

**SMPTE STANDARD**  
  
for Motion-Picture Film —  
35- and 16-mm Television  
Release Prints —  
Leaders and Cue Marks



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## **Foreword**

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Administrative Practices.

SMPTE ST 55 was prepared by Technology Committee 20F.

## **Intellectual Property**

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

## 1 Scope

This standard specifies the make-up or assembly of leaders and cue marks for 35- and 16-mm analog audio motion-picture release prints for use in television studios.

## 2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

## 3 Normative References

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

SMPTE RP 65:2000, Motion-Picture Enlargement/Reduction Ratios

## 4 Reduction Ratio

The reduction ratio in the production of the head and foot leaders from 35-mm motion-picture film shall be in accordance with SMPTE RP 65.

## 5 Orientation of Words and Numerals

**5.1** Orientation and dimensions of letters and numerals in this standard are with respect to 35-mm motion-picture film and are modified proportionally for 16-mm prints in accordance with Section 4.

**5.2** The third, fourth, and fifth frames of the identification sections containing the title of the film and reel number shall be printed in clear letters on a black background so that they can be read normally when the reel is uppermost and the leading end or head of the film hangs down ready for threading.

**5.3** The words "type of sound," "aspect ratio," "picture title," "company," "series," "reel No.," and "prod. No." shall be printed lengthwise with the film in clear letters on a black background.

**5.4** In sections where information is to be printed lengthwise with the film, clear framelines shall be included and all such printing placed within the outlined areas so that it can be read on 16-mm reduction prints.

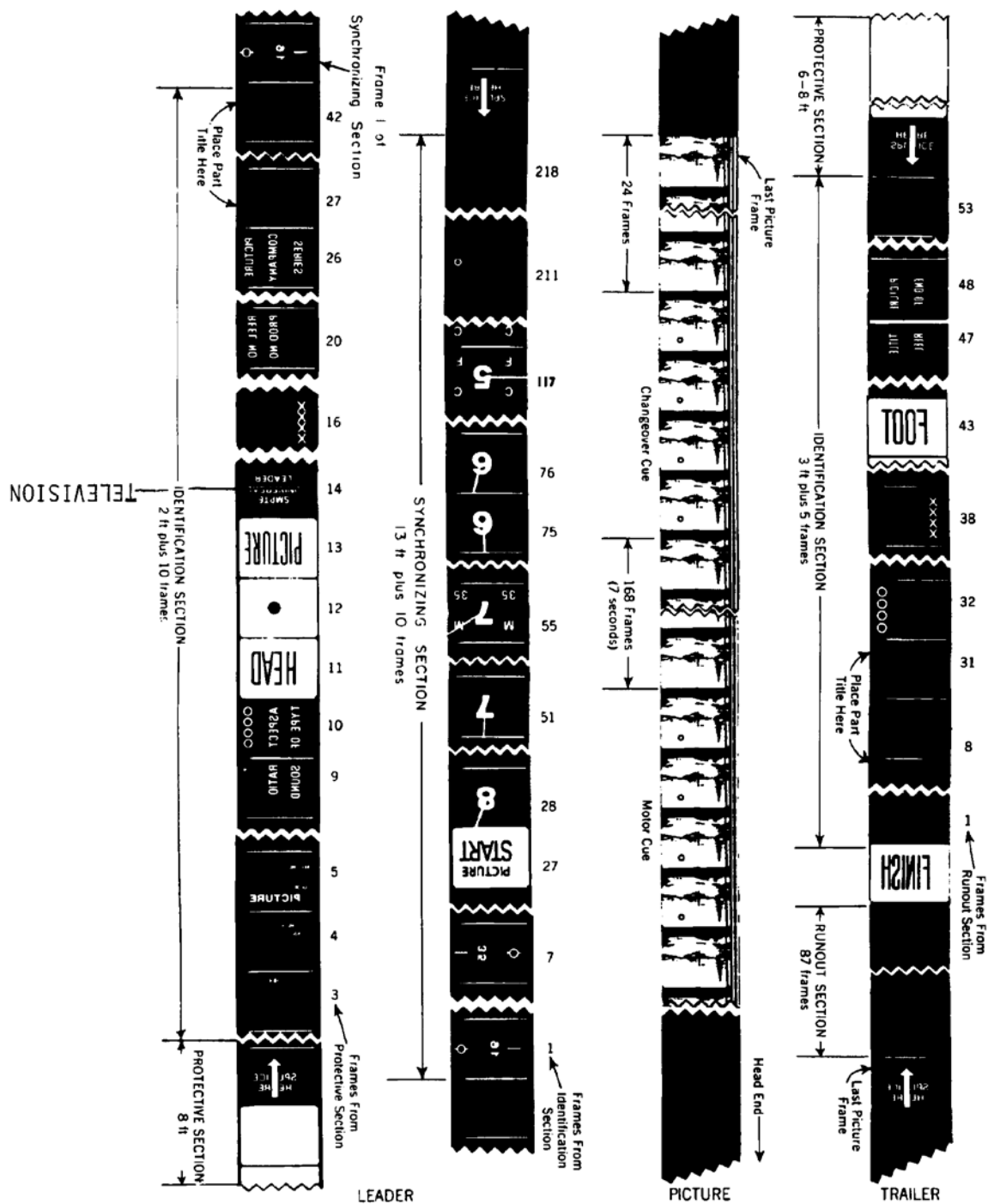
**5.5** In the trailer (foot leader), the title of the film and the reel number shall be printed so that they appear inverted when the remainder of the reel is uppermost and the film hangs downward.

## 6 Head Leader (See Figure 1)

### 6.1 Protective Section

The protective section of the 35-mm leader shall contain frameline marks and consist of 8 ft (2.44 m) of transparent or raw stock; for 16-mm leader, 3.25 ft (0.99 m). When the protective leader has been reduced to a length of 6 ft (1.83 m) for 35-mm film or 2.5 ft (0.76 m) for 16-mm film, it shall be restored to its original length.

The last frame of this section shall contain the words "splice here" and an arrow pointing to the frameline between this frame and frame 1 of the identification section. The letters should be at least 0.125 in (3.18 mm) high.



Note: Figure shows 35-mm film with analog audio track on right edge as seen from the light source in the projector. The analog audio track is on the left edge of 16-mm film.

Figure 1 – Leaders and cue marks

## 6.2 Identification Section

The identification section of the leader shall be 42 frames in length. The frames may be of the 4 × 3 format or of a reduced height.

**6.2.1** Since many types of film may be used for leaders, exact neutral densities have not been specified. For the purpose of this standard, the following approximate neutral densities are referred to:

- Clear (low neutral density of 0.35);
- Black (high neutral density of 1.95).

**6.2.2** The identification section, when viewed as specified in Section 5.2, shall be made up as follows:

Frames 1-2 — Black.

Frame 3 — The printed word “subject” with letters 1/16 in (1.6 mm) high at top of frame in upright position, clear on black background (4 × 3 format).

Frame 4 — The printed word “length” at top left side of frame and the printed word “roll” at center of frame on left side. Lettering shall be comparable to that in frame 3 (4 × 3 format).

Frame 5 — The printed words “reel No.” at top left side of frame and printed word “color” at center of frame on left side. Lettering, read upright, shall be comparable to that in frame 3. At bottom of frame printed word “picture” 1/8 in (3.2 mm) high.

Frames 6-10 — Five frames of black with clear framelines on which the words “aspect ratio” and “type of sound” are plainly printed lengthwise with the film in 1/8 in (3.2 mm) high clear letters. Each group of words shall start in the 10th frame and in two separate lengthwise lines reading through base of film from left to right with head end of film at right.

Frame 10 — Four letter O’s vertically in line and opposite the analog audio track area approximately 5/16 in (7.9 mm) from the 35-mm camera aperture centerline opposite the analog audio area. Letters shall be 1/8 in (3.2 mm) high and 1/8 in wide, clear on black background (4 × 3 format).

Frame 11 — The printed word “head” nominally 3/8 in (9.5 mm) high in inverted black letters on clear background.

Frame 12 — A 1/8-in (3.2-mm) diameter black dot in center of 4 × 3 format on clear background with black framelines.

Frame 13 — The printed word “picture” nominally 3/8 in (9.5 mm) high in inverted black letters on clear background.

Frames 14-15 — Two frames in which the words “SMPTE Television Leader” are printed. Letters shall not be less than 1/8 in (3.2 mm) high. Inverted clear letters on a black background (4 × 3 format).

Frame 16 — Four letter X’s vertically in line adjacent to analog audio track area approximately 5/16 in (7.9 mm) from the 35-mm camera aperture centerline toward analog audio area. Letters shall be 1/8 in (3.2 mm) high and 1/8 in wide, clear on black background (4 × 3 format).

Frames 17-18 — Same as frames 14-15.

Frames 19-26 — Eight frames of black with clear framelines. The words “reel No.” and “prod. No.” shall be printed lengthwise with the film in 1/8 in (3.2 mm) high clear letters in frame 20. In frame 26, on three lines lengthwise, reading left to right through film base with head of leader to right, the words “picture,” “company,” and “series” shall be printed using the same format as that in frame 20.

Frames 27-42 — Sixteen frames in which part titles are inserted. In each frame 1) the reel number (Arabic numeral not less than 1/4 of frame height) and 2) the picture title shall be printed in black letters on a clear background. If part titles are not available, these frames should be black with clear framelines.

### 6.3 Synchronizing Section

The synchronizing section of the leader shall be 218 frames in length.

**6.3.1** The two large concentric circles used throughout the visual count-down shall be clear on a black background. Seconds count-down numerals shall be clear on a black background and shall project right side up. The broad clock arm shall be clear.

**6.3.2** The synchronizing section, when viewed as specified in 4.2, shall be made up as follows (see 5.3.3):

Frame 1 — The 16-mm sound-start indication, printed in clear letters on a black background as shown in Figure 2.

Frames 2-6 — Five frames of black.

Frame 7 — The 35-mm sound-start indication, printed in clear letters on a black background as shown in Figure 3.

Frames 8-26 — Nineteen frames of black.

Frame 27 — The words "picture start," printed in black on a clear background. The letters in the word "picture" shall be not less than 1/8 in (3.2 mm) high and those in "start" not less than 1/4 in (6.4 mm) high. Visual count-down begins with this frame.

Frames 28-50 — Continuation of visual count-down, beginning with a clear figure "8" on a black background and a clear clock arm extending clockwise at 15° vertically from the center to the top of the frame (see Figure 4). In each succeeding frame, the clock arm shall continue to rotate clockwise from the center of the frame in 15° increments.

Frame 51 — Change of the numeral to a clear "7" on a black background. The clear clock arm shall again be vertical from the center of the frame.

Frame 55 — "M" and "35" vertically on each side of the "7" in letters 1/8 in (3.2 mm) high, clear on a black background, to indicate 35-mm magnetic sound start (see Figure 5).

Frames 56-117 — Continuation of the sequence of numerals marking the seconds of film running time at 24 frames/s.

Frames 117-122 — The moving clock arm and numeral, with the addition of the Gothic letters "C" and "F" on the left- and right-hand side of the circle, respectively, to indicate the position in the leader where one to six frames may be removed and a similar number of control frames spliced in.

Frames 123-170 — Continuation of the sequence of numerals and moving clock arm marking the seconds of film running time.

Frame 171 — The numeral "2" in black on a clear background, ending the visual count-down.

Frames 172-210 — Thirty-nine frames of black density.

Frame 211 — A single clear dot, located as specified in Section 7.2.

Frames 212-218 — Seven frames of black density.

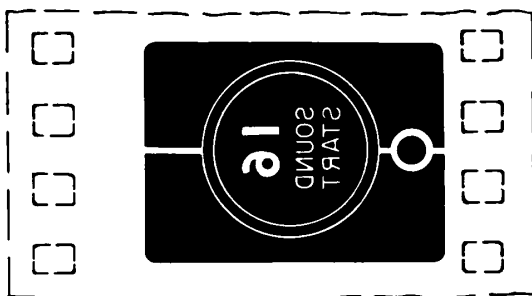


Figure 2 – 16-mm sound start identification frame

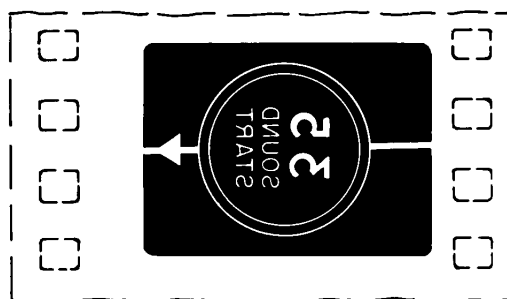


Figure 3 – 35-mm sound start identification frame



Figure 4 – Example of visual count-down



Figure 5 – 35-mm magnetic sound start

**6.3.3** Except for frames 172 to 218, all frames shall be separated by a clear 0.050-in (1.27-mm) nominal frameline).

**6.3.4** One additional frame shall follow with the words “splice here” and an arrow pointing to a clear frameline between frame 218 and this frame. The letters should be at least 1/8 in (3.2 mm) high.

## 7 Picture Section (See Figure 1)

### 7.1 Picture

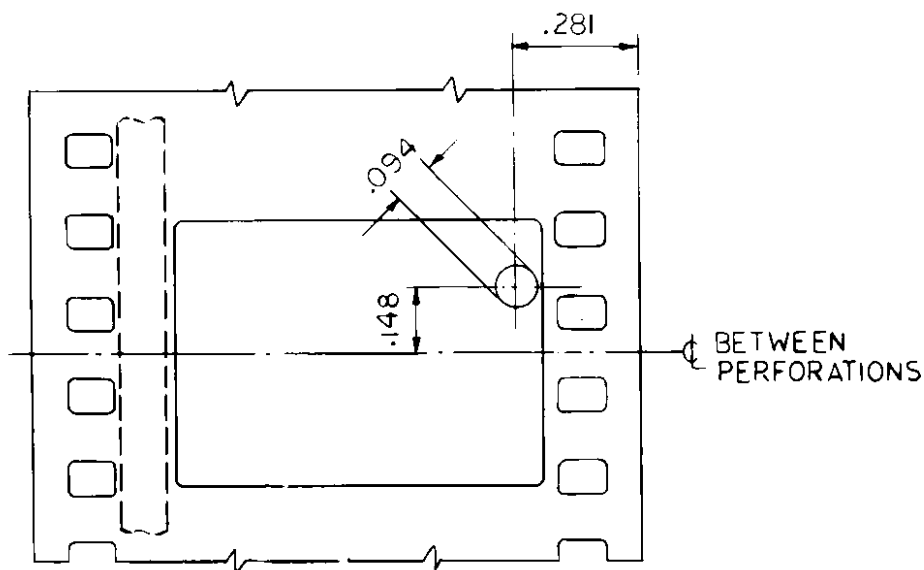
It is recommended that picture action start and finish on fades wherever possible. Otherwise, significant audio should be kept at least 5 ft (1.52 m) for 35-mm prints and 2 ft (0.61 m) for 16-mm prints from the start and finish of the picture.

### 7.2 Motor cue

The motor cue shall consist of a black circular dot with a clear outline or a clear circular dot with a black outline, printed from a 35-mm negative which has had four consecutive frames punched with a die 0.094 in (2.39 mm) in diameter. The position of this cue mark shall be as shown in Figure 6.



Following the four frames containing the motor cue, there shall be 168 frames, or seven seconds running time, to the beginning of the changeover cue.



Note: Image as seen on the screen.

**Figure 6 – Position of cue marks for release prints**

### 7.3 Changeover cue

The changeover cue shall consist of four frames containing circular dots of the same dimensions and position on the frame as those in the motor cue.

Following the four frames of the changeover cue, there shall be 24 frames, or one second running time, to the beginning of the runout section of the trailer.

## 8 Trailer (Foot Leader) (See Figure 1)

### 8.1 Additional Frame

One additional frame shall follow with the words “splice here” and an arrow pointing to a clear frameline between the picture section and the trailer. The letters should be at least 1/8 in (3.2 mm) high.

### 8.2 Runout Section

The runout section of the trailer shall consist of 88 frames, 87 of which are to be black. Frame 88 shall have the printed word “finish” nominally 3/8 in (9.5 mm) high in upright black letters on clear background.

### 8.3 Identification Section

The identification section of the trailer shall consist of 53 frames.

**8.3.1** The identification section shall be made up as follows:

Frames 1-7 — Seven frames of black without framelines.

Frames 8-31 — Twenty-four frames in which part titles are inserted. In each frame 1) the end of reel, 2) the reel number (Arabic numeral not less than one quarter of frame height), and 3) the picture title shall be printed in black letters on a clear background. If part titles are not available, these frames shall be black with narrow clear framelines.

Frame 32 — Four letter Os vertically in line and opposite the analog audio track area approximately 5/16 in (7.9 mm) from the 35-mm camera aperture centerline opposite the analog audio area. Letters shall be 1/8 in (3.2 mm) high and 1/8 in wide, clear on black background (4 × 3 format).

Frames 33-37 — Five black frames with clear framelines for reproduction of information written on the negative.

Frame 38 — Black with four Xs adjacent to the audio track, similar to frame 16 of the head leader identification section.

Frames 39-40 — Similar to frames 14-15 of head leader identification section with words “SMPTE Television Leader,” except that the words shall be upright.

Frame 41 — Similar to frame 13 of head leader identification section, except that the word “picture” shall be upright (not inverted).

Frame 42 — Dot similar to that in frame 12 of head leader identification section.

Frame 43 — Similar to frame 11 of head leader identification section, except printed word shall be “foot,” which is upright (not inverted).

Frames 44-48 — Five blank frames of black with clear framelines upon which the words 1) “picture title” and 2) “end of reel” are printed lengthwise with the film in 1/8 in (3.2 mm) high clear letters on black background.

Frames 49-51 — Three frames identical to frames 5, 4, and 3, respectively, of head leader identification section, except that the letters shall be inverted.

Frames 52-53 — Two black frames.

**8.3.2** One additional frame with the words “splice here” and an arrow pointing to a clear frameline between this frame and frame 53 to indicate where the protective section joins the trailer.

**8.4 Protective Section**

The protective section of the trailer shall consist of 8 ft (2.44 m) of transparent or raw stock for 35-mm prints and 3.2 ft (0.99 m) for 16-mm prints.

Note: The Society of Motion Picture and Television Engineers makes available leaders on master positive motion-picture stock in 16-mm and 35-mm sizes. Intended for reproduction as negatives, they are identified as SMPTE Television Leaders.

## **Annex A Additional Data (Informative)**

**A.1** The difference between projection rates of 24 and 25 frames/s is negligible in the normal usage of the leader.

**A.2** Logos, trademarks, or other extraneous material, if absolutely necessary, could be inserted in the leader prior to the 16-mm sound-start cue or just preceding frame 32 of the trailer identification section or both.

**A.3** The outside diameter of the larger clear circle, referred to in Section 6.3.1, is approximately the height of the television safe action area specified in SMPTE RP 27.3.

**A.4** The outside diameter of the smaller clear circle, referred to in Section 6.3.1, is approximately the height of a projector aperture having an aspect ratio of 1.85:1.

## **Annex B Bibliography** (Informative)

SMPTE RP 27.3:1989, Specifications for Safe Action and Safe Title Areas Test Pattern for Television Systems