

181. The Commission also imposed the 5% fee to LPTV stations involved in the digital data service "pilot project" set forth in Section 336(h) of the Act.³⁷⁵ When the Commission set up that pilot project in 2001, it noted that, under Section 336(h)(6), Congress mandated that the Commission collect "an annual fee or other schedule or method of payment comparable to any fee imposed under the authority of this Act on providers of similar services."³⁷⁶ We agree with the Commission's finding that: "Based on the statute, we believe that the services that will be offered by LPTV licensees in the pilot project (digitally-based interactive broadcast services and wireless Internet access) are similar to certain of the services, including ancillary or supplementary services that may be offered by Digital Television (DTV) licensees. . . . Not only are the digital data services that may be provided by LPTV stations similar to those that may be provided by DTV licensees, but, in addition, we believe that a fee of five percent will not discourage the provision of these services just as we noted that it would not dissuade DTV broadcasters from offering such DTV ancillary or supplementary services." Consistent with those earlier pronouncements, we conclude that imposition of a 5% fee for the provision of feeable ancillary and supplementary services by digital LPTV stations is appropriate and will not discourage the provision of these services. The same ancillary and supplementary services that are feeable if provided by full-service stations shall be feeable if provided by LPTV stations.³⁷⁷

8. International Coordination

182. In establishing rules for digital LPTV, TV translator and Class A stations, we are mindful of our obligations under our existing bilateral agreements with Canada and Mexico regarding the authorization of LPTV service in the common border areas.³⁷⁸ We recognize that existing bilateral agreements do not contain provisions for digital LPTV, TV translator or Class A stations. Under the existing agreements, analog LPTV and TV translator stations have secondary status with respect to Canadian and Mexican primary television stations and allotments and must not cause interference to the reception of these stations, nor are LPTV and TV translator stations protected against interference from these stations.

183. As stated in the *Notice*, we will work over time to update the current bilateral agreements to include provisions for digital LPTV and TV translator stations and also for digital Class A stations.³⁷⁹ In the interim, we will attempt to obtain the approval of such stations in the border area on a case-by-case basis. Any digital low power or Class A stations authorized on this basis will be subject to conditions resulting from the coordination process and any final bilateral agreements reached with Canada and Mexico. We disagree with the MSTV/NAB that authorizing digital companion channels to LPTV and translator stations in the border areas will complicate the process of full-service stations obtaining authorizations for their digital services in the border areas.³⁸⁰ In this regard, the NTA "does not believe that unspecified impacts on international agreements should be the basis of a determination that very large

³⁷⁵ See 47 U.S.C. § 336(h).

³⁷⁶ See *Implementation of LPTV Digital Data Service Pilot Project*, 16 FCC Rcd 9734, 9743 (2001).

³⁷⁷ See 47 C.F.R. 73.624(c).

³⁷⁸ Agreement on the Assignment of Low Power Television Stations along the Border, Sept. 14, 1998, United States-Mexico; Agreement on VHF and UHF Television Broadcasting Channels, Jan. 5, 1994, United States-Canada.

³⁷⁹ *Notice*, 18 FCC Rcd at 18414.

³⁸⁰ MSTV/NAB Comments at 8.

segments of the United States should not receive free digital television.³⁸¹

G. Station Operation

1. Unattended Operation

184. LPTV and TV translator stations may be operated unattended subject to certain requirements to guard against interference and outages of tower lighting.³⁸² In the *Notice* we proposed to apply the analog regulatory provisions to digital LPTV and TV translator operations.³⁸³ Bonneville supports our proposal noting that rural television translator networks often involve hundreds of translator stations in remote areas.³⁸⁴ Given the fact that unattended operation has not been problematic under the existing rule for analog stations, we adopt our proposal and we will apply the current rule for unattended operation for digital LPTV and TV translator operations.

2. Time of Operation

185. LPTV and TV translator stations are not required to adhere to a minimum operating schedule because we desire to facilitate flexible LPTV station operations and to minimize the cost of regulatory compliance. While there is no minimum operating schedule, TV translator stations are required to "provide service to the extent that such is within its control and to avoid unwarranted interruptions in the service provided."³⁸⁵

186. In the *Notice* we sought comment on whether to require minimum hours of operation for digital TV translator and/or LPTV stations and, if so, how to structure the requirement.³⁸⁶ CBA, Commercial, and Venture oppose adding a minimum operating requirement for digital stations in the low power service.³⁸⁷ CBA argues that these stations are "not likely to waste second-channel digital facilities that they were not compelled to construct in the first place."³⁸⁸ To encourage low power television service stations to convert to digital operation and to experiment with innovative services, CBA recommends that the Commission "eschew simulcasting requirements."³⁸⁹ Entravision and the Joint Commenters, however, support a minimum operating schedule similar to DTV full-power and Class A stations.³⁹⁰ Entravision recommends that "in urban areas this requirement be 6 A.M. to 11 P.M., while in rural areas it [apply between] 7 A.M. to 10 P.M., local time."³⁹¹

³⁸¹ NTA Reply Comments at 8.

³⁸² See 47 C.F.R. § 74.734. For example, if a transmitter site cannot be promptly reached at all times, technical means must be provided to turn the transmitter on and off from a location that is readily accessible.

³⁸³ *Notice*, 18 FCC Rcd at 18398-9.

³⁸⁴ Bonneville Comments at 9.

³⁸⁵ 47 C.F.R. § 74.763(a).

³⁸⁶ *Notice*, 18 FCC Rcd at 18398.

³⁸⁷ CBA Comments at 18; Venture Comments at 6-7; Commercial Reply Comments at 11-12.

³⁸⁸ CBA Comments at 18.

³⁸⁹ CBA Comments at 18.

³⁹⁰ Entravision Comments at 4; Joint Commenters Comments at 8.

³⁹¹ Entravision Comments at 4.

187. We find no compelling reason to adopt a minimum operating schedule for new digital stations in the low power television service. While there will be a competitive environment for digital spectrum in some areas, we believe that LPTV and TV translator licensees that undertake the challenge to construct and operate new digital facilities are unlikely to waste their resources and allow these stations to remain "dark" for extended periods of time. We also desire to allow stations the flexibility to operate their digital facilities. Some stations may desire to operate their digital facilities 24 hours a day and some may desire to operate them according to a program schedule. Requiring minimum operating hours could discourage some stations from seeking digital facilities and could stifle innovation for those stations. Regard simulcasting of programming for stations with companion digital channels, the *Notice* did not propose, nor will we adopt such a requirement for these stations.

3. Station Identification

188. The *Notice* sought comment on appropriate means of station identification for digital TV translator and low power TV stations.³⁹² International radio regulations provide that radio transmissions "should be capable of being identified either by identification signals or by other means" and that the signals of broadcast stations contain such identifying information as call sign and station location.³⁹³ The *Notice* inquired as to what identifying information should be required. We also asked about the means of station identification for heterodyne translator rebroadcast and LPTV signal retransmission. The *Notice* proposed that DTV broadcast stations be permitted to identify translators rebroadcasting their signals and that satellite service providers be permitted to identify LPTV stations retransmitting their programming. We sought comment on the technical means and related costs of inserting locally generated identification information into the digital bit stream being retransmitted. Finally, we asked about identification requirements for digital LPTV stations that originate local programming, inquiring whether such stations should be required to provide visual or aural identification in the manner of DTV broadcast stations and about equipment and cost to station licensees.

189. Few parties commented on these issues and very little information was provided on the technical means for station identification and related costs. APTS/PBS opposes a unique identification requirement for digital TV translators.³⁹⁴ It suggests that "customized station identification" would be difficult and expensive and that such requirements should apply only to translators operating with an effective radiated power of 10 kW or more. NTA also opposes a translator identification requirement,³⁹⁵ contending that the current Morse Code identification alternative in the LPTV rules serves no practical purpose.³⁹⁶ APTS/PBS and NTA submit that a translator output signal would contain sufficient information to identify the DTV broadcast station whose signal is being rebroadcast, which should satisfy international station identification provisions with regard to the translator.³⁹⁷

190. A few commenters suggest technical means for digital translator station identification.

³⁹² *Notice*, 18 FCC Rcd at 18399.

³⁹³ See ITU RR 19.1, 19.4, 19.16, 19.17.

³⁹⁴ APTS/PBS Comments at 15.

³⁹⁵ NTA Comments at 20.

³⁹⁶ 47 C.F.R. § 74.783. This rule provides an option for transmission of a station's call sign in International Morse Code through the mechanism of "frequency shift keying" of the aural and visual carrier frequencies. This is accomplished by shifting a translator's local oscillator frequency. NTA states that a specially designed receiver would be required to convert to the frequency shifts to an audible and readable signal. NTA Comments at 20.

³⁹⁷ APTS/PBS Comments at 15; NTA Comments at 21.

Riverton submits data from which it concludes that frequency shift keying could be used to transmit a station's call sign in International Morse Code.³⁹⁸ According to Greg Best, a heterodyne translator could be modified to enable a 10 kHz shift of its output signal through the use of a Morse Code generator that would control the shift keying of the local oscillator frequency of the translator's upconverter stage.³⁹⁹ David Hale of LARCAN USA states that a regenerative-based translator will accommodate insertion of a station's call sign.⁴⁰⁰

191. Kent Parsons recommends that digital translator stations be identified by their primary DTV broadcast station or through the use of a regenerative translator.⁴⁰¹ With regard to LPTV stations that retransmit programming received via satellite feeds, Joint Commenters suggest that we encourage service providers to embed in their signals the station identification information of their LPTV station affiliates, "since many small LPTV stations have extremely limited video insertion capabilities."⁴⁰² For those LPTV stations receiving two or more satellite-fed program services, Joint Commenters submit that identification of the LPTV station on any one of these should meet our requirements, and that digital LPTV station identification should be required only at the beginning and end of the broadcast day.⁴⁰³

192. Although we recognize the value of the ITU provisions for station identification, we conclude that we cannot at this time establish identification requirements for digital LPTV and TV translator stations, nor do we believe it would be appropriate to attempt to "bootstrap" our current analog identification requirements for digital station operations.⁴⁰⁴ The record in this proceeding lacks sufficient technical and cost information from which to develop standards for this purpose. We do not wish to impose requirements that could now be cost prohibitive for licensees of translator and LPTV stations, thereby discouraging their conversion to digital operation.

193. We agree with NTA that the current Morse Code identification alternative in the rules should not be applied to digital station operations.⁴⁰⁵ As NTA points out, a specially designed receiver would be required to discern a call sign transmitted in International Morse Code through frequency shift keying of a station's local oscillator frequency. Thus, we believe such a manner of identification would have little utility in the digital world and would increase equipment costs. Also, while it may be possible to insert a translator station's call sign into a regenerative translator or, alternatively, a PSIP generator, we

³⁹⁸ Riverton Comments at 3 (concluding that frequency shifts of 10 kHz would not adversely affect the bit error rate of a DTV signal); *see also* Elko Comments at 3.

³⁹⁹ Greg Best Comments at 8.

⁴⁰⁰ Larcán Comments at 1; *see also* Sgrignoli Reply Comments at 3.

⁴⁰¹ Parsons Comments at 14.

⁴⁰² Joint Commenters Comments at 18.

⁴⁰³ *Id.*

⁴⁰⁴ For example, Section 74.783 of our rules provides an alternative in which TV broadcast stations may identify within specific time intervals the translators rebroadcasting their programming. "Two such identifications shall be made between 7:00 a.m. and 9:00 a.m. and 3:00 p.m. and 5:00 p.m. each broadcast day at approximately one hour intervals during each time period. Television stations which do not begin their broadcast day before 9:00 a.m. shall make these identifications in the hours closest to these time periods at the specified intervals." 47 C.F.R. § 74.783. However, DTV broadcast stations subject to the May 1, 2002, and May 1, 2003, DTV construction deadlines are required to operate, at a minimum, during the prime time hours specified in our rules. Thus, such DTV stations are not generally required to operate during the time intervals specified for the identification of analog transmitters.

⁴⁰⁵ NTA Comments at 20.

have no information in the record on the practical utility of this approach for station identification.

194. Until we have sufficient information to consider means of implementing the type of station identification provisions contemplated in the ITU regulations, we believe that digital TV translator and LPTV stations could be practically identified by other means. As NTA notes, a station can be located by triangulation on its signal. We agree with APTS/PBS that the identity of a digital translator could be ascertained from information on its parent station in the DTV broadcast signal. In most cases, viewers of a digital LPTV station could identify the station using the on-line resources in our web site on the basis of the TV channel number and the name of their community. For these reasons, we will not establish at this time identification requirements for digital LPTV and TV translator stations. We recommend that practical and affordable means for the identification of such stations be addressed by study groups through the auspices of the ITU. We also encourage operators of digital LPTV and TV translator stations to experiment with possible means for identifying their stations. We plan to revisit this issue in a future periodic review proceeding.

4. Call Signs

195. In the *Notice* we sought comment on an appropriate set of call sign suffixes for digital LPTV, TV translator, and Class A stations.⁴⁰⁶ We noted that call signs for analog LPTV and translator stations consist of the letter K or W followed by the station's assigned channel number and two additional letters.⁴⁰⁷ LPTV and Class A stations may use four letter call signs with the designated suffices "-LP" and "-CA" respectively.⁴⁰⁸ We sought comment on whether these existing call sign formats should be altered for digital stations. We suggested, for example, use of the following suffixes for digital operation: "-LD" for digital LPTV and "-CD" for digital Class A stations.

196. Some commenters support use of new suffixes for digital stations in the low power television service.⁴⁰⁹ NTA also suggests using the suffix "-DT" for TV translator stations.⁴¹⁰ The Joint Commenters suggest that the "DT" suffix be used for Class A stations, and that no special suffix be used to identify digital TV translator stations.⁴¹¹ Venture suggests using the following suffixes to help consumers recognize the station is digital: "-DA" for Class A stations and "-DL" for LPTV stations.⁴¹² Byron St. Clair suggests using the following suffixes: "-DT" for TV translators, and "-AD" for digital Class A stations.⁴¹³ Bruno argues that the use of analog suffixes "-LP" and "-CA" has "caused serious confusion in the public and in the advertising marketplace."⁴¹⁴ Bruno maintains that it is necessary to explain to advertisers its ads will appear on its station even though the station has a call sign with an "-LP" suffix.⁴¹⁵ Bruno suggests allowing all digital stations – full-service and low power – the flexibility to use the "-DT"

⁴⁰⁶ *Notice*, 18 FCC Rcd at 18412.

⁴⁰⁷ *See* 47 C.F.R. § 74.783(d).

⁴⁰⁸ *See* 47 C.F.R. § 73.3550.

⁴⁰⁹ *Entravision Comments* at 9; *NTA Comments* at 28.

⁴¹⁰ *NTA Comments* at 28.

⁴¹¹ *Joint Commenters Comments* at 24.

⁴¹² *Venture Comments* at 8-9.

⁴¹³ *St. Clair Reply Comments* at 2.

⁴¹⁴ *Bruno Comments* at 7.

⁴¹⁵ *Id.*

suffix "to keep viewers and advertisers from being confused about what they are watching."⁴¹⁶

197. We adopt the following call sign suffixes for new digital stations in the low power and Class A television services. As proposed in the *Notice* digital LPTV stations will be identified with the suffix "-LD" and digital Class A stations with the suffix "-CD." This system will prevent confusion with other call sign combinations as well as possible technical problems. We understand that PSIP generators can accommodate six character call signs. We will, therefore, use the single letter "D" as the suffix for identifying digital translators and those digital LPTV stations assigned the five character letter/number call sign so that their call signs will not extend beyond six characters (e.g., K20AA-D). We will not allow LPTV and Class A stations to use the suffix "-DT." That suffix has been reserved for use by full-service DTV stations. We believe it is necessary for proper station identification to avoid using the same suffix for both full-service and low power digital stations. Using "-DT" for digital stations in the low power stations would *create* confusion for viewers, not eliminate it.

5. Broadcasting Auxiliary Service Frequencies

198. LPTV stations may be authorized to use television broadcast auxiliary service (BAS) spectrum to operate such stations as remote pickup, studio-to-transmitter links and point-to-point relays.⁴¹⁷ TV translator stations may be authorized to operate translator relay stations. LPTV and TV translator stations use BAS spectrum on a secondary basis, subject to displacement by full-service television stations. In the *Notice* we proposed to extend the BAS eligibility provisions to permit digital LPTV and TV translator stations to operate in the same bands and for the same purposes as analog LPTV and TV translators, subject to the BAS rules governing digital operations.⁴¹⁸

199. The Joint Commenters maintain that Class A stations and LPTV stations in urban areas should be permitted to use BAS frequencies on the same basis as full-service television stations and that TV translators should continue to use BAS frequencies on a secondary basis.⁴¹⁹ The Joint Commenters' recommendation is based on their proposal that digital Class A and LPTV station in urban areas be licensed on a primary, interference-protected basis. Class A stations are now permitted to use BAS frequencies on a primary basis, and we clarify here that its status also applies to digital Class A stations (*i.e.*, those authorized Class A stations that convert to digital operation on their analog channels). We reject the Joint Commenters' proposal, and we will not license BAS frequencies assigned to LPTV stations with primary regulatory status. As proposed in the *Notice*, all BAS frequencies assigned to digital LPTV and TV translator stations will be on a secondary basis.

6. Digital Class A TV Area for Locally Produced Programming

200. Class A TV stations are required to broadcast "locally produced" programming, which our rules define as programming produced with a station's predicted Grade B contour or at the station's main studio.⁴²⁰ In the *Notice* we clarified that the station's predicted analog Grade B contour would also define the area for the locally produced programming of digital Class A TV stations and sought comment

⁴¹⁶ Bruno Comments at 7; *see also* International Comments at 4; KHEM Reply Comments at 2.

⁴¹⁷ *See* 47 C.F.R. §§ 74.432 and 74.632.

⁴¹⁸ *Notice*, 18 FCC Rcd at 18413.

⁴¹⁹ Joint Commenters Comments at 25.

⁴²⁰ 47 C.F.R. §§ 73.6000 and 73.6001. This area is also defined to include "the contiguous predicted Grade B contours of any of the stations in a commonly owned group."

on whether the station's digital service contour should be used for this purpose.⁴²¹ CBA submits that it would be more reasonable to define this area as the larger of the station's analog Grade B contour or the noise-limited contour of its digital station or commonly owned group of stations.⁴²²

201. The statutory qualifications for Class A TV regulatory status include a provision related to programming produced with the "market area served by such station, or the market area served by a group of commonly controlled low-power stations that carry common local programming produced within the market area served by such group."⁴²³ The statute does not define the term "market area." In the Report and Order establishing the Class A TV service, we defined the market area as the area within a station's predicted Grade B contour, finding that this would be a realistic area in which local programming would be produced.⁴²⁴ Significantly, we did not define the market area to be the area within the station's protected signal contour, which is smaller than the area within a station's Grade B contour.

202. We chose protected signal contour values for digital stations Class A stations that would produce protected services areas comparable in size to a Class A station's associated analog area. We did not choose to protect the area defined by our DTV noise-limited contours,⁴²⁵ which we noted are comparable to the analog Grade B contour.⁴²⁶ We agree with CBA that the DTV noise-limited contours would offer a more direct basis for defining the market area of a digital Class A station for purposes of locally produced programming. Also, upon conversion to digital operations, a Class A station's former Grade B contour will no longer exist. For these reasons, we will define the market area for the locally produced programming of a digital Class A station as the area within the predicted DTV noise-limited contour based on the station's authorized facilities. These contour values are: 28 dBu for Channels 2-6, 36 dBu for Channels 7-13, and 41 dBu for Channels 14-51.

203. In connection with our clarification of the digital Class A TV area for locally produced programming, KM asks that we define the term "locally produced programming."⁴²⁷ KM suggests that we define "locally produced programming" as programming that is "locally originated." KM notes that the term "locally originated" was used by Congress when it created the Class A service in the CBPA and that it is defined in Section 74.701(h) of the rules.⁴²⁸

204. We decline KM's suggestion to adopt "locally originated" as the definition of "locally produced programming." To begin with, we did not seek comment on this issue in the *Notice*, and our intent was only to determine whether or not to adopt the analog Grade B contour approach for determining the Class A TV area for locally produced programming. In any event, KM has confused two different

⁴²¹ *Notice*, 18 FCC Rcd at 18413.

⁴²² CBA Comments at 2. We are not in this proceeding authorizing Class A licensees a separate channel for digital Class A operations, but rather, licensees are permitted on-channel conversions of their analog stations for digital operation. Thus, the area defined as the station's Grade B contour refers to the area associated with the licensee's former analog operation.

⁴²³ 47 U.S.C. § 336(f)(2).

⁴²⁴ See *Class A Report and Order* at ¶ 18.

⁴²⁵ See 47 C.F.R. § 73.622(e). The DTV noise-limited signal contours are defined to have the following values: 28 dBu for Channels 2-6, 36 dBu for Channels 7-13, and 41 dBu for Channels 14-69.

⁴²⁶ *Notice*, 18 FCC Rcd at 18384.

⁴²⁷ KM Comments at 16-18.

⁴²⁸ KM Comments at 16-17 citing H.R. Report No. 384, 106th Cong., 2d Sess. 6.

terms. As set out in Section 74.701(h) of the rules, “local origination” refers to the location of the transmission of a program and not to the location of program production.⁴²⁹ A program produced elsewhere may be considered “locally originated” if its transmission is generated at the transmitter site of a low power television or television translator station. “Locally produced programming” must be produced in some area proximate to the community.

H. Other Technical Issues

I. Power Limits

205. In the *Notice* we asked for comment on the adequacy of the digital effective radiated power (“ERP”) limits adopted for low power TV and TV translator stations in our DTV proceeding:⁴³⁰

<u>Channels</u>	<u>Peak Analog ERP</u>	<u>Average Digital ERP</u>
2 - 13	3 kW	300 Watts
14-69	150 kW	15 kW

206. The *Notice* indicated that digital “average” power levels 10 dB below those of analog “peak” power levels produce analog and digital service areas of approximately comparable size. Of the few commenters addressing power issues, some recommend that we distinguish between Low Band VHF (channels 2 – 6) and High Band VHF (channels 7 – 13) stations in setting ERP limitations. Specifically, they submit that if the Low Band limits are to remain at 3 kW (analog) and 300 watts (digital), the limits for High Band should be set to larger values proportional to the differences between Low Band and High Band VHF power limits for full-service TV and DTV stations.⁴³¹ With respect to the analog vs. digital power ratio of 10 dB, there is general agreement among commenters that this is a reasonable distinction, at least for the time being,⁴³² although a few commenters argue that higher digital powers are justified at this time. Commenters present no arguments or data specifically addressing whether or not these digital ERP levels are congruent with the contour values we proposed for digital LPTV and TV translator stations: 43 dBu for channels 2 – 6, 48 dBu for channels 7 – 13, and 51 dBu for channels 14 – 69.

207. We remain satisfied that the existing ERP limits for analog and digital low power stations are adequate and appropriate for the corresponding signal contour values, and we are not changing these limits.⁴³³ No commenter has demonstrated that the ERP limits would be inadequate for digital signal coverage of the communities and areas typically served by LPTV and TV translator stations. Conversely, some commenters maintain that lower ERP limits for TV translator stations would be beneficial in many circumstances. Kent Parsons states that “while the established power limits may be adequate for urban or near urban service, they are extremely high for rural translator service.”⁴³⁴ Gary Sgrignoli comments that “these maximum powers appear to be fairly large for most translator operations and therefore probably

⁴²⁹ 47 C.F.R. § 74.701(h).

⁴³⁰ *Advanced Television Systems and Their Impact upon the Existing Broadcasting Services*, 12 FCC Red (1997), ¶ 147; see also 47 C.F.R. § 74.735

⁴³¹ See, for example, CBA Comments at 15 (proposing analog and digital ERP limits of 9.5 kW and 900 watts, respectively, for channels 7-13). See also the full-service TV and DTV ERP limits in §§ 73.614(b) and 73.622(f), respectively.

⁴³² See, e.g., NTA Comments at 14.

⁴³³ As noted, *supra*, we are also adopting 30-watt and 3-watt transmitter output power limits for UHF and VHF heterodyne digital translators.

⁴³⁴ Parsons Comments at 12.

reflect the requirements of LPTV stations that often reside in urban areas rather than translators that reside in rural areas. Obviously, lower transmitted power produces less interference, which then allows more DTV stations to be utilized.⁴³⁵ We agree that station operations with ERP levels below the maximum permissible values may be appropriate in many circumstances, particularly where outdoor receiving antennas are used. We encourage station licensees to confine their operations to ERP levels deemed necessary for adequate signal coverage. Operating in this manner will further reduce the potential for interference and help to maximize spectrum use.

2. Out-of-Channel Emission Limits

208. In the *Notice* we sought data and analyses regarding appropriate emission mask(s) for digital low power TV and TV translator stations.⁴³⁶ We asked if there is a need for multiple masks with differing performance requirements and associated costs and, if we were to adopt multiple masks in our rules, whether we should explicitly prescribe situations that would require use of the more restrictive mask or whether the choice should be left to station operators. We asked if the mask(s) adopted in this proceeding should also apply to digital Class A TV stations. We sought comment on our proposal to utilize a 500 kHz resolution bandwidth as a standard reference for determining compliance with out-of-channel emission limits.

209. The *Notice* specifically sought comment on two emission masks proposed by Gary Sgrignoli: a "Simple" mask and a "Stringent" mask. The decibel attenuation requirements of these masks are given below, where Δf is the frequency difference in MHz between the mask measurement point and the edge of the 6 MHz channel beyond which the measurement is being taken. Emission attenuation levels are measured in a 500 kHz resolution bandwidth and compared to the total average power in the 6 MHz channel.

Simple mask

$$A \text{ (dB)} = 46 + (\Delta f^2 / 1.44)$$

$$A \text{ (dB)} = 71$$

for $\Delta f = 0.0$ MHz to 6.0 MHz

everywhere else

Stringent mask

$$A \text{ (dB)} = 47$$

$$A \text{ (dB)} = 47 + 11.5 (\Delta f - 0.5)$$

$$A \text{ (dB)} = 76$$

for $\Delta f = 0.0$ MHz to 0.5 MHz

for $\Delta f = 0.5$ MHz to 3.0 MHz

everywhere else

210. The Simple mask is identical in attenuation to the emission mask for DTV broadcast stations originally chosen by the Commission.⁴³⁷ Subsequently, this emission mask was replaced by the current and more restrictive DTV mask.⁴³⁸ The Simple mask can be described as having two components: (1) a quadratic curve which starts at 46 dB of attenuation below the total in-band power of the digital signal (35 dB below the in-band flat top digital spectrum), increasing to 71 dB of attenuation at the edge of each first-adjacent channel (60 dB below the in-band flat-top digital spectrum) and (2) a horizontal line denoting an ultimate attenuation level of 71 dB at all frequencies greater than and less than 6 MHz from the upper and lower channel edges, respectively. The total integrated unweighted "splatter" power within

⁴³⁵ Gary Sgrignoli Reply Comments at 11.

⁴³⁶ *Notice*, 18 FCC Rcd at 18391-3.

⁴³⁷ *Advanced Television Systems and Their Impact upon the Existing Television Broadcast Services (Sixth Report and Order)*, 12 FCC Rcd 14588 (1997) at ¶195.

⁴³⁸ 47 C.F.R. § 73.622(h)(1).

this mask, as measured in each first-adjacent channel, is approximately 39 dB below the total average digital signal power in the 6 MHz channel. The Stringent mask can be described as having 3 components: (1) a "shelf" or flat curve that, for the first 500 kHz each side of the 6 MHz channel, lies 47 dB below the average power in the channel (36 dB below the in-band flat-top digital spectrum), (2) a linear curve decreasing to an attenuation level of 76 dB at 3 MHz on each side of the channel edge (65 dB below the in-band flat-top digital spectrum), and (3) a horizontal line denoting an ultimate attenuation level of 76 dB at all frequencies greater than 3 MHz from the upper channel edge and less than 3 MHz from the lower channel edge.

211. Numerous commenters address issues involving low power digital emission masks.⁴³⁹ Most favor the use of multiple emission masks, and several propose additional "grandfathered" masks for the digital conversion of existing analog low power stations. These masks have somewhat lesser emission attenuation than those of the Simple mask.⁴⁴⁰ NTA suggests that we adopt the use of three masks based on specific levels of digital transmitter output power.⁴⁴¹ It proposes that digital transmitters with "large" power (*e.g.*, above 30 watts for UHF channels) be required to meet the Stringent mask, while those using "small" transmitters should meet the Simple mask. According to NTA, stations operating with "very small" transmitters (up to 1 watt for VHF channels and up to 6 watts for UHF channels) should, in lieu of any mask, be required to attenuate out-of-channel emissions by at least 28 dB in any 500 kHz measurement bandwidth.⁴⁴² NTA proposes an additional mask for analog translators with an output power not exceeding 100 watts when custom-modified for digital operations:⁴⁴³

$$\begin{array}{ll} A \text{ (dB)} = 40.6 + 3.33 \Delta f & \text{for } \Delta f = 0.0 \text{ MHz to } 6.0 \text{ MHz} \\ A \text{ (dB)} = 60.6 + ((\Delta f - 6)(6.37)) & \text{for } \Delta f = 6.0 \text{ MHz to } 7.5 \text{ MHz} \\ A \text{ (dB)} = 70 & \text{for } \Delta f = 7.5 \text{ MHz and beyond} \end{array}$$

212. Although the attenuation of this mask flattens out at a value only 1 dB less than the Simple mask (*i.e.*, 70 dB vs. 71 dB), this attenuation value occurs at 7.5 MHz from the channel edge, as compared to 6 MHz for the Simple mask. Also, NTA's "grandfathered" mask ranges from approximately 5 - 10 dB less attenuation than the Simple mask in the Δf segment between 0 and 6 MHz.

213. In considering what mask(s) would be appropriate for low power digital stations, we seek to balance the performance benefits and costs of the available alternatives. As noted by Sgrignoli and others,⁴⁴⁴ one important benefit of the Simple mask is that it requires the installation of only a 3-section band pass filter at the transmitter output, compared to the more complex and expensive 5-section band pass mask filter required for compliance with the Stringent mask. Another benefit of the 3-section filter over a 5-section filter is the lower degradation of a transmitted digital signal's signal-to-noise (S/N) ratio. Laboratory tests have shown that a 27 dB S/N is achievable without using precorrection circuitry in digital transmitters with 3-section filters, while the same transmitters typically achieve only a 22 dB S/N when a

⁴³⁹ See, *e.g.*, MSTV/ NAB Comments at 16; APTS/PBS Comments at 14-15; Elko Comments at 2; Greg Best Comments at 3-7; Joint Commenters Comments at 14; NTA Comments at 14-18; Parsons Comments at 11-12; Riverton Comments at 9-10; Venture Comments at 6; and Gary Sgrignoli Reply Comments at 8.

⁴⁴⁰ See, *e.g.*, Greg Best Comments at 4; Riverton Comments at 10.

⁴⁴¹ NTA Comments at 16-17.

⁴⁴² *Id.*

⁴⁴³ *Id.*

⁴⁴⁴ Gary Sgrignoli Reply Comments at 11.

5-section filter is used.⁴⁴⁵ This occurs because, as more sections are added to a filter in order to achieve greater out-of-channel attenuation of emissions, the filter produces increased amount of on-channel distortion (e.g., group delay). Precorrection circuitry installed in the digital transmitter - circuitry that partially compensates for distortion - can restore the output S/N from the 5-section mask filter back to at least 27 dB. Such circuitry would, of course, increase the cost of new transmitting equipment as well as the complexity and cost of modifying existing analog transmitting equipment for digital operation. Gary Sgrignoli notes that, for full-service DTV operations, the Advanced Television Systems Committee has recommended a minimum S/N of 27 dB and that linear precorrection of transmitter distortion is routinely utilized at facilities where, otherwise, this standard would not be met.⁴⁴⁶ No similar standard has been suggested for low power digital operations, and none was proposed in the *Notice*.

214. As noted by Sgrignoli and others, the primary benefit of the Stringent emission mask is that it could provide a means for using TV channels for low power operations that might not be achievable with the Simple mask, particularly some co-sited operations involving first adjacent channels.⁴⁴⁷ With such operations, licensees must adequately safeguard against "side band splatter" interference from transmissions in adjacent channels. The amount of power from a transmitter that spills into adjacent channels, especially the first-adjacent channels above and below the channel in use, is heavily influenced by the shape of the attenuation pattern of the mask filter used with the transmitter. Although the "flattened" attenuation values of the Stringent and Simple masks are 76 dB and 71 dB, respectively, these values are reached differently. The Stringent mask flattens out at a separation of +/- 3 MHz from the channel edge of the potentially interfering station, while the 71 dB attenuation of the Simple mask is not reached until a separation of +/- 6 MHz. The result of these differences is that significantly less out-of-channel transmitter splatter, integrated over the 6 MHz bandwidths of the two first-adjacent channels, is permitted by the Stringent mask.

215. As noted, many low power licensees may face difficulties securing companion channels for digital operations. We believe co-sited adjacent channel operations will offer a promising means of meeting spectrum availability challenges. Such operations may require more stringent attenuation of out-of-channel emissions to prevent adjacent channel interference, but at a somewhat greater cost to station operators. In other situations, lesser emission filtering may suffice, with a cost savings to station licensees. For this reason, we will adopt two digital emission masks for the LPTV service, the Simple and Stringent masks. We will permit station operators the flexibility to select the mask most suitable for their operations, even though this will increase the complexity of application processing.

216. We seek emission mask requirements for digital low power operations that balance performance, cost, and administrative complexity. On this basis we conclude that the attenuation of out-of-channel emissions of digital LPTV and TV translator stations should at least meet the specifications of the Simple emission mask described above, regardless of transmitter power level. If a station licensee chooses to utilize filtering which meets the attenuation requirements of the Stringent mask, whether installed on an existing transmitter which has been converted for digital use or installed as part of a newly purchased transmitter, that licensee will be permitted to conform to the less stringent D/U ratios we are adopting for that mask. In the *Notice* we proposed that station operators be required to file a minor change

⁴⁴⁵ Gary Sgrignoli Paper "DTV Repeater Emission Mask Analysis," *IEEE Transactions on Broadcasting*, March 2003, Volume 49, Number 1, at 35.

⁴⁴⁶ *Id.* at 33.

⁴⁴⁷ Gary Sgrignoli Reply Comments at 12. He also notes that the Stringent mask might be needed when "an NTSC signal is 'sandwiched' in-between" two digital signals and the adjacent channel splatter from both of these add to cause interference.

application to seek a change of emission mask. We adopt this proposal because the two masks are associated with adjacent channel D/U ratios used in our interference prediction studies.

217. While we understand the cost-saving rationale behind NTA's proposed "grandfathered" mask, we do not believe that it provides sufficient out-of-channel suppression to facilitate efficient spectrum use. Given the congested spectrum environment that now exists in many locations, we do not believe an emission mask with lesser attenuation specifications than those of the Simple mask is generally desirable. Permissible use of a third mask would also further increase administrative complexity in our application process. Due to the limited budgets of many stations in the LPTV service, we will, however, make an accommodation to stations converting existing analog transmitters for digital operation that may be unable to meet directly the requirement of the Simple mask at the channel edge. In this regard, we will permit station licensees to reduce their digital transmitter output power to levels that would "equivalently" meet this out-of-channel emission requirement.

218. In the *Notice* we asked if the emission mask(s) adopted for digital LPTV stations should be extended to digital stations in the Class A television service.⁴⁴⁸ Currently, Class A digital stations must meet the emission mask required for DTV broadcast stations.⁴⁴⁹ Class A TV, LPTV, and TV translator stations operate with the same power limits and will be subject to the same interference standards and prediction methodology. Accordingly, we will apply the LPTV emission mask requirements (and associated D/U ratios) to digital Class A TV stations. No commenter opposed this action.

219. The attenuation values for the Simple and Stringent emission masks are referenced to a bandwidth of 500 kHz, which we proposed and are adopting as the standard reference bandwidth for calculations and measurements of out-of-channel attenuation.⁴⁵⁰ This is the same reference bandwidth to be employed for DTV mask calculations and measurements.⁴⁵¹ If an alternate bandwidth is utilized for any reason, it should be converted to the 500 kHz reference value by use of the formula:

$$A \text{ (dB)} = A_{\text{alternate}} + 10 \text{ Log} (BW_{\text{alternate}} / 500)$$

where A(dB) is an attenuation measured or calculated referenced to a 500 kHz bandwidth and $A_{\text{alternate}}$ is an attenuation measured or calculated which is referenced to a bandwidth, $BW_{\text{alternate}}$, other than 500 kHz. For example, an out-of-channel attenuation, $A_{\text{alternate}}$ calculated or measured as 68 dB as referenced to a bandwidth, $BW_{\text{alternate}}$, of 1000 kHz, would correspond to 71 dB of attenuation in a 500 kHz bandwidth (*i.e.*, $71 = 68 + 10 \text{ Log} (1000/500)$).

220. The *Notice* noted the request of NTIA that we sufficiently limit emissions to protect operations in the three radio navigation satellite service ("RNSS") microwave bands (*i.e.*, from radio frequency harmonic emissions falling in these bands): 1164-1188 MHz, 1215-1240 MHz and 1559-1610 MHz,⁴⁵² and it asked whether the Simple and Stringent masks would provide adequate protection. In *ex parte* filings, Gary Sgrignoli and the U.S. GPS Industry Council ("Council") submit differing

⁴⁴⁸ *Notice*, 18 FCC Rcd at 18392.

⁴⁴⁹ 47 C.F.R. § 73.622(h)(1).

⁴⁵⁰ *Notice*, 18 FCC Rcd at 18395.

⁴⁵¹ 47 C.F.R. § 73.622(h)(2).

⁴⁵² See letter of July 30, 2003, from Frederick R. Wentland, Associate Administrator, NTIA Office of Spectrum Management, to Edmond J. Thomas, FCC Office of Engineering and Technology.

approaches for protecting the RNSS bands.⁴⁵³ Other parties provide results of measurements of 2nd and 3rd harmonic emissions and cost information on emission filtering.⁴⁵⁴

221. The Council subsequently submitted a modified RNSS protection proposal reflecting its discussions with the NTA and LPTV industry technical advisers.⁴⁵⁵ This proposal specifies requirements for filtered attenuation of 2nd and 3rd harmonic emissions falling in the RNSS bands. These requirements would apply only to digital LPTV and TV translator stations that operate on TV channels for which such harmonics are generated (*i.e.*, channels 22-24, 36-38 and 65-69). As set forth below, with minor modification, we adopt the protection requirements proposed in the Council's letter of July 26, 2004, into our digital LPTV rules:

In addition to the harmonic limits set by the emission mask, specific 'Out of Band' protection must be provided in the frequency ranges corresponding to the GPS bands: L5 (1164-1215 MHz); L2 (1215-1240 MHz) and L1 (1559-1610 MHz). This special requirement applies specifically to digital LPTV and translator stations operating on channels 22-24, 36-38, and 65-69.⁴⁵⁶

1) A type certified transmitter specifically certified for use on one or more of the above channels must include filtering with an attenuation of 85 dB in the GPS band which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and this attenuation must be demonstrated as part of the certification application.

2) For an installation on one of the above channels with a digital transmitter not specifically type certified for the channel, a low pass filter or equivalent device rated by its manufacturer to have an attenuation of at least 85 dB in the GOS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and must be installed in a manner that will prevent the harmonic content from reaching the antenna. A description of the low pass filter or equivalent device with the manufacturer's rating or a report of measurements by a qualified individual shall be retained with the station license. Field measurements of

⁴⁵³ See Gary Sgrignoli Supplemental Reply Comments, filed April 6, 2004 (proposing that emissions of digital TV translator and LPTV stations in the RNSS bands be limited to 10 microwatts in any 500 kHz bandwidth - the emission power equal to that of a 1 Megawatt UHF DTV station operating with the Commission's DTV mask, with emissions attenuated by 110 dB below the in-channel average digital power); see also Written *Ex Parte* presentations of F. Michael Swiek, Executive Director of the U.S. GPS Industry Council, filed April 26, 2004 (providing analysis and concluding that low power digital stations should meet approximately the same 110 dB attenuation below in-channel power applicable to full-service DTV stations).

⁴⁵⁴ See Supplemental Engineering Field Study of R. Kent Parsons, filed May 28, 2004 (concluding that with the addition of low pass filtering, interference would not occur to GPS reception and that suitable filters are available in the price range of \$275.00-\$475.00); see also Supplemental Reply Comments of Riverton Freemont TV Club, Inc., filed June 7, 2004 and the supplemental *ex parte* filing of the U.S. GPS Council dated May 20, 2004.

⁴⁵⁵ See letter dated July 26, 2004, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission from Raul R. Rodriguez, Esq. Counsel for the U.S. GPS Council.

⁴⁵⁶ We note that while the GPS Council refers to these emissions as "out-of-band" (see letter from the GPS Council to Ms. Marlene Dortch, July 26, 2004), these are more properly termed "harmonic emissions".

the second or third harmonic output of a transmitter so equipped are not required.⁴⁵⁷

NTA filed an *ex parte* letter recommending that we adopt the Council's proposal and include the above text in our rules for digital LPTV and TV translator stations.⁴⁵⁸ Subsequently, CBA filed an *ex parte* letter stating that it has consulted with the NTA on this matter and "concur[s] with NTA's position and recommendation."⁴⁵⁹ NTIA also supports the above RNSS protection requirements.⁴⁶⁰

222. In conjunction with the Simple and Stringent mask filters we are adopting for digital low power stations, we believe the 85 dB filter requirement will adequately protect the various RNSS operations.⁴⁶¹ The record clearly indicates that filters meeting this requirement are readily available at prices that should not be financially burdensome to most station operators. Significantly, this approach permits LPTV and TV translator operators to rely on manufacturers' specifications and does not require station operators to make field measurements of 2nd and 3rd harmonic output levels. Also, as proposed by the Council, we will apply the 85 dB filtering requirement only to digital LPTV and TV translator station operations on channels 22-24, 36, 38, and 65-69. This filter requirement and the associated emission limits are for the protection of GPS operations only from possible harmonic emissions from digital LPTV and TV translator station operations and does not apply to other possible sources of emissions in the GPS bands.⁴⁶²

3. Other Transmission System Facilities Issues

223. Section 74.750 of our rules requires that analog transmitters operated at LPTV and TV translator stations must either be "certificated for licensing" by the Commission or qualify for use under the TV broadcast rules in Part 73, which provide a verification procedure.⁴⁶³ The rule provides specific

⁴⁵⁷ *Id.* at 3. The Council notes that its modified GPS protection proposal recognizes "that power in the second and third harmonics are at least 25 dB below carrier power. Consequently, we modified the attenuation specification included in our original comments to reflect this knowledge." *Id.* at 2.

⁴⁵⁸ See letter dated July 30, 2004, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission from George R. Borsari, Jr., Esq. and Anne Thomas Paxson, Esq., Counsel for the National Translator Association.

⁴⁵⁹ See letter dated August 5, 2004, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission from Peter Tannenwald, Esq., Counsel for the Community Broadcasters Association.

⁴⁶⁰ See letter of August 27, 2004, from Frederick R. Wentlend, Associate Administrator, NTIA Office of Spectrum Management, to Edmund J. Thomas, FCC Office of Engineering and Technology.

⁴⁶¹ We note that the emission masks we are adopting for broadcast protection are based on signal attenuation below the digital average power in a station's 6 MHz channel. In contrast, the RNSS protection requirements are based on filter specifications (*i.e.*, an attenuation of 85 dB in the GPS bands).

⁴⁶² For example, other out-of-band emission limitations to protect GPS operations from transmitters operating on frequencies near the GPS bands are addressed in the GMPCS Rulemaking. See generally Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements, IB Docket 99-67, *Report and Order and Further Notice of Proposed Rulemaking*, 17 FCC Rcd 8903 (2002), *Second Report and Order*, 18 FCC Rcd 24423 (2003).

⁴⁶³ 47 C.F.R. § 74.750. The certification procedure is set forth in Sections 2.907 and 2.1031-2.1060 of the rules, 47 C.F.R. §§ 2.907 and 2.1031-2.1060; the verification procedure is set forth in Sections 2.902 and 2.951-2.962 of the rules, 47 C.F.R. §§ 2.902 and 2.951-2.962. Under the certification procedure, applicants (equipment manufacturers or responsible parties) submit descriptions of equipment, measurement data, and other information to the Commission in an application for grant of equipment authorization. The Commission reviews this submission and, if it finds the device to be in compliance with the applicable rules, issues a grant of equipment authorization.

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technical requirements that must be met before the Commission will certify LPTV and TV translator transmitters. In the *Notice* we sought comment on whether the LPTV certification requirement should be extended to the digital transmitters used at these stations or whether the TV/DTV verification procedure should be used.⁴⁶⁴ If we adopted a certification requirement, we asked if we should certify a transmitter or translator as a whole, including output filtering or also certify individual components (e.g., the front-end digital processor and final RF amplifier). In this regard, the *Notice* considered equipment standards related to signal reception and technical quality and those related to interference avoidance.

224. NTA supports the certification procedure, noting that full-service stations (subject to verification) must undertake a proof of performance. NTA submits that many LPTV and translator stations are installed by persons that lack the skills and/or test equipment to conduct a proof of performance, and that digital signals are more complex than analog signals.⁴⁶⁵ Some commenters support certification of transmitter components.⁴⁶⁶ One party supports the verification procedure.⁴⁶⁷

225. We will adopt our certification procedure for new digital LPTV and TV translator transmitters. Specifically, we are amending Part 74 of our rules to require that any newly manufactured transmitters sold for digital operations at LPTV or TV translator stations after the effective date of this *Report and Order* shall be subject to the equipment certification provisions of Part 2 of our rules. We are taking this action because we believe that certification of new equipment is an effective means of assuring that our technical standards, especially our out-of-channel emission mask requirements, will be met. We agree with NTA that the certification process has worked well with respect to analog stations in the LPTV service and that some station licensees, lacking the necessary skills or resources to verify compliance with our equipment standards, may wish to rely on transmitter manufacturers in this regard. We are primarily concerned about compliance with standards intended for interference avoidance, related to the characteristics of the transmitted output signals. Therefore, we will certify new digital translator and LPTV transmitters as self-contained units, including emission mask filters; tests of the transmitter output waveform must be made at the output port of the final filter. This will ensure that the components of a transmitter are properly interfaced to produce an output signal in compliance with our technical standards.

226. *Equipment Standards Related to Signal Reception and Technical Quality.* In the *Notice* we proposed not to require specific standards related to signal quality (i.e., standards designed to enhance the signal viewability or reliability). Unlike an analog signal, which is subject to various degrees of picture degradation, a digital signal received above a particular threshold level will produce a satisfactory visual image, while a signal below this level will produce no picture. A digital signal of poor quality (e.g., low signal-to-noise ratio) will generally decrease service reliability and, as NTA points out, reduce a

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Under the verification procedure, the equipment manufacturer or responsible party conducts appropriate measurements to determine whether a device is in compliance with the rules and then "self-approves" the device. There is no requirement for notification to or approval by the Commission. However, the manufacturer/responsible party must maintain records of the equipment design, test procedure, report of test results and other information and must submit this information to the Commission upon request.

⁴⁶⁴ *Notice*, 18 FCC Rcd at 18397.

⁴⁶⁵ NTA Comments at 19.

⁴⁶⁶ Riverton Comments at 4 (certify the transmitter final amplifier and emission mask); Parsons Reply Comments at 1 (certify the exciter front-end of a translator).

⁴⁶⁷ Greg Best Comments at 7 (however, in the event of a certification procedure, certify the entire transmitter, including emission mask filter).

station's coverage area.⁴⁶⁸ Some commenters stress the importance maintaining an adequate signal-to-noise ratio ("SNR") and a means for determining SNR of a transmitted signal.⁴⁶⁹ Clearly, in-band signal performance characteristics such as SNR should be important to station operators. We believe these concerns should be left to the market place; station operators will want to provide service technically attractive to their viewers. In this regard, we will require transmitter manufacturers or other responsible parties to certify only that digital TV translator and LPTV transmitters provide signals that are viewable on receiving equipment designed for the Commission's DTV transmission standard (*i.e.*, the ATSC 8-VSB standard).

227. *Equipment Standards for Interference Avoidance.* In the *Notice* we indicated two principal areas of concern related to transmitter standards for interference avoidance: sufficient attenuation of out-of-channel emissions and the ability of a transmitter to operate within its rated output power.⁴⁷⁰ We proposed that digital LPTV transmitters and TV translators must comply with the emission mask(s) we adopt herein. We also asked if we should establish a tolerance level for deviation from the rated output power and a specific means of power control, such as automatic level control. We noted that excessive power could result in co-channel interference and also cause a rapid rise in the level of out-of-channel emissions. We sought comment on whether to adopt any other equipment standards for digital translators and transmitters in the LPTV service.

228. Several parties commented on these issues, generally agreeing that compliance with our out-of-channel emission limits should be a required element for transmitter certification. Parsons proposes that the output power of a translator "must be maintained and not exceed more than 5% of its authorized power."⁴⁷¹ CBA states that it "does not object to automatic power limiters, but it does not believe that a licensee should be required to use equipment that automatically boosts a falling power level because of the potential distortion that such equipment may introduce into a digital signal."⁴⁷² Greg Best asserts that "[I]t is required to implement some form of power output limit on this equipment. This power limit should be based on a sample taken at the output of the mask filter. Automatic gain control should be permitted in digital translators." For equipment placed into service after these rules are adopted, he recommends that the power output variation be limited to no more than 0.5 dB.⁴⁷³ As a condition for permitting the digital conversion of analog translators, Riverton recommends limiting output power variations to +/- 1 dB "for an input increase of 20 dB, and a decrease of 10 dB when the translator has been optimized for digital transmission."⁴⁷⁴ Regarding other standards issues, Greg Best proposes that we limit the translator frequency tolerance to +/- 1 kHz, noting that "the frequency tolerance of multiple hop translator systems can stack up in the same direction."⁴⁷⁵

229. We adopt what we believe to be the minimally necessary transmitter requirements for interference avoidance, recognizing that compliance with additional standards could increase equipment costs and be burdensome for stations operating on limited budgets. Thus, the following requirements must

⁴⁶⁸ NTA Comments at 18.

⁴⁶⁹ See, for example, Parsons Reply Comments at 1.

⁴⁷⁰ *Notice*, 18 FCC Rcd at 18396.

⁴⁷¹ Parsons Comments at 14.

⁴⁷² CBA Comments at 15.

⁴⁷³ Greg Best Comments at 7.

⁴⁷⁴ Riverton Comments at 2.

⁴⁷⁵ Greg Best Comments at 8. See also KNME Comments at 3.

be met before we will certify LPTV and TV translator digital transmitters. First, out-of-channel emissions measured at the output terminals of the transmitter (including all output filtering) and at the transmitter's rated output power must meet at least the specifications of the "Simple" emission mask. Transmitters may be certificated for use with either the Simple or Stringent masks, as well as with the additional filtering for harmonic emission protection of Radio Navigation Satellite Service ("RNSS") frequency bands. We will assign different FCC identifier numbers to transmitters with different emission filtering specifications: (1) Simple emission mask, (2) Simple emission mask plus RNSS filtering protection, (3) Stringent emission mask and (4) Stringent emission mask plus RNSS filtering protection. A transmitter certificated to meet RNSS protection requirements must employ filtering that attenuates harmonic emissions in the RNSS bands by at least 85 dB.⁴⁷⁶

230. An LPTV or TV translator digital transmitter will be certified at its rated digital average output power level. Similar to our analog equipment requirement, we will require that a heterodyne digital translator maintain the average digital output power constant within 1 dB when the strength of the input signal is varied over a range of 30 dB.⁴⁷⁷ Further, we will not permit the digital average output power of any digital translator or LPTV transmitter to exceed the maximum rated value under any condition.⁴⁷⁸ Based on the record, we believe this power tolerance, which is slightly more restrictive than the peak power tolerance for analog transmitters, could readily be met by transmitter manufacturers. This tolerance should also ensure a relatively stable emission mask. We will not specify a method of maintaining transmitter output power within the required limits, but will leave this decision to transmitter manufacturers. We will require the transmitter to be suitably equipped to display the average digital transmitter output power. To further ensure the stability of the emission mask, we will require the local oscillator frequency in the RF channel upconverter of the transmitter to be maintained within 10 kHz over a temperature range between 0 and 40 degrees Centigrade and variations in the main power supply voltage between 85 and 115 percent.⁴⁷⁹ Because of cost considerations and to facilitate flexible use of existing equipment, we will not require the 1 kHz tolerance that is recognized by the ATSC as acceptable in cases where no interference is expected.⁴⁸⁰ However, we encourage manufacturers to design such upconverters with this tolerance. We expect that compliance with a 10 KHz tolerance will not be problematic for digital LPTV stations or translators operating in the regenerative transmission mode. However, this tolerance could constrain the operation of heterodyne translators in "multiple hop" networks, because frequency deviations from nominal values accumulate as signals are retransmitted through such networks. For this purpose, we encourage licensees to employ regenerative-based digital translators.

4. Modification of Transmission Systems

231. In the *Notice* we sought comment on issues involving modification of existing analog LPTV and TV translator transmitters for digital operation.⁴⁸¹ We noted that our rules permit manufacturers

⁴⁷⁶ As discussed above, this protection requirement applies only to station operations on channels 22-24, 36, 38, and 65-69.

⁴⁷⁷ The power output of regenerative translators is independent of the strength of the input signal.

⁴⁷⁸ Analog low power LPTV and TV translator transmitters must maintain the peak visual power output constant within 2 dB when the strength of the input signal is varied over a range of 30 dB and prevent the peak visual power output from exceeding the maximum transmitter power output rating under any circumstances. *See* 47 C.F.R. § 74.750(c)(4).

⁴⁷⁹ This power supply voltage range is specified for analog low power transmitters in § 74.750(c). The selected temperature range, we believe, encompasses the ambient temperature at most transmitter installations.

⁴⁸⁰ *See*, "Guide to Use of the ATSC DTV Standard" at Section 8.5.6., available at www.atsc.org.

⁴⁸¹ *Notice*, 18 FCC Rcd at 18397.

to obtain authorizations for changes to the mechanical or electrical characteristics of certified equipment and to supply field modification kits to station operators (e.g., to substitute solid state modules for vacuum tube modules). Station licensees are not required to have approval to make such equipment changes, but are required to notify the Commission upon completion.

232. Several commenters recommend that existing stations be permitted to convert their existing analog equipment for digital operation if certain technical requirements are met.⁴⁸² NTA recommends that if a transmitter is modified by the installation of a kit supplied by an equipment manufacturer and tested according to the manufacturer's instructions, it should be considered as meeting our equipment certification requirements.⁴⁸³ For analog equipment modified for digital use without a manufacturer-supplied kit, NTA recommend that such modifications be allowed if the licensee makes "appropriate measurements, particularly calibration of the power meter and of the out of band spurious emissions" and these measurements are "retained as part of the station's permanent record."⁴⁸⁴ Greg Best submits that conversion of analog transmitters for digital operation would be "significantly more cost effective than requiring new generation power amplifiers to be employed at all sites."⁴⁸⁵

233. We will adopt provisions to permit the modification of existing analog LPTV and TV translator transmitters for digital operation. We recognize that many translator and LPTV stations operate on very limited budgets and that, accordingly, their digital operations may depend on the use of their existing equipment (e.g., use of the final RF amplifier in an analog transmitter they have on hand). We will extend our policies and procedures for analog field modification kits to analog-to-digital conversion and to modifications of digital transmitters. Manufacturers may seek authorization to modify certificated analog equipment for digital operation. Upon our approval, they may supply station operators with kits containing modules or discrete components that can be retrofitted into an analog LPTV or translator transmitter, together with installation and testing procedures and a label with a new FCC identifier and model number.

234. We are therefore amending our rules to authorize this process as long as the following requirements are met: (1) Field modifications are carried out by a person or persons qualified for such work; (2) modification kits, when installed at heterodyne TV translator stations, are fitted only to transmitters which, when modified for digital operation, will produce a power output of no more than 30 watts of digital average power for UHF transmitters and 3 watts for VHF transmitters; (3) the final amplifier stage of an analog transmitter modified for digital output shall not have an average digital output power greater than 25% of its previous peak sync NTSC output power unless the amplifier has been specifically refitted or replaced for higher power operation;⁴⁸⁶ (4) after installation of the modification kit,

⁴⁸² See, for example, CBA Comments at 14; Elko Comments at 2; Greg Best Comments at 3 and Reply Comments at 4; NTA Comments at 19-20; Riverton Comments at 2.

⁴⁸³ With regard to equipment changes that we have approved, the manufacturer includes with the modification kit a label giving a new FCC identifier, which is to be affixed to the transmitter.

⁴⁸⁴ NTA Comments at 20; See also, Riverton Comments at 2.

⁴⁸⁵ Greg Best Comments at 3.

⁴⁸⁶ This requirement stems from the approximate 6 dB relationship between levels of NTSC peak and digital average power. Absent special circumstances (e.g., an upgrading of the power handling capacity of the amplifier, we are concerned that permitting a greater power conversion ratio could result in excessive degradation of the quality of the digital signal, as well as an increase in the amount of unwanted out-of-channel power. As Parsons notes in his comments, "one should strive for the out-of-band shoulders to be near 36 dB down at the output of the translator, with a minimum in-band signal to noise ratio of 27 dB. We have been able to accomplish these numbers

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the transmitter is performance-tested in accordance with instructions supplied by the manufacturer and demonstrated to comply with our digital low power transmitter certification requirements, including compliance with RNSS filtering protection requirements, as applicable; (5) a record of the materials provided by the manufacturer and the results of tests and measurements is maintained with the station's records for a period of not less than two years and will be made available to the Commission upon request; and (6) that the licensee notifies the Commission upon completion of the transmitter modifications.

235. We will not require that the original manufacturer of the transmitter and the manufacturer of the modification kit be the same entity, as this would be impractical, perhaps impossible in some cases. Rather, with respect to meeting our certification requirements, we will require that the manufacturer of the modification kit install and test the kit on each model of transmitter to which it can be retrofitted and submit those results in accordance with the certification procedures in Part 2 of our rules. A unique authorization will be issued for each combination of transmitter and associated kit. The person who installs the kit at the LPTV or TV translator station becomes, as provided by Rule Section 2.909, the party responsible for compliance of the transmitter with all applicable provisions of the rules unless that party is working under the specific authority of the certification grantee.⁴⁸⁷ These procedures require that suitable tests and measurements be done by qualified person(s) after the transmitting equipment is installed in order to determine its compliance with all applicable technical requirements and the results of these tests and measurements be kept on file by the licensee and made available for Commission inspection and review upon request.

236. We will also permit modification of analog transmitting equipment for digital operation without the use of a manufacturer's kit (*i.e.*, "custom" modifications). In so doing, we are concerned about potential problems that could arise if such work is not done properly. Nevertheless, we agree with NTA and other commenters that such modifications should be permitted if certain restrictions are met: (1) The modifications are carried out by a person or persons qualified to perform such work; (2) no modifications are performed that will enable a heterodyne digital TV translator to operate with a power output exceeding 30 watts for UHF stations and 3 watts for VHF stations; (3) the final amplifier stage of an analog transmitter modified for digital output is not operated at an average digital output power greater than 25% of its previous peak sync NTSC power output level unless the amplifier has been specifically refitted or replaced for higher power operation; (4) after completion of the modifications, the transmitter is performance-tested and demonstrated to comply with our digital low power transmitter certification requirements, including compliance with RNSS protection filtering requirements, as applicable; (5) a record including a description of the nature of the modifications and test procedures and the results of tests and measurements is maintained with the station records for a period of not less than two years and will be made available to the Commission upon request; and (6) that the licensee notify the Commission upon completion of the modification(s) and certify compliance with our transmitter certification requirements.

237. With regard to the conversion of existing analog transmitters for digital operation, we believe it necessary to make some accommodation for those stations operating analog transmitters that

(...continued from previous page)

even with older translator power amplifiers using bi-polar output transistors while producing 25% of the rated analog power." Parsons Comments at 14.

⁴⁸⁷ This rule states, in pertinent part: "The following parties are responsible for the compliance of radio frequency equipment with the applicable standards: (a) In the case of equipment which requires the issuance by the Commission of a grant of equipment authorization, the party to whom that grant of authorization is issued (the grantee). If the radio frequency equipment is modified by any party other than the grantee and that party is not working under the authorization of the grantee pursuant to § 2.929(b), the party performing the modification is responsible for compliance of the product with the applicable administrative and technical provisions in this chapter.

would not comply with out-of-channel emission specifications of the Simple emission mask at the channel edge. Based on testing of a sample of existing analog translator with a band pass filter at the transmitter output, Greg Best concludes that “[T]he general shape of the simple mask can be met by most equipment but not the shoulder levels.”⁴⁸⁸ He indicates that out-of-channel emissions for the tested equipment fell about 6 dB short of the requirements of the Simple mask. He states that “No amount of filtering can practically compensate for the adjacent channel interference introduced by the power amplifier ‘shoulder’ (i.e., 500 kHz segment just outside the digital channel).”⁴⁸⁹ He submits that the emission mask of such equipment be “grandfathered” for a period not to exceed five years.⁴⁹⁰ Sgrignoli suggests the following approach for addressing this concern:

“In order to combat this increased adjacent channel splatter (shelves less than 35 dB due to the use of some older translator units) and to keep all the splatter interference the same, I agree with the principle that the in-band average power be reduced one dB for every dB that the close-in shelves are less than 35 dB down from the flat-top part of the in-band spectrum. This way, the total adjacent channel splatter energy would have the same interference power (assuming the same splatter spectral shape exists), but the in-band power is de-rated.”⁴⁹¹

238. Because of budgetary considerations, we understand that some station operators may want to use their existing analog power amplifiers for digital operations. In order to ensure “equivalent” compliance with the attenuation requirement of the Simple mask at the channel edge, we will adopt the above approach in connection with the on-channel conversion of existing analog transmitters for digital operation, and illustrate its use. First, we will generally assume that the nominal digital transmitter output power of such a station is 6 dB below the analog output power used to determine the station’s authorized ERP. Second, based on measurements, the station operator should determine the emission mask attenuation at the channel edges and determine the difference of the measured value from the required value of 35 dB (below flat-top or, alternatively, 46 dB below the average in-band digital power). Suppose the measured emission shortfall is 5 dB. To ensure equivalency with the Simple mask requirement, the operator would be required to further reduce the digital output power by this amount and apply for a digital authorization with an ERP at least 11 dB less than the authorized ERP of the analog station being modified for digital use (i.e., 6 dB plus 5 dB). We will require operators meeting our mask requirements in this manner to certify equivalent compliance on the basis of signal measurements and the appropriate power reduction. We emphasize that this procedure will only apply to the on-channel conversion of existing analog transmitters for digital operation.⁴⁹²

⁴⁸⁸ Greg Best Comments at 3.

⁴⁸⁹ Greg Best Reply Comments at 3.

⁴⁹⁰ *Id.*

⁴⁹¹ Sgrignoli Reply Comments at 12.

⁴⁹² We recognize that a potential exists with this approach for an inaccurate future depiction of “masking” interference. This inaccuracy will arise where our interference prediction software assumes the authorized digital low power facility is meeting the Simple mask and that the associated adjacent channel D/U signal strength ratios apply. Because of the equivalent power reduction, the digital station would meet the requirements to protect adjacent channel stations. However, as part of the broadcast environment, the masking effects of this station would factor into the analysis of other proposed stations. In this regard, the digital station’s adjacent channel emissions would actually be equivalent to those that a higher power digital station would produce, thus potentially creating some adjacent channel interference that is not predicted by the prediction software. In other circumstances, the

(continued....)

239. As noted, we are permitting station operators substantial flexibility to use their existing analog equipment for digital operation, which we believe, will facilitate off-air digital service to translator-served communities. Nonetheless, we would prefer the use of transmitters designed for digital operation, including translator use of a regenerative DTV receiver/processor. In our future consideration of the end of the DTV transition for LPTV and TV translator stations, we may wish to consider a termination date for permitting custom conversion of analog transmitters for digital operation, including the mask equivalence procedure described above. We do not believe that there should be an unlimited period available for the custom-conversion of old (and perhaps obsolete) analog transmitting gear, when there will be an increasing availability of new equipment at a reasonable cost that will produce uniformly high quality digital signals. We may address this issue in a future proceeding.

5. PSIP

240. In the *Report and Order* in our Second DTV Periodic Review proceeding, we adopted into our DTV transmission standard the ATSC Program System and Information Protocol ("PSIP") standard (ATSC A/65B).⁴⁹³ Therein, we described the principal features and benefits of PSIP:

PSIP is data that is transmitted along with a station's DTV signal that tells DTV receivers information about the station and what is being broadcast. PSIP provides a method for DTV receivers to identify a DTV station and to determine how a receiver can tune to it. PSIP identifies both the DTV channel and the associated NTSC channel and enables DTV receivers to associate the two channels, thereby making it easier for viewers to tune to the DTV station even if they do not know the channel number. In addition to identifying the channel number, PSIP tells the receiver whether multiple program channels are being broadcast and, if so, how to find them. It also identifies whether the programs are closed captioned, and conveys available v-chip information, among other things.⁴⁹⁴

The ATSC A/65B PSIP standard offers a standard means of channel navigation and many other benefits to consumers, including the transmission of an electronic program guide. We therefore concluded that its adoption into our DTV transmission standard would serve the public interest. We also indicated that we would address the implications of PSIP to LPTV and TV translator stations in the digital low power proceeding⁴⁹⁵

(...continued from previous page)

facilities proposed in a future application would be accepted where predicted interference from this facility would fall in an area that already is predicted to receive interference from an already-authorized station (*i.e.*, where the existing station would meet the mask requirements). However, in this case, such a future application proposal would need to protect an area that receives unpredicted interference. We believe this situation will not occur often and will have only a minor impact on the facilities future digital low power stations can operate. In our view, the greater impact will be "masking" due to co-channel interference, and that will be accurately determined by this approach.

⁴⁹³ See *Second Periodic Review of the Commission's rules and Policies Affecting the Conversion to Digital Television, Report and Order*, FCC 04-192, released September 7, 2004 ("*Second Periodic Report and Order*"): See also "Program and System Information for Broadcast and Cable," Advanced Television Systems Committee, Doc. A/65B, Rev. B to PSIP for Terrestrial Broadcast and Cable ("ATSC A/65B") (Mar. 18, 2003).

⁴⁹⁴ *Id.*

⁴⁹⁵ *Id.*

241. The Second Periodic Review *Notice of Proposed Rule Making* requested comment on issues concerning the implications of PSIP on the operation of TV translator facilities.⁴⁹⁶ We requested comment on how the proper PSIP information is to be provided on TV translator rebroadcasts and who should be responsible for ensuring that the information is provided. We also requested comment regarding the costs of providing PSIP information on TV translators as well as any other concerns that translator operators might have in implementing PSIP in their digital operations. Commenters agree that the PSIP standard now adopted by the Commission accommodates translators.⁴⁹⁷

242. We are generally requiring a digital TV translator to rebroadcast all programs and signals of a DTV broadcast station, which includes a station's PSIP information. Only in limited situations would a digital translator need to modify the incoming PSIP information from its primary DTV station. For example, it is possible that a translator may rebroadcast a distant DTV station having the same major channel number (NTSC channel) as another broadcast station being received directly in the translator-served community. The ATSC A/65B standard addresses this situation as follows: "For a translated signal, the major/minor channel numbers shall remain the same as the original broadcast station unless the major channel conflicts with a broadcaster operating in the service area of the translator. In that case, the translator shall change the major number to a non-conflicting number."⁴⁹⁸ This provision for use of major channel numbers provides a uniform methodology to access DTV services, and we are adopting it for translator rebroadcasts. As a second possibility, the operator of a digital translator system may seek to rebroadcast two DTV stations with the same major channel number (*e.g.*, in multiple-hop networks). This situation will also require one of the translators to change the major channel to a non-conflicting number, perhaps the number of the translator output channel. We believe the resolution of this situation is best left to mutual agreement among the licensees of the translator and involved DTV stations. We understand that regenerative translators can be equipped for this purpose, and we will require use of regenerative technology in these situations.⁴⁹⁹ Finally, we are permitting translator operators to enter into agreements with the licensees of two or more DTV broadcast stations to multi-cast individual program streams of these stations on the translator output channel, which will also require the use of regenerative technology. Through the transport stream identifiers ("TSID") of the DTV stations involved in this arrangement, the ATSC A/65B PSIP standard provides a receiver navigation mechanism to permit such multiplexing of individual program streams from different sources. However, it does not provide a basis for determining the major channel number embedded in the translator output signal. We believe the resolution of this situation is also best left to the involved station licensees.

243. The *Notice* in this proceeding did not specifically consider the implications of PSIP for digital LPTV stations, including cost information, nor did our *Notice* in the *Second DTV Periodic Review*

⁴⁹⁶ See *Second DTV Periodic Review NPRM*, at ¶123.

⁴⁹⁷ See *Second Periodic Report and Order*, *supra*. We received comments on these issues from the Consumer Electronics Association, and the Harris Corporation, and the joint comments of the Association for Public Television Stations, Corporation for Public Broadcasting and the Public Broadcasting Service.

⁴⁹⁸ See ATSC A/65B, Annex B, Assignment of Major Channel Numbers for Terrestrial Broadcast in the U.S. (March 18, 2003). The major channel number in the PSIP Virtual Channel Table is generally a broadcaster's NTSC RF channel number; a DTV viewer tunes to this channel. Minor channel numbers identify specific programs and services (*e.g.*, channel 7.0 corresponds to the NTCS channel, 7.1, 7.2, ... may indicate DTV HDTV or SDTV program channels).

⁴⁹⁹ Heterodyne translators are simple "pass through" devices and, thus, are not designed to modify PSIP and other signal information.

proceeding seek comment in this regard. Commenters generally did not address this issue.⁵⁰⁰ As described above, the A/65B PSIP standard offers significant benefits to broadcasters and consumers, including channel navigation protocols to facilitate tuning of single and multiple program channels in the digital bit stream. It also specifies a means for the transmission of v-chip program ratings and closed captioning information.⁵⁰¹ In order to make these benefits available to viewers and provide an attractive service, we believe many licensees of digital LPTV stations may choose to implement the ATSC A/65B PSIP standard, at least those elements that facilitate tuning and channel navigation by DTV receivers.⁵⁰² We strongly encourage these licensees to implement ATSC A/65B PSIP in their station operations.⁵⁰³ We are also mindful of the costs of full or partial implementation of PSIP, and we do not want to impose requirements that would financially burden stations that operate on limited budgets. We are concerned that we do not have an adequate record of these costs and their impact on LPTV station licensees, particularly the smaller stations.⁵⁰⁴ As we begin to create opportunities for digital LPTV service, we do not want to impose costs that could discourage licensees from operating digital stations. Thus, for this reason, we will not at this time require digital LPTV stations to comply with the ATSC A/65B standard. Situations may arise, however, that may compel a station to become compliant with the PSIP navigational elements.⁵⁰⁵ We also note that digital LPTV stations will be required to transmit closed captioning information that can be displayed on DTV receivers. The full implementation of PSIP would facilitate licensee compliance with this requirement.⁵⁰⁶ We will revisit the PSIP implications for digital LPTV stations in a future DTV proceeding.

I. Digital Booster Stations

244. Our LPTV service rules include an analog TV booster station class, devices that amplify the signals of a TV broadcast station for retransmission on the same channel.⁵⁰⁷ Only full-service TV broadcasters may operate TV boosters and for the limited purpose of serving areas of low signal strength within their Grade B contours (e.g., terrain-shadowed areas). Booster may not be located outside of a

⁵⁰⁰ See MSTV/NAB Comments at 21 (“[D]igital LPTV stations, like full service stations, must have PSIP generation capability so that they will be compliant with the ATSC channel-mapping protocol.”)

⁵⁰¹ The PSIP Event Information Tables (“EITs”) contain Content Advisory Descriptors for broadcast programming for broadcasters that choose to provide v-chip blocking information and the Rating Region Table (“RRT”), which explains the content advisory rating systems being used. The ATSC PSIP standard also requires that the EITs contain the caption service descriptor to facilitate a DTV receiver’s search for closed caption information.

⁵⁰² The following system tables and descriptors under ATSC A/65B related to tuning and channel navigation entail a one-time setup in the PSIP generation equipment: Transport Stream Identifier (TSID), Short Channel Name, Service Type, Modulation Mode, Source ID, and Service Location Descriptor.

⁵⁰³ We clarify here that the transmissions of digital Class A stations are required to comply with our DTV broadcast transmission standard, which now incorporates the ATSC A/65B PSIP standard. Thus, digital Class A stations must comply with the ATSC PSIP standard in the same manner as full-service DTV broadcasters.

⁵⁰⁴ See Harris Comments at 9 in the *Second DTV Periodic Review* proceeding, April 21, 2003 (“Based on Harris’ experience as a manufacturer of broadcast station PSIP equipment, it currently would cost a DTV broadcast station \$29,900 for full implementation of PSIP, including all Program and System tables, or \$16,500 for full implementation of the PSIP System tables and limited implementation of the Program tables”).

⁵⁰⁵ For example, if the transmissions of a digital LPTV station impeded the PSIP-related tuning of a DTV broadcast station, we may require the LPTV station to implement PSIP to the extent it could eliminate the conflict.

⁵⁰⁶ Captioning information can also be placed in the PMT table of the DTV bit stream.

⁵⁰⁷ 47 C.F.R. § 74.701(i).

station's Grade B contour, nor may the predicted Grade B contour of a booster extend beyond that of its primary TV broadcast station.⁵⁰⁸ Applications for booster stations may be filed any time and without geographic restrictions on where these stations can be operated.

245. The *Notice* sought comment on whether we should establish a digital booster station class in the LPTV rules.⁵⁰⁹ We contemplated that low power digital boosters could serve the same "fill-in" purpose of analog boosters and might also be useful in delivering digital television service to communities where other TV channels are unavailable. We asked what requirements should apply to the authorization and operation of digital low power booster stations; for example, whether eligibility to operate such stations should be extended to include Class A TV, LPTV, and TV translator licensees. If we were to analyze potential interference from boosters using the prediction methodology applicable to translators, we asked whether there is any reason to continue prohibiting boosters from serving areas outside a station's service contour (*i.e.*, as an alternative delivery mechanism to digital TV translators.) We also asked if we should apply to digital boosters the technical standards adopted for digital LPTV and translator stations.

246. Commenters are divided on whether we should establish a digital booster station class at this time and how it should be regulated. Several parties believe that digital boosters would be useful and they recommend that we create this station class in the LPTV service.⁵¹⁰ APTS/PBS notes that it previously submitted evidence that digital boosters are "a technically feasible and spectrum efficient means of distributing a digital signal to remote areas within a station's digital contour that are not ordinarily reached due to terrain or other factors."⁵¹¹ Most parties favor limiting the use of digital boosters to full-service broadcasters or imply that we would do so.⁵¹² Other parties submit that we should permit the use of a booster at locations outside of the protected contour of a licensee's main station.⁵¹³

247. MSTV/NAB recommends that we not establish a digital booster station class and related rules at this time.⁵¹⁴ It notes that we are considering rules for distributed transmission systems ("DTS") in our *Second DTV Periodic Review* proceeding "as an alternative to the use of on-channel booster stations."⁵¹⁵ AFCCE suggests that digital boosters are "part of a larger issue regarding use of single

⁵⁰⁸ 47 C.F.R. § 74.731(j).

⁵⁰⁹ *Notice*, 18 FCC Rcd at 18410.

⁵¹⁰ APTS/PBS Comments at 12; Entravision Comments at 8; Greg Best Consulting Comments at 8; KHEM-LP Reply Comments at 2; NTA Comments at 26; Southern Oregon Comments at 1; Sunbelt Comments at 2; T50/51 Telemundo Reply Comments.

⁵¹¹ APTS/PBS Comments at 12 (citing its Petition for Rulemaking, *Enhancement of Broadband Access Through the Preservation of Public Television Translator Service and the Development of Digital Translators and Digital On-Channel Repeaters* (May 29, 2002). The *Notice* in this proceeding generally sought comment on this petition.

⁵¹² APTS/PBS Comments at 12; Entravision Comments at 8; NTA Comments at 26; Southern Oregon Comments at 1; Sunbelt Comments at 3.

⁵¹³ APTS/PBS Comments at 13; Entravision Comments at 8; Greg Best Consulting Comments at 8; Sunbelt Comments at 3 (See also Rancho Palos Verdes Broadcasters Reply Comments at 4, which oppose Sunbelts comments in this regard.)

⁵¹⁴ MSTV/NAB Comments at 23. See also Joint Commenters Reply Comments at 38.

⁵¹⁵ *Id.* at 24. Distributed transmission systems involve the operation of multiple highly synchronized transmitters that could operate in single frequency networks. The Commission has sought comment on a range of issues for distributed systems including regulatory status, location and service area, power, interference protection and other technical standards. See *Second DTV Periodic Review NPRM*, ¶¶ 99-106. On August 4, 2004, the Commission adopted a *Report and Order* in this proceeding that (1) approved "in principle" the use of DTS technology, and (2) committed to commencing in the near future a separate "fast track" proceeding to propose rules for use of DTS. See

(continued...)

frequency networks for full-service stations.”⁵¹⁶

248. At this time, we will not establish a digital booster station class in our LPTV service rules.⁵¹⁷ If such stations were to be authorized, we expect these would be primarily used by broadcasters to serve terrain-shadowed portions of their DTV service areas, in the manner of analog boosters. We concur with MSTV/NAB that we should resolve issues regarding distributed transmission systems before further considering whether to authorize on-channel digital boosters.

249. NTA maintains that there may be circumstances where the best output channel for a digital translator would be the input channel of its primary DTV broadcast station. It recommends that we make this option available to any prospective licensee under our translator rules.⁵¹⁸ NTA notes that the primary broadcast licensee, through its retransmission consent, would exercise control over where such operations could take place. We recognize that in some areas spectrum for digital companion channels will be extremely limited, especially during the full-service DTV transition. The NTA proposal has merit in that it would facilitate efficient use of available TV channels. Therefore, we will permit digital translator and LPTV stations to retransmit programming directly received on the same TV channel, but only if the licensee of the original input signal (e.g., full-service DTV station licensee) has given its consent.⁵¹⁹ We will authorize such operations under our technical rules for digital translator and LPTV stations. While allowing operations that are technically equivalent to boosters, applications for these stations must be filed as a new TV translator or LPTV station. These stations will be subject to the same interference analysis we perform on other stations in the LPTV service.

J. Petition for Rule Making by APTS, PBS and CPB

250. APTS, PBS and CPB (referred to collectively as the “LPTV Petitioners”) filed a Petition for Rulemaking (the “Petition”) asking that the Commission initiate a proceeding to “ensure the delivery of noncommercial educational and public safety services to all Americans by protecting the existing system of translators and facilitating the development of . . . digital translators and digital on-channel repeaters.”⁵²⁰ In the *Notice* we sought comment on some of the requests sought by the LPTV Petitioners.⁵²¹ This

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Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Report and Order, FCC 04-192, released September 7, 2004.

⁵¹⁶ AFCCE Comments at 5 (AFCCE states that until rules for distributed transmission systems are established, we should permit booster operation by special temporary authority (STA), confining the noise-limited signal contour of a booster to within the noise-limited contour of the associated DTV broadcast station, based on its authorized or allotted facilities).

⁵¹⁷ Nor will we amend of our rules (Section 74.733 - “UHF translator signal boosters”) to permit translator licensees to operate low power analog booster stations, as recommended by NTA. NTA submits that operation of booster stations with an effective radiated power not exceeding 20 watts would be both useful and feasible. NTA Comments at 27. However, the *Notice* did not address this issue and we find it to be outside of the scope of this proceeding.

⁵¹⁸ NTA Comments at 27.

⁵¹⁹ We contrast such operations with the situation where the broadcast signal on the same TV channel as that of the translator output channel is not directly received by the translator, but via a relay station on a different frequency. The latter case is a translator rebroadcast of a TV broadcast station, but is not technically similar to the operation of a TV booster.

⁵²⁰ APTS/PBS Petition for Rule Making at 3.

⁵²¹ *Notice*, 18 FCC Rcd 18413.

included whether: (1) to authorize dual analog/digital channels for translators; (2) to allow interested translator operators to “flash-cut” from analog to digital; (3) to allow applications for new digital on-channel repeaters; (4) to provide on-channel repeaters the same interference protection granted to the main transmitter with which it is associated; and (5) to allow applications for new digital translators.

251. Given our actions herein, we believe we have addressed the issues raised by the LPTV Petitioners.⁵²² We adopt rules to allow existing translator stations to seek digital companion channels or to convert on-channel from analog to digital. We adopt rules for the filing of applications for new digital translators on a first-come, first-served basis. Finally, we decided to not create a digital low power television booster service at this time. We conclude that our actions address the LPTV Petitioners’ overall goals that we facilitate the transition from analog to digital operation for these translators.⁵²³ We therefore dismiss the Petition as moot.

IV. ADMINISTRATIVE MATTERS

252. *Accessibility Information.* Accessible formats of this *Report and Order* (computer diskettes, large print, audio recording and Braille) are available to persons with disabilities by contacting Brian Millin, of the Consumer & Governmental Affairs Bureau, at (202) 418-7426, TTY (202) 418-7365, or at bmillin@fcc.gov.

253. *Paperwork Reduction Act of 1995 Analysis.* This document contains new and modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements and forms contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we have assessed the effects of adopting these rules, and find that there may be an administrative burden on businesses with fewer than 25 employees. However, since this action is consistent with our mandate to ensure the successful transition from analog to digital television, we believe small businesses will also benefit from the requirements we adopt herein in that they will be permitted to participate in the digital transition. In addition, the rules allow flexibility to operate low power digital television facilities, allowing stations new and unique sources of income, and for new entrants to seek digital television stations, which should substantially alleviate any burdens imposed on all businesses, including those with fewer than 25 employees.

254. Written comments by the public on the proposed information collection(s) are due 60 days from date of publication of this *Report and Order* in the Federal Register. Written comments must be submitted by the public, Office of Management and Budget and other interested parties on the proposed information collection(s) on or before 60 days from date of publication of this *Report and Order* in the Federal Register. In addition to filing comments with the Secretary, a copy of any comments on the information collection(s) contained herein should be submitted to Judith F. Herman, Federal Communications Commission, Room 1-A804, 445 12th Street, SW, Washington, DC 20554, or via the Internet to Judith-B.Herman@fcc.gov, and to Kristy L. LaLonde, OMB Desk Officer, Room 10234 NEOB, 725 17th Street, NW, Washington, DC 20503, or via the Internet to [Kristy L. LaLonde@omb.eop.gov](mailto:Kristy.L.LaLonde@omb.eop.gov), or via fax at 202-395-5167.

⁵²² In the *Notice* we declined to address certain issues raised by the LPTV Petitioners. *See Notice*, 18 FCC Rcd at 18415-18416.

⁵²³ LPTV Petitioners’ Petition for Rule Making at 3.

255. *Regulatory Flexibility Act.* As required by the Regulatory Flexibility Act,⁵²⁴ the Commission has prepared a Final Regulatory Flexibility Analysis ("FRFA") relating to this *Report and Order*. The FRFA is set forth in Appendix C.

V. ORDERING CLAUSES

256. **IT IS ORDERED** that pursuant to the authority contained in Sections 1, 4(i) and (j), 5(c)(1), 7, 301, 302, 303(f), 303(r), 303(u), 303(w), 303(x), 307, 308, 309, 316, 319, 324, 336(c), 336(f), 337, 330(b), 330(c), 332(c) of the Communications Act of 1934, 47 U.S.C §§ 151, 154(i) and (j), 155(c)(1), 157, 301, 302, 303(f), 303(r), 303(u), 303(w), 303(x), 307, 308, 309, 316, 319, 324, 336(c), 336(f), 337, 330(b), 330(c), 332(c) that the Commission's rules **ARE HEREBY AMENDED** as set forth in Appendix B, and shall become effective 60 days after publication in the Federal Register except that rule sections that contain information collection requirements under the PRA shall not be effective until approved by OMB. The FCC will publish a document in the Federal Register announcing the effective date for those sections.

257. **IT IS FURTHER ORDERED** that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, **SHALL SEND** a copy of this *Report and Order*, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

258. **IT IS FURTHER ORDERED**, That the Commission will send a copy of this *Report and Order* in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION


Marlene H. Dortch
Secretary

⁵²⁴ *See* 5 U.S.C. § 604.

**APPENDIX A
LIST OF COMMENTERS**

Comments

Abacus Television, Turnpike Television, et. al. (Joint Commenters)
Access Spectrum, LLC (Access)
Adams Telecom (Adams)
Aloha Partners, L.P. (Aloha)
Annapolis Broadcasting Company, Inc. (Annapolis)
Arctic Slope Telephone Assn Coop.. Inc.; Grand River Communications, Inc.; Kanokla
Telephone Assn., Inc.; Peoples Telephone Coop., Inc.; Valley Telephone Coop. (Arctic)
Association of Federal Communications Consulting Engineers (AFCCE)
Association for Maximum Service Television, Inc. and The National Association of Broadcasters
(MSTV/NAB)
Association of Public Safety Communications Officials International, Inc. (APCO)
Association of Public Television Stations and the Public Broadcasting Service (APTS/PBS)
Bonneville International Corp. (Bonneville)
Brey, Ronald J.
Bruno Goodworth Network, Inc. (Bruno)
Cavalier Group, LLC (Cavalier)
Cherryland Wireless, LLC (Cherryland)
Community Broadcasters Assn. (CBA)
Cooperative Television Assn. (CTA)
Cordillera Files\Common Files, Inc. (Cordillera)
Corr Wireless Communications, LLC (Corr)
Corridor Television, LLP; Rapid Broadcasting Co. (Corridor)
Cox Broadcasting, Inc.; Liberty Corp. (Cox)
Cruze Electronics (Cruze)
Datacom, LLC (Datacom)
Dept. of Special Districts of San Bernadino County, Calif. (San Bernardino County)
duTriel, Lundin & Rackley, Inc. (duTriel)
Elko Television District (Elko)
Engle Broadcasting (Engle)
Entravision Holdings, LLC (Entravision)
Fox Television Stations, Inc. and Fox Broadcasting Co. (Fox)
Greg Best Consulting, Inc. (Greg Best)
Harbor Wireless, LLC (Harbor)
H&R Production Group, LLC (H&R)
International Broadcasting Network (International)
Island Broadcasting Co. (Island)
KAET (TV) (Arizona State Univ.) (KAET)
KM Broadcasting, Inc. (KM)
Larcen USA, Inc. (Larcen)
Lin TV Corp. and Banks Broadcasting, Inc. (LIN)
Martin Group, Inc. (Martin)
Metrocast Corporation (Metrocast)
Miller, Keily
Motorola, Inc. (Motorola)
Mullaney Engineering, Inc. (Mullaney)
National Translator Assn. (NTA)

P&P Cable Holdings, LLC (P&P)
Parson, R. Kent (State of Utah) (Parson)
Paxson Communications Corp. (Paxson)
Pioneer Telephone Coop., Inc. (Pioneer)
QUALCOMM, Inc. (Qualcomm)
Renville County TV Corp. (Renville)
Riverton Freemont TV Club, Inc. (Riverton)
Rural 700 MHz Band Licensees (Rural 700 MHz)
Selective TV, Inc. (Selective)
Snoop, Donald R.
Southern Oregon Public Television, Inc. (Southern Oregon)
St. Clair, B.W. (St. Clair)
Sunbelt Television, Inc. (Sunbelt)
TV-61 San Diego, Inc.
United Telephone Assn., Inc. (UTA)
Venture Technologies Group, Inc. (Venture)
Vermont Educational Television (Vermont Educational)
Viacel
Vulcan Spectrum, LLC (Vulcan)
Wardell, Ed; Wardell, Jane
WatchTV, Inc.
Willmar Assembly of God Church
Word of Life Ministries (Word)
Wyoming Pubic Television (Wyoming)

Reply Comments/Ex Parte Comments

Abacus Television, Turnpike Television, et.al.
Association for Maximum Service Television, Inc. and the National Association of Broadcasters
Association of Public Television Stations and The Public Broadcasting Service
Bruno Goodworth Network, Inc.
Commercial Broadcasting Corp.
Corridor Television, LLP and Rapid Broadcasting Co.
Cox Broadcasting, Inc. and The Liberty Corp.
Dept. of Special Districts of San Bernardino County, Calif.
Fiori, John
Greg Best Consulting, Inc.
Greg Best Consulting, Inc. for University of New Mexico
Idaho Public Television Stations
International Broadcasting Network
Island Broadcasting Co.
Jackson, Martin J.
KUED-TV and KULC-TV
Larcan USA, Inc.
Lawrence, Kathy for College Media Advisers
Motorola, Inc.
National Translator Assn.
Ogden Valley TV Translator Special Service District
Page, Kevin L. for KHEM-LP
Parsons, R. Kent (State of Utah)

Paxson Communications Corp.
Rancho Palos Verdes Broadcasters, Inc.
Renard Communications Corp.
Reynolds Media Inc.
Riverton Fremont TV Club, Inc.
Rural 700 MHz Band Licensees
Sgrignoli, Gary
Sheldahl, Douglas
Statewide Wireless Network of the New York State Office for Technology
Tiger Eye Broadcasting Corp.
Venture Technologies Group, LLC
WZBN TV, Inc.
Zenith Electronics Corp.
700 MHz Advancement Coalition

**APPENDIX B
FINAL RULE CHANGES**

For the reasons set forth in the preamble, Parts 73 and 74 of the U.S. Code of Federal Regulations is amended as follows:

PART 73 – RADIO BROADCAST SERVICES

1. The authority citation for Part 73 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 334 and 336.

Subpart J – Class A Television Broadcast Stations

2. Section 73.6000 is revised by adding a new subparagraph (2) and renumbering existing subparagraph (2) as subparagraph (3).

§ 73.6000 Definitions.

* * * * *

(2) Produced within the predicted DTV noise-limited contour (see § 73.622(e) of this part) of a digital Class A station broadcasting the program or within the contiguous predicted DTV noise-limited contours of any of the digital Class A stations in a commonly owned group; or

* * * * *

3. Section 73.6016 is revised to read as follows:

§ 73.6016 Digital Class A TV station protection of TV broadcast stations.

Digital Class A TV stations must protect authorized TV broadcast stations, applications for minor changes in authorized TV broadcast stations filed on or before November 29, 1999, and applications for new TV broadcast stations that had been cut-off without competing applications or that were the winning bidder in a TV broadcast station auction as of that date, or that were the proposed remaining applicant in a group of mutually-exclusive applications for which a settlement agreement was on file as of that date. This protection must be based on meeting the requirements of § 74.793 (b)-(d) and (f) of this chapter. An application for DTV operation of an existing Class A TV station or to change the facilities of a digital Class A TV station will not be accepted if it fails to protect these TV broadcast stations and applications pursuant to these requirements.

4. Section 73.6017 is revised to read as follows:

§ 73.6017 Digital Class A TV station protection of Class A TV and digital Class A TV stations.

An application for digital operation of an existing Class A TV station or to change the facilities of a digital Class A TV station will not be accepted if it fails to protect authorized Class A and digital Class A stations in accordance with the requirements of § 74.793 (b)-(d) and (g) of this chapter. This protection must be afforded to applications for changes in other authorized Class A and digital Class A stations filed prior to the date the digital Class A applications is filed.

5. Section 73.6018 is revised to read as follows:

§ 73.6018 Digital Class A TV station protection of DTV stations.

Digital Class A TV stations must protect the DTV service that would be provided by the facilities specified in the DTV Table of Allotments in § 73.622 of this part, by authorized DTV stations and by applications that propose to expand DTV stations' allotted or authorized coverage contour in any direction, if such applications either were filed before December 31, 1999 or were filed between December 31, 1999 and May 1, 2000 by a DTV station licensee or permittee that had notified the Commission of its intent to "maximize" by December 31, 1999. Protection of these allotments, stations and applications must be based on meeting the requirements of § 74.793 (b)-(e) of this chapter. An application for digital operation of an existing Class A TV station or to change the facilities of a digital Class A TV station will not be accepted if it fails to protect these DTV allotments, stations and applications in accordance with this section.

6. Section 73.6019 is revised to read as follows:

§ 73.6019 Digital Class A TV station protection of low power TV, TV translator, digital low power TV and digital TV translator stations.

An application for digital operation of an existing Class A TV station or to change the facilities of a digital Class A TV station will not be accepted if it fails to protect authorized low power TV, TV translator, digital low power TV and digital TV translator stations in accordance with the requirements of § 74.793 (b)-(d) and (h) of this chapter. This protection must be afforded to applications for changes filed prior to the date the digital Class A station is filed.

7. Section 73.6020 is revised to read as follows:

§ 73.6020 Protection of stations in the land mobile radio service.

An application for digital operation of an existing Class A TV station or to change the facilities of an existing Class A TV or digital Class A TV station will not be accepted if it fails to protect stations in the land mobile radio service pursuant to the requirements specified in § 74.709 of this chapter. In addition to the protection requirements specified in § 74.709(a) of this chapter, Class A TV and digital Class A TV stations must not cause interference to land mobile stations operating on channel 16 in New York, NY.

* * * * *

8. Section 73.6024 is revised by adding a new paragraph (d).

§ 73.6024 Transmission standards and system requirements.

(d) A digital Class A station must meet the emission requirements of § 74.794 of this chapter.

* * * * *

9. Section 73.6027 is added to read as follows:

§ 73.6027 Class A TV notifications concerning interference to radio astronomy, research and receiving installations.

An applicant for digital operation of an existing Class A TV station or to change the facilities of an existing Class A TV or digital Class A TV station shall be subject to the requirements of § 73.1030 – Notifications concerning interference to radio astronomy, research and receiving installations.

* * * * *

PART 74 – EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

10. The authority citation for Part 74 is amended to read as follows:

Authority: 47 U.S.C. 154, 303, 307, 309, 336 and 554

Subpart G – Low Power TV, TV Translator, and TV Booster Stations

11. Section 74.701 is revised by adding new paragraphs (j) through (p):

§ 74.701 Definitions.

* * * * *

(j) *Digital television broadcast translator station (“digital TV translator station”).* A station operated for the purpose of retransmitting the programs and signals of a digital television (“DTV”) broadcast station, without significantly altering any characteristic of the original signal other than its frequency and amplitude, for the purpose of providing DTV reception to the general public.

(k) *Digital low power TV station (“digital LPTV station”).* A station authorized under the provisions of this subpart that may retransmit the programs and signals of a DTV broadcast station, may originate programming in any amount greater than 30 seconds per hour for the purpose of providing digital television (DTV) reception to the general public and, subject to a minimum video program service requirement, may offer services of an ancillary or supplementary nature, including subscription-based services. (See § 74.790 of this part).

(l) *Digital Program Origination.* For purposes of this part, digital program origination shall be any transmissions other than the simultaneous retransmission of the programs and signals of a TV or DTV broadcast station or transmissions related to service offerings of an ancillary or supplementary nature. Origination shall include locally generated television program signals and program signals obtained via video recordings (tapes and discs), microwave, common carrier circuits, or other sources.

(m) *Existing low power television or television translator station.* When used in this Subpart G, the terms existing low power television and existing television translator station refer to an analog or digital low power television station or television translator station that is either licensed or has a valid construction permit.

(n) *Suitable in core channel.* When used in this Subpart G, the term “suitable in core channel” refers to a channel that would enable a digital low power television or television translator station to produce a protected service area comparable to that of its associated analog LPTV or TV translator station.

(o) *Companion digital channel.* When used in this Subpart G, the term “companion digital channel” refers to a digital channel authorized to an existing low power television or television translator station to be associated with the station’s analog channel.

(p) *Digital conversion channel.* When used in this Subpart G, the term “digital conversion channel” refers to a channel previously authorized to an existing low power television or television translator station that has been converted to digital operation.

* * * * *

12. Section 74.703 is revised by adding new paragraphs (f) and (g) and renumbering existing paragraphs (f) and (g) as (h) and (i):

§ 74.703 Interference.

* * * * *

(f) It shall be the responsibility of a digital low power TV or TV translator station operating on a channel from channel 52-69 to eliminate at its expense any condition of interference caused to the operation of or services provided by existing and future commercial or public safety wireless licensees in the 700 MHz bands. The offending digital LPTV or translator station must cease operations immediately upon notification by any primary wireless licensee, once it has been established that the digital low power TV or translator station is causing the interference.

(g) An existing or future wireless licensee in the 700 MHz bands may notify (certified mail, return receipt requested), a digital low power TV or TV translator operating on the same channel or first adjacent channel of its intention to initiate or change wireless operations and the likelihood of interference from the low power TV or translator station within its licensed geographic service area. The notice should describe the facilities, associated service area and operations of the wireless licensee with sufficient detail to permit an evaluation of the likelihood of interference. Upon receipt of such notice, the digital LPTV or TV translator licensee must cease operation within 120 days unless: (1) it obtains the agreement of the wireless licensee to continue operations. (2) the commencement or modification of wireless service is delayed beyond that period (in which case the period will be extended), or (3) the Commission stays the effect of the interference notification, upon request.

* * * * *

13. Section 74.705 is amended by revising paragraph (e) to read as follows:

§ 74.705 TV broadcast analog station protection.

* * * * *

(e) As an alternative to the preceding paragraphs of this section, an applicant for a low power TV, TV translator or TV booster may make full use of terrain shielding and Longley-Rice terrain dependent propagation prediction methods to demonstrate that the proposed facility would not be likely to cause interference to TV broadcast stations. Guidance on using the Longley-Rice methodology is provided in *OET Bulletin No. 69* (but also see §74.793(d) of this part). Copies of *OET Bulletin No. 69* may be inspected during normal business hours at the: Federal Communications Commission, CY-C203, 445 12th Street, SW., Reference Information Center, Washington, DC 20554. This document is also available through the Internet on the *FCC Home Page* at <http://www.fcc.gov>.

14. Section 74.705 is amended by revising paragraph (e) to read as follows:

§ 74.707 Low power TV and TV translator station protection.

* * * * *

(e) As an alternative to the preceding paragraphs of this section, an applicant for a low power TV or TV translator station may make full use of terrain shielding and Longley-Rice terrain dependent propagation prediction methods to demonstrate that the proposed facility would not be likely to cause interference to low power TV, TV translator and TV booster stations. Guidance on using the Longley-Rice methodology is provided in *OET Bulletin No. 69* (but also see §74.793(d) of this part). Copies of *OET Bulletin No. 69*

may be inspected during normal business hours at the: Federal Communications Commission, Room CY-C203, 445 12th Street, SW., Reference Information Center, Washington, DC 20554. This document is also available through the Internet on the *FCC Home Page* at <http://www.fcc.gov>.

15. Section 74.710 is added to read as follows:

§ 74.710 Digital low power TV and TV translator station protection.

(a) An application to construct a new low power TV, TV translator, or TV booster station or change the facilities of an existing station will not be accepted if it fails to protect an authorized digital low power TV or TV translator station or an application for such station filed prior to the date the low power TV, TV translator, or TV booster application is filed.

(b) Applications for low power TV, TV translator and TV booster stations shall protect digital low power TV and TV translator stations pursuant to the following requirements:

(i) An application must not specify an antenna site within the protected contour of a co-channel or adjacent channel digital low power TV or TV translator station, as defined in § 74.792 of this part.

(ii) The ratio in dB of the field strength of the low power TV, TV translator or TV booster station at the protected contour of a co-channel digital TV or TV translator station must meet the requirements specified in subparagraph (d)(1) of § 74.706.

(iii) The ratio in dB of the field strength of the low power TV, TV translator or TV booster station at the protected contour of a digital low power TV or TV translator station on the lower and upper adjacent channels must not exceed 49 dB and 48 dB, respectively.

(iv) The above analysis should use the propagation methods specified in paragraph (c) of § 74.706.

(c) As an alternative to the requirements of paragraph (b), an applicant for a low power TV, TV translator or TV booster may make full use of terrain shielding and Longley-Rice terrain dependent propagation prediction methods to demonstrate that the proposed facility would not be likely to cause interference to digital low power TV or TV translator stations, as described in § 74.707(e) of this part (*i.e.*, reduce the service population by no more than 0.5% within the station's protected contour based on the interference thresholds of § 73.623(c) of this chapter).

16. Section 74.786 is added to read as follows:

§ 74.786 – Digital channel assignments.

(a) An applicant for a new low power television or television translator digital station or for changes in the facilities of an authorized digital station shall endeavor to select a channel on which its operation is not likely to cause interference. The applications must be specific with regard to the channel requested. Only one channel will be assigned each station.

(b) Any one of the 12 standard VHF Channels (2 to 13 inclusive) may be assigned to a VHF digital low power television or television translator station. Channels 5 and 6 assigned in Alaska shall not cause harmful interference to and must accept interference from non-Government fixed operation authorized prior to January 1, 1982.

- (c) UHF channels 14 to 36 and 38 to 51 may be assigned to a UHF digital low power television or television translator station. In accordance with § 73.603(c) of part 73, Channel 37 will not be assigned to such stations.
- (d) UHF Channels 52-59 may be assigned to a digital low power television or television translator station for use as a *digital conversion channel*. These channels may also be assigned as a *companion digital channel* if the applicant is able to demonstrate that a *suitable in core channel* is not available. Stations proposing use of such channels shall notify all potentially affected 700 MHz wireless licensees not later than 30 days prior to the submission of their application (FCC Form 346). Applicants shall notify wireless licensees of the 700 MHz spectrum comprising the same TV channel and the adjacent channel within whose licensed geographic boundaries the digital LPTV or translator station is proposed to be located, and also notify licensees of co-channel and adjacent channel spectrum whose service boundaries lie within 75 miles and 50 miles, respectively, of their proposed station location. Specific information for this purpose can be obtained from the Commission's auction web site at <http://www.fcc.gov/auctions>.
- (e) UHF Channels 60-69 may be assigned to a digital low power television or television translator station for use as a *digital conversion channel* only. Stations proposing use of such channels shall notify all potentially affect 700 MHz commercial licensees not later than 30 days prior to the submission of their application (FCC Form 346) in the manner provided by (d) of this part. Stations proposing use of channels 63, 64, 68 and 69 must secure a coordinated spectrum use agreement with the pertinent 700 MHz public safety regional planning committee and state administrator prior to the submission of their application (FCC Form 346). Coordination shall be undertaken with regional planning committee and state administrator of the region and state within which the digital LPTV or translator station is proposed to be located, and those of adjoining regions and states with boundaries within 75 miles of the proposed station location. Stations proposing use of channels 62, 65, and 67 must notify the pertinent regional planning committee and state administrator not later than 30 days prior to the submission of their application (FCC Form 346). Notification shall be made to the regional and state administrators of region and state within which the digital LPTV or translator station is proposed to be located, and those of adjoining regions and states with boundaries within 50 miles of the proposed station location. Information for this purpose is available at the above web site and also at the following internet sites: <http://wireless.fcc.gov/publicsafety700MHzregional.html>, <http://wireless.fcc.gov/publicsafety/700MHz/state.html>, and <http://wireless.fcc.gov/publicsafety/700MHz/interop-contacts.html>.
- (f) Application for new analog low power television or television translator stations specifying operation above Channel 51 will not be accepted for filing. Applications for displacement relief on channels above 51 will continue to be accepted.

17. Section 74.787 is added to read as follows:

§ 74.787 – Digital licensing.

(a) *Applications for digital low power television and television translator stations.*

(1) *Applications for digital conversion.* Applications for *digital conversion channels* may be filed at any time. Such applications shall be filed on FCC Form 346 and will be treated as a minor change application. There will be no application fee.

(2) *Applications for companion digital channel.*

(A) A Public Notice will specify a time period or "window" for filing applications for *companion digital channels*. During this window, only existing low power television or television translator stations or licensees and permittees of Class A TV stations may submit applications for *companion digital channels*. Applications submitted prior to the initial window identified in the Public Notice will be returned as premature. At a subsequent time, a Public Notice will announce the commencement of a filing procedure in which applications will be accepted on a first-come, first-served basis not restricted to existing station licensees and permittees.

(B) Applications for *companion digital channels* filed during the initial window shall be filed in accordance with the provisions of §§ 1.2105 and 73.5002 regarding the submission of the short-form application, FCC Form 175, and all appropriate certifications, information and exhibits contained therein. To determine which applicants are mutually exclusive, applicants must submit the engineering data contained in FCC Form 346 as a supplement to its short-form application. Such engineering data will not be studied for technical acceptability, but will be protected from subsequently filed applications as of the close of the initial window period. Determinations as to the acceptability or grantability of an applicant's proposal will not be made prior to an auction.

(C) After the close of the initial window, a Public Notice will identify the short-form applications received during the window filing period which are found to be mutually exclusive. Such short-form applications will be resolved via the Commission's Part 1 and broadcast competitive bidding rules, Sections 1.2100 et seq., and Sections 73.5000 et seq. Such applicants shall be afforded an opportunity to submit settlements and engineering solutions to resolve mutual exclusivity pursuant to Section 73.5002(d).

(D) After the close of the window, a Public Notice will identify short-form applications received that are found to be non-mutually exclusive. All non-mutually exclusive applicants will be required to submit an FCC Form 346 pursuant to Section 73.5005. Such applications shall be processed pursuant to Section 73.5006.

(E) With regard to fees, an application (FCC Form 346) for *companion digital channels* shall be treated as a minor change application and there will be no application fee.

(3) *Construction permit applications for new stations, major changes to existing stations in the low power television service.* A Public Notice will specify the date upon which interested parties may begin to file applications for new stations and major facilities changes to existing stations in the low power television service. It will specify parameters for any applications that may be filed. Applications submitted prior to date announced by the Public Notice will be returned as premature. Such applications shall be accepted on a first-come, first-served basis, and shall be filed on FCC Form 346. Applications for new or major change shall be subject to the appropriate application fee. Mutually exclusive applications shall be resolved via the Commission's Part 1 and broadcast competitive bidding rules, Sections 1.2100 et seq., and Sections 73.5000 et seq. Such applicants shall be afforded an opportunity to submit settlements and engineering solutions to resolve mutual exclusivity pursuant to Section 73.5002(d).

(4) *Displacement applications.* A digital low power television or television translator station which is causing or receiving interference or is predicted to cause or receive interference to or from an authorized TV broadcast station, DTV station or allotment or other protected station or service, may at any time file a displacement relief application for change in channel, together with technical modifications that are necessary to avoid interference or continue serving the station's protected service area, provided the proposed transmitter site is not located more than 30 miles from the reference coordinates of the existing station's community of license. See Section 76.53 of this chapter. A displacement relief application shall be filed on FCC Form 346 and will

be considered a minor change and will be placed on public notice for a period of not less than 30 days to permit the filing of petitions to deny. These applications will not be subject to the filing of competing applications. Where a displacement relief application for a digital low power television or television translator station becomes mutually exclusive the application(s) for new analog or digital low power television or television translator stations, with a displacement relief application for an analog low power television or television translator station, or with other non-displacement relief applications for facilities modifications of analog or digital low power television or television translator stations, priority will be afforded to the displacement application for the digital low power television or television translator station to the exclusion of other applications. Mutually exclusive displacement relief applications for digital low power television and television translator stations shall be resolved via the Commission's Part 1 and broadcast competitive bidding rules, Sections 1.2100 et seq., and Sections 73.5000 et seq. Such applicants shall be afforded an opportunity to submit settlements and engineering solutions to resolve mutual exclusivity pursuant to Section 73.5002(d).

(b) *Definitions of "major" and "minor" changes to digital low power television and television translator stations.*

(1) Applications for major changes in digital low power television and television translator stations include any change in the frequency (output channel) not related to displacement relief or transmitting antenna location where the protected contour resulting from the change does not overlap some portion of the protected contour of the authorized facilities of the existing station.

(2) Other facilities changes will be considered minor.

18. Section 74.788 is added to read as follows:

§ 74.788 – Digital construction period.

(a) Each original construction permit for the construction of a new digital low power television or television translator station shall specify a period of three years from the date of issuance of the original construction permit within which construction shall be completed and application for license filed.

(b) Any construction permit for which construction has not been completed and for which an application for license or extension of time has not been filed, shall be automatically forfeited upon expiration without any further affirmative cancellation by the Commission.

(c) *Authority delegated.*

(1) Authority is delegated to the Chief, Media Bureau to grant an extension of time of up to six months beyond the relevant construction period for each original construction permit upon demonstration by the digital licensee or permittee that failure to meet the construction deadline is due to circumstances that are either unforeseeable or beyond the licensee's control where the licensee has take all reasonable steps to resolve the problem expeditiously.

(2) Such circumstances shall include, but shall not be limited to:

(A) Inability to construct and place in operation a facility necessary for transmitting digital television, such as a tower, because of delays in obtaining zoning or FAA approvals, or similar constraints;

(B) the lack of equipment necessary to obtain a digital television signal; or

(C) where the cost of construction exceeds the station's financial resources.

(3) The Bureau may grant no more than two extension requests upon delegated authority. Subsequent extension requests shall be referred to the Commission. The Bureau may deny extension requests upon delegated authority.

(4) Applications for extension of time shall be filed no earlier than 90 and no later than 60 days prior to the relevant construction deadline, absent a showing of sufficient reasons for filing within less than 60 days of the relevant construction deadline.

19. Section 74.789 is added to read as follows:

§ 74.789 – Broadcast regulations applicable to digital low power television and television translator stations.

The following rules are applicable to digital low power television and television translator stations:

Section 73.1030 - Notifications concerning interference to radio astronomy , research and receiving installations.

Sections 74.600- Eligibility for license.

Section 74.703 - Interference

Section 74.709 - Land mobile station protection.

Section 74.732 - Eligibility and licensing requirements.

Section 74.734 – Attended and unattended operation.

Section 74.735 - Power limitations.

Section 74.751 – Modification of transmission systems.

Section 74.763 – Time of operation.

Section 74.765 – Posting of station and operator licenses.

Section 74.769 - Copies of rules.

Section 74.780 – Broadcast regulations applicable to translators, low power, and booster stations (except Section 73.653 – operation of TV aural and visual transmitters and Section 73.1201 – station identification).

Section 74.781 - Station records.

Section 74.784 - Rebroadcasts.

20. Section 74.790 is added to read as follows:

§ 74.790 Permissible service of digital TV translator and LPTV stations.

(a) Digital TV translator stations provide a means whereby the signals of DTV broadcast stations may be retransmitted to areas in which direct reception of such DTV stations is unsatisfactory due to distance or intervening terrain barriers.

(b) Except as provided in paragraph (f) of this section, a digital TV translator station may be used only to receive the signals of a TV broadcast or DTV broadcast station, another digital TV translator station, a TV translator relay station, a television intercity relay station, a television STL station, or other suitable sources such as a CARS or common carrier microwave station, for the simultaneous retransmission of the programs and signals of a TV or DTV broadcast station. Such retransmissions may be accomplished by any of the following means:

(1) Reception of TV broadcast or DTV broadcast station programs and signals directly through space and conversion to a different channel by one of the following transmission modes:

(i) Heterodyne frequency conversion and suitable amplification, subject to a digital output power limit of 30 watts for transmitters operating on channels 14-69 and 3 watts for transmitters operating on channels 2-13 or,

(ii) Digital signal regeneration (*i.e.*, DTV signal demodulation, decoding, error processing, encoding, remodulation, and frequency upconversion) and suitable amplification; or,

(2) Demodulation, remodulation and amplification of TV broadcast or DTV broadcast station programs and signals received through a microwave transport.

(c) The transmissions of each digital TV translator station shall be intended for direct reception by the general public, and any other use shall be incidental thereto. A digital TV translator station shall not be operated solely for the purpose of relaying signals to one or more fixed receiving points for retransmission, distribution, or further relaying.

(d) Except as provided in (e) and (f) of this section, the technical characteristics of the retransmitted signals shall not be deliberately altered so as to hinder reception on consumer DTV broadcast receiving equipment.

(e) A digital TV translator station shall not retransmit the programs and signals of any TV broadcast or DTV broadcast station(s) without the prior written consent of such station(s). A digital TV translator may multiplex on its output channel the video program services of two or more TV broadcast and/or DTV broadcast stations, pursuant to arrangements with all affected stations, and for this limited purpose, is permitted to alter a TV broadcast and/or DTV broadcast signal.

(f) A digital TV translator station may transmit locally originated visual and/or aural messages limited to emergency warnings of imminent danger, to local public service announcements ("PSAs") and to seeking or acknowledging financial support deemed necessary to the continued operation of the station. Acknowledgments of financial support may include identification of the contributors, the size and nature of the contribution and the advertising messages of the contributors. The originations concerning financial support and PSAs are limited to 30 seconds each, no more than once per hour. Emergency transmissions shall be no longer or more frequent than necessary to protect life and property. Such originations may be accomplished by any technical means agreed upon between the TV translator and DTV station whose signal is being retransmitted, but must be capable of being received on consumer

DTV broadcast reception equipment. A digital TV translator shall modify, as necessary to avoid DTV reception tuning conflicts, the Program System and Information Protocol ("PSIP") information in the DTV broadcast signal being retransmitted.

(g) A digital LPTV station may operate under the following modes of service:

(1) For the retransmission of programming of a TV broadcast or DTV broadcast station, subject to the prior written consent of the station whose signal is being retransmitted;

(2) For the origination of programming and commercial matter as defined in § 74.701(l).

(3) Whenever operating, a digital LPTV station must transmit an over-the-air video program signal at no direct charge to viewers at least comparable in resolution to that of its associated analog (NTSC) LPTV station or, in the case of an on-channel digital conversion, that of its former analog LPTV station.

(4) A digital LPTV station may dynamically alter the bit stream of its signal to transmit one or more video program services in any established DTV video format.

(h) A digital LPTV station is not subject to minimum required hours of operation and may operate in either of the two modes described in paragraph (g) of this section for any number of hours.

(i) Upon transmitting a signal that meets the requirements of subparagraph (g)(3) of this section, a digital LPTV station may offer services of any nature, consistent with the public interest, convenience, and necessity, on an ancillary or supplementary basis in accordance with the provisions of § 73.624(c) and (g) of this chapter.

(j) A digital LPTV station may not be operated solely for the purpose of relaying signals to one or more fixed receiving points for retransmission, distribution or relaying.

(k) A digital LPTV station may receive input signals for transmission or retransmission by any technical means, including those specified in paragraph (b) of this section.

* * * * *

21. Section 74.791 is added to read as follows:

§ 74.791 – Digital call signs.

(a) *Digital low power stations.* Call signs for digital low power stations will be made up a prefix consisting of the initial letter K or W followed by the channel number assigned to the station and two additional letters and a suffix consisting of the letters –D.

(b) *Digital television translator stations.* Call signs for digital television translator stations will be made up a prefix consisting of the initial letter K or W followed by the channel number assigned to the station and two additional letters and a suffix consisting of the letter –D.

(c) *Digital low power television stations and Class A television stations.* Digital low power television and Class A television stations may be assigned a call sign with a four-letter prefix pursuant to Section 73.3550 of Part 73 of the rules. Digital low power stations with four-letter prefixes will be assigned the suffix –LD and digital Class A stations with four-letter prefixes will be assigned the suffix –CD.

22. Section 74.792 is added to read as follows:

§ 74.792 – Digital low power TV and TV translator station protected contour.

(a) A digital low power TV or TV translator will be protected from interference from other low power TV, TV translator, Class A TV or TV booster stations or digital low power TV, TV translator or Class A TV stations within the following predicted contours:

- (1) 43 dBu for stations on Channels 2 through 6;
- (2) 48 dBu for stations on Channels 7 through 13; and
- (3) 51 dBu for stations on Channels 14 through 69.

(b) The digital low power TV or TV translator protected contour is calculated from the authorized effective radiated power and antenna height above average terrain, using the F(50,90) signal propagation method specified in § 73.625(b)(1) of this chapter.

23. Section 74.793 is added to read as follows:

§ 74.793 – Digital low power TV and TV translator station protection of broadcast stations.

- (a) An application to construct a new digital low power TV or TV translator station or change the facilities of an existing station will not be accepted if it fails to meet the interference protection requirements in this section.
- (b) Except as provided in this section, interference prediction analysis is based on the interference thresholds (D/U signal strength ratios) and other criteria and methods specified in §§ 73.623(c)(2)-(c)(4) of this chapter. Predictions of interference to co-channel DTV broadcast, digital Class A TV, digital LPTV and digital TV translator stations will be based on the interference thresholds specified therein for “DTV-into-DTV.” Predictions of interference to co-channel TV broadcast, Class A TV, LPTV and TV translator stations will be based on the interference threshold specified for “DTV-into-analog TV.” Predictions of interference to TV broadcast, Class A TV, LPTV and TV translator stations with the following channel relationships to a digital channel will be based on the threshold values specified for “Other Adjacent Channels (Channels 14-69 only),” where N is the analog channel: N-2, N+2, N-3, N+3, N-4, N+4, N-7, N+7, N-8, N+8, N+14, and N+15.
- (c) The following D/U signal strength ratios (dB) shall apply to the protection of stations on the first adjacent channel. The D/U ratios for “Digital TV-into-analog TV” shall apply to the protection of TV broadcast, Class A TV, LPTV and TV translator stations. The D/U ratios for “Digital TV-into-digital TV” shall apply to the protection of DTV, digital Class A TV, digital LPTV and digital TV translator stations. The D/U ratios correspond to the digital LPTV or TV translator station’s specified out-of-channel emission mask.

	Simple Mask	Stringent Mask
Digital TV-into-analog TV	10	0
Digital TV-into-digital TV	-7	-12

- (d) For analysis of predicted interference from digital low power TV and TV translator stations, the relative field strength values of the assumed antenna vertical radiation pattern in Table 8 in OET Bulletin 69 shall be doubled up to a value of 1.0.
- (e) Protection to the authorized facilities of DTV broadcast stations shall be based on not causing predicted interference to the population within the service area defined and described in § 73.622(e) of this chapter, except that a digital low power TV or TV translator station must not cause a loss of service to 0.5 percent or more of the population predicted to receive service from the authorized DTV facilities.
- (f) Protection to the authorized facilities of TV broadcast stations shall be based on not causing predicted interference to the population within the Grade B field strength contours defined and described in § 73.683 of this chapter, except that a digital low power TV or TV translator station must not cause a loss of service to 0.5 percent or more of the population predicted to receive service from the authorized TV broadcast facilities.
- (g) Protection to the authorized facilities of Class A and digital Class A TV stations shall be based on not causing predicted interference to the population within the service area defined and described in §§ 73.6010 (a)-(b) and (c)-(d), respectively, of this chapter, except that a digital low power TV or TV translator station must not cause a loss of service to 0.5 percent or more of the population predicted to receive service from the authorized Class A TV or digital Class A TV facilities.
- (h) Protection to the authorized facilities of low power TV and TV translator stations and digital low power TV and TV translator stations shall be based on not causing predicted interference to the population within the service area defined and described in §§ 74.707(a) and 74.792, respectively, of this part, except that a digital low power TV or TV translator station must not cause a loss of service to 2.0 percent or more of the population predicted to receive service from the authorized low power TV, TV translator, digital low power TV or digital TV translator station.

24. Section 74.794 is added to read as follows:

§ 74.794 – Digital emissions.

(a)(1) An applicant for a digital LPTV or TV translator station construction permit shall specify that the station will be constructed to confine out-of-channel emissions within one of the following emission masks: simple or stringent.

(2) The power level of emissions on frequencies outside the authorized channel of operation must be attenuated no less than following amounts below the average transmitted power within the authorized 6 MHz channel. In the mask specifications below, A is the attenuation in dB and Δf is the frequency difference in MHz from the edge of the channel.

(i) *Simple mask:* At the channel edges, emissions must be attenuated no less than 46 dB. More than 6 MHz from the channel edges, emissions must be attenuated no less than 71 dB. At any frequency between 0 and 6 MHz from the channel edges, emissions must be attenuated no less than the value determined by the following formula:

$$A \text{ (dB)} = 46 + (\Delta f^2 / 1.44)$$

(ii) *Stringent mask:* In the first 500 kHz from the channel edges, emissions must be attenuated no less than 47 dB. More than 3 MHz from the channel edges, emissions must be attenuated no less than 76 dB. At any frequency between 0.5 and 3 MHz from the channel edges, emissions must be attenuated no less than the value determined by the following formula:

$$A(\text{dB}) = 47 + 11.5 (\Delta f - 0.5)$$

(3) The attenuation values for the simple and stringent emission masks are based on a measurement bandwidth of 500 kHz. Other measurement bandwidths may be used and converted to the reference 500 kHz value by the following formula:

$$A(\text{dB}) = A_{\text{alternate}} + 10 \log (BW_{\text{alternate}} / 500)$$

where $A(\text{dB})$ is the measured or calculated attenuation value for the reference 500 kHz bandwidth, and $A_{\text{alternate}}$ is the measured or calculated attenuation for a bandwidth $BW_{\text{alternate}}$. Emissions include sidebands, spurious emissions and radio harmonics. Attenuation is to be measured at the output terminals of the transmitter (including any filters that may be employed). In the event of interference caused to any service by out-of-channel emissions, greater attenuation may be required.

(b) In addition to meeting the emission attenuation requirements of the simple or stringent mask (including attenuation of radio frequency harmonics), digital low power TV and TV translator stations authorized to operate on TV channels 22-24 (518-536 MHz), 36 (602-608 MHz), 38 (614-620 MHz) and 65-69 (776-806 MHz) must provide specific "out of band" protection to Radio Navigation Satellite Services in the bands: L5 (1164-1215 MHz); L2 (1215-1240 MHz) and L1 (1559-1610 MHz).

(1) An FCC-certificated transmitter specifically certified for use on one or more of the above channels must include filtering with an attenuation of not less than 85 dB in the GPS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and this attenuation must be demonstrated as part of the certification application to the Commission.

(2) For an installation on one of the above channels with a digital transmitter not specifically FCC-certificated for the channel, a low pass filter or equivalent device rated by its manufacturer to have an attenuation of at least 85 dB in the GPS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and must be installed in a manner that will prevent the harmonic emission content from reaching the antenna. A description of the low pass filter or equivalent device with the manufacturer's rating or a report of measurements by a qualified individual shall be retained with the station license. Field measurements of the second or third harmonic output of a transmitter so equipped are not required.

25. Section 74.795 is added to read as follows:

§ 74.795 – Digital low power TV and TV translator transmission system facilities.

(a) A digital low power TV or TV translator station shall operate with a transmitter that is either certificated for licensing based on the following provisions or has been modified for digital operation pursuant to § 74.796 of this part.

(b) The following requirements must be met before digital low power TV and TV translator transmitter will be certificated by the FCC:

(1) The transmitter shall be designed to produce digital television signals that can be satisfactorily viewed on consumer receiving equipment based on the digital broadcast television transmission standard in § 73.682(d).

(2) Emissions on frequencies outside the authorized channel, measured at the output terminals of the transmitter (including any filters that may be employed), shall meet the requirements of § 74.794, as applicable.

(3) The transmitter shall be equipped to display the digital power output (*i.e.*, average power over a 6 MHz channel) and shall be designed to prevent the power output from exceeding the maximum rated power output under any condition.

(4) When subjected to variations in ambient temperature between 0 and 40 degrees Centigrade and variations in power main voltage between 85% and 115% of the rated power supply voltage, the frequency stability of the local oscillator in the RF channel upconverter shall be maintained within 10 percent of the nominal value.

(5) The transmitter shall be equipped with suitable meters and jacks so that appropriate voltage and current measurements may be made while the transmitter is in operation.

(6) The following additional requirements apply to digital heterodyne translators:

(i) The maximum rated power output (digital average power over a 6 MHz channel) shall not exceed 30 watts for transmitters operating on channels 14-69 and 3 watts for transmitters operating on channels 2-13.

(ii) The transmitter shall contain circuits which will maintain the digital average power output constant within 1 dB when the strength of the input signal is varied over a range of 30 dB.

(d) Certification will be granted only upon a satisfactory showing that the transmitter is capable of meeting the requirements of paragraph (b) of this section, pursuant to the procedures described in § 74.750(e) of this part.

26. Section 74.796 is added to read as follows:

§ 74.796 – Modification of digital transmission systems and analog transmission systems for digital operation.

(a) The provisions of § 74.751 shall apply to the modification of digital low power TV and TV translator transmission systems and the modification of existing analog transmission systems for digital operation.

(b) The following additional provisions shall apply to the modification of existing analog transmissions systems for digital operation, including installation of manufacturers' certificated equipment ("field modification kits") and custom modifications.

(1) The modifications and related performance-testing shall be undertaken by a person or persons qualified to perform such work.

(2) The final amplifier stage of an analog transmitter modified for digital operation shall not have an "average digital" output greater than 25 percent of its previous NTSC peak sync power output, unless the amplifier has been specifically refitted or replaced to operate at a higher power.

(3) Analog heterodyne translators, when modified for digital operation, will produce a power output (digital average power over the 6 MHz channel) not exceeding 30 watts for transmitters operating on channels 14-69 and 3 watts for transmitters operating on channels 2-13.

(4) After completion of the modification, suitable tests and measurements shall be made to demonstrate compliance with the applicable requirements in this section including those in § 74.795. Upon installation of a field modification kit, the transmitter shall be performance-tested in accordance with the manufacturer's instructions.

(5) The station licensee shall notify the Commission upon completion of the transmitter modifications. In the case of custom modifications (those not related to installation of manufacturer-supplied and FCC-certificated equipment), the licensee shall certify compliance with all applicable transmission system requirements.

(6) The licensee shall maintain with the station's records for a period of not less than two years the following information and make this information to the Commission upon request:

(i) a description of the modifications performed and performance tests or, in the case of installation of a manufacturer-supplied modification kit, a description of the nature of the modifications, installation and test instructions and other material provided by the manufacturer.

(ii) results of performance-tests and measurements on the modified transmitter.

(iii) copies of related correspondence with the Commission.

(c) In connection with the on-channel conversion of existing analog transmitters for digital operation, a limited allowance is made for transmitters with final amplifiers that do not meet the attenuation of the Simple emission mask at the channel edges. Station licensees may obtain equivalent compliance with this attenuation requirement in the following manner:

(i) Measure the level of attenuation of emissions below the average digital power output at the channel edges in a 500 kHz bandwidth; measurements made over a different measurement bandwidth should be corrected to the equivalent attenuation level for a 500 kHz bandwidth using the formula given in § 74.794 of this section.

(ii) Calculate the difference in dB between the 46 dB channel-edge attenuation requirement of the Simple mask.

(iii) Subtract the value determined in the previous step from the authorized effective radiated power ("ERP") of the analog station being converted to digital operation. Then subtract an additional 6 dB to account for the approximate difference between analog peak and digital average power. For this purpose, the ERP must be expressed in decibels above one kilowatt: $ERP(\text{dBk}) = 10 \log ERP(\text{kW})$.

(iv) Convert the ERP calculated in the previous step to units of kilowatts.

(v) The ERP value determined through the above procedure will produce equivalent compliance with the attenuation requirement of the simple emission mask at the channel edges and should be specified as the digital ERP in the minor change application for an on-channel digital conversion. The transmitter may not be operated to produce a higher digital ERP than this value.

APPENDIX C
FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act of 1980, as amended ("RFA"),¹ an Initial Regulatory Flexibility Analysis ("IRFA") was incorporated in the *Notice of Proposed Rule Making* ("NPRM").² The Commission sought written public comment on the proposals in the *NPRM*, including comment on the IRFA. One comment was received on the IRFA. This Final Regulatory Flexibility Analysis ("FRFA") conforms to the RFA.³

A. Need for and Objectives of the Report and Order

1. The *Report and Order* (*R&O*) establishes a regulatory framework that will hasten the transition of LPTV and TV translator stations to digital operations while minimizing disruption of existing service to consumers served by analog LPTV and TV translator stations. These stations are a valuable component of the nation's television system, delivering over-the-air TV service, including locally produced service, to millions of viewers in rural and discrete urban communities. The Commission desires to facilitate, wherever possible, the digital transition of these stations, thereby enabling their viewers to realize the many benefits of digital broadcast television (DTV) technology. The rules and policies adopted in the *R&O* provide flexible and affordable opportunities for low power digital television service, both through the conversion of existing analog service and, where spectrum is available, new digital stations.

2. The *R&O* provides additional flexibility for existing broadcasters to transition to digital. The *R&O* declines to apply the full-service deadline for stations to cease analog operations finding that low power television broadcasters and their viewers do not have the resources to "flash-cut" from analog to digital and need additional time to identify available channels for digital use. Setting a transition deadline at some fixed time after the full-service transition would be less disruptive and minimize potential loss of service.

3. The *R&O* allows existing broadcasters the first opportunity to either immediately convert from analog to digital ("flash-cut") on their existing analog channel or to apply for a digital companion channel. This will provide existing broadcasters the flexibility to identify a workable digital channel for operation before new broadcasters are allowed to apply for channels. These applications will be filed as "minor changes," thus reducing the overall time and processing burden on the stations.

4. While the *R&O* concludes that digital flash-cut and companion channel applications filed by low power broadcasters are subject to auction (except Class A flash-cut applications), an opportunity is provided for applicants to find settlements or engineering solutions to avoid having to go to auction. This will facilitate the processing of applications and permit applicants to avoid having to use limited resources to bid for their digital channels.

5. Applicants that choose to flash-cut or file for digital companion channels will have greater flexibility to seek channels between 52-69 (with restrictions). This will enable numerous stations that otherwise could not find a digital channel with the opportunity to participate in the digital transition.

¹See 5 U.S.C. § 603. The RFA, see 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

²Notice, 18 FCC Red 18365 (2003).

³See 5 U.S.C. § 604.

6. Stations will have the flexibility to choose the types of service to provide for their viewers. Translators will be limited to rebroadcasting programs and signals of full-service DTV stations without alteration to content or video format but may insert the types of local messages permitted for analog translators and may rebroadcast a DTV signal as an analog signal. LPTV stations must provide a free over-the-air video program service but have the freedom to use the remainder of their spectrum to offer ancillary services on the same basis as full-service DTV stations (including a 5% fee on gross revenues of feeable services).

7. The interference rules and methodology in the R&O provide the needed flexibility for stations to engineer new digital operations without undermining established interference protection rights of existing broadcasters. The equipment rules will enable stations to use much of their existing equipment, thus reducing the overall cost of digital implementation.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

8. There were no comments filed in response to the Initial Regulatory Flexibility Analysis.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

9. The RFA directs the Commission to provide a description of and, where feasible, an estimate of the number of small entities that will be affected by the proposed rules.⁴ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁵ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁶ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration ("SBA").⁷

10. In this context, the application of the statutory definition to television stations is of concern. An element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimates that follow of small businesses to which rules may apply do not exclude any television station from the definition of a small business on this basis and therefore might be over-inclusive.

11. An additional element of the definition of "small business" is that the entity must be independently owned and operated. It is difficult at times to assess these criteria in the context of media entities and our estimates of small businesses might therefore be over inclusive.

12. **Class A TV, LPTV, and TV translator stations.** The rules and policies apply to licensees of LPTV and TV translator, and to potential licensees in these television services. Certain rules and policies

⁴ 5 U.S.C. § 604(b)(3).

⁵ 5 U.S.C. § 601(b)(3).

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

⁷ 15 U.S.C. § 632.

also apply to licensees of Class A TV stations. The Small Business Administration defines a television broadcasting station that has no more than \$12 million in annual receipts as a small business.⁸ Television broadcasting consists of establishments primarily engaged in broadcasting images together with sound, including the production or transmission of visual programming which is broadcast to the public on a predetermined schedule.⁹ Included in this category are establishments primarily engaged in television broadcasting and which produce programming in their own studios.¹⁰ Separate establishments primarily engaged in producing programming are classified under other NAICS numbers.

13. Currently, there are approximately 2,100 licensed LPTV stations, 600 licensed Class A stations, 4,700 licensed TV translators and 11 TV booster stations.¹¹ According to Commission staff review of the BIA Publications, Inc., Master Access Television Analyzer Database, virtually all LPTV broadcast stations, including LPTV stations that have converted to Class A status, have revenues of less than \$12 million. We note, however, that under the SBA's definition, revenue of affiliates that are not LPTV stations should be aggregated with the LPTV station revenues in determining whether a concern is small. Our estimate may thus overstate the number of small entities since the revenue figure on which it is based does not include or aggregate revenues from non-LPTV affiliated companies. We do not have data on revenues of TV translator or TV booster stations, but virtually all of these entities are also likely to have revenues of less than \$12 million and thus may be categorized as small, except to the extent that revenues of affiliated non-translator or booster entities should be considered.

14. **Cable and Other Program Distribution.** Cable systems often receive the television service transmitted over the cable system from a TV translator or LPTV station. Thus, cable systems may also be affected by the rules in the *R&O*. The SBA has developed a small business size standard for cable and other program distribution services, which includes all such companies generating \$12.5 million or less in revenue annually.¹² This category includes, among others, cable operators, direct broadcast satellite ("DBS") services, home satellite dish ("HSD") services, multipoint distribution services ("MDS"), multichannel multipoint distribution service ("MMDS"), Instructional Television Fixed Service ("ITFS"), local multipoint distribution service ("LMDS"), satellite master antenna television ("SMATV") systems, and open video systems ("OVS"). According to Census Bureau data, there are 1,311 total cable and other pay television service firms that operate throughout the year of which 1,180 have less than \$10 million in revenue.¹³ We address below each service individually to provide a more precise estimate of small entities.

⁸ 13 C.F.R. § 121.201 (North American Industry Classification System ("NAICS") Code 515120).

⁹ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Subject Series – Source of Receipts, Information Sector 51, Appendix B at B-7-8 (2000).

¹⁰ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Subject Series – Source of Receipts, Information Sector 51, Appendix B at B-7 (2000).

¹¹ *Public Notice*, "Broadcast Station Totals as of March 31, 2003" (May 5, 2003).

¹² 13 C.F.R. § 121.201 (NAICS Code 517510). This NAICS Code applies to all services listed in this paragraph.

¹³ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Subject Series – Establishment and Firm Size, Information Sector 51, Table 4 at 50 (2000). The amount of \$10 million was used to estimate the number of small business firms because the relevant Census categories stopped at \$9,999,999 and began at \$10,000,000. No category for \$12.5 million existed. Thus, the number is as accurate as it is possible to calculate with the available information.

15. **Cable Operators.** Under the Commission's rules, a "small cable company" is one serving fewer than 400,000 subscribers nationwide.¹⁴ We last estimated that there were 1,439 cable operators that qualified as small cable companies.¹⁵ Since then, some of those companies may have grown to serve over 400,000 subscribers, and others may have been involved in transactions that caused them to be combined with other cable operators. Consequently, we estimate that there are fewer than 1,439 small entity cable system operators that may be affected by the decisions and rules proposed in this *Notice*.

16. The Communications Act, as amended, also contains a size standard for a small cable system operator, which is "a cable operator that, directly or through an affiliate, serves in the aggregate less than 1% of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000."¹⁶ The Commission has determined that there are 68,500,000 subscribers in the United States. Therefore, an operator serving fewer than 685,000 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all of its affiliates, do not exceed \$250 million in the aggregate.¹⁷ Based on available data, we find that the number of cable operators serving 685,000 subscribers or less totals approximately 1,450.¹⁸ Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed \$250,000,000, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

17. **Direct Broadcast Satellite ("DBS") Service.** Because DBS provides subscription services, DBS falls within the SBA-recognized definition of Cable and Other Program Distribution services.¹⁹ This definition provides that a small entity is one with \$12.5 million or less in annual receipts.²⁰ There are four licensees of DBS services under Part 100 of the Commission's rules. Three of those licensees are currently operational. Two of the licensees that are operational have annual revenues that may be in excess of the threshold for a small business.²¹ The Commission, however, does not collect annual revenue data for DBS and, therefore, is unable to ascertain the number of small DBS licensees that could be impacted by these proposed rules. DBS service requires a great investment of capital for operation, and we acknowledge, despite the absence of specific data on this point, that there are entrants in this field that may not yet have generated \$12.5 million in annual receipts, and therefore may be categorized as a small business, if independently owned and operated. Therefore, we will assume all four licensees are small, for the purpose of this analysis.

18. **Home Satellite Dish ("HSD") Service.** Because HSD provides subscription services, HSD falls within the SBA-recognized definition of Cable and Other Program Distribution services.²² This

¹⁴ 47 C.F.R. § 76.901(e). The Commission developed this definition based on its determinations that a small cable system operator is one with annual revenues of \$100 million or less. *Implementation of Sections of the 1992 Cable Act: Rate Regulation*, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd. 7393 (1995).

¹⁵ Paul Kagan Associates, Inc., Cable TV Investor, Feb. 29, 1996 (based on figures for Dec. 30, 1995).

¹⁶ 47 U.S.C. § 543(m)(2).

¹⁷ 47 C.F.R. § 76.1403(b).

¹⁸ Paul Kagan Associates, Inc., Cable TV Investor, Feb. 29, 1996 (based on figures for Dec. 30, 1995).

¹⁹ 13 C.F.R. § 121.201 (NAICS Code 517510).

²⁰ *Id.*

²¹ *Id.*

²² 13 C.F.R. § 121.201 (NAICS Code 517510).

definition provides that a small entity is one with \$12.5 million or less in annual receipts.²³ The market for HSD service is difficult to quantify. Indeed, the service itself bears little resemblance to other MVPDs. HSD owners have access to more than 265 channels of programming placed on C-band satellites by programmers for receipt and distribution by MVPDs, of which 115 channels are scrambled and approximately 150 are unscrambled.²⁴ HSD owners can watch unscrambled channels without paying a subscription fee. To receive scrambled channels, however, an HSD owner must purchase an integrated receiver-decoder from an equipment dealer and pay a subscription fee to an HSD programming package. Thus, HSD users include: (1) viewers who subscribe to a packaged programming service, which affords them access to most of the same programming provided to subscribers of other MVPDs; (2) viewers who receive only non-subscription programming; and (3) viewers who receive satellite programming services illegally without subscribing. Because scrambled packages of programming are most specifically intended for retail consumers, these are the services most relevant to this discussion.²⁵ As noted, *supra*, for the category Cable and Other Program Distribution, most of providers of these services are considered small.

19. Multipoint Distribution Service (“MDS”), Multichannel Multipoint Distribution Service (“MMDS”) Instructional Television Fixed Service (“ITFS”) and Local Multipoint Distribution Service (“LMDS”). MMDS systems, often referred to as “wireless cable,” transmit video programming to subscribers using the microwave frequencies of the MDS and ITFS services.²⁶ LMDS is a fixed broadband point-to-multipoint microwave service that provides for two-way video telecommunications.²⁷

20. In connection with the 1996 MDS auction, the Commission defined small businesses as entities that had annual average gross revenues of less than \$40 million in the previous three calendar years.²⁸ This definition of a small entity in the context of MDS auctions has been approved by the SBA.²⁹ The MDS auctions resulted in 67 successful bidders obtaining licensing opportunities for 493 Basic Trading Areas (“BTAs”). Of the 67 auction winners, 61 met the definition of a small business. In addition, MDS includes licensees of stations authorized prior to the auction. As noted, the SBA has developed a definition of small entities for pay television services, which includes all such companies generating \$12.5 million or less in annual receipts.³⁰ This definition includes multipoint distribution services, and thus applies to MDS licensees and wireless cable operators that did not participate in the MDS auction. Information available to us indicates that there are approximately 850 of these licensees and operators that do not generate revenue in excess of \$12.5 million annually. Therefore, using the SBA small business size standard, we find that there are approximately 850 small MDS providers.

²³ *Id.*

²⁴ *Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming*, 12 FCC Rcd 4358, 4385 (1996) (“*Third Annual Report*”).

²⁵ *Id.* at 4385.

²⁶ *Amendment of Parts 21 and 74 of the Commission’s rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act – Competitive Bidding*, 10 FCC Rcd at 9589, 9593 (1995) (“*ITFS Order*”).

²⁷ *See Local Multipoint Distribution Service*, 12 FCC Rcd 12545 (1997) (“*LMDS Order*”).

²⁸ 47 C.F.R. § 21.961(b)(1).

²⁹ *See ITFS Order*, 10 FCC Rcd at 9589.

³⁰ 13 C.F.R. § 121.201 (NAICS Code 515210).

21. The SBA definition of small entities for Cable and Other Distribution services, which includes such companies generating \$12.5 million in annual receipts, seems reasonably applicable to ITFS.³¹ There are presently 2,032 ITFS licensees. All but 100 of these licenses are held by educational institutions. Educational institutions are included in the definition of a small business.³² However, we do not collect annual revenue data for ITFS licensees, and are not able to ascertain how many of the 100 non-educational licensees would be categorized as small under the SBA definition. Thus, we tentatively conclude that at least 1,932 licensees are small businesses.

22. Additionally, the auction of the 1,030 LMDS licenses began on February 18, 1998, and closed on March 25, 1998. The Commission defined "small entity" for LMDS licenses as an entity that has average gross revenues of less than \$40 million in the three previous calendar years.³³ An additional classification for "very small business" was added and is defined as an entity that, together with its affiliates, has average gross revenues of not more than \$15 million for the preceding calendar years.³⁴ These regulations defining "small entity" in the context of LMDS auctions have been approved by the SBA.³⁵ There were 93 winning bidders that qualified as small entities in the LMDS auctions. A total of 93 small and very small business bidders won approximately 277 A Block licenses and 387 B Block licenses. On March 27, 1999, the Commission re-auctioned 161 licenses; there were 40 winning bidders. Based on this information, we conclude that the number of small LMDS licenses will include the 93 winning bidders in the first auction and the 40 winning bidders in the re-auction, for a total of 133 small entity LMDS providers as defined by the SBA and the Commission's auction rules.

23. **Satellite Master Antenna Television ("SMATV") Systems.** The SBA definition of small entities for Cable and Other Program Distribution services includes SMATV services and, thus, small entities are defined as all such companies generating \$12.5 million or less in annual receipts.³⁶ Industry sources estimate that approximately 5,200 SMATV operators were providing service as of December 1995.³⁷ Other estimates indicate that SMATV operators serve approximately 1.5 million residential subscribers as of July 2001.³⁸ The best available estimates indicate that the largest SMATV operators serve between 15,000 and 55,000 subscribers each. Most SMATV operators serve approximately 3,000-4,000 customers. Because these operators are not rate regulated, they are not required to file financial data with the Commission. Furthermore, we are not aware of any privately published financial information regarding these operators. As noted, *supra*, for the category Cable and Other Program Distribution, most of providers of these services are considered small.

³¹ *Id.*

³² SBREFA also applies to nonprofit organizations and governmental organizations such as cities, counties, towns, townships, villages, school districts, or special districts, with populations of less than 50,000. 5 U.S.C. § 601(5).

³³ See *LMDS Order*, 12 FCC Rcd at 12545.

³⁴ *Id.*

³⁵ See Letter to Daniel Phythyon, Chief, Wireless Telecommunications Bureau (FCC) from A. Alvarez, Administrator, SBA (January 6, 1998).

³⁶ 13 C.F.R. § 121.201 (NCAIS Code 517510).

³⁷ See *Third Annual Report*, 12 FCC Rcd at 4403-4.

³⁸ See *Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming*, 17 FCC Rcd 1244, 1281 (2001) ("*Eighth Annual Report*").

24. **Open Video Systems ("OVS").** Because OVS operators provide subscription services,³⁹ OVS falls within the SBA-recognized definition of cable and other program distribution services.⁴⁰ This definition provides that a small entity is one with \$ 12.5 million or less in annual receipts.⁴¹ The Commission has certified 25 OVS operators with some now providing service. Affiliates of Residential Communications Network, Inc. ("RCN") received approval to operate OVS systems in New York City, Boston, Washington, D.C. and other areas. RCN has sufficient revenues to assure us that they do not qualify as small business entities. Little financial information is available for the other entities authorized to provide OVS that are not yet operational. *Given that other entities have been authorized to provide OVS service but have not yet begun to generate revenues, we conclude that at least some of the OVS operators qualify as small entities.*

25. **Electronics Equipment Manufacturers.** Rules adopted in this proceeding could affect manufacturers of digital transmitting and receiving equipment and other types of consumer electronics equipment. The SBA has developed definitions of small entity for manufacturers of audio and video equipment⁴² as well as radio and television broadcasting and wireless communications equipment.⁴³ These categories both include all such companies employing 750 or fewer employees. The Commission has not developed a definition of small entities applicable to manufacturers of electronic equipment used by consumers, as compared to industrial use by television licensees and related businesses. Therefore, we will utilize the SBA definitions applicable to manufacturers of audio and visual equipment and radio and television broadcasting and wireless communications equipment, since these are the two closest NAICS Codes applicable to the consumer electronics equipment manufacturing industry. However, these NAICS categories are broad and specific figures are not available as to how many of these establishments manufacture consumer equipment. Census Bureau data indicates that there are 554 U.S. establishments that manufacture audio and visual equipment, and that 542 of these establishments have fewer than 500 employees and would be classified as small entities.⁴⁴ The remaining 12 establishments have 500 or more employees; however, we are unable to determine how many of those have fewer than 750 employees and therefore, also qualify as small entities under the SBA definition. Under the SBA's regulations, a radio and television broadcasting and wireless communications equipment manufacturer must also have 750 or fewer employees in order to qualify as a small business concern.⁴⁵ *Census Bureau data indicates that there 1,215 U.S. establishments that manufacture radio and television broadcasting and wireless communications equipment, and that 1,150 of these establishments have fewer than 500 employees and would be classified as small entities.*⁴⁶ The remaining 65 establishments have 500 or more employees;

³⁹ See 47 U.S.C. § 573.

⁴⁰ 13 C.F.R. § 121.201 (NAICS Code 515210).

⁴¹ *Id.*

⁴² 13 CFR § 121.201 (NAICS Code 334310).

⁴³ 13 CFR § 121.201 (NAICS Code 334220).

⁴⁴ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Industry Series – Manufacturing, Audio and Video Equipment Manufacturing, Table 4 at 9 (1999). The amount of 500 employees was used to estimate the number of small business firms because the relevant Census categories stopped at 499 employees and began at 500 employees. No category for 750 employees existed. Thus, the number is as accurate as it is possible to calculate with the available information.

⁴⁵ 13 C.F.R. § 121.201 (NAICS Code 517510).

⁴⁶ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Industry Series – Manufacturing, Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, Table 4 at 9 (1999). The amount of 500 employees was used to estimate the number of small business firms because the relevant Census categories stopped at 499 employees and began at 500 employees.

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however, we are unable to determine how many of those have fewer than 750 employees and therefore, also qualify as small entities under the SBA definition. We therefore conclude that there are no more than 542 small manufacturers of audio and visual electronics equipment and no more than 1,150 small manufacturers of radio and television broadcasting and wireless communications equipment for consumer/household use.

26. **Computer Manufacturers.** The Commission has not developed a definition of small entities applicable to computer manufacturers. Therefore, we will utilize the SBA definition of electronic computers manufacturing. According to SBA regulations, a computer manufacturer must have 1,000 or fewer employees in order to qualify as a small entity.⁴⁷ Census Bureau data indicates that there are 563 firms that manufacture electronic computers and of those, 544 have fewer than 1,000 employees and qualify as small entities.⁴⁸ The remaining 19 firms have 1,000 or more employees. We conclude that there are approximately 544 small computer manufacturers.

D. Description of Projected Reporting, Recordkeeping and other Compliance Requirements

27. The *R&O* contains additional reporting and recordkeeping requirements. For example, stations must file an application to either flash-cut to digital or for a companion digital channel. Applicants proposing digital channels 52-69 must make a certification in their application that no suitable channel 2-51 is available. In addition, applicants proposing to use digital channel 60-69 must certify that they have coordinated the use of their facilities with public safety entities. In addition, applicants in mutually exclusive groups may file settlements or engineering solutions with the Commission to avoid having to go to auction. Without these filings, stations cannot participate in the digital television transition. Factors that could make the digital transition time consuming are not likely to be related to whether the entity is small or large. These requirements will serve to promote the overall DTV transition and represent a temporary burden on stations. We expect that stations will be able to recoup the cost of these filings with advance DTV operation.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

28. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.⁴⁹

29. The Commission is aware that many low power licensees, including smaller entities, operate with limited budgets. Accordingly, every effort was taken to craft rules that impose the least possible burden on all licensees, including smaller licensed entities.

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No category for 750 employees existed. Thus, the number is as accurate as it is possible to calculate with the available information.

⁴⁷ 13 C.F.R. § 121.201 (NAICS Code 334111).

⁴⁸ Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1997 Economic Census, Industry Series – Manufacturing, Electronic Computer Manufacturing, Table 4 at 9 (1999).

⁴⁹ 5 U.S.C. § 603(b).

30. The *R&O* allows low power broadcasters additional time (as compared to full-service broadcasters) to transition from analog to digital service. The amount of additional time has not yet been determined. Allowing additional time for the low power DTV transition is less disruptive to low power broadcasters and will minimize potential loss of service. The Commission considered making low power broadcasters cease operating their analog facilities at the deadline applicable to full-service broadcasters but we found that this would result in many low power stations being unable to obtain the spectrum they needed to accomplish the digital transition. The Commission rejected this approach in order to prevent low power broadcasters from prematurely flash-cutting to digital and the loss of service that would result.

31. The *R&O* allows existing broadcasters the first opportunity to either flash-cut on their existing analog channel or to apply for a digital companion channel. This will provide existing broadcasters the flexibility to identify a workable digital channel for operation before new broadcasters are allowed to apply for channels. The Commission considered allowing applicants to seek new channels at the same time that incumbent stations seek companion channels but rejected this approach because new channels would use valuable spectrum that must be used by incumbent stations to successfully transition to digital.

32. The *R&O* concludes that digital flash-cut and companion channel applications filed by low power broadcasters are subject to auction (except Class A flash-cut applications). The Commission concluded that the statute provides the discretion in this case. At the same time, the Commission sought to alleviate the burden on all stations by allowing all applicants an opportunity to find settlements or engineering solutions to avoid having to go to auction. The Commission concluded that the settlement opportunity will facilitate the processing of applications and permit applicants to avoid having to use limited resources to bid for their digital channels.

33. The *R&O* allows applicants to seek digital channels between 52-69 on a limited secondary basis. The Commission found that this approach will provide stations with greater flexibility to seek channels where a core channel (between 2 and 51) cannot be identified. The Commission considered not allowing any additional licensing on these channels because of concerns of interference to new wireless and public safety users. This approach was rejected because it was found that limited use of channels 52-69 was necessary for the successful DTV transition of many LPTV and TV translator stations. This will enable numerous stations that otherwise could not find a digital channel with the opportunity to participate in the digital transition.

34. The *R&O* provides stations with the flexibility to choose the types of service to provide for their viewers. Translators will be limited to rebroadcasting programs and signals of full-service DTV stations without alteration to content or video format but may insert the types of local messages permitted for analog translators and may rebroadcast a DTV signal as an analog signal. LPTV stations must provide a free over-the-air video program service but have the freedom to use the remainder of their spectrum to offer ancillary services on the same basis as full-service DTV stations (including 5% fee on gross revenues of feeable services). We considered allowing LPTV and TV translator stations to operate without restrictions but that proposal was rejected because it would interfere with the Commission's overall DTV goals and the rules and policies adopted for full-service stations.

35. The *R&O* adopts interference rules and methodology to provide the needed flexibility for stations to engineer new digital operations without undermining established interference protection rights of existing broadcasters. The equipment rules will enable stations to use much of their existing equipment, thus reducing the overall cost of digital implementation. The Commission considered adoption of stricter rules but concluded that such rules would interfere with low power stations being able to successfully propose and construct new DTV facilities and to afford to convert their analog facilities.

F. Federal Rules Which Duplicate, Overlap, or Conflict with the Commission's Proposals

36. None.

G. Report to Congress

37. The Commission will send a copy of the Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.⁵⁰ In addition, the Commission will send a copy of the Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register.⁵¹

⁵⁰ See 5 U.S.C. § 801(a)(1)(A).

⁵¹ See 5 U.S.C. § 604(b).

**STATEMENT OF
CHAIRMAN MICHAEL K. POWELL**

Re: Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translators, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations

A hallmark of the Commission's digital migration agenda has been ushering in the era of digital television and its many benefits for our citizens. In so doing, we have sought to bring the DTV transition to a successful conclusion so that we can reclaim spectrum for vital public safety and new, broadband wireless services. At the same time, one of the central goals of the entirety of the Commission's agenda is to bring universal availability of new, digital services to each and every American.

Today, we take a substantial step on all of these fronts as we set a course for translator services and low-power broadcasters to bring the benefits of the DTV transition to all corners of our country, including the most rural areas of the United States. By allowing these broadcasters—many of whom are public, municipally owned, minority or religious stations—to engage in a mini-digital broadcast television transition of their own, we signal our desire to prevent disruption of broadcast service to our nation's citizens during the DTV transition, while bringing them the benefits of the digital television enjoyed in the vast majority of markets today.

As we provide these broadcasters with the capability to receive a second channel so that they can fully participate in the DTV transition, it should be clear that use of this second channel will be short-lived. To my mind, bringing an end to this transition at the same time as the end of the full-power DTV broadcast transition is of utmost importance.

Through these steps and by embracing a hard date for both this and the end of the full-power DTV transition, we can bring our citizens the benefits of digital television, bring more "saving lives" spectrum to the public safety community and drive the development of innovative wireless broadband services to all Americans.

Our commitment to moving along the DTV transition has been unwavering as we begin to take the necessary steps to visualize and then realize the end of the DTV transition and the vast benefits of that end to our citizens and homeland and economic security. At the same time, we remain committed to opening up this spectrum for new wireless services, as demonstrated by our pursuit of the use of broadcast white spaces for new wireless broadband use. On both fronts, we continue to plan to move forward aggressively.

**STATEMENT OF
COMMISSIONER MICHAEL J. COPPS
APPROVING IN PART, CONCURRING IN PART**

Re: Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations

As I have traveled around the country, I have seen first-hand the tremendous benefits that low power television stations and translators bring to the American people. These stations help in significant ways to meet the needs of underserved audiences and to increase localism, competition, and diversity in our media. Hundreds of communities all across this country depend on these stations—often run by municipalities, schools, colleges, churches and small business—for free over-the-air television service. In some rural areas, they may be the only ones providing local news and information. In other areas, low power television stations may fill a void by airing programming, including non-English programming, geared to an under-represented community.

As with any other user of the public's airwaves, these stations have the responsibility to serve the public interest. Today, as analog stations, they generally do, often with great distinction. The digital transition will afford these stations new opportunities to serve their local communities. Our job is to ensure that these new opportunities are carried out in a manner that serves the interests of all the people, most assuredly including those in rural areas for whom digital low power television and translator stations hold such great promise. Today's order, on balance, should help us to promote the digital transition for these stations and achieve this objective.

On one aspect of the decision, however, I do not find the statute as clear as the decision states. In particular, the Order concludes that the auction exemptions clearly do not apply at all for temporary second channels to advance the digital transition. I think this is a debatable reading of the law and of the intent of Congress. We should be looking for ways to facilitate the digital transition for these small stations that often have limited capital to devote to deploying digital technology. I will therefore concur in part in this decision and I urge the Commission to use the means at its disposal to minimize costly conflicts among applicants.

Finally, I note that today's decision applies to low power and translator stations the same rules on use of spectrum for ancillary and supplementary services as were applied to full-service DTV stations. When we adopted the rules on ancillary and supplementary use, we recognized that the fundamental purpose of this spectrum is to provide free over-the-air broadcast services. We further indicated that we would regularly review our approach to permitted ancillary and supplementary services. Moreover, Congress directed us to reexamine our policies from time to time to adjust the fees charged for use of the spectrum for such services. It has been several years since we have undertaken any such analysis. As technology advances and we gain a clearer picture of how broadcasters in general are using the spectrum, I hope that the Commission will carry out such a review.

Thanks to the Bureau and our staffs for their hard work on this proceeding.

**STATEMENT OF
COMMISSIONER JONATHAN S. ADELSTEIN
APPROVING IN PART AND CONCURRING IN PART**

Re: Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations, Report and Order

I'm pleased we're moving the digital transition forward for low power television stations and the many viewers living in our rural communities who rely on them.

Thousands of translators and low power stations across our country fill a vital need as the primary source of over-the-air television for people in Rural America. As I've seen firsthand, often these stations are the only station in an area providing local news, weather, public affairs and emergency programming. They are operated by a diverse range of the public, including individuals, schools, churches, local governments, and minority groups. Their modes of operation and programming vary widely, with some stations airing the most locally-produced programming among all broadcasters and others broadcasting important news and information in several languages. The conversion to digital, and the ability to offer ancillary and supplementary services, should bring opportunities for even more innovation and local programming services for these stations.

Today's comprehensive item lays out the avenues available for the transition of low power services to digital. Opportunities for low power operators to convert existing stations and to apply for transitional companion channels where feasible will encourage the overall rollout of digital services in these areas. I am mindful of the dual challenges of limited spectrum availability and limited finances of many stations in the low power service. The Order appropriately protects full power broadcasters and other primary services like public safety and wireless services, while seeking to minimize any disruption to viewers who rely on low power operations.

Yet I do not find the statutory direction compelling the auction of mutually exclusive low power temporary companion channels as unambiguous as the item declares. The item's cursory analysis fails to take into account significant aspects of this unique situation, including the temporary nature of the licenses and their role in promoting the digital transition, the status of municipality-owned stations, and that some of these stations may ultimately be digital Class A stations subject to full power transmission standards. Wherever legally and practically possible, digital low power stations should be given the same ability to ensure a smooth transition for their viewers as full power stations. I trust that we will use engineering solutions extensively to resolve conflicts.

Despite today's positive step in accelerating the transition for low power stations, other work remains to be done. Issues involving the qualification of Class A stations and public interest responsibilities for digital operation have yet to be resolved. As I have emphasized with respect to full power stations, providing certainty on public interest requirements of broadcasters in the digital age is just as important as laying out further mechanics of the transition. We should not overlook this crucial step as we fulfill Congress's vision of an enhanced digital viewing experience for all Americans.