RP 150-2000
Revision of RP 150-1993

# SMPTE RECOMMENDED PRACTICE

# Channel Assignments and Test Leader for Magnetic Film Masters Intended for Transfer to Video Media Having Stereo Audio



## 1 Scope

This practice specifies the left- and right-channel assignments for stereo usage on magnetic film masters intended for transfer to video media. It also gives recommended test signals for use on the head leader of the magnetic master.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI/IEEE 152-1992, Audio Program Level Measurement

ANSI/SMPTE 86-1996, Motion-Picture Film — Magnetic Audio Records — Two, Three, Four and Six Records on 35-mm and One Record on 17.5-mm Magnetic Film

ANSI/SMPTE 208M-1992 (R1998), Motion-Picture Film — 35- and 16-mm Magnetic Audio Records — Recorded Characteristics

SMPTE EG 9-1995, Audio Recording Reference Level for Post-Production of Motion-Picture Related Materials

## 3 Track assignment

**3.1** Track 1 shall contain the record intended for the left loudspeaker, and track 2 shall contain the record intended for the right loudspeaker, with left and right determined from the position of a viewer watching a screen. When more than two tracks are recorded, all odd-numbered tracks shall contain information for the left loudspeaker, and all even-numbered tracks shall contain information for the right loudspeaker.

**3.2** The identity of the track numbers is contained in ANSI/SMPTE 86, which specifies the position, dimensions, and reproducing speed for the track format in use.

## 4 Head leader

**4.1** The first test section of the leader shall be a 1-kHz sine-wave signal recorded at reference level. The tone shall be recorded simultaneously and in phase on the channels of the master for a duration of 10 s. The reference level is specified in SMPTE EG 9.

**4.2** The second section shall identify the channels audibly by sequencing in time one beep on the left channel and two beeps on the right channel.

**4.3** The third section shall be a 10-kHz sine-wave signal recorded at a relative flux level equal to reference level, with the recorded characteristic frequency response of ANSI/SMPTE 208M applied. The tone shall be recorded simultaneously and in phase on the channels of the master for a duration of 20 s.

**4.4** The fourth section shall be pink noise recorded simultaneously and in phase on the two channels of the master for a duration of 30 s. It shall be recorded at the reference level as read by a vu meter at 15 dB below the reference level, with the recorded characteristic specified in 4.3 applied. (The objective of using a pink-noise test signal is to obtain a reference signal with equal energy in equal logarithmic frequency intervals within the audio bandwidth.)



Approved May 30, 2000

**4.4.1** The level in each one-third octave band shall be to the tolerances given in ANSI/SMPTE 208M.

**4.4.2** The vu meter shall be as specified in ANSI/IEEE 152.

**4.5** If companding noise-reduction systems are in use, the fifth section of the leader shall be the tone generated by the noise-reduction system for its reference level for a duration of 10 s. Such tones generally have audible identifying characteristics, such as a deliberate periodic frequency shift, to identify the type of noise reduction audibly.

## **Annex A** (informative)
## **Additional information**

### A.1 Uses of reference-level tone

**A.1.1** Clauses A.1.1.1 and A.1.1.2 provide interactive adjustments which may have to be performed more than once to optimize the results.

**A.1.1.1** The reference level tone may be used for setting the preliminary head-mounting adjustments such as coarse rotation, azimuth, zenith, and height by setting the appropriate mechanical adjustments for the highest and most level-stable output.

**A.1.1.2** An X-Y display of the reference tone on an oscilloscope may be used for coarse azimuth setting using the following method:

Connect the preamplifier outputs corresponding to the two channels which represent the outside tracks on the film to the X and Y inputs of an oscilloscope, respectively. With the sensitivity of the preamplifier channels set to play the film at the oscilloscope connection point at equal voltages, and the sensitivity of the X and Y oscilloscope channels made equal, adjust the azimuth for a 45° diagonal line on the oscilloscope. Setting the azimuth coarsely, first at medium frequencies before adjusting at high frequencies, ensures that when fine adjustments are made for best high-frquency azimuth, they take place on the same cycle of the high frequency without the possibility of displacement by one full cycle which can lead to a false peak.

**A.1.2** The reference-level tone may also be used as a relative channel polarity test by using an X-Y display to check that each of the preamplifier outputs corresponding to the records, compared to a reference channel output, has the same slope, not the opposite slope, which would indicate a polarity reversal in the head or preamplifier wiring.

### A.2 Uses of pink noise

**A.2.1** Pink noise can be used to obtain the best overall azimuth by observing a Lissajous pattern on an oscilloscope with the X and Y axes connected to the signals from the two channels. When the reproducer sensitivity and equalization have been set for equal performance in the channels, and the azimuth is correct, a line will be displayed at a 45° angle, not a fuzzy ellipse. Pink noise has an advantage over sine-wave tones for azimuth adjustment as it produces unambiguous results. One cannot misadjust by one full cycle.

**A.2.2** In addition, pink noise can be used with a constant-percentage bandwidth spectrum analyzer, such as a one-third-octave band analyzer, to set equalization adjustments.