EBU / SMPTE Joint Task Force on Timing & Synchronisation

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New Task Force

- EBU/SMPTE Joint Task Force on Timing and Synchronization
- Chaired by Hans Hoffmann & Peter Symes
- Meetings
  - New York 11/07
  - Burbank 12/07
  - Geneva 1/31-2/1 2008
- Details at http://www.smpte.org/standards/tf_home/

What Problem are we Trying to Solve?

- Current reference signals
  - Color black
  - 50 years old!
  - Rely on zero crossings of 3.579545454. . .MHz or 4.43361875MHz for timing precision
  - These frequencies have little relevance in the digital world . . . why would we generate them in the future?
  - Requires wideband dedicated distribution
  - No easy way to generate references for multi-standard environments
  - No defined synchronization of audio & video

What Other Problem are we Trying to Solve?

- SMPTE 12M Time Code:
  - 30+ years old
  - Designed for linear audio track
  - Does not support > 30Hz*
  - Has been poked, prodded, amended, loaded, paged, etc. for 30 years and is overloaded and a mess
  - Not a sound basis for a time-labeling system for the future

* Limited support for 50 Hz & 60 Hz in SMPTE12M-2008

The Aim

- Green field solutions
- Determine user requirements *for the future*
- Rationalize and prioritize
- Draft RFT
- Get industry proposals
- Measure against user requirements
- Draft “Request for Standardization”
- Hand over to SMPTE process

Tentative Schedule

- Draft & refine user requirements; Draft RFT
- Meetings 1/31 & 2/1/08 (Geneva)
- Publish RFT mid-Feb; Q & A Meeting March (in Colorado)
- Status report at NAB
- Responses due May ’08
- Evaluate & draft RFS
- Status report at IBC ’08
- To SMPTE late 2008

Process

- Plenary and Drafting Groups
- Wiki at EBU site
- Mailing lists
- Open to anyone who will really participate
- Basic SoP with confidentiality & patent clause
- Aggressive schedule – the really important thing is to get the user requirements right
- Important to get everything in that we need
- Just as important to avoid things we do not need that may eliminate possible solutions

THE DRAFT RFT

!! WORK IN PROGRESS !!

Issues To Be Addressed?

- Sync System
- Time-related label (TRL)
- TRL Binding?
  - Binding TRL to essence
  - Binding TRL to transports

User requirements for a sync system

- Introduction & History
- Limitations of Current Solutions
  - No deterministic synchronization of all signals
  - No multi-standard capability
  - Reliance on unsuitable frequencies
  - Signal Bandwidth
- Previous Work
- Global requirements
  - Architecture & basic functionality
  - Value & Economy

Sync system (continued)

- Frequency reference
  - External lock
  - Lock indication
  - Slave lock
  - Frequency accuracy and stability
- Time reference
  - Time of day
  - External lock
  - Lock indication
  - Leap second and DST management
  - Alternate Time
  - Extensibility

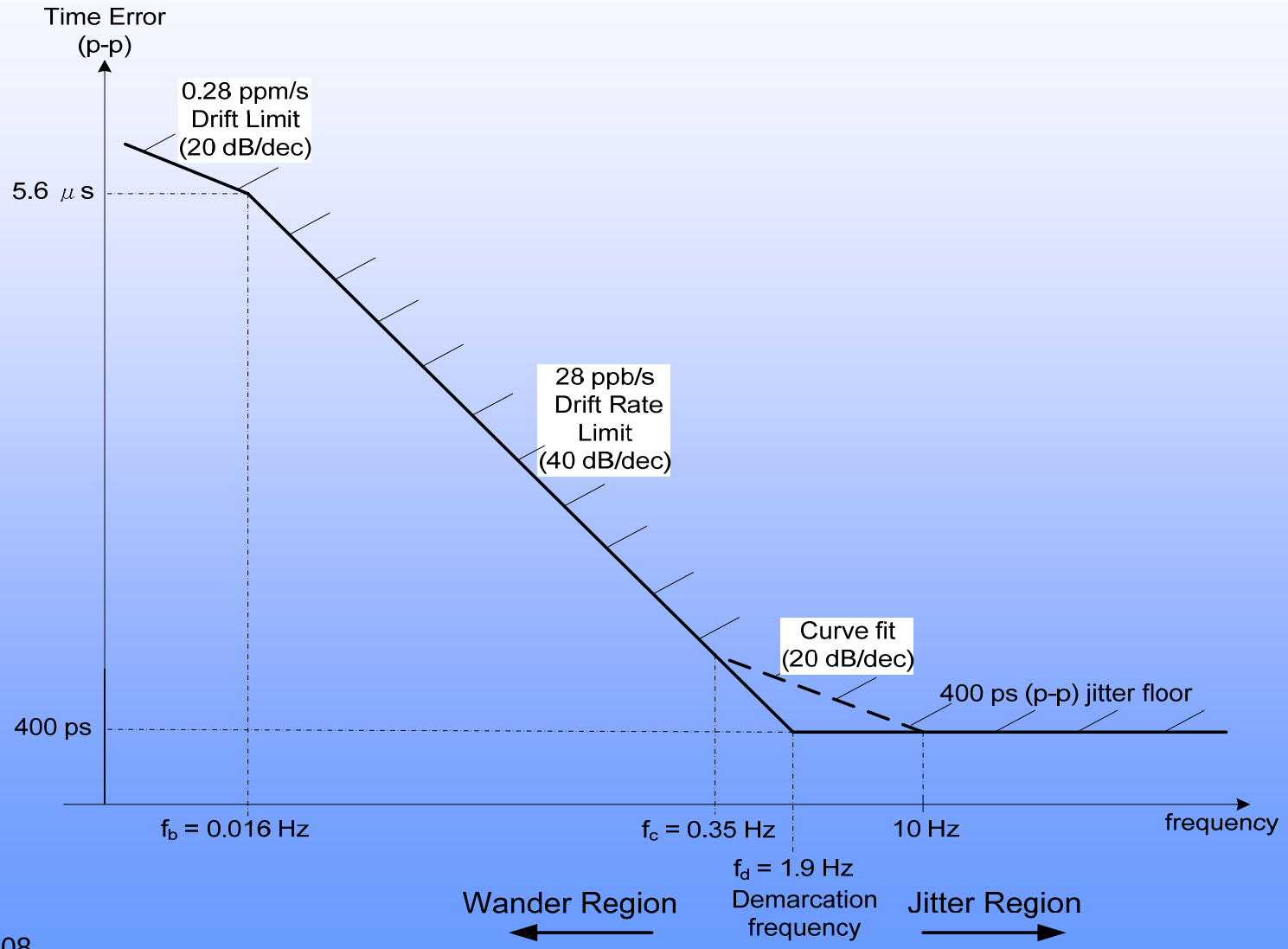
Sync system (continued)

- Compatibility with legacy systems
  - Repeatability
  - Timing accuracy
  - Timing stability
- Transport
  - Existing color black distribution
  - Existing Ethernet
  - Dedicated SDI distribution
  - Narrow band analog distribution
  - Distribution range
  - Special transport capability
  - Multiple transport capability

Sync system (continued)

- Locking behavior
  - Master lock to frequency and time reference
  - Consistency of frequency and time references
  - Slave lock
- Optional Features
  - Dynamic and automatic timing

Jitter and Wander template



Requirements for a time-related label

- Introduction & History
- Limitations of Current Solutions
  - No simple relationship with NTSC video
  - No robust solution for frame rates > 30Hz
  - No support for “super slo-mo”
  - Poor support for audio/video synchronization e.g. with skipped video frames

Requirements for a TRL (continued)

- Compatibility with legacy systems
- Transport & Binding
  - Transport/recording in SMPTE 12M environments
  - Transport in compressed bitstreams
  - Transport over AES-3 streams
- Variable speed reproduction
  - Accurate duration capability
  - Accurate duration capability is also required for conversions such as “3:2 pulldown”.

Other TRL Documents

- Edit data user requirements
- Binding to transports
- Binding to essence

Status Report

- Good participation from TV manufacturers & users
- Good participation (and education) from IT & Telecom industries
- Surprising (to most) progress on developing RFT
- Good convergence on requirements, particularly for sync
- Focus on moving from “shopping list” to prioritised requirements
- We have all learned a lot!
- On track to release RFT in February
- Q&A session planned for March
- Progress then will depend on RFT responses

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