

RECOMMENDATION ITU-R BT.1359-1

RELATIVE TIMING OF SOUND AND VISION FOR BROADCASTING

(Question ITU-R 35/11)

(1998)

The ITU Radiocommunication Assembly,

considering

- a) that a perceptible time difference between the sound and vision components of a television signal impairs the viewers' reception of the programme;
- b) that separate picture and sound processing is becoming more and more widely used in broadcasting systems;
- c) that digital production and distribution equipment causes differential delay between the sound and vision signals;
- d) that programme production may involve tandem connected studios;
- e) that in studios the sound/vision relative timing should be the responsibility of the programme production directors;
- f) that the transmitting equipment and the receiver may introduce an additional, variable timing difference;
- g) that subjective evaluations show that detectability thresholds are about +45 ms to –125 ms and acceptability thresholds are about +90 ms to –185 ms on the average, a positive value indicates that sound is advanced with respect to vision,

recommends with reference to Figure 1

- 1** that the timing zero, as a reference for the subsequent measurement of the relative timing of sound and vision signals is defined at the point of the final programme source selection element*;
- 2** that the overall tolerance in sound/picture timing (between points 1' and 6') shall not exceed +90 ms or –185 ms;
- 3** that the timing tolerance between image source (point 1) and the zero reference point as defined in *recommends* 1 above be taken as falling within the limits of +25 ms and -100 ms (Note that this is the zone within which the programme producer may exercise control over the relative timing of sound and picture. It is not possible to identify the correct or intended timing within this range, first because of the “plateau of undetectability” as noted in Appendix 1 Figure 2 and secondly because the producer may have selected “for artistic effect” a non-zero relative timing.);
- 4** that the timing difference in the path from the output of the final programme source selection element* to the input to the transmitter for emission should be kept within the values +22.5 ms and –30 ms**;
- 5** if correction of errors is not possible then each downstream segment that is not under the control of the broadcaster shall not introduce any timing error in excess of ± 2 ms.

Annex 1 outlines the user requirements for the corrections of relative timing difference of sound and vision signals which were used in preparing this recommendation.

Appendix 1 is an explanation of the selection of the recommended timing difference values.

Appendix 2 details currently used conditions for subjective assessment of sound/vision delay difference testing.

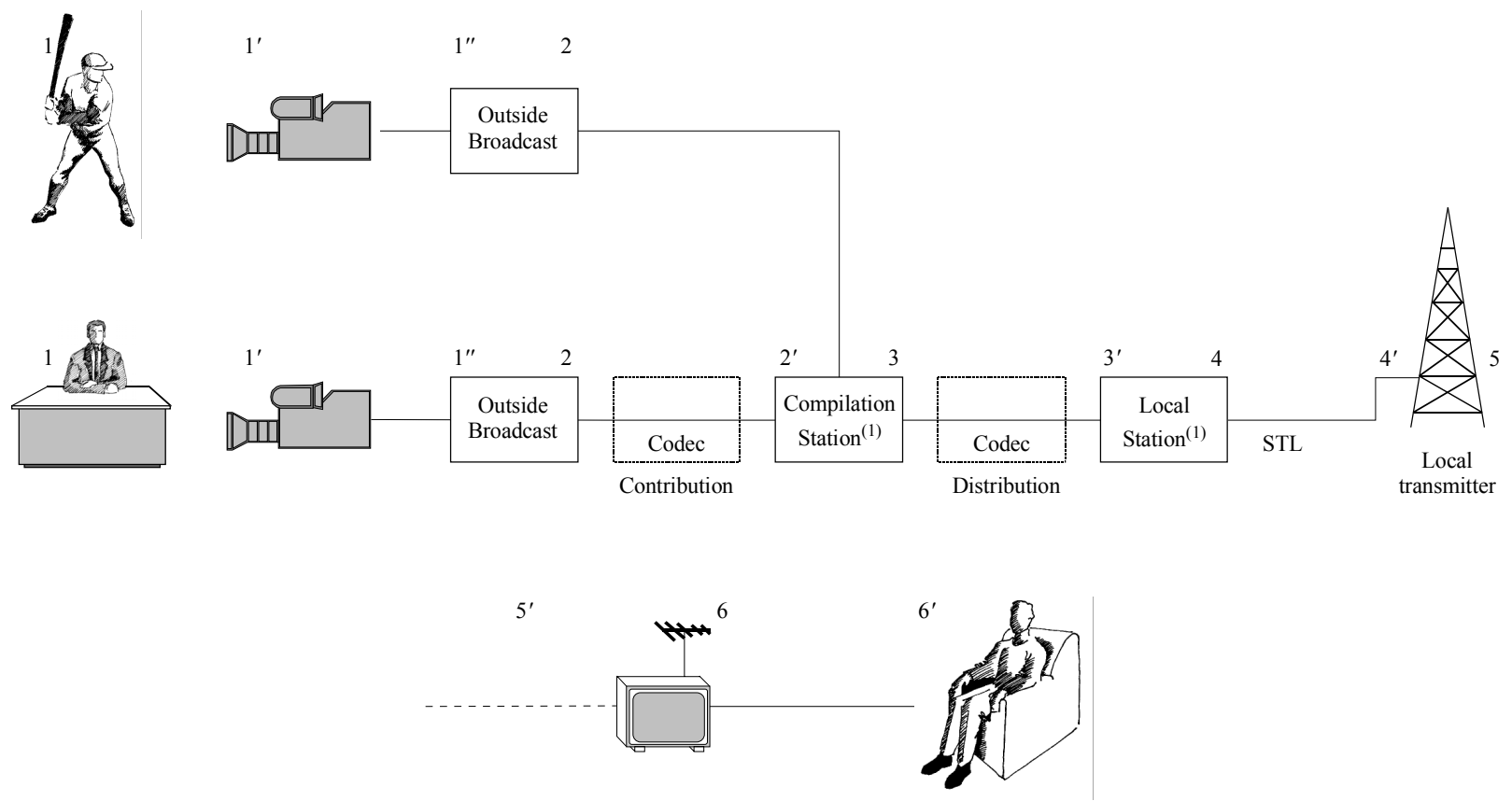
NOTE 1 – A positive value indicates that sound is advanced with respect to vision.

NOTE 2 – Studies should be made of time stamping in such a way as to facilitate the maintenance and correct timing at appropriate points in the broadcast chain.

* The definition of this point may vary depending on the particular broadcast organization and operating requirements. Typical examples are master control, network control, master switching or outside broadcast control.

** Where the path from the output of the final programme source selection element to the input of the transmitter is comprised of one or more digital codecs it should be noted that Recommendation ITU-R BT.1203 specifies that the delay error introduced by any single digital codec should be in the range ± 2 ms.

FIGURE 1
Simplified reference chain for television sound/vision timing



⁽¹⁾ This includes synchronization equipment needed such as frame synchronizer