SMPTE STANDARD

for Television Recording — 1-in Reels

ANSI/SMPTE 24M-1991
Revision of
ANSI/SMPTE 24M-1985

1 Scope

This standard specifies the configuration and dimensions for reels intended for 1-in magnetic tape for television recording on helical-scan video recorders, as specified in ANSI/SMPTE 25M-1989.

2 Reel construction

The method for fastening or the fasteners used to hold the flanges to the hub shall not cause protrusions beyond the hub mounting surface. The reel shall be symmetrical about the axis of rotation. Irregularities of configuration, such as flange openings, shall conform to this requirement.

3 Dimensions

The dimensions shall be as shown in the figures and tables. The dimensions apply to reels normalized at 23°C ± 1°C and at 50% ± 2% relative humidity.

4 Flange clearance

With the reel mounted in the test apparatus, a width gauge of 25.500 mm + 0.010 mm – 0.000 mm (1.0039 in + 0.0004 in – 0.0000 in) shall be mounted so the gauge centerline is 15.37 mm (0.605 in) from the hub mounting surface and at 90° relative to the hub winding surface. The reel shall be rotated and the width gauges moved between the flanges from the flange rim to the hub surface. The width gauge shall not touch the flange during this operation. When the reel is turned over so that the other side of the hub is the reel mounting surface, it shall also pass tape path clearance check.

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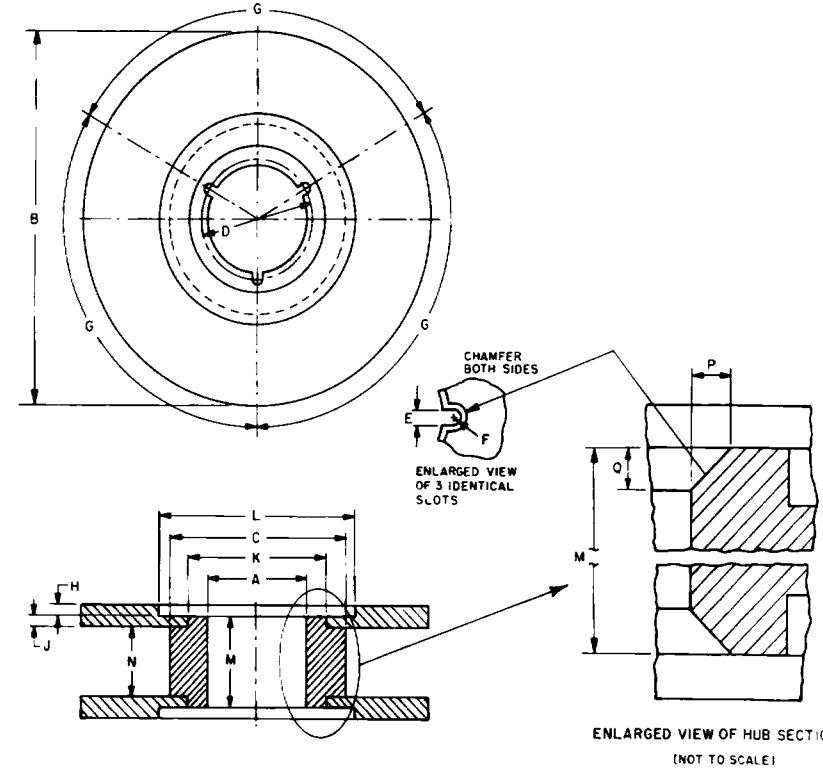

Figure 1 – Reel for 1-in magnetic tape

Table 1 – Reel dimensions

Dimensions	Millimeters	Inches
A	76.20 $^{+0.10}_{-0.00}$ Dia	3.000 $^{+0.004}_{-0.000}$ Dia
B*	See table 2	See table 2
C	114.30 ± 0.25 Dia	4.500 ± 0.010 Dia
D	82.55 ± 0.05 Dia	3.250 ± 0.002 Dia
E	5.56 $^{+0.15}_{-0.00}$	0.219 $^{+0.006}_{-0.000}$
F	2.77 R ref	0.109 R ref
G	120° ± 0.1°	120° ± 0.01°
H	0.64 max	0.025 max
J	2.39 max	0.094 max
K†	91.44 min	3.600 min
L*†	152.40 min	6.000 min
M	30.78 ± 0.08	1.212 ± 0.003
N	25.91 ± 0.05	1.020 ± 0.002
P	0.76 max	0.030 max
Q	0.76 max	0.030 max

* Outside surfaces of reel flanges between diameters L and B shall not extend more than 0.64 mm (0.025 in) beyond the surfaces defined by the actual dimension M.

† Outside surfaces of reel flanges between diameters K and L shall not extend beyond the surfaces defined by the actual dimension M.

Table 2 – Dimension B, flange diameters

Millimeters	Inches
165.10 ± 0.25	6.500 ± 0.010
203.20 ± 0.25	8.000 ± 0.010
228.60 ± 0.25	9.000 ± 0.010
266.70 ± 0.25	10.500 ± 0.010
292.10 ± 0.25	11.500 ± 0.010
298.50 ± 0.25	11.752 ± 0.010
304.80 ± 0.25	12.000 ± 0.010
317.50 ± 0.25	12.500 ± 0.010
355.60 ± 0.25	14.000 ± 0.010

NOTES
1 Reel shall meet tape clearance requirements when mounted on either side.
2 Tape path clearance takes precedence over any tolerance buildup. See clause 4 for measurement technique.

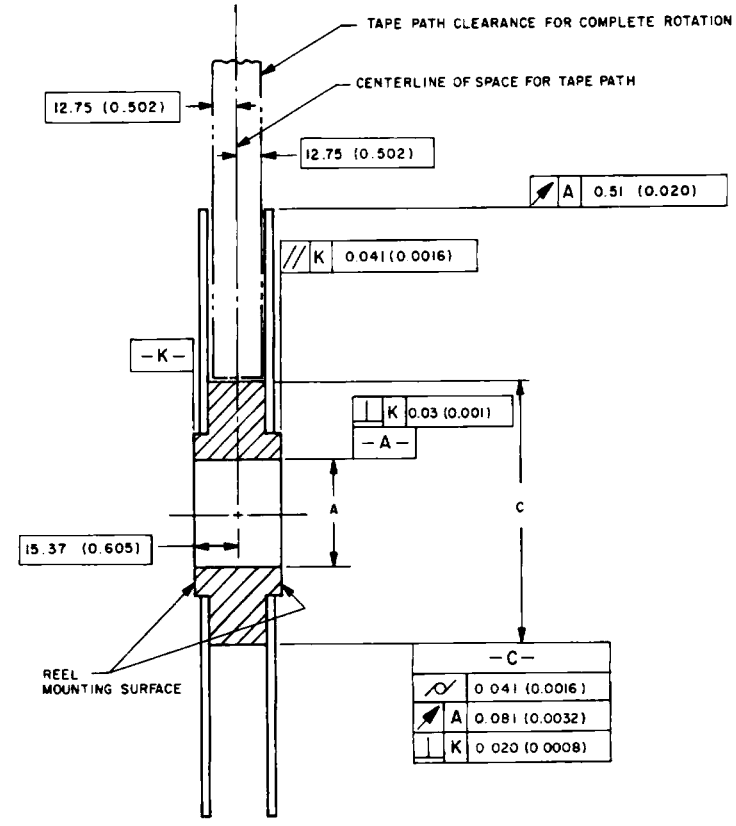

Figure 2 – Clearance

Annex A (informative)
Reel identification

It is recommended that reels be identified in a manner making it readily apparent that they contain video tape in order to prevent inadvertent use of other types of tape having a similar appearance.

Annex B (informative)
Bibliography

ANSI/SMPTE 25M-1989, Video Recording — 1-in Magnetic Recording Tape

SMPTE STANDARD

ANSI/SMPTE 87M-1991
Revision of
ANSI/SMPTE 87M-1985

for Motion-Picture Film (16-mm) — 100-Mil Magnetic Striping

1 Scope

This standard specifies the location and dimensions of the magnetic striping material applied to 16-mm motion-picture film, which is used for both picture and sound.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was 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 standard indicated below.

ANSI/SMPTE 109-1986, Motion-Picture Film (16-mm) — Perforated 1R

3 Magnetic striping

3.1 The location and dimensions of the magnetic striping shall be as given in figure 1 and table 1.

3.2 The magnetic striping material shall be on the side of the film toward the lamp on a projector arranged for direct projection on a reflection-type screen.

4 Film stock

The film stock used shall be safety type, cut and perforated in accordance with ANSI/SMPTE 109-1986.

5 Balance stripe

If the stripe is raised significantly (greater than 0.1 mil), then a balance stripe is required. The balance stripe need not be a continuous magnetic coating.

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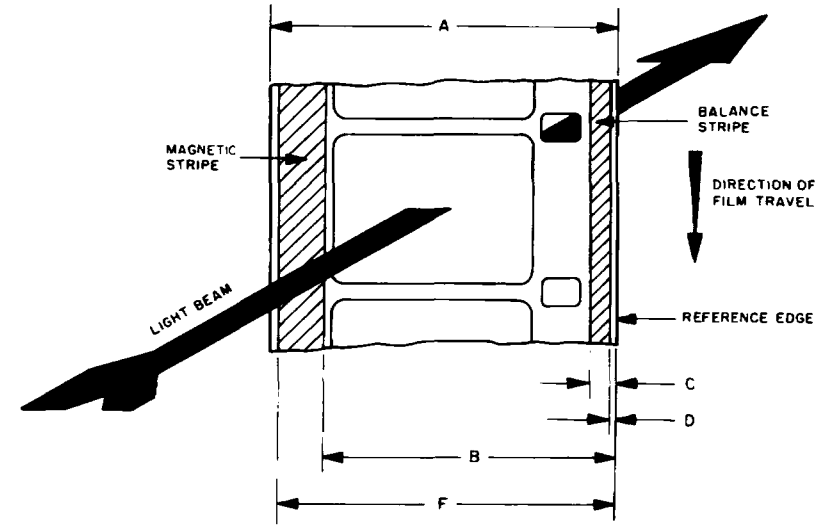

Figure 1

Table 1

Dimensions	Millimeters	Inches
A	15.95 ref	0.628 ref
B	13.25 $^{+0.00}_{-0.15}$	0.522 $^{+0.000}_{-0.006}$
C	0.80 $^{+0.00}_{-0.15}$	0.031 $^{+0.000}_{-0.006}$
D	0.15 max	0.006 max
F	15.80 min	0.622 min

Annex A (informative)
Application

The outer edge of both stripes ideally should be coincident with the edge of the film.

SMPTE STANDARD

ANSI/SMPTE 218M-1991
Revision of
ANSI/SMPTE 218M-1985

for Motion-Picture Film (16-mm) — 200-Mil Center-Position Magnetic Audio Record

1 Scope

This standard specifies the position, dimensions, and reproducing speed of the nominal 5.08-mm (0.200-in) center-position magnetic audio record on 16-mm motion-picture film.

2 Audio record

2.1 The lateral location and width of the center-position magnetic audio record shall be as specified in figure 1 and table 1.

2.2 The recording shall be made so that the azimuth of the record is at an angle of 90° ± 3' to the reference edge of the film.

2.3 With the direction of travel as shown in figure 1, the magnetic coating is on the surface toward the observer.

3 Reproducing speed

The recording shall be made so that the audio record will reproduce properly at 24 perforations per second (approximately 11 m [36 ft] per minute or 183 mm [7.2 in] per second) which is 24 frames per second. An alternate reproducing speed may be 25 frames per second.

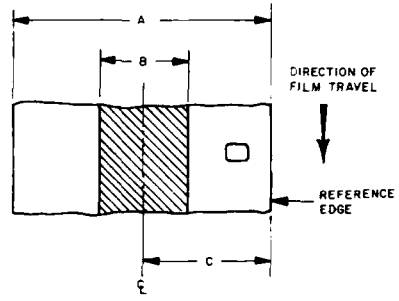

Figure 1

Table 1

Dimensions	Millimeters		Inches	
A	15.95	ref	0.628	ref
B	5.08	+ 0.05 − 0.00	0.200	+ 0.002 − 0.000
C	7.98	± 0.05	0.314	± 0.002

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Annex A (informative)
Additional data

A.1 Record width

The width of the recorded area must be measured with great care as it enters directly into the calculation of flux per unit track width.

When the recording head gap is narrower than the width of the coating or stripe, as is normal for all motion-picture test films, there is a measurement complication involving both the uncertainties in seeing the track and in determining the recording fringing.

If the recording head is available, the track width is best measured indirectly by measuring the gap width and adding to this dimension twice the thickness of the test record magnetic coating. This correction will usually be 0.0003 in to 0.0006 in (8 µm to 15 µm).

If the recording head is unavailable, the recorded record may be made visible by the use of a carbonyl iron suspension. Care should be taken to apply the minimum quantity that makes the recording visible, so that the developed image is not wider than the actual recorded area.

A.2 Reproducing head gap width

If precision measurements or calibrations are to be made on magnetic audio records made in accordance with this standard, reproducing head gaps of the same width dimension or wider than the recorded track must be used to prevent edge effects or fringing.

A.3 Erase heads

Erasing head gaps used to erase the records specified in this standard should be substantially wider than the record specified.

A.4 Film base

The film base used for the audio records conforming to this standard is usually made in accordance with ANSI/SMPTE 109-1986.

A.5 Picture-audio synchronization

The film is used for audio records only. Any accompanying picture is on a separate photographic film. When audio records are intended to be used in synchronization with pictorial material found on a separate film, the picture-audio relationship should be in accordance with SMPTE RP 25-1984.

A.6 Magnetic coating

The dimensions of the magnetic coating are not specified, but it is assumed to be wide enough to permit placement of the audio records in accordance with this standard.

Annex B (informative)
Bibliography

ANSI/SMPTE 109-1986, Motion-Picture Film (16-mm) — Perforated 1R

SMPTE RP 25-1984 (R1989), Audio and Picture Synchronization on Motion-Picture Film Relative to the Universal Leader for Magnetic and Photographic Records

SMPTE STANDARD

ANSI/SMPTE 220-1991
Revision of
ANSI/SMPTE 220-1985

for Motion-Picture and Television Equipment — Camera Mounting Connections — 1/4-Inch-20 Thread and 3/8-Inch-16 Thread Tripod Screws

1 Scope

1.1 This standard specifies the location of the head mounting sockets in the mounting plates of motion-picture and television cameras intended to mate with 1/4-inch-20 thread and 3/8-inch-16 thread locking screws.

1.2 The standard is not intended to prescribe design except for the dimensions affecting interchangeability; for this reason, the socket figures indicate two of many possible designs.

2 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.

ANSI/ASME B1.1-1989, Unified Inch Screw Threads (UN and UNR Thread Form)

ANSI PH3.101-1983 (R1987), Photography (Cameras)— Tripod Connections for American Cameras (1/4-Inch-20 Thread)

ANSI PH3.102-1983 (R1987), Photography (Cameras) — Tripod Connections for Heavy-Duty or Imported Cameras (3/8-Inch-16 Thread with Adapter for 1/4-Inch-20 Thread Tripod Screws)

3 Tripod screws

3.1 One-quarter inch tripod screws shall be in accordance with ANSI PH3.101-1983.

3.2 Three-eighth inch screws shall be in accordance with ANSI PH3.102-1983.

3.3 The mounting area on the camera base shall have the following thickness:

	Recommended	Minimum
1/4-in screw	0.240 in	0.188 in
3/8-in screw	0.359 in	0.250 in

4 Mounting plate

4.1 Socket

The head mounting socket shall be on nominally 1-in (25.4-mm) centers and be located in line as shown in figures 1, 2, and 3.

4.2 1/4-in screw

The thread in the head mounting socket shall be 3/8-inch-16 UNC-2A, in accordance with ANSI/ASME B1.1-1989, with the following diameter specifications:

	Minor dia (Inches)	Pitch dia (Inches)	Major dia (Inches)
Min	0.196	0.2175	0.2500
Max	0.207	0.2223	—

4.3 3/8-in screw

The thread in the head mounting socket shall be 3/8-inch-16 UNC-2A, in accordance with ANSI/ASME B1.1-1989, with the following diameter specifications:

	Minor dia (Inches)	Pitch dia (Inches)	Major dia (Inches)
Min	0.307	0.3344	0.3750
Max	0.321	0.3401	—

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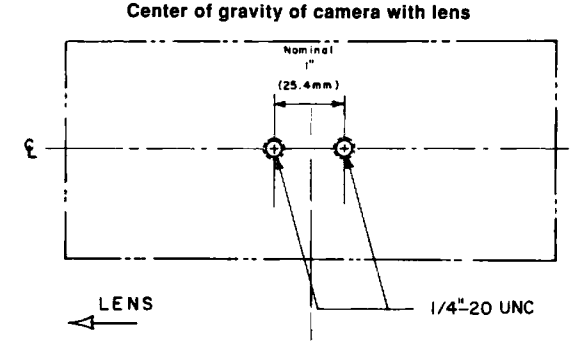

Figure 1 – 1/4-inch head-mounting socket

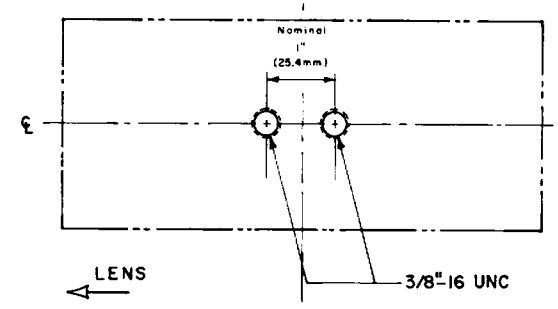

Figure 2 – 3/8-inch head-mounting socket

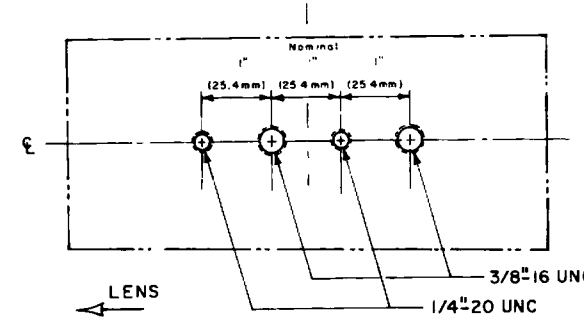

Figure 3 – Combined head-mounting socket