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# International Standard



# 2404

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## **Cinematography — Six-track magnetic sound records on 70 mm striped release prints — Locations and dimensions**

*Cinématographie — Copies d'exploitation sur films 70 mm à six pistes magnétiques sonores — Emplacements et dimensions*

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**Descriptors :** cinematography, motion-picture film, motion-picture film 70 mm, sound recording, magnetic recording, sound track, position (location), dimensions.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2404 was prepared by Technical Committee ISO/TC 36, *Cinematography*.

This second edition cancels and replaces the first edition (ISO 2404-1979), of which it constitutes a minor revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

# Cinematography — Six-track magnetic sound records on 70 mm striped release prints — Locations and dimensions

## 1 Scope and field of application

This International Standard specifies the locations and the width dimensions of magnetic stripes and recording and reproducing gaps of magnetic heads for six-track magnetic sound records on 70 mm striped release prints on safety base stock cut and perforated in accordance with ISO 3023.

## 2 Reference

ISO 3023, *Cinematography — 65 mm and 70 mm unexposed motion-picture film — Cutting and perforating dimensions.*

## 3 Dimensions

The locations and width dimensions of magnetic stripes and gaps of magnetic heads shall be as shown in the figure and as given in the table.

Dimension	mm	in
A (see note 1)	69,95	2.754
B	0,20 ± 0,05	0.008 ± 0.002
C	5,28 ± 0,05	0.208 ± 0.002
D	8,38 + 0,05 0	0.330 + 0.002 0
E	10,54 ± 0,05	0.415 ± 0.002
F	1,27 ± 0,05	0.050 ± 0.002
G	2,92 ± 0,05	0.115 ± 0.002
H	8,20 ± 0,05	0.323 ± 0.002
K	59,21 ± 0,05	2.331 ± 0.002
L (width)	1,90 ± 0,05	0.075 ± 0.002
M	64,50 ± 0,05	2.539 ± 0.002
N	67,41 ± 0,05	2.654 ± 0.002
Q (width)	1,78 ± 0,05	0.070 ± 0.002

### NOTES

- For reference only.
- The locations and width dimensions of magnetic stripes and recording gaps of magnetic heads are chosen on the assumption that the lateral film shrinkage is within the range of 0 to 0,2 % at the time of striping and/or recording.
- The locations of reproducing gaps of magnetic heads for projectors are chosen on the assumption that the lateral film shrinkage at the time of presentation is 0,2 % greater than at the time of striping. The locations of reproducing gaps of magnetic heads in the equipment used for the production of release prints can be the same as that for the recording heads.

## 4 Alignment of heads

The gaps of recording and reproducing magnetic heads respectively shall be in line at an angle of  $90^\circ \pm 3'$  to the direction of the film travel.

## 5 Sound recording

For the listener facing the screen, the stripes shall be used for the sound recording for the following channels :

Stripe No. 1 — for the extreme left channel

Stripe No. 2 — for the left central channel

Stripe No. 3 — for the central channel

Stripe No. 4 — for the right central channel

Stripe No. 5 — for the extreme right channel

Stripe No. 6 — for the loudspeakers in auditorium or for recording (monitoring) signals inaudible to a spectator

Audio records No. 4 and 5 shall be recorded adjacent to the frameline identifier as shown in the figure.

NOTE — In special motion-picture films, for achieving certain sound effects, some other arrangement of the stripes on the release print is warranted.

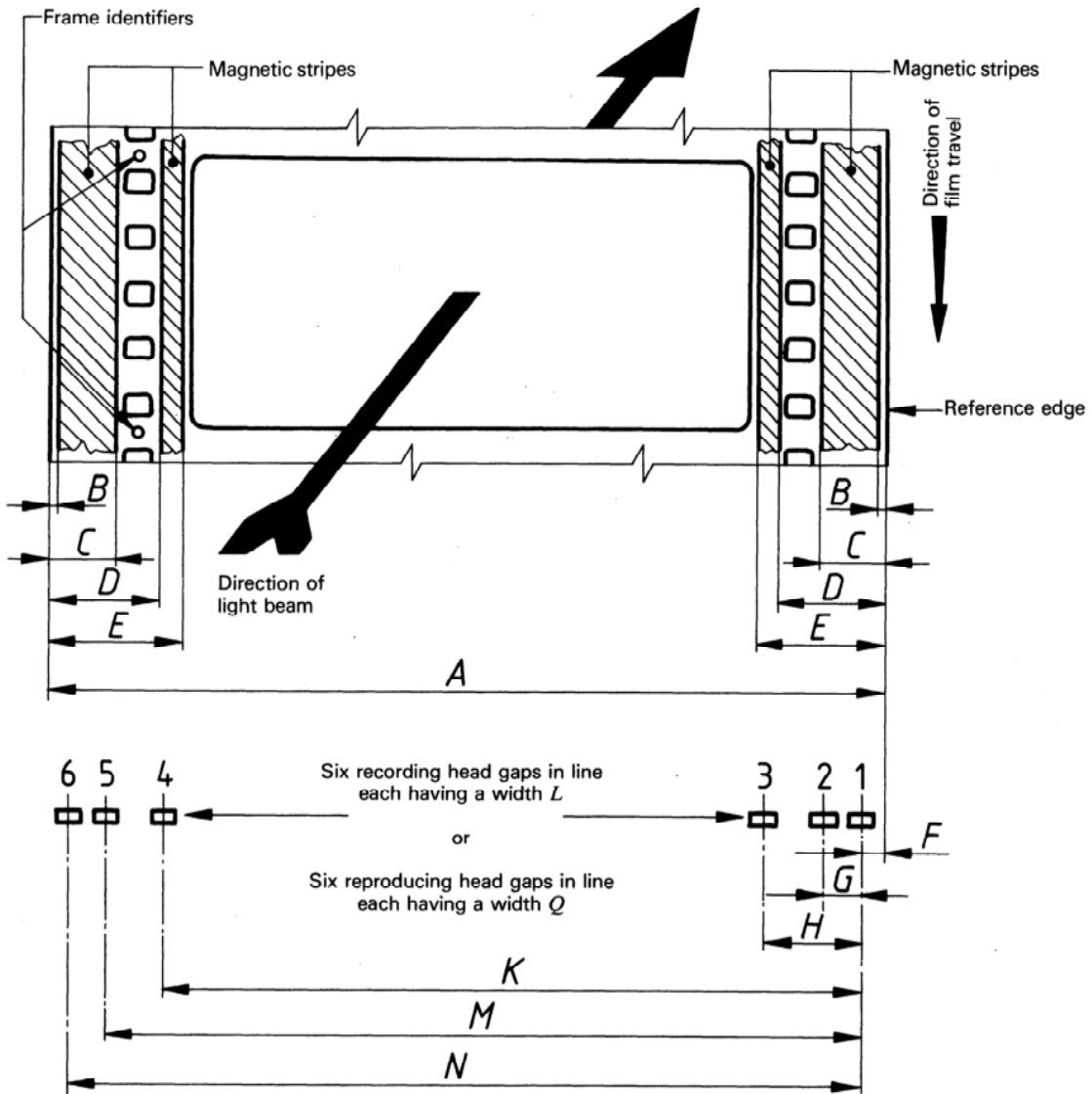
## 6 Picture-sound displacement

The magnetic sound records on the film shall lag behind the centre of the corresponding picture by a distance of  $24 \pm 1/2$  frames.

NOTE — With the picture-sound displacement on the film of 24 frames and the projector threaded at 25 frames, synchronization of picture and sound will be correct for an observer at a distance of about 15 m (50 ft) from the screen.

## 7 Reproducing speed

The recording shall be made so that the sound records will reproduce properly at 120 perforations per second, i.e. 24 frames (5 perforations each) per second. This results in a linear speed of approximately 34 m/min (112 ft/min).



Figure

The figure shows the film as seen from the light source in the projector arranged for projection onto a reflection type screen. With the direction of film travel as shown in the figure, the photographic layer is on the side of the film facing the light source and the magnetic coating is on the side of the film away from the light source.