Pantelis Michalopoulos
202.429.6494
pmichalo@steptoe.com

1330 Connecticut Avenue, NW
Washington, DC 20036-1795
Tel 202.429.3000
Fax 202.429.3902
steptoe.com

August 25, 2005

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: **Ex Parte Written Presentation**
In the Matter of Technical Standards for Determining Eligibility for Satellite-Delivered Network Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004 -- ET Docket No. 05-182

Dear Ms. Dortch,

In accordance with Section 1.1206 of the Commission's Rules, 47 C.F.R. § 1.1206, EchoStar Satellite L.L.C. ("EchoStar") hereby submits (a) the results of a survey commissioned by EchoStar regarding the antenna equipment and quality expectations of consumers that rely on over-the-air reception; and (b) a further statement of Hammett & Edison, Inc. ("H&E Further Statement") providing additional signal strength data on time variability and responding to certain arguments raised by broadcasters.

In short, the survey shows that the percentage of consumers with sophisticated rotatable antennas is about 26% in remote areas, and about 20% overall. Moreover, a very large portion of consumers, 43% in remote areas, do not even have an outdoor antenna. Overall, the *majority* of consumers do not have an outdoor antenna of any kind. These realities strongly militate for a change to the Commission's signal strength testing procedures. The current procedure effectively assumes that that consumer is equipped with an outdoor antenna that can be rotated. Under the current rules, the test antenna must be mounted outdoors and oriented in the direction of greatest signal strength for the local network station in question. Similarly, the Individual Location Longley-Rice ("ILLR") model assumes that consumers have an antenna with a directional gain pattern oriented in the direction of the

transmitter. Therefore, in developing measurement rules and recommending to Congress use of a predictive model, the Commission should *not* assume that the typical consumer has an outdoor antenna, much less that he or she has a rotatable antenna. Such assumptions would be the opposite of the reality on the ground. In addition to the options suggested in EchoStar's comments for reflecting these realities, EchoStar is hereby submitting an alternative field testing procedure for the Commission's consideration. Under this alternative, the tester measures the signal strength of each local network station at each of a number of antenna orientations. These orientations are determined by rotating the test antenna to the direction of maximum signal strength for *every* network station in the market (including the station being measured). The tester then simply calculates the median of the resulting measurements (as is done already for each of the five so-called "cluster measurement" points).

The survey also shows that the majority of consumers expect DTV reception to be more reliable than analog reception. These heightened expectations mean that the Commission should consider revising upward the threshold DTV strength standard which decides whether a household is served in the first place.

Finally, the broadcasters ask that the Commission should discount the importance of inadequate signal strength during the day on the ground that signals are typically stronger during the primetime hours. That request reflects a rather cavalier disregard for localism -- in particular, for the ability of consumers to receive local programming often broadcast prior to primetime. In any event, however, the claim of a typical differential between day and night relies on an erroneous and highly selective reading of an FCC study. For VHF broadcasts, for example, the study cited by the broadcasters found the differential on which they rely to be "negligible."

I. SURVEY

For the purposes of this proceeding, EchoStar commissioned The Survey Center of Maspee, Massachusetts, to conduct a consumer telephone survey. The survey's objective was to determine what kind of over-the-air antennas consumers employ and to ascertain consumer expectations concerning the quality of DTV reception. During the period June 20 to July 5, 2005, the Survey Center asked a set of questions to randomly selected persons residing in four categories of areas, as classified by Nielsen Media Research ("Nielsen") based on population density.[1] To ensure adequate statistical

[1] Nielsen classifies counties into four groups -- "A," "B," "C," and "D" -- based on Census household counts and metropolitan proximity. "A" counties are highly urbanized areas and belong to the 21 largest Metropolitan Statistical Areas. These counties combined contain 40% of U.S. households. "B" counties are non-A counties that have more than 85,000 households. When combined, "B" counties contain 30% of U.S. households. "C" counties are non-A and non-B counties that have more than 20,000 households or are in Consolidated Metropolitan Statistical Areas or Metropolitan Statistical Areas with more than 20,000 households. The combined "C" counties contain 15% of U.S. households. "D" counties comprise all other counties and are considered very rural. 15% of U.S. households are in "D" counties. *See* http://www.nielsenmedia.com/glossary (last visited Aug. 5, 2005).

significance, the Survey Center continued to survey respondents until it had responses from 225 people in each of the four classes of county indicating that they watched television programming on a television in their home that relies exclusively on an antenna for reception. The survey questions and results are tabulated in Exhibit 1.

The results of the survey are that most consumers who rely on over-the-air reception have indoor antennas, and only a small minority of consumers have sophisticated "rotatable" outdoor antennas. This is the case even in rural "C" and "D" counties, where consumers would be expected to have comparatively more sophisticated television reception equipment. Only about 26% of the consumers who rely on over-the-air reception had outdoor rotatable antennas, while 43% had indoor antennas on or near their televisions. For all respondents that relied on over-the-air reception (from "A" through "D" counties), the percentages of households with outdoor rotatable antennas were even lower at about 20%, and conversely the percentages of households with indoor antennas was even higher at 51%.[2] In such circumstances, it would be unwise to assume that consumers have outdoor antennas that can be oriented in the direction of maximum signal strength either for purposes of measuring or predicting signal strength.[3]

These survey results show that retention of the current digital signal strength testing procedures and ILLR model, with their unrealistic assumptions about consumer antenna types, placement and pointing, will inevitably lead to many inaccurate determinations as to when a consumer can actually receive a good quality DTV picture over-the-air. This problem is made worse by the survey's results showing consumers' heightened expectations regarding DTV reception. More than half (57%) of all survey respondents who rely on over-the-air reception said that they expected the reliability of their local broadcaster's over-the-air digital signal to be much better or somewhat better than the reliability of the station's analog signal.[4] A similar percentage responded that the availability of digital satellite or cable service raised their expectations about the quality and reliability of television reception.

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[2] The results are even more stark if the survey results for respondents from each class of county are weighted by each class's share of U.S. households (40% for "A" counties, 30% for "B" counties, and 15% each for "C" and "D" counties). The resulting nationwide percentages are as follows: 18% of households that rely on over-the-air reception have outdoor rotatable antennas, and 54% have indoor antennas.

[3] *See* 47 C.F.R. § 78.686(d)(2)(iv); Federal Communications Commission, OET Bulletin No. 72, *The ILLR Computer Program*, at 3 (July 2, 2002) ("OET Bulletin No. 72"), *referring to* OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* (Feb. 6, 2004) ("OET Bulletin No. 69").

[4] If the survey results for respondents from each class of county are weighted by their share of U.S. households (40% for "A" counties, 30% for "B" counties, and 15% each for "C" and "D" counties), the resulting nationwide percentage of households that have higher DTV reception expectations is 56%.

Therefore, the Commission should discard the unrealistic assumptions in its testing methodology and predictive model to avoid defeating the DTV reception expectations of a majority of U.S. households.

Accordingly, the Commission should revise its testing procedures and predictive model to make them more realistic. EchoStar has already put forward several changes in its comments that would greatly improve the accuracy of the signal strength testing procedures and predictive model.[5] EchoStar is hereby submitting an additional alternative that could accomplish that result for field strength testing. Under the current rules, the tester would take the median of five cluster measurements with the antenna pointing in the direction of greatest signal strength for the local network station in question.[6] EchoStar's proposed alternative is for the tester to repeat the cluster measurements for a particular signal with the antenna oriented in several different positions. Each position is determined by orienting the antenna so as to receive a maximum strength signal from each of the local network stations (including the station to be measured). The tester then derives the median of these measurements. This method would take into account antenna mis-orientation in light of the fact that most consumers do not have rotatable antennas.. As H&E describes the method:[7]

> While the optimal orientation cannot be known *a priori* for a particular location, a more reasonable way to account for antenna mis-orientation would be as follows, when several stations are being measured to determine DTV field strength.
>
> 1. Orient the measurement antenna in the direction which maximizes the value of field strength for the first station to be measured, and record the field strength for that station, as described in Section 73.686(d)(2)(iv).
>
> 2. While maintaining this antenna orientation, record the field strength for the other stations to be measured.
>
> 3. Repeat steps 1 and 2 in turn for each of the other stations to be measured.
>
> This procedure is compatible with the present rule, which specifies a cluster measurement of five points in the area of the subscriber's antenna. When measuring four network stations, for instance, the above procedure will result in 20 measurements for each station: one for each antenna orientation at each of the five cluster measurement points.

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[5] *See* Comments of EchoStar Satellite L.L.C., *filed in* ET Docket No. 05-182 (filed June 17, 2005); Reply Comments of EchoStar Satellite L.L.C., *filed in* ET Docket No. 05-182 (filed July 5, 2005).

[6] *See* 47 C.F.R. § 73.686(d)(1)(ii).

[7] *See* H&E Further Statement at 5.

From those data, one can calculate the median of the 20 measurements in units of dBu, and use that as the measurement result.

II. H&E FURTHER STATEMENT

The H&E Further Statement (attached as Exhibit 2) addresses two issues raised in the reply comments of certain broadcaster interests related to time variability of signal strength.

First of all, a number of broadcast parties criticized EchoStar for not submitting all of the signal strength data that had been collected to support H&E's report on the issue of time variability.[8] The H&E Further Statement addresses this by providing the remainder of the signal strength data collected in support of H&E's June 17 statement.[9] The Further Statement also describes the method used to collect the signal strength data and some of H&E's most striking findings.[10] These additional data fully support the need to adjust both the testing procedures and any DTV predictive model to address variability in digital signal strength over time. With respect to the testing procedures, the proper adjustment is to conduct cluster measurements to determine the median signal strength value and then apply a correction factor to achieve 90% time reliability. With respect to the ILLR model, the time variability factor inherent in the predictive model is 50%.[11] Accordingly, the DTV signal strength standards in 47 C.F.R. § 73.622(e)(1) need to be adjusted, as H&E suggests, to provide for 99% time reliability as a matter of prudence until there is greater experience with consumer reception of DTV signals, and certainly to no less than the 90% reliability assumed in the DTV planning factors. Indeed, the Commission found it necessary to make a similar adjustment in the analog context when it established the Grade B contour.[12] The DTV signal strength standards, however, did not incorporate a

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[8] *See* Reply Comments of the ABC, CBS, and NBC Television Affiliate Associations at 7, *filed in* ET Docket No. 05-182 (filed July 5, 2005); Reply Engineering Statement of Meintel, Sprignoli & Wallace Concerning Measurement and Prediction of Digital Television Reception at ¶ 21, *filed in* ET Docket No. 05-182 (filed July 5, 2005) ("MSW Reply Statement").

[9] *See* H&E Further Statement at 1-3, figs. 1 and 2.

[10] *Id*. at 1-2.

[11] OET Bulletin No. 72, at 3.

[12] *See* OET Bulletin No. 72, at 3 (2002) (using 50% time variability in the ILLR on the basis that the Grade B field strength "already includes an allowance for long term (daily and seasonal) time fading"); *In the Matter of Technical Standards for Determining Eligibility For Satellite-Delivered Network Signals Pursuant To the Satellite Home Viewer Improvement Act*, FCC 00-90, Report, 15 FCC Rcd 24321, at ¶ 6 n.20 (2000) ("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 41 dB/ [mu] v/m is needed for an acceptable picture. In order for this signal strength to be available 90% of the time, the

(Continued…)

correction for time variability, as is evident in the procedure prescribed in 47 C.F.R. § 73.625(b) for deriving the F(50,90) DTV field strength contour using the F(50,50) and F(50, 10) charts.[13] The Commission should do no less in the DTV context than it has done in the analog context to ensure adequate signal strength reliability over time.

The engineering consultants engaged by the National Association of Broadcasters ("NAB") challenge EchoStar's proposed method of correcting for time variability by claiming that it is improper to assume that signal strength measured during the day represents the median over time.[14] The NAB's consultants rely on FCC Report No. R-6602 for the proposition that "field strength measurements, which are taken during the daytime, will typically be lower than at night (*e.g.*, "primetime") when the majority of television viewing occurs. . . . Thus, signal strength measurements during the daytime are likely to be below the median over time."[15] By asking the Commission to discount the importance of inadequate signal strength during the day on the ground that signals are typically stronger during the primetime evening hours, the broadcasters are showing a cavalier disregard for localism -- in particular, for the ability of consumers to receive the local programming often broadcast prior to primetime. In any event, as the H&E Further Statement shows, the claim of a typical differential between day and night relies on an erroneous and highly selective reading of a FCC report cited by the broadcasters. First, NAB's consultants fail to mention that the same report found that "the differential between the day and night field strengths was negligible in the VHF bands . . . ."[16] Moreover, reliance on the report as support for diurnal variation in UHF signal strength is fundamentally flawed because the report was in support of an "area-method propagation" model that has since been superseded by point-to-point propagation models such as the ILLR. In fact, H&E's analysis of field

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median or F(50,50) field strength is set at 47 dB/ [mu] v/m, which includes the addition of a time variability planning factor of 6 dB.").

[13] *See also* OET Bulletin No. 69, at 2 (2005) ("For digital television stations, service is evaluated inside contours determined by DTV planning factors in combination with field strength curves derived for 50% of locations and 90% of the time from curves which are also found in Section 73.699 of FCC rules. The family of FCC propagation curves for predicting field strength at 50% of locations 90% of the time is found by the formula F(50, 90) = F(50, 50) - [F(50, 10) - F(50, 50)]. That is, the F(50, 90) value is lower than F(50, 50) by the same amount that F(50, 10) exceeds F(50, 50).").

[14] MSW Reply Statement at ¶ 23.

[15] *Id*.

[16] Jack Damelin et al., *Development of VHF and UHF Propagation Curves for TV and FM Broadcasting*, FCC Report No. R-6602, at 6 (1974).

measurements it collected over a two-week period shows that the typical variation over a 24-hour period is less than ±1 dB and, more importantly, was not systematic as between day and night.[17]

III. CONCLUSION

Both the survey results and the H&E Further Statement underscore the need to change the Commission's signal strength testing standards and procedure, and the existing ILLR predictive model, to determine more accurately when a consumer can actually receive a good quality DTV picture over-the-air. In particular, the Commission should revise its signal strength testing standards and procedures (and any DTV predictive model) by discarding the unrealistic assumptions inherent in them regarding consumer antennas and antenna placement. Moreover, it should correct for time variability in signal strength over time to ensure consumers can receive a reliable DTV signal. The Commission risks defeating the heightened expectations of consumers if it were to fail to take these matters into account.

If you have any questions regarding this matter, please do not hesitate to contact the undersigned.

Respectfully submitted,

/s/

Pantelis Michalopoulos
Counsel for EchoStar Satellite L.L.C.

cc:

David Sturdivant, Office of Engineering & Technology

[17] H&E Further Statement at 4.

EchoStar Satellite L.L.C.
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EXHIBIT 1

Table 1-1

1. Do you have a television or televisions in you home?

	Overall
Yes	4,726 98%
No	75 2%
Totals	4,801

Table 2 –1

2. Do you watch TV programming on a television in your home that relies exclusively on an antenna for reception? **This could be your main TV or a second or third TV on which you don't have cable or satellite.**

Base: Those who have a television or televisions in their homes.

	Overall
Yes	900 19%
No	3,826 81%
Totals	4,726

Table 3-1

3. Is the antenna for this television mounted on the roof or attic of your home or apartment, or is it on or near the television itself

Base: Those who watch TV programming on a television in their homes that relies exclusively on an antenna for reception.

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
On roof or in attic	439 49%	104 46%	79 35%	112 50%	144 64%
On or near TV	461 51%	121 54%	146 65%	113 50%	81 36%
Totals	900	225	225	225	225

Table 4-1

4. Can you rotate this antenna remotely? *(If they say they have a rotor on their antenna = Yes*)

Base: Those whose antenna is mounted on the roof or attic of their home or apartment.

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Yes	181 41%	34 33%	31 39%	56 50%	60 42%
No	258 59%	70 67%	48 61%	56 50%	84 58%
Totals	439	104	79	112	144

Table 5-1

5. On which story of your residence is this television located?

Base: Those whose antenna is on or near the television itself.

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
First	328 71%	75 62%	105 72%	83 73%	65 80%
Second	115 25%	42 35%	35 24%	24 21%	14 17%
Third or higher	18 4%	4 3%	6 4%	6 5%	2 2%
Totals	461	121	146	113	81

Table 6-1

6. Do you also subscribe to a pay television provider such as cable or satellite?

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Yes	431 48%	109 48%	94 42%	114 51%	114 51%
No	469 52%	116 52%	131 58%	111 49%	111 49%
Totals	900	225	225	225	225

Table 7-1

7. How would you expect the reliability of receiving your local broadcaster's *digital* signal over the air to compare with the reliability of receiving its *analog* signal today?

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Much better (5)	200 22%	46 20%	50 22%	52 23%	52 23%
Somewhat better (4)	319 35%	72 32%	82 36%	84 37%	81 36%
The same (3)	333 37%	97 43%	79 35%	82 36%	75 33%
Somewhat worse (2)	36 4%	8 4%	11 5%	5 2%	12 5%
Much worse (1)	12 1%	2 1%	3 1%	2 1%	5 2%
Totals	900	225	225	225	225
Mean	3.73	3.68	3.73	3.80	3.72

Table 8-1

8. Has the availability of digital satellite TV service, such as DirecTV and DISH Network and digital cable service raised your expectations about the quality and reliability of television reception?

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Yes	510 57%	116 52%	128 57%	136 60%	130 58%
No	390 43%	109 48%	97 43%	89 40%	95 42%
Totals	900	225	225	225	225

Table 9-1

9. Which of the following statements best describes your current residence?

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Own or rent single unit	769 85%	167 74%	195 87%	193 86%	214 95%
Own or rent in multiple dwelling unit	131 15%	58 26%	30 13%	32 14%	11 5%
Totals	900	225	225	225	225

Table 10-1

10. Are there any outdoor areas of your current residence that only you and the persons you permit may use? These "exclusive outdoor areas" may include a balcony, terrace, deck or patio that others in your building may not use without your permission. These areas would *not* include any *common* areas which are shared with others or accessible without your permission.

Base: Those who rent a single dwelling unit or own or rent a unit in a multiple dwelling building.

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
Yes	90 69%	40 69%	22 73%	25 78%	3 27%
No	41 31%	18 31%	8 27%	7 22%	8 73%
Totals	131	58	30	32	11

Table 11-1

11. How many total stories are there at your residence?

	Overall	Population density area A	Population density area B	Population density area C	Population density area D
One	439 49%	93 41%	113 50%	104 46%	129 57%
Two	312 35%	83 37%	77 34%	80 36%	72 32%
Three or more	149 17%	49 22%	35 16%	41 18%	24 11%
Totals	900	225	225	225	225

CERTIFICATION OF JAY AMBROSE

I, Jay Ambrose, certify under penalty of perjury that the foregoing discussion of the survey methodology and results is true and correct.

Executed on: August 25, 2005

Jay Ambrose, President
The Survey Center
800 Falmouth Road, Unit 304C
P. O. Box 1168
Mashpee, MA 02649

EchoStar Satellite L.L.C.
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EXHIBIT 2