SMPTE 334M

DATA DOES HAVE A LIFE BEFORE EMISSION

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MY MISSION

TO CONVINCE YOU THAT THE 292 VERTICAL ANCILLARY SPACE IS WHERE A LOT OF DATA SHOULD BE

- WHY ME?
- WHAT DATA?
- THE APPLICATIONS
- THE STANDARD
- SOME EXAMPLES
WHY ME?

norpak corporation is:

- Developer of the packet multiplexed data broadcast concepts and standards. 22 years of experience. Interactive TV again and again

- The leader in TV Data Broadcasting products - believe 90% of the world market

- Over 3,400 NTSC/ PAL/ SECAM, 525/625 line systems in 42 countries. All major data formats. Analogue, serial digital and HD
WHAT DATA?

- Needs to synch with the video and sound - captions at VEF triggers

- Not syched but needs to stay with the video and sound - metadata

- That needs to stand the 'test of time' and 'Murphy's Law'

- That lends some order to the crazy world of digital emission formats

- Let's call it 'sticky' data
DATA - TWO MARKETS

- COMMERCIAL
  - Usually closed system - some encryption
  - Network internal use, financial, government
  - New HD applications - metadata

- CONSUMER
  - Interactive TV, PVRs, captions, EPGs
PC target delivery - best place to insert the data is at the point of emission. Many speakers will be addressing those opportunities.

'Internal' use. Present minimal use of 'metadata' takes off with DTV. Motion picture data, rights data, assets management, etc. A focus of increasing standards work. Needs to be inserted at the start of the process.
CONSUMER MARKET

VBI

VANC

HIGH SPEED

LOW SPEED

PC

STB

TV

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WHAT ABOUT SIMPLE TV APS?

- Enhanced TV - built into TV
- Killer application is Program Guide
- Sit back, limited interaction
- Cost - $10, restricts storage
- Bandwidth, content very limited
- Best tied to TV programming
- Gemstar dominates market
- Broadcast is “natural” carrier
- Gemstar, WebTV, ATVEF.....
WHAT ABOUT PC BASED APS?

- Killer application is real-time info
- Sit forward, detail, process info
- Cost - $100, plus PC resource
- Areas where telecom is poor
- Independent of TV programming
- Lots of room for competition
- Broadcast / satellite “natural” carriers
- Financial data, news, weather,
WHAT ABOUT THOSE STBs?

- Set Top Box - STB - ATVEF
- Killer application - EPG+Internet
- Sit back, but lots of detail
- Bandwidth, content rich
- Best if interactive with TV
- Lots of room for competition
- Cable MSOs “natural” carriers
- MSTV, Wink, Liberate, WebTV.....
Most solutions are focussed on adding data at the point of emission. This is fine for data which is unrelated to the video/sound.

‘Sticky’ data is content that needs to ‘stick’ with the V/S as it travels through multiple plants on its way from the creator to broadcast.

Needs to be transparently stored and retrieved without the complications of locating it on a server somewhere. Delays of seconds, hours, days are commonplace - and what about years down the road?
FORWARD / BACKWARD COMPATIBILITY

- Whether the signal is analogue, serial digital or HDTV the 'sticky' data interface should be the identical.

- Applications such as captioning, VChip, XDS and ATVEF URLs should interface to the data encoder in the same way regardless of the TV standard used.

- Makes the move from analogue to digital or HDTV simple and straightforward.
SMPTE 334M

- The new standard for adding data to the SMPTE 292M signal using proven broadcast procedures and processes

- VANC in the SMPTE 292M stream means that the combined V/S/D can be switched, routed, and stored using familiar processes

- Captioning, VChip and ATVEF interactive data injection continue to be done at the same point in the process, using the same tools and in the same way as it presently is done
ANCILLARY DATA FORMAT
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LUMINANCE : 1920 OR 1280 BYTES
CHROMINANCE : 1920 OR 1280 BYTES
ANCILLARY DATA FORMAT

ANC PACKET
7-262 BYTES

ANC PACKET
7-262 BYTES

ANC PACKET
7-262 BYTES

LUMINANCE : 1920 OR 1280 BYTES

CHROMINANCE : 1920 OR 1280 BYTES

ACTIVE PICTURE DATA

VANC
ANCILLARY DATA FORMAT

- **LUMINANCE**: 1920 OR 1280 BYTES
- **CHROMINANCE**: 1920 OR 1280 BYTES

**ANC PACKET**: 7-262 BYTES

- **ADF (3)**
- **DID**
- **SDID**
- **DC**

**DATA PAYLOAD**: 0-255 BYTES

**CS**
CAPTION ENCODING

USING EXISTING CAPTION CREATION SYSTEM
292 VANC RECORDING

Compress

ADB7 BRIDGE

VTR or server

Decompress

ADB7 BRIDGE

RECORDING USING 259M VTR OR SERVER

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292 TO MPEG BRIDGE

EXTRACTION OF DATA FOR USE BY MPEG ENCODER
EMISSION AREA OF A DTV STATION

292M VIDEO

TES7

CAPTIONS

ATSC PROGRAM ENCODER

PSIP GENERATOR

MUX

DTV DATA INSERTER

ATSC BROADCAST
VANC THROUGHPUT

- **Each line of luma or chroma carries:**
  - 1920 x 60 = 115.2K bytes/sec (274M)
  - 1280 x 60 = 76.8K bytes/sec (296M)

- **Each line carries:**
  - 115.2K x 2 = 230.4K bytes/sec (274M)
  - 76.8K x 2 = 153.6K bytes/sec (296M)

- **VANC space contains:**
  - 274M: Lines 1-20, minus 2 switching = 18 lines
  - 296M: Lines 1-25, minus 2 switching = 23 lines
CONCLUSION

- NEW SMPTE334M STANDARD DEFINES METHOD OF CODING DATA FOR DTV. WORKS WITH BOTH 292 AND 259 SIGNALS
- OFFERS SIGNIFICANT BANDWIDTH, SUPPORTS MULTIPLE DATA TYPES, ESPECIALLY VALUABLE FOR 'STICKY' DATA
- EQUIPMENT IMPLEMENTING THE STANDARD IS NOW AVAILABLE