

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION**

WASHINGTON, D.C. 20554

In the Matter of)	
)	PP Docket No. 00-67
Compatibility Between Cable Systems)	
And Consumer Electronics Equipment)	

COMMENTS OF MOTOROLA, INC.

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Motorola, Inc. ("Motorola"), by its attorneys, hereby files its comments on the Notice of Proposed Rulemaking ("Notice") in the above-captioned proceeding.¹

I. INTRODUCTION AND SUMMARY

Motorola applauds the February, 2000 agreement between the National Cable Television Association ("NCTA") and the Consumer Electronics Association ("CEA") on two of the four outstanding compatibility issues between cable systems and digital receivers,² and is hopeful the two organizations can resolve the remaining differences in the near term. Motorola agrees with

¹ *In the Matter of Compatibility Between Cable Systems And Consumer Electronics Equipment*, PP Docket No. 00-67, FCC 00-137 (rel. April 14, 2000) ("Notice").

² *See* Letter from Robert Sachs, President and CEO, NCTA, and Gary Shapiro, President and CEO, CEA, to William Kennard, Chairman, FCC (Feb. 22, 2000) (detailing agreements between NCTA and CEA on interface specifications and PSIP data carriage).

the Commission's assessment that NCTA and CEA are in the best position to effect a compromise on labeling and copy protection issues and that a consensus reached by the parties on these matters would obviate the need for the instant rulemaking.³ While those private negotiations move ahead, Motorola takes this opportunity to comment on two issues raised by the Notice.

First, Motorola urges the Commission to adopt digital closed captioning rules that do not render obsolete the substantial deployed base of digital cable and satellite encoding and decoding equipment. In its DTV closed captioning proceeding, the Commission has proposed to require that digital TVs incorporate closed captioning decoding functionality according to the specification in Section 9 of the EIA-708 standard.⁴ As Motorola has previously explained and reiterates below, however, adopting such a rule would render obsolete the substantial deployed base of closed captioning encoding and decoding equipment used in the cable industry (as well as a substantial amount of equipment already deployed and soon to be deployed by direct-to-home satellite providers), since such equipment is designed solely to process EIA-608 captions, not EIA-708 captions, and only EIA-608 captions that are carried in the DVS-157 format as opposed to the incompatible A/53 format specified in the EIA-708 standard.

Motorola respectfully suggests that the optimal way to achieve backward compatibility with this substantial base of existing equipment would be for the Commission to require that all closed captions for digital programming are transmitted in the well-established DVS-157 format (even if they are also simultaneously transmitted in the A/53 format) and that digital TVs are

³ See Notice at ¶ 22.

⁴ See *In the Matter of Closed Captioning Requirements for Digital Television Receivers*, NPRM, ET Docket No. 99-254, FCC 99-180, at ¶¶ 7, 12 (rel. July 15, 1999) ("Captioning Notice").

capable of decoding captions in the DVS-157 format (even if they are also capable of decoding captions in the A/53 format). The burden of such a requirement on broadcasters and equipment manufacturers would be minimal. In fact, Motorola has already begun to incorporate such dual processing functionality into its new digital hosts, beginning with its DCT2020 model. Thus, Motorola is only asking that TV manufacturers and broadcasters be required to step up to the same level of commitment that it has already undertaken in order to ensure compatibility in the closed captioning area.

Second, Motorola notes that a final license for use of specific components of the 5C copy protection technology by POD and host devices has not yet been negotiated. Incorporation of this technology -- which must reside in both the POD and the host -- is necessary to ensure that the host device is not a pirate box that can make unauthorized copies of protected digital programming. CableLabs is working hard with the licensing agent of the 5C companies -- the Digital Transmission Licensing Administrator ("DTLA") -- to reach a final agreement, and Motorola is hopeful that such an agreement will be achieved in the near term so that manufacturers will be able to activate this technology in their retail equipment that they are planning to deploy by July 1, 2000.

II. THE COMMISSION'S COMPATIBILITY RULES MUST ADDRESS HOW TO AVOID RENDERING OBSOLETE THE SUBSTANTIAL DEPLOYED BASE OF DIGITAL ENCODING AND DECODING CAPTIONING EQUIPMENT USED IN THE CABLE AND SATELLITE INDUSTRIES.

The *Notice* seeks comment on "how compatibility decisions could enhance implementation of closed captioning standards."⁵ Motorola has previously addressed this issue in the Commission's DTV closed captioning proceeding⁶ and feels strongly that the Commission must adopt digital closed captioning rules which avoid rendering obsolete the well-established system in the cable industry that has been delivering closed captioning information within digital video programming to millions of hearing-impaired Americans for several years.⁷

The cable industry relies on the EIA-608 standard to create closed captions for analog and digital programming, as do most video distributors.⁸ Cable programmers and cable operators that

⁵ See *Notice* at ¶ 21.

⁶ See *Captioning Notice, supra*, n. 4.

⁷ Numerous commenters in the DTV closed captioning proceeding, including many in the disabled community, agreed that the Commission should address the backward compatibility issue. See, e.g., Comments of National Cable Television Association, filed in ET Docket No. 99-254, at 5-7 (Oct. 18, 1999) ("NCTA Captioning Comments"); Reply Comments of Council of Organizational Representatives On National Issues Concerning People Who Are Deaf Or Hard Of Hearing, filed in ET Docket No. 99-254, at 9 (Nov. 15, 1999) (noting that GI's concerns about backward compatibility should be addressed); Reply Comments of Thomson Consumer Electronics, filed in ET Docket No. 99-254, at 7 (Nov. 15, 1999) (stating that cable compatibility issues raised by GI and NCTA should be resolved before captioning rules are adopted); Reply Comments of WGBH Educational Foundation, filed in ET Docket No. 99-254, at 17-18 (Nov. 15, 1999) (noting that incompatibilities between digital terrestrial broadcast and digital cable television standards must be resolved).

⁸ The EIA-608 standard is widely used across the video industry to deliver closed captioning to American consumers. As the Commission knows, analog television programmers carry closed captioning data within line 21 of the television signal's vertical blanking interval ("VBI") as defined in the EIA-608 standard. Other programmers utilize the EIA-608 standard, as well. For example, digital broadcasters currently use a combination of proprietary and open
(footnote continued ...)

provide digital programming to millions of American consumers deliver the EIA-608 captioning data using the DVS-157 format, a well-established SCTE transport standard. Specifically, all cable programmers' digital encoders, all digital cable headend equipment, and the over 7 million digital customer terminals that have already been shipped to cable MSOs (most of which have already been deployed to consumers) are designed solely to process EIA-608 closed captioning data in the DVS-157 format.

Motorola is concerned that the rules proposed in the Captioning Notice would render obsolete this substantial deployed base of cable closed captioning encoding and decoding equipment. The Captioning Notice proposes that future digital TVs be required to support a new closed captioning transport method planned for use by digital terrestrial broadcasters, namely section 9 of the EIA-708 standard. As correctly noted by NCTA and other commenters, however,⁹ EIA-708 is incompatible with closed captioning encoding and decoding equipment utilized in the cable industry today. This is because, as noted, cable encoding equipment and cable customer terminals are designed to process closed captions carried in the DVS-157 format, whereas the EIA-708 standard specifies that closed captions must be carried in the incompatible ATSC A/53 format. Consequently, for example, a digital terrestrial broadcast that carries captioning information in the A/53 format cannot be processed and reconstructed by cable

(... footnote continued)

standards to transport analog EIA-608 captioning data embedded in the original digital programming content. Similarly, satellite broadcasters use proprietary systems to encode EIA-608 captioning data within the picture user data extensions of the MPEG-2 video streams.

⁹ See NCTA Captioning Comments at 5-7; Comments of General Instrument Corporation, filed in ET Docket No. 99-254, at 5-8 (Oct. 18, 1999); Reply Comments of General Instrument Corporation, filed in ET Docket No. 99-254, at 1-2 (Nov. 15, 1999); Reply Comments of AT&T Corporation, filed in ET Docket No. 99-254, at 3-6 (Nov. 15, 1999).

headend equipment or digital customer terminals for display on analog TVs.¹⁰ Similarly, since digital cable programming services, such as HBO, all use the DVS-157 format to carry EIA-608 captions, if the Commission were to require new digital TVs to incorporate a closed captioning decoding capability that complies only with the EIA-708 standard (and the accompanying A/53 format), the captions included in such digital cable programming services could not be processed and displayed on new digital TV sets.¹¹

¹⁰ The fact that the Captioning Notice proposes to apply the rules only to equipment manufactured one year after the adoption of the rules does not help this situation. Since the deployed digital customer terminals have useful lives of five years and greater, they will still be around for quite a while to allow consumers with analog TVs to view digital video signals. If the standard for carrying closed captions is changed by Commission rule to the A/53 format and programmers thereafter no longer carry captions in the DVS-157 format, these terminals would no longer be able to decode captions after the rule takes effect.

¹¹ Motorola notes that the DVS-157 technology was developed and implemented before the A/53 format was created and was established as a *de facto* cable industry standard before the relevant portion of A/53 was incorporated into any DTV product. General Instrument (“GI”) developed the DVS-157 format for carrying NTSC captions in digital video signals in 1992-1993. The DVS-157 technology was built into digital cable equipment beginning in 1993-1994 and deployed soon thereafter by cable operators. The A/53 format did not exist at that time. GI submitted the DVS-157 technology to the Grand Alliance in 1994 for adoption as a digital broadcast standard. The Grand Alliance modified this proposal so that it could carry DTV captions instead of EIA-608 captions, and this resulted in the A/53 format (which was standardized by ATSC in September 1995). However, the A/53 format that was standardized was not backward compatible with the submitted DVS-157 format. In February 1999, SCTE formally adopted the *de facto* DVS-157 standard. EIA-708-B was balloted in October 1999, and this standardized the coding and carriage of DTV captions, as well as “a method” of carrying EIA-608 captions. Unfortunately, this method (based on the A/53 format) was not compatible with the SCTE-DVS-157 format, and the EIA-708-B standard did not include any statements on other methods that were being used by the cable and satellite industries for carriage of EIA-608 captions in digital video programming.

As a result, to comply with a Commission requirement specifying EIA-708 and the A/53 format as the new standard, cable programmers would have to spend between \$18,000 and \$28,000 per encoder (depending on the status of the encoder's warranty and excluding all field engineering implementation costs) for new encoding software.¹²

Likewise, cable systems -- which are all currently designed to process, deliver, and decode EIA-608 captions in the DVS-157 format -- would be unable to process captions in the A/53 format, and cable operators would therefore confront two costly and equally undesirable alternatives: (1) purchase and install new equipment at each headend to parse and decode the EIA-608 captions carried in the new A/53 format and re-encode them in the DVS-157 format so they can be understood by the 7+ million (and growing) deployed digital customer terminals, and, in turn, displayed on analog TVs; or (2) dispatch trucks and technicians to swap existing digital customer terminals with terminals that can process and decode closed captions in the new A/53 format. Either alternative would be extremely expensive for such distributors and, ultimately, for consumers. For example, the cost to cable operators alone to pursue the former of the above options would be approximately \$7,000 per digital transport multiplex feed, which would translate into approximately \$42,000 to \$50,000 per digital-capable headend. Since there are approximately 1,000 cable headends currently delivering digital video signals, the cost to cable

¹² While Motorola recognizes that the focus of the Captioning Notice is on establishing closed captioning decoding requirements for digital *receivers*, any such requirements will necessarily cause programmers to transmit closed captions using a compatible standard, and this, in turn, will produce the incompatibility with existing digital equipment that cannot process or decode the new standard.

operators in the aggregate would be approximately \$40-\$50 million, excluding the significant additional field engineering costs to implement such new equipment.¹³

In effect, exclusive adoption by the Commission of EIA-708 would severely penalize the cable industry for leading the early development and deployment of digital video programming and digital closed captioning equipment. More importantly, exclusive adoption of EIA-708 would leave millions of hearing-impaired individuals and other consumers who currently use deployed digital terminals to decode closed captions for their analog TVs with equipment that no longer works merely as a result of a regulatory change in the standard used to transmit closed captioning information.

Motorola notes that the impact of the backward compatibility issue addressed herein is not limited solely to the cable industry. It affects the satellite industry as well. For example, the digital customer terminals designed to operate with the recently-launched HITS2HOME service -- which will allow subscribers in small cable systems with only analog service to receive 140+ channels of digital programming via a direct satellite feed -- are also capable of decoding only the DVS-157 format. Several million such terminals are expected to be deployed in the near future. Similarly, Star Choice, a direct-to-home provider of multichannel video service that operates primarily in Canada, has already deployed 500,000 digital customer terminals (and expects to deploy 1.2 million), and these terminals are also capable of decoding only the DVS-157 format.

¹³ Of course, the number of digital-capable headends and the number of deployed digital customer terminals will be much higher still by the time the Commission's rules become effective, which would further increase the costs for addressing these backward compatibility issues.

It is important to stress that the enormous costs that would be incurred by cable programmers, distributors, manufacturers, and consumers alike to carry EIA-608 captions in the A/53 format would provide no corresponding benefits to consumers over carriage of EIA-608 captions in the existing DVS-157 format.

In light of the foregoing, Motorola respectfully urges the Commission to ensure that there is compatibility among the closed captions that are carried in digital video streams, the substantial deployed base of digital cable (and, increasingly, direct-to-home) encoding and decoding equipment, and digital TVs. The optimal way to achieve such backward compatibility would be for the Commission to require that all closed captions are transmitted in the well-established DVS-157 format (even if they are also simultaneously transmitted in the A/53 format) and that digital TVs are capable of decoding captions in the DVS-157 format (even if they are also capable of decoding captions in the A/53 format).

For example, digital TVs that have a dual captioning decoding capability would be able to display A/53-formatted captions in digital broadcast signals, whether those signals are received over-the-air or over a cable system. Such digital TVs would also be capable of processing DVS-157-formatted captions contained in digital cable programming services, with or without the use of a separate digital customer terminal. Moreover, the continued use of DVS-157 would mean that the substantial deployed base of digital customer terminals will continue to be able to process and decode captions in digital video programming for display on millions of analog TV receivers which will be around for a long time.¹⁴

¹⁴ It is important to note that even if digital TVs were to incorporate decoding functionality for the DVS-157 format, that alone would not solve the backward compatibility problem. For example, absent carriage by broadcasters of closed captions in the DVS-157 format, cable systems (footnote continued ...)

Motorola notes that the burden of such a requirement on broadcasters and equipment manufacturers would be minimal. For example, most broadcasters that use Motorola as their vendor purchased their digital encoding equipment relatively recently and, as a result (unlike most cable programmers who purchased their encoders some time ago), they already have in place encoders that use a software version that allows the simultaneous transmission of captions in both the A/53 and DVS-157 formats. Moreover, Motorola notes that the impact of such simultaneous transmission on broadcast spectrum is *de minimis*. Similarly, certain suppliers are already building chip-sets for Motorola and other manufacturers that provide dual processing functionality for both the A/53 and the DVS-157 formats, and the incremental cost of including such dual functionality is less than a penny. *In fact, Motorola has already begun to incorporate such dual processing functionality into its new digital hosts, beginning with its DCT2020 model.* Motorola is thus only asking that TV manufacturers and broadcasters be required to step up to the same level of commitment that Motorola has already undertaken in order to ensure compatibility in the closed captioning area.

(... footnote continued)

that carry a broadcaster's digital signal would still be unable to process and decode the closed captions carried in the digital broadcast signal which is transmitted in the A/53 format. Similarly, as noted, unless digital TVs can process captions in the DVS-157 format, the closed captions contained in digital cable programming services that carry EIA-608 captions in the DVS-157 format could not be displayed on new digital TV sets.

III. THE LICENSE FOR USE OF SPECIFIC COMPONENTS OF 5C COPY PROTECTION TECHNOLOGY BY POD AND HOST DEVICES MUST BE COMPLETED PROMPTLY TO ENSURE THAT THIS TECHNOLOGY MAY BE ACTIVATED IN RETAIL EQUIPMENT THAT MOTOROLA AND OTHER MANUFACTURERS PLAN TO DEPLOY BY JULY 1, 2000.

The Commission also seeks comment on whether "there is any reason to believe that any unresolved copy protection licensing or other copy protection issues create uncertainty with respect to the physical configuration of POD security modules or host devices."¹⁵ Motorola wishes to apprise the Commission of such a licensing issue. CableLabs has been working hard to negotiate a license with DTLA -- the licensing agent for the 5C companies -- for the use of specific appropriate components of 5C copy protection technology (namely, the 5C certificates and certificate processing) by POD and host devices. To date, the parties have not agreed on the final terms of this license.¹⁶ Manufacturers of both PODs and hosts will need this license in order to activate the appropriate components of the 5C technology in their equipment. Moreover, once the final license has been executed and the technology becomes available for use, manufacturers will need to conduct their final production testing of this technology within their POD and host devices. Motorola is hopeful that execution of such an agreement will be achieved in the near term so that manufacturers will be able to incorporate this technology into their retail equipment that they are planning to deploy by July 1, 2000.

¹⁵ Notice at ¶ 19.

¹⁶ A draft license is currently under review at CableLabs. Motorola has provided its comments on that draft as have other participants in the CableLabs process, but no final license has been issued.

IV. CONCLUSION

Based on the foregoing, Motorola respectfully urges the Commission to: (1) adopt digital closed captioning requirements that do not render obsolete the substantial deployed base of cable and satellite encoding and decoding equipment; and (2) encourage the parties to finalize adoption of a license for the use of the specific appropriate components of the 5C copy protection technology by POD and host devices.

Respectfully submitted,

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