MSTV

MAXIMUM SERVICE TELEVISION

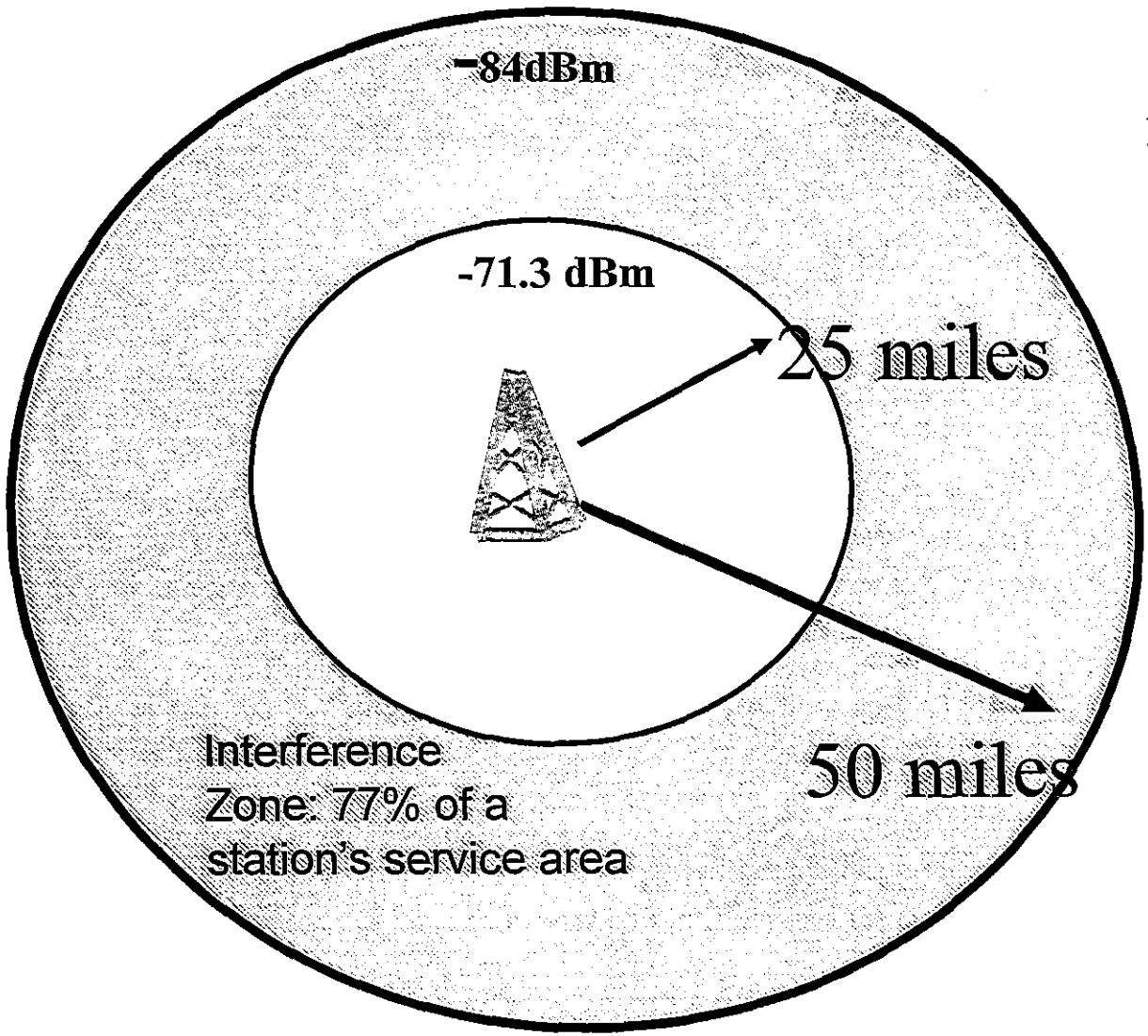
COMPROMISING THE LAWS OF PHYSICS TV WHITE SPACES PROPOSAL

FIRST ADJACENT CHANNEL INTERFERENCE

Compromising DTV

- FCC plans to let personal and portable devices operate at 40 milliwatts on the first adjacent channel
- DTV sets cannot block out signals at these power levels
- Interference will come from unlicensed devices operating in the next apartment or down the hall
- Zone for potential interference is about 77% of a station's coverage area

Based on data contained in the FCC's *DTV Receiver Report* from March 30, 2007. A 40 milliwatt device operating on the first adjacent channel will lead to interference in nearly 77% of a TV station's coverage area.



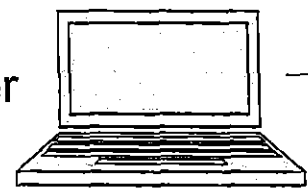
Interference from operating a 40 milliwatt device on the first adjacent channel begins at about 25 miles from the TV tower. At 25 miles the interference distance from the unlicensed device to the TV set is approximately 10 meters. At a distance of about 50 miles from a tower, the interference distance from the device to the TV set increases to 45-50 meters.

Using "Egli Model" employed by OET in DTV Receiver Report, March 30, 2007 at 2.2

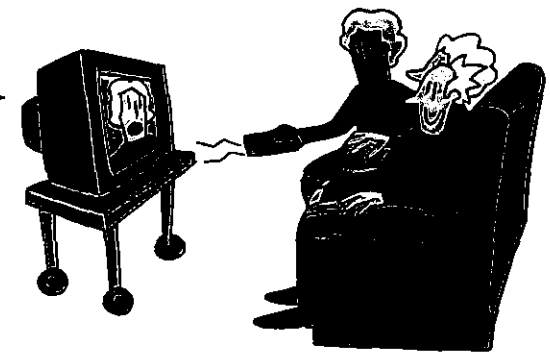
Interference distances from a 40mW unlicensed device operating on the first adjacent channel to a digital TV set

TV set tuned to DTV channel 30 and unlicensed device operating on channel 31 or 29

Interference distance where TV set is approximately 25 miles from TV tower or closer using an indoor antenna.

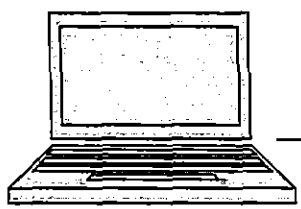


10 meters

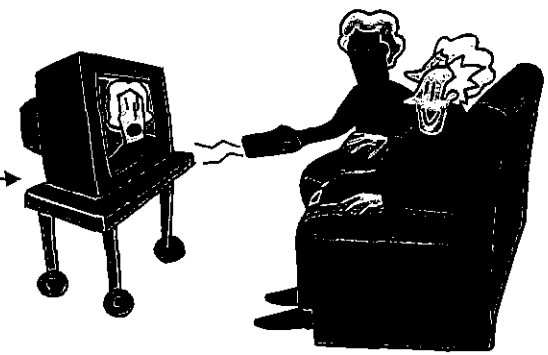


unlicensed device

Interference distance where TV set is approximately 50 miles from TV tower or closer using an indoor antenna.

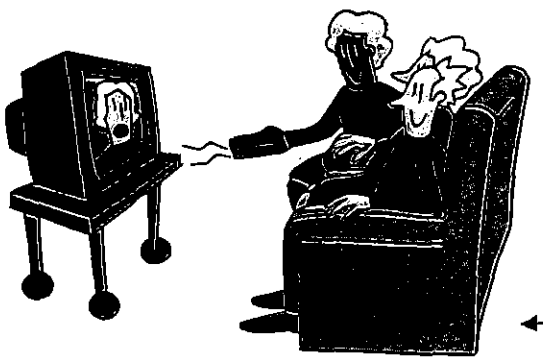


45-50 meters



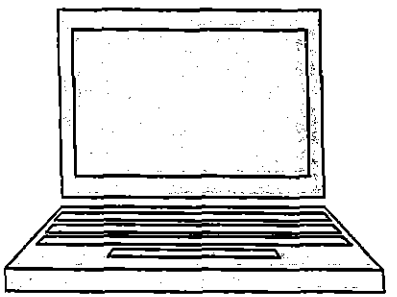
unlicensed device

First adjacent channel interference analysis 40 milliwatt unlicensed device operating on the first adjacent channel



TV set tuned to TV channel 30 and unlicensed device operating on channel 31 or 32

Interference distance



FCC DTV Receiver Tests	D/U (Tested at N-1 at 68 dBm)	DTV Signal filed strength level where interference begins[1]	Free space interference distance from the device to a TV set where device is approximately 25 miles from a TV tower	Free Space Interference distance from device to TV set at Edge of DTV Contour Approx 50 milesr[3]	Interference Area approximately 25 to 50 miles for typical station (% DTV Service Area)[2]
FCC Best Receiver	-40.1	-72.1	10 meters	40 meters	73%
FCC Worst Receiver	-37.9	-69.9	10 meters	50 meters	80%
FCC 2nd Worse	-38.0	-70	10 meters	50 meters	80%
FCC Median	-39.3	-71.3	10 meters	45 meters	77%

MSTV

MAXIMUM SERVICE TELEVISION

COMPROMISING THE LAWS OF PHYSICS: PROPOSED UNLICENSED DEVICE PLAN INTERFERES WITH CONSUMERS' DIGITAL TELEVISION RECEPTION

GOAL OF WHITE SPACES PROPONENTS IS TO END OVER-THE-AIR BROADCAST TELEVISION.

"Take TV off the air" in a few years, said Michael Calabrese, director of the foundation's Wireless Future Program, since 2002 an advocate of opening the TV white spaces. To open all TV spectrum to wireless broadband, over-the-air broadcasts should be replaced entirely by cable, satellite and Internet viewing, he said. All channels should be available by broadband, with the government possibly subsidizing cable and satellite providers to deliver free Lifeline service, Calabrese said."

"The FCC proposes to limit devices to 40 milliwatts of power in white-space channels adjacent to TV stations, but "we're going to push that up over time," Calabrese said. Mark McHenry, CEO of Shared Spectrum Co., said "the FCC is going to start conservatively, but we're going to wear them down. In a few years, we're going to be at 10 W all over the place."

Communication Daily, October 22, 2008 at 3-4

FCC SHOULD NOT RUSH TO JUDGMENT WITH A PLAN BASED ON AN ENGINEERING REPORT THAT HAS NOT BEEN SUBJECT TO PUBLIC COMMENT AND REVIEW.

- TRADITIONAL FCC PROCEDURES ALWAYS ALLOW FOR PUBLIC COMMENT ON TECHNICAL REPORTS.
- THERE IS NO REASON WHY THIS DECISION MUST BE MADE ON ELECTION DAY, NOV. 4TH, 2008.

FCC SHOULD NOT ALLOW ANY UNLICENSED DEVICES IN THE BAND THAT RELY EXCLUSIVELY ON SENSING TO PREVENT INTERFERENCE.

DATA FROM ENGINEERING REPORT PROVES THAT DEVICES CANNOT ACCURATELY SENSE DTV SIGNALS. DATA REPORTED IN THE STUDY CONFLICTS WITH PURPORTED CONCLUSION THAT THE FAILED DEVICES "PROVED THE CONCEPT" THAT SENSING WORKS.

- THREE OF FOUR DEVICES (ADAPTRUM, I2R AND MOTOROLA) FAILED TO DETECT DTV SIGNALS EVEN THOUGH THERE WAS A VIEWABLE PICTURE.

- THE FOURTH DEVICE (PHILIPS) FAILED TO DETECT 85% OF THE VACANT CHANNELS.

- A SENSING FAILURE RESULTS IN THE DEVICE TURNING ON TO AN OPERATING TV CHANNEL, CAUSING INTERFERENCE TO CONSUMERS' DTV SETS AND CONVERTER BOXES AT DISTANCES OF A KILOMETER OR MORE.

FCC'S PLAN TO ALLOW 40 MILLIWATT UNLICENSED DEVICES ON THE FIRST ADJACENT CHANNEL CREATES THE POTENTIAL FOR INTERFERENCE TO DTV SETS THROUGHOUT <u>77% OF A TV STATION'S SERVICE AREA.</u>

- PREVIOUS FCC STUDIES SHOW DTV SETS AND CONVERTER BOXES ARE UNABLE TO "REJECT OR BLOCK OUT" SIGNALS FROM DEVICES OPERATING ON FIRST ADJACENT CHANNELS. THE KEY ISSUE IS WHICH SIGNAL IS STRONGER, THE TV SIGNAL OR THE INTERFERING SIGNAL FROM THE UNLICENSED DEVICE?

- INTERFERENCE ZONE RANGES FROM 25 TO 50 MILES FROM THE BROADCAST TOWER. THIS REPRESENTS ABOUT 77% OF A TV STATION'S SERVICE AREA *(USING FCC APPROVED FREE SPACE METHODOLOGY).*

  - AT 25 MILES FROM THE TV TOWER, THE INTERFERENCE OCCURS IF THE DEVICE IS OPERATED AT ABOUT 10 METERS FROM THE TV SET.

  - AT 50 MILES FROM A TOWER, THE INTERFERENCE OCCURS IF THE DEVICE IS OPERATED AT ABOUT 45 TO 50 METERS FROM THE TV SET.

  - WITH LESSER QUALITY DTV SETS, INTERFERENCE MAY OCCUR IF THE DEVICE IS OPERATED AT A RANGE UP TO 250 METERS FROM A TV SET (AT A DISTANCE OF 50 MILES FROM A BROADCAST TOWER).

- CONSUMERS LIVING NEAR BROADCAST TOWERS AND USING INDOOR ANTENNAS WILL ALSO RECEIVE INTERFERENCE.

  - TV SIGNALS BEING RECEIVED INDOORS WITH AN ANTENNA ARE GENERALLY WEAKER BECAUSE OF WALLS, ETC.

  - WHILE WALLS MAY REDUCE THE SIGNAL STRENGTH OF AN UNLICENSED DEVICE, IT WILL STILL OVERWHELM THE SIGNAL STRENGTH OF THE TV SIGNAL AT THE ANTENNA.

TV BROADCASTERS' COMPREHENSIVE PLAN ALLOWS USE OF TV WHITE SPACES WITHOUT INTERFERENCE.

- BROADCASTERS SUPPORT USING WHITE SPACES FOR RURAL BROADBAND. THIS HAS NEVER BEEN A PROBLEM.

- BROADCASTERS SUPPORT FIXED AND PERSONAL PORTABLE USES PROVIDED ALL DEVICES USE A GEOLOCATION SYSTEM IN COMBINATION WITH AN ACCURATE DATABASE TO AVOID INTERFERENCE.

- BECAUSE SENSING DEVICES HAVE UTTERLY FAILED, WE OPPOSE ANY RULES ALLOWING DEVICES IN THE BAND THAT RELY EXCLUSIVELY ON "SENSING" TO AVOID INTERFERENCE.

- BECAUSE OPERATING DEVICES ON THE FIRST ADJACENT CHANNEL WILL CAUSE INTERFERENCE IN APPROXIMATELY 77% OF A STATION'S GEOGRAPHIC COVERAGE AREA, WE OPPOSE PLACING 40 MILLIWATT DEVICES ON THE FIRST ADJACENT CHANNEL.

- IN ORDER TO PROTECT CABLE SUBSCRIBERS, WE SUPPORT LIMITING POWER ON THE REMAINING ADJACENT CHANNELS TO AVOID DIRECT PICK UP INTERFERENCE TO DIGITAL CABLE-READY SETS.

- IN ORDER TO PROTECT LICENSED WIRELESS MICROPHONES USED IN REPORTING NEWS AND SPORTING EVENTS, WE SUPPORT SETTING ASIDE CHANNELS FOR EXCLUSIVE USE BY LICENSED WIRELESS MICROPHONES.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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

EMERGENCY REQUEST

THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC. ("MSTV"),
THE NATIONAL ASSOCIATION OF BROADCASTERS ("NAB"),
THE ABC, NBC, CBS, AND FOX TELEVISION NETWORKS, AND
THE OPEN MOBILE VIDEO COALITION ("OMVC")

SUMMARY

The Association for Maximum Service Television, Inc. ("MSTV"), the National Association of Broadcasters ("NAB"), the ABC, NBC, CBS, and Fox Television Networks, and the Open Mobile Video Coalition ("OMVC") request that the Commission issue a public notice seeking comment from members of the public on the 400-page report released on October 15, 2008 by the Office of Engineering and Technology ("OET").

The OET's report provides detailed results of extensive laboratory and field tests of prototype white space devices. The underlying data contradict the conclusions that are made in the report, including the assertion that there has been a "proof of concept" of spectrum-sensing devices. The data show that spectrum sensing cannot be used to determine accurately whether a television channel is occupied or vacant.

The Chairman has announced that the Commission will vote in 14 business days to adopt rules authorizing TV band white space devices based on the conclusions in the OET's report. If the Commission adopts rules hastily based on a flawed reading of the OET test results, WSDs will be let into the broadcast band without the protections that are necessary to prevent widespread interference to television and cable reception. Yet the Commission has not allowed members of the public to review and comment meaningfully on the results of the OET tests. Millions of viewers of digital television and cable services have a stake in the results of this proceeding. In light of the complexity of the report and critical issues raised by this proceeding, the Commission should issue a public notice seeking comment on the 400-page OET report, with initial comments be due within 45 days of the release of that public notice and with reply comments due 25 days thereafter.

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
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	)	
	)	
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	)	

EMERGENCY REQUEST

Two days ago, the Commission's Office of Engineering and Technology ("OET") released a 400-page report with "detailed results of laboratory and field interference tests of several prototype TV band white space devices," and conclusions purportedly based on those results.[1] Simultaneously, in a press conference, the Chairman announced that the Commission will vote to adopt, in fourteen business days, rules authorizing TV band white space devices ("WSDs") based on those conclusions.[2] On the same day, the FCC released its tentative agenda for the meeting placing this decision as the eighth item of the November 4th open meeting. In

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[1] *Evaluation of the Performance of Prototype TV-Band White Spaces Devices: Phase II*, FCC/OET 08-TR-1005 (rel. Oct. 15, 2008) ("OET report"). This laboratory and testing process took place over a six month period, during most of which the broadcast industry was represented by Bruce Franca, former Chief of the OET. His views and those of other experts, as well as the public, should be taken into account before the Commission authorizes unlicensed services that will jeopardize the public's broadcast service and that cannot effectively be policed once millions of devices are at large. Indeed, under the Data Quality Act (DQA), 44 U.S.C. § 3516 n., and the Office of Management and Budget Guidelines implementing the DQA, agencies are required to apply "stricter quality standards to the dissemination of information that is considered 'influential.'" 67 Fed. Reg. 8452, 8454 (Feb. 22, 2002). Under the FCC's own data quality guidelines, the study here is "influential" since it will have "a clear and substantial impact on important public policies." See Information Quality Guidelines, 17 FCC Rcd 19890, 19895 (2002). OMB has established that important scientific information must be peer-reviewed by qualified specialists before it is disseminated by the federal government. 70 Fed. Reg. 2664, 2665 (Jan. 14, 2005).

[2] With the meeting in fourteen days, and taking account of the Sunshine Period, only nine business days remain for the public to discuss these issues with Commissioners and staff.

addition to running afoul of the Commission's usual practice of seeking public comment prior to adopting a major rule, this plan relies on conclusions that directly contradict the data contained in OET's report. Moreover, the OET Report contains conclusions that are patently in conflict with these data. The results show that the parameters that the Commission reportedly intends to adopt for WSDs will fail to protect viewers of digital television stations and cable services. If the Commission adopts rules hastily based on a flawed reading of the OET test results, WSDs will be let into the broadcast band without the protections that are necessary to prevent widespread interference to television and cable reception. Accordingly, the Association for Maximum Service Television, Inc. ("MSTV"), the National Association of Broadcasters ("NAB"), the Association of Public Television Stations ("APTS"), the ABC, NBC, CBS, and Fox Television Networks, and the Open Mobile Video Coalition ("OMVC") urge the Commission to issue a public notice seeking comment from members of the public concerning the OET report.

I. THE COMMISSION'S CURRENT PLANS DEVIATE NOT ONLY FROM THE COMMISSION'S ESTABLISHED COURSE BUT ALSO FROM SOUND PRACTICES OF ADMINISTRATIVE PROCEDURE.

For good reason, the Commission's established practice has been to seek comment from the public on studies before issuing a final rule that relies substantially on those studies. For example, OET sought public comment after releasing its study concerning use of the 2500-2690 MHz spectrum for third generation wireless systems and before adopting rules to that end.[3] Similarly, before the Commission adopted revisions to the newspaper/broadcast cross

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[3] Public Notice, *FCC Releases Staff Final Report "Spectrum Study of 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems" Seeks Comment on Final Report in Pending Spectrum Allocation Proceeding*, ET Docket No. 00-258, 16 FCC Rcd 10272 (rel. Mar. 30, 2001); *see also, e.g.*, Public Notice, *Media Bureau Seeks Comment on Experimental Economics Study Examining Horizontal Concentration in the Cable Industry*, CS Docket No. 98-82, et al., 17 FCC Rcd 10544 (rel. June 3, 2002); Public Notice, *Comment* (continued...)

ownership rules in December 2007, it sought comments from the public on its media ownership studies in July 2007.[4] It sought public comment on the technical studies submitted during the Northpoint/DBS proceeding.[5] In 2003, the Commission asked the public to comment on studies addressing use of the separate antennas for the analog and digital components of hybrid FM IBOC signals.[6] And just last year, in this proceeding, the Commission sought public comment on two of OET's technical reports providing initial measurement studies for prototype personal/portable white space devices.[7] Simply put, until two days ago, it has been the Commission's practice to adopt rules based on complex data only *after* allowing the public an opportunity to comment on that data. Failure to provide adequate opportunity for public comment on information so central to the outcome of this proceeding raises serious questions about compliance with the Administrative Procedures Act.[8]

Sought on National Radio Systems Committee DAB Subcommittee's "Evaluation of the iBiquity Digital Corporation IBOC System," MM Docket No. 99-325, 16 FCC Rcd 22436 (rel. Dec. 19, 2001).

[4] *See* Public Notice, *FCC Seeks Comment on Research Studies on Media Ownership*, MB Docket No. 06-121, 22 FCC Rcd 14313 (rel. July 31, 2007). It is worth noting that the 2007 proceeding was required after the courts sent the rules back to the FCC, noting that the rules were adopted without being released to the public for comment.

[5] *See* Public Notice, *Comments Requested on The MITRE Corporation Report on Technical Analysis of Potential Harmful Interference to DBS from Proposed Terrestrial Services in the 12.2-12.7 GHz Band*, ET Docket 98-206, 16 FCC Rcd 8417 (rel. Apr. 23, 2001)

[6] *See* Comments Sought on Use of Separate Antennas to Initiate Digital FM Transmissions, DA 03-3898, 18 FCC Rcd 25676 (rel. Dec. 8, 2003).

[7] *See* Public Notice, *The Office of Engineering and Technology Announces the Release of Reports of Initial Measurements on TV White Space Devices*, ET Docket No. 04-186, 22 FCC Rcd 13846 (rel. July 31, 2007); *see also Am. Radio Relay League v. FCC*, 524 F.3d 227 (D.C. Cir. 2008) (recognizing the importance of seeking notice and comment on a technical report).

[8] Similarly, under the FCC's guidelines implementing the DQA, the agency has committed to the "quality, objectivity, utility and integrity" of the information it disseminates. 17 FCC Rcd at 19894. Here this means that the agency must have meaningful, public peer review of the OET study and its conclusions. *See* 67 Fed. Reg. at 8454; *see also* 70 Fed. Reg. at 2670 ("public participation in peer review is an important aspect of obtaining a high quality product through a credible process.").

In fact, Chairman Martin has stated previously that the Commission must not only seek public comment, but also must fully consider the arguments made in these comments, before the Commission takes further action on a matter. On November 25, 2002, the Spectrum Policy Task Force released a report on the operation of Part 15 unlicensed devices and the possibility of allowing these devices to operate in other frequency bands. The Commission subsequently sought public comment on the conclusions of this report.[9] Less than a month after the report was released, however, the Commission initiated a Notice of Inquiry seeking public input on the viability of allowing unlicensed devices to operate in additional frequency bands, including the TV broadcast spectrum. Then a Commissioner, Chairman Martin issued a separate statement approving in part and dissenting in part, in which he stated:

> Finally, I question the timing of this item. This item is based around several recommendations of the Commission's Spectrum Policy Task Force Report. We only recently put that Report out for comment, with comments not even due until January 9, 2003, and reply comments not due until February 10, 2003. It seems odd to me to initiate this proceeding before we even receive any comments on the Task Force's recommendations. If the Task Force Report was unnecessary for this item, the Commission could have released this item months ago, instead of delaying action for the Task Force to write its Report. If, on the other hand, the Task Force's work was instrumental to this item, it would make more sense to wait for comment on the Report before proceeding.[10]

In fact, Commissioner Copps expressed a similar sentiment with respect to similar reports:

> This is not the way to do rational, fact-based, and public interest-minded policy making. It's actually a great illustration of why

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[9] Public Notice, *Commission Seeks Public Comment on Spectrum Policy Task Force Report*, ET Docket No. 02-135, 17 FCC Rcd 24316 (rel. Nov. 25, 2002).

[10] Notice of Inquiry, *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket No. 02-380, 17 FCC Rcd 25632, 25649 (Dec. 11, 2002).

> administrative agencies are required to operate under the constraints of administrative process —and the problems that occur when they ignore that duty. At the end of the day, process matters. Public comment matters. Taking the time to do things right matters. A rule reached through a slipshod process, and capped by a mad rush to the finish line, will — purely on the merits — simply not pass the red face test. Not with Congress. Not with the courts. Not with the American people.[11]

In stark contrast to the examples above, the Commission has announced that it intends to adopt rules based on the OET report without soliciting *any* public comment on the OET report. The relationship between the studies evaluated in the OET report, that report's conclusions, and the decision to be rendered in the underlying rulemaking could not be more integral. Yet the vote to adopt these rules will occur on November 4, and the sunshine period prohibition will go into effect seven days earlier — meaning that only nine business days will have elapsed before parties are prohibited from even filing an *ex parte* presentation concerning the OET report.[12]

II. THE TESTING EVIDENCE DOES NOT SUPPORT THE CONCLUSIONS IN FAVOR OF SPECTRUM SENSING.

While the below-signed parties have only begun to review the report, it is already clear that the OET report's conclusions are not supported and are in fact contradicted by the underlying data. These contradictions further the need for the Commission itself to take time to

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[11] Report and Order and Order on Reconsideration, *2006 Quadrennial Regulatory Review - Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996*, MB 06-121, et al., 23 FCC Rcd 2010, 2117 (Dec. 18, 2007).

[12] Press Release, *FCC Announces Tentative Agenda for November 4th Open Meeting* (Oct. 15, 2008). Thus, the Commission's notice stating that parties "may submit ex parte comments if they choose to do so" is no substitute for soliciting public comment and providing sufficient time for members of the public to evaluate the 400-page report and prepare considered comments. *See* Public Notice, *The FCC's Office of Engineering and Technology Releases Report On Tests of Prototype TV White Spaces Devices*, ET Docket No. 04-186, DA 08-2243 (Oct. 15, 2008).

study the test results and for the Commission to have the benefit of the evaluations of the report and the results provided by commenting parties.

The OET report concludes that there has been a "proof of concept" and that it is satisfied "that issues regarding future development and approval of any additional devices, including devices relying on sensing alone, can be addressed."[13] The OET report also concluded that "[s]pectrum sensing worked to some degree and it may be possible to authorize products that rely on spectrum sensing [alone], in the future, if it can be demonstrated that they will not interfere."[14] These are the conclusory statements included in the OET report. But the massive factual data set forth in the 400-page report show that spectrum sensing cannot be used to determine reliably and accurately whether a television channel is occupied or vacant.

OET's testing showed two distinct and common types of failures: (1) lack of sensitivity, resulting in devices that operate on channels already occupied by television signals and (2) oversensitivity, resulting in devices that return "false positives" on channels that are not occupied by television signals. A "proof of concept" must avoid both types of failures.[15] The first type of failure will cause interference to the public's free, over-the-air digital television service, while the second type of failure will result in an inefficient use of spectrum.

As reflected in the actual test data included in the report, the WSDs tested by OET showed a significant failure rate. The FCC's WSD proposals are premised on the absence of WSD operations within the protected contour of a DTV station. The absence of WSD operation

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[13] Executive Summary at iv.

[14] OET report at 115.

[15] *See, e.g., Fundamental Design Tradeoffs in Cognitive Radio Systems or Fundamental Limits on Detection in Low SNR Under Noise Uncertainty* by Department of Electrical Engineering and Computer Science, University of California at Berkley.

within a station's DTV contour is particularly important given that WSDs can cause interference at a distance of 1 km or more.[16]

For example, the OET report in tables 5-61 to 5-66 show that:

A) Under "Condition I" (in which the WSD was operating within a station's DTV contour and its signal was viewable on a simple DTV receiver):

- Three of the WSDs (Adaptrum, I2R, and Motorola) failed to accurately detect DTV signals even when they were receivable by a simple $40 NTIA coupon-eligible converter box;[17]
- Motorola's WSD in sensing-mode failed to accurately detect occupied channels 10 percent of the time; and
- The Philips device had an oversensitivity failure on 85 percent of vacant channels.[18]

B) Under "Condition II" (in which the WSD was operating within a station's DTV contour, although the signal was not viewable in that specific location on a DTV receiver), device performance was even worse:

- I2R's device failed to identify 70 percent of channels within a station's DTV contour;[19]
- Adaptrum's device had a 49 percent failure rate;[20]
- Motorola's WSD in sensing-mode had a 52 percent failure rate;[21] and

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[16] *See* OET report at 37, finding that co-channel DTV operations "can experience interference at significant separation distances (data extrapolation indicates to up to 1.2 km) from the WSD transmitter when it is radiating a signal at ~150 mW EIRP."

[17] *See* OET report at 115. *See also id.* at vii (noting that "[i]n some instances, the Adaptrum, I2R, and Motorola (in sensing only mode) devices incorrectly reported channels as unoccupied (available) when the WSD was operated within a station's service contour and the signal was viewable"). In fact, on other radials, the extrapolated interference distance would be much greater than the 1.2 km shown.

[18] *Id.*

[19] *See id.* at 112.

[20] *Id; see also id.* at 115 (observing that the Adaptrum and I2R devices did not reliably detect occupied channels).

- The Philips device had an 8 percent failure rate, and a 27 percent failure rate when an attenuator was used to decrease its sensitivity so that vacant channels could be better identified.[22]

With respect to "Condition II" tests, and spectrum sensing more generally, it is important to note that the fact that a DTV signal is not received at one specific location within that contour does not mean that WSD operation at that location is acceptable. As the OET report notes, a WSD operating at that location could cause interference at distances of 1 km or more. This means that signals from a WSD could interfere with viewable DTV signal reception in surrounding locations.

The widespread WSD sensing failures, all documented in the report, rebut the report's conclusion that there has been a "proof of concept." Further, the concerns over the WSDs' widespread failure are exacerbated by the proven sensing difficulties due to adjacent channel operations[23] and the devices' sensing failures with respect to wireless microphone operations.[24] Nor do the results give any technical support to or shed any light on what is an appropriate "sensing threshold" to protect DTV viewers. Thus, there is no basis for concluding that devices that rely on spectrum sensing only, without geolocation, are feasible.

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[21] *See id.* at 113.

[22] *See id.* at 114.

[23] *See* OET report, at 26 (finding that "moderate-to-strong DTV signals occupying channels adjacent to the detection channel can significantly degrade detection capability, thereby affecting the ability of a device to reliably detect DTV signals").

[24] *See id.* at 141 (observing that "[a]t both sites and all the test locations, the Philips device reported all the channels on which the microphones were designated to transmit as occupied whether the microphone was transmitting or not. The I2R device indicated several channels as available even when the microphones were on.").

It is also reported that the proposed rules would permit unlicensed devices to operate at 40 mW on first-adjacent channels to television operations serving the public.[25] The risk of first adjacent-channel interference to the viewing public from operating at any power level has been fully documented in this proceeding. Moreover, this power level and the proposed 100 mW power level for the remaining adjacent channels will seriously interfere with cable viewing. The extent of this injury depends on the required power limits. Opportunity should be provided for informed comment on whether the test results documented in the most recent OET report and previous OET reports support the proposed power limits envisioned by the Commission. We believe that they do not.[26]

* * *

Millions of viewers of digital television and cable services have a stake in the results of this proceeding. If the Commission adopts rules hastily based on a flawed reading of the OET test results, WSDs will be let into the broadcast band without the protections that are necessary to prevent widespread interference to television and cable reception. If that happens, the Commission will have no ability to reverse course. It may be able to correct the mistaken rules, but it will not be able to recall millions of devices in the field or undo the resulting harm to the public interest. It thus is crucial that the Commission allow members of the public to review and comment meaningfully on the results of the OET tests.

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[25] *See* Howard Buskirk, "High Tech Poised for Big Win on TV White Spaces," *Communications Daily* (Oct. 16, 2006).

[26] Further, the OET report does not address the issue of what impact authorization for unlicensed devices with these power levels will have on mobile television broadcasting, which is expected to roll out next year to the benefit of millions of viewers.

Accordingly, the undersigned parties urge the Commission to issue a public notice seeking comment from members of the public on the 400-page OET report. In light of the complexity of the report and critical issues raised by this proceeding, initial comments should be due within 45 days of the release of that public notice, with reply comments due 25 days thereafter.

Respectfully submitted,

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October 17, 2008

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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

SUPPLEMENT TO EMERGENCY REQUEST

The Association for Maximum Service Television, Inc. ("MSTV"),[1] the National Association of Broadcasters ("NAB"),[2] the Association of Public Television Stations ("APTS")[3] and the ABC, NBC, CBS, and Fox Television Networks hereby supplement the Emergency Request filed on October 17, 2008 in response to the release by the Office of Engineering and Technology ("OET") of a 400-page report detailing the results of the testing of prototype TV-band white space devices ("WSDs")[4] and simultaneous announcement that the Commission would vote on November 4, 2008 to authorize WSDs based on the flawed conclusions in the Report.

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

[2] NAB is a nonprofit trade association that advocates on behalf of more than 8,300 free, local radio and television stations and also broadcast networks before Congress, the Federal Communications Commission, the Courts, and other federal agencies.

[3] APTS is a non-profit organization whose membership comprises the licensees of nearly all of the nation's CPB-qualified noncommercial educational television stations. The APTS mission is to support the continued growth and development of a strong and financially sound noncommercial television service for the American public.

[4] *Evaluation of the Performance of Prototype TV-Band White Spaces Devices: Phase II*, FCC/OET 08-TR-1005 (rel. Oct. 15, 2008) ("OET Report").

As recent comments by white spaces proponents show, it is absolutely critical for the Commission to protect the public's free, over-the-air broadcasting service not just from interference from white spaces devices but from a movement to totally eliminate television broadcasting.

The Commission must also evaluate both the risks and the benefits of any proposed white spaces regime. The undersigned parties here provide the Commission with a more detailed analysis of the serious risks to the public's television service that would be posed by 40 milliwatt WSD adjacent-channel operations (which are reportedly under consideration by the FCC). This analysis targets the 40 mW power limitation for adjacent channel operations. This is in addition to the point made in the Emergency Request that the findings of the OET Report do not support, and in fact rebut the conclusion in the Report that the tests provide a "proof of concept" for sensing as a reliable means of avoiding interference,[5] especially since once such devices are in the field by the hundreds of thousands, there is no practical cure for prior miscalculation. The signatories also propose a path forward that would allow use of the white spaces without compromising the public's free, over-the-air television service.

I. WHITE SPACES PROPONENTS ARE INDIFFERENT TO TELEVISION BROADCASTS, AND SOME EVEN AIM FOR THE COMPLETE CESSATION OF OVER-THE-AIR BROADCASTS.

Certain white spaces proponents have made no secret of their antipathy – indeed, hostility – towards the public's television service. They disregard the fact that television broadcasting provides the public – all the public – with important news programming, emergency information and disaster coverage, and other critical services. It is still the only video

[5] Motorola and Google share the view that spectrum sensing alone is not a viable solution.

service that is free, local and universal. Forty-five million Americans rely on over-the-air television exclusively. Cable, satellite, and telco subscribers view over-the-air broadcast content nearly half the time. Over 90% of the top-rated programs each week are broadcast-originated. Local broadcast news is highly valued and highly rated. Neither Congress nor the Commission has adopted the position that the FCC should administer euthanasia to the public's over-the-air service.

But these white space proponents have now made clear their agenda:

> "[I]n a few years a second phase of the DTV transition should get TV off the air."
>
> "'Take TV off the air' in a few years."
>
> "[O]ver-the-air broadcasts should be replaced entirely by cable, satellite and Internet viewing."
>
> "The FCC proposes to limit devices to 40 milliwatts of power in white-space channels adjacent to TV stations, but 'we're going to push that up over time,' Calabrese said. Mark McHenry, CEO of Shared Spectrum Co., said 'the FCC is going to start conservatively, but we're going to wear them down. In a few years, we're going to be at 10 W all over the place.'"[6]

The end-game for these groups is, over the next few years, to increase the power of personal, portable devices to dangerously high levels, with complete disregard for the effects on the public's television broadcasting service (as well as on licensed wireless microphone operations and cable).

Whether a white spaces proponent is motivated by the goal of destroying television or is just indifferent to the consequences that flow from embracing sensing technologies that have failed and from an adjacent-channel power limit (40mW) that would

---

[6] *See* "Clear All TV from Spectrum for Wireless Broadband, Says New America," *Communications Daily* (Oct. 22, 2008).

destroy service, the result is the same. These latest revelations as to the goals of some proponents underscore that the Commissioner cannot responsibly authorize unlicensed devices (except fixed rural broadband) without, at least, obtaining public comment on OET's report.

II. FORTY MILLIWATT WSD OPERATIONS ON CHANNELS ADJACENT TO TELEVISION CHANNELS WOULD CREATE WIDESPREAD INTERFERENCE TO TELEVISION OPERATIONS.

It is reported that the rules under consideration by the Commission would permit unlicensed devices to operate at 40 mW on first-adjacent channels to television operations serving the public.[7] This power level would adversely affect television broadcasting, creating the potential for interference to viewers' DTV sets throughout 77% of a station's service area.

Assuming median receiver performance and flat terrain,[8] WSDs operating at 40 mW will:

- at approximately 25 miles from the television tower, interfere with television sets operated at a range of 10 meters from the WSD; and
- at approximately 50 miles from the television tower, interfere with television sets operated up to 45 to 50 meters from the WSD.

If a household is using a lower-quality DTV set, then the WSD may cause interference even when operating at much greater distances. For example, a receiver with below-median receiver performance – and by definition, 49.9% of all receivers are below median – located 50 miles from the television tower could suffer interference from a 40 mW WSD operating at a range of 250 meters, not 45 to 50 meters.

---

[7] *See* Howard Buskirk, "High Tech Poised for Big Win on TV White Spaces," *Communications Daily* (Oct. 16, 2008).

[8] These calculations were performed by MSTV using the free space propagation model. *See* Attachment 1.

Further, WSDs will cause interference even closer to the broadcast towers than 25 miles in cases where viewers are using indoor antennas and in high-density urban areas. Although the walls of a building may weaken the undesired WSD signal, the DTV signal will also be reduced by the walls and will be susceptible to being overwhelmed by the WSD's signal. Consequently, the potential for interference to DTV sets could be much greater than 77% of a station's service area.

Therefore, broadcasters urge the Commission to reject a 40 mW power authorization for devices that will operate on the first adjacent channel to television operations. The proposed 40 mW power level creates an unacceptable risk of interference to viewers located in 77% of a station's service area.

III. BROADCASTERS HAVE PROPOSED A WORKABLE SOLUTION THAT ADVANCES THE PUBLIC INTEREST BY PERMITTING WHITE SPACE UTILIZATION WHILE PROTECTING THE PUBLIC'S OVER-THE-AIR BROADCASTING SERVICE.

The Commission should adopt a white space solution that promotes valuable new uses of the white spaces while preserving the integrity of the public's television broadcasting service and other licensed uses of the spectrum. All of the elements of this solution were placed before the Commission beginning on September 23.[9] There is a pragmatic, careful, and constructive two-step path forward.

First, the Commission should move forward on November 4 to authorize appropriate rural broadband deployment. Broadcasters have long supported using the white spaces for fixed rural broadband uses, and believe that the Commission need not hold off on authorizing rural broadband purposes while it puts out the OET Report for public comment and

[9] *See* Ex Parte Presentation, MSTV, ET Docket Nos. 04-186 and 02-380 (filed Sept. 24, 2008), attached hereto as Attachment 2.

more careful and thorough evaluation. In other words, the proceeding should be bifurcated and the Commission may move forward promptly with this aspect of the proceeding.

Second, with respect to personal portable devices, the Commission should:

- Require geolocation. Broadcasters support the use of personal portable devices that use the white space spectrum, but it is critical that the Commission not compromise when it comes to the integrity of the public's over-the-air television service. Broadcasters have worked very hard with the data, testing results, and technical calculations to create a workable solution that will allow these devices to utilize the white spaces. Geolocation, in combination with a comprehensive and accurate database, will help to avoid interference to television broadcasts.

- Do not allow devices in the band that rely exclusively on so-called "spectrum sensing." As documented in the Emergency Request, the laboratory and field tests show that spectrum sensing devices have failed generally and have specifically failed to provide necessary protection to television broadcasts.

- Limit power on the first adjacent channel to 5 mW. As noted above and in Attachment 1, a 40 mW power limit for devices operating on channels adjacent to television operations will not provide sufficient protection to over-the-air broadcasts and the viewers who rely on those broadcasts. Broadcasters believe that 5 mW will provide sufficient protection,[10] and further note that 5 mW is generally greater than the power level that would be permitted under the Motorola proposal.

- Protect licensed wireless microphones. In order to protect the licensed wireless microphones used in reporting news and sporting events and for other purposes, the Commission should set aside several channels for exclusive use by wireless microphones as a "safe harbor" from WSD operations.

- Protect cable. The Commission should limit power on the remaining adjacent channels in order to avoid direct pick-up ("DPU") interference to cable subscribers using digital cable ready sets.

* * *

[10] We note, however, that even 5 mW operation will be challenging for DTV receivers to handle on adjacent channels when the desired signal is very low. Given a received -84 dBm minimum desired signal, even the best performing receiver in the FCC tests (-40 dB D/U for adjacent channel) could withstand an adjacent channel signal at a level no higher than -44 dBm. A 5 mW device at 10 meters yields a received level of -41 dBm, 3 dB stronger than the limit for adjacent channel immunity on that receiver. For the reasons stated in this footnote, and in light of the likely widespread distribution of such devices, Fox does not support ANY use of the first adjacent channel.

The undersigned parties urge the Commission (1) to protect nation's free, over-the-air broadcast television service, licensed wireless microphone use, and cable operations, and (2) to move forward with the compromise proposal submitted by MSTV on September 30.[11] And, in any event, the Commission should not provisionally, conditionally, or in any other manner authorize devices that rely exclusively on sensing or adjacent-channel operations at more than 5 mW without first putting out for public comment the OET Report with particular focus on whether the data it lays out in great detail support the conclusions set forth in the first few general paragraphs of the report.

Respectfully submitted,

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[11] *See* Notice of Ex Parte Communication, MSTV, ET Docket Nos. 04-186 and 02-380 (filed Oct. 1, 2008), attached hereto as Attachment 3.

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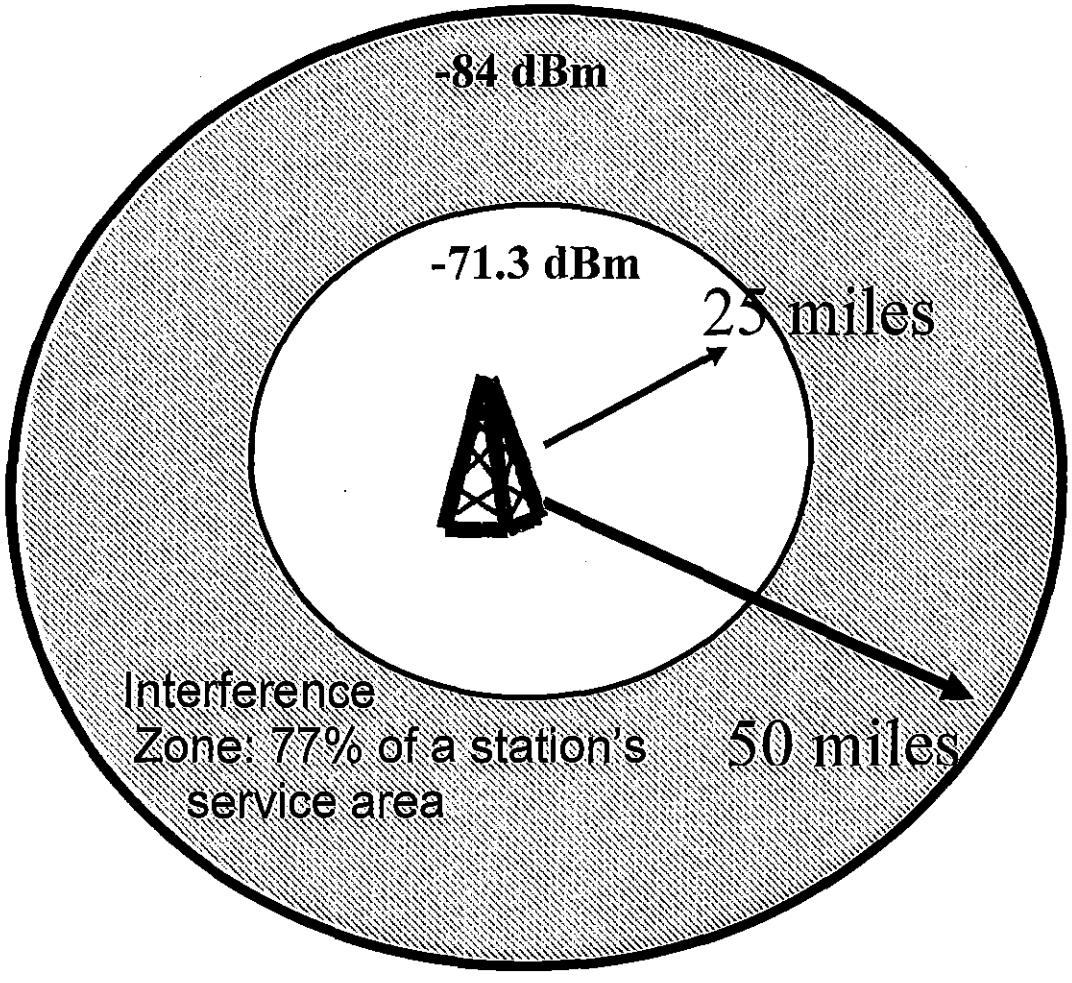
October 22, 2008

Attachment 1

A 40 Milliwatt Device Operating On The First Adjacent Channel Will Lead To Interference In Nearly 77% Of A TV Station's Coverage Area

For a television receiver of median quality, interference from operating a 40 milliwatt device on the first adjacent channel begins at about 25 miles from the TV tower. (However, interference may commence closer than 25 miles depending on the circumstances.) Interference distance from the unlicensed device to the TV set is approximately 10 meters at 25 miles from the tower and increases to 45-50 meters at the edge of the station's service area (50 miles).[1]



[1] Based on data and using the "Egli Model" contained in the FCC's DTV Receiver Report, FCC/OET 07-TR-100, 22 FCC Rcd 6616 (rel. March 30, 2007).

Interference Analysis
40 Milliwatt Unlicensed Device Operating On The First Adjacent Channel

The interference caused by a WSD will be a function of (1) the station's DTV signal strength, relative to the signal strength of the WSD and (2) the television set's reception quality. For a television receiver of median quality, a DTV field strength necessary to avoid interference caused by a 40 mW WSD at a range of 10 meters from the television set is present at only 33% of the station's service area.

DTV Receiver tested by the FCC	D/U (Tested at adjacent channel at 68 dBm)	DTV field strength at which interference begins[1]	Interference Area (Percent of DTV Station's Service Area)[2]	Free Space Interference Distance at Edge of DTV Contour[3]
FCC Best Receiver	-40.1	-72.1	73%	40 meters
FCC Worst Receiver	-37.9	-69.9	80%	50 meters
FCC 2nd Worse	-38.0	-70	80%	50 meters
FCC Median	-39.3	-71.3	77%	45 meters
UK Receiver #1	-24	-56	95%	250 meters
UK Receiver #2	-31	-63	88%	110 meters
UK Receiver #3	-30	-62	90%	125 meters
CRC Receiver #1	-29.7	-61.7	90%	125 meters
CRC Receiver #2	-34.2	-66.2	85%	80 meters
CRC Receiver #3	-36.7	-68.7	83%	60 meters
CRC Receiver #4	-37.2	-69.2	80%	60 meters
CRC Receiver #5	-37.7	-69.7	80%	50 meters

[1] DTV field strength (FS) at which the measured D/U ratio for each tested DTV receiver would be violated and interference could be caused by a 40 mW device at 10 meters (-32 dBm).

[2] Percentage of DTV station's service that has a field strength equal to or less than required to meet the measured D/U ratio for each tested DTV receiver that would be therefore be subject to potential interference from a 40 mW device at 10 meters. Percentage values calculated using the model contained in the March 30, 2007 OET Report, *Interference Rejection Thresholds of Consumer Digital Television Receivers Available in 2005 and 2006*, FCC/OET 07-TR-1003.

[3] The distance at which a 40 mW device could potentially cause interference to each tested DTV receiver at the edge of a DTV station's service area using the free space propagation model.

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September 24, 2008

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

Re: Ex Parte Presentation
ET Docket Nos. 04-186 and 02-380

Dear Ms. Dortch:

On Tuesday afternoon, September 23, the MSTV directors and representatives listed in the attachment met with (1) Commissioner Robert McDowell and his advisors Angela Giancarlo and Rosemary Harold, (2) Rick Chessen, Media Advisor to Commissioner Copps, (3) Commissioner Jonathan Adelstein and his advisor, Rudy Brioché, and (4) Commissioner Deborah Tate and her advisor, Wayne Leighton, to discuss the above designated white spaces proceeding.

The MSTV group particularly addressed the results of the OET white spaces tests and possible approaches for resolving the issues involved in the white spaces proceeding. It made the following specific points:

- Rural broadband uses, possibly under a light licensing regime, which broadcasters have not opposed, could have been authorized earlier. Their authorization has been unjustifiably held up by linkage to possible authorization of unlicensed mobile and portable devices intended for use in congested urban areas (even though these latter uses could interfere with the fixed broadband uses).

- OET's tests demonstrate that sensing is a dead-end technology and should not be authorized.

- On the other hand, geolocation can be a basis for authorizing unlicensed devices if it is accompanied by (1) a complete, reliable, and continually updated data base, (2) a viable solution for continued use of licensed wireless microphones, (3)

effective protection for cable operations on all channels, (4) effective protection for the public's broadcast service on first-adjacent channels, and (5) a rigorous certification regime -- all of which we believe are achievable goals.

- With respect to continued licensed wireless microphone operation, MSTV has worked and is working closely with that community and supports the need for a set-aside of TV spectrum (as has been suggested by parties on both side of this proceeding) plus certain other protections for licensed wireless microphone operations, such as ensuring that sports venues, large new events, like political conventions, and program production sites are included in the geolocation database.

- With respect to protection of cable television services, MSTV pointed out that, based on both industry and FCC testing, the cable industry has advocated a 10 milliwatt power limitation on all channels in order to protect cable viewers.

- With respect to protection of the public's broadcast service from first adjacent-channel interference, receiver tests by the FCC and others have shown that a reduction in power substantially *below* 10 milliwatts will be required. MSTV stated its willingness to work with the Commission on developing a power limitation consistent with these findings. This adjacent-channel protection requirement should not be treated as a matter of political compromise, but rather as a matter of science and fact, with viewer interests paramount.

The MSTV group also emphasized its commitment to working with the Commission and the industry to address the issues -- relating to converter boxes, antennas and coverage -- that were highlighted by the early Wilmington cut-over to all digital transmissions.

We would be pleased to respond to any questions you may have about this notice.

Respectfully submitted,

/s/

Jonathan D. Blake
Counsel to MSTV

cc: Commissioner McDowell
Angela Giancarlo
Rosemary Harold
Rick Chessen
Commissioner Adelstein
Rudy Brioché
Commissioner Tate
Wayne Leighton
David Donovan
Victor Tawil
Bruce Franca

ATTACHMENT

1. William F. Duhamel, President & CEO, Duhamel Broadcasting Enterprises
2. Martin D. Franks, Exec. VP, Planning Policy & Govt. Relations, CBS Corporation
3. Robert W. Hubbard, President & CEO, Hubbard Television Group
4. David T. Lougee, President, Gannett Broadcasting
5. Vincent L. Sadusky, President & CEO, LIN TV Corporation
6. Sterling Davis, Vice President, Engineering, Cox Broadcasting
7. David L. Donovan, President, MSTV
8. Victor Tawil, Senior Vice President, MSTV
9. Bruce Franca, Vice President, Policy & Technology, MSTV
10. Jonathan Blake, Esq., Covington & Burling, MSTV Legal Counsel

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October 1, 2008

Via Electronic Filing

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12 Street, SW
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Re: Notice of Ex Parte Communication,
ET Docket Nos. 04-186, 02-380

Dear Ms. Dortch:

On September 30, 2008, David Donovan, Victor Tawil and Bruce Franca of the Association for Maximum Service Television (MSTV) met with Mr. Julius Knapp, Mr. Alan Stillwell, and Mr. Bruce Romano of the Office of Engineering and Technology (OET).

MSTV discussed the results of recent field testing in this proceeding and presented a comprehensive proposal for moving forward. MSTV pointed out that the field results show that all of the tested devices failed to correctly identify whether TV channels were occupied or vacant. The test results also show that the devices could not correctly detect wireless microphone operation. MSTV noted that the field tests raise serious cable interference issues and confirm OET's earlier testing in this area.

MSTV presented a comprehensive solution based on geo-location and a "trusted" data base that will permit both high power fixed rural broadband operation and unlicensed operations while protecting TV viewers, cable TV operations and wireless microphones. The attached power point slides were presented and discussed.

Respectfully submitted,

Bruce Franca
VP, Policy and Technology

cc: Julius Knapp
Alan Stillwell
Bruce Romano

MSTV

MAXIMUM SERVICE TELEVISION

White Space Proposal

OET Presentation

September 30, 2008

Background

MSTV
MAXIMUM SERVICE TELEVISION

- Broadcasters have supported and continue to support rural broadband deployment
  - Rural broadband deployment is being delayed as FCC waits for White spaces proponents to develop workable technology
  - Personal/portable devices and "sensing" technology are not necessary for the deployment of rural broadband systems

Test Results

- Laboratory and field tests demonstrate that "sensing" is not an effective means of avoiding interference to TV reception or wireless microphones
  - Even in limited laboratory and field tests, all devices failed to accurately detect whether channels are occupied or vacant

- Cable DPU interference was observed in the laboratory and the field

MSTV
MAXIMUM SERVICE TELEVISION

Solution Possible

- Solution needs to be based on the science and test results
  - A single "one size fits all" approach will not provide solution
- Geolocation (as opposed to sensing) can provide co-channel interference protection to TV viewers
- However, solutions needed for other interference mechanisms:
  - Adjacent channel interference to over-the-air viewers
  - Cable TV DPU interference
  - Continued operation of licensed wireless microphones
- Must have effective interference resolution and enforcement mechanisms

MSTV
MAXIMUM SERVICE TELEVISION

Solution Framework

- All white space operations based on geo-location and "trusted" database to protect all incumbent operations
  - Protection should include all TV, Class A, LPTV and translator operations, TV production and studios, cable head ends, satellite receive sites, sports and entertainment (such as Broadway) venues, etc.
  - Safe harbor/limited number of TV channels set aside for licensed wireless microphones
  - Beacons are not a viable option to protect wireless microphones used in news gathering

MSTV
MAXIMUM SERVICE TELEVISION

Solution Framework

- Broadband High Power Fixed Use
  - High power fixed permitted under Part 90 "light licensing" (ala 3650 MHz)
  - No transmission on co- or adjacent TV channels to protect TV viewers (and licensed wireless microphones on adjacent channels)
  - Professional installation/licensing to protect cable viewers
- Part 15 Unlicensed Use
  - No transmission on co-channel TV operation to protect TV viewers
  - Max. 10 mW to protect cable viewers
  - Max. 5 mW on first adjacent to *minimize* interference to TV viewers (Generally, permits device to operate with more power than Motorola proposed calculations)

Summary

- White space solution should include:
  - Geo-location
  - Trusted data base
  - Safe harbor for wireless microphones
  - Interference resolution and enforcement mechanisms
- White space solutions should not include :
  - Sensing
  - Beacon