

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

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

**REPLY COMMENTS OF
THE NATIONAL CABLE & TELECOMMUNICATIONS ASSOCIATION
ON PETITIONS FOR RECONSIDERATION**

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In its Petition for Reconsideration, the National Cable & Telecommunications Association (“NCTA”) demonstrated that some White Space Devices (WSDs) be permitted by the new rules would jeopardize television reception for the nearly 100 million consumers who subscribe to MVPD services, through pervasive direct pick-up (DPU) interference and through interference to headends. DirecTV, the largest non-cable MVPD, filed comments echoing NCTA’s concerns about both DPU interference and headend protection, and urged the Commission to adopt the proposals in NCTA’s Petition as necessary to protect consumers.

The oppositions to NCTA’s Petition proceed from a flawed premise. For example, Dell and Microsoft argue that “cable companies, who are not incumbent licensees, are entitled to no interference protection whatsoever.”¹ That assertion is plainly incorrect.² But, more importantly, it ignores the fact that the Commission’s foremost concern in adopting protections like those at issue in NCTA’s Petition is to protect *cable customers*, not cable companies.

The Commission explained that it “is important to avoid disruption of TV service to viewers who are located beyond TV station service areas and able to receive those signals through

¹ Dell and Microsoft Comments at 11. PISC similarly argues that the Commission has “gone too far” in protecting cable headends because they have “never been licensed.” PISC Comments at 16.

² Cable operators are at the heart of many of the nation’s most important communications policy objectives. The Commission has relied on cable operators for decades to deliver broadcast stations and diverse programming, and more recently, to educate consumers about the DTV transition. Cable has also led the way in delivering broadband Internet service and telephone competition to consumers.

... cable systems. While those viewers are in fact located beyond the areas where we normally protect TV services, in these cases TV services have *de facto* been extended and valuable service is being provided to a significant number of households.”³ The Commission has a long history of protecting consumer televisions from interference inside the home.⁴ It is therefore clearly incorrect to claim that cable customers deserve “no interference protection whatsoever,” and the oppositions to NCTA’s petition that are based upon that logic should be disregarded.

I. NO PARTY HAS OFFERED EVIDENCE THAT REFUTES NCTA’S SHOWING THAT EXCESSIVE POWER LIMITS COULD DISRUPT MVPD SERVICE FOR MILLIONS OF CONSUMERS

A. Power Limits for Portable Devices

Google claims that the risk to consumers from DPU interference is “largely theoretical” and that, “in any event, both devices typically will be under the control of the person who owns them, and therefore [they] will be able to increase the distance between them or cease operating one of them.”⁵ This is simply false. The record shows that a 100 mW output from portable white space devices would cause interference to television receivers 80 feet away through intervening walls.⁶ This wide swath of interference is much larger than the 33 foot radius that the Commission has previously used to protect consumers from devices used by their neighbors.

Dell and Microsoft argue that NCTA’s interference evidence applies only to analog cable service. They do not present any evidence, but instead rely only on the *Second R&O*’s incorrect conclusion that interference is “virtually non-existent on the digital tier” when the consumer is using a digital set-top box. However, digital customers are vulnerable to significant DPU interference picked up by their in-home wiring feeding into the set-top. That is why DirecTV, which is all-digital, stated that “the same direct pickup interference challenges posed to cable

³ *Second R&O*, ¶ 185.

⁴ See NCTA Comments at 7.

⁵ Google Comments at 17, n. 56.

⁶ See NCTA Petition at 7-11; NCTA Comments at 6-7.

systems apply equally to DBS providers like DIRECTV.”⁷

Many homes have cable wiring and outlets located throughout the house, and these wires can pick up interference from white spaces from any of these rooms and carry it to the televisions. Interference to digital service through in-home wiring has been illustrated by test results from OET and Motorola. OET found an immediate “complete loss of picture” in cable digital channel 77 through a set-top box when exposed to WSD interference, but the picture was restored when all of the coaxial components between the cable outlet and cable box input were replaced with a laboratory grade jumper cable.⁸ Motorola also conducted its own testing of DPU interference to digital reception through in-home wiring and found that 100mW devices would cause interference up to 57 feet from those devices.⁹ Motorola noted that it had “recommended a ... power limit of 10 mW” to minimize “the potential for interference to the existing widely deployed cable TV service,” and explained that its “test data that shows TVWS devices operating at power levels much greater than 10 mW in the consumer environment significantly increases the potential to cause DPU interference into the home cable TV wiring in many cases.”¹⁰ The test results from C.J. Jones attached to NCTA’s Petition are consistent with these conclusions.¹¹

The OET test results do show that a cable box in isolation is capable, as the Commission found, of rendering interference to digital signals “virtually non-existent,” but only in laboratory

⁷ DirecTV Comments at 2.

⁸ OET Report 08-TR-1005, at 33-34 (rel. Oct. 14, 2008) (“Interference was immediately observed in the form of a complete loss of picture.”). With laboratory shielding, no DPU was observed even at +22 dBm, demonstrating that the major factor in DPU ingress is the in-home wiring leading into the set-top box.

⁹ ET Docket 04-186, *Motorola Whitepaper*, (Dec. 6, 2007), at 15.

¹⁰ *Id.* at 16.

¹¹ Google argues that the Commission should ignore these updated test results under Rule 1.429(b), arguing the information presented by NCTA could have been presented earlier in this proceeding. That assertion is incorrect. NCTA’s recent testing – upon which NCTA’s Petition is based – was undertaken to test the requirements of the new rules adopted by the Commission. Obviously those requirements could not have been subject to testing until they were adopted. In any event, it plainly is in the public interest to address engineering test results that show that the new rules could threaten television reception for 100 million consumers. Moreover, the *Second R&O* explicitly recognized the public interest need to continue to consider new evidence upon which it might adopt changes to its white spaces rules. *Second R&O*, ¶ 4.

conditions, not in the real world where in-home wiring remains a problem. It is not a viable option for consumers to rip out all of their in-home wiring and replace it with laboratory grade cables, even if they were able to guess that their interference was being caused by a neighbor's WSD and could be remedied by such reconstruction.¹² Therefore, a reduction in the 100mW power output limit is needed even for consumers who have digital set-top boxes. In any case, even if WSDs did not interfere with digital cable service received through a set-top, millions of cable customers receive cable service without a set-top box, and will continue to do so for years to come, well after the expected deployment of WSDs. These consumers remain exposed to interference due to lack of adequate shielding in their analog *and digital* televisions, in addition to their in-home wiring.

Dell incorrectly suggests that NCTA's DPU concerns are overstated because "many cable systems already use frequencies up to 1 GHz," and that cable operators have not complained about similar interference from 800MHz devices. Although a few cable systems have been upgraded to these capacities, there is no evidence in the record of any significant use by cable of the portions of the 800 MHz band that is being used by other communications devices. Dell also questions why the cable industry has not raised more concern about interference from new devices in the 700 MHz spectrum. Unlike WSDs, these devices are expected to have little spectrum overlap with cable channels and will typically emit only sporadic interference.

B. Spacing of High-Powered Fixed Devices from Cable Customers

Fixed devices emitting 4W EIRP could cause interference inside consumers' homes up to 1000 feet away, so NCTA proposed that such devices be deployed at least 400 feet from buildings served by cable. Motorola opposes this proposal but fails to offer any remedy for consumers who

¹² Motorola White Paper at 15-16 ("Many homes have been constructed with in-wall cable distribution systems and these would be the most difficult and expensive to remediate. This is because such efforts will require fishing new wires and opening walls in some cases to access buried splitters and connectors. This may be more of an issue in shared dwellings such as apartments, condos, and town-homes as compared to single family houses since there may be cabling devices in the shared walls and the DPU interference may be caused by a neighbor's TVWS device.").

would suffer interference from the placement of high-powered devices so close to their homes.

WISPA and Carlson Wireless do not present counterevidence either, but claim that the C.J. Jones test methodology submitted by NCTA in support of the spacing requirement is flawed. First, they argue that the indoor test environment was not shielded to exclude other external sources of interference. However, Jones' test preparation included spectral evaluation to verify that ambient in-band signals on each test frequency were well below material levels.¹³ Second, WISPA is incorrect in suggesting that Jones failed to conduct sufficient noise floor testing and argues that AC line and bandpass filtering should have been used. However, the Jones report indicates that engineers tested the signal level across the entire band, determined that the delivered signal met all subscriber terminal standards, and verified that there was no material external noise present inside of the room. Thus, no additional filters were necessary. Third, they note that Jones' initial tests were affected by leaky cables that permitted the ingress of interference. However, Jones retested with professional quad-shielded cables and performed extensive tests to confirm that no material ingress from external sources to the coaxial input cable was observed, at any time, on any channel.

More importantly, though, WISPA's complaints prove too much. The environment in which Jones performed its initial testing was much cleaner than a consumer home. The Commission cannot expect consumers to use quad-shielded cables or place televisions only in rooms with no windows to avoid interference. WISPA should have responded with its own professional test results showing lower levels of interference using the test methodologies that it claims are supposedly necessary. Instead, and tellingly, it offers none. NCTA is confident that any such testing would only confirm that 4W fixed devices do cause substantial interference to televisions in nearby homes and should be spaced in order to protect consumers.

¹³ All in-band emissions were at least 40 dB below the lowest simulated TVBD signal level required to cause perceptible interference, except in Channel 20, which was 21 dB below.

Next, WISPA argues that, even if the Jones test results are accurate, NCTA has not correctly extrapolated them to real-world conditions. First, it argues that WSD antennas will not be aimed at buildings, but rather at distant base stations. While that will sometimes be true, it is likely that some fixed antennas will be aimed directly at buildings to most effectively penetrate the walls and reach the portable devices.¹⁴ WISPA also argues that NCTA's assumption of 5 dB wall attenuation is too low because of its unsupported suggestion that "the majority of exterior walls likely exceed 5 dB of attenuation." While many walls may have such higher levels, the relevant fact is that many do not.¹⁵

Finally, WISPA claims that NCTA is trying to divert attention away from interference problems supposedly caused by cable operators' own outdoor plant. WISPA ignores the fact that more than 60 million Americans receive cable just fine over this outdoor plant today. If WISPA means that fixed WSDs would cause *new* interference to consumers indirectly through cable operators' outdoor plant (and not directly by penetrating consumer homes), the Commission should be no less concerned about interference to consumers regardless of its path. It would not be practical, or in the public interest, for the Commission to require cable operators to replace the entirety of their outdoor plant to permit higher-powered WSDs, so appropriate limits must be placed on WSDs. In any case, WISPA's theory is disproven by the results of the Jones tests, which specifically measured the susceptibility of television receivers to interference from fixed WSDs when those TVs were connected through high-quality interconnecting cables within a small interior space. The measured interference in those tests did not come through outdoor plant. Moreover, cable plants are monitored for signal leakage on a strict schedule pursuant to the

¹⁴ In any case, the 6-dB transmit antenna will typically have a rather wide beamwidth so that, even if aimed towards another station that is not within a building, nearby served buildings may well be within that beamwidth. Nothing in the rules forbids pointing the antenna directly at a building or limits the field strength in the direction of a building.

¹⁵ OET found that wall attenuation was undetectable when compared with the same equipment, channel and spacing with the wall removed, and that interior walls exhibited lower attenuation than exterior walls. OET Report 07-TR-1005, Table 3-1, page 3-2. These results are not inconsistent with the 5 dB assumption used by NCTA.

Commission’s Rules, with mandatory signal leakage reporting and repair schedules, so the plant is not porous as WISPA erroneously suggests.

In sum, the oppositions to NCTA’s proposal to require reasonable spacing between high-powered devices and consumer homes present only unsupported and inaccurate pot-shots at the record evidence. They fail to present any of their own testing evidence to support their own arguments that the rules they support would not cause unacceptable interference to consumers under real-world conditions.

II. ALL HEADENDS MUST BE PROTECTED TO PROTECT CONSUMERS

NCTA has demonstrated that changes to the rules are needed to avoid interference to headends from disrupting and impairing access to broadcast stations over cable to entire communities. The arguments made by opponents of NCTA’s proposals again ignore NCTA’s (and the Commission’s) efforts to protect consumers. For example, PISC argues that the Commission should grant the Microsoft/Dell proposal to exclude from headend protection any non-local broadcast channel, on the theory that “cable systems are under no obligations to carry out-of-market distant signals.” This misses the point of the Commission’s *public interest* focus in this proceeding. Of course the cable operator is under no Commission obligation in that instance; nor do Microsoft or Dell have any obligation to sell white space devices that use those channels. The point is that cable operators are carrying those channels because consumers want them, and the Commission has determined that it should not permit new WSDs to displace those “valuable” services.¹⁶ The specific objections to NCTA’s proposals described below reflect a similar lack of appreciation for the purpose of protecting consumers from the loss of these existing services.

A. Registration of Headends Within Contour

The Commission declined to permit registration for headends located within broadcast

¹⁶ *Second R&O*, ¶ 185.

contours because it apparently believed that such registration was unnecessary on top of the existing restrictions on white space devices inside the contour. However, the protection afforded to consumer antennas within these contours is not necessarily sufficient to protect headends (especially those on the periphery of the contour), since headends use taller towers more susceptible to distant interference. NCTA submitted evidence that, at such a peripheral headend, portable devices transmitting on adjacent channels at 40mW must be at least 490m from the headend if within the main beam of a receiving antenna or within about 80m if outside that beam. Similarly, NCTA's evidence shows that the co-channel interference buffer distance outside the contour must be larger for headends and for typical home antennas.

PISC criticizes NCTA's evidence on this point by emphasizing that the test headend was situated outside the protected TV signal contour rather than within it. While true, there is no reason to expect the results to be materially different just a short distance away. Similarly, Dell argues that additional protection for these headends would "create large 'dead zones' where white space operations would be precluded entirely,"¹⁷ but it fails to provide any support for this overly broad assertion. The opponents of NCTA's proposals should provide actual evidence rather than resort solely to sophistic criticisms of NCTA's studies.

B. Protecting Headends Outside the Broadcast Contour

NCTA demonstrated that there is no compelling reason to deny protection to headends located more than 80 km from a broadcast facility. PISC argues that this common-sense change would "foreclose massive amounts of spectrum" for WSDs. But the headends at issue, as Motorola explained, mostly "occur in rural areas where spectrum for WSDs is plentiful" even if a few additional channels are protected around the headend, and Motorola concurs that NCTA's proposal should be adopted. PISC also argues that the "Commission has no idea how many

¹⁷ Dell/Microsoft Comments at 14.

headends there are, nor where they are located, and therefore has no means to assess the cost/benefit of extending protection to all cable headends.” The Commission does have substantial information regarding cable systems from community registrations, aeronautical frequency notifications and other filings. Moreover, it is hypocritical for PISC to complain about the lack of information regarding headends when it opposes allowing all headends to register in the white spaces database. In sum, no party has offered any compelling reason to deny interference protection to rural consumers served by these headends.

C. Coordination with Cable Operators

Motorola and WISPA object to NCTA’s proposal to require operators of fixed devices to coordinate with the operators of headends within 100 km. They argue that headends will already be protected by being registered in the database. Their argument might have more force if others were not simultaneously arguing against allowing all headends to be registered in the database. And in this initial period before the database has been developed and tested, the Commission does not have a sufficient basis to be confident that white space devices that are supposed to access the database will be 100% effective in detecting and avoiding interference to registered locations.

At the same time, it is not NCTA’s intent that this coordination be “excessively burdensome” or that cable operators could use this process to “hold up deployment of fixed services indefinitely.” NCTA is simply proposing that WSD operators notify MVPDs within a reasonable time and offer testing at full power with the antenna oriented as it is proposed to be in normal operation, on appropriate channels. These tests would detect problems and enable the parties to correct them before they affect consumers on a sustained basis or at peak hours.

D. Coverage of the Protected Area

NCTA’s Petition demonstrated that the Commission should increase the width of the wedge in the protection zone to ± 50 degrees and increase the co-channel protection radius for

portable WSDs outside the wedge to at least 13 km. Motorola claims that the existing rule would be sufficient if the cable operator were using a single-channel receive antenna with a narrow beamwidth.¹⁸ However, such antennas are impractical for many headends, where it makes more sense to use multi-channel antennas to receive more stations rather than have separate antennas for each. The antennas more commonly used at headends have wider beamwidths and require wider protection. The Commission already decided that headends should receive protection based upon their existing characteristics rather than have to replace their antennas to accommodate WSDs. Therefore, Motorola’s policy argument has already been rejected by the Commission, and what remains is only to correct the specifications to effectuate the Commission’s intent.¹⁹

CONCLUSION

NCTA continues to support the introduction of new wireless communications devices, provided the rules fairly balance the benefits of such devices with protecting cable customers from harmful interference to their video programming and broadband services. The Commission should grant NCTA’s Petition for Reconsideration.

Respectfully submitted,

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¹⁸ Motorola Comments at 8, fn. 18.

¹⁹ One of NCTA’s proposals is entirely unopposed. Paragraph 186 of the *Second R&O* describes the protected zone as “limited in distance to 80 kilometers from the [station’s] protected contour for co-channel operation and to 20 kilometers for adjacent channel operation,” but Rule 15.712(b) appropriately references the protection distances from the headend. The Commission should grant NCTA’s request to modify the order to be consistent with the rule.