

RECOMMENDATION ITU-R BR.265-9*

**Operating practices for the international exchange
of programmes** on film for television use**

(Question ITU-R 92/6)

(1956-1959-1963-1966-1970-1974-1982-1986-1990-1992-1997-2004)

The ITU Radiocommunication Assembly,

considering

- a) that the international exchange of recorded television programmes among broadcasters is currently, and predominantly, based on the exchange of recorded tapes;
- b) that some television programmes are still exchanged in the form of films;
- c) that several Recommendations already exist that relate to the international exchange of television programmes in the form of films;
- d) that several Recommendations already exist that relate to the subjective assessment of television pictures from telecine reproduction, as well as the viewing conditions, specifications and alignment procedures for television displays;
- e) that there is a need for an up-to-date Recommendation that, while recognizing the prevalence of television tape exchanges, details the operational provisions recommended for the exchange of television programmes in the form of films,

recommends

- 1 that, for the international exchange of television programmes among broadcasters, the exchange of recorded tapes should be the preferred mode of operation;
- 2 that, in those cases where the exchange of programmes on film is preferred, the films should conform with the specifications given in Annex 1.

* This Recommendation should be brought to the attention of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

** International programme exchange is defined as the transmission of television or sound programme material (or components thereof) among professional parties in different countries. It should be based on internationally agreed and widely employed technical standards or operating practices, except by prior bilateral agreement among the parties involved. For the purpose of this Recommendation the term is used to indicate the delivery of programme material on film for use in television.

Annex 1

International exchange of television programmes on film¹

1 Film code words

The types of film to which this Recommendation refers are designated by code words in conformity with ISO 3640.

- The code word consists of a letter and a number (or numbers) followed by a two- or three-syllable word, for example: C 35 COMOPT.
- The first letter indicates either monochrome, B, or colour, C, film type.
- The number, usually 16 or 35, indicates the nominal width of the film in millimetres.
- The first syllable indicates either a combined sound and picture recording, COM, or separate sound and picture recordings, SEP.
- The last syllable indicates whether the sound recording is magnetic, MAG, or optical, OPT:

for example:

- 35 mm colour film with an optical track is C 35 COMOPT;
- 16 mm monochrome film with a magnetic stripe is B 16 COMMAG;
- 16 mm colour film with sound on a separate magnetic film, having one or more tracks, is C 16 SEPMAG.

For picture films without sound, the designation is MUTE, for example: B 16 MUTE.

If the picture and the sound films have the same width a single number is used. If not, then two numbers separated by an oblique stroke are used, the first indicating the width of the picture film. For example: 35 mm picture film with magnetic sound track on 16 mm film is 35/16 SEPMAG.

An identification of the tracks utilized must be added after the word SEPMAG. For example: 35 SEPMAG (tracks 1 and 3) or 16 SEPMAG (edge track).

The appropriate code word should be placed on the identification leader of films intended for international exchange of programmes and it should be used in the related correspondence.

¹ Reference can usefully also be made to Recommendation ITU-R BR.1530 which is intended as a guide to the Recommendations in the BR Series that are relevant to various aspects of the use of film in television.

2 Types of films recommended for international exchange of television programmes

When the international exchange of television programmes is effected by means of films it should be based on one of the following types:

- a) 35 COMOPT
- b) 16 COMOPT²
- c) 16 COMMAG
- d) 16 SEPMAG
- e) 16 MUTE
- f) S16 SEPMAG³
- g) 35 MUTE
- h) 35 COMMAG
- i) 35 SEPMAG
- j) S35 SEPMAG.

Films of types f), h), i) and j) may only be exchanged by mutual agreement between the organizations concerned.

The fundamental technical parameters of each listed type should conform to the specifications given below.

3 Specifications for the image film

Normally the image on the film should be a photographic positive.

The picture (frame) frequency should be either 25 or 24 frames/s. The indication of the picture frequency should accompany any reference to programme duration.

Since the white point of colour television systems is either International Commission on Illumination (CIE), Illuminant *C* or CIE Illuminant *D*₆₅, adequate prints of colour films may be obtained if the print is balanced for projection by an illuminant approximating the spectral distribution of a black body at a colour temperature of 5400 K⁴. The print, when so illuminated, should provide a pleasing reproduction of neutral grey and skin colours.

Optimum viewing conditions for the appraisal of films for television are specified in Recommendation ITU-R BR.1355.

The dimensions of the films and of the images recorded thereon should conform to the appropriate international standards. Recommendation ITU-R BR.1374 provides information on the image area on the various film types. See also ISO 2939 for 35 mm films and ISO 4243 for 16 mm films.

² Although the quality of sound obtainable with 16 COMOPT films is marginal, this type cannot be excluded because of its widespread use.

³ The sound of Super 16 film programmes must be provided on a separate support (SEP) since there is no space for a sound track on the image film.

⁴ This neutral grey balance is very close to a metameric match with a neutral grey in the scene. (The metameric match of two colours of which the spectral compositions are different is obtained when the visual comparison of these two colours does not permit them to be distinguished by the CIE standard observer.)

4 Safe action and safe title area

When films are produced for television by conventional cinematographic methods, allowances should be made for the loss of picture area that occurs both in film-scanning and in consumer receivers. The television-scanned area, the action field and the title and sub-title areas should conform to the appropriate international standards (see ISO 1223).

Figure 5 shows that the safe action area is roughly 0.9 times the width and height of the full image, and the safe title area is roughly 0.8 times its width and height.

Account should also be taken of the fact that a programme on film may be used for television at an aspect ratio of 4:3 or of 16:9. The solution to the problem is detailed in Recommendation ITU-R BR.1374.

In addition, some broadcasters have introduced the practice of using an aspect ratio of 14:9 to televise 35 mm wide-screen films during the period when their audience will use both 4:3 and 16:9 receivers. This practice is detailed in Recommendation ITU-R BR.1441.

5 Specifications for film sound tracks

5.1 COMOPT types

The preferred types of optical sound tracks are variable area, bilateral or double bilateral.

The nominal optical sound-recording characteristic for 35 mm and 16 mm film is that which produces a constant modulation of its optical transmission as a function of frequency within the given frequency range on the sound track of the film when a sine-wave signal of constant amplitude is fed into the input of the recording channel.

The corresponding nominal reproducing characteristic is that which produces a sine-wave output signal whose level is independent of frequency when reproducing a sound-track recorded with the nominal recording characteristic specified above.

The preferred method of calibrating a reproducing chain is by means of a standard test film recorded with a number of audio sine-waves producing constant modulation of the optical transmission.

5.1.1 35 COMOPT

The location and dimensions of picture frames and sound track of 35 COMOPT films should conform to the appropriate international standard (see ISO 2939 and Recommendation ITU-R BR.1374).

The sound record should be in advance of the centre of the corresponding picture by 20 ± 0.5 frames.

5.1.2 16 COMOPT

The location and dimensions of picture frames and sound track should conform to the appropriate international standards (see ISO 359, ISO 4243 and Recommendation ITU-R BR.1374).

The sound record should be in advance of the centre of the corresponding picture by 26 ± 0.5 frames.

5.2 COMMAG types

5.2.1 35 COMMAG

The location and dimensions of the magnetic sound stripe should be as given in Fig. 3.

The sound record should be behind the centre of the corresponding picture by 28 ± 0.5 frames.

The magnetic sound stripe should be on the side of the film towards the lens of a projector arranged for direct projection on to a reflecting screen.

If a balancing stripe is used, it should have the same thickness as the magnetic sound stripe. No sound recording should be made on the balancing stripe.

The recording and reproducing characteristics should conform to ISO 1189. In practice the appropriate standard film will be used.

5.2.2 16 COMMAG

The location and dimensions of the magnetic sound stripes of 16 COMMAG films should conform to ISO 490. They are given in Fig. 1.

The sound record should be in advance of the centre of the corresponding picture by 28 ± 0.5 frames.

The magnetic stripe should be on the side of the film that faces the light source of a projector arranged for direct projection onto a reflecting-type screen.

The maximum additional thickness due to the magnetic coating should be 0.02 mm.

If a balancing magnetic stripe is used, it should have the same thickness as the main magnetic stripe. No sound recording should be made on the balancing stripe.

The recording and reproducing characteristics should conform to ISO 1188. In practice the appropriate standard film will be used.

5.3 SEPMAG types

5.3.1 35 SEPMAG

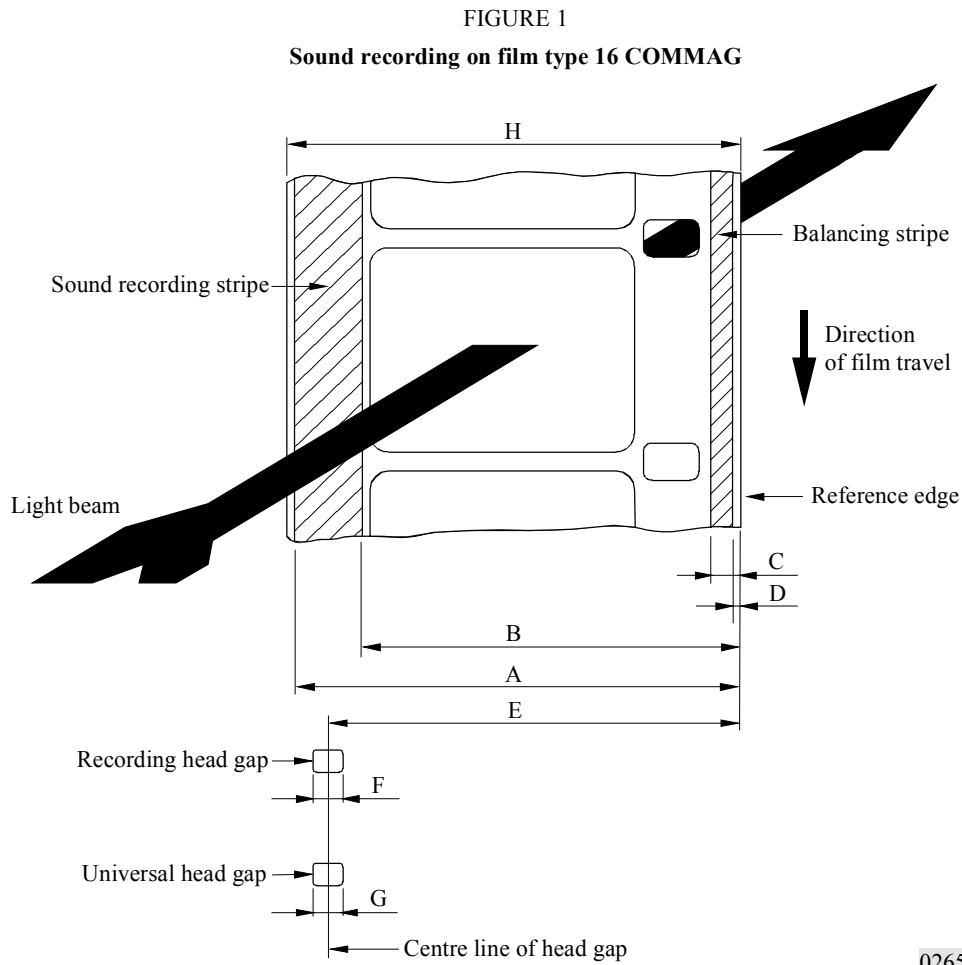
The separate sound film should be a 35 mm magnetic film of standard dimensions and perforations.

The location and dimensions of the sound tracks should conform to ISO 162, as shown in Fig. 4.

The allocation of tracks on the separate 35 mm magnetic film should be as follows:

- for some countries (e.g. Region 1):
 - track No. 1: left channel,
 - track No. 2: right channel,
 - track No. 3: mono or blank,
- for other countries (e.g. Regions 2 and 3):
 - track No. 1: mono,
 - track No. 2: left channel,
 - track No. 3: right channel.

The recording and reproducing characteristics should conform to ISO 1189. In practice the appropriate standard film will be used.



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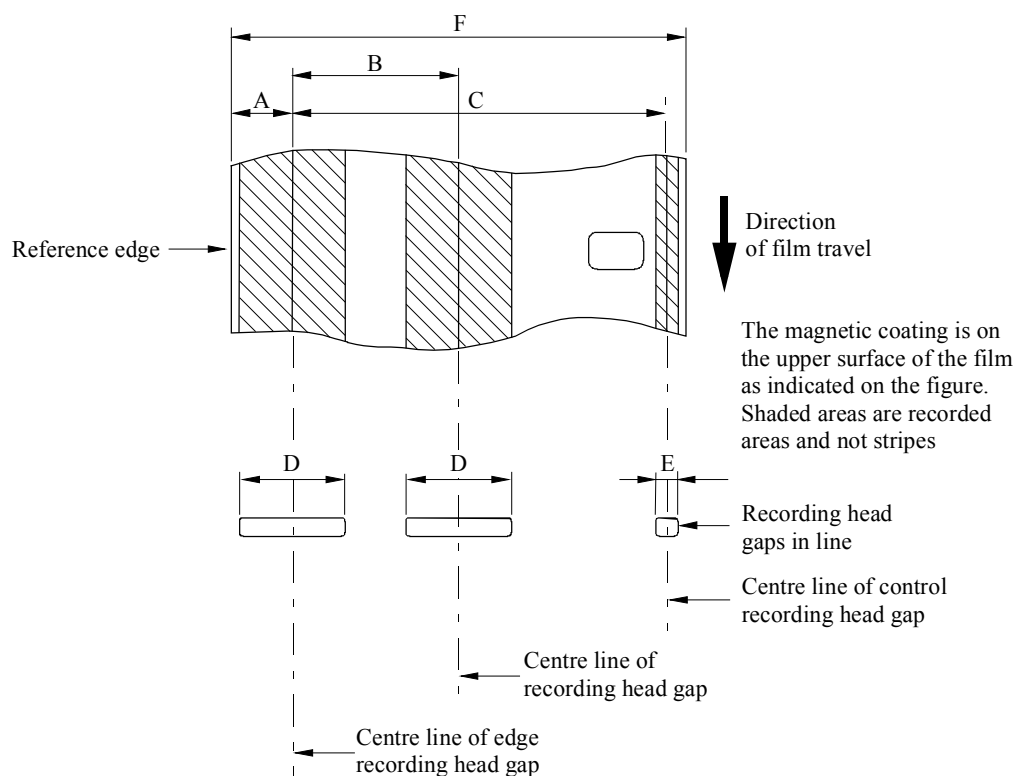
Dimensions	
	(mm)
A (minimum)	15.80
B	$13.25 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
C	$0.80 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
D (maximum)	0.15
E	14.55 ± 0.05
F	2.35 ± 0.10
G ⁽¹⁾	2.15 ± 0.10
H (reference)	15.95

⁽¹⁾ When it is desired to employ a single head for the dual function of recording and reproducing, the universal head dimensions should apply.

5.3.2 16 SEPMAG

The separate sound film should be a 16 mm magnetic film of standard dimensions and perforations. The location and dimensions of the sound tracks should conform to ISO 4242. They are given in Fig. 2.

FIGURE 2
Sound recording on film type 16 SEPMAG



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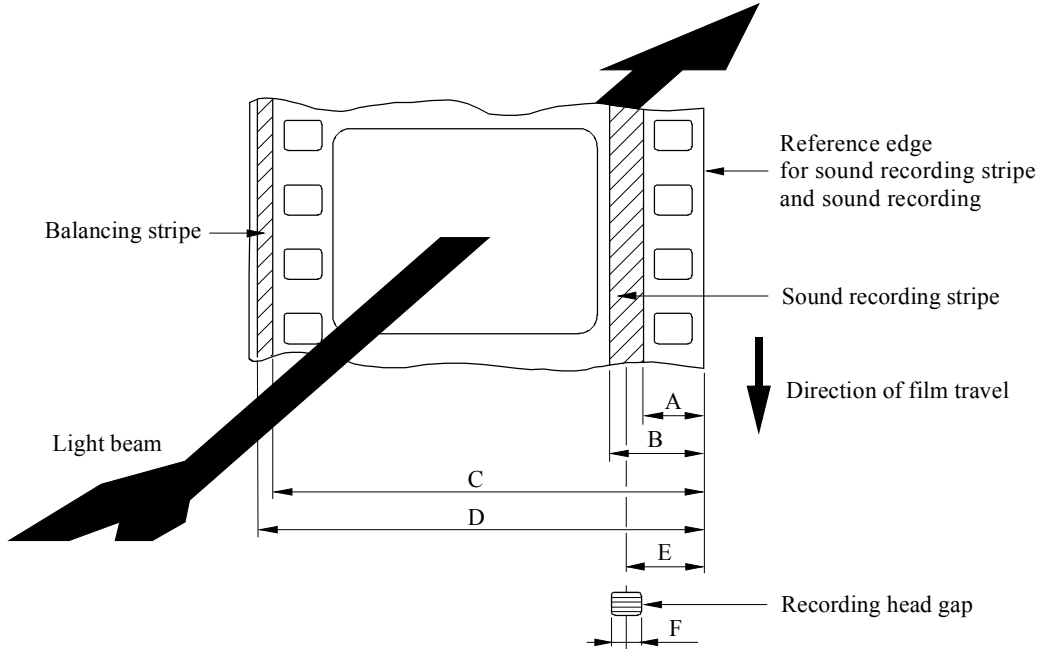
Dimensions	
	(mm)
A	2.05 ± 0.05
B	5.95 ± 0.05
C	13.45 ± 0.05
D ⁽¹⁾	4.0 ⁰ _{-0.1}
E	0.7 ⁰ _{-0.1}
F (reference)	15.95

⁽¹⁾ To prevent the erase head overlapping the film edge, a dimension of:

$$3.85 \begin{matrix} 0 \\ -0.1 \end{matrix}$$

is preferred in some countries.

FIGURE 3
Sound recording on film type 35 COMMAG

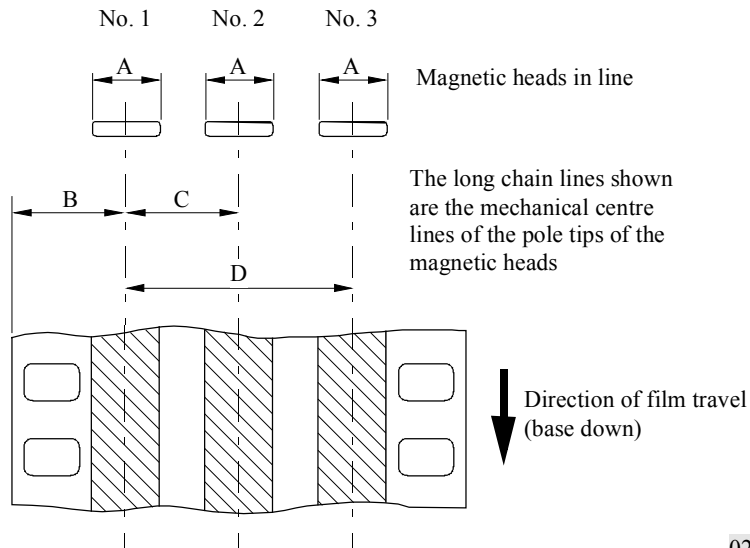


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Dimensions	
	(mm)
A	$5.10 \begin{smallmatrix} 0 \\ -0.10 \end{smallmatrix}$
B	$7.60 \begin{smallmatrix} +0.10 \\ 0 \end{smallmatrix}$
C	$33.25 \begin{smallmatrix} 0 \\ -0.10 \end{smallmatrix}$
D	$34.70 \begin{smallmatrix} +0.10 \\ 0 \end{smallmatrix}$
E	6.35 ± 0.05
F	2.35 ± 0.05

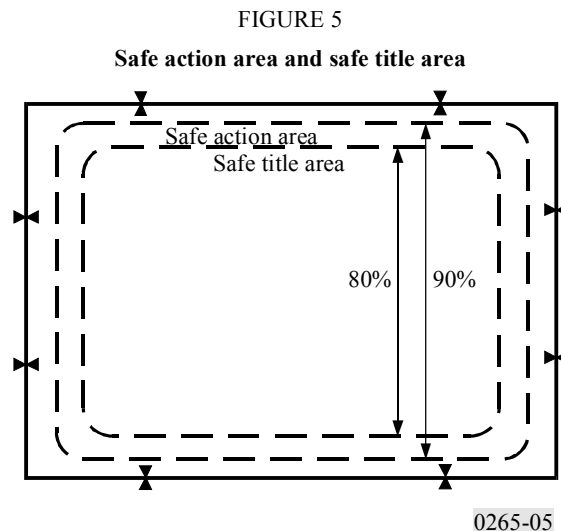
NOTE 1 – If the magnetic sound stripe increases the thickness of the film, a balancing stripe should be applied to equalize the thickness of the two edges of the film. The balancing stripe should be of the same material and thickness as the main magnetic stripe and its location and dimensions should be as referred to in the Figure and given in the Table. For television programme exchange, no programme recording shall be made on the balancing stripe.

FIGURE 4
 Sound recording on film type 35 SEPMAG with one or more tracks



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Dimensions	
	(mm)
A	$5.0^{+0.1}_0$
B	8.6 ± 0.05
C	8.9 ± 0.05
D	17.8 ± 0.05



The allocation of tracks on the separate 16 mm magnetic film should be as follows:

- for stereo sound:
 - centre track: left channel;
 - edge track: right channel,
- for independent synchronous sounds:
 - centre track: dubbing or subtitling sound;
 - edge track: original transmission sound.

The recording and reproducing characteristics should conform to ISO 1188. In practice the appropriate standard film will be used.

5.4 Other provisions for sound tracks

5.4.1 Multiple sound tracks

The COM and SEP types should not be combined. That is to say, if one or more sound tracks are provided on a separate film, only the SEP tracks should be used for reproduction.

For the exchange of film programmes having multichannel sound, see Recommendation ITU-R BR.1287.

Provisions related to the use of sound tracks recorded with noise reduction and matrix surround sound are given in Recommendation ITU-R BR.1422.

5.4.2 Absolute polarity of sound recording

For optical tracks, a positive audio signal⁵ shall correspond to increasing optical transmittance of the sound track.

⁵ The definition of a positive audio signal is given in EBU Recommendation R50 – An audio signal is deemed to be positive when it results from an increase in the acoustic pressure on the microphone diaphragm, and thus in the displacement of the diaphragm towards the rear.

For magnetic tracks the direction of the magnetization in the sound track corresponding to the presence of an instantaneous positive audio signal shall be in the same direction as that of the film movement.

6 Presentation and packaging of films

Film splices should be avoided as far as possible on exchanged films. When that is not possible, they should be carried out in accordance with the appropriate international standards (see ISO 6038).

A leader for protection and identification should be attached to each reel of film.

The minimum length of the protection and identification leader should be 3 m.

The minimum information given on the identification leader should be as follows:

- name of sending organization,
- title of programme,
- code word,
- screen ratio (e.g. 1.35:1, 1.66:1, 1.85:1 or cinemascope),
- total programme duration and picture frequency,
- total number of reels,
- reel number,
- duration or length of the film on the reel.

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 is on the same side on both leader and film.

Films may be transported on flanged reels or on cores as specified in the appropriate international or national standards. The boxes in which films are transported should be identified with labels carrying the same information as the corresponding film leader.
