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

In the Matter of	)	
Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations	)	ET Docket No. 10-152
Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004	)	ET Docket No. 06-94

JOINT REPLY COMMENTS OF DIRECTV, INC. AND DISH NETWORK L.L.C.

Alison A. Minea
Corporate Counsel
DISH NETWORK L.L.C.
1110 Vermont Avenue N.W.
Suite 750
Washington, DC 20005
(202) 293-0981

Susan Eid
Sr. Vice President, Government Affairs
Stacy R. Fuller
Vice President, Regulatory Affairs
DIRECTV, INC.
901 F Street, N.W.
Suite 600
Washington, DC 20004
(202) 383-6300

Pantelis Michalopoulos
Christopher Bjornson
Andrew W. Guhr
STEPTOE & JOHNSON LLP
1330 Connecticut Avenue, N.W.
Washington, DC 20036
(202) 429-3000

Counsel for DISH Network L.L.C.

William M. Wiltshire
Michael Nilsson
WILTSHIRE & GRANNIS LLP
1200 Eighteenth Street, N.W.
Washington, DC 20036
(202) 730-1300

Counsel for DIRECTV, Inc.

September 3, 2010

TABLE OF CONTENTS

Attachment – Declaration in Support of Reply Comments of Christopher Kurby

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

In the Matter of	)	
Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations	)	ET Docket No. 10-152
Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004	)	ET Docket No. 06-94

JOINT REPLY COMMENTS OF DIRECTV, INC. AND DISH NETWORK L.L.C.

DIRECTV, Inc. ("DIRECTV") and DISH Network L.L.C. ("DISH" or "DISH Network") hereby submit these reply comments in the above-referenced proceedings regarding Congress's changes to the criteria for distant signal eligibility under the Satellite Television Extension and Localism Act of 2010 ("STELA").[1]

I. INTRODUCTION AND SUMMARY

The Broadcasters are very blunt as to what they want from this proceeding: "to protect the role of local broadcasters in providing over-the-air television by limiting satellite delivery of

[1] Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations, ET Docket Nos. 10-152, 06-94, *Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking*, FCC 10-133, (rel. July 28, 2010) ("*Notice*"); *see also* The Satellite Television Extension and Localism Act of 2010, Pub. L. No. 111-175, § 203 ("STELA"). Comments were filed by DIRECTV and DISH jointly; the National Association of Broadcasters, ABC Television Affiliates Association, CBS Television Affiliates Association, FBC Television Affiliates Association, NBC Television Affiliates Association, and the Association for Maximum Service Television jointly ("Broadcasters"); Cohen, Dippell and Everist, P.C.; and Givens & Bell, Inc.

network broadcast programming . . . ."[2] It is, therefore, perhaps no surprise that the Broadcasters are advocating methods that would significantly and systematically overpredict the number of households served over-the-air.

The Broadcasters thus ask the Commission to fossilize the method of predicting whether a household can receive an over-the-air signal while ignoring any available improvements to a model that, as they themselves emphasize (as if it were a mark of distinction), had its origins in 1968.[3] For the measurement method, too, they base their recommendations either on the nostalgic assumption that consumers continue to erect the same outdoor antennas that pockmarked American landscapes in the 1950s and 1960s, or the futuristic assumption that consumers are free to buy "low-noise preamplifiers, higher-gain antennas, and lower-loss download cables."[4] Both assumptions are out of touch with reality and inconsistent with STELA.

STELA's intent and commands are much different. The use of a "conventional, stationary, outdoor rooftop receiving antenna" is no longer required to determine whether a household is unserved. Moreover, Congress directed that "the Commission shall seek ways to minimize consumer burdens . . . ."[5] The Broadcasters dismiss the relevance of these statutory changes. The deletion of the outdoor antenna requirement means nothing, according to them, as if Congress erased the words by accident. Even if the courts allowed such deletions to be ignored, which they do not, the Broadcasters' "they-must-have-made-a-mistake" approach to statutory interpretation is belied by the legislative history of STELA. As the Report of House

[2] Broadcasters Comments at 2.

[3] *Id.* at 4.

[4] *Id.* at 14.

[5] 47 U.S.C. § 339(c)(3)(B).

Commerce and Energy Committee makes clear: "the Committee expects the Commission to consider the types of antennas that are readily available for purchase by consumers to receive the signals of local digital television broadcast stations over-the-air."[6]

The Broadcasters next attempt to invent a conflict between the Copyright and Communications Acts. They ask the Commission to ignore the deletion of "outdoor" from the definition of "unserved household" in the Copyright Act because the Communications Act's provision of Section 339(c)(3)(B) instructs the Commission to "rely on" the ILLR model, an instruction that in their view embraces indirectly the outdoor antenna assumption on which that model is currently based. No such conflict exists. First, the Broadcasters' argument ignores the initial words of the sentence: "In prescribing *such* model." "Such model" refers to the model described in the previous sentence—*i.e.*, one that makes predictions on the ability to receive signals "through the use of an antenna." Second, the statutory provision does not require the Commission to *use* its earlier models, only to "rely on" the earlier models in "develop[ing]" and "prescribe[ing]" a new one. Third, the congressional change to the antenna language seems to have been a reaction to the Commission's recommendation of a digital ILLR model, rather than an endorsement of it. Finally, the Broadcasters argue that because the Communications Act's *sentence itself* did not contain antenna language, Congress did not mean to change the predictive model. But such "direction" comes both in the immediately preceding sentence and in the Copyright Act, which expressly incorporated the antenna language.

The problems the Broadcasters claim would arise from the use of an indoor antenna, whether assumed in the predictive model or actually used for the measurement method, are all either non-existent or easy to resolve. These purported problems should not deter the

[6] H.R. Rep. No. 111-349, at 19 (2009).

Commission. The variability superimposed on the model by consumers' different living configurations is no different in kind than the variability of the external environment, which the predictive model incorporates to some degree (and should do a better job of incorporating). In fact, as Mr. Kurby explains, the relevant differences of the indoor world can be readily defined and accounted for, in contrast to the differences implied by a large number of land use and land cover scenarios, which the model today has to negotiate and predict. By citing variability of accommodations as an insuperable obstacle, the Broadcasters are essentially telling consumers that they live in circumstances that are too peculiar for the model to seek to predict. This is untrue.

As for the use of indoor antennas in on-location testing, the major hurdle cited by the Broadcasters is the specter of manipulation. This argument totally ignores the statutory requirement that the tester be independent. A tester whose compensation does not depend on the test's results would have no incentive either to manipulate or tolerate manipulation of these results.

Equally important, STELA requires that a viewer *receive* a signal of a certain strength. In the digital age, this means that on-location testing necessarily has two components. The broadcast signal (1) must be of a certain strength, and (2) must be *received*. The Commission's testing protocol needs to be updated to give this wording meaning in the digital context.

The Broadcasters argue that the use of an indoor antenna would somehow undermine the DTV transition.[7] They do not explain how this claim can be squared with the fact that the Commission has been encouraging consumers to use indoor antennas in its efforts to implement the transition. But even assuming they were right, this argument is inapposite. Congress has

[7] Broadcasters Comments at 12.

spoken, and it has chosen to permit households to qualify as unserved based on the antennas they overwhelmingly use.

In the end, the Broadcasters tell consumers they are free to purchase low noise preamplifiers and better antennas. But the Commission encouraged them to use rabbit-ear antennas for digital television reception, and Congress dispensed with the Broadcasters' approach with one stroke of the pen, by deleting all of the characteristics the antenna previously needed to have. The Commission should not ignore the will of Congress by extending the antiquated and anti-consumer testing regime advocated by the Broadcasters.

II. THE COMMISSION SHOULD GIVE EFFECT TO CONGRESS'S CHANGES TO THE "UNSERVED HOUSEHOLD" DEFINITION

Subscribers have long been eligible for *distant* network signals if they were unable to receive sufficiently strong *local* signals "through the use of a conventional, stationary, outdoor rooftop receiving antenna."[8] In the face of overwhelming evidence both that consumers do not use such antennas and that many subscribers who should have been eligible for distant signals have been found ineligible, Congress changed the key eligibility standard. A household is now "unserved" if it cannot receive a signal of a particular strength "through the use of an antenna."[9]

As the Supreme Court has made clear, "[w]hen Congress acts to amend a statute, we presume it intends its amendment to have real and substantial effect."[10] Thus, the one thing

[8] 17 U.S.C. § 119(d)(10)(A) (2006) (amended 2010). The word "stationary" was added to this definition in 1999; it has otherwise remained unchanged since 1988.

[9] *Id.*

[10] *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687, 701 (1995); *see also Jama v. Immigration and Customs Enforcement*, 543 U.S. 335, 341 (2005) ("We do not lightly assume that Congress has omitted from its adopted text requirements that it nonetheless intends to apply . . . ."); *Chickasaw Nation v. United States*, 534 U.S. 84, 93 (2001) (noting that courts will "not assume that Congress intended 'to enact statutory language that it has earlier discarded in favor of other language'") (quoting *INS v. Cardoza-Fonseca*, 480 U.S.

Congress could *not* have meant is for distant signal eligibility to continue to be based on the use of a "conventional, stationary, outdoor rooftop receiving antenna."

Yet the Broadcasters argue exactly the opposite—that, in changing the distant signal qualification, Congress actually "intended the Commission to continue to assume use of an outdoor antenna."[11] This is a remarkable claim, and the Broadcasters' attempts to support it fail completely.

A. The Commission Cannot Ignore the Copyright Act

The Broadcasters at one point seem to argue that the Commission should simply ignore the changes to the Copyright Act because "[t]he elimination of the words qualifying 'antenna' in 17 U.S.C. § 119(d)(10)(A) are irrelevant to the tasks Congress assigned the Commission under this Communications Act provision of STELA."[12] On this issue, however, the Communications and Copyright Act are inextricably linked, because one incorporates the definition of "unserved households" from the other. A subscriber is eligible for distant signals under the *Communications Act* if, *inter alia*, he or she resides in "an unserved household, as determined under section 119(d)(10)(A) of title 17, United States Code"[13]—the very provision of the Copyright Act that the Broadcasters tell the Commission to ignore.[14]

421, 443 (1987)); *Moshe Gozlon-Peretz v. United States*, 498 U.S. 395, 404 (1990) ("[Where] Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.") (internal citations omitted); *Russello v. United States*, 464 U.S. 16, 23 (1983) (same).

[11] Broadcaster Comments at i.

[12] *Id.* at 6.

[13] 47 U.S.C. § 339(a)(2)(D)(i)(III).

[14] As explained above, this is vastly different from claiming the existence of a conflict between two laws enacted at different times, perhaps by different Congresses. Both of these provisions, were enacted at the same time by each congressional chamber. It is therefore untenable to posit,

B. The Model Provision Does Not Mandate Use of an Outdoor Antenna

The Broadcasters also argue that Communications Act provisions describing the predictive model and testing methodology expressly mandate use of an outdoor antenna and therefore override any changes to the Copyright Act. This assertion is also erroneous. Below are the relevant provisions in their entirety, with additions (in bold underline) and deletions (in strikethrough) to pre-2010 law noted.

> **(A) Predictive model.—**Within 180 days after the date of the enactment of the Satellite **Television Extension and Localism Act of 2010**~~**Home Viewer Improvement Act of 1999 [enacted Nov. 29, 1999]**~~, the Commission shall ~~**take all actions necessary, including any reconsideration, to**~~ develop and prescribe by rule a point-to-point predictive model for reliably and presumptively determining the ability of individual locations**, through the use of an antenna,** to receive signals in accordance with the signal intensity standard in **section 73.622(e)(1) of title 47, Code of Federal Regulations, or a successor regulation, including to account for the continuing operation of translator stations and low power television stations** ~~**effect under section 119(d)(10)(A) of title 17, United States Code**~~. In prescribing such model, the Commission shall rely on the Individual Location Longley-Rice model set forth by the ~~**Federal Communications**~~ Commission in **CS** Docket No. 98-201**, as previously revised with respect to analog signals, and as recommended by the Commission with respect to digital signals in its Report to Congress in ET Docket No. 05-182, FCC 05-199 (released December 9, 2005).** ~~**and ensure that such model takes into account terrain, building structures, and other land cover variations.**~~ The Commission shall establish procedures for the continued refinement in the application of the model by the use of additional data as it becomes available.
>
> **(B) On-location testing.—The Commission shall issue an order completing its rule-making proceeding in ET Docket No. 06-94 within 180 days after the date of enactment of the Satellite Television Extension and Localism Act of 2010. In conducting such rulemaking, the Commission shall seek ways to minimize consumer burdens associated with on-location testing.**[15]

As discussed below, these provisions not only do not "trump" the Copyright Act in any way, they are entirely consistent with the Copyright Act's changes.

---

as the Broadcasters do, that the changes to that definition are irrelevant to the Communications Act.

[15] 47 U.S.C. § 339(c)(3).

1. Congress Used the Same "Antenna" Language in Both the Copyright and Communications Acts.

First of all, Congress inserted *the very same new phrase* from the Copyright Act into the Communications Act provision governing predictive models. The Communications Act now requires the Commission to develop a predictive model to determine the ability of households to receive signals "through the use of an antenna,"[16] just as the Copyright Act now specifies that a household is unserved if it cannot receive signals "through the use of an antenna."[17] Of course, "identical words used in different parts of the same act are intended to have the same meaning."[18] Thus Congress's substitution of "through the use of an antenna" for "conventional, stationary, outdoor rooftop receiving antenna" in the Copyright Act must be given the same meaning in its contemporaneous addition into the Communications Act. If more evidence were necessary, Congress changed this provision in the Communications Act from "conventional, stationary, outdoor rooftop receiving antenna" in an earlier version of the bill to "antenna" in the final bill.[19] This should be the end of the debate: the predictive model is supposed to assume use of "an antenna"—which specifically is *not* an outdoor antenna.

The Broadcasters, however, argue that allegedly "specific" language later in the provision "governs" this allegedly "general" addition.[20] Yet Congress could not have been more "specific" in (1) removing the words "conventional, stationary, outdoor rooftop receiving" from the Copyright Act; and (2) importing the same "antenna" phrase into the provision of the

[16] 47 U.S.C. § 339(c)(3)(A).

[17] 17 U.S.C. § 119(d)(10)(A).

[18] *Sullivan v. Stroop*, 496 U.S. 478, 484 (1990); *see also, e.g.*, *Commissioner v. Lundy*, 516 U.S. 235, 249-50 (1996).

[19] H.R. Rep. No. 111-349, at 3 (2009) (proposing new 47 U.S.C. § 339(c)(3)).

[20] Broadcaster Comments at 8.

Communications Act related to the predictive model. The subsequent language is not in any meaningful sense more "specific" and, as discussed in more detail below, does not mandate use of an outdoor antenna in any event.

2. Neither the Citation to the Commission's Rules Nor the "Shall Rely On" Language Requires Use of Outdoor Antennas

Largely ignoring the introduction of the phrase "through the use of an antenna," the Broadcasters devote most of their analysis to two phrases that they assert compel the use of outdoor antennas. The two phrases do no such thing.

First, the Broadcasters point to the phrase immediately following "through the use of antenna," which specifies that the model must predict whether a subscriber can "receive signals in accordance with the signal intensity standard in section 73.622(e)(1) of title 47, Code of Federal Regulations, or a successor regulation."[21] The cited section, according to the Broadcasters, requires the Commission to "rely on use of a conventional 'outdoor' antenna."[22] This is wrong for several reasons. To begin with, as DIRECTV and DISH pointed out in their initial comments, "*the signal intensity standard* in section 73.622(e)(1)" is simply a set of numbers measured in decibel levels.[23] Although those numbers were derived (for other purposes) based on certain antenna assumptions, nothing about the numbers themselves requires that such assumptions be maintained when the strength of a particular signal is predicted to determine if it is below or above these numbers, or when the standards themselves are used for this purpose. Moreover, "section 73.622(e)(1)" references those levels "as determined using the method in section 73.625(b)." Even if one were to (mistakenly) look beyond the numbers at "the

[21] *Id.* at 6 (citing 47 U.S.C. § 339(c)(3)(A)).

[22] *Id.*

[23] DISH-DIRECTV Comments at 12-13.

method" for predicting the strength of a particular signal and comparing it against the values cited in the rules, that "method" (*i.e.*, that contained in 47 C.F.R. § 73.625(b)) says nothing about antenna height and placement.

Second, the Broadcasters look to the next sentence for evidence about outdoor antennas:

> In prescribing such model, the Commission shall rely on the Individual Location Longley-Rice model set forth by the Commission in CS Docket No. 98-201, as previously revised with respect to analog signals, and as recommended by the Commission with respect to digital signals in its Report to Congress in ET Docket No. 05-182, FCC 05-199 (released December 9, 2005).[24]

Because the Commission "shall rely" on the model it recommended five years ago, the argument goes, and because that model assumed outdoor antennas, so too must this one—notwithstanding any other changes to the statute.[25] This too is wrong.

- The argument ignores the first words of the sentence: "In prescribing *such* model." "Such model" refers to the model described in the previous sentence—*i.e.*, one that makes predictions on the ability to receive signals "through the use of an antenna."
- The statutory provision does not require the Commission to *use* its earlier models. It requires the Commission merely to "rely on" the earlier models in "develop[ing]" and "prescrib[ing]" a new one. "Rely on" means simply "to be dependent on."[26] The new model can "be dependent" on the old ones—in the everyday sense of being derived from those models—while still heeding Congress's specific directive to eliminate the outdoor antenna assumption. If Congress truly meant for the old models to remain unchanged in

[24] 47 U.S.C. § 339(c)(3)(A).

[25] Broadcaster Comments at 5-6 (arguing that "[t]he statutory specification of a particular ILLR model is dispositive of the predictive signal measurement issue").

[26] *Rely Definition*, Merriam-Websters.com, http://www.merriam-webster.com/netdict/rely?show=0&t=1282778172.

every respect, as the Broadcasters argue, it would not have directed the Commission in the very next sentence to "establish procedures for the continued refinement in the application of the model by the use of additional data as it becomes available."[27] Any such "refinement" would, by definition, conflict with assumptions upon which the older models were based. Had Congress meant to import this standard in its entirety, it would not have said "shall rely on" at all. It would have simply said "shall use."

- The Broadcasters correctly observe that Congress "knew that the Commission had recommended a digital ILLR model that was based on an outdoor antenna standard."[28] But this does not mean that Congress *adopted* the Commission's recommendation. Indeed, as DIRECTV and DISH explained in their initial comments, its change to the antenna language seems to have been a reaction to exactly that recommendation. In response to a request from Congress,[29] the Commission recommended *not* changing the noise limited standard in part because changing it would affect policies unrelated to distant signal eligibility, such as the power level at which digital stations could operate.[30] Having been told that the standards themselves should not change, Congress quite reasonably concluded that their application should change to track consumers' choices and circumstances.

[27] 47 U.S.C. § 339(c)(3)(A).

[28] Broadcaster Comments at 7 (emphasis removed).

[29] *See 2005 SHVERA Report* ¶ 21 (citing 47 U.S.C. § 339(c)(1)(B), which asked the Commission to specifically consider "whether to account for the fact that an antenna can be mounted on a roof or placed in a home and can be fixed or capable of rotating").

[30] *See id.* ¶ 43 ("If DTV service were instead based on consideration of indoor reception, then the power levels needed to replicate stations' analog service at distances of 55-60 miles or greater would be substantially higher.").

- The Broadcasters argue that, because the *sentence itself* did not contain antenna language, Congress did not mean to change the predictive model.[31] But this "silence" is tantamount to expecting Congress to repeat itself. Such "direction" is certainly found elsewhere—*i.e.*, in the immediately preceding sentence and in the unserved household definition of the Copyright Act, which is expressly incorporated into the Communications Act's eligibility provisions.[32] Nothing in the "measurement" provision offers any basis for the Commission to ignore that clear statutory command.

C. The Legislative History Confirms the Intent

STELA's intent and commands are much different than what the Broadcasters assert. The use of a "conventional, stationary, outdoor rooftop receiving antenna" is no longer required to determine if a household is unserved. Moreover, the statute now specifically directs that "the Commission shall seek ways to minimize consumer burdens . . . ."[33] The Broadcasters dismiss the relevance of these statutory changes. According to them, the deletion of the outdoor antenna requirement means nothing; it is as if Congress erased the words by accident. Even if the courts allowed deletions to be ignored, which they do not, this "they-must-have-made-a-mistake" approach to statutory interpretation is belied by the legislative history. To credit the Broadcasters' construction, one would have to assume that lawmakers heard DIRECTV's Mr. Gabrielli testify to the fact that consumers overwhelmingly use indoor antennas;[34] that they then

[31] Broadcasters Comments at 6-7 (arguing the STELA "did not change the antenna requirements for on-site testing" and that it contains "no direction or suggestion . . . that the Commission should abandon or modify the outdoor antenna requirement for on-site measurements").

[32] 47 U.S.C. § 339(a)(2)(D)(i)(III).

[33] 47 U.S.C. § 339(c)(3)(B).

[34] *See* Written Testimony of Robert Gabrielli, Senior Vice President, Program Operations, DIRECTV, Inc., Before the Senate Committee on Commerce, Science, and Transportation (Oct.

forgot about this testimony; and that they proceeded to delete "outdoor" not as a result of the testimony, but in accidental coincidence with the point made therein. This is implausible. As the Report of the House Commerce and Energy Committee also states, the "Committee expects the Commission to consider the types of antennas that are readily available for purchase by consumers to receive the signals of local digital television broadcast stations over-the-air."[35] This provides further evidence, if more were needed, that the deletion of the "outdoor" antenna requirement was intentional.

III. THE COMMISSION MUST IMPROVE ITS PREDICTIVE MODEL NOW

STELA mandates that the predictive model be reviewed and updated as expeditiously as possible. The specific mandate is to conduct a rulemaking and complete it by November 24, 2010.[36] Had Congress intended to make no changes to the model, it would not have required such a proceeding.

A. Indoor Antennas Should Be Part of the Predictive Model

The Commission has consistently encouraged consumer use of indoor antennas for digital television during the DTV transition, recognizing the lack of outdoor DTV receive broadcast

---

7, 2009), *available at* http://commerce.senate.gov/public/?a=Files.Serve&File_id=6c1bf04a-bbb5-4ced-8e80-737da650eba7.

[35] H.R. Rep. No. 111-349, at 19 (2009). While the Broadcasters ignore this legislative history, they try to hold DIRECTV to their reading of a colloquy from a legislative hearing. They argue that DIRECTV's Executive Vice President Derek Chang "committed to adhere to the Commission's recommended digital ILLR model" before Congress. This is untrue and irrelevant. As is clear from the transcript, Mr. Chang stated that DIRECTV would be "willing" to adhere to the then-recommended predictive model. Were that model the law of the land, DIRECTV would indeed be "willing" (not to mention obliged) to "adhere to" it. But Congress has changed the law. The Commission's role in interpreting the new law has nothing to do with whether DIRECTV was willing to adhere to a prior formulation.

[36] 47 U.S.C. § 339(c)(3)(A).

antennas in today's marketplace.[37] As noted above, Congress acknowledged this reality with STELA's explicit recognition that the Commission could no longer rely solely on outdoor antennas in predicting what households are "unserved." Now, by incorporating indoor antennas into the predictive model, the Commission can improve on its existing model by more accurately accounting for the television environment actually experienced by consumers.

B. The Predictive Model Should Take Into Account Real Obstructions—Both Outdoor and Indoor—and Interference

The Broadcasters claim that the indoor environment simply presents too many variables for a predictive model. Yet outdoor reception, too, presents numerous variables—such as antenna height, antenna location, house location, natural terrain, and manmade terrain. The Commission had no problem coming up with simplifying assumptions (30 foot antenna, etc.) that allowed eligibility determinations even at the risk of some inaccuracy. There is no principled reason why it cannot do the same in the indoor environment—and Congress has now instructed it to do so.

The predictive model can be improved while taking into account all of the indoor obstruction factors raised by the Broadcasters.[38] As Mr. Kurby testifies, the variability injected by the assumption of indoor antenna use can be readily defined and accounted for,[39] in contrast to the almost inexhaustible variation of the external environment. Mr. Kurby's analysis demonstrates how the ILLR model can be adapted, as it has for other radio services, to account

---

[37] *See* DIRECTV-DISH Comments at 7-8.

[38] *See* Broadcasters Comments at 11-12 (citing variations in (a) indoor signal strength across different homes, (b) indoor signal strength in the same home, and (c) types of antennas as concerns).

[39] Kurby Report at 2-5 (attached to DIRECTV-DISH Comments); Declaration of Christopher Kurby ¶ 4 (Sept. 3, 2010) (attached hereto) ("Kurby Declaration").

for building penetration loss (whether across different homes or in the same house).[40] In addition, Mr. Kurby shows how the model can be updated to account for antennas on low-cost set-top-box receivers.[41] Because this represents a refinement to the model, the Commission should update the ILLR model to account for indoor obstructions.

Even with respect to outdoor factors, the Broadcasters oppose any "additional" variables to account for land use and land cover more comprehensively. The term "additional" in this case is a misnomer. The number of variables that the Commission has adopted at the Broadcaster's behest for all VHF stations is exactly zero.[42] This elimination of land use as a factor was based on studies conducted in some of the flattest states in the country. These studies' conclusion—that taking land use and cover into account leads to over predictions of unserved households—was always suspect. If the model favored by the Broadcasters is accurate, why would taking account of the household's geography lead to such distortions? The fact that the D.C. Circuit upheld the Commission's decision meant only that it was not arbitrary at the time. Indeed, the D.C. Circuit noted that if "EchoStar, another interested party, or the Commission itself in the future identifies an adjustment to the model that both varies with land cover and increases the accuracy of the model, then presumably the Commission will be obligated to refine the model accordingly."[43]

Certainly that decision does not in any way diminish STELA's mandate of "continued refinement in the application of the model by the use of additional data as it becomes available."

---

[40] Kurby Report at 4; Kurby Declaration ¶ 4.

[41] Kurby Report at 4.

[42] Establishment of an Improved Predictive Model for Predicting the Broadcast Television Field Strength Received at Individual Locations, *First Report and Order*, 15 FCC Rcd. 12118, 12126 (2000).

[43] *EchoStar v. FCC*, 457 F.3d 31, 38 (D.C. Cir. 2006).

In fact, the decision reinforces the Commission's duty to update the model because both the Kurby Report and the Givens & Bell comments provide mechanisms to more fully account for the variables cited by the Court.[44] Indeed, Givens & Bell produces extraordinary evidence of the ILLR model's underpredictions, which belies the Broadcasters' engineering analysis and shows that the predictive model can be updated to more fully account for obstructions.[45]

The model should also be improved by accounting for interference from stations in neighboring areas as well as multipath interference. Interference from neighboring stations is easy to predict, and there is no plausible reason to exclude it. In addition, multipath interference can be accounted for with a reasonable and conservative 3dB correction factor.[46] While this would not be sufficient to account for all cases of catastrophic interference, it would refine and improve the predictive model.

C. The Predictive Model Should Be Based on 99% Time Variability

The predictive model should be based on 99% time variability. The Broadcasters complain that any change to the rules would "penalize stations."[47] To provide consumers with the same benefits as 99% time variability, the Broadcasters suggest that consumers can go out and purchase "low-noise preamplifiers, higher gain antennas, and lower loss downlead cables."[48] But as Mr. Kurby points out, low-noise preamplifiers and low-loss downlead cables provide precious little benefit for most consumers, and higher gain antennas are too large to be of use in

[44] Kurby Report at 4-5; Givens & Bell Comments at 6-9.

[45] Givens & Bell Comments at 3-6.

[46] Kurby Report at 5.

[47] Broadcasters Comments at 13.

[48] *Id.* at 14.

an indoor setting.[49] And consumers deserve better over-the-air reception in a digital world without being required to spend thousands of dollars for it. Consumers have the right to expect the same high quality signal regardless of the source.[50] Reception of broadcast signals should be held to the same standards for availability as those that Section 342 of the Communications Act has put in place for providing a good quality signal for local service by qualified satellite carriers to newly launched designated market areas.[51]

IV. ON-LOCATION TESTING PROCEDURES MUST BE MODIFIED TO MINIMIZE CONSUMER BURDENS

STELA's command to the Commission regarding on-location testing is not only that indoor antennas be permitted; the Commission must also seek "ways to minimize consumer burdens associated with on-location testing."[52] Even the Broadcasters recognize this later mandate, but they nonetheless advocate an overly complex and expensive testing procedure that bears no relationship to whether a consumer will be able to receive an appropriate signal.[53] To minimize the burden on the consumer, the Commission must include indoor antennas for its testing procedures and add a reception component to the testing.

A. Signal Strength Testing Must Use Indoor Antennas

Rather than focusing on minimizing the burden to consumers, the main premise for the Broadcasters' opposition to indoor antenna testing seems to be distrust of consumers—the assumption that indoor antenna testing would be manipulated by consumers.[54] But consumers

[49] Kurby Declaration ¶ 2.

[50] *See* 47 U.S.C. § 342(e)(2)(A)(i).

[51] 47 U.S.C. § 342(e)(2)(A)(i).

[52] 47 U.S.C. § 339(c)(3)(B).

[53] Broadcasters Comments at 15.

[54] *Id.* at 11-12.

have not held back from installing outdoor antennas in a nefarious scheme to qualify to receive distant stations. Nor have they arranged the thickness of their walls with that purpose in mind. The readings can differ from room to room as well as from point to point outside the house. But this can and should be taken into account with the design of the test. And any risk of manipulation can be addressed for indoor testing as it has been addressed for outdoor testing: by means of the statutory requirement of an independent tester.[55] A tester whose compensation does not depend on a particular outcome has no incentive to practice or condone manipulation.

The Broadcasters complain about variations in indoor models. But when the Commission allowed the use of dipoles for the analog tests, it did not encounter any such concerns, and the rule did not, as far as DIRECTV or DISH know, give rise to significant disputes. If variations in antennas prove to be a problem, they can be accounted for by specifying minimum standards that include off-the-shelf dipoles available at retail.

In addition, requiring testing details to be recorded would provide a "belt-and-suspenders" safeguard against manipulation, even when multiple televisions exist in the household, because such a regime would allow the test results to be analyzed after-the-fact.

While the purported problems with testing indoor antennas could all easily be solved, if they exist at all, outdoor antennas pose very real problems for consumers. Outdoor antennas today are irrelevant to consumers, as the vast majority do not use them and many do not live in the two-story single family dwellings that the antenna height requirement is predicated upon. This means using an outdoor antenna for testing will not test the antenna that the consumer will be using, thus creating a mismatch between the test and the actual ability of the consumer to receive the signal. The Broadcasters' proposed use of calibrated gain antennas disregards these

[55] 47 U.S.C. § 339(c)(4).

antennas' exorbitant cost, which will represent a significant burden for the independent technicians conducting the tests.[56] Moreover, outdoor testing is itself a cumbersome process for technicians because, among other reasons, the 30-foot height requirement is difficult to comply with considering the small size of their vans.[57]

Contrary to the Broadcasters' assertions,[58] the use of outdoor antennas for satellite reception does not support the assumption of an outdoor over-the-air antenna. In drawing the analogy between the two, the Broadcasters ignore the reasons why millions of customers use satellite antennas and find them consumer-friendly with satisfactory results, while rooftop broadcast antennas are fast becoming a relic used only by hobbyists and enthusiasts. Satellite antennas are generally installed for the customer by satellite operators or their contractors, while broadcast antennas typically are installed by the consumers themselves. Technicians are not generally available for installing broadcast antennas and certainly are not available to do so for free.[59] And the Broadcasters do not suggest in their comments that their member stations will start rolling trucks. In addition, satellite dishes are also much smaller than outdoor over-the-air antennas, which makes them less visible and easier to handle.

B. On-location Testing Should Include a Reception Component

Adequate signal strength cannot be the only prerequisite to qualifying a household as unserved. As DIRECTV and DISH have pointed out in their comments, STELA also requires

[56] Kurby Declaration ¶ 3.

[57] *Id.*

[58] *See* Broadcasters Comments at 10.

[59] DIRECTV-DISH Comments at 7.

that consumers actually receive the signal,[60] which in turn requires signal "lock" for digital signals. In the analog world, it was understandably difficult to distinguish good reception from bad reception and difficult to dismiss bad reception (for example a ghosted signal) as no reception at all. In digital television, the difference is stark, and it is between reception and no reception. Accordingly, it is an impermissible interpretation of the statute to posit that a household is "served" if it cannot obtain a watchable signal at all. No reception means that the household cannot "receive" a signal of adequate strength, not because the signal necessarily lacks the strength, but because it cannot be received. Accordingly, reception should be recognized as a required additional component before designating a household as served.

As Mr. Kurby has demonstrated, a reception test would be fairly easily to administer, would be transparent for all parties involved (consumers, satellite carriers, and broadcasters), and would not suffer from any of the administrative difficulties of outdoor antenna testing.[61]

[60] DIRECTV-DISH Comments at 23-24; *see also* 17 U.S.C. § 119(d)(10); 47 U.S.C. § 339(c)(3)(B).

[61] Kurby Report at 8.

V. CONCLUSION

In prescribing a predictive model and the measurement method to determine whether a household is unserved in the digital era, the Commission must give effect to the changes made in STELA and recognize the reality of consumer choices and today's circumstances. This will mean updating the predictive model and testing procedures to include the use of indoor antennas.

Respectfully submitted,

DISH NETWORK, L.L.C.

By: */s/*

Alison A. Minea
Corporate Counsel
DISH NETWORK L.L.C.
1110 Vermont Avenue N.W.
Suite 750
Washington, DC 20005
(202) 293-0981

Pantelis Michalopoulos
Christopher Bjornson
Andrew W. Guhr
STEPTOE & JOHNSON LLP
1330 Connecticut Avenue, N.W.
Washington, DC 20036
(202) 429-3000

Counsel for DISH Network L.L.C.

DIRECTV, INC.

By: */s/*

Susan Eid
Sr. Vice President, Government Affairs
Stacy R. Fuller
Vice President, Regulatory Affairs
DIRECTV, INC.
901 F Street, N.W.
Suite 600
Washington, DC 20004
(202) 383-6300

William M. Wiltshire
Michael Nilsson
WILTSHIRE & GRANNIS LLP
1200 Eighteenth Street, N.W.
Washington, DC 20036
(202) 730-1300

Counsel for DIRECTV, Inc.

September 3, 2010

Attachment

Declaration in Support of Reply Comments of Christopher Kurby, MEM, MEE, BSEE

Declaration in Support of Reply Comments of Christopher Kurby, MEM, MEE, BSEE

1. My name is Christopher Kurby, and I have been retained by DIRECTV, Inc. and DISH Network L.L.C. to provide expert technical analysis of the issues raised in this proceeding. This declaration touches on issues raised in the comments to the *Notice* released by the FCC on July 28, 2010, FCC 10-133, in ET Docket Nos. 10-152 and 06-94 and supplements the Engineering Analysis and Statement I provided for DIRECTV and DISH for their comments in that proceeding (dated August 24, 2010). My curriculum vitae was attached to my earlier statement in this proceeding.

2. Low-noise preamplifiers and lower loss downlead cables are not a substitute for 99% time variability.

A. Low-noise preamplifiers

Any improvement in the signal reception due to the addition of low-noise preamplifiers ("LNA") at the TV receiver input will be limited due to the inherent physics of the TV electronics. Specifically, any benefit of a LNA will be limited by the noise figure ("NF") of the TV and the LNA. The problem is that, while the signal will be increased by an LNA, so too will its noise contribution, thereby setting a hard limit on any improved signal reception. Consider that a nominal TV tuner's NF is 11dB[1] and a good LNA has 20dB of gain and an NF of 1dB[2]. One might expect that the TV receiver will improve by 20dB, but this is not the case. The actual improvement is only 10dB, and adding increasing gain will not improve the TV receiver by more than a tenth of a dB or so. The improvement in signal reception is due to the change in the NF and not the gain itself. The formula below shows how the NF with the LNA is calculated:

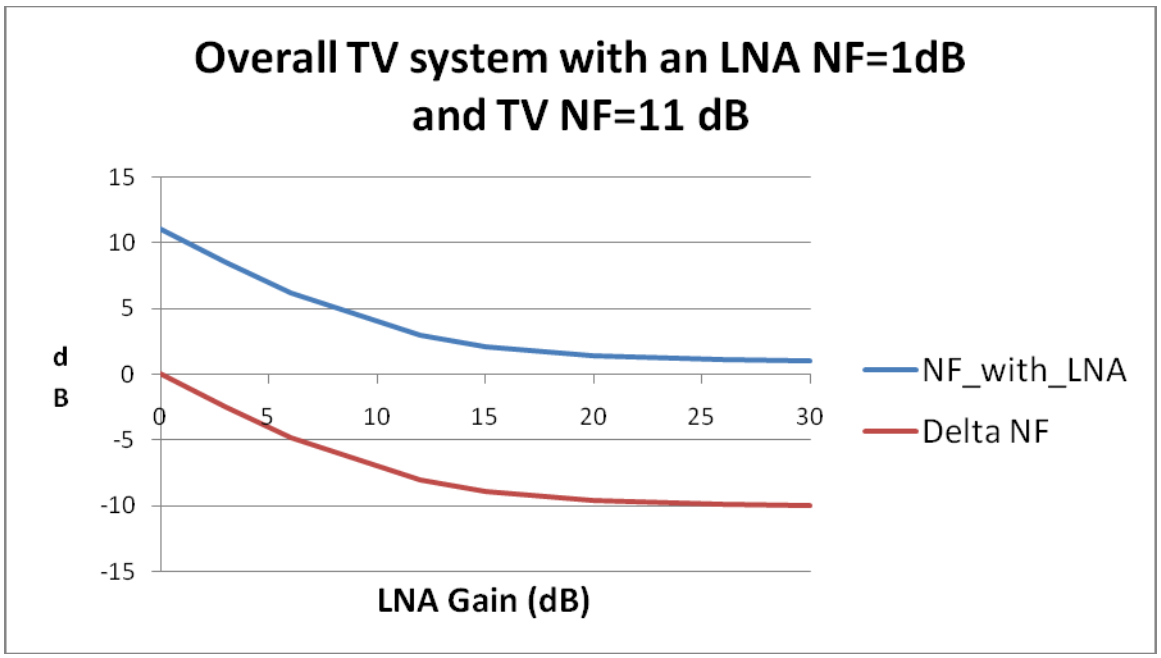
$$NF_{w_{LNA}} = NF_{TV} + \frac{(NF_{TV} - 1)}{G_{LNA}}$$ (all linear terms)

Or in logarithmic terms:

$NFw_{LNA} = 10*\log10(NFw_{LNA})$ (dB).

If the TV tuner's NF is actually better than 11dB the improvement will be even worse. So typically an LNA can help some, but it cannot overcome the entire loss of signal from outdoor-to-indoor and the other factors.

The chart below shows how the overall NF changes with LNA gain, assuming the LNA has a very good 1dB NF (assumes a 75ohm source – more commonly known as an ideal source). One can see that, for high LNA gain, the system NF approaches that of the LNA.



In practice the LNA will be driven by an antenna, not an ideal source, and so the LNA noise figure can be much worse, making the calculated improvement rather optimistic. One can find more expensive LNAs with an NF as low as 0.5dB, but again this will at most improve sensitivity by (1-0.5) = 0.5dB. Only in the extremely rare case where the TV's or set top box's NF is exceedingly poor can we expect that the LNA will make a signficant difference. This will increasingly not be the case as electronics dramatically improve.

One may be able to find an integrated LNA and antenna system for indoor use that might appear to operate differently than the analysis provided above: however, the analysis remains the same. In good receiver design practice, the parameters of LNA gain and noise figure are carefully balanced to create a good performing receiver. The placement of additional gain in front of a TV receiver does not represent good engineering practice. A simple way to understand this is by noting that the addition of an LNA increases the signal power of the desired signal and all the undesired signals at the same time. Thus, it effectively increases the interference. The most severe negative effect is that these undesired signals create higher on-channel interference due to non-linear processes in the receiver, most notably 3rd order intermodulation. Increasing the signals by 20dB can increase the undesired interference product generated on-channel signal by up to 60dB – i.e., 3:1 in dB. So adding an LNA can actually degrade the receiver performance.

B. Lower loss downlead cables

The idea of using lower loss cables between the antenna and the TV only effectively applies to TVs with an external antenna and a reasonably long cable between them. Obviously, in most cases, where an indoor antenna is co-located with a TV, requiring only a few feet of cable with negligible cable loss, this technique cannot provide any meaningful benefit.

The use of an LNA with low loss cables between it and the TV will be even less effective since the LNA gain should be high enough to overcome any incidental loss between it and the TV. In fact, LNAs are usually used with external antennas to overcome the loss of long cables between those antennas and a TV placed some distance away.

3. Testing with calibrated gain antennas places a greater burden on consumers and technicians. Gain antennas, namely antennas that have gain greater than 0dBd, will be large structures, especially for VHF signals. These large structure devices are hard to transport, store, and use, and are very susceptible to damage due to their size and non-rugged construction. They certainly are too large for use indoors.

The Table below provides the dimensions, cost, and other data from the company sources mentioned in the Comments of the Broadcasters. The price for the CL-26 and CL-713 was obtained by telephone and email quote from Hutton Communications, and all antennas are available and can be ordered via http://www.hol4g.com/mk/index.aspx#.

TV channels	Freq(MHz)	Model	Gain	Size(in)	Wt(lbs)	Cost	Reference
2-6	54-88	Scala CL-26/HCM/50N	8.2dBd	181x109x10	62.5	$1,133.97	http://www.kathrein-scala.com/vhf-tv_log.php
7-13	174-216	Scala CL-713/HCM/50N	9dBd	89x34x10	40	$649.98	
14-69	470-862	Scala CL-1469B/50	8dBd	29x17x12	22	$467.99	http://www.kathrein-scala.com/uhf-tv_log.php
misc cost estimated		tripod TU-510				$100.00	
		cables				$100.00	
		mounting mast				$100.00	
					total	**$2,551.94**	

Also included in this list are some of the accessories needed to complete the testing system. All of these items add to the cost of testing and difficulty in storage and transportation, as well as the logistics of keeping all the elements together so they do not get lost, especially when one considers that the mounting mast for an independent tester must be large enough to support a gain antenna's operation at a height of 30 feet.

4. Indoor assumptions can readily be taken into account for both the predictive model and testing. The Broadcasters suggest it is just too difficult to take varying indoor factors into account for the predictive model. However, cellular system planners have been doing this for years. The method proposed here is to apply correction factors to the outdoor propagation model to convert to indoor viewing using approaches commonly used in the cellular industry. Cellular planners typically design for a 90% confidence factor in building penetration, while not

addressing any individual building design. Of course, this 90% factor alone does not guarantee service to all indoors users in all indoors locations, but this is to be expected in a mobile environment. In the case of an unserved TV user in a stationary location, greater time availability is required to determine whether an adequate TV signal is being provided by a local station. In any event, the individual building environment can be more precisely addressed as reflected in my earlier statement on converting outdoor propagation predictions to indoors. Two significant factors are further discussed here.

A. TV antenna height

The present FCC rules use a 6m or 9m antenna height for calculation of signal power. (The ILLR model suggests 6m for one-story buildings and 9m for outdoor antennas; 6m is used here as the worst case reference.) Data taken by Okumura – and also captured in COST231[3] and used to some extent by the ILLR – provides correction factors for a change in mobile antenna height – here applied as TV antenna height. This factor can be directly used to determine the scale factor from the reference height used by the ILLR model to the desired height as:

K=10Log10(hact(m)/6) dB for 150MHz to 1000MHz.

As reflected in my earlier statement, a 1m antenna height would be more appropriate for TV viewing on a first floor TV receiver. For TV channels above 150MHz, the above correction factor can be used to reflect a reduction in antenna heights. Using 1m as the typical indoor height, the value is 7.7dB lower than an antenna at 6m outdoors. The FCC can seek further comment on the proper factor for TV channels below 150MHz.

B. TV indoor antenna and building penetration loss

In my earlier statement, I reported that indoor antennas were found to have 9dB less gain than antennas used for outdoor planning. Thus this can readily be used to convert expected signal strength in the prediction model.

Building penetration loss is dependent on many factors including whether the building is in the direct line of sight ("LOS") of the transmitter or non-LOS as in a clutter situation. Many cellular and land mobile coverage calculations use fixed factors depending on frequency band. The typical value used for cellular at 800MHz is 20dB[4] for 90% confidence, which increases with increasing frequency. The 20dB factor is a general factor for purposes of confidence[4], but it is derived from the median building penetration loss of about 8.5dB and a sigma of 9.2dB. One can also find similar values of ~20dB in many documents describing cellular indoor coverage.

There has been much research into building penetration, and Mejuto[5] provides an excellent summary of studies conducted as of that date. In fact, they report that "[b]uilding loss can be utilized in the engineering of a radio system in much the same way as other propagation losses." They show tables of data for large buildings with

median and sigma factors for different floor levels, provide figures for loss versus frequency, and also provide factors for various house constructions types. In addition, the COST231 model provides for the entry of many factors for building penetration, including the number of walls penetrated. Thus, by using the information in Mejuto[5], QUALCOMM[4], and any recent building penetration data or research, a good in-building propagation model per building type can be achieved.

The simple formula to convert outdoor to indoors is shown below:

$S_{in\text{-}build} = S_{outdoors} + Ant_{out\_in} + Ant_{ht\ out\_in}$ - Build Loss + Ant Ht Factor.

Nominally this is:

$S_{in\text{-}build} = S_{outdoors}$ -9 -7.7 - Build Loss.

REFERENCES

[1] TI TV tuner SN761681.

[2] Kitztech KT-100VG LNA.

[3] "DIGITAL MOBILE RADIO TOWARDS FUTURE GENERATION SYSTEMS COST 231 Final Report," Chapter 4.

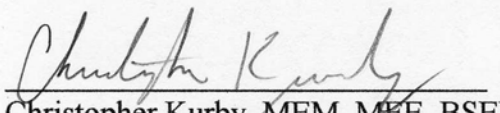
[4] "Aspects of HSUPA Network Planning," 80-W1159-1 Rev B, Qualcomm, 5775 Morehouse Drive San Diego, CA 92121-1714, Engineering Service Group, page 19.

[5] Mejuto, Noe1ia Vazquez, Penetration and Transmission of UHF Radio Waves Into/Through Buildings: A Literature Review, Eindhoven University of Technology, Faculty of Electrical Engineering Telecommunications, Technology and Electromagnetics Group, March to August 1999.

DECLARATION

I, Christopher Kurby, declare that I have prepared the engineering analysis contained in the foregoing Declaration using facts of which I have personal knowledge or upon information provided to me. I declare under penalty of perjury that the foregoing is true and correct to the best of my information, knowledge and belief.

Executed on September 3, 2010.



Christopher Kurby, MEM, MEE, BSEE