as Rep. Jay Inslee (D-WA), Marsha Blackburn (R-TN) and Tammy Baldwin (D-WI) introduced legislation that was identical to the Stevens bill.

Stevens says that broadcasters are allocated hundreds of MHz of spectrum to provide television service across the country but that in any one market some of the spectrum goes unused.



"Some studies have indicated that there is more than 150 MHz of spectrum in Anchorage, Alaska, and Honolulu, Hawaii, that could be used by unlicensed devices for wireless services," he says. "Even in large cities like Boston and Chicago it is estimated that nearly 50 MHz of spectrum goes unused."

Plans to allow unlicensed devices on white space spectrum could interfere with emergency communications and live helicopter video during events like Hurricane Katrina.

The goal of the legislation, says Stevens, is to make it easier for companies to offer broadband services to consumers. "Allowing unlicensed operations in the broadcast band could play a significant role in bringing wireless broadband and home networking to more of our citizens by lowering costs, particularly in Alaska where connectivity is so important due to our remoteness," he says.

While the vision sounds great on paper the concensus among spectrum experts, broadcasters, and manufacturers is that it just won't work. "In the past things that didn't play well together in the spectrum were kept apart," says Jeff Krull, Sennheiser VP of product development. "And that worked well. But the new proposals open up some very real interference problems for devices that operate in those frequencies."

Stevens' bill does acknowledge potential problems and it calls for the FCC to craft technical requirements for unlicensed devices in the broadcast band that would protect broadcast stations. In addition, the legislation urges the FCC to further establish an interference complaint resolution process for broadcasters. "I believe that the requirements in the bill will give the broadcasters additional protection while allowing more efficient use of the valuable broadcast spectrum, which is an invaluable public resource," said Stevens.

A fundamental flaw in that approach, says Krull, is that devices operating on different power levels might think the same piece of spectrum is free when it really isn't. "You'll see Blackberry's interfering with microphones and Blue-Tooth devices crashing into WiFi and cordless phones," says Krull.

"The notion that smart technology can solve everything when there has yet to be a smart technology solution that has proven effective is absurd," says Jeanne Walsh Stockman, who represents Shure Bros. at the Washington, DC firm Bingham McCutchen, LLP. "Shure advocates that Congress not rush to judgment and instead let the engineers do their job and work out a technical solution. There's too much at risk."

Sen. Stevens is expected to roll his white spaces bill into a larger piece of

telecommunications legislation that will be introduced following the Easter break. The larger bill is expected to address issues like Internet neutrality and universal service, among other items.

With legislators increasingly intent on broadening wireless access members of the broadcast community believe the industry needs to make its concerns clear. "Everyone in the broadcast industry needs to contact their Senators and Congressmen to urge them to never allow for unlicensed devices to be allowed in TV white space spectrum," says Dave Donovan, president of Maximum Service Television.

Donovan says allowing unlicensed devices into white spaces will also cause interference with over-the-air television reception. "You could be in an apartment and the person upstairs could use a wireless device and prevent you from receiving a TV signal," he explains.

Next week MSTV has scheduled meetings with the House and Senate staff to make its concerns clear. They'll take place on April 10, 11, 12, 13, and 17. Anyone interested in attending should contact Susan Baurenfeind with MSTV via email at sbaurenfeind@mstv.com for more details.

Ardell Hill, Media General Broadcast Group SVP of Broadcast Operations, the wireless needs for broadcasters and networks at events, whether political conventions, sports or news in general, are simply too important to both the broadcaster and the viewer. "Wireless devices are not just a luxury," he says. "Today they're essential to telling the story."

The new legislation compounds an already difficult ENG wireless situation for broadcasters. Broadcasters today are losing the majority of the spectrum they rely on for ENG use because Sprint Nextel is giving up some of its spectrum on the 800 MHz frequency band and moving to the 2 GHz band currently used by broadcasters. Because the 2GHz band has less bandwidth than the 800 MHz band Sprint Nextel is spending approximately \$500 million on digital microwave gear that will help fit more stations into the bandwidth.

"We're already being forced to compress spectrum that is already crowded," says Hill. "And while technology does allow us to create the same number of channels we didn't have enough channels to begin with."

Ken Aagaard, CBS Sports SVP, operations and production services, says who has rights to bandwidth will be an ongoing question for a long time, particularly as the U.S. becomes more of a wireless society. "But no one group can solve the problem-not the government, the FCC, the broadcasters, or the equipment manufacturers. Serious talks are going to have to take place because right now there are two trains on a collision course."

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April 17, 2006

The Hon. Ted Stevens
U.S. Senate
Washington, DC 20510

Dear Senator Stevens:

On behalf of the Radio-Television News Directors Association (RTNDA), I am writing to express concerns about two bills that are pending before the Senate Commerce Committee — S. 2322, the “American Broadband for Communities Act” and S. 2327, the “Wireless Broadband Act of 2006.” While both bills promote important public policy objectives, because they authorize the use of unlicensed devices in the broadcast television band, they will have the unintended consequence of significantly impairing the ability of electronic journalists to cover live news events, particularly during emergency situations.

Among the most important tools for covering breaking news are wireless microphones and wireless video assist devices, which are licensed by the FCC. These are “low powered” devices that operate on the so-called “vacant” television broadcast channels in a market. Unlike unlicensed devices, however, the frequencies these licensed wireless microphones use are subject to extensive frequency coordination.

In each market throughout the country, television, radio and cable news departments are assigned specific frequencies by frequency coordinators. As a result, when news teams are sent out to report on unfolding events and emergencies, the equipment they use does not interfere with the equipment used by others. This pre-coordination is vitally important when emergency situations arise and wireless microphones must work immediately. As “first informers” during critical situations—many involving health and safety—the ability of RTNDA’s members to disseminate information to the public cannot be compromised by equipment that is subject to interference.

Pre-assigned frequencies are also essential to coverage of planned major news events such as political conventions, or sporting events. Large events often require the coordination of several hundred wireless microphones. It can take months of coordination to provide quality coverage.

The fundamental problem with the bills is that they authorize the use of unlicensed wireless devices on the same channels that news departments currently use for licensed wireless microphones and wireless video assist devices. There is little doubt that these unlicensed devices will interfere with the equipment used by electronic journalists.

Proponents of unlicensed devices argue that "spectrum sensing" devices will avoid interference. Studies conducted by SHUR, the major manufacturer of licensed wireless microphone equipment, however, demonstrate that unlicensed devices would, in fact, cause harmful interference to wireless microphones. To the best of RTNDA's knowledge, there is no real world device that is capable of sensing low power devices like wireless microphones. It is RTNDA's understanding that IEEE, the world's leading engineering organization, is in the process of studying the issue now.

RTNDA believes that the legislation will result in millions of devices entering the band, overwhelming the current system. Because they are unlicensed, it will be impossible for professional frequency coordinators to assign frequencies to news departments and provide electronic journalists with any kind of assurance that their wireless microphones will work once they are on-scene. News crews may start their reports, only to discover that their wireless mics have cut-off. The flow of information could suddenly cease during a live newscast or when government officials are relaying important life-saving information.

With millions of devices in the marketplace, it is likely that news crews will have no idea where interference is coming from and that those using unlicensed devices will not realize that they are causing interference. With the interference potentially coming from hundreds of different devices operating in the area of the news crew, it will be difficult if not impossible to correct any interference problems encountered at all, much less quickly.

RTNDA's members provide the American public with immediate and accurate coverage of news events. The role of electronic journalists is critically important during emergency situations where they provide real-time, sometimes life-saving information. The ability of electronic journalists to serve the public in this manner must not be impaired. Accordingly, I urge you to proceed with the utmost caution and not to authorize unlicensed devices in the television band at this time. These devices must be thoroughly tested in both the laboratory and the real world *before* they are permitted to operate in the band.

Sincerely,



Barbara Cochran
President

**NEWS, SPORTS AND ENTERTAINMENT PRODUCTION
COALITION**

March 11, 2005

The Honorable Michael Powell
Chairman
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

RE: ET Docket 04-186 (unlicensed use of TV broadcast bands)

Dear Chairman Powell:

We are concerned about the future of our newsgathering and live sports and entertainment coverage operations. Tens of millions of Americans rely on, and have come to expect, high quality production in live news, sporting and entertainment events. The ability of local radio and television stations, broadcast networks and cable networks to provide a good quality product has been in jeopardy for quite some time. But the Commission's proposed plan in the above-captioned docket to allow new users in the broadcast spectrum poses the most severe threat yet. We ask that before the Commission make any determinations in this docket that it first initiate a rule making proceeding that seeks to dedicate spectrum to services relied upon by those in live newsgathering, sports and entertainment production and broadcast and cable delivery.

The undersigned are representatives of local radio and television stations, broadcast networks, cable networks, sports leagues, news operations, video production companies and manufacturers (as well as trade associations whose members include those entities) actively involved in the production of sporting and news events for the benefit of American television viewers (collectively the "News, Sports and Entertainment Production Coalition"). We have always supported an approach to spectrum policy that marries innovation with respect for the goals and requirements of both established and emerging services. But it is becoming nearly impossible to do our jobs in the face of diminishing spectrum in the Broadcast Auxiliary Service (BAS). We are specifically concerned that the Commission should not allow higher power Part 15 devices to operate on so-called "unused" TV channels, because of the interference and denial of service threats that would be caused to licensed, Part 74, Subpart H, Low Power Auxiliary stations.

At this point, the television channels assigned for use by wireless microphone and wireless video assist devices are highly congested in all metropolitan areas. Interference is the inevitable result of further overcrowding of these existing channels.

Advances in digital technology are not a solution to this problem because digital technology is already being incorporated in wireless microphone use. The limited allocations remain severely overcrowded. The channel bandwidth has been reduced thereby, but the number of channels is nonetheless far too small. The problem is that there are no other bands for wireless microphones available for use in most markets across the United States for providing coverage of breaking news, outdoor sporting events and live entertainment events, in the manner that the public has grown accustomed to viewing.

We believe that the FCC has overlooked the impact of higher power Part 15 devices on so-called "unused" TV channels to Part 74, Subpart H, Low Power Auxiliary stations. These include widely used wireless microphone stations, which operate on the ever scarcer locally vacant VHF and UHF TV channels. Spectrum for wireless microphones and wireless video assist devices, which operate in unused UHF television channels, has been reduced dramatically by use of those channels for DTV, and the loss of UHF channels 52-69. The small guard bands remaining would not be enough by any means. The wireless microphone is one technology that may not necessarily benefit from a move to digital technology. As licensed, Part 74 stations, they are entitled to protection from interference from unlicensed Part 15 devices. We recommend that a permanent and exclusive spectrum allocation be made for these devices so that they can be used reliably in the future.

Wireless microphones are extensively used by broadcasters and cable programmers in support of sports events and electronic news gathering (ENG) operations, and because ENG venues are ever changing, it appears that even "cognitive" or "smart" higher power Part 15 devices attempting to also operate on locally vacant TV channels would never be able to know the location of licensed wireless microphones. Further, because FM wireless microphones do not transmit continuously, but rather only when needed at a news or sporting event venue, allowing higher power Part 15 devices to share the same spectrum could create a denial of service problem to the licensed, higher-priority wireless microphone stations. Licensed users could easily be placed at the mercy of an unlicensed Part 15 device, waiting for the Part 15 device to momentarily "power down."

In most major metropolitan areas there are virtually no vacant TV channels, due to those channels also being used by DTV, Class A, TV translator, LPTV, and some point-to-point TV translator relay stations. The drastically reduced number of "unused" TV channels makes it all the more likely that higher power Part 15 devices operating on TV channels would cause interference to, or denial of service problems to, higher-priority, licensed, stations. If the Commission were to grant the use of broadcast spectrum to unlicensed devices, we could have situations in which: a local radio or TV station or cable news channel covering a local emergency, such as the hurricanes in Florida, would

suddenly lose the picture and audio of its reporters on the scene; interviews with athletes and coaches would be lost and irretrievable, as would be referee calls and coaches' communications with each other during a game; and live news interviews of public officials and others at breaking events might also be lost. The flexibility and creativity that wireless microphones and wireless video assist devices bring to production is invaluable.

In conclusion, we understand the goals of broadening the uses of spectrum, but we ask that you first consider our plight and seek to address it before going forward in this proceeding. We request that you initiate a rule making proceeding that seeks to dedicate a portion of spectrum to devices we use to bring live sports, news and entertainment to American viewers in their homes.

We would appreciate the opportunity to provide further information and demonstrations of the issues discussed above to you and your staff.

Sincerely,

Stacy Brady
Vice President, Field &
Satellite Operations
NBC Network News

Jeffrey Birch
Vice President of Engineering
Viacom Television Stations Group

Shaun Sheehan
Vice President
Tribune Company

Glynn Walden
Senior Vice President, Engineering
Infinity Broadcasting

Barbara Cochran
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<p>Frank Governale Vice President, News Operations CBS News</p>	<p>Justin Smith Vice President of Legal Affairs The Golf Channel</p>
<p>Steve Kaufman Senior Vice President, Production, Operations & Technology MTV Networks Inc.</p>	<p>Russell Gabay Executive Producer Major League Baseball International</p>
<p>Michael S. Meehan VP, Sports Operations & Production Planning NBC Universal</p>	<p>Michael Cohen Executive Producer Major League Soccer</p>
<p>Peter Homes Director of Broadcasting & Recording IBEW</p>	<p>Gunther Meisse President Mid-State Television, Inc. WMFD-TV DT Mansfield, Ohio</p>
<p>Daniel L. Brenner SVP, Law and Regulatory Policy NCTA</p>	<p>Dean Hinson President Morris Network of Mississippi, Inc. WXXV-TV DT Gulfport, Mississippi WCBI-TV, LLC WCBI-TV DT Columbus, Mississippi Morris Network, Inc. WMGT-TV DT Macon, Georgia</p>
<p>Gil Kerr Senior Vice President, Broadcasting, Programming & Production PGA Tour</p>	<p>Gunter Marksteiner Individual Licensee and Chief Engineer WHDT-DT Stuart, Florida</p>
<p>Steve Hellmuth SVP, Operations and Technology NBA Entertainment</p>	<p>John Tortora Director, Team Television and Business Affairs National Hockey League</p>
<p>David Donovan President MSTV</p>	
<p>Greg Shaheen VP, Division I Men's Basketball NCAA</p>	

Frank Hawkins
Senior Vice President, Business Affairs
National Football League

Ahren J. Hartman
Technology Director
Shure Incorporated

Edgar C. Reihl, P.E.
Technology Director
Shure Incorporated

cc: Commissioner Kathleen Abernathy
cc: Commissioner Jonathan Adelstein
cc: Commissioner Michael J. Copps
cc: Commissioner Kevin J. Martin



Dennis Wharton

Senior Vice President, Corporate Communications
1771 N Street NW • Washington, DC 20036

NAB recently performed a series of tests on 17 wireless FM modulator devices that are currently on the market today. These devices are used by many consumers to transmit audio signals from their satellite radio or MP3 player to their in-dash car radio. Our tests showed that 13 of the 17 wireless devices (76%) exceeded field strength limits set by the FCC. Six of those devices exceeded the FCC field limit by 2,000%. **One device transmitted a signal that was 20,000% stronger than allowed by FCC rules.** Many of the devices also transmitted signals that were substantially wider in bandwidth than permitted by the FCC, resulting in potential interference to 1st and 2nd adjacent channels as well.

NAB has sent letters to both FCC Chairman Martin as well as Senate Commerce Committee Chairman Ted Stevens and Co-Chairman Daniel Inouye notifying them of these results. This timely study raises many questions about the operation of wireless transmitter devices in broadcast spectrum and should be taken into account when considering any "white space" legislation that would permit unlicensed device operation in TV spectrum.

A full copy of the report can be viewed and downloaded by clicking [here](#).

If you have any questions, please contact me at (202) 429-5350.

Regards,



Dennis Wharton

A Report To
National Association of Broadcasters
Regarding Study and Measurements of
Part 15 Devices Operating in the
FM Broadcast Band

June 2, 2006

Prepared By:



Meintel, Sgrignoli, & Wallace

Dennis Wallace, C.B.T.E.
Meintel, Sgrignoli, & Wallace
1282 Smallwood Drive
Suite 372
Waldorf, Maryland 20603
(202) 251-7589

Background:

Increasingly, broadcasters are receiving complaints from listeners that their FM receivers are intercepting unwanted transmissions from nearby Part 15 devices being used with Satellite radio and MP3 players such as iPods. In particular these unwanted transmissions are being found in the automotive environment, on highways and such, where Part 15 device users are sending their satellite radio or MP3 player audio to the FM receivers installed in their vehicles.

This problem is a concern to incumbent spectrum licensees for several reasons. First, these devices interfere with licensed broadcast operations. In addition, some audio programs that are broadcast with these devices do not comply with the FCC's rules regarding indecency and can be mistakenly attributed to the licensed broadcaster. These devices can certainly create an annoying experience for a radio listener when, for example, stopping at a traffic signal next to an automobile with such a device that is causing interference to the listener's FM reception.

It is important that regulatory agencies apply the Part 15 rules in an equitable manner to protect primary spectrum licensees, consumers, and other Part 15 device manufacturers that strive to manufacture devices that are Part 15 rule compliant. Thus, enforcement of the Part 15 rules should be a priority for enforcement officials. Finally, interference caused by the devices hurts the goal of efficient spectrum management and impairs the introduction of HD Radio services in the FM broadcast bands.

In an effort to address some of these concerns, the National Association of Broadcasters (NAB) undertook a program to study the issue at hand. One goal of that study was to measure the field strength of signals emitted from a variety of Part 15 FM transmitter devices designed for use with satellite radio and MP3 or iPod devices under a variety of conditions, to determine whether these devices are in compliance with Part 15 of the FCC rules.

The National Association of Broadcasters (NAB) retained the firm of Meintel, Sgrignoli, & Wallace (MSW) to conduct a study of some of these Part 15 FM Transmitters and to determine their compliance with the requirements of Part 15 authorization. This report will detail the study conducted by MSW and report the results of that study.

Introduction:

A series of measurements were conducted on 17 "wireless" devices as well as 4 "wired" devices. Measurements of the field strength of the FM Broadcast Band signal transmitted by these devices were made. In addition, verification of the required FCC ID numbers and verification of the compliance with the antenna rules was also performed. This report describes recent measurements of measured field strengths from the devices and outlines the compliance of these devices with other Part 15 requirements.

Conclusions

The measurements summarized above show that many of the devices currently on the market that are required to be compliant with Part 15 of the FCC rules, are in fact, not meeting these requirements. Less than 25% of the devices tested met the field strength criteria of the Part 15 rules. Further, some of the devices did not meet the antenna, FCC ID label, and compliance labeling requirements of Part 15. From the sample of devices tested here, it is clear that a majority of devices on the market are violating the FCC rules.

Based upon these tests, it is reasonable to conclude that significant interference to licensed FM broadcast stations exists from these devices. The modulation capabilities of the devices allow them to occupy more than one FM channel simultaneously and may hinder the roll-out of HD Radio services. The strong field strengths emitted by some of these devices will exceed the co-channel and adjacent channel interference ratios (D/U ratios) at which consumer receivers will operate.

The OET Bulletin 63 makes clear that a "person (or company) that sold this non-compliant transmitter to the user has violated the FCC marketing rules in Part 2 as well as Federal Law." Violators are subject to an enforcement action by the Commission's Field Operations Bureau and can result in forfeiture of equipment, fines including criminal penalties, and administrative fines. Further, manufacturers that have submitted false certification documents to the FCC OET may be subject to penalties of perjury.

The undersigned hereby certifies that the foregoing report was prepared by him or under his direction, and that it is true and correct to the best of his knowledge and belief.

Submitted June 2, 2006

Dennis W. Wallace, C.B.T.E.

Meintel, Sgrignoli, & Wallace, LLC
1282 Smallwood Drive, Suite 372
Waldorf, Maryland 20603
(202) 251-7589



TV White Spaces: Enforcement is a Significant Problem

FCC needs ability to withdraw equipment authorization or certification of a “white-spaces” unlicensed device found noncompliant without having to go through formal revocation and hearing process.

Recent FCC NAL against Behringer USA, Inc. shows current FCC processes ineffective. Behringer marketed **66 models** of unauthorized digital audio devices **for more than five years**. In fact, Behringer **continued to market for almost a year after it was on notice of the FCC’s investigation**. Behringer, in fact, **manufactured approximately 1.33 million** of these devices in the United States **and imported approximately 1.17 million more of these illegal devices!**

IN OTHER WORDS, 2.5 MILLION ILLEGAL UNLICENSED DEVICES WERE PERMITTED TO GET INTO THE MARKETPLACE UNDER THE CURRENT FCC PROCESSES! Had these devices operated in the TV spectrum the impact on free over-the-air television would have been devastating. The current processes and this level of FCC oversight cannot be permitted for unlicensed devices operating on TV broadcast spectrum.

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

In the Matter of)	
)	File No. EB-04-SE-069
)	NAL/Acct No. 200632100005
Behringer USA, Inc.)	FRN 0014638803

NOTICE OF APPARENT LIABILITY FOR FORFEITURE AND ORDER

Adopted: February 16, 2006

Released: February 16, 2006

In this Notice of Apparent Liability for Forfeiture (“NAL”) and Order, we find that Behringer USA, Inc. (“Behringer”) marketed 50 models of unauthorized radio frequency devices specifically, digital audio music devices, in apparent willful and repeated violation of Section 302(b) of the Communications Act of 1934, as amended (“Act”), and Section 2.803(a) of the Commission’s Rules (“Rules”). Significantly, we find that Behringer continued to import and market substantial numbers of these unauthorized devices for more than a year after the Enforcement Bureau initiated an inquiry into Behringer’s compliance with the Commission’s equipment authorization requirements. Based on the facts and circumstances before us, including the egregious nature of Behringer’s continued non-compliance, we conclude that Behringer is apparently liable for a forfeiture in the amount of one million dollars (\$1,000,000).

In March 2004, the Bureau received a complaint alleging that Behringer was marketing digital audio equipment that was not labeled and therefore may not have been authorized in accordance with the Commission’s equipment authorization requirements. In response to the complaint, the Bureau issued Behringer a letter of inquiry (“First LOI”) on March 29, 2004. Behringer responded to the First LOI on April 19, 2004.

In its response to the First LOI, Behringer stated that, in January 2000, it began importing, marketing, distributing for sale and selling in the United States digital audio products, such as mixers, amplifiers, and digital effects processors (“digital devices”). The information provided by Behringer indicated that, since January of 2000, it imported, marketed and distributed for sale at least 66 different models of digital devices. A listing of these 66 models is included in Attachment A. Behringer further stated that, from January 2000 through April 2004, it manufactured approximately 1.33 million of its digital devices for sale in the United States, and actually imported approximately 1.17 million of its digital devices, which it distributed to approximately 2,000 retailers for sale in the United States.

Redacted text from FCC decision



Perspective: Why Don't We Just Auction the 'White Space'?

**Progress Snapshot
Release 2.13 May 2006**

by Thomas Lenard*

Economists who study the spectrum issue are virtually unanimous in concluding that the only way to assure that spectrum is allocated to its highest-valued uses is by allowing a market in spectrum rights to develop. They argue that spectrum is analogous to real estate, which operates efficiently only under a market-allocation regime.

In recent years, the Federal Communications Commission has been slowly moving in the direction of a spectrum market, with auctions and other measures to provide licensees greater flexibility. It is therefore extremely disappointing that Congress, supported by a large part of the technology industry that apparently believes it will sell more products in an unlicensed regime, is now proposing to take a big step backward by allocating a significant chunk of "beachfront" spectrum--the TV broadcast spectrum "white space"--to "unlicensed" uses. This is the polar opposite of a market-allocation regime.

Bills have been introduced by Alaska Sen. Ted Stevens (Chairman of the Commerce Committee), Virginia Sen. George Allen and Washington Rep. Jay Inslee. The bills have co-sponsors from both parties. A similar provision has been incorporated into the Senate Commerce Committee's telecom bill working draft.

"White space" refers to underutilized spectrum on which productive activities could take place if permitted. When the transition to digital TV is completed in February 2009, broadcasters will vacate channels 52 to 69, freeing up 108MHz. Most of this spectrum will be auctioned off to the private sector and allocated by the market. Some will be used by the government for public-safety purposes. The broadcasters will retain channels 2 to 51, space that most observers believe includes a substantial amount of underutilized spectrum that is potentially very valuable for the build-out of wireless broadband or other activities.

*Thomas Lenard is Senior Vice President for Research for The Progress & Freedom Foundation. The views expressed here are his own and are not necessarily the views of PFF, its board, fellows or staff. This article appeared in CNET news on May 16, 2006.

Spectrum has historically been allocated under a "command and control" regime, under which the FCC assigned blocks of spectrum to specific uses--for example, broadcast television--over specific frequencies in specific locations under specific parameters of service. This system has imposed large costs and is clearly ill-adapted to the explosion of the demand for the airwaves for innovative new wireless technologies.

The alternatives to command-and-control are either a property-rights/market-allocation regime, or what has come to be called the "commons" or "unlicensed" model. Under the unlicensed model, interference is controlled through the establishment of rules, such as power limits for approved devices, that effectively determine what the spectrum can be used for.

Proponents of the unlicensed model make great claims for it, contending that it is more conducive to the development of new technologies and even that it will lead to the end of scarcity. These arguments are unpersuasive, essentially because the unlicensed model really is just a new version of a centralized allocation system. After all, it will be the FCC that has to establish the rules that govern unlicensed spectrum. In that sense, it's not qualitatively different from the legacy command-and-control regime. And there's no reason to believe that the regulators are in a position to do a better job with this new centralized allocation system than they have with the old one. Moreover, as with command-and-control, there is no market mechanism in an unlicensed regime to move spectrum to its highest valued uses, and no way to determine the opportunity cost of allocating spectrum to unlicensed uses.

Proponents also argue that more unlicensed spectrum will spread the deployment of wireless broadband, especially to underserved areas. However, a property rights regime is really the only way to provide the certainty needed for businesses to make the very large investments that might eventually make a wireless broadband pipe a reality.

We see this already in the operation of the mobile telephone bands, where service providers with secure priority rights--quasi-property rights--have made and continue to make billions of dollars worth of investments in providing new wireless services.

If policy makers want to subsidize broadband in underserved areas, they should do so in a technology-neutral way, by providing direct subsidies. Finally, a market allocation regime will do a better job of controlling interference, a major concern of the broadcasters (who, by the way, are not without political clout). Under a market regime, a relatively small number of people have the responsibility not to overstep their boundaries. In contrast, under an unlicensed regime, there are likely to be tens of millions of people using approved devices and perhaps some using unapproved devices.

In sum, managing spectrum the right way will speed the delivery of innovative new wireless communications technologies to consumers. Doing it the wrong way will

impose hundreds of billions of dollars of costs on the economy. The FCC will follow a market allocation model when it auctions the advanced wireless service spectrum later this year and the DTV spectrum in 2009. There is no obvious reason that the TV broadcast white space should be allocated any differently. The white space bills now pending in Congress are doing it the wrong way and, if enacted, will constitute a significant setback on the road to a rational spectrum policy.

NOT MUCH RIGHT ABOUT 'WHITE SPACE' PROPOSAL

TVNEWSDAY, MAY. 23, 2006, 9:10 PM ET Potential harm to broadcasting is just one of the reasons Congress should rethink permitting non-broadcast use of TV spectrum. By Kenneth Robinson

For some years now, computer companies have been arguing that the FCC needs to allow "ancillary," "non-interfering" use of the radio frequency spectrum set aside for over-the-air broadcasting. Proposals vary. Some want to use the TV channels that are unassigned in particular markets. For instance, if there's no one using channel 2 in Washington, D.C., because WMAR's using it in Baltimore, Intel thinks channel 2 should be made available.

Others want to use all the TV channels—at very low wattage, they promise. It would be sort of like letting the garage door openers, microwave ovens and "Mister Radio" all broadcast on TV channels. Who cares, the argument goes, now that everyone has satellite or cable hookups anyway? Thus, there's even so-called white space language in S. 2686, the communications regulatory reform bill the Senate Commerce Committee is currently considering.

Now, if any companies interested in using the broadcast spectrum promised to do all research, development, and manufacturing in the United States—including all components—I'd probably be more open to the proposition. I'm big on domestic activity, particularly manufacturing.

But all we expect Intel, Microsoft, Sun and others would do is expand their factories in Shanghai or Vietnam or Thailand. That might be great for America's trade rivals. But the United States already has a large and growing advanced technology trade deficit. Disloyal companies like Microsoft contribute to that. Why in the world is it necessary to make the Xbox 360 in Shanghai? Why can't these companies even hire U.S. call centers to handle customer matters, right?

Remember, mutuality's a core governance principle. In other words, companies have to make a deposit, usually, before they can just write checks. And, companies have to do something for the country, don't they, before government needs to do something for them, right? So, ask yourself: What exactly are Intel, Microsoft, Sun and others planning to do for the United States and American workers, assuming they're ever allowed to make use of the TV white space? Enhance the Grove Foundation's holdings or boost the Gates family's dividend income while creating an even bigger advanced technology trade deficit for this country? What sort of a social bargain is that?

A good reason for not allowing massive, unlicensed use of all TV channels, moreover, is that a lot of this resource is supposed to be auctioned off in a couple of years, isn't it? Why in the world would Congress in 2006 want to impair the potential value of these channels? And, by giving away the use of them, to boot.

Look at it this way: What if you were trying to sell your house, and someone came by and asked if an "out-of-status" family could move into the garage for a while? Think that would influence the willingness of buyers to buy, or how much they'd pay?

Well, under just-passed reconciliation legislation, the national transition to digital broadcasting is set to be completed in February 2009. Analog television channels are scheduled to be auctioned in 2008. Yet here's Intel and Microsoft arguing that millions of unlicensed transceivers need to be allowed in exactly those bands. At a minimum, wouldn't you think the Budget Committee needs to get involved, so that its calculations aren't fouled up?

Another reason why rapid proliferation of unlicensed wireless systems is troubling is the fact that these systems have been proven magnets for identity theft and other consumer problems. Both Reader's Digest and Consumers Reports, for instance, have recommended that computer users avoid logging onto no-charge WiFi Internet access systems because of the risk their machine will be compromised.

Evidently there are evil doers exploiting this wireless technology to steal customer information or insert spyware and other malicious software into computers. The industry's endeavoring to develop safeguards. But until that's done, why in the world would we want to cause these crime magnets to proliferate?

Radio frequency management is complicated, and the task of making multiple use of television channels is very complicated, indeed. The FCC has examined these issues and, before legislation is passed, wouldn't you think a field trial would make sense? The computer industry's Beta-testing approach—just toss it out there and see if it causes problems—might work in software. But it isn't a very sound approach in the frequency management field.

Exacerbating our advanced technology trade deficit, creating more magnets for illegal activity and potentially compromising the TV channel auctions seem like good reasons to be against any white areas legislative initiative. So the answer? Be reasonable, Senator Stevens, and defer action on white space legislation for the time being.

Kenneth Robinson writes the Telecommunications Policy Review, a weekly newsletter about communications policy and all else that interests him. His long career in government included a stint as senior adviser to FCC Chairman Alfred Sikes during the first Bush Administration. He can be reached at 72154.232@compuserve.com or Jackson 8-0960 in the area code 703.

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Unlicensed To Kill DTV?

Spectrum lobbyists in Wi-Fi brawl By John Eggerton



MSTV President David Donovan argues that Wi-Fi-enabled laptops using the broadcast band can interfere with TV reception.

A battle between the broadcast industry and backers of a more wide-open spectrum policy is turning into wide-open warfare.

The Association for Maximum Service Television (MSTV), essentially the broadcasting industry's spectrum watchdog, has been showing a videotape to staffers of the House and Senate Commerce committees warning of the dangers of allowing unlicensed devices, such as Wi-Fi-enabled laptops, to operate in the spaces between DTV channels. Backers of the devices say the video is a "shameless" attempt by broadcasters to protect their spectrum windfall from the digital transition.

The MSTV video, which is also available on its Web site (mstv.org), shows a viewer with an indoor antenna trying to watch various Washington-area DTV channels, only to have them stop abruptly and pixelate when adjacent-channel interference is simulated; a Wi-Fi-enabled laptop is identified as the likely culprit.

Broadcasters were alarmed last year by a proposal from then-FCC Chairman Michael Powell to allow "smart" devices—ones that can seek out available spectrum—to operate on the channels in the 2-51 band not occupied by DTV broadcasters.

Now computer companies said to include Microsoft and Intel, as well as independent wireless Internet service providers, are pressuring Congress to allow the smart devices to utilize unused frequencies. The issue could be included in one of the DTV-related bills that Congress is considering as it sets the rules of the road for spectrum reallocation during the DTV transition.

A principal advocate in Washington for the smart-device spectrum scenario has been the New America Foundation, which says that, rather than worrying about legitimate interference, broadcasters are being alarmist and obstructionist and simply want to warehouse spectrum that they can expand into at a later date.

It's not about warehousing, says MSTV President David Donovan: "We are trying to protect the consumer equipment brought to market now from new devices that will interfere with them."

New America Senior Research Fellow J.H. Snider says there is no merit to MSTV's technical argument.

Snider says that the broadcasters' video deals "with the few worst-case scenarios," including using a device to produce a level of interference that even New America would agree is excessive. "I think they have generally found a problem—but one that is easily rectified."

Michael Marcus, of Marcus Spectrum Solutions, a consultant to New America and former FCC associate chief of technology, says the new briefing paper he helped write will show that MSTV essentially used a loophole in the FCC proposal to create interference that a personal computer would be unlikely to ever produce.

"When they said in the video that the out-of-band emissions comply with the proposed FCC rules, they were right," he says, but they were "not core to what the proponents want to do." As for the extreme interference depicted in the video, he says, "real systems don't do that. Two-hundred million personal computers meet the exact same technical standard that MSTV was twisting in that video."

Donovan counters that the difference is,

"[MSTV has] generally found a problem—but one that is easily rectified."

J.H. SNIDER, NEW AMERICA FOUNDATION

today's computers "currently operate in spectrum that is nowhere near the broadcast band, as opposed to this proposal, which puts it smack dab in the middle of the TV band."

Donovan also says that, if New America thought MSTV's device was not real world, then "let them come up

with a specific device, and let's test it."

The standards reflected in the MSTV video "were the standards laid out by the commission. We asked the FCC to get very specific," Donovan says. "But they refused to get back to us under the argument that, if it were an unlicensed device, it could be anything. And that's the problem of sharing an unlicensed service with a licensed one: You don't know what's coming at you until it hits you." ■



Communications Daily

The Authoritative News Service of Electronic Communications

Unlicensed Wireless Devices Face Tall Task in Operating Reliably, CEA Says

The "attenuation" of buildings is a "critical factor" in determining whether an unlicensed wireless device can cause harmful interference to over-the-air TV reception and that device's ability to "autonomously detect" vacant TV channels if it's to operate reliably, CEA told the FCC in an ex parte filing Wed.

To find out how critical a factor it is, CEA commissioned field tests at 10 homes in the Washington area to probe building attenuation and other key issues raised in the FCC's rulemaking that proposes to allow the operation of unlicensed wireless devices within the frequency bands now used for TV broadcasting. The survey found that higher building attenuation can reduce the chance that an unlicensed device in one home will interfere with TVs or other devices in a neighbor's home, CEA said. However, the tests found that higher attenuation also "makes it more difficult for an unlicensed device inside a home to detect vacant channels," CEA said.

The tests, conducted by the Meintel, Sgrignoli & Wallace consulting firm of Waldorf, Md., also studied the signal-strength differences between a rooftop antenna that would typically be used for TV reception and an unlicensed device trying to detect that same signal inside a home, CEA said. The survey found that about 10% of the samples tested had a signal-strength difference in the 39-43-dB range, CEA said. "Autonomous sensing" functions in such unlicensed devices "will need to overcome this difference to reliably detect vacant channels," CEA said. CEA conceded the study covered "a relatively small sample" of the actual universe, considering the large installed base of TVs and the diversity of geography and home construction. However, it said it hopes that "experts working on techniques to avoid interference from unlicensed device operation in the TV bands" can make effective use of the study. CEA said it will make the raw data from the study available for download within 2 weeks. In a summary of the test methodology and results, Meintel, Sgrignoli & Wallace said field strength data was gathered on adjacent RF channels 39 and 40 using a vector sector analyzer. "This allows a scenario where a strong adjacent channel exists, but does not preclude reception of the weaker channel 40 signal using an outdoor antenna," the summary said: "Sensing the presence of the weaker channel 40 signal is critical and difficult in this scenario due to the strong channel 39 signal."

For an unlicensed wireless device to detect the presence of an existing broadcast signal, "it must receive the DTV signal by whatever means it has available to it," the summary says. It must detect that signal wherever in the house the user has placed it, "with whatever self-contained small omni-directional antenna it has, and in whatever interference condition that exists at that location," it says. That the unlicensed wireless device transmits its own signal makes the task of detecting an existing over-the-air signal all the more challenging, it said.

Making matters worse, successful DTV reception of a weak ATSC signal using an outdoor antenna at 30 ft. above-ground level in the same or a nearby house may be possible, "but sensing the presence of a DTV signal inside the house on the first floor with an omni-directional indoor antenna may not be feasible," the summary says.

"In this case, the unlicensed device would then incorrectly select this particular channel on which to transmit its data and possibly interfere with DTV receivers." A DTV receiver connected to the outdoor antenna "will have a much better chance of getting an adequate signal for DTV reception" than a set not so connected, it said. That's because the unlicensed wireless device will typically have a low-gain, omni-directional antenna while an outdoor antenna -- especially one situated farther away from the transmitter site -- will have a high-gain, directional antenna,

and perhaps even a low-noise preamplifier at its output, the summary said. -- *Paul Gluckman*



Unlicensed Devices Could Compromise EAS

Since my article in the Oct. 19, 2005 issue of TV Technology, ("Developing a 24/7 Digital EAS System"), some real progress has been made by the FCC in the matter of the Emergency Alert System.

While broadcasters are required to transmit EAS messages from the White House over analog channels, they are not required to transmit EAS messages over digital channels. With the analog sunset pending, the FCC seeks to extend EAS not just to DTV channels, but to all electronic media, including cell phones.

This column has suggested one technique by which a DTV channel can provide a 24/7 emergency alarm capability, something the present analog system cannot do. It also showed how a unique EAS header can be transmitted from the White House to all local TV stations, providing 24/7 continuous testing to confirm the EAS is actually operational. That could replace the weekly EAS testing, which is an annoyance to the public and to broadcasters.

I am not suggesting that my previous articles played any part in the actions of the FCC. The need to include DTV channels is self-evident. I believe the need for a 24/7 EAS is also obvious since 9/11 and the Katrina disasters. Last fall, I sent copies of my articles about EAS to the Advanced Television Systems Committee, which would play a crucial role in creating a 24/7 EAS over DTV channels by assigning specific ATSC headers for implementing an EAS over DTV channels. The ATSC is sponsored by broadcasters and by representatives of consumer electronics manufacturers.

One problem with implementing a 24/7 EAS over DTV channels is that so far, this has been an unfunded, voluntary effort largely by the Society of Broadcast Engineers.

However, the FCC soon may have funding from the Congress for this effort. It is rather hard to imagine how something like a national EAS can ever succeed on a voluntary basis, as it would require receiver designers to provide for 24/7 monitoring of the ATSC digital datastream for EAS headers, and sounding of both audible and visual alarms when an actual EAS header is received from over-the-air broadcasters. So it is an uphill struggle to implement this on a purely voluntary basis.

While I believe the incremental cost in receivers to provide this function is well worth it, it is not going to be free—it requires a battery backup function should AC power fail. I separate the alarm function from the delivery of emergency messages of what to do in a specific emergency that, as Katrina showed, may rely on battery-operated receivers, i.e. radios. Consumer electronic manufacturers are very sensitive to cost and to governmental regulations of how they design products.

The first step at the ATSC may occur this month. I was invited to attend a committee meeting in Washington, D.C. to explain my concept of how to provide a 24/7 EAS over DTV channels, but alas, that will not be possible since I have moved back to the great Northwest.

A lot has been said about the recent proposal by the FCC to permit further sharing of the remaining broadcast spectrum (Channels 2-36 and 38-51).

There is a proposal to allow unlicensed transmitters to operate in the so-called "white spaces" of the TV spectrum. These are channels not allocated to the community in which unlicensed transmitters will be permitted to operate. In many cases, these white-space channels are adjacent to channels in use in the given community.

MSTV and others have expressed their concern that such unlicensed transmitters might interfere with the reception of broadcast TV signals. This sounds to me like a digital citizens' band—DCB—within Channels 5-51.

WHOSE OX IS GORED

At least one paper has been published which supports the FCC view that such interference will not be significant, but then whose ox is being gored is the question.

The field strength at 1 mile from the antenna with an effective radiated power of 1,000 watts is 102.8 dB above 1 microvolt per meter. For the 1 watt ERP limit of unlicensed transmission, the field strength at 1 mile = 72.8 dB μ V/m.

The power intercepted by a resonant dipole aimed towards the signal source can be determined from the field strength by means of the dipole factor, which at the center of the UHF band is -130.8. The maximum power available at a resonant dipole antenna from one unlicensed transmitter at 1 mile is 72.8 - 130.8 = -58 dBm. This would not generate third-order intermodulation or cross modulation in the front-end of DTV receivers.

Those are the mechanisms by which adjacent channel interference to DTV is caused, not poor IF selectivity, as was the case when the analog TV system was developed circa 1940.

At one-half mile, the received power will increase by 6 dB to -52 dBm; at one-quarter mile, it will

increase to -46 dBm; and at one-eighth mile, to -40 dBm. One DCB transmitter will not interfere with reception even on nearby DTV receivers.

Please note that I am assuming line-of-sight transmission. There is no reason why rooftop directional antennas may not be used for DCB, is there?

MULTIPLE RECEIVE SITES

But we are talking about one transmitter into one receiver. DCB is expected to be a very popular new wireless service. At four to six residences per acre in a suburban area, there may be 3,000 homes in a square mile, many of which will have these DCB transmitters. None of these would be more than a mile from a DTV receiver in this little cluster of homes. Now this is a very different matter:

The total of say, 2,000 transmitters = 2 kilowatts ERP loose in the neighborhood! Interference may extend outside of this particular 1-square-mile neighborhood as the field strength decreases rather slowly with increasing distances.

Will these all be operating at the same time? Yes (they might) and/not no, not usually.

Will these transmitters be required to observe strict sideband splatter limits into adjacent (non-white) channels?

Will some of these DCB transmitters be moved to another community and no longer be in a white channel?

Will some operators add a power amplifier, which is available on the market today boosting power 10 - 20 dB?

Now for the billion dollar question:

What if intermittent and harmful interference at the site of a CATV headend due to DCB causes the CATV operator to discontinue carriage of some over-the-air broadcast signals?

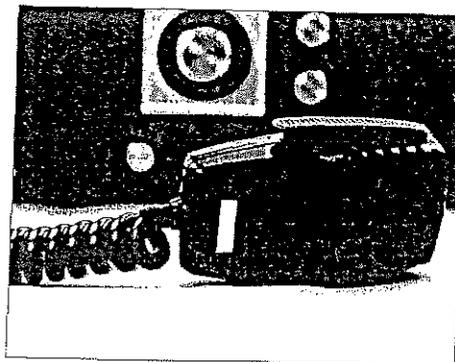
And finally, who is going to police this new DCB wireless band?

It would be extremely difficult to organize a field test of this kind of interference, as it would involve a large number of these unlicensed DCB transmitters. However it should be possible to create a model of the situation and to analyze the noise at the receiving antenna from a multitude of 1 watt transmitters evenly distributed over several square miles around the receive site. If this has been done, this author is unaware of such calculations and would like to know of it.

My initial calculations show that the noise power in a white channel will vary erratically from nil to -12.5 dBm, which I believe may overload receivers. Details to follow.

Slay Tuned

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at charleswrhodes@worldnet.att.net.



MSTV and others have expressed their concern that such unlicensed transmitters might interfere with the reception of broadcast TV signals. This sounds to me like a digital citizens' band—DCB—within Channels 5-51.



July 21, 2006

The Honorable Bill Frist
Senate Majority Leader
S-230 Capitol Building
Washington, DC 20510-7010

The Honorable Harry Reid
Senate Minority Leader
S-221 Capitol Building
Washington, DC 20510-7020

Dear Majority Leader Frist and Minority Leader Reid:

On behalf of the 66 members of the Grand Ole Opry, comprised of country music's finest and most acclaimed performers, I am writing you to express our serious concerns with the "Wireless Innovation Networks" title (Title VI) of the pending Senate telecommunications legislation (H.R. 5252) as reported by the Senate Committee on Commerce, Science, and Transportation.

For 80 years, the Grand Ole Opry has been heralded as the home of country music, utilizing state-of-the-art technology to bring "America's Music" to the world. From its humble beginnings on WSM-AM radio in 1925, today's Opry can also be enjoyed on Sirius satellite radio, the Great American Country (GAC) television network, on 200-plus syndicated radio stations and worldwide over the internet on www.opry.com.

The success and longevity of the Grand Ole Opry can be attributed to a variety of factors. However, our commitment to the utilization of the latest technology has been the principle factor in our staying power. We present nearly 200 performances each and every year. Each performance may feature up to 20 respected country music performers, from new stars to Hall of Fame legends. These artists expect (and deserve) a premiere audio experience as part of the overall concert production. Wireless microphones, wireless ear monitors and wireless instruments are a key element to presenting a program which exceeds the artists', musicians' and consumers' expectations. For an artist, being wireless is no longer an option, it is mandatory for "connecting" with their audience. In addition, as you know, we were honored to host President George W. Bush the day following this year's State of the Union address. Numerous wireless microphones were used to successfully present this event.

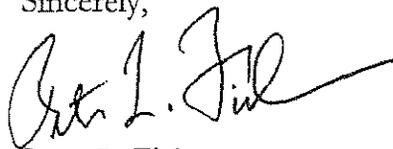
For tickets and information, call (615) 871-OPRY or log on to www.opry.com

Our reliance on this technology is a major reason why we are so concerned about Title VI in H.R. 5252. As currently drafted, the proposed legislation would allow millions of new and potentially interfering devices to operate in the TV spectrum band (where wireless microphones currently operate) in a mere 9 months from the date of enactment – despite the complete lack of any field tests to demonstrate that such devices will not interfere with wireless microphones, or even over-the-air television broadcasts. As Illinois Senator Richard J. Durbin said recently “the FCC and other technical experts ... [must be] allowed sufficient time to thoroughly study and resolve serious interference issues before new services are allowed to be turned on.”

Moreover, the Senate language provides only the thinnest of interference protections for incumbent services like wireless microphones. An “after-the-fact” FCC complaint process is, at best, unworkable and would expose our industry to significant new risks of low-or-no quality audio due to new “wireless audio congestion.” The millions of U.S. fans of country music artists deserve better.

The Grand Ole Opry urges the Senate to strike Title VI from H.R. 5252 and revisit the issue in a later Congress when the engineering experts have had sufficient opportunity to iron out all of the potential interference-related issues.

Sincerely,



Peter L. Fisher
Vice President, General Manager
Grand Ole Opry
A Division of Gaylord Entertainment Co.

cc: The Honorable Ted Stevens
The Honorable Daniel K. Inouye
The Honorable Lamar Alexander
The Honorable Joe Barton
The Honorable John D. Dingell
The Honorable Fred Upton
The Honorable Edward J. Markey
The Honorable Marsha W. Blackburn
The Honorable Bart Gordon

VICTOR SANSONE, CHAIRMAN OF THE BOARD
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Capitol Records-Nashville
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TIM NICHOLS
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ALAN SLEDGE
Clear Channel Radio-KNIX
JEFF WALKER
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RUSTY WALKER
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STEVE BUCHANAN
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CHARLIE COOK
Cumulus Radio
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TIM DUBOIS
Universal South
KITTY MOSES EMERY
NWK Entertainment
SARA EVANS
LARRY FITZGERALD
The Fitzgerald Holiday Company
JAMES FREE
The Smith-Free Group
JOE GALANTE
RCA Label Group
DICK GARY
The Gary Group
TROY GENTRY
SCOTT GREENSTEIN
Sire/Nachley/Decca
EDWARD HARDY
Great American Country
LON HELTON
Radio & Records
CLYNT HIGHAM
Merco Management Group
DANN HUFF
Dana Hall Distribution & OverDance Music
JOHN HUIE
Creative Artists Agency
KIM KOSAK
Chevrolet Division - General Motors
KEN LEVITAN
Veeva Management
LUKE LEWIS
LANC Nashville
MARK MAYS
Clear Channel
STEVE MOORE
ABC Live
GARY OVERJUN
EMI Music Publishing
BRIAN PHILIPS
Country Music Television
ROB POTTS
Allied Arts & Event Services
JOHN RICH
Big & Rich
DAVID ROSS
Music Row Publications
RICK SHIPP
William Morris Agency
PHILLIS STARK
Billboard Information Group
JAMES STROUD
UMG Nashville
JODY WILLIAMS
Jody Williams Music
TAMMY GENOVESE
Chief Operating Officer
ED BENSON
Chief Strategic Officer
R. HORTON FRANK, COUNSEL
Stewart, Estes & Connell
RICHARD FRANK, COUNSEL EMERITUS
JOEL KATZ, SPECIAL COUNSEL FOR DEVELOPMENT
Greenberg Trautman



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Phone: (615) 244-2840 Fax: (615) 726-0314
www.CMAAwards.com
www.CMAFest.com
www.CMAworld.com

August 8, 2006

The Honorable Bill Frist
Senate Majority Leader
S-230 Capitol Bldg.
Washington, DC 20510-7010

The Honorable Harry Reid
Senate Minority Leader
S-221 Capitol Bldg.
Washington, DC 20510-7020

Dear Majority Leader Frist and Minority Leader Reid:

On behalf of the Country Music Association and our over 6000 members, I am writing to you to express our serious concern with the "Wireless Innovation Networks" title (Title VI) of the pending Senate telecommunications legislation (H.R. 5252) as reported by the Senate Committee on Commerce, Science and Transportation.

Since 1958, CMA's mission has been to bring the poetry and emotion of Country Music to the world. As part of this mission, CMA annually hosts the CMA Music Festival (with attendance of 161,000 and a primetime network television special) and the CMA Awards Show, (with 36 million viewers). Both of these significant performances utilize state-of-the-art wireless audio equipment in order to enhance the musical experience of our viewers, audience and artists. Passage of this legislation would authorize unlicensed devices to operate in the TV broadcast bands, potentially causing interference to incumbent wireless devices and considerably impacting our ability to produce these events.

We request the Senate to strike Title VI from H.R. 5252 and allow engineering experts to address potential interference related issues before re-introducing similar legislation.

Respectfully,

Tammy Genovese
Chief Operating Officer

March 14, 2006

The Honorable Ted Stevens, Chairman
The Honorable Daniel Inouye, Co-Chairman
Senate Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Chairman Stevens and Co-Chairman Inouye:

We, the undersigned digital television and set top box manufacturers, are writing to express our views on legislation pending before the Committee to authorize unlicensed wireless devices to utilize vacant television channel frequencies, in so-called "white spaces." We ask that our correspondence be made a part of the official record of the hearing held by the Senate Committee on Commerce, Science, and Transportation on March 14, 2006.

As manufacturers of digital television receivers and a wide range of consumer electronics products, we have a keen interest in this issue. On the one hand, we share the enthusiasm of the sponsors and co-sponsors of S. 2332 and S. 2327 about the potential of unlicensed wireless devices to enhance the communications experiences of many Americans and to facilitate the more ubiquitous deployment of broadband services. On the other hand, as companies that have participated in the creation and development of digital television, in some cases for more than 20 years, we are absolutely committed to ensuring that American consumers will be able to enjoy and benefit fully from the marvels of digital television technology which they have been promised by industry and the Congress.

We applaud the Congress for having established a hard deadline of February 17, 2009 for the conversion from analog to digital television ("DTV") transmission and for creating a subsidy program that should lighten the burden of making that transition for households dependent on free, over-the-air broadcasting to receive their television programming. At this critical juncture in the migration to all digital television service, extraordinary care must be taken to ensure that government action does not inadvertently undermine the digital television conversion. The result of the legislative and regulatory process must be a win-win situation for both wireless unlicensed device operations and digital television service if American consumers are to reap the full benefits of our collective technological innovation.

As a matter of science and engineering, there is no question that the potential exists for interference from unlicensed wireless devices to the operation of digital television receivers and set top boxes. There exists a great deal of uncertainty about the operation of unlicensed wireless devices in vacant broadcast television spectrum.

The Honorable Ted Stevens, Chairman
The Honorable Daniel Inouye, Co-Chairman
March 14, 2006
Page 2

As a technical matter, we will be operating in uncharted waters. Unduly hasty action in establishing the rules and parameters for the operation of unlicensed devices could seriously disrupt the digital television transition for millions of Americans and taint the roll-out of unlicensed devices.

Accordingly, we believe that any legislation adopted by the Congress authorizing the use of "white spaces" for operation of unlicensed wireless devices must require that such operation not cause interference with television signals. Implementation of this non-interference requirement should require the Commission to make a specific finding to that effect, following appropriate testing. The burden of meeting the non-interference requirement should rest with the proponent of the unlicensed wireless product or technology seeking to use this spectrum. Artificial deadlines should not be imposed as they create heightened risk of approving unlicensed wireless device operation that could cause interference to television signals. Finally, as S. 2332 provides, channels 2 through 4 and 37 should not be available for unlicensed wireless device operations.

Notwithstanding the establishment of a hard date to complete the DTV transition, much work remains to ensure that our Nation gets it right. We accept our responsibility to help educate consumers about the transition and to provide them with abundant choices of product functionality and affordability. We urge the Congress to do nothing that would imperil or disrupt the DTV transition, including by the authorization of new services which would cause interference with television signals. We look forward to working with the Committee on all relevant legislation to complete a smooth and consumer-friendly conversion to digital television for all Americans.

Sincerely,

David H. Arland
Vice President, Communications &
Government Affairs
Thomson Inc.

John Taylor
Vice President, Public Affairs and
Communications
LG Electronics USA, Inc.

Paul Thomsen
Director, Design, Technology & Standards
Hitachi Home Electronics (America) Inc.

Richard Dinsmore
Vice President of Marketing
TTE Corporation

The Honorable Ted Stevens, Chairman
The Honorable Daniel Inouye, Co-Chairman
March 14, 2006
Page 3

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Vice President, Government and
Public Affairs
Samsung Electronics

Peter Fannon
Vice President, Technology Policy,
Government & Regulation
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David Kline
General Manager, Strategic Product Planning
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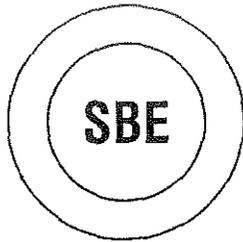
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AMITRA of Mexico ANDEBU of Uruguay
BES of India CCBE of Canada
KOBETA of Korea SBETP of Philippines
SET of Brazil WABE of Canada



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Phone: (317) 846-9000 • Fax: (317) 846-9120 • Website: www.sbe.org

May 12, 2006

Honorable Ted Stevens
Co-chairman
Senate Commerce Committee
522 Senate Hart Office Building
Washington, DC

Honorable Daniel Inouye
Co-chairman
Senate Commerce Committee
722 Senate Hart Office Building
Washington, DC

Re: S.2686 and H.R. 5085, the American Broadband
For Communities Act; "unused" broadcast television
Spectrum availability for wireless use.

Dear Mr. Chairmen:

As President of the Society of Broadcast Engineers, Incorporated (SBE), the national association of broadcast engineers and technical operating personnel, I would like to provide you with some information about the concerns of our organization relative to the pending House legislation, H.R. 5085, and its companion in the Senate, S. 2686.

Each of these bills would require that any unused broadcast television spectrum in the frequency bands between 72 and 698 MHz (i.e. television broadcast channels 5 through 51) except 608-614 MHz (i.e. television broadcast channel 37) be made available for use by "unlicensed devices" including wireless broadband devices. Rulemaking to accomplish this must be completed by the Federal Communications Commission within six months of the enactment of the legislation. The bills would require that only minimal technical rules be adopted, so as to facilitate wireless broadband rollout. The bills provide vaguely that the rules should protect "incumbent services" including broadcast television and public safety equipment from interference; to "respond" to complaints not later than 30 days after receipt, provided that the complaints include "verification" in the field of "actual harmful interference;" that manufacturers be able to disable such devices remotely in case of interference; and require equipment authorization for such devices.

First of all, this legislation represents extremely poor spectrum management. At most, the legislation should order the FCC to conduct a compatibility study to determine whether unlicensed devices, including wireless broadband devices, are, or can be configured to be, compatible with incumbent licensed users. The legislation should not order the adoption of rules to permit potentially incompatible sharing of frequencies. The past history of the FCC's lax approach to compatibility assessments prior to authorizing unlicensed devices to operate in various frequency bands reveals the need for advance spectrum planning. Wireless broadband, though successful in and of itself, has made operation in certain frequency bands virtually impossible in most markets. This includes broadcast auxiliary (TV Pickup) operation at 2450-2483.5 MHz, for example. Arguably, Congress should not involve itself in what is essentially technical decision making. However, to the extent that legislation to influence broadband rollout is a *fait accompli*, Congress should limit its role to that of ordering compatibility studies, to determine whether television

channels have the capacity to accommodate unlicensed devices, and if so, what the operating parameters should be. The cart is in this case squarely before the horse.

There are no vacant broadcast television channels in most markets. A number of factors are coming together at once, putting pressure on television channels throughout the United States. First, as of course you are aware, the digital television conversion is well-along, and each full-power television broadcast station is now operating on two channels, one analog and one digital, to permit the conversion to occur without depriving viewers of over-the-air television that they rely on for entertainment, news and emergency information. Second, all television channels above 51 are in the process of reallocation for other services, including commercial wireless broadband, public safety, and narrowband business and industrial radio. This will cause all of those television stations, full-power and low-power (the latter containing much minority-oriented programming in urbanized areas), to be compressed in the channels below 51. These are the same channels that are to be made available, within six months of the passage of the legislation, for unlicensed use.¹

Perhaps most importantly, the legislation misses entirely the fact that the allegedly "unused" television channels, although perhaps in some areas unused for over-the-air television broadcast transmissions, are not in fact unused. They are always in use for production of video and other important events. VHF and UHF television channels are used now for wireless microphones and wireless intercom systems. These devices are critical for such varied purposes as coach-to-coach communications for televised NFL and college football games; live television news interviews; Golf and automobile racing events; the Olympics; the Academy Awards ceremonies; the political conventions; and thousands of other televised events. The reallocation of television channels 52 through 69 has put immense pressure on the remaining television channels for these licensed, broadcast auxiliary devices and systems. It is, in our view, impossible as a practical matter for an unlicensed wireless device to protect wireless microphones and wireless intercom systems used for television program production against harmful interference. Unlicensed devices, including unlicensed wireless broadband devices, are mobile; their deployment tends to be ubiquitous and unpredictable, and the devices are operated by non-technical consumers. There is no way to predict or avoid interference from them in advance, and no way to timely resolve the interference after the fact.

Because of the intense overuse of existing broadcast auxiliary allocations, including television broadcast channels, the SBE has for the past 25 years conducted a cooperative frequency coordination program, premised on licensee-to-licensee contact and expert database management. The program, administered by volunteers, serves in essentially all markets throughout the United States to insure that there are no conflicts in shared broadcast auxiliary use of the television broadcast bands. This program has been a complete success. Because of this success, a version of the SBE frequency coordination program has been adopted by the National Football League. Frequency coordination of auxiliary operations in broadcast television channels in and around NFL stadiums is a routine during the week prior to, and on, game days. The ability of the NFL teams to use wireless headsets for coach-to-coach communications has been facilitated, as is the varied broadcast production before, during and after games. If unlicensed devices are permitted in the television broadcast bands, this program, and as well the entire NFL football games, will be jeopardized, and interference will be unavoidable. To the extent that the proposed legislation would require a response to a "verified" instance of harmful interference within 30 days, that remedy is completely useless. Post-hoc interference remedies are, in the context of the operations conducted by broadcast auxiliary licensees, not possible.

In the larger metropolitan areas of the United States, the supposed availability of "unused" TV channels is not supported by engineering studies. In reality, available VHF and UHF TV channels for wireless microphones and wireless intercom systems used by broadcasters have become scarce, as a result of both the assignment of second

¹ As but one example of the unavailability right now of television broadcast channels for broadcast auxiliary operation, noncommercial television Station KQED, analog Channel 9 in San Francisco, California, applied for a low power auxiliary license for wireless intercoms to be used inside its studios for cueing and other production purposes. This license, WQER-925, was granted on March 31, 2006. What is significant is the waiver request and showing that had to be included, because there were no UHF TV Channel frequency pairs available meeting the spacing requirement of the FCC Rules (separating broadcast auxiliary channels from television broadcast transmitter sites to prevent interference to television viewers). Because the waiver request documented this fact, and because a "consent" letter was obtained from the television station to which the proposed auxiliary operation was short-spaced (KVIE-DT, D53, Sacramento, California), station, the requested waiver was granted.

DTV channels for full-service TV stations, and displaced TV stations (both full-service and secondary) migrating out of TV Channels 52 through 69. The SBE urges, therefore, that the proposed legislation is exceptionally poor spectrum management as a technical matter. While the SBE is sympathetic to the current administration's noble goal of universal broadband access by 2007, there are good ways to approach this and bad ways. H.R. 5085 and S.2686, and their progeny, are notably misguided. The SBE, on behalf of its approximately 5,700 members in the United States, urges that the legislation not pass.

Please feel free to disseminate this letter as you see fit.

Sincerely,

A handwritten signature in cursive script that reads "Chris Scherer".

Christopher Scherer, CPBE CBNT
President, SBE



March 16, 2006

The Honorable Ted Stevens
The Honorable Daniel Inouye
Co-Chairmen
Senate Committee on Commerce, Science and Technology
United States Senate
SD-508 Dirksen Office Building
Washington, DC 20510

Dear Co-Chairmen Stevens and Inouye:

On behalf of the Nations Religious Broadcasters, an international association of Christian communicators with over 1400 member organizations representing millions of viewers, listeners, and readers, I am writing to express our deep concern over legislation pending before the Senate Commerce Committee: S. 2327 the "Wireless Innovation Act of 2006," and S 2332 "The American Broadband for Communities Act. Both bills would allow unlicensed devices to operate in the broadcast television band on the so-called TV White spaces. We respectfully request that you not move forward with these bills *in their present form* at this time. We are concerned that these bills will have a negative impact on our Christian mission in three ways.

Millions of viewers receive Christian programs on their television sets over-the-air. Because these signals are "free" and can be received with just an antenna, we can reach all viewers, rich and poor, urban and rural. Nationwide, the GAO estimated that approximately 19.6 million homes rely exclusively on over-the-air signals to watch television. According to the NAB there are 73 million television sets that are not connected to cable or satellite. From experience, I know that a significant number of my members viewers get their religious programming exclusively through an antenna.

Based on the available research, we are very concerned that these unlicensed devices will interfere with television reception. The very reason unlicensed services want to use TV channels 2-51 is the very reason for our concern. These signals will travel over a wide area and through walls. With unlicensed services, consumers will not know the source of the interference. It could be coming from the apartments above you or the townhouses on either side. To make matters worse, consumers using these devices have no idea they are interfering with their

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**Christian
Communicators
Impacting
the World**

Senators Stevens and Inouye
Page two, 3/16/06

neighbor's television set. With millions of these devices placed in the TV band, there will be no effective way to prevent or police this type of interference.

At considerable cost, my member television stations are in the process of shifting to digital television. To meet the February 2009 transition deadline, consumers will have to acquire a new expensive digital television sets or acquire a government subsidized converter box. Between 6.9 and 8 million digital sets, with off-air digital tuners, have entered the market in the past few years. Increasing interference to these new digital television sets may have an adverse impact on the digital transition.

In addition, television broadcasters are still in the process of selecting their final digital channels. In fact, the FCC has not yet assigned digital channels to low power, class A and translator stations. In other words, spectrum use will still be in a significant state of flux until the 2009 transition date. It would seem to make sense to wait until the transition is over before authorizing these devices in the TV band.

Our second concern about these legislative proposals involves interference to wireless microphones. Wireless microphones are currently licensed under the FCC rules. They operate at very low power and share spectrum with existing television stations. Wireless microphones are very important to religious broadcasters. Much of today's television program production, including live remote coverage, depends on using a wireless microphone. The frequencies used by these wireless microphones are coordinated in each market by all local television stations. Unfortunately, these are precisely the same frequencies that will be used by unlicensed devices. It is simply impossible to coordinate with millions of these devices. Because the devices are unlicensed, broadcast engineers will have no idea where the devices are located. It will become impossible to provide live news coverage with any certainty that your microphone will shut off because it is overwhelmed by unlicensed devices operating in the same area.

More troubling is the impact of these devices on religious services. Churches across the country rely on wireless microphones to reach large congregations. They are also critical for television coverage and production of these services.

Senators Stevens and Inouye
Page three, 3/16/06

However, permitting unlicensed devices to operate on the same spectrum presents a significant risk to these microphones.

Advocates promoting unlicensed devices point to new technologies, such as spectrum sensing radios that will prevent interference to television sets and wireless microphones. These spectrum sensing technologies are designed avoid operation on frequencies that are being used and shift operations to "vacant channels." However, none of these technologies have been tested and proven effective at avoiding interference in the television band. None have been tested in the real world. Never before has the FCC authorized high power unlicensed devices to operate in a band that is already occupied by millions of consumer receiving devices.

The Federal Communications Commission is examining this issue. Also, IEEE, the leading engineering organization in the world, is developing a system for fixed unlicensed serves that may work in rural areas and not result in significant interference. This system needs to be tested. Because of the enormous interference consequences involved, I urge you to let the scientific community and the FCC complete its work. Government cannot fiat the laws of physics.

While I understand the need to expand rural wireless broadband opportunities, such expansion should not be at the expense of the only existing free, universal wireless service – broadcast television. Viewers of religious broadcasting services should not be forced to bear the burden of new interference caused by unlicensed devices operating on television channels.

As always, I admire your joint leadership on these important and challenging issues and trust we can work together to resolve these concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "FWright", with a long, sweeping horizontal stroke extending to the right.

Frank Wright, Ph.D.
President & CEO
National Religious Broadcasters (NRB)



David K. Rehr

President & CEO

1771 N Street, NW Washington, DC 20036-2800

April 12, 2006

The Honorable George Allen
United States Senate
204 Russell Senate Office Building
Washington, D.C. 20515

Dear Senator Allen:

As the Senate Commerce Committee fashions proposals that would allow unlicensed devices to operate within the television band "white spaces," I am writing on behalf of the National Association of Broadcasters (NAB) to share some thoughts and concerns.

We understand and support your desire for greater broadband availability for rural America. We recognize the appeal of the television spectrum that sits unassigned in various rural markets, and we share your goal of providing greater community and consumer access to the Internet.

The NAB and our nearly 1,100 television station members, however, are very concerned with the entry of unlicensed devices into the television band and the harmful interference that is likely to result. Allowing entry of unlicensed devices threatens consumers' television reception. We appreciate your consideration of additional approaches to mitigating that interference and remain committed to working with you on an approach that balances protection for consumers while spurring greater access to broadband.

Second, the engineering community is involved in a process to establish technical standards and guidelines, known as the IEEE 802.22, that when completed, will offer a technical framework for unlicensed devices operation. This process is under way and on track to be completed in early 2009. We are concerned that devices that may come on the market in the interim and that are allowed to operate in the TV white space will not have the interference mitigation technologies being developed by the IEEE standard and will cause much unintended harm to television reception.

Third, through the Committee's efforts last year, the hard date for the digital television transition has been established. Between now and the date of the analog cutoff, the FCC continues its channel repacking process, its licensing of digital stations, and ultimately the transition of translators to digital operation. Consumers and television stations will have a greater degree of certainty when this process is completed. Also, television

stations will have vacated and returned their analog channels, opening possibilities for alternate services in some markets.

I would ask you to consider allowing the IEEE and FCC processes to be completed before permitting unlicensed devices into the television band. I would also ask you to consider an approach that involves extensive lab and field testing of candidate devices, so that we might better measure their potential to cause interference and lessen the disruption to television viewers.

Thank you for your consideration of our views. We look forward to continuing to work with you and the Committee.

Sincerely,

A handwritten signature in cursive script that reads "David K. Rehr".

David K. Rehr

cc: S. 2327 cosponsors



David K. Rehr
President & CEO
1771 N Street, NW Washington, DC 20036-2800

April 12, 2006

The Honorable Ted Stevens
United States Senate
254 Russell Senate Office Building
Washington, D.C. 20515

Dear Chairman Stevens:

As the Senate Commerce Committee fashions proposals that would allow unlicensed devices to operate within the television band "white spaces," I am writing on behalf of the National Association of Broadcasters (NAB) to share some thoughts and concerns.

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the Committee to consider an approach that involves extensive lab and field testing of candidate devices, so that we might better measure their potential to cause interference and lessen the disruption to television viewers.

Thank you for your consideration of our views. We look forward to continuing to work with you and the Committee.

Sincerely,

A handwritten signature in black ink that reads "David K. Rehr". The signature is written in a cursive style with a large, prominent "D" and "R".

David K. Rehr

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MIAMI, FL 33178
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RAY RODRIGUEZ
PRESIDENT
CHIEF OPERATING OFFICER

DIRECTOR
UNIVISION COMMUNICATIONS, INC.



April 13, 2006

The Honorable Ted Stevens
Chairman, Committee on Commerce, Science, and Transportation
United States Senate
Washington, D.C. 20510

The Honorable Daniel K. Inouye
Co-Chairman, Committee on Commerce, Science, and Transportation
United States Senate
Washington, D.C. 20510

Dear Chairman Stevens and Co-Chairman Inouye:

Univision Communications Inc., on behalf of television viewers and, in particular, Hispanic viewers throughout the United States, writes to oppose legislation that would allow unlicensed devices to operate on allegedly "unused" television channels. Two bills, S. 2332 and S. 2327, now before the Senate Commerce Committee, would require the FCC to adopt rules authorizing these devices within 180 days. Univision is very concerned that these bills will lead to increased interference to over-the-air television reception, thereby negatively impacting millions of television viewers nationwide. Because Hispanic viewers rely far more heavily on over-the-air reception than the general population, and often reside in densely populated areas where a single interfering device can harm television reception in many surrounding households, Hispanic viewers will be significantly and disproportionately harmed.

Nielsen data indicates that Hispanics constitute 34% of over-the-air viewers in the U.S., though they make up just 14% of the overall population. Exclusive reliance on over-the-air reception by Hispanic households is well over twice that of the non-Hispanic population, with approximately 33% of Hispanic viewers relying *exclusively* on over-the-air television reception. (Nielsen Media Research, Nielsen Universe Estimates, NHTI). An additional 7% of Hispanic households are satellite television households that rely on over-the-air reception for all of their *local* programming. (Nielsen Media Research, Home Tech Recontact Study, Feb. 2003). Thus, a total of 40% of Hispanic households nationwide rely *exclusively* on over-the-air reception for their local news, emergency information, and other local programming.

Even this number, however, understates Hispanic reliance on over-the-air reception, as many Hispanic cable and satellite households rely on over-the-air reception for second and third sets in their homes. Because Hispanic households are significantly larger on average than non-Hispanic households (3.6 versus the U.S. average of 2.4 persons per household) and tend to be multi-generational, these additional over-the-air sets get significant use. For example, in Los Angeles, 40% of Hispanic households rely *solely* on over-the-air broadcast signals for *all* of their viewing, and 67% watch at least one over-the-air set in their home. In Dallas-Fort Worth, 46% of Hispanic households rely *solely* on over-the-air broadcast signals, and 57% watch at least one over-the-air set in their home. (Nielsen Media Research, NHSI, Feb. 2004).

Thus, the myth perpetuated by those seeking this legislation—that over-the-air viewers are a negligible segment of the population not worthy of adequate interference protection—is just plain wrong. In fact, the total number of Hispanic viewers relying exclusively on over-the-air reception has *increased by over 7% since 1999*. (Nielsen Media Research, NHTI, 1999-2004).

Interference received from unlicensed devices harms all over-the-air viewers, but Hispanic viewers are particularly susceptible to such interference, as nearly 40% of Hispanic households reside in multiple dwelling units, compared with the Non-Hispanic U.S. average of 21.7% (American Housing Survey for the United States in 2003). In such apartment-style living, where residents share walls, electrical wiring, copper water supply pipes, and often a single rooftop master antenna, a single unlicensed device can cause interference throughout the building. Such signals traveling through walls, floors and ceilings into nearby apartments ensure that interference is not limited to just the user of the unlicensed device, and even that individual will likely be unaware that the unlicensed device is the source of his own reception problems. Aggravating this problem is the tendency of a building's copper electrical wires to serve as an antenna that picks up the signal of the unlicensed device (either through the air or traveling down the device's power cord) and then relays it directly into neighboring television sets through their power cords or by reradiating that signal throughout the building.

One unlicensed unit can cause substantial interference, particularly if it is inadequately designed, improperly operated, or just plain misused. Building residents would have no way of knowing what the cause is, nor could they remedy the problem even if they did. In short, once these devices enter the market, they can never successfully be removed from circulation, even if the FCC finds that a particular make or model creates horrendous interference. While the manufacturer might be fined if caught, that is no help to over-the-air viewers being blocked from their broadcast signals. Also, users of such devices who are cable subscribers frankly won't care about interference they cause to their over-the-air neighbors, eliminating even a consumer's own self-interest as a natural check on interference.

The notion that such devices can be easily designed to confine themselves to "unused" television spectrum is based on the fundamentally flawed premise that ample amounts of such spectrum exist. As Univision can attest from its own experience, the notion

that there will be ample “unused” television band spectrum available for unlicensed use after television stations are compressed into Channels 2-51 in 2009 is just plain wrong. This is particularly true of the densely populated urban areas where Hispanic viewers are concentrated and where makers of unlicensed devices must sell their product if they are to achieve economies of scale and make their profit. Over half of the U.S. population lives in metropolitan areas with a population of one million or more residents, and it is not realistic to think that unlicensed devices will only be marketed and sold in rural areas that are not spectrum congested.

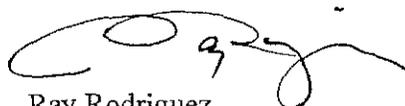
Univision is the largest owner of television stations whose analog and digital channels are both outside the “core” spectrum (Channels 2-51) where all stations must be located after February 17, 2009. As a result, it has had to build digital stations on non-core channels assigned to it by the FCC, and then must rebuild those stations on in-core channels assigned by the FCC when analog broadcasting ceases. In attempting to locate in-core channels for those permanent DTV operations, Univision has found very little spectrum available. Univision was unable to locate viable channels for its post-2009 digital operations that could serve the same populations as its current analog operations in cities like New York, Philadelphia, San Francisco, and Boston. In fact, in San Francisco, no viable channels existed at all, so Univision has had to propose moving its transmitter site away from San Francisco in order to locate a permanent channel. As low power television stations also move their operations into the core spectrum and begin to apply for paired DTV channels, that congestion will only worsen. Thus, even if an “unused” channel did exist at the time an unlicensed device is purchased, that channel is unlikely to remain unused for long, stranding millions of such devices and the consumers that bought them. If the device fails to regularly reevaluate spectrum availability, it will interfere with those recently moved television signals. If it recognizes the newly-moved signal and shuts itself down for lack of spectrum, there will be numerous irate consumers who cannot even return the devices for a refund at that point. If it recognizes the newly-moved signal and elects not to shut down for lack of spectrum, but to continue operating on an interfering channel, it will be causing illegal interference to television reception and may also function poorly due to interference received. None of these options is acceptable for consumers, viewers, or broadcasters.

Univision has also noted that Hispanic viewers often watch its analog signal in rural locations that are beyond where the FCC’s methodologies would predict a viewable signal is available. Thus, any interference standard for unlicensed devices hastily adopted by the FCC would likely not protect these viewers against interference caused by unlicensed devices. As a result, *rural* viewers are also likely to lose broadcast service due to interference from unlicensed devices, and this harm will be exacerbated by the transition to digital television. While interference from unlicensed devices to an analog television signal will manifest itself as an increasingly “snowy” picture, interference to a digital signal results in no picture at all. Viewers in the rural fringe areas of a station’s signal, who must necessarily work with a weaker television signal in the first place, are therefore highly susceptible to even low levels of interference from unlicensed devices. Whether the effect is a loss of access to Spanish-language entertainment programming, or to critical, lifesaving news and public safety information during times of local emergencies, it undermines the valuable community service that free, over-the-air television provides to millions of viewers.

Finally, there is little benefit to balance against this harm. A lack of spectrum for use by such devices is clearly not the problem, as the FCC is auctioning off large blocks of television spectrum above Channel 51 for use by such new technologies. That was the very reason why broadcast stations currently operating on channels 2-69 are now being compressed into channels 2-51. In turn, that compression is the reason why "unused" broadcast spectrum is quickly becoming a mythical creature. It is a perverse result where broadcast stations have been forced from channels 52-69 (at great expense to entities like Univision) so that government can obtain revenue from auctioning that spectrum, only to have the government undercut the value of that auctioned spectrum by telling potential bidders that the government is making additional spectrum available for free, without even any licensing costs.

Univision is therefore opposed to any arbitrary deadline for implementing unlicensed use of broadcast spectrum. It may very well be impossible for such devices to operate on a non-interfering basis, and a rushed implementation certainly is not going to help that situation. Univision urges a resolution of the matter based on good engineering rather than legislative deadlines. Univision therefore continues to support the currently pending FCC and Institute of Electrical and Electronics Engineers (IEEE) proceedings aimed at determining appropriate technical and interference standards for unlicensed use of broadcast spectrum. Legislation mandating a quick but erroneous resolution of such complex technical and policy questions is harmful to all parties, particularly the public. Once such devices are introduced into commerce, the interference they cause will be with us indefinitely. Allowing the FCC and the IEEE the necessary time to consider and address the many issues raised by such unlicensed devices operating in the television band is essential. Legislation that disrupts that process is far too blunt an instrument for such a delicate operation.

Sincerely,



Ray Rodriguez
President and Chief Operating Officer

cc: Committee on Commerce, Science, and Transportation



May 3, 2006

The Honorable Ted Stevens
Co-Chair, Senate Commerce Committee
United States Senate
Washington, DC 20510

Re: "White Spaces" Legislation in the TV Broadcast Band

Dear Senator Stevens:

I am writing on behalf of the Community Broadcasters Association ("CBA") to express serious and urgent alarm over the prospect that Congress will pass legislation requiring the Federal Communications Commission to permit the operation of unlicensed broadband devices on television channels before the scientific community has completed the job of figuring out how these devices can co-exist without causing interference to television reception.

The CBA is the trade association of the nation's Class A and Low Power Television stations. Our stations have two very important characteristics that distinguish them from full power TV stations. First, only those outside the top 160 Metropolitan Statistical Areas have any possibility of mandatory cable carriage, and none of our stations have satellite carriage rights. Second, these stations serve small communities and minority and other niche audience in larger markets that are not served by full power stations that require mass audiences for their business to succeed. Indeed, Class A television stations are the only broadcast stations of any kind that are required by an Act of Congress to broadcast local programming (47 USC Sec. 336(f) (2)(A)(II)) requires an average of three hours a week).

In other words, our stations and their audiences depend in very large part on over-the-air viewing and because of their low power will be the first and most harmed victims of interference from unlicensed stations. There are hundreds of Low Power TV stations licensed in Alaska.

I know you are being told by very highly paid lobbyists and engineers that the engineering problems are solvable and that TV spectrum is being wasted. However, all these people have a vested interest in using as much spectrum as they can get, and they have no incentive to worry about reception of local and niche market programming from Class A and Low Power TV stations.

The Honorable Ted Stevens
May 3, 2006
Page 2

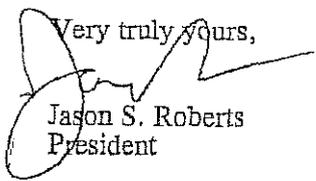
It does not require an engineering degree to understand the interference problem. Any over-the-air TV viewer uses a much larger antenna than anything that can be built into any computer device, especially a portable laptop. The TV antenna is bigger even if the viewer uses only indoor rabbit ears. Unlike wi-fi spectrum that computers use every day, TV signals need a relatively large antenna for proper reception because of the part of the spectrum where they operate. That means that any kind of small receiving antenna built into a computer is inefficient in the TV band, so it will not necessarily detect the relatively weak signal on a Class A or Low Power channel. The result will be that the computer system will transmit on our television channels or the next channel over, damaging our picture and sound, and our viewers will not know why they cannot see our stations.

If TV spectrum is shared by unlicensed devices, there will be no effective process to locate sources of interference to a television signal. No one will have a list of users. Beyond that, our stations do not have the resources or the equipment to drive up and down every street in town looking for interfering signals. That is why I am asking you not to require the FCC to allow these operations without giving industry engineers time to come to a consensus as to the best way to control the frequencies used by wireless devices. The problem is very difficult to solve, and it cannot be solved overnight, or even in a few months.

If you conclude that it is absolutely critical to use parts of the TV spectrum for wireless broadband services prior to the end of the digital television transition, then a pilot program would be the better way to start, using licensed devices on controlled channels at controlled locations. That way, if there is a problem, the source can be identified, and the problem can be addressed. Jumping immediately into an unlicensed environment, which means that consumer products that cannot be controlled or traced will flood the market, before the engineering community agrees on effective technical standards to avoid interference, makes no sense. It will leave consumers confused and without any remedy.

Please do not destroy our Class A and Low Power TV stations by polluting the spectrum they actually use with devices that are supposed to use "vacant" spectrum but will not be able to determine what spectrum is really vacant if they are unlicensed and not controlled by a central source. If you do that, then our stations need to be on cable, even more than full power stations. Until they are give cable rights, they need clear spectrum. Please do not continue to deny them access to wired distribution and then degrade their airwaves on top of that.

Very truly yours,



Jason S. Roberts
President



NATIONAL TRANSLATOR ASSOCIATION

OUR AIM – TO PROVIDE FM and TV SIGNALS in EVERY HOME

Office of the President, 2355 Ranch Drive, Westminster, CO 80234 303-465-5742 Fax 303-465-4067 stcl@comcast.net

To: All Concerned
From: Byron St., Clair, President, March 9, 2006

URGENT!

re: Operation of Unlicensed Transmitters on “vacant” TV channels.

Senator Stevens is pushing legislation which would force the FCC to set up rules allowing unlicensed data transmitters to operate on “vacant” TV channels. He proposes to force the FCC to complete the rulemaking in Dockets ET 04-186 and ET 02-380.

The FCC is apparently not actively trying to adopt rules authorizing the unlicensed operation possibly because they recognize there are many unresolved issues regarding whether widespread unlicensed operations would cause interference.

The presumed use would be for broadband Internet connections. The prevailing assumption is that unlicensed fixed and mobile stations would make service more widely available and at reduced cost.

Our members, most of whom are in relatively rural areas, would presumably benefit. However, in spite of the prospect of a benefit the NTA is truly frightened at the prospect of hundreds of thousands or even millions of unlicensed transmitters operating in the TV band.

The proponents claim that interference would be avoided partly by requiring the unlicensed devices to have advanced signal detection techniques that would block transmission on any channel where a signal could be detected with their techniques.

These techniques have not been demonstrated and proven effective for this use either in lab tests or more importantly in field tests. Because of the immense potential for harm if the interference avoidance techniques are not entirely successful and the difficulty of undoing any mistake, the NTA has urged that no rules be adopted until field tests in multiple locations with varying climates, terrain and population densities prove successful.

We note that the FCC has never authorized a new service with out field tests establishing its viability and do not think they should do so in this controversial proceeding.

We believe Senator Stevens bill would force the FCC to take action before the plan is proven workable. Accordingly we ask that other Members of Congress oppose the Steven’s bill.

PS: The list of possible and even probable problems raised by commentors in the Docket is available on request from me.

March 6, 2006

The Honorable Ted Stevens, Co-Chairman
Committee on Commerce, Science
and Transportation
United States Senate
254 Russell Senate Office Building
Washington, DC 20510

The Honorable Daniel Inouye, Co-Chairman
Committee on Commerce, Science
and Transportation
United States Senate
560 Dirksen Senate Office Building
Washington, DC 20510

Dear Co-Chairmen Stevens and Inouye:

The Association of Public Television Stations writes to voice its concern regarding two bills under consideration by the Senate Commerce Committee: The American Broadband for Communities Act (S.2332) and the Wireless Broadband Act of 2006 (S. 2327). Both these bills seek to authorize the introduction of unlicensed wireless devices at so-called vacant broadcast channels. APTS is gravely concerned that these bills will inadvertently contribute to interference with over-the-air television reception (both digital and analog), especially in rural areas like Alaska that are served by low power "translator" stations. We urge your Committee to consider either tabling these bills or including provisions (a) to delay introduction of unlicensed devices into the TV band until after the analog shut-off date of February 17, 2009 and only after adequate technical testing has occurred, and (b) to ensure the continuity and integrity of television broadcast service for rural communities.

Although both bills seem to contain admirable efforts to create procedural and technical protections against interference with incumbent broadcasters, the nature of an unlicensed device is such that it would be impossible to police. Such devices would be operated by unidentified, untrained individuals at multiple, undisclosed and possibly changing locations. A television viewer—or a broadcaster or the government—could be unable to identify who or what is causing interference to television reception at any given time. As a result, the provision at S. 2332 that requires a broadcaster to provide "verification, in the field, of actual harmful interference" would be almost impossible to fulfill. Stricter safeguards need to be in place and not ones that would impose an unreasonable burden on resource-constrained noncommercial broadcasters.

Further, APTS urges a delay in any introduction of unlicensed devices into the TV band until after the digital transition is finished. Before unlicensed devices are authorized to operate in any spectrum band, complete and thorough experimental field testing should be conducted. To date, no such tests have been made, and there have been no real-world demonstrations of the kind of technological innovation that proponents of unlicensed devices have said might mitigate interference. A delay past the analog shut-off date of February 17, 2009 would provide time for the industry to conduct such tests and for expert government agencies to evaluate these tests. In addition, both the FCC and the IEEE are independently considering the technical issues and should be given time to carefully complete their deliberations before authorizing such devices. Further, delay of

authorization of unlicensed devices past February 17, 2009 would also provide enough time for the FCC to finalize its DTV table of allotments and to ensure a successful resolution to the digital transition. Resolving the final channel assignments for the digital broadcast licensees of not only digital channels for main transmitters but also digital channels for TV translators and LPTV stations is a prerequisite to a successful DTV transition and continuity of service to the public.

Over-the-air television viewing remains an important means by which many Americans receive quality noncommercial educational programming. As you know, 73 million television sets remain unconnected to cable or satellite. Both the FCC and GAO have separately found that on average, up to 19 percent, or 20.8 million households rely *exclusively* on free over-the-air television. Naturally, in some markets, reliance on over-the-air reception is greater than this national average. Both the FCC and GAO have concluded that these households are more likely to be African-American, Hispanic and low-income. In addition, the American Association of Retired Persons has testified that older Americans are more likely to depend on over-the-air reception. In addition, "broadcast-only" households are more likely to be frequent public television viewers.

Moreover, rural communities are also especially reliant on over-the-air transmissions. For instance, in many rural areas, consumers receive a television signal from low power translator stations that pick up a low intensity, attenuated signal from a distant full-power station, and retransmit the signal sometimes at only a few watts of power. These over-the-air transmissions are sometimes the only television service to a community; in other cases, small and rural cable systems rely on translator transmissions to feed television signals to their cable headends. Further, because these transmissions are at low power, they would be especially susceptible to interference from nearby unlicensed devices. Both bills being considered would allow an untested and unproven technology to potentially interfere with the television reception and would inadvertently affect rural communities that rely on television translator reception.

Accordingly, APTS urges the Committee to table the two bills being considered. Alternatively, APTS urges the Committee to amend the bills (a) to delay introduction of unlicensed devices into the TV band until after February 17, 2009 and then only after adequate technical testing has occurred, and (b) to ensure the continuity and integrity of television broadcast service, especially for rural communities

Sincerely,

John Lawson

Coalition for Spectrum Integrity

March 18, 2005

The Honorable John McCain
United States Senate
241 Russell Senate Office Building
Washington, DC 20510

Dear Senator McCain:

The undersigned trade associations, organizations, businesses, manufacturers, and public safety organizations are writing to you to express our deep concern over an extremely troubling proposal by the Federal Communications Commission that would permit the operation of higher powered unlicensed devices in the band of frequencies used for television broadcasting. We have formed the Coalition for Spectrum Integrity ("COSI") in response to the threat that the FCC's proposal poses to the viewing public.

COSI members represent communications industries that have invested billions of dollars in this band. Also, billions of dollars in the American economy are generated by COSI members. The FCC's proposal places this investment, and the benefits that flow to the public, in grave jeopardy. In our view, authorizing unlicensed devices by the Commission based on the record compiled to date would be precipitous, and would result in adverse consequences that would far outweigh any potential benefits from permitting unlicensed interfering devices in these frequencies.

In order to avoid spectrum chaos, Congress wisely enacted the Communications Act of 1934. Its fundamental precept is found in Section 301:

"It is the purpose of this Act, ...to maintain the control of the United States over all the channels of radio transmission; and to provide for the use of such channels, but not the ownership thereof, by persons for limited periods of time, under licenses granted by Federal authority...."

No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio...except under and in accordance with this Act and *with a license* in that behalf granted under the provision of this Act."
(Emphasis supplied.)

The FCC's proposal tears at the basic fabric of the Act. This proposal is much more than the simple authorization of unlicensed low powered, short-range electronic devices, such as a garage door opener, microwave oven or a TV remote "clicker." To the

contrary, the FCC's proposal contemplates the establishment of an entirely new communications system, with unlicensed radio transmissions supposedly reaching 10 to 35 miles. There will be no federal licensing or control. The entire policy rests on the simple belief that this unlicensed equipment can be manufactured so as not to cause interference, and that these manufacturers and unlicensed services will have sufficient incentives to avoid interfering with other communications systems. Both of these assumptions have never been tested in the real world.

Without so much as a single Congressional hearing, the proposal alters 70 years of federal spectrum management and ignores the Congressional requirement to license spectrum users. It is based on a regulatory model that has been employed for short-range products such as garage door openers, and now seeks to extend that model to full powered communications systems that are claimed to cover large, highly populated geographic areas. The consequences of the FCC's proposal may be devastating to the American public. Some major concerns are as follows.

Interference to 73 million television sets: According to an NAB study, there are more than 73 million television sets in the United States that rely exclusively on the reception of over-the-air signals. A recent laboratory study found that under the power levels proposed in the FCC's rules, an unlicensed portable device located within 75 feet of a television set could overload a television tuner, causing interference to the reception of all channels. This means that consumers living in townhomes or apartments could lose their over-the-air TV service as a result of the interference received from their neighbors.

Impairing the digital transition: Interference to newly purchased DTV receivers may cause consumers to return their new TV sets. Undermining consumer acceptance of digital television will delay the digital transition, and prevent recovery of broadcast spectrum on TV channels 52-69.

Interference with public safety communications: Public safety currently shares TV channels 14-20 with television broadcasters in major markets. The FCC proposes to permit unlicensed devices on these channels in medium and small markets, creating interference problems in adjacent overlapping areas.

Undermining newsgathering and sports programming production: Local television stations, broadcast networks, cable news networks, sports networks, sports leagues, and video production companies depend on wireless microphones and wireless video assist devices. The channels used by wireless microphones are very congested, especially in major markets. The FCC's proposal permits unlicensed devices on these same channels, making wireless microphones and wireless video assist devices unreliable. It will become increasingly difficult, if not impossible, to produce live news and sporting events.

Interference with theaters, churches and school events: Theaters and churches often use wireless microphones in their performances and services, respectively. Unlicensed devices may very well interfere with these microphones.

Permanently chills investment and impairs the value of the spectrum for the public: The FCC proposes to give unlicensed services access to this prime spectrum, free of charge, for commercial services. Some have proposed giving free access for unlicensed operations to Channels 52 to 69, even though some of these channels have already been auctioned for the deployment of new wireless services upon conclusion of the DTV transition. Such a give-away of prime licensed spectrum, particularly the channels within the Lower 700 MHz band that have already been auctioned, would be fundamentally unfair and would chill investment and reduce the value of licensed spectrum. Businesses have already spent millions of dollars to buy licenses for the Lower 700 MHz spectrum based on the existing FCC rules, which do not allow unlicensed operations on their spectrum and in the adjoining TV bands. These businesses are investing large sums of money to launch innovative services on their frequencies. The FCC should not change its rules now, years after the auctions, and give away free access to the adjacent TV spectrum, as proposed by the FCC, or free access to the same Lower 700 MHz licensed spectrum that the FCC has already auctioned, as others have proposed. Moreover, in future auctions, bidders may well bid far less if there is a real prospect that, after the auction, the government could force them to share the spectrum with millions of unlicensed devices, whose manufacturers obtained access to the spectrum from the government for free. Finally, once unlicensed devices are permitted into a licensed band, there is no way to remove them in order to cure the interference so that the licensed services can continue unimpaired or to accommodate future, more advanced licensed services.

Interference to cable service: Introducing unlicensed base stations into the broadcast band may have an adverse impact on the reception of broadcast television signals at a cable headend. As a result, subscribers to that cable system may be unable to see certain broadcast channels and programs. In addition, portable unlicensed devices may interfere with “in-home” cable wiring and connections. All of the factors are likely to confuse consumers, who will not know who or what is causing the interference they are suffering, much less how to stop it.

Proponents of unlicensed devices argue that new advanced technology ensures there will be no interference. This simply has not been the case in the real world. A recent example of interference to military radar underscores the dangers posed by unlicensed devices operating in licensed spectrum bands. On January 27, 2005, United States Air Force officials reported that wireless Internet connections in the 5 GHz band were interfering with military radar at the Eglin Air Force Base in Florida.¹ According to Master Sgt. Dawn Hart, “The sources of interference show up as targets on tracking

¹ See, e.g., Associated Press, *High Speed Net, Wi-Fi Interfering with Military Radar*, USA Today (Jan. 28, 2005).

radars because of their strong signals.”² Officials from the county, which is home to the base, mistakenly (but understandably) opined: “There are evidently people who are firing up [wireless Internet] hotspots without [FCC] licensing.”³ In fact, those Wi-Fi hotspots are in the *unlicensed* U-NII band. It is unclear when, or even if, officials will be able to locate and remedy the unlicensed sources of harmful interference to the radar tests. Indeed, the FCC recently announced that the federal government and the unlicensed device manufacturers have found it so difficult to solve these interference problems that the FCC cannot yet adopt measurement procedures to authorize unlicensed devices to operate in 255 MHz of spectrum in the 5 GHz band reallocated for unlicensed operations in November 2003.⁴ Yet, the parties who favor allowing unlicensed devices in the TV bands seek to rely on many of the very same techniques that are not working now in the 5 GHz bands to mitigate interference in the TV bands.

The FCC’s response to a similar situation can be found in the attached *Public Notice*.⁵ The *Public Notice* indicates there is no effective way to prevent interference from taking place: “It is not possible to predict in advance which specific users or locations near military bases may experience interference, because of the variety of technical characteristics of garage door controls and configuration of the mobile radio systems.”

Our concern is magnified by the fact that the FCC is proposing that television receivers and unlicensed devices share the same frequencies.⁶ Unlicensed interfering devices are portable, and there won’t be any database of licensees who can be contacted by the Commission once television viewers begin to complain that their sets periodically go dark. The same is true for interference from unlicensed devices with police radios and wireless microphones. There is no practical way to control their use once interference commences. Moreover, it is impossible for the government to confiscate these unlicensed, interfering devices once they are in the hands of the public.

Permitting such devices in the broadcast television band, at this time, is premature. It will undermine the digital transition. Significantly more work, including real world testing, needs to be accomplished before such devices can be authorized to share spectrum. The services provided to the American public by the undersigned organizations are too important to be subject to potential significant interference.

² Associated Press, *High Speed, Wi-Fi Internet Messing with Eglin AFB Radar*, South Florida Sun-Sentinel (Jan. 28, 2005).

³ *Id.*

⁴ *Order*, Revision of Parts 2 and 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz Band, FCC 05-43, February 23, 2005 at Pg. 4.

⁵ *Public Notice*, Consumers May Experience Interference to Their Garage Door Opener Controls Near Military Bases, DA 05-424, February 15, 2005.

⁶ Under FCC rules, consumers have a *right* to install and operate antennas up to one meter in length for the operation of unlicensed transmitting or receiving equipment. See *Public Notice*, Commission Staff Clarifies FCC’s Role Regarding Radio Interference Matters, DA 04-1844, June 24, 2004.

Sincerely,

David L. Donovan
President
Association for Maximum Service Television, Inc.

Participating Organizations

Trade Associations

Association for Maximum Service
Television, Inc.
Association of Public Television
Stations
Community Broadcasters Association
National Translator Association
National Systems Contractors
Association (NSCA)
Society of Broadcast Engineers, Inc.
SW Colorado TV Translator Assn.

Individual Companies

QUALCOMM Incorporated

Total RF, Inc

The ABC Television Network
The ABC Owned Television Stations
CBS Television Network
Fox Television Stations, Inc.
NBC Universal and NBC Telemundo
License Co.
UPN Television Network
Viacom Television Stations Group

Belo Corp.
Capitol Broadcasting Co., Inc.
Clear Channel Communications, Inc.
Cox Broadcasting
Emmis Communications
Entravision Holdings, LLC
Fisher Broadcasting Company
Gannett Broadcasting
Hearst-Argyle Television, Inc.
Hubbard Broadcasting, Inc.
Liberty Corporation
LIN Television, Inc.
Morgan Murphy Stations
Mid-State Television, Inc.
WMFD-TV DT, Mansfield, OH
Morris Network of Mississippi, Inc.
WXXV-TV DT, Gulfport, MS
WCBI-TV, LLC, WCBI-TV DT
Columbus, MS
Morris Network, Inc.
WMGT-TV DT, Macon, GA
Guenter Marksteiner
WHDT-DT, Stuart, FL
New York Times Broadcast Group
Pappas Telecasting Companies
Paxson Communications Corporation
Sarkes Tarzian, Inc.
Tribune Television, Inc.

Hammett & Edison, Inc.

Sevier Valley Communications
Monroe, Utah 84754-0163

R. Kent Parsons
Phone 435-527-3566
Fax 435-527-4041

Honorable Ted Stevens
522 Hart Senate Office Building
Washington, DC
20510

Dear Senator Stevens:

I represent the licensees and owners of TV translators in the Salt Lake City DMA, and in this capacity, I urge you to reconsider your Senate Bill S2686 which directs the Federal Communications Commission to allow the use of unlicensed devices in so-called "white spaces", those portions of the broadcast spectrum not used by TV broadcasters.

The passing of this bill will:

- Cause loss of local broadcast reception to the majority of the 6,000 TV translator stations now serving Rural America, most particularly in the Western States.*
- Cause interference to home television receivers in proximity to unlicensed devices.
- Fail to define how to protect TV broadcasters and other licensed services from harmful interference caused by the use of such devices.
- Fail to consider the problem of the impact of mobile transmit signals to our existing TV receive channels (Snowmobiles, ATV's, etc.)
- Fail to offer protection to government agencies that have existing Special Use Permits (US Forest Service, Bureau of Land Management, US Park Service, etc) for remote locations.

Please note: Analog signal interference merely produces unwanted co-channel lines that degrade the picture. However, even minor interference into digital signals creates a pixel or blanking effect and becomes intolerable. Increased interference completely removes all picture and sound.

** The following western states translator numbers are approximate and were derived from a recent TV Fact Book. In addition, LPTV stations operating as translators are not included in these numbers:*

Alaska.....	517
New Mexico...	291
California.....	454
Oregon.....	406
Colorado.....	620
Idaho.....	244
Utah.....	669
Washington....	253
Montana.....	357
Wyoming.....	182
Nevada.....	315
Arizona	229

Total.....4537

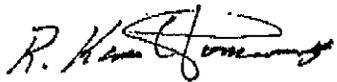
Further concerns about this bill:

- Not a single field test has actually been conducted to prove the verbal claims of this new concept.
- The industry is unaware of any new innovative equipment that has been manufactured to provide absolute protection.
- Free over-the-air television reception must be protected for rural viewers who depend on local broadcast signals for emergency information and warnings, i.e., EAS, Amber Alert and Terrorist Alerts.
- Rural viewers should have their existing services protected because many rural people simply cannot afford any type of subscription television.
- Once the proposed rules are approved, history has shown that any violations to them involving interference or power levels will be unenforceable. The violations involving CB radios throughout the 1970's to the present are a pertinent example.

CONCLUSION AND PROPOSED ACTION

In light of these demonstrated interference issues and other probable technical problems, we urge the immediate formation of a panel of independent industry experts (including Dr. Byron St. Clair, President of the National Translator Association) that will completely examine the impending interference problems resulting from the passage of this Bill. This Panel should have the authority to present the necessary standards and rules for unlicensed "white space" devices, as required by all other licensed broadcast facilities to clarify the further impact on unlicensed use of the TV band.

Respectfully,



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Senator Orrin Hatch
Senator Robert Bennett
Utah Broadcasters Association
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National Association of Broadcasters
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FCC