

October 18, 2011

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MB Docket No. 11-154

FCC 11-138

I am a hard of hearing person who depends on captions to enjoy entertainment TV programs, DVD and Blue-Ray movies, and to stay informed about events, news, weather, and other information.

I thank the FCC for the opportunity to comment on this proceeding and I am impressed with the very large content of the NPRR.

Section 202, Paragraph 14:

The VPAAC Report discussed three interfaces that may require standardization – (i) interchange formats (*i.e.*, between video programming owners and video programming distributors/providers), (ii) delivery file formats (*i.e.*, between video programming distributors/providers and user devices), and (iii) linkages to users' captioning display controls (*i.e.*, between devices or between software and firmware running on one device).¹

Agree. There may be many ways an Internet source could format caption data, but there needs to be just one or a “few” standard ways, or formats for the end user equipment. While PCs could include decoders for lots of formats some other devices may be limited in processing power or storage size and can only support a few formats. Plus it may be more difficult for the user to download drivers and decoders on less sophisticated devices.

Section 202, Paragraph 16: The CVAA requires the Commission to “describe the responsibilities of video programming providers or distributors and video programming owners.”² We propose to require VPOs to send program files to VPDs/VPPs with all required captions, and, as contemplated by Section 202(b), to require VPDs/VPPs to enable “the rendering or pass through” of all required captions to the end user.³

¹ See *id.* at 22-23, 26-28. We discuss interchange and delivery formats in Sections III.E. and IV.B., *infra*.

² 47 U.S.C. § 613(c)(2)(D)(iv).

³ See also Section III.D., *infra* (discussing a proposed mechanism that would require VPOs providing a video program to VPDs/VPPs for IP delivery to provide the program either with captions, or with a certification that captions are not required for a reason stated in the certification). Congress did not explain what it meant by enabling “the rendering or pass through” but we presume that Congress meant that VPDs/VPPs must ensure that closed captions are transmitted appropriately.

The phrase “rendering or pass through” is found in the Act and several places in the NPRR. The FCC should make it clear what “rendering” means and what “pass through” means. The two terms are not the same. The HDMI web page quoted below says HDMI fully supports closed captions if the caption data has been “rendered”. In that definition it means the video source device has decoded the caption data, formed a graphical representation of the data, and overlaid the graphical representation onto the video image. So as far as the HDMI interface is concerned, there is nothing unique that it has to do. It just transmits the video image. On the other hand, if the HDMI interface “passed through” the caption data, (which it doesn’t) then the data would arrive at the caption decoder in the television receiver and the receiver does the rendering. I realize the Commission probably has this same concern with the phrase as noted in note 2 below.

This HDMI web page http://www.hdmi.org/news_events/announcements_archives.aspx#CC says:

“All HDMI specifications support Closed Captioning (CC) and enable the rendering of CC signals between CE devices. HDMI carries and delivers all the rendered data, in its entirety (including CC), produced from the source device to the display device.”

Section 202, Paragraphs 17 & 18:

As a consumer, I support the quality concerns of the VPAAC Report.

Section 203, Paragraph 49:

All Apparatus. Section 203(a) of the CVAA requires that “if technically feasible” each “apparatus designed to receive or play back video programming transmitted simultaneously with sound . . . be equipped with built-in closed caption decoder circuitry or capability designed to display closed-captioned video programming.”⁴ We seek comment on the issue of what constitutes an “apparatus.”

Apparatus for receiving or playing back video programming includes televisions, DVD & Blue-Ray players, computers including the newer tablet devices, smart phones such as Android and iPhone, DVRs in playback mode, MVPD set top boxes, VCRs, projectors, etc. While DVD and Blue-Ray players are the most common and state-of-the-art, there could be new technology on the horizon and the Commission Rules should make it clear that new receiving and playback equipment is included.

Projectors are a key component that is largely overlooked. A few projector models do have a CC decoder built in. Projectors are used in business, education, and home theater. The projectors that I am familiar with only support CC when the source device is set to 480i from a composite or component interface. Therefore when a projector is used in a home theater where the ultimate resolution is desired, captions do not work. Businesses use projectors for presentations and training. When used for training, quite often a DVD is used to project a training video and some

⁴ 47 U.S.C. § 303(u)(1)(A).

employees need captions. Schools use projectors in the classroom with content received from over-the-air TV, cable, satellite, or from a DVD player. The coming trend is to connect the projector with a WiFi network, driving it from a network attached storage device or a computer. This concern would not be important if all playback and receiving equipment handled the decoding and rendering of the caption data, and the Commission may decide to place projectors in the class of display-only monitors. I mention it here because currently it is a major problem.

As for “technically feasible” I cannot really say what is feasible, but I have a digital TV with a 7 inch screen that cost less than \$100 and it has a 608 and a 708 caption decoder and the captions are very readable. Similar small, battery operated, TVs are now available from several sources. While I prefer a larger screen, the small screen is useful during power outages when I may need to view emergency information broadcast over-the-air or from Internet. This TV does not have an Internet connection, but one may become available someday. Likewise, I have an iPhone (4 inch screen) and while I have not viewed any video programs with closed captions I have viewed a YouTube video that was uploaded with open captions, and the captions are very readable. The iPhone supports closed captions on certain content but I do not care to view movies on such a small screen. One application of interest to me on the iPhone is a weather page from a local TV station and captions do not appear on that page. People with normal hearing can carry their iPhone or other smart phone with them away from the house and be able to view weather alerts when conditions seem threatening. People with hearing loss should have the same capability.

Section 203, Paragraph 50:

Accordingly, we seek comment on the factors that the Commission should evaluate in determining whether an apparatus is eligible for a waiver. Should we consider how the apparatus is designed and marketed? How should we consider the fact that different people may consider the same device as having a different “essential utility”? In recognition of the fact that, as technology evolves, the “essential utility” of apparatus may change, should waivers be temporary, and if so, what should their duration be and what process should be used for renewing waivers?

If the device is sold as being able to view or playback video programming there should be no blanket waivers. Then as the process of establishing conformity unfolds there may be some devices that qualify for a waiver or new devices may appear that were not considered during this proceeding. There should be a mechanism for the Commission to inform the hearing loss community of a possible waiver and seek input from the people who are affected.

Section 203, Paragraph 51. We also seek comment on whether apparatus also includes software. To what extent is hardware that is designed to receive or play back video programming dependent on software for its functionality?

If the device is sold as being able to receive or playback video programming, and it depends on software to do that, the device manufacturer must make the software available. The device may have a hardware or software CC decoder. Some third party may also provide software for download and some people may prefer to use that instead without regard for CC support.

Section 203, Paragraph 54:

Recording Devices. In addition to devices that consumers use to directly view video, those that record video must also have closed-captioning capability. Specifically, the CVAA added Section 303(z) to the Act, which requires that, “if achievable . . . apparatus designed to record video programming . . . [must] enable the rendering or the pass-through of closed captions.”⁵

I realize the phrase “enable the rendering or the pass-through of closed captions” is in the Act, but it seems out of place for recording devices.

Logically, all I would want the recording device to do is to record the video, audio, and caption data, plus any necessary control files onto the media, in a standard way such that a playback device can send the caption data to the TV for rendering or the playback device can do the rendering itself. The recording device may record on removable media that it can playback itself, or the media can be transferred to a playback device. The recording device may record on non-removable media such as a hard drive and the hard drive may be in the device itself or located on the home network. It is important for the Commission to specify the format of how the audio, video and caption data are recorded. For example, broadcast DTV and DVDs use the mpeg-2 format. Blue-Ray may use something else such as mpeg-4 and content from Internet sources may also use mpeg-4. It may be possible to accommodate more than one format, but all playback devices must be able to function with the specified formats.

Regardless of whether the recording device is a DVR, DVD or Blue-Ray recorder, a computer with its own hard drive, or a computer sending data to a network attached storage device, they must all record the caption data in a standard way such that other devices can read the data and make it available on all interfaces. Mpeg-2 has a container field for 608 and 708 caption data and mpeg-4 probably has one too. I do not have the technical knowledge to know how the Commission can enforce caption support in software running on a PC to record on a network attached storage device. The DLNA probably can be of assistance in network infrastructure and enforcement approaches.

Section 203, Paragraph 55:

Interconnection Mechanisms. Finally, the CVAA directs the Commission to regulate interconnection mechanisms. Specifically, the CVAA requires that “interconnection mechanisms and standards for digital video source devices [be] available to carry from the source device to the consumer equipment the information necessary to permit or render the display of closed captions.”⁶ We seek input on how this objective can best be achieved. Is it sufficient to require that intermediate devices, such as set-top boxes and digital video recorders, be capable of conveying closed captions to display devices and to assume that standards for interconnection will be developed as necessary? Does the Commission need to extend its regulations to manufacturers or standards bodies that develop and deploy these interconnection mechanisms to ensure that they are capable of conveying closed captioning information? Should the Commission take a more active role in requiring a particular standard?

⁵ 47 U.S.C. § 303(z)(1).

⁶ 47 U.S.C. § 303(z)(2).

As a consumer, I strongly urge the Commission to step in and take an active role in developing a standard for interconnect mechanisms, with help if necessary from standards setting bodies. HDMI has been a fiasco for people with hearing loss. HDMI maintains that it is the responsibility of video source devices to render the captions. Set top boxes do perform rendering but consumers find the instructions to enable CC to be very confusing and I have heard of cases where the cable company's own technical personnel did not know how to get captions working. Additionally I do not know of any DVD or Blue-Ray players that perform rendering of captions. Therefore the consumer has to use a non-HDMI cable to view captions from a DVD player and at 480i resolution. If the DVD player is set for 480p captions do not work. Blue-Ray is capable of higher resolutions, and the HDTV is capable of higher resolutions, but we are limited to 480i. There are some DVD recorders that have ATSC tuners that renders CC, but no DVD players that I am aware of decode and render captions. Even with set top boxes, we are limited to the appearance of captions designed into the set top box and cannot use the enhanced display of captions specified by the DTV caption decoder.

We have the standard for captions on analog TV - the VBI line 21 method. HDMI does not have a line 21 VBI but it surely has plenty of other areas in the frame that could be used to convey the rather slow data rate of caption data – slow compared to the audio and video signals. Affected parties need to come to an agreement on the type of packet for caption data, and where to put it, how to route it to the CC decoder.

Besides HDMI, component cables set for anything higher than 480i do not work for caption data. It is not the fault of the cable. The current 608 caption decoder only recognizes 480i frames. (DVDs only have 608 captions) Some HDTVs do not work at all with a component connection, even if the resolution is 480i. It is simply because the manufacturer did not make the routing from the component interface to the CC decoder.

In addition to HDMI and component interfaces, the Commission should develop an overall standard for connecting anything to anything with caption support such as wired and wireless home Ethernet networks. The DLNA is working on this.

However, I realize that if future video source devices do indeed render captions of the same quality as the DTV 708 caption decoder, then the interfaces issue is not as important.