

UNIVERSAL FILM LEADER FOR CINEMA AND TELEVISION

Tech 3203 - E

June 1973

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HISTORY

This document describes a film leader designed to satisfy the requirements of both television and the cinema. It has been developed by the experts of Sub-group G3 of EBU Working Party G, who decided to study the possibilities of standardising the presentation of leaders in 1967, principally to facilitate the international exchange of programmes on film.

As is explained in the introduction, the Sub-group based its work on the various national or international proposals for leaders in order to produce a leader suitable for the maximum number of users. When the draft had been prepared, copies of the leader were made in Stockholm by Sveriges Radio, which used them experimentally for cinema projection and showing on television. These experiments have confirmed that this leader is suitable for both applications.

The design incorporates a very small number of signs, and thus provides a basis for the possible development of more elaborate national leaders. The intention is that this structure should enable any operator in any country to deal with familiar images. The original leader can thus be retained with any film that is exchanged.

DESIGN OF THE LEADER

Many different film leaders have been designed during the history of motion picture films. Basically, the leader is a length of film attached to the head of the programme film to assist in lacing the telecine machine or cinematograph projector. If, however, it is marked with suitable visual information it may be used to ensure that the correct amount of time is allowed for the machine to run up to speed and arrive at the beginning of the programme information at a specific moment. It is also usual for the leader to bear marks which facilitate the synchronisation of the reproduction of the sound record with that of the picture information. General advice on leaders is contained in C.C.I.R. Recommendation 265-2.

The reason for the existence of many different leaders lies in the fact that the visual requirements for cinema projection tend to be different from those for television use and there is the further complication that there are systems using both 24 frames per second and 25 frames per second. The latter is encountered where the field rate of the television system is 50 Hz.

It is very desirable that there should be a substantial reduction in the number of leaders encountered since operational errors arise from failure to recognise the significance of certain marks (particularly those concerned with the synchronisation of the sound) when an unfamiliar leader is used. There would also be an advantage in having a leader which is suitable for use in cinematograph projectors or in telecine machines: it should also permit the synchronisation of all commonly-encountered separate sound systems and give a sufficiently accurate run-up timing when used in systems having either 24 or 25 frames per second.

A draft leader, intended to fulfill these requirements, is described in the following paragraphs.

DESCRIPTION OF THE LEADER

The general form of the proposal follows that of ISO Document ISO/TC/36 (October, 1968) entitled "Leaders and run-out trailers for 35mm and 16mm release prints". Other relevant documents are AFNOR No. Pr S 25-003, DIN 15 698, BSI document 69/5182 and ASA PH22.55-1966. The changes incorporated in this draft are those necessary to provide a leader which is suitable for films used in television as well as for motion picture theatre presentation.

Leaders are normally divided into three sections:

- a protective section of blank film,
- an identification section,
- a synchronising section.

Only the last two sections are reproduced in the drawing illustrating this document and some details concerning the design are given in the following report.

1. Identification Section

The Identification Section will begin at frame No. 307 (marked HEAD) and will finish at frame No. 241. It will carry information in accordance with the following provisions of C.C.I.R. Recommendation 265-2.

- "3.9 A leader for protection and identification should be attached to each film"
- 3.9.1 The minimum length of the protection and identification leader should be 3m (10ft)
- 3.9.2 The minimum information given on the identification leader should be as follows:
- name of sending organisation,
 - title of programme,
 - code word,
 - position of emulsion,
 - total programme duration and picture frequency
 - total number of reels,
 - reel number,
 - duration or length of the film on the reel
- Further information may be given, such as: production methods used, e.g. telerecording or a code word according to ISO.
- 3.9.3. The identification leader should have the same type of base and perforations as the film to which it is attached. Leaders should be attached to the film in such a manner that the emulsion on both leader and film is on the same side."

Frames Nos. 288 and 264 count numbers 12 and 11 respectively and although they fall within the Identification Section, they are an extrapolation of the Synchronising Section for use in certain dubbing operations where a very long run-up time is necessary.

2. Synchronising Section

a) Projection speed

The distances between the principal marker frames (nos. 48, 72, 96, etc.) are 24 frames, conforming to normal cinema leader practice. Thus the "blinks" caused by the projection of the lower-density image in the marker frames will occur at intervals of one second, once the projector has run up to speed.

For part of the passage of the synchronising section through the projector or telecine the speed of the machine will be increasing from zero to the normal 24 or 25 frames per second. Even when stability is reached, the importance of precise one-second measurements is not, as a rule, of great operational significance since the cue to start the machine must be made with a prior knowledge of its run-up characteristics.

For this reason it is proposed that there is no substantial value in having leaders for both 24 frames per second 25 frames per second. The majority of usage is at 24 frames per second and, therefore, the leader should be based on this rate.

b) Frame-by-form details of the synchronising section

<i>Frame 240</i>	The synchronising section starts at frame 240 with count number 10 surrounded by two circles with markings for every 15°. Number and "clock" in black-on-white but minimum density controlled to prevent overload of telecines. A triangular black pointer marks 0° here
<i>Frames 239 - 217</i>	Count number 10 in white-on-black. The rate of 24 frames/sec is indicated by a white pointer rotating around a centre point 15° every frame
<i>Frame 216</i>	Count number 9. Otherwise as for frame 240.
<i>Frame 215 - 193</i>	Count number 9. Otherwise as for frames 239 - 217.
<i>Frame 192</i>	Count number 8. Otherwise as for frame 240. This frame corresponds to START of the Academy Head Leader or PICTURE START of the S.M.P.T.E Universal leader.
<i>Frames 191 - 188</i>	4 black frames marked "COLOUR REFERENCE" (printed lengthwise with the film) and intended to be replaced by 4 frames of colour reference picture in the leader of all master material.
<i>Frames 187 - 173</i>	Count number 8. Pointer indications from 75° to 285°.
<i>Frame 172</i>	Indicator for position of sound reproducer for 16-mm film with magnetic stripe "16 COMMAG SYNC" printed in white letters. (Correctly spaced with respect to Frame 144.)
<i>Frame 171</i>	Count number 8. Pointer indication 315°
<i>Frame 170</i>	Indicator for position of sound reproducer for 16-mm film with an optical track: "16 COMOPT SYNC" (correctly spaced with respect to Frame 144).
<i>Frame 169</i>	Count number 8. Pointer indication 345°
<i>Frame 168</i>	Count number 7. Otherwise as for frame 240.
<i>Frame 167 - 165</i>	Count number 7. Pointer indication from 15° to 45°.
<i>Frame 164</i>	Indicator for position of sound reproducer for 35-mm film with an optical track: "35 COMOPT SYNC" (correctly spaced with respect to Frame 144).
<i>Frames 163 - 145</i>	Count number 7. Pointer indications from 75° to 345°.
<i>Frame 144</i>	START. The reference image for synchronisation of all sound tracks.
<i>Frames 143 - 121</i>	Count number 6. Pointer indications from 15° to 345°.
<i>Frame 120</i>	Count number 5. Otherwise as for frame 240.
<i>Frames 119 - 97</i>	Count number 5. Pointer indications from 15° to 345°.

<i>Frame 96</i>	Count number 4. Otherwise as for frame 240.
<i>Frames 95 - 73</i>	Count number 4. Pointer indications from 15° to 345°.
<i>Frames 72</i>	Count number 3. Otherwise as for frame 240.
<i>Frames 71 - 49</i>	Count number 3. Pointer indications from 15° to 345°.
<i>Frames 48</i>	Count number 2. Otherwise as for frame 240.
<i>Frames 47 - 1</i>	Black.
<i>Frame 0</i>	White with black text "SPLICE HERE" with a pointer which marks the junction between leader and programme, i.e. between frames 1 and 0.

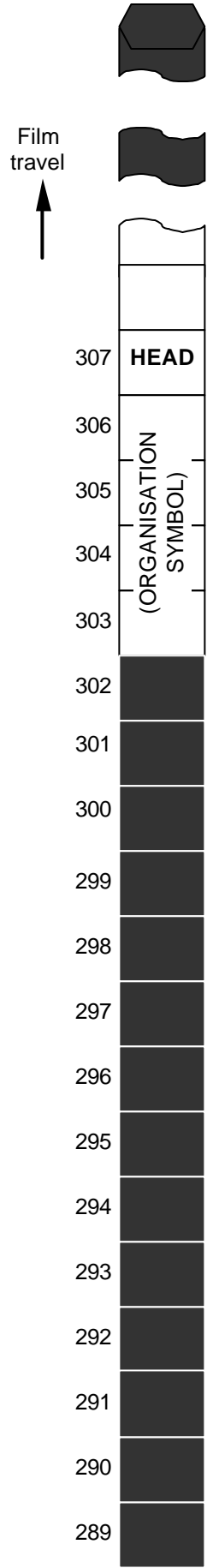
c) Technical design

1. The following approximate densities are suggested:
white or low density = minimum 0.35
black or high density = maximum 2.00
2. The backgrounds shall be of 4 x 3 format with a white frame line between the frames.
3. The "START"-mark and the count numbers are confined too half picture-height to allow legibility when set up as a still frame in a flying-spot telecine.

d) Separate sound recording

In the case of the SEPMAG system, the sound film should have a very small perforation (approximately 1 mm square) at the point in the sound recording corresponding to the START reference point on the leader. In order that the user may locate this point easily, a piece of adhesive tape may be attached to the sound film in advance.

Another method for ensuring that the picture and sound coincide at the start is to use the leader described above for the sound film also.



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- Density = 0.35
- Density = 2.00

UNIVERSAL FILM LEADER

SPLICE
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