

The CPB/WGBH

NCAM

National Center for Accessible Media

November 26, 2003

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20544

Re: Ex Parte Presentation, MB Docket No. 03-15; RM 9832: Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television.

Dear Ms. Dortch:

On Thursday, November 25, 2003, I met with Eloise Gore, Rick Chessen, Mary Beth Murphy, Steve Broeckert, Peter Corea, John Gabrysch, Gordon Godfrey, Sonia Greenaway, William Johnson and John Wong of the Media Bureau, and Pam Gregory, Amelia Bronn, Martha Contee, Helen Chang, Traci Randolph, and Jennifer Simpson of the Consumer and Governmental Affairs Bureau on matters related to the above-referenced proceeding.

Specifically, at the invitation of Ms Gore, I repeated my presentation from the recent Advanced Television Systems Committee "PSIP and Closed Captioning University" seminar, entitled "DTV Closed Captioning: A Progress Report". A copy of the presentation handout is attached to this filing.

Sincerely,

S/Gerry Field

Gerry Field
Manager
DTV Access Project
CPB/WGBH National Center for Accessible Media (NCAM)

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**DTV Closed Captioning:
A Progress Report**

Gerry Field
Manager, DTV Access Project
CPB/WGBH National Center for Accessible Media
(NCAM)

ATSC PSIP & Closed Captioning University
Alexandria, VA
October 23, 2003

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**DTV Access Project
Scope and Activities**

- Closed Captioning & Video Description
- Standards Development and Implementation
ATSC, CEA, SMPTE, SCTE, W3C
- Support to PBS Member Stations
- Support to Industry At Large

 
Corporation for Public Broadcasting
Television Future Fund National Institute for Disability & Rehabilitation Research
United States Department of Education

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Today's Seminar

- Overview & Progress Report
- DTV Captioning Primer
- Standards Update
- Practical Problem Solving

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Accessibility: What Is It? Why Do It?

- Equivalent or Alternate Access
- Primary Audience of 36 Million People
- Extended Audiences and Uses
- Benefits of Universal Design
- It's The Law
- It's Smart Business

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Accessibility Laws and FCC Regulations

- Americans With Disabilities Act
- Rehabilitation Act, Section 508
- Assistive Technology Act of 1998
- Individuals With Disabilities Education Act
- Television Decoder Circuitry Act of 1990
- Telecommunications Act of 1996

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FCC Rules & Regulations
<http://www.fcc.gov/cgb/et-0/links.html>

- 47 CFR 79.1 - Closed Caption Programming
- 47 CFR 79.2 - Emergency Information
- 47 CFR 15.119 - Analog Decoder Rules
- 47 CFR 15.122 - DTV Decoder Rules
- As of July 1, 2002, Caption Deadlines Apply to DTV Broadcasts
- Currently 10 hours/day of "new", 30% of "pre-rule" programs
- "New" programming increases to 15 hrs/day on January 1 '04
- Additional, separate schedule for Spanish language programming
- Currently, all emergency information must be accessible

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DTV Transition Goals

- **Maintain Existing Services**
 - Migration path for NTSC sources, libraries
 - Support for installed base of NTSC consumer devices
 - Begin with local emission
- **Develop Advanced Services**
 - Receiver display capabilities
 - Support through Distribution Chain
 - Advanced authoring capabilities
 - Expanded services

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Related Technical Standards

- CEA - EIA-608B - Line 21 Data Services
- CEA - EIA-708B - DTV Closed Captioning
- SMPTE 333M - Serial Caption Encoder Interface
- SMPTE 334M - VANC Carriage of Data
- ATSC - A/53 (DTV), A/65 (PSIP)
- SCTE - ANSI/SCTE 20, 21, 43

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An Informal Survey

Market "A"
9 DTV Stations On The Air
 1/3 No Captions
 1/3 608 Only
 1/3 608 and 708

Of 51 Random Stations Nationally
 35% No Captions
 45% 608 Only
 20% 608 and 708

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Building Accessibility into DTV

ATSC DTV Transport Stream

ATSC Captions Are EIA-708 B Captions

SD or HD No Distinction

DTVCC & NTSC

Caption Service Descriptor EIT (PSIP) / PMT (PSI)

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Building Accessibility into DTV

ATSC DTV Transport Stream

Reference Documents

EIA-708B
Digital Television (DTV) Closed Captioning
December 1999

CEA CEB-10A
EIA-708B Implementation Guidance
December 2002

CEA CEB-8
Consideration of Line 21 Caption Data
October 2000

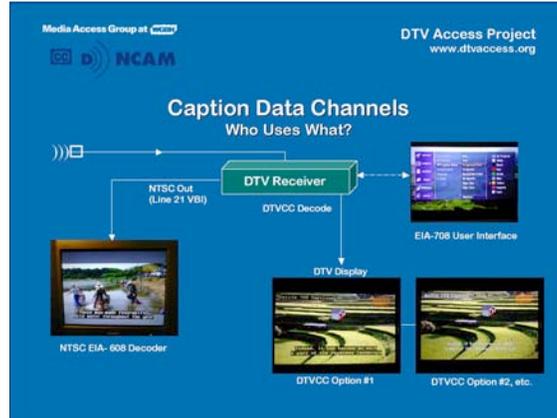
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Caption Data Channels

Who Uses What?

ATSC DTV Transport Stream

- **NTSC Caption Data Channel**
 - Also called "Embedded 608"
 - To "tunnel" 608 compatibility bytes to NTSC devices
 - Required to satisfy 47 CFR 79.1 and 15.119 rules
 - Cannot satisfy needs of required 708 caption decoder
- **DTVCC Caption Data Channel**
 - Must be used by 708 DTVCC caption decoders
 - Required to satisfy 47 CFR 79.1 and 15.122 rules
 - Can be "derived" from 608 (Line 21) sources
 - Simple data can invoke all display features in decoder
 - Authoring systems for complex data being developed



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DTV Captions Are 708 Captions

FCC Report and Order

FCC 00-259
DTV Captioning Report & Order (July 2000)

- Established DTV Program Requirements
 - July 1, 2002 Established as "New" / "Pre-Rule" Date
 - Video Programming Distributors, Broadcast & MVPDs
 - Also requires carriage of analog caption data (§ 63)
- Established Decoder Requirements for July 1, 2002
 - Beyond the EIA-708-B Section 9 Recommendations
 - 3 Pen Sizes, 8 Fonts, 8 Colors, Standard Services #1-6

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DTV Captions Are 708 Captions

FCC Rules

47 CFR 79.1 (Modified)
Closed Captioning of Video Programming

47 CFR 15.122 (New)
Closed Caption Decoder Requirements for Digital Television Receivers & Converter Boxes

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47 CFR 79.1
Closed Captioning of Video Programming

- **R&O Amends Definition of Closed Captioning**
 - Drops reference to VBI in Part 79.1(a)(4)
 - Makes more general reference to providing captions
"in a format that can be recovered and displayed by decoders meeting the standards of Part 15" rules:
 - Part 15.119 - Analog TV decoders
 - Part 15.122 - DTV decoders
- **Establishes DTV Programming Requirements**
 - Uses existing per channel, per calendar quarter dates
 - Current average 10 hours per day, up to 15 hrs (1/1/04)

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47 CFR 79.1
Closed Captioning of Video Programming

<http://www.fcc.gov/cgb/consumerfacts/closedcaption.html>



Consumer Facts

CLOSED CAPTIONING

New Programming

All English language programming prepared or formatted for display on analog television and first shown on or after January 1, 1998, as well as programming prepared or formatted for display on digital television that was first published or exhibited after July 1, 2002 ("digital programming"), is considered "New Programming," and must be captioned according to benchmarks set by the FCC. The following benchmarks establish how much "New Programming" must be captioned each calendar quarter:

| | |
|---------------------------------------|---------------------------------------------------|
| January 1, 2000 to December 31, 2001: | 450 hours of programming per channel per quarter |
| January 1, 2002 to December 31, 2003: | 900 hours of programming per channel per quarter |
| January 1, 2004 to December 31, 2005: | 1350 hours of programming per channel per quarter |
| January 1, 2006 and thereafter: | 100% of all programming, with some exemptions |

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47 CFR 15.122
Closed Caption Decoder Requirements for Digital Television Receivers & Converter Boxes

- **708 Decoders In DTV Receivers and Tuners Manufactured After July 1, 2002**
 - 13" diagonal for 4:3 screens
 - 7.8" vertical for 16:9 screens
 - All separately sold DTV tuners
 - Must decode and process DTVCC Services # 1 - 6
- **Must Pass Any Analog Caption Information To Attached Analog Receivers**
 - Re-insert in Line 21 of NTSC video outs

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Two Parts To Caption Delivery

Payload
 EIA-708B = 608 + 708 Data
 Distinct Data Channels
 Within Video Elementary Stream
 MPEG User_Data

Service Info
 Caption Service Descriptor
 PMT & EIT
 NTSC CC = cc_type "00", "01"
 DTVCC = cc_type "10", "11"
 Service Number "0" is reserved

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Caption Service Information

PSIP - ATSC A/65

- **Caption_Service Descriptor**
 - Descriptor Loop Lists Each Instance of Caption Data
 - Line 21, DTVCC Service, Language, Format
 - Up To 16 Services Per Elementary Stream
- **Must Be Present (NCAM Observations)**
 - Or New 708 Decoders May Ignore DTVCC Caption Data
 - Place in Both PMT and EIT
 - To Meet Needs Of Both TVCT and CVCT
 - Need Support From Listing Services, Traffic, Automation, PSIP Generators

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Caption Service Information

PSIP - ATSC A/65

Table 6.17 Bit Stream Syntax for the Caption Service Descriptor

| Syntax | Bits | Format |
|----------------------------------------|------|--------------------|
| caption_service_descriptor { | | |
| descriptor_tag | 8 | 0x86 |
| descriptor_length | 8 | uint8f |
| reserved | 3 | "111" |
| number_of_services | 5 | uint5f |
| for (i=0; i<number_of_services; i++) { | | |
| language | 8*3 | uint8f |
| cc_type | 1 | boolf |
| reserved | 1 | "1" |
| if (cc_type==line21) { | | |
| reserved | 5 | "11111" |
| line21_field | 1 | boolf |
| } | | |
| } | | |
| caption_service_number | 6 | uint6f |
| easy_reader | 1 | boolf |
| wide_aspect_ratio | 1 | boolf |
| reserved | 14 | "1111111111111111" |
| } | | |

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ATSC Receivers and Captions



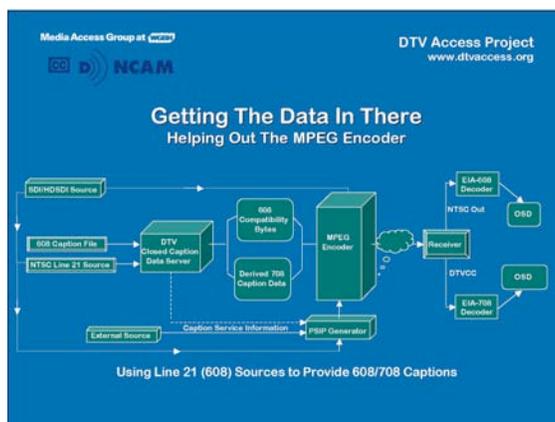
- May Display Only 708
- If NTSC Tuner - 608 option
- May Require Descriptors
- Default = As Created
- Viewer Can Choose
 - Fonts
 - Font Size
 - Character Color
 - Background Color

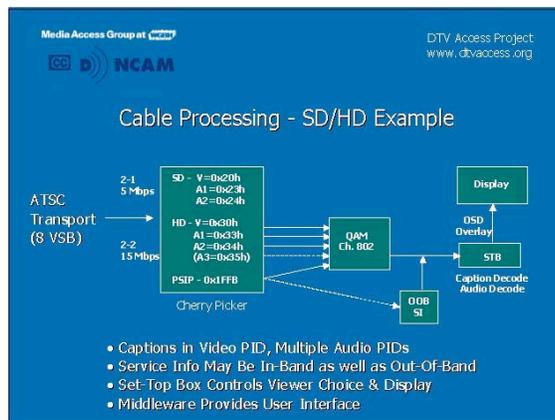
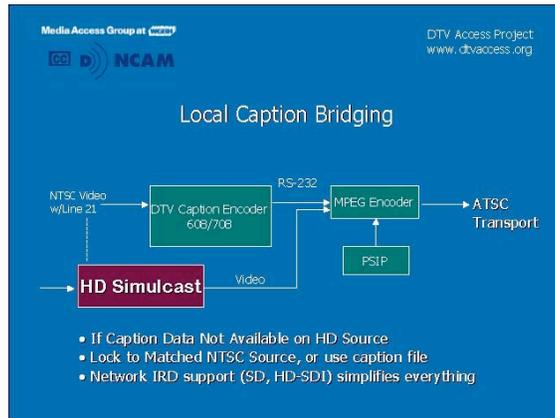
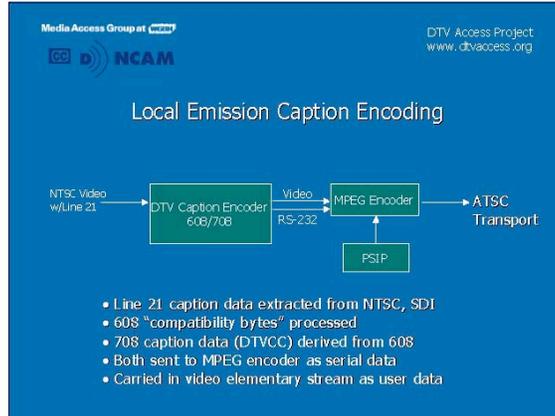
708 Authoring Systems Being Developed

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DTV Technology & Captions

- Captions Encoded Prior To Distribution
- Caption Creation The Same For Now
- HD Programming
Letterboxed NTSC Master Usually Required
- Can Encode For DTV
 - By Extracting from the NTSC Master
 - From Standard 608 Caption File
- VANC Recording on SD/HD Tape
 - New SMPTE 334 Encoders Available Now





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Getting The Data In There

Helping Out The MPEG Encoder

- **Extract Line 21 (EIA-608) Data from Sources**
 - Must be ATSC Compliant, Captions in User_data
 - Should perform both 608 embedding & 708 translation
 - Typically requires an external device, but some vendors now providing software support
 - Data bridging, latency issues
- **Use Existing 608 Caption Files for Encoding**
 - Author from letterboxed NTSC dubs (HD, SD WS)
 - Encode/Translate into MPEG Encoder (GA, SMPTE 333)
 - Encode Onto Tape Directly (SMPTE 334)

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Getting The Data In There

Putting It In The VANC

- **New HD VTRs Support VANC Data**
 - Sony (HDCam), Panasonic (HD-D5) at NAB 2002
 - Record Captions, Other Data Directly To Tape
- **Caption Data Servers Using SMPTE 334M**
 - Form Caption Distribution Packets (CDPs)
 - Caption Data Follows Video Through Distribution
 - Routing and Switching Through 292, 259 Systems
 - Currently Supported By Norpak and Evertz, others

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Getting It From The Network

- **Data Bridging For Local Station Use**
 - Locked NTSC, ATSC Sources
 - Latency issues and operational concerns
- **MPEG Over Satellite**
 - Either 19.4Mbps (Pass-Through) or 45Mbps
 - User_Data or Dedicated Data PID
 - Remux or Decode/Encode Must Retain Caption Data
 - IRDs Now Starting To Embed Caption Data
 - New Product From Sencore, DigitalVision, others

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Storing It And Getting It Back

- Don't Regress When You Compress
 - Video Server Systems Preserve Caption Data In Uncompressed Files
 - Encode On Playout
 - Line 21 (608) Solutions Are Well Known
 - DTVC0 Support Is Required
 - Opportunities for Just In Time Encoding For Captions and Other Data Services

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Check List

- ✓ 608 and 708 for All Streams
- ✓ Local Transcode and Translate
- ✓ IRD Support Features
- ✓ VANC Support for Routing
- ✓ Recovery At Every Decode/Encode
- ✓ Server Ingest and Playout
- ✓ PSIP Present, Current & Accurate

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Thank You

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