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NEWS

Managing lip sync

May 11, 2012 1:06 PM, By Brad Dick

The ITU-R BT 1359 RP says the detection threshold for lip sync errors is about +45ms to –125ms (audio early to audio late) and that the threshold of acceptability is about +90ms to –185ms. While we've progressed from where it seemed that every evening newscast had at least one example of lip sync error, to where it problem is far less prevalent, the causes can still confuse the smartest engineer.

The ATSC says lip sync should be in the range of +15ms to –45 ms, measured at the input to the DTV encoding device. The EBU recommendation R37-2007 specifies a range of +40ms to –60ms measured at the output intended to feed the transmitter. (Emphasis added.) Note the key differences, both in terms of deltas and the points of measurement.
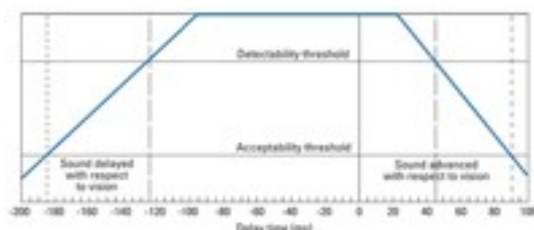

Figure 1: A/V sync error tolerances based on ITU-R BT.1359-1.

The culprit
Digital processing equipment requires a different processing time for video and audio content, primarily due to the disparate bandwidth of the digital data. With baseband SD video sampled typically at 13.5MHz and audio at 48kHz, any equipment processing the signals will produce a delay in the signals that is different for video and audio. Process HD video and throw in compression too, and the potential for problems increase. While good equipment design can minimize the problem, what is also needed is a good way to measure and correct it — ideally back to zero — before broadcast or recording. And, with today's multichannel, minimal-staff playout centers, all this has to happen automatically.

Early solutions were to simply add delay circuits in audio consoles. That allowed the audio mixer to readjust the offset to rid the program of lip sync errors. That turned out to be a major workflow factor as you needed a warm body to "ride gain", so to speak. Embedded audio solved much of the problem and unless the local station does a breakaway to separate A/V signals, viewers seldom see/hear the error.

Digital pesticide

There are many tools available that can be used offline to measure and correct A/V sync error, but what is really needed is an unobtrusive way to manage it on live signal paths. Several solutions are available, but let's focus on two: fingerprinting and watermarking.

With watermarking, an encoder analyzes the envelope of the audio signal, and from this generates a watermark that embeds timing information into the corresponding video. At a downstream point, the video and audio are analyzed, the watermark is decoded, and a corresponding measure of any intermediary A/V sync error can be produced. As such, the encoding must be done at a point with known (preferably ideal) A/V sync. A key point to keep in mind is that watermarking alters the image. The watermark may or may not be highly visible. Think of watermarking as a video tattoo. If the tattoo is large and on your forehead, everyone can see it. If, on the other hand, the tattoo is small and under your belt line, few will notice.

Fingerprints on the other hand do not alter the image. A fingerprint can be in the form of audio or video data. To generate a video fingerprint, the video is decoded and some algorithm that looks at specific characteristics is applied. A numeric value is generated from that process. A fingerprint can be based on a single frame or a group of frames.

EL PASO,TX CHAPTER 38 MEETING MINUTE DATE   7/12/2012 LOCATION: CLEAR CHANNEL

MEETING CALLED TO ORDER: 18:05 PM, BY ANTONIO CASTRO, THERE WERE 18 MEMBERS.

REPORT OF THE SECRETARY: MINUTES ACCEPTED BY NORBERT MILES, 2nd BY DON BOHRER

REPORT OF THE TREASURER: CURRENT BALANCE OF $ 4,411.06. CHECK SENT TO SBE FOR ENNES WORKSHOP SPONSORSHIP OF $ 3,026.92. ACCEPTED BY ELIAS VENTANILLA, 2nd BY OWEN SMITH.

REPORT OF THE CERTIFICATION COMMITTEE: ENRIQUE LOPEZ APPLIED FOR CBRE

REPORT OF THE MEMBERSHIP COMMITTEE: PAUL TERRY TO PROVIDE THE INFORMATION OF FUTURE SUSTAINING MEMBER.

REPORT OF THE FREQUENCY COORDINATOR COMMITTEE: NO REPORT

REPORT OF THE SCHOLARSHIP COMMITTEE: NO REPORT

REPORT OF THE WEBSITE COMMITTEE 1167 HITS. (27 MORE FROM LAST MONTH)

REPORT OF THE EAS CHAIRMAN : NO REPORT

REPORT OF THE PROGRAM COMMITTEE: ALFRED KENYON FROM FEMA, INVITED TO PRESENT PLAN TO EL PASO ENGINEERS AND ANSWER QUESTIONS.

UNFINISHED BUSINESS: NONE

NEW BUSINESS OR ANY ITEMS FOR THE CHAPTER INTERES: NONE.

NEXT MEETING DATE AND LOCATION: TUESDAY AUGUST 14, 2012 COMO'S ITALIAN RESTAURANT @ NOON

MEETING ADJOURNED: AT 19:40 PM

 A NOTE FROM THE EDITOR :
That IPAWS yes, that IPAWS no, that we don't know, bla, bla,…..
Let's find out in our next chapter meeting.
 Try to make it, so we get informed !

JULY PROGRAM

Directly from Washington we had ALFRED KENYON, Program Manager of IPAWS Program Office. Presented a prototype of station construction.

David Harpering (KROD) is going to explain the little confusion that arose this week about the weekly test from IPAWS.

Don't have a special presentation for August, but we are going to talk about SBE Certification program.

There is a possibility that a vendor will show in our meeting, I will let everybody know if this happens.
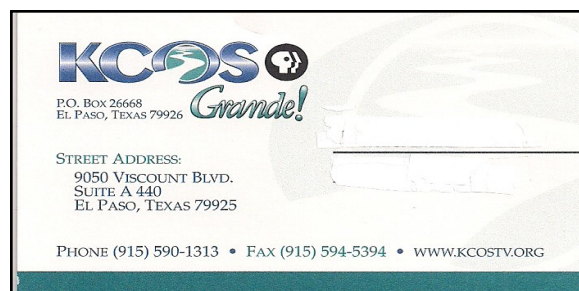
The fingerprint can be packaged as metadata and stored with content as files, streamed concurrently with the content, or even sent over an entirely separate path. Downstream, a similar fingerprint can be generated, and a delay processor can use the two fingerprints to regenerate an A/V signal with the original (correct) timing relationship.

Fingerprints vs. Watermarks	Fingerprint	Watermark
Content Remains Unchanged	Yes	No
Unique	Yes	Not Necessarily
Can be removed	No	Yes
Used Retrospectively	Yes	No
Survive Manipulation or Processing of Content	Yes	Limited
Compatible with all devices in delivery chain	Yes	No
Print stored separately	Yes	No
Proprietary	Yes	Yes

Table 1. Key differences in fingerprints and watermarks. Courtesy Miranda.

Table 1 summarizes key differences in watermarks and fingerprints.

Additional information on A/V timing, as well as fingerprinting and watermarking, can be found here and here.

Read more: http://broadcastengineering.com/audio/managing-lip-sync/#ixzz1zfwiYfV3