

reclassified into three separate, but ultimately interrelated, concerns: (1) the appropriateness of the DTV planning factors which resulted in the digital signal intensity standards set forth in Section 73.622(e)(1); (2) the appropriateness of the objective analog signal site test methodology in Section 73.686(d) in the digital signal context; and (3) the advisability of developing a predictive model for future use.

Fundamental to digital television is the Commission's decision to predicate the coverage area of the new DTV service upon each station's existing NTSC Grade B service area. The Commission carefully crafted its approach to "foster the transition to DTV, while simultaneously preserving viewers' access to off-the-air TV service and the ability of stations to reach the audiences they now serve." Maintaining viewer "access to the stations that they can now receive over-the-air" was a critical component of the DTV replication scheme. Thus, the value of over-the-air service to both viewers and broadcasters was fundamental to the Commission's actions. Obviously, the Commission would not have predicated DTV—for which broadcasters have invested many millions of dollars—on planning factors intended to replicate existing television service if those factors were not, in fact, adequate or up to the task.

As the *Notice* correctly states—and critical to the Commission's entire DTV plan to replicate NTSC Grade B service areas—"*[t]hese criteria presume that households will exert similar efforts to receive DTV broadcast stations as they have always been expected to exert to receive NTSC analog TV signals.*" As the extensive discussion herein of each of these planning factors demonstrates, the Commission's existing noise-limited field strength thresholds for DTV service are more than adequate for real-world reception of local digital broadcast signals.

In fact, the discussion of the adequacy of the DTV planning factors, the specifications and characteristics of currently available consumer equipment, and the Commission's intentions and

expectations in promulgating the DTV planning factors all point ineluctably to the following answers

to queries raised in the *Notice*:

- The receiving antenna must be mounted outside on the roof or adjacent to the house. Moreover, the antenna must be oriented to the desired signal, and if the desired stations are not located in the same direction, then the antenna must be orientable in the direction of the desired signal(s). An excellent outdoor antenna receiving system can be installed for approximately \$100, including an eight-way bowtie-with-screen antenna and a rotor with remote control.
- ▶ The Commission should continue to recommend that the current signal strength thresholds for noise-limited digital service should be used to define the availability of a DTV signal for determining whether a household is eligible to receive distant digital signals from satellite services. Real-world equipment, including fifth generation receivers, demonstrates that the Commission's current signal strength thresholds are more than adequate to receive a high-quality digital picture.
- ▶ Variation in DTV set prices should play no role in determining whether a household is unserved by an adequate DTV network signal. The evidence shows that there is very little penetration (no more than 1%) of early generation DTV receivers in television households. Most households have or will acquire DTV sets with integrated tuners incorporating the latest generational chip design (fifth generation or later), including equalizers demonstrating superior multipath handling performance capabilities.
- ▶ Multipath should not be taken into account in determining whether a household is served by an adequate digital signal. Fifth generation receivers incorporate equalizers that are remarkably good at handling very early pre-ghosts and very late post-ghosts (on the order of 50 microseconds each). But, more fundamentally, multipath is not a matter of signal strength, which is the objective means by which a digital "unserved household" should be determined. The effects of multipath, however, can be greatly, if not wholly, mitigated by the use of the latest generation receiver; by the use of an outdoor antenna raised to 30 feet which will place the antenna above many of the principal multipath reflectors; and by the use of highly directional antennas with high front-to-back ratios, properly oriented to the strongest desired signal.

Although the Commission's testing procedure for cluster measurements of signal strength at household locations in Section 73.686(d) was developed specifically for analog signals, it is

generally workable for digital signals once several slight modifications are made to measure the signal strength of digital signals: *First*, a directional gain antenna should be utilized instead of a half-wave dipole. *Second*, the field strength of a digital signal should be determined by measuring the integrated average power over the 6 MHz bandwidth. *Third*, the tester should use a spectrum analyzer tuned to the center of the channel, sweep across a variety of small intermediate frequency bandwidths, and integrate the total power across the 6 MHz bandwidth.

With these slight modifications, the testing methodology in Section 73.686(d) will permit the objective testing of the signal strength of digital signals. But this is true only if the remaining elements of the testing methodology are not altered. Most notably, the site test must measure signal strength *outdoors*, at the specified rooftop heights (20 feet for one-story residences, 30 feet for all others), and with the testing antenna properly oriented. Finally, the test methodology must remain objective. There is neither any basis nor any warrant for the Commission to consider altering any aspect of the test methodology that would add any element of subjectivity to the test.

Network Affiliates believe that the Commission should develop and recommend a predictive model for digital signals, but only for future, and not immediate, use. By “future use,” Network Affiliates mean *after* the digital transition is *complete*. Before the end of the transition, too much is unknown, the process would be too complicated, and the resulting viewer confusion could be rampant. For example, not all stations have made elections for their final digital channel, and the spectrum repacking process is far from complete. Importantly, digital service for low power stations and translators has not yet been authorized. Because a household is considered “served” if it receives a signal from any station, be it full power, satellite, or translator, affiliated with the network in issue, it is not possible to predict whether a household can receive a digital signal if the station that could be delivering the signal has not yet been authorized to broadcast in digital or the station has not yet

had a reasonable opportunity to construct digital facilities. Waiting for the completion of the digital transition will not materially prejudice the distant signal license, especially when weighed against the countervailing harms to local affiliates if a predictive model is implemented prematurely.

It would be appropriate for the Commission to recommend the ILLR model for digital signal prediction purposes at the end of the DTV transition—with one exception. The ILLR model as currently structured in OET 72 *over-provides* for clutter at UHF frequencies, and, in the digital context, these UHF clutter loss values make the model less accurate, rather than more accurate. In the case of digital signal predictions, the clutter considerations already inherent in the basic, semi-empirical Longley-Rice model provide a more accurate predictive model than the additional UHF clutter loss values added into the ILLR model in OET 72. The National Association of Broadcasters (“NAB”) is providing extensive data (more than 2000 individual site predictions with associated measured field strengths) in its comments in this proceeding providing empirical support for this slight modification to the ILLR model.

For the reasons contained herein, Network Affiliates respectfully request that the Commission recommend to Congress (1) that the digital signal strength thresholds set forth in Section 73.622(e)(1) remain the same for purposes of determining whether a household is “unserved” by a digital signal pursuant to 17 U.S.C. § 119(d)(10); (2) that the testing methodology set forth in Section 73.686(d) be modified slightly so that the procedure may be correctly used for digital signal site tests; and (3) that Congress prescribe a slightly modified ILLR model (without UHF clutter loss values) to be used after the digital television transition is complete to presumptively determine the eligibility of a household to receive a duplicating distant digital network signal.

* * *

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Technical Standards for Determining) ET Docket No. 05-182
Eligibility for Satellite-Delivered Network Signals)
Pursuant to the Satellite Home Viewer)
Extension and Reauthorization Act of 2004)

**COMMENTS OF THE
ABC, CBS, AND NBC
TELEVISION AFFILIATE ASSOCIATIONS**

The ABC Television Affiliates Association, the CBS Television Network Affiliates Association, and the NBC Television Affiliates Association (collectively, the “Network Affiliates”), by their attorneys, hereby comment upon the *Notice of Inquiry* (“*Notice*”), FCC 05-94, released on May 3, 2005, in the above-referenced proceeding.¹

I. In Addressing SHVERA’s Statutory Study Considerations, the Commission Should Be Guided by the Fundamental Nature of the Section 119 Compulsory License

The Satellite Home Viewer Extension and Reauthorization Act of 2004 (“SHVERA”)² requires the Commission to report to Congress on a variety of factors that may ultimately affect whether a household is deemed to be “unserved” by a digital television signal as that term is defined in the Copyright Act pursuant to 17 U.S.C. § 119(d)(10). While SHVERA specifies certain particular considerations the Commission is to study, as the *Notice* recognizes, the Commission’s

¹ The Network Affiliates collectively represent approximately 600 local television stations affiliated with the ABC, CBS, and NBC Television Networks.

² Pub. L. No. 108-447, Div. J, Tit. IX (2004), at § 204(b) (codified at 47 U.S.C. § 339(c)(1)).

inquiry must be predicated upon the fundamental nature of the “unserved household” limitation set forth in the Copyright Act. That fundamental nature is a compulsory license operating in derogation of the property rights of copyright holders which should, accordingly, always be conservatively construed in favor of the local broadcast station.

The Section 119 “unserved household” provision permitting the limited importation of a distant duplicating network signal in a narrow set of circumstances has been an element of copyright law since the original Satellite Home Viewer Act (“SHVA”) in 1988. In the Copyright Act, Congress, pursuant to its constitutional authority in the Copyright Clause, Art. I, § 8, cl. 8, has granted an exclusive, albeit time-limited, right in original works of authorship fixed in a tangible medium of expression.³ A copyright, therefore, is a constitutionally- and congressionally-sanctioned property right. One of the principal exclusive rights subsisting in copyright is the right to choose whether and how one’s copyrighted works can be distributed to others.⁴

SHVA (as did the Satellite Home Viewer Improvement Act of 1999 (“SHVIA”) and now SHVERA) granted a limited and conditional compulsory copyright license to satellite carriers to enable them to distribute distant network signals to a narrow class of viewers—a class of viewers that has shrunk even further under SHVERA, as explained below. This compulsory license is an express limitation on the distribution rights of creators of original works of expression, and, thus, is in derogation of the normally broad power to exercise control over one’s copyrighted works.⁵ The

³ See 17 U.S.C. § 102(a).

⁴ See 17 U.S.C. § 106(3).

⁵ See U.S. Copyright Office, *A Review of the Copyright Licensing Regimes Covering Retransmissions of Broadcast Signals* (Aug. 1, 1997) (“*Copyright Office Report*”), at 13 (“A compulsory license mechanism is in derogation of the rights of authors and copyright owners.”)

(continued...)

compulsory license permits satellite carriers to retransmit copyrighted material without having to obtain the express permission of the owner. Compulsory licenses are not favored in the law and, therefore, are narrowly construed. As stated by the Fifth Circuit, because a “compulsory license provision is a limited exception to the copyright holder’s exclusive right to decide who shall make use of his [copyrighted work] . . . it must be construed narrowly, lest the exception destroy, rather than prove, the rule.”⁶

Each of the satellite laws has had a dual purpose: (1) to enable households located beyond the reach of a local affiliate, primarily in rural areas,⁷ to obtain access to broadcast network

(...continued)
(internal quotation marks and citation omitted).

⁶ *Fame Publ’g Co. v. Alabama Custom Tape, Inc.*, 507 F.2d 667, 670 (5th Cir.), *cert. denied*, 423 U.S. 841 (1975).

⁷ Reviewing the legislative history of the original SHVA and its 1994 renewal demonstrates that the original intent of Section 119 was to enable satellite carriers, through a compulsory license mechanism, to provide broadcast network service to *rural* areas:

[The bill] will benefit *rural America*, where significant numbers of farm families are inadequately served by broadcast stations licensed by the Federal Communications Commission.

H.R. REP. NO. 100-887, pt. 1, at 15 (1988) (emphasis added).

The extension of the SHVA “ensure[s] that *rural home satellite dish consumers* will be able to continue to receive retransmitted broadcast programming. This is essential because in many rural areas satellite technologies represent the only way that *rural families* can receive the kind of information and entertainment programming that many urban Americans take for granted.”

140 CONG. REC. E1770 (daily ed. Aug. 19, 1994) (statement of Rep. Long) (emphases added).

The extension of the SHVA is needed “to ensure that *rural consumers* will continue to receive television programming.”

(continued...)

programming by satellite and (2) to protect the integrity of the copyrights that make possible the existing free, over-the-air national network/local affiliate broadcast distribution system.⁸

Section 119, therefore, has always represented a careful balance between the public interest, on the one hand, in allowing households located beyond the reach of a local network station to secure access to broadcast network programming and, on the other hand, in preserving “localism” by protecting the copyrights each local network station has for the broadcast of its network programming in its local market. Each of these laws was designed to protect the exclusivity of the copyright held by each affiliate for exhibition in its market of its network programming.⁹ At the heart of these laws is an acknowledgment by Congress of the national interest in preserving “local” broadcast service by protecting the longstanding, free, universally-available, over-the-air national network/local affiliate television distribution system—a system Congress acknowledged “has served the country well.”¹⁰

⁷(...continued)

140 CONG. REC. H9268, H9270 (daily ed. Sept. 20, 1994) (statement of Rep. Hughes) (emphasis added).

This same basis has been expressed in the legislative history of SHVERA:

Its [the Section 119 license] primary purpose is to ensure that those residing in *rural* areas or in areas where terrain makes it impossible to receive an acceptable over-the-air signal from their television stations can receive a “*life-line*” network television service from a satellite provider.

H.R. REP. NO. 108-660, at 10 (2004) (emphases added).

⁸ See H.R. REP. NO. 100-887, pt. 1, at 8 (1988); H.R. REP. NO. 108-660, at 11 (2004).

⁹ See H.R. REP. NO. 100-887, pt. 2, at 19-20 (1988); H.R. REP. NO. 100-887, pt. 1, at 14 (1988).

¹⁰ H.R. REP. NO. 100-887, pt. 2, at 20 (1988); H.R. REP. NO. 108-660, at 11 (2004).

Localism is a bedrock principle of the nation's broadcast television system. "[T]he Commission historically has followed a policy of 'localism' as a sound means of promoting the statutory goal of efficient public service."¹¹ Indeed, the Commission has acknowledged that "our commercial television system is based upon the distribution of programs to the public through a multiplicity of local station outlets. [W]e have not turned to an alternative system of signal and program distribution, based upon a handful of 'super stations.'"¹²

In initiating its first SHVA proceeding, in CS Docket No. 98-201, the Commission recognized the central role that the core policy of localism plays in the Section 119 regime:

The network station compulsory licenses created by the Satellite Home Viewer Act are limited because Congress recognized the importance that the network-affiliate relationship plays in delivering free, over-the-air broadcasts to American families, and because of the value of localism in broadcasting. Localism, a principle underlying the broadcast service since the Radio Act of 1927, serves the public interest by making available to local citizens information of interest to the local community (e.g., local news, information on local weather, and information on community events). Congress was concerned that without copyright protection, the economic viability of local stations, specifically those affiliated with national broadcast networks, might be jeopardized, thus undermining one important source of local information.¹³

In the resulting *SHVA Order*, the Commission allowed the principle of localism and several important corollaries to guide its decision to recommend to Congress the Individual Location

¹¹ *National Ass'n of Broadcasters v. FCC*, 740 F. 2d 1190, 1198 (D.C. Cir. 1984).

¹² *Restrictions on Use of Microwave Relay Facilities to Carry Television Signals to Community Antenna Television Systems*, First Report and Order, FCC 65-335, 4 Rad. Reg. 2d (P & F) 1725 (1965), ¶ 47.

¹³ *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act*, Notice of Proposed Rule Making, FCC 98-302, 14 Comm. Reg. (P & F) 2163 (1998).

Longley-Rice (“ILLR”) predictive model in the form that it did. *First*, the Commission respected the fact that the “Satellite Home Viewer Act limits the compulsory copyright license to ‘unserved’ households, reflecting Congress’ intent to protect the role of local broadcasters in providing free, over-the-air television to American families.”¹⁴ *Second*, the Commission sought to formulate an approach throughout the *SHVA Order* whose effect would neither “increase the number of unserved households that already exist, nor . . . reduce the size of local stations’ markets by subtracting viewers who are able to receive their signal.”¹⁵ *Third*, the Commission properly observed that “when served households are deemed eligible for satellite-delivered broadcast network service, network affiliates are harmed and the SHVA’s intent is also thwarted.”¹⁶ *Fourth*, and finally, the Commission recognized that a “predictive model that includes truly served households in an unserved category, even temporarily, creates . . . undesired effects.”¹⁷ These principles must continue to guide the Commission in the instant proceeding.

While SHVIA in 1999 added new sections to the existing SHVA, most notably the Section 122 local-into-local compulsory license for satellite carriers,¹⁸ the Section 119 distant compulsory license provision was reenacted basically unchanged. The Conference Report accompanying passage of SHVIA noted that “the Section 119 regime is largely being extended in

¹⁴ *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act*, Report and Order, 14 FCC Rcd 2654 (1999) (“*SHVA Order*”), at ¶ 11.

¹⁵ *SHVA Order* at ¶ 8.

¹⁶ *SHVA Order* at ¶ 65.

¹⁷ *SHVA Order* at ¶ 77.

¹⁸ See 17 U.S.C. § 122.

its current form.”¹⁹

As the SHVIA Conference Report states:

[T]he specific goal of the Section 119 license is to allow for a *life-line network television service* to those homes which cannot receive the local network television stations. Hence, the unserved household limitation that has been in the license since its inception.²⁰

When Congress passed SHVIA, it specifically reiterated its intention to promote the concept of localism. As the Conference Report accompanying SHVIA further states:

[T]he Conference Committee reasserts the importance of protecting and fostering the system of television networks as they relate to the concept of localism. It is well recognized that television broadcast stations provide valuable programming tailored to local needs, such as news, weather, special announcements and information related to local activities. *To that end the Committee has structured the copyright licensing regime for satellite to encourage and promote retransmissions by satellite of local television broadcast stations to subscribers who reside in local markets of those stations.*²¹

Congress continued to recognize that allowing satellite carriers to retransmit distant network programming into a local affiliate’s market is a violation of a local station’s exclusive copyright privileges. The SHVIA Conference Report observes that “allowing the importation of distant or out-of-market network stations in derogation of the local station’s exclusive right—bought and paid for in market negotiated arrangements—to show the works in question, undermines those arrangements.”²² Congress, therefore, intended that the scope of this extraordinary privilege continue

¹⁹ Conference Report on H.R. 1554, Intellectual Property and Communications Omnibus Reform Act of 1999, 145 CONG. REC. H11793 (daily ed. Nov. 9, 1999) (hereinafter “SHVIA Conference Report”).

²⁰ SHVIA Conference Report, 145 CONG. REC. H11792-H11793 (emphasis added).

²¹ SHVIA Conference Report, 145 CONG. REC. H11792 (emphasis added).

²² SHVIA Conference Report, 145 CONG. REC. H11792.

to be extremely narrow. As the SHVIA Conference Report further recognized:

[P]erhaps most importantly, the Conference Committee is aware that in creating compulsory licenses, it is acting in derogation of the exclusive property rights granted by the Copyright Act to copyright holders, and that it therefore *needs to act as narrowly as possible* to minimize the effects of the government's intrusion on the broader market in which the affected property rights and industries operate.²³

Against this consistent historical backdrop, Congress in SHVERA, in another full explication of these same underlying principles, continued to express its recognition of the need to minimize the abrogation of the rights of local broadcast stations:

The abrogation of copyright owners' exclusive rights and the elimination of transaction costs for satellite carriers are valuable accommodations that benefit the DBS industry. The terms and conditions of § 119, therefore, are crafted to represent a careful balance between the interests of satellite carriers who seek to deliver distant broadcast programming to subscribers in a manner that is similar to that offered by cable operators, and the need to provide copyright owners of the retransmitted broadcast programming fair compensation for the use of their works.

[. . .]

An element of the § 119 license since inception, the unserved household limitation has been a central tenet of congressional policy on distant signal carriage. Its primary purpose is to ensure that those residing in rural areas or in areas where terrain makes it impossible to receive an acceptable over-the-air signal from their television stations can receive a "life-line" network television service from a satellite provider.

Where a satellite provider can retransmit a local station's exclusive network programming but chooses to substitute identical programming from a distant network affiliate of the same network instead, the satellite carrier undermines the value of the license negotiated by the local broadcast station as well as the continued viability of the network-local affiliate relationship. . . .

The Committee has consistently considered market-negotiated exclusive arrangements that govern the public performance of broadcast programming in a given geographic area to be preferable to statutory mandates. Accordingly, a second purpose of the unserved

²³ SHVIA Conference Report, 145 CONG. REC. H11792 (emphasis added).

household limitation is to confine the abrogation of interests borne by copyright holders and local network broadcasters to only those circumstances that are absolutely necessary to provide the “life-line” service.²⁴

But SHVERA is not merely a continuation of the Section 119 *status quo ante*. Rather, SHVERA, building upon the local-into-local Section 122 compulsory license enacted in SHVIA, begins to *phase out* the Section 119 distant compulsory license. Although the definition of “unserved household” has not been substantively changed, the class of viewers to whom satellite carriers may retransmit distant duplicating network signals has been considerably narrowed through the principle of “if local, no distant.” Thus, Section 103 of SHVERA, codified in 17 U.S.C. § 119(a)(4), creates a new limitation on the applicability of the distant signal license, greatly restricting its applicability where local-into-local retransmissions are available. Section 204 of SHVERA, codified in 47 U.S.C. § 339(a)(2), creates a Communications Act analogue to the Copyright Act amendment. The new, fundamental limitation imposed by SHVERA is the *ineligibility* for distant network signals of satellite subscribers who are able to obtain access to the local network signals of local broadcast stations via local-into-local service offered pursuant to the Section 122 license. This principle applies as fully to digital signals as it does to analog signals.²⁵ The relationship between localism and the congressional policy preference for local-into-local service was expressed by Congressman Buyer as follows:

The act imposes a variety of limits designed to protect free, local, over-the-air broadcasting. . . . Put another way, local-to-local service is the right way, and—except when there is no other choice—distant network stations are the wrong way, to deliver broadcast programming by satellite. Local-to-local fosters localism and helps

²⁴ H.R. REP. NO. 108-660, at 9-11 (2004).

²⁵ See 17 U.S.C. § 119(a)(4)(D); 47 U.S.C. § 339(a)(2)(D).

keep free, over-the-air television available to everyone, while delivery of distant network stations to households that can receive their own local stations (whether over the air or via local-to-local service) has just the opposite effect.²⁶

Currently, DIRECTV offers local-into-local analog service in 133 markets covering 92.53% of the nation's television households.²⁷ EchoStar offers local-into-local analog service in 157 markets covering 95.25% of television households.²⁸ Accordingly, the number of households that cannot receive local network stations *either* over the air *or* via local-into-local satellite service is truly minuscule. In addition, DIRECTV has announced its intention to provide local-into-local *digital* service by the end of 2005 in 30-40 of the largest markets in the country, providing local HD service to as many as 60% of television households just as the Commission's report to Congress is due²⁹; local HD service to the rest of the country is expected by the end of 2007. When Congress enacted SHVERA with its substantially narrowed Section 119 compulsory license, it acted with

²⁶ 150 CONG. REC. H8221-H8222 (Oct. 6, 2004) (statement of Rep. Buyer).

²⁷ See *DIRECTV Local Channels available at* <http://www.directv.com/DTVAPP/see/LocalChannels_markets.dsp> (visited June 1, 2005).

²⁸ See *Dish Network Local Channels available at* <<http://www.dishnetwork.com/content/programming/locals/index.asp>> (visited June 1, 2005).

²⁹ See Mark Seavey, *DirecTV Expects to Have Local HD Available in 30-40 Markets*, COMMUNICATIONS DAILY (June 2, 2005) (citing DIRECTV CEO Chase Carey); see also *DIRECTV's Spaceway F1 Satellite Launches New Era in High-Definition Programming; Next Generation Satellite Will Initiate Historic Expansion of DIRECTV Programming* (Apr. 26, 2005) available at <<http://phx.corporate-ir.net/phoenix.zhtml?c=127160&p=irol-newsArticle&ID=700828&highlight=>>> (visited June 1, 2005) (stating that the Spaceway F1 satellite will provide local HD service to 32.8% of television households); *DIRECTV Spaceway F2 Satellite will Expand Local Digital/HD Services for DIRECTV Customers; Satellite shipped to French Guiana* (May 25, 2005) available at <<http://phx.corporate-ir.net/phoenix.zhtml?c=127160&p=irol-newsArticle&ID=713981&highlight=>>> (visited June 1, 2005) (stating that the Spaceway F2 satellite, and its twin, the Spaceway F1, "will provide the needed capacity to roll out local digital and HD in at least 24 markets this year, representing more than 45 percent of U.S. TV households"). According to Nielsen Media Research, the top 30 markets contain 53.4% of U.S. television households and the top 40 markets contain 60.8% of U.S. television households.

knowledge of this extensive local-into-local service.³⁰

Against this background of a long history of minimizing the abrogation of the rights of copyright holders and of preserving and promoting localism, through both over-the-air and local-into-local satellite service, Congress enacted a very special and particularly limited regime for the satellite delivery of duplicating distant *digital* network signals. *First*, in any market where a satellite carrier offers local-into-local digital signals, any subscriber who did not purchase a distant digital signal of the relevant network prior to the commencement of local-into-local digital service would be ineligible for distant digital service. By the end of 2005, as many as 60% of television households subscribing to DIRECTV's service will be able to obtain local-into-local digital service and thus will be ineligible for distant digital service.

Second, in any market where satellite carriers do not offer either local-into-local digital service or local-into-local analog service, only subscribers living in an *analog* white area will be eligible for distant digital service (provided the relevant local affiliate has obtained a special testing waiver pursuant to 47 U.S.C. § 339(a)(2)(D)(viii)(VI) for just such a circumstance). As seen above, less than 5% of television households for EchoStar and less than 8% of television households for DIRECTV are even located in such markets, and the number of satellite subscribers who also live in an analog white area in those markets is virtually *de minimis*. In fact, the number of households who cannot receive local network stations by *any* means can only be counted in the thousands, not in the hundreds of thousands, and certainly not in the millions.

Third, in a market where a satellite carrier does not offer local-into-local digital service but

³⁰ See 150 CONG. REC. H8222 (Oct. 6, 2004) (statement of Rep. Buyer) (citing local-into-local service figures and acknowledging DIRECTV's announcement of its plans for local HD service).

does offer local-into-local analog service, if a satellite subscriber lives in an analog white area *and* purchases the local analog signal of the relevant network, then that subscriber is eligible for a distant digital signal. Although not ideal for the local network station since DTV coverage can exceed analog coverage, because the Commission intended that a station's digital facility only replicate its analog coverage area, Congress made the policy determination that such a subscriber unserved by the over-the-air analog signal would likely be unserved by the over-the-air digital signal. Moreover, Congress required that the subscriber "buy-through" the local-into-local analog service in order to obtain the distant digital service so that its local signal would still be received by the satellite subscriber.

Fourth, and the primary category of relevance to this proceeding, in a market where a satellite carrier does not offer local-into-local digital service but does offer local-into-local analog service (as in the third category, *supra*), if the satellite subscriber is *served* over the air by the local station's analog signal, then such a subscriber *may* be eligible for distant digital service provided a site test measurement, under certain further conditions as to market, date, and DTV build-out status and conducted pursuant to the current test methodology set forth in Section 73.686(d) of the Commission's rules, demonstrates that the household cannot receive a digital signal of signal intensity that exceeds the DTV signal intensity standards set forth in Section 73.622(e)(1) of the Commission's rules.

As enacted, the digital "unserved household" scheme is virtually self-executing. SHVERA specifies the circumstances under which a subscriber may be eligible for a distant digital signal; specifies conditions under which a household site test may occur, including the beginning dates on which testing can begin for certain markets; specifies the initial objective test methodology; and specifies the DTV signal intensity standard the site measurement must exceed. Notably absent from

this digital “unserved household” scheme as enacted is a predictive model. That is, eligibility for distant digital service for subscribers falling into the fourth category delineated above can *only* be determined by a household site test. Given the “if local, no distant” principle, given the local-into-local analog service “buy-through” requirement, and given the reliance on an *analog* white area determination in many circumstances, Congress obviously intended that actual household site tests for digital signal intensity be few and far between in order to protect the investments of local stations in the DTV transition.

What is left, then, for the Commission in this proceeding, like the Section 119 license itself, is narrow, requiring a conservative approach to respect the limited nature of the compulsory license and to preserve the integrity of the localism principle. Although SHVERA lists six specific items that the Commission is to study in this proceeding, logically these items may be reclassified into three separate, but ultimately interrelated, concerns: (1) the appropriateness of the DTV planning factors which resulted in the digital signal intensity standards set forth in Section 73.622(e)(1); (2) the appropriateness of the objective analog signal site test methodology in Section 73.686(d) in the digital signal context; and (3) the advisability of developing a predictive model for future use. In addressing these issues, the starting point must always be a clear recognition that Congress has already made the policy determination to protect the exclusive arrangement the local network affiliate has made with its network partner and that distant service should only be available as a “life-line” for those subscribers for whom it is *impossible* to receive a local digital signal.

II. The DTV Planning Factors Established Appropriate Signal Strength Thresholds for Reception of Real-World Digital Broadcast Signals

In its DTV proceeding, the Commission decided to predicate the coverage area of the new DTV service upon each station’s existing NTSC Grade B service area. The Commission’s goals

were two-fold: first, to provide DTV coverage comparable to a station's current coverage area and, second, to provide the best correspondence between the size and shape of the proposed DTV channel's coverage area and the station's existing coverage.³¹ The Commission carefully crafted this approach to "foster the transition to DTV, while simultaneously preserving viewers' access to off-the-air TV service and the ability of stations to reach the audiences they now serve."³² Maintaining viewer "access to the stations that they can now receive over-the-air" was a critical component of the DTV replication scheme.³³ Thus, the value of over-the-air service to both viewers and broadcasters was fundamental to the Commission's actions. Obviously, the Commission would not have predicated DTV—for which broadcasters have invested many millions of dollars—on planning factors intended to replicate existing television service if those factors were not, in fact, adequate or up to the task.

DTV service areas are defined in terms of the geographic area within which a station's noise-limited field strength is expected to exceed a pre-determined field strength level at 50% of the locations 90% of the time, i.e., F(50,90). That pre-determined field strength depends on the broadcast band and is derived from the DTV planning factors intended, as stated above, to replicate NTSC service areas. The DTV noise-limited field strength standards are 28 dBu for the low VHF band, 36 dBu for the high VHF band, and 41 dBu for the UHF band,³⁴ which have been rounded up to the nearest whole number. The relationship between the planning factors and the requisite noise-

³¹ See *Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, Sixth Report and Order, 12 FCC Rcd 14588 (1997) ("*Sixth DTV Report and Order*"), ¶ 12.

³² *Sixth DTV Report and Order* at ¶ 14.

³³ *Sixth DTV Report and Order* at ¶ 29.

³⁴ See 47 C.F.R. § 73.622(e)(1).

limited field strength is shown in Table 1.³⁵

DTV Planning Factors

Table 1

<i>Parameter</i>	Channels 2 to 6	Channels 7 to 13	Channels 14 to 69
Thermal Noise	(106.2)	(106.2)	(106.2)
Dipole Factor	111.8	120.8	130.8
System Noise Figure	10	10	7
Downlead Line Loss	1	2	4
Receiving Antenna Gain	(4)	(6)	(10)
Carrier-to-Noise Ratio	15.2	15.2	15.2
Median Field Intensity	27.8 dBu	35.8 dBu	40.8 dBu

As the *Notice* correctly states—and critical to the Commission’s entire DTV plan to replicate NTSC Grade B service areas—“[t]hese criteria presume that households will exert similar efforts to receive DTV broadcast stations as they have always been expected to exert to receive NTSC analog TV signals.”³⁶ As the discussion below of each of these planning factors demonstrates, the Commission’s existing noise-limited field strength thresholds for DTV service are more than adequate for real-world reception of local digital broadcast signals.³⁷

Thermal Noise. Thermal noise is a function of the laws of physics. It has not and will not change. The Commission’s planning factor for thermal noise is appropriate as is.

³⁵ See *Sixth DTV Report and Order* at Appendix A & Appendix B; OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* (revised Feb. 6, 2004) (“OET 69”), at Table 3.

³⁶ *Notice* at ¶ 6 (emphasis added).

³⁷ See generally Engineering Statement of Jules Cohen, P.E. (“Cohen Engineering Statement”), at 1-5 (attached hereto as an Appendix).

Dipole Factor. The dipole factor is also a function of the laws of physics. However, the dipole factor is dependent upon frequency, and in the DTV planning factors the Commission utilized the geometric mean frequency of a UHF band extending from 470 MHz to 806 MHz (Channels 14 to 69). But the DTV transition is not just about migrating to digital broadcasting, it is also about reallocating Channels 52 to 69 (698 MHz to 806 MHz) to other services. Because the core DTV channels extend only to Channel 51—and the only channels for which digital site testing will ever occur are located in the core—the dipole factor should be recalculated on the basis of the geometric mean frequency of the UHF band extending from 470 MHz to 698 MHz (Channels 14 to 51). The geometric mean frequency of the core UHF band is 573 MHz, which results in a dipole factor of -130.2 dB.

Carrier-to-Noise Ratio. The carrier-to-noise ratio of 15.2 dB (15.19 dB) for DTV is derived from measurements of the Grand Alliance system conducted by the Technical Subgroup of the Advisory Committee on Advanced Television Service.³⁸ Thus, the carrier-to-noise ratio is empirically derived and represents the minimum ratio of signal strength to noise adequate for a digital receiver to decode the data and produce a digital picture.

Download Line Loss. The Commission has long recommended the use of RG-6 coaxial cable for television reception installations.³⁹ RG-6 coaxial cable is a shielded cable for which

³⁸ See *Sixth DTV Report and Order* at Appendix A; Advisory Committee on Advanced Television Service, *Final Technical Report* (Oct. 31, 1995), at Table 5.1.

³⁹ See Philip B. Gieseler *et al.*, *Comparability for UHF Television: Final Report* (Office of Plans and Policy Sept. 1980) (“*UHF Comparability Final Report*”), at 69 (stating that “RG-6 coax offers very good performance” and that “an RG-6 system is a good value because the coaxial systems offer even less performance variability than shielded twin-lead; and coax is much easier to manipulate than shielded twin-lead, and, therefore, presents fewer installation problems”).

“wetness and metal proximity ma[k]e no change in the attenuation characteristics.”⁴⁰ As the Commission recently reported to Congress following SHVIA: “[T]here is no serious question that RG-6 is clearly the preferred and recommended choice that consumers residing near the Grade B contours of TV stations would typically employ”⁴¹

RG-6 coax cable is commonly available. Based on current specifications for such readily available RG-6, attenuation for 50 feet is as follows⁴²:

Low VHF	0.75 dB to 0.93 dB
High VHF	1.31 dB to 1.44 dB
UHF	2.20 dB to 2.76 dB

where the range provides the loss from the lowest to the highest channel in each band. Based on these current data, it is plain that transmission line loss occurring in 50 feet of recommended RG-6 coaxial cable is, for low VHF, less than 1 dB; for high VHF, less than 2 dB; and for UHF, less than 3 dB. Therefore, the Commission’s DTV planning factor for downlead line loss is a little conservative.⁴³

Receiving Antenna Gain. SHVERA requires the Commission to examine a number of

⁴⁰ *UHF Comparability Final Report* at 60. See also *Improvements to UHF Television Reception, Report and Order*, 90 F.C.C.2d 1121 (1982), ¶ 50 (noting that RG-6 is a good quality cable).

⁴¹ *Technical Standards for Determining Eligibility for Satellite-Delivered Network Signals Pursuant to the Satellite Home Viewer Improvement Act*, Report, 15 FCC Rcd 24321 (2000), at ¶ 28.

⁴² See *Channel Master Coaxial Cable and Wire available at* <<http://www.channelmaster.com/Pages/TVS/Cable.htm>> (providing cable attenuation values at various frequencies for Channel Master’s RG-6 Coaxial Cable—Pro Install Series). The UHF band was considered only through Channel 51 (mid-frequency 695 MHz).

⁴³ Cf. *Technical Standards for Determining Eligibility for Satellite-Delivered Network Signals Pursuant to the Satellite Home Viewer Improvement Act*, Report, 15 FCC Rcd 24321 (2000), at ¶ 28 (stating that the “transmission loss planning factor values for Grade B provide a conservative margin for this type [RG-6] of coaxial cable”).

considerations concerning antennas. In order to do so, it is necessary to determine whether the basis for the receiving antenna gain assumed in the DTV planning factors is reasonable. Television receiving antennas have, of course, been a component of a home television receiving installation for more than 50 years, and existing consumer antennas are capable of receiving both analog and digital television signals.

The Commission itself has recommended that consumers use “[s]eparate UHF and VHF outdoor antennas” because separate antennas will “provide better performance on UHF than can a combination UHF/VHF antenna, at little or no extra cost.”⁴⁴ Therefore, in determining appropriate gain figures, what is relevant are the results of analyses of separate VHF and UHF antennas.

The Commission and its staff have recognized that the best UHF antenna, considering both performance and value, is an eight-bay bowtie-with-screen antenna.⁴⁵ An FCC-sponsored study in 1980 determined that the average gain for such an antenna is 13.4 dB.⁴⁶ In fact, the Electronics Technicians Association—the group that actually installs and works in the field with antennas on a day-to-day basis—stated in its Comments in CS Docket No. 98-201 that the eight-bay and four-bay bowtie-with-screen antennas “are *the* conventional UHF antennas for fringe rural areas.”⁴⁷ Antennas

⁴⁴ *Improvements to UHF Television Reception*, Report and Order, 90 F.C.C.2d 1121 (1982), ¶ 50; see also *UHF Comparability Final Report* at xiii, 52, 83.

⁴⁵ See *Improvements to UHF Television Reception*, Report and Order, 90 F.C.C.2d 1121(1982), ¶¶ 47-51 & Appendix B; *UHF Comparability Final Report* at xiii, 50 n.8, 51, 83.

⁴⁶ See *Improvements to UHF Television Reception*, Report and Order, 90 F.C.C.2d 1121(1982), at Appendix B; *UHF Comparability Final Report* at 51; W.R. Free *et al.*, *Final Report, Program to Improve UHF Television Reception*, Project No. FCC-0315 (Georgia Inst. of Tech., Eng’g Experiment Station, Sept. 1980) (“*UHF Antenna Report*”).

⁴⁷ Comments of the Electronics Technicians Association, International, Inc. (hereinafter “*Electronics Technicians Association*” and “*Electronics Technicians Association Comments*”) in CS Docket No. 98-201, at 23 (emphasis added).

with higher average UHF gains are available, although they are slightly more expensive. For example, one parabolic UHF antenna possessed an average gain of 14.6 dB.⁴⁸ The UHF Comparability Task Force used an average UHF antenna gain of 14.3 dB in one part of its analysis.⁴⁹ Each of these gain figures is well in excess of the 10 dB gain assumed in the DTV planning factors for UHF.

Pursuant to the *Notice's* request for information on currently available antennas,⁵⁰ the Network Affiliates have compiled data from several leading manufacturers of consumer television antennas which are attached hereto as Exhibit 1. As can be seen from these data, Channel Master offers an eight-bay bowtie-with-screen UHF antenna, Model No. 4228, with an average gain of 12.0 dB. Winegard offers a UHF antenna designed for deep fringe areas, the Model PR-9032, with a gain of 15.6 dB. Antennas Direct also offers a long-range UHF antenna, Model 91XG, with a gain of 16.7 dB.⁵¹ In short, there is no question that the Commission's DTV planning factor for UHF antenna gain, 10 dB, is very conservative and can easily be achieved with readily available consumer UHF antennas.

The most recent study of VHF antennas of which the Network Affiliates are aware was conducted by the Institute for Telecommunications Sciences ("ITS"), an arm of the Department of Commerce, in 1979. That study indicates that the average gain in the low VHF band is 4.43 dB and

⁴⁸ See *Improvements to UHF Television Reception*, Report and Order, 90 F.C.C.2d 1121 (1982), at Appendix B (citing *UHF Antenna Report*).

⁴⁹ See *UHF Comparability Final Report* at 76 (Table 3-10) (citing *UHF Antenna Report*).

⁵⁰ See *Notice* at ¶ 11.

⁵¹ See Exhibit 1. The Channel Master 4228 retails for \$38.99 from Solid Signal (solidsignal.com). Winegard's PR-9032 retails for \$34.99 from Solid Signal. Antenna Direct's Model 91XG sells for \$79 (antennasdirect.com).

in the high VHF band is 8.34 dB.⁵² These gains exceed the relevant DTV planning factor gains for the VHF bands.

Currently, Antennacraft manufactures a VHF antenna, Model CS1100, with an average gain in the low VHF band of 6.9 dB and an average gain in the high VHF band of 9.6 dB. Channel Master offers a VHF antenna, Model No. 3610, with an average gain in the low VHF band of 5.8 dB and an average gain in the high VHF band of 11.4 dB. Winegard offers a VHF antenna, Model HD4053P, with a gain between 5.9 dB and 6.6 dB in the low VHF band and a gain between 9.6 dB and 11.1 dB in the high VHF band.⁵³ Again, there is no question that the Commission's DTV planning factors for low VHF gain, 4 dB, and for high VHF gain, 6 dB, are also very conservative and can easily be achieved with readily available consumer VHF antennas.

Although combination VHF/UHF antennas do not generally perform as well as separate VHF and UHF antennas, there are consumer models available that still handily exceed the assumed gains in the DTV planning factors. For example, Winegard's Model HD7084P has gains of from 6.2 dB to 7.6 dB in the low VHF band, from 10.8 to 12.0 in the high VHF band, and from 11.8 dB to 14.6 dB in the UHF band. Antennacraft's Model HD1850 has an average gain of 6.2 dB in the low VHF band, 10.7 dB in the high VHF band, and 10.0 in the UHF band.⁵⁴ Even Channel Master's

⁵² See R.G. FitzGerrell *et al.*, *Television Receiving Antenna System Component Measurements*, Report No. 79-22 (NTIA June 1979) (cited in Philip B. Gieseler *et al.*, *Comparability for UHF Television: A Preliminary Analysis* (Office of Plans and Policy Sept. 1979), at 45 (Table 3-1)).

⁵³ See Exhibit 1. The Antennacraft CS1100 has a list price of \$96.08 (antennacraft-tpd.com). Winegard's HD4053P retails for \$119.99 from Solid Signal (solidsignal.com). Pricing information on Channel Master's 3610 is not available.

⁵⁴ See Exhibit 1. The Winegard HD7084P retails for \$127.99 from Solid Signal (solidsignal.com). Antennacraft's HD1850 has a list price of \$174.97 (antennacraft-tpd.com).

eight-bay bowtie-with-screen UHF antenna, Model No. 4228, has been measured by an independent engineer, Kerry Cozad of Dielectric Communications, to possess an average gain of approximately 3.0 dB in the low VHF band, approximately 9.0 dB in the high VHF band, and approximately 15.0 dB in the UHF band (which exceeds the manufacturer's own specifications).⁵⁵

Such high-gain antennas are not appropriate for all receiving locations. Where signal strength is already adequate, or nearly adequate, such a high-gain antenna could overload the receiver. For circumstances such as these, antenna manufacturers produce smaller antennas with less gain. But even if the gain of such an antenna is less than the gain assumed in the planning factors, that does not mean the planning factors are defective. At such locations, the ambient signal strength will already exceed the thresholds established by the planning factors. The Consumer Electronics Association ("CEA"), in conjunction with Decisionmark, has created a website, AntennaWeb.org, that is designed to assist consumers in selecting an appropriate outdoor receiving antenna. It is evident from the website that CEA does not recommend a large high-gain antenna for all locations and all circumstances. In fact, CEA has introduced an antenna labeling program with six different categories, ranging from small, medium, and large antennas that are either directional or multi-directional, and the AntennaWeb.org website recommends an antenna from one or more of these categories depending on the consumer's location in relation to the location, distance, and predicted signal strength of various desired television station signals.

Although it is not an element affecting the digital signal intensity standards, the Commission did assume that the receiving antenna would have a directional gain pattern in order to discriminate

⁵⁵ See Kerry W. Cozad, *Measured Performance Parameters for Receive Antennas Used in DTV Reception* (text available from the author at kerry.cozad@dielectric.spx.com).

Once again, the Channel Master 4228 retails for only \$38.99 from Solid Signal (solidsignal.com).

against off-axis undesired stations and, therefore, ameliorate interference. In fact, the ATSC recommends the use of a directional gain antenna to enhance *receiver* performance with respect to multipath: “[A]n antenna with a directional pattern that gives only a few dB reduction in a specific multipath reflection can dramatically improve the equalizer’s performance. Such modest directional performance can be achieved with antennas of consumer-friendly size, especially at UHF.”⁵⁶ Accordingly, an element of the DTV planning factors is the front-to-back ratio of the receiving antenna, which the Commission assumed to be 10 dB for low VHF, 12 dB for high VHF, and 14 dB for UHF. (Incidentally, these front-to-back ratios greatly exceed those assumed for analog television reception, which was 6 dB across all bands.)⁵⁷

It is common for readily available consumer antennas to meet or exceed these assumed front-to-back ratios. Thus, of the antennas mentioned in the text above for which data are available, the front-to-back ratio of Channel Master’s eight-bay bowtie-with-screen UHF antenna, Model No. 4228, exceeds 19 dB at all UHF frequencies and is 24 dB at Channel 43. These front-to-back ratios far exceed the 14 dB assumed in the DTV planning factors. Similarly, the front-to-back ratio of Winegard’s UHF Model PR-9032 is 14 dB at Channel 14 and 20 dB at both Channel 32 and Channel 50, which meets or substantially exceeds the assumed front-to-back ratio for the UHF band.⁵⁸

Consumer VHF antennas appear to easily exceed the assumed front-to-back ratios for the low VHF and high VHF bands. Thus, Antennacraft’s previously mentioned VHF antenna, Model

⁵⁶ *ATSC Recommended Practice: Receiver Performance Guidelines*, Doc. A/74 (June 18, 2004), at 24.

⁵⁷ See OET 69 at Table 6.

⁵⁸ See Exhibit 1.

CS1100, has a front-to-back ratio of 19.4 dB in the low VHF band and 17.6 dB in the high VHF band. The front-to-back ratio of Winegard's VHF Model HD4053P is 17 dB or greater across both the low VHF and high VHF bands.⁵⁹

It appears that VHF/UHF combination antennas also greatly exceed the Commission's assumed front-to-back ratios for the low VHF and high VHF bands and just meet the assumed front-to-back ratio for the UHF band. For instance, the front-to-back ratio of Winegard's VHF/UHF combination antenna, Model HD7084P, is 20 dB or greater in the low VHF band, 15 dB or greater in the high VHF band, and is 11 dB at Channel 14 and 20 dB at both Channel 32 and Channel 50. The front-to-back ratio of Antennacraft's VHF/UHF combination antenna, Model HD1850, is 20.2 dB in the low VHF band, 17.3 dB in the high VHF band, and 13.7 dB in the UHF band.⁶⁰

In addition to the specific numerical values of antenna gain and front-to-back ratio, the DTV planning factors, more generally, are, as stated in OET 69, "assumed to characterize the equipment, including antenna systems, used for home reception."⁶¹ As the instant *Notice* aptly summarizes it: "These criteria presume that households will exert similar efforts to receive DTV broadcast stations as they have always been expected to exert to receive NTSC analog TV signals."⁶² In the past, the Commission has always assumed that homeowners would employ an outdoor, directional gain antenna for over-the-air reception of television signals. Because of the directional nature of the receiving antenna, a typical installation also utilizes a rotor so that the antenna may be properly oriented. In addition, in fringe areas where signal strength is known to be weak, the typical home

⁵⁹ See Exhibit 1.

⁶⁰ See Exhibit 1.

⁶¹ OET 69 at 3.

⁶² *Notice* at ¶ 6.

installation uses a low-noise amplifier (“LNA”), also known as a pre-amplifier.

As the Commission has previously explained in the analog context but whose basic principles apply equally in the digital context:

A radio frequency (RF) preamplifier is a device that is utilized in a receiving antenna system to increase the RF power of the desired signal delivered to the receiver. In a television receiving system, a preamplifier can improve overall system performance by both compensating for the decrease in signal strength (attenuation) caused by the transmission line and components, and by lowering the amount of noise, or snow, the receiving antenna system contributes to the displayed image. The degree to which the preamplifier affects the transmission line attenuation and system noise depends on its own gain and the amount of noise internally generated by the preamplifier (which to a certain extent are a function of its cost) and where in the receiving antenna system the preamplifier is installed. If the preamplifier is located at the antenna, the overall amount of noise in the picture will be established by the noise characteristic of the preamplifier, because its gain can then compensate for most, if not all, of the signal attenuation due to the transmission line and components. . . . When mounted at the terminals of an outdoor antenna, a preamplifier can provide its maximum degree of picture quality improvement.⁶³

The UHF Comparability Task Force itself noted that “[p]reamplifiers have historically been utilized in ‘fringe’ reception areas.”⁶⁴ The Electronics Technicians Association—again, the group that installs antennas—stated in its comments in CS Docket No. 98-201 that, in its home county in rural Indiana, “*virtually all* rooftop antenna systems include a pre-amplifier.”⁶⁵ And the ATSC has also recommended LNAs for digital reception: “Many reception problems can be mitigated by use

⁶³ *UHF Comparability Final Report* at 73-74.

⁶⁴ *Id.* at 78.

⁶⁵ Electronics Technicians Association Comments, CS Docket No. 98-201, at 6 (emphasis added).