

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

In the Matter of)	
)	
)	
Second Periodic Review of the)	MB Docket No. 03-15
Commission's Rules and Policies)	
Affecting the Conversion)	RM 9832
To Digital Television)	

MOTION TO ACCEPT LATE-FILED COMMENTS

Harmonic Inc. respectfully submits this Motion to Accept Late-Filed Comments on the Commission's Notice of Proposed Rule Making in the proceeding noted above. This proceeding deals with the Commission's review of its rules and policies affecting the conversion to digital television (DTV) in the United States.¹ Harmonic's comments on the Notice are limited to section L, paragraphs 119 and 120 regarding Closed Captioning.

Harmonic had not intended to file comments on the above noted Docket, however as a result of exempt *ex parte* conversations with Neal McNeil and Peter Corea of the FCC

¹ Harmonic manufactures and sells MPEG-2 encoders (video and audio) amongst other products. We are one of the top 3 ranked encoder manufacturers in the ATSC marketplace in terms of number of encoders deployed.

Staff, Harmonic noted that no other commenter had addressed the issues Harmonic believes the Commission needs to address.

Harmonic sincerely hopes that the Commission will both grant this Motion and rule on the issues raised in our Comments.

Respectfully submitted,

/s/

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Dated: June 24, 2003

Before the
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To Digital Television)	
)	
Public Interest Obligations of TV)	MM Docket No. 99-360
Broadcast Licensees)	
)	
Children's Television Obligations of)	MM Docket No. 00-167
Digital Television Broadcasters)	
)	
Standardized and Enhanced Disclosure)	MM Docket No. 00-168
Requirements for Television Broadcast)	
Licensee)	
Public Interest Obligations)	

COMMENTS OF HARMONIC INC.

Harmonic Inc. hereby submits these comments on the Commission's Notice of Proposed Rule Making in the proceeding noted above dealing with the Commission's review of its rules and policies affecting the conversion to digital television (DTV) in the United

States.¹ Harmonic's comments on the Notice are limited to section L, paragraphs 119 and 120, regarding Closed Captioning.

Paragraph 119 requests comments regarding additional actions the Commission can take to "... ensure the accessibility and functioning of closed captioning service for digital television." Harmonic requests such additional clarifications.

Harmonic notes that Report and Order FCC 00-259² sets requirements for decoding devices. The current Rules³ specify requirements for decoding devices. The EIA-708-B Standard⁴ discusses both encoding and decoding devices. For the purposes of this Comment submission, Harmonic views all of these issues from the encoder viewpoint.

Harmonic's encoding equipment supports EIA-708-B either through an external server (using SMPTE 333M⁵ interface) or, for standard definition encoders only, via extraction of EIA-608-B⁶ waveforms and encapsulation per the requirements of EIA-708-B. Harmonic is currently developing support in several of our HD and SD encoders to extract captioning data from

¹ Harmonic manufactures and sells MPEG-2 encoders (video and audio) along with other digital video related equipment. We are one of the top 3 ranked encoder manufacturers in the ATSC marketplace in terms of number of encoders deployed.

² Closed Captioning Requirements for Digital Television Receivers, 15 FCC Rcd. 16788 (2000) ("DTV Closed Captioning Order").

³ 47 C.F.R. § 15.122(b); 47 C.F.R. § 79

⁴ "Digital Television (DTV) Closed Captioning," Electronic Industries Alliance, December 1999.

⁵ "DTV Closed-Caption Server to Encoder Interface," The Society of Motion Picture and Television Engineers, November 1999.

⁶ "Line 21 Data Services," Electronic Industries Alliance, October 2000.

VANC in a serial digital signal when it is present (per SMPTE 334M⁷).

There has been considerable confusion in the industry regarding the necessity of reprocessing the existing EIA-608-B captions carried by current SD programming, a process referred to by many as “upconversion” of EIA-608-B captions. However, EIA-708-B specifies the means for transporting EIA-608-B captions in a manner that the new decoders can utilize in compliance with FCC 00-259.

Here Harmonic is in accord with the Comments on Docket 03-15 filed by CPB/WGBH NCAM.⁸ While Harmonic differs with NCAM on its conclusions regarding the requirements for automatic upconversion, we concur in the need for the Commission to clarify the precise requirements for handling EIA-608-B captions in a standard definition MPEG-2 encoder functioning in ATSC service.

The Basic Questions

Is “upconversion” required by FCC 00-259 or not?

If it is, who is to define the mapping between existing EIA-608-B captions and the new EIA-708-B captions?

⁷ “Vertical Ancillary Data Mapping for Bit-Serial Interface,” The Society of Motion Picture and Television Engineers, May 2000.

⁸ “COMMENTS OF THE CPB/WGBH NATIONAL CENTER FOR ACCESSIBLE MEDIA (NCAM),” MB Docket No. 03-15 April 21,2003.

Neither the EIA/CEA nor the ATSC has addressed the issue of standardizing the upconversion process.

The only guidance Harmonic can find from the EIA/CEA on this subject is in “CEB-8”⁹ (issued in October of 2000, *after* the Report and Order was issued). It states:

4 Use of EIA-608-B Data by DTV Receivers¹⁰

The purpose of the EIA-608-B data stream is primarily for the encoding process required to convert DTV video into NTSC compliant video for use with NTSC devices. It should not be used in place of EIA-708-B closed captioning. However, DTV receivers may *use EIA-608-B data when EIA-708-B data is not available* for providing closed captioning. If the EIA-708-B caption data is present, DTV receivers should use it as the default closed caption format.

Emphasis added. Guidance within EIA-708-B is also very vague. The other CEA bulletin “CEB-10-A”¹¹ (which is titled “EIA-708-B Implementation Guidance”) states:

27.2.1 Discussion-Need for EIA-608 Captions Transcoded to EIA-708 Syntax¹²

The adoption of EIA-708-B requires the development of new systems to create captioning information conforming to EIA-708-B. Until native 708 captioning are mature, *it may be useful for caption encoding equipment* to accept data conforming to EIA/CEA-608-B *and transcode this to generate and insert data conforming to EIA-708-B*. The goal of this process is to produce captions with an appearance as close as possible to the appearance of the original data on an EIA/CEA-608-B decoder.

⁹ “Consideration of EIA-608-B Data Within the DTV Closed Captioning (EIA-708-B) Construct,” Electronic Industries Alliance, October 2000. The Report and Order was issued in July 2000.

¹⁰ EIA CEB8, page 1.

¹¹ “EIA-708-B Implementation Guidance,” Consumer Electronics Association, December 2002.

¹² CEA CEB-10-A, page 44.

Emphasis added. Note that the verb is *may* not *shall*. It then proceeds to provide 3 very detailed examples of caption sequences. These are not understandable to someone who is not intimately familiar with closed captioning implementation.

A further concern regards having some automatic process change the "look and feel" of the captioning in a manner that the original producer of the captions finds objectionable.

Attempting to find guidance on that aspect, Harmonic notes that the Report and Order appears to address it in two places:

61. ... The captions for this programming must be able to be decoded by a closed caption decoder manufactured in accordance with the requirements adopted in this order. Under the standard, captions created for use in analog (pursuant to EIA-608) and "upconverted" to be transmitted in EIA-708 can be decoded by a receiver in compliance with the rules we are adopting here. Upconverted captions are created by using the original 608 data as source material and employing a limited set of EIA-708 features to present the captions to an EIA-708 decoder. These captions maintain the "look and feel" or (*sic*) traditional analog captions but are presented and decoded using the true digital construct. ***The upconversion occurs at the origination point*** of a video program's distribution (***in the production process by the captioner or programmer***). Therefore, programs that have been created and captioned for display on analog television receivers may be upconverted for digital delivery without the need to create a new caption script. ...

Emphasis added. In other areas of the Report and Order which *do* apply to broadcasters, the Commission explicitly writes "by the broadcaster". Harmonic notes the Commission does not write "by the broadcaster" in the above quoted section of the Report and Order. The omission here seems to be a statement on the part of the Commission that the stations are not to be held accountable for upconversion except, perhaps, for content they originate and caption (and for which, presumably, they have staff assigned to review and monitor).

This point is perhaps more clearly made by the final Rule change found in the Report and Order.¹³ It is an amendment to 47 C.F.R. § 79.1(c), which is amended to read:

(c) Obligation to Pass Through Captions of Already Captioned Programs. All video programming distributors *shall deliver all programming received from the video programming owner or other origination source* containing closed captioning to receiving television households *with the original closed captioning data intact in a format that can be recovered and displayed* by decoders meeting the standards of Part 15 of this chapter *unless such programming is recaptioned or the captions are reformatted by the programming distributor.*

Emphasis added. So any change made to the captions generated by the program producer must be done intentionally, not by some automatic process that is not subject to operator review and correction and is not under the control of the distributor.

Regarding the Question of Upconversion of EIA-608-B to EIA-708-B Closed Captions

All of the closed caption server vendors have implemented upconversion as a standard product feature in their units that extract EIA-608-B closed captions from either analog composite or SDI. This is a logical step for this market segment since closed captioning *is* their core competency.

The original DTVCC Working Group had a website created (which is still available, although no longer maintained), found at <http://www.avio-systems.com/dtvcc/home.html>.

Note that the website is hosted by a contractor to DTVCC Working Group, who also

¹³ FCC 00-259, Appendix B, “Rules,” changes to Part 79 Number 3.

wrote the “freeware” software available for download from the site. This consists of an example of source code for an EIA-608-B to EIA-708 upconverter application.

The site says the code supports 708, not 708B. There is a note acknowledging their awareness that the software is non-compliant with 708B.

This upconverter software has been downloaded, compiled cleanly, and examined by Harmonic staff. It consists of 15 C++ source programs, a similar set of “.h” files, and 11 C++ classes. Upon reading the code, it is clear that the task performed is clearly non-trivial and requires a very deep understanding of EIA-608-B closed captions and how they are used.

The complexity of this process is underscored by a reading of CEA CEB-10-A, which, as noted earlier, provides a number of very detailed examples¹⁴ to clarify arcane points about the upconversion process. Harmonic believes this demonstrates that a deep knowledge of both EIA-608-B and EIA-708-B is required to correctly implement upconversion. This knowledge is not simply a technical one of understanding the syntax of the messages, rather it also requires understanding how the standards are actually implemented.

¹⁴ CEA CEB-10-A Annex B, page 53.

Additional questions

If the Commission decides that the Report and Order *does* require upconversion, might there be a clear statement of that fact placed somewhere on the Commission's website?

Might there be a request to the EIA/CEA and/or the ATSC to define the upconversion algorithms?

Dated: June 24, 2003