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

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Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act	)	CS Docket No. 98-201 RM No. 9335 RM No. 9345
Part 73 Definition and Measurement of Signals of Grade B Intensity	)	

To: The Commission

COMMENTS OF ECHOSTAR COMMUNICATIONS CORPORATION

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SUMMARY

EchoStar Communications Corporation ("EchoStar") hereby files its comments in the above-captioned proceeding.[1] EchoStar is pleased that the Commission has initiated this proceeding for defining "Grade B intensity" as used in the Satellite Home Viewer Act, 17 U.S.C. § 119 ("SHVA"), including development of a tool for predicting it and rules for measuring it. EchoStar believes that the Commission should: promulgate for purposes of the SHVA updated values for Grade B intensity corresponding to more updated consumer acceptance standards and analogous to the quality standards that cable operators must provide to their subscribers; develop a method for predicting the incidence of Grade B intensity at each household that is based on reliably good probabilities of receiving service most of the time and takes account of obstructions attenuating the signal on its way to the household; and establish a methodology for measuring broadcast signal strength at an individual household that similarly takes account of all factors attenuating the signal on its way to the consumer's television set.

Much will depend on the Commission's action in this rulemaking. Particularly, the Commission can make a great stride in ensuring the availability of network service to all Americans – ensuring that all or nearly all of those that cannot receive an adequate signal over the air can receive a distant network signal by satellite – without threatening the network-affiliate relationship. The Commission's action will provide necessary assistance to all satellite companies, as well as courts faced with copyright disputes, which now have to struggle with the

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[1] *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act; Part 73 Definition and Measurement of Signals of Grade B Intensity*, Notice of Proposed Rule Making, FCC 98-302 (rel. Nov. 17, 1998) ("NPRM").

meaning of the "unserved household" term in the SHVA without the benefit of any guidance from the expert agency on the key term "Grade B intensity."[2]

EchoStar supports and incorporates by reference most of the comments filed today by the Satellite Broadcasting and Communications Association ("SBCA"). Among other things, the SBCA's expert engineer Mr. Benjamin E. Dawson III, P.E., has recommended a range of revised values for the "Grade B intensity" level. In particular, Mr. Dawson analyzes the various elements and planning factors of the "Grade B intensity" standard, points to the Commission's recognition that the values assigned to many of these elements are outdated, and proposes a new range of values that would more align the Grade B standard to the acceptable standards that the Commission requires in the area of cable television. The Commission, for example, has established 43 dB (fully 13 dB more than the 30 dB reflected in the current Grade B intensity levels) as the minimum acceptable signal-to-noise ratio that cable systems must provide to subscribers. This difference is absolutely indefensible and should be eliminated. It means that a satellite subscriber must be content with significantly worse quality of reception for network service received over the air than his/her neighbor who subscribes to the local cable system. This in turn produces a perverse further incentive not to abandon cable. Such incentives work to entrench the dominance of cable operators in the Multi-Channel Video Programming Distribution market.

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[2] As the Commission is aware, EchoStar has initiated a declaratory judgment action on the meaning of this term in federal district court in Colorado, *EchoStar Communications Corp. v. CBS Broadcasting, Inc.*, Plaintiff's Original Complaint and Request for Declaratory Judgment, Civil Action No. 98-B-2285 (D. Colo., Oct. 19, 1998), and has been sued by the broadcast interests in district court in Florida, *CBS Broadcasting, Inc. v. EchoStar Communications Corporation*, Complaint, 98-2651-CIV-NESBITT (S.D. Fla., Nov. 5, 1998).

EchoStar also notes that the revised values suggested by Mr. Dawson do not take into account several factors that further affect signal quality, including man-made interference and the deleterious effects of "ghosting." Omission of these factors militates for adoption of the upper limit of the range suggested by Mr. Dawson.

In addition, Mr. Dawson recommends adoption for SHVA purposes of the point-to-point version of the Terrain Integrated Rough Earth Model ("TIREM"), which virtually eliminates location variability and can be set at a time variability level of 90% and a situation/location confidence level of 90-95%, coupled with use of United States Geological Survey ("USGS") data to account for losses due to foliage and land use clutter. Such a model ensures that, before being presumed ineligible for satellite network service, *each individual household* must be expected to receive an adequate over-the-air signal *most of the time* and *with reasonable confidence*. As Mr. Dawson explains in his analysis, the additional precision afforded by TIREM may not have been necessary in the context of charting digital television allotments; therefore, in Mr. Dawson's view, the Commission was justified in deciding that the Longley-Rice 50-50-50 model was a "good enough" approximation for these purposes. On the other hand, the TIREM model's precision makes it especially appropriate for the purposes of SHVA. In particular, the definition of "unserved household" relies on "Grade B intensity" at each individual household as opposed to geographical contours, and thus requires to the extent possible a point-to-point predictive tool such as Mr. Dawson's proposed version of TIREM.

Finally, with respect to actual measurements, the NPRM correctly states that, apart from the possibly prohibitive expense of the current methodology,[3] "many of its assumptions may not hold in individual situations."[4] In particular:

> [M]any homes do not have antennas 30 feet above the ground, especially if they are one-story homes. The definition of unserved household only describes reception over a conventional outdoor rooftop receiving antenna, so requiring measurements on a 30-foot antenna may not reflect what is "conventional." Requiring the truck's antenna to face the direction of the station's tower ignores the reality that consumers' antennas receive several stations, and many do not rotate to the best position for each station. Finally, requiring clusters of tests and a 100-foot mobile run ignores the fact that homes are stationary and that reception may vary considerably over a mobile run on a nearby street. The purpose of the procedure specified in the rules is not to determine the receivability of a signal at a single spot, but to determine, through measurements at a series of grid intersections over a community, the nature of service to the community.[5]

The signal strength that the consumer actually receives at his/her television set, with all the imperfections of his/her conventional equipment, is the relevant criterion for determining whether the consumer should be eligible for distant network service. Under no reasonable reading of the SHVA can an unserved household be robbed of its right to network service because an idealized household in its place might have been able to receive a Grade B signal by use of non-conventional, perfectly tuned and oriented equipment. Accordingly, EchoStar believes that the proposal it has already made in its Petition for Declaratory Judgment

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3 *See* NPRM at ¶ 39.

4 *Id.* at ¶ 40.

5 *Id.* at ¶ 39 (footnotes omitted).

in federal district court is a reasonable way to take account of actual (as opposed to ideal) conditions, and respectfully asks the Commission to adopt it. As the NPRM states, that procedure:

> [I]nvolves placement of a conventional outdoor rooftop antenna within three feet of the home and raised to the height of the roof. The antenna is oriented to maximize signal strength for the one local station than the consumer watches most often. A length of standard household cable is attached to the antenna, and a number of splitters are attached to duplicate the number of splitters the consumer uses to service multiple televisions. A signal measurement is then conducted. If the signal strength is not stable, the antenna is relocated and the same procedure utilized until a stable signal strength is achieved. Readings are taken approximately every thirty seconds for a period of five minutes. If any of the signal strength readings register less than the Grade B signal strength threshold as established by Congress and the FCC, the consumer will be deemed an "unserved household" eligible to receive distant network signals.[6]

As an alternative, the Commission can also prescribe a simple voltage or dB measurement at the consumer's television set, which by definition takes account of the actual consumer's system as it exists, and thus renders unnecessary any effort to replicate that system.

In addition to the arguments persuasively made by SBCA, EchoStar wishes to further emphasize several points regarding the Commission's authority to promulgate SHVA-specific Grade B rules and the urgent need for Commission action to fill the huge vacuum that now hampers attempts to implement the SHVA.

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[6] *Id.* at ¶ 39 n.76.

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reliably good probabilities of receiving service most of the time and takes account of obstructions attenuating the signal on its way to the household; and establish a methodology for measuring broadcast signal strength at an individual household that similarly takes account of all factors attenuating the signal on its way to the consumer's television set.

Much will depend on the Commission's action in this rulemaking. Particularly, the Commission can make a great stride in ensuring the availability of network service to all Americans – ensuring that all or nearly all of those that cannot receive an adequate signal over the air can receive a distant network signal by satellite – without threatening the network-affiliate relationship. The Commission's action will provide necessary assistance to all satellite companies, as well as courts faced with copyright disputes, which now have to struggle with the meaning of the "unserved household" term in the SHVA without the benefit of any guidance from the expert agency on the key term "Grade B intensity."[2]

EchoStar supports and incorporates by reference most of the comments filed today by the Satellite Broadcasting and Communications Association ("SBCA"). In addition, EchoStar wishes to further emphasize several points regarding the Commission's authority to promulgate SHVA-specific Grade B rules and the urgent need for Commission action to fill the huge vacuum that now hampers attempts to implement the SHVA.

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[2] As the Commission is aware, EchoStar has initiated a declaratory judgment action on the meaning of this term in federal district court in Colorado, *EchoStar Communications Corp. v. CBS Broadcasting, Inc.*, Plaintiff's Original Complaint and Request for Declaratory Judgment, Civil Action No. 98-B-2285 (D. Colo., Oct. 19, 1998), and has been sued by the broadcast interests in district court in Florida, *CBS Broadcasting, Inc. v. EchoStar Communications Corporation*, Complaint, 98-2651-CIV-NESBITT (S.D. Fla., Nov. 5, 1998).

I. ARGUMENT

A. The Commission Has Authority to Define, and Redefine, Grade B Intensity Specifically for SHVA Purposes

EchoStar fully agrees with the Commission's tentative conclusion that it has authority under the SHVA's ample authority to define, and redefine, "Grade B intensity."[3] Frankly, EchoStar fails to see how such authority, backed by the full weight of the Supreme Court's recent decision in *Lukhard v. Reed*,[4] can be doubted. As an inextricable part of that authority, the Commission may also develop presumptive tools for predicting the incidence of Grade B intensity, and rules for measuring Grade B intensity.[5] EchoStar agrees with the SBCA's analysis on these points.

The Notice of Proposed Rulemaking also seeks comment on "whether the Commission has the authority to revise its Grade B rules specifically for the purposes of the SHVA."[6] EchoStar, again, agrees with the SBCA that the Commission has ample authority to do so. As the NPRM itself observes, "[t]he Commission has tailored its rules for specific purposes in the past,"[7] and the promulgation of a different predictive model for DTV allotments than for other purposes is an example close to home. EchoStar wishes, however, to add several thoughts

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3 NPRM at ¶ 20.

4 481 U.S. 368, 379 (1987).

5 NPRM at ¶ 30.

6 NPRM at ¶ 22 (footnote omitted).

7 *Id.*

concerning the SHVA-specific nature of the Commission's authority. Both the SHVA itself and well-settled administrative law precedent support the proposition that the Commission can promulgate rules concerning the SHVA without revisiting the entire universe of broadcast issues that would be affected by a "global" revision of its signal intensity standards.

Indeed, once it is established that the Commission has authority to define, and redefine, "Grade B intensity" under SHVA, it makes no sense to suggest that Congress meant to constrain the Commission's flexibility in how to go about doing this. Nowhere in the statute is the Commission instructed that it must adopt new definitions of "Grade B intensity" throughout its rules. Nor can such a far-reaching instruction be found in any of the SHVA's legislative history.

In the absence of any such expressed congressional constraints, it is well settled that agencies have broad authority to choose policymaking models. Agencies have broad discretion, for example, to make policy either through rulemaking or adjudication.[8] Thus, if it wished, the Commission could define, and redefine, Grade B intensity on a case-by-case basis. If, for example, on a motion to refer a Grade B matter to the Commission's primary jurisdiction, a court asked the Commission to certify the status of Grade B intensity in connection with a particular factual situation, the Commission could redefine Grade B intensity in connection with those facts, and could choose whether or not to "globalize" such a redefinition in future case-by-case adjudications.[9] If the Commission has authority to change Grade B intensity in certain

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[8] *E.g.*, *NLRB v. Bell Aerospace Co*, 416 U.S. 267, 291-94 (1974); *Shalala v. Guernsey Memorial Hospital*, 115 S.Ct. 1232, 1233 (1995); *SEC v. Chenery Corp.*, 332 U.S. 194, 203-204 (1947).

[9] *C.f. Bell Aerospace*, 416 U.S. at 294 (NLRB has authority to define "managerial employees" in different factual situations through a series of adjudications).

factual situations, it *a fortiori* has authority to do the same thing as part of a SHVA-specific rulemaking.

B. The Commission Should Set Updated Values for "Grade B Intensity"

The explanation of the current Grade B intensity levels set forth in the NPRM illustrates vividly the substantial confusion and huge vacuum that have existed in connection with defining Grade B intensity for SHVA purposes, and that would continue to exist absent Commission action. As the Commission explains, the dBu levels currently set forth in the Commission's rules, 47 C.F.R. § 73.683, include a "time variability" factor:

> The "time variability" planning factor used in the determination of the Grade B standard may create some confusion. In the TV & Cable Factbook, TV Stations Volume (1998 edition page A-15), the Grade B is described as providing service to 50% of locations 90% of the time. The Commission's *Sixth Report and Order* in Dockets 8736 *et al.* 41 FCC 148, 177 (1952), which adopted the initial television station allocation rules, states, "In the case of Grade B service the figures are 90 percent of the time and 50 percent of the locations." *See also*, Third Notice of Further Proposed Rule Making, FCC Report 51-144, 16 Fed. Reg. 3072, Appendices A and B (1951); O'Connor, Robert A., "Understanding Television's Grade A and Grade B Service Contours," at 137. Both the broadcast and satellite parties state the time variability factor differently than above. They describe the field strength at the Grade B contour as being available to at least 50% of the locations at least 50% of the time. This apparent inconsistency arises from an adjustment the Commission adopted for the Grade B signal strength values when it originally established them. This adjustment results in a Grade B value that predicts reception of an acceptable picture 90% of the time. For example, on channels 2-6, a signal strength of 41dBu is needed for an acceptable picture. In order for this signal strength to be

> available 90% of the time, the median or F(50,50) field strength is set at 47 dBu.[10]

This explanation is nowhere to be found in the Commission's Rules, and can only be gleaned from arcane 1950s rulemakings.[11] Congress, of course, cannot reasonably be expected to have understood in 1988 or 1994 that the then applicable level of Grade B intensity was in fact even lower than the 47 dBu set forth in the Rules – *i.e.*, that the standard of consumer acceptance developed during the Truman Administration was at an even lower 41 dBu. Thus, if the Commission were not to change the Grade B intensity levels for SHVA purposes, consumers would have to content themselves with an even lower standard of Grade B intensity than the 47 dBu that Congress believed to be the then Commission standard when it enacted the statute.[12]

In any event, EchoStar believes that a 47 dBu Grade B intensity standard is itself woefully low and should be revised. Overwhelming evidence suggests that the current definition no longer bears any relationship whatsoever to modern notions of acceptable service. Indeed, the Commission itself has indicated that the current dBu levels of 47 C.F.R. § 73.683 no longer represent adequate picture reception. For example, the Commission has established *43 dB* – **fully 13 dB greater than that computed in the Grade B standard** – as the minimum

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[10] NPRM at ¶ 4 n.16. While, as EchoStar has shown, the congressional reference to the Commission's expertise does not freeze the Commission's then existing rules in place, Congress believed that the then existing Grade B intensity levels were codified at 47 C.F.R. § 73.683. *See* H. Rep. No. 100-887 Part 1, at 26 (1988) (referring to Grade B intensity "as defined by the FCC, *currently in* 47 C.F.R. section 73.783(a)") (emphasis added).

[11] *Sixth Report and Order* in Dockets 8736 *et al.*, 41 FCC 148, 177 (1952); *see also*, Third Notice of Further Proposed Rule Making, FCC Report 51-144, 16 Fed. Reg. 3072, Appendices A and B (1951).

[12] Of course, to predict the incidence of ***47*** dB with probabilities of 90 percent of the time and 50 percent of the locations, the Commission would need to add the applicable time fading factor ***to*** 47 dBU.

acceptable signal-to-noise ratio that cable operators must provide to subscribers.[13] One reason for this higher carrier-to-noise ratio is that "the American household's typical television equipment has changed markedly since . . . the early 1970s [when] most television households had a single television set, usually black and white, and VCRs were non-existent."[14] Moreover, the Commission's must-carry rules require a television station to deliver to a cable operator's principal headend a signal of –49 dBu for VHF and –45 dBu for UHF, which "will generally result in a good quality television signal being received."[15] However, the Commission has repeatedly held that even these signal levels – markedly higher than the Commission's current Grade B rules – do not always result in acceptable picture quality.[16]

The current differences between Grade B intensity and quality standards in the cable television area are absolutely indefensible and should be eliminated. They mean that a satellite subscriber must be content with significantly worse quality of reception for network service received over the air that his/her neighbor who subscribes to the local cable system. This in turn produces a perverse further incentive not to abandon cable service. Such incentives work

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[13] *Compare Cable Television Technical and Operational Standards*, 7 FCC Rcd. 2021, 2027-28 (1992) *with* O'Connor at 140.

[14] *Cable Television Technical and Operational Standards*, 7 FCC Rcd. at 2028.

[15] *See Implementation of the Cable Television Consumer Protection and Competition Act of 1991*, 8 FCC Rcd. 2965, 2990 (1993).

[16] *See WRNN-TV Associates Ltd*, 13 FCC Rcd. 12654, 12657 (1998) (denying must-carry complaint where station signal failed to meet minimum signal-to-noise ratio of 53 dB set by NCTA); *Northwest Indiana Public Broadcasting, Inc.*, 12 FCC Rcd. 4709, 4711 (1997) (denying must carry complaint because station failed to deliver a signal with acceptable picture quality).

to entrench the dominance of cable operators in the Multi-Channel Video Programming Distribution market.

Based on these standards adopted by the Commission, the SBCA's expert engineer Mr. Benjamin E. Dawson III, P.E., has developed a range of values that would constitute reasonable proxies for the new Grade B intensity standard. The upper limit of that range is based on the 43 dB signal-to-noise ratio used for cable retransmission of broadcast signals, and is thus more appropriate in light of the Commission's mandate to try to level the playing field between cable operators and satellite distributors. Indeed, EchoStar notes that Mr. Dawson's analysis does not quantify the effects of factors with a significant effect on the quality of consumer reception such as man-made interference and ghosting. This omission too militates for adoption of a value for "Grade B intensity" that lies at the upper limit of the range proposed by Mr. Dawson.

C. The Commission Should Adopt the TIREM Point-to-Point Predictive Model

EchoStar fully supports and incorporates by reference the comments and technical appendix filed today by the SBCA. Mr. Dawson recommends adoption of a point-to-point variant of the predictive Terrain Integrated Rough Earth Model ("TIREM"), which virtually eliminates location variability and can be set at a time variability level of 90% and a "situation/ location" confidence level of 90-95%. Mr. Dawson proposes combining that model with use of United States Geological Survey ("USGA") data to account for losses due to foliage and land use clutter. Such a model ensures that, before being presumed ineligible for satellite network service, *each individual household* must be expected to receive an adequate signal *most of the time* and *with reasonable confidence*.

The TIREM model is thus crucially different from the traditional Grade B contour, which the Commission tentatively concludes is "insufficient for predicting signal strength at individual households."[17] The TIREM model also offers much more accurate predictions of signal strength at individual households than the Longley-Rice model, which – contrary to the Commission's tentative conclusions[18] – is not a "true" point-to-point methodology. As Mr. Dawson explains in his analysis, Longley-Rice predictions are based on "cells" – in cells where propagation path impairments prevent the program from computing within its confidence limits, Longley-Rice returns an error code. The version of Longley-Rice proposed by the Commission *assumes service* where error codes are returned. Longley-Rice also does not compute interference for these cells. By contrast, TIREM was specifically developed to show "islands" of poor coverage, and other topographically specific coverage anomalies *within* a predicted Grade B contour. It is thus better suited for, and more accurate at, predicting signal coverage to an individual household.

The additional precision afforded by TIREM may not have been necessary in the context of charting digital television allotments; therefore, in Mr. Dawson's view, the Commission was justified in deciding that the Longley-Rice 50-50-50 model was a "good enough" approximation for these purposes.[19] Indeed, Mr. Dawson views Longley-Rice's shortcomings in connection with DTV allotment as relatively inconsequential and notes that "the

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[17] NPRM at ¶ 33.

[18] NPRM at ¶ 34.

[19] *Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, 12 FCC Rcd. 14588, 14605 (1987).

results provided are manifestly more valid than the use of the simplistic F (50,50) and F(50,10) method . . . ."[20] On the other hand, Longley-Rice is woefully inappropriate for the purposes of the "unserved household" definition, with its emphasis on individual households. In particular, the definition of "unserved household" relies on "Grade B intensity" at each individual household as opposed to geographical contours, and thus requires, to the extent possible, a point-to-point predictive tool such as the version of TIREM put forward by Mr. Dawson.

D. The Commission Should Establish Measurement Rules That Take Account of Individual Situations

Finally, with respect to actual measurements, the Commission acknowledges that the current methodology is both prohibitively expensive[21] and insufficiently tailored to individual situations.[22] Indeed, the Commission notes that, "[t]he purpose of the procedure specified in the rules is not to determine the receivability of a signal at a single spot, but to determine, through measurements at a series of grid intersections over a community, the nature of service to the community." [23] In particular:

> [M]any homes do not have antennas 30 feet above the ground, especially if they are one-story homes. The definition of unserved household only describes reception over a conventional outdoor rooftop receiving antenna, so requiring measurements on a 30-foot antenna may not reflect what is "conventional." Requiring the truck's antenna to face the direction of the station's tower ignores the reality that consumers' antennas receive several stations, and many do not rotate to the best position for each station. Finally,

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20 SBCA Comments, Technical Appendix.

21 *See* NPRM at ¶ 39.

22 *Id.* at ¶ 40.

23 *Id.* (footnotes omitted).

> requiring clusters of tests and a 100-foot mobile run ignores the fact that homes are stationary and that reception may vary considerably over a mobile run on a nearby street.[24]

Of course, individual situations are the hallmark of the SHVA's "unserved household" standard. The signal strength that the consumer actually receives at his/her television set, with all the imperfections of his/her conventional equipment, is the relevant criterion for determining whether the consumer should be eligible for distant network service. Under no reasonable reading of the SHVA can an unserved household be robbed of its right to network service because an idealized household in its place might have been able to receive a Grade B signal by use of rotors, actuators, in-line amplifiers, or other exotic accoutrements. To take account of "individual situations," the Commission should eliminate these unrealistic assumptions.

Accordingly, EchoStar believes that the proposal it has already made in its Petition for Declaratory Judgment in federal district court is a reasonable way to take account of actual (as opposed to non-existent ideal) conditions, and respectfully asks the Commission to adopt it.[25] As the NPRM states, that procedure:

> [I]nvolves placement of a conventional outdoor rooftop antenna within three feet of the home and raised to the height of the roof. The antenna is oriented to maximize signal strength for the one local station than the consumer watches most often. A length of standard household cable is attached to the antenna, and a number of splitters are attached to duplicate the number of splitters the consumer uses to service multiple televisions. A signal measurement is then conducted. If the signal strength is not stable, the antenna is relocated and the same procedure utilized until a stable signal strength is achieved. Readings are taken

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[24] *Id.* at ¶ 39 (footnotes omitted).

[25] *EchoStar Communications Corp. v. CBS Broadcasting, Inc.*, Plaintiff's Original Complaint and Request for Declaratory Judgment, Civil Action No. 98-B-2285 (D. Colo., Oct. 19, 1998).

> approximately every thirty seconds for a period of five minutes. If any of the signal strength readings register less than the Grade B signal strength threshold as established by Congress and the FCC, the consumer will be deemed an "unserved household" eligible to receive distant network signals.[26]

As an alternative, the Commission could simply measure the signal strength (in volts terminated in the characteristic impedance of the coaxial or twin-lead transmission line) at the television sets themselves. This by definition takes account of the actual consumer's system as it exists, and thus renders unnecessary any effort to replicate that system.

II. CONCLUSION

For the foregoing reasons, the Commission should redefine "Grade B intensity" for SHVA purposes and develop the TIREM model for predicting it and appropriate rules for measuring it.

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[26] NPRM at ¶ 39 n.76. In the event the Commission adopts the updated Grade B intensity values put forward by Mr. Dawson, which include a 3 dB predictive allowance conservatively based on one splitter per household, a measurement adjustment based on actual number of splitters could be used instead of the 3dB allowance to determine whether the measured household receives a signal of Grade B intensity.

Respectfully submitted,

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