

# American National Standard

## for motion-picture equipment (8-mm type S)— model II camera cartridges (15-m capacity)— camera run film length

Approved October 28, 1988

Sponsor: Society of Motion Picture and Television Engineers

### 1. Scope

1.1 This standard describes the camera run length of film supplied in 8-mm type S model II motion-picture film camera cartridges of 15-m (50-ft) nominal capacity and the length of film returned to the customer.

1.2 The purpose of this standard is to provide a uniform basis for the operation of footage counters in cameras.

### 2. Referenced American National Standards

This standard is intended for use in conjunction with the following American National Standards: ANSI/SMPTE 149-1988, Motion-Picture Film (8-mm Type S)—Perforated IR; ANSI/SMPTE 189M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Loaded Film Location

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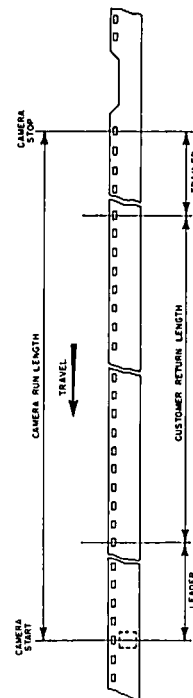
ANSI/SMPTE 190M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Cartridge-Camera Fit and Core

ANSI/SMPTE 191M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Slots, Projections and Cartridge Hole

### 3. Specifications

3.1 The camera run length of film may vary between 3670 perforation pitches (15.5 m or 51 ft) and 3710 perforation pitches (15.7 m or 51.5 ft). (See Note.) The overall length of the film is to be determined by the manufacturer to provide the camera run length specified.

3.2 A complete film as returned to the customer shall contain a minimum customer return length of 3600 perforation pitches (15.2 m or 50 ft). The customer return length shall be that portion of the camera run length available for subject



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matter which starts at least 35 perforation pitches (approximately 148 mm or 5.8 in) after the frame which forms the camera aperture, as the cartridge is supplied by the manufacturer, and ends at least 35 perforation pitches (148 mm or 5.8 in) short of the limit as provided by a perforation cutout. (See Appendix A1.)

3.3 The start of the film should have a suitable visual marking in the frame area. The end should have the perforations cut out over a minimum

### Appendix

(This Appendix is not part of the American National Standard, but is included for information only.)

A1. The lengths of the leader and trailer are necessary to ensure that the fog produced near the aperture is removed. The material removed also provides space for identification numbers and allows for manufacturing variability of film lengths.

A2. The film lengths specified in this standard are based on a maximum film thickness of 0.108 mm (0.0043 in).

length of two pitches so that the film will stop in the camera aperture. The cutout also gives the user visual confirmation that all film has been exposed. The shape and location of the cutout notch are not significant and are left to the discretion of the manufacturer.

NOTE: A nominal pitch, based on 72 perforation pitches per foot, of 4.234 mm (0.1667 in) is assumed for all comparisons of the number of perforation pitches in a given film length. This assumption is based on ANSI/SMPTE 149-1988.

ANSI/SMPTE 188M-1988

# American National Standard for motion-picture equipment (8-mm type S)— model II camera cartridges— loaded film location

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## 1. Scope

This standard specifies the location of the film loaded in 8-mm type S model II motion-picture camera cartridges.

## 2. Referenced American National Standards

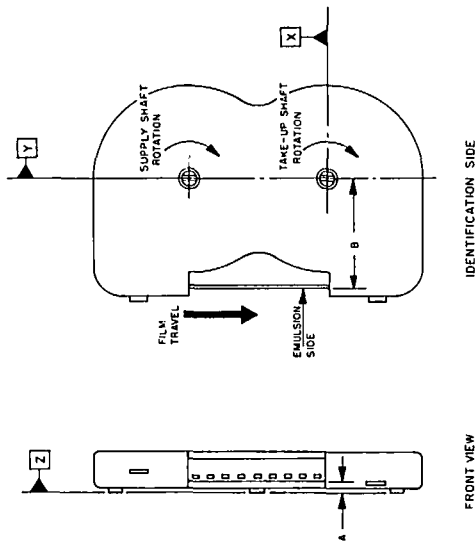
This standard is intended for use in conjunction with the following American National Standards: ANSI/SMPTE 188M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges (15-m Capacity)—Camera Run Film Length

ANSI/SMPTE 190M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Cartridge-Camera Fit and Core

ANSI/SMPTE 191M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Slots, Projections and Cartridge Hole

## 3. Dimensions

3.1 The dimensions shall be as specified in the figure and table.



FRONT VIEW

IDENTIFICATION SIDE

Dimensions	Millimeters*	Inches
A†	2.6 ± 0.1	0.102 ± 0.004
B	33.0 ± 0.5	1.30 ± 0.02

\*The metric system is the primary measuring system for this standard.  
†Inch dimension intentionally carried one additional decimal place.

3.2 Dimensions A and B apply where the film enters and leaves the cartridge (the space provided for the camera film guide, aperture, and pressure plate) and are measured to the emulsion side edges of the film, respectively. (The edges of the film are specified because film curl would have to be taken into account if dimension B applied at other locations. However, the film plane is parallel within the tolerance of dimension B.)

3.3 Datum planes used for dimensioning are coincident with the surfaces that engage mating camera parts when the cartridge is properly aligned in the camera. The datum planes are mutually perpendicular.

3.3.1 Datum plane Z (primary) is established from the extremities of the three seating bosses (logs).

3.3.2 Datum plane Y (secondary) is established coincident with the axes of the cartridge take-up core opening and the supply core opening.

3.3.3 Datum plane X (tertiary) is also established coincident with the axis of the cartridge take-up core opening.

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# American National Standard for motion-picture equipment (8-mm type S) — model II camera cartridges — cartridge-camera fit and core

Approved October 28, 1988

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## 1. Scope

This standard specifies the external dimensions for the cartridge-camera fit and core specifications for 8-mm type S model II motion-picture film camera cartridges.

## 2. Referenced American National Standards

This standard is intended for use in conjunction with the following American National Standards:

- ANSI/SMPTE 188M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges (15-m Capacity) — Camera Run Film Length
- ANSI/SMPTE 189M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Loaded Film Location
- ANSI/SMPTE 191M-1988, Motion-Picture Equipment (8-mm Type S)—Model I Camera Cartridges—Slots, Projections and Cartridge Hole

## 3. Dimensions and Characteristics

- 3.1** The dimensions shall be as given in the figures and tables and apply to an assembled cartridge containing a film load.
- 3.2** Datum planes used for dimensioning are coincident with the surfaces that engage mating

camera parts when the cartridge is properly aligned in the camera. The datum planes are mutually perpendicular.

**3.2.1** Datum plane Z (primary) is established from the extremities of the three seating bosses (lugs) 1, 2, and 3 (dimension L).

**3.2.2** Datum plane Y (secondary) is established coincident with the axes of the cartridge take-up core opening, dimension  $W_2$ , and the supply core opening, dimension  $W_3$ .

**3.2.3** Datum plane X (tertiary) is also established coincident with the axis of the cartridge take-up core opening, dimension  $W_2$ .

**3.3** The bosses (lugs)  $L_1$ ,  $L_2$ , and  $L_3$ , which establish datum plane Z and engage mating surfaces to locate laterally the cartridge in the camera, shall be nominally flat.

**3.4** The centerline for the supply shaft, dimension F, also applies to the identification side view.

**3.5** If tape is used to seal the cartridge, it should fall within the values established by dimensions  $A_1$ ,  $A_2$ , C, and D.

**3.6** The coaxiality of the core post, dimension f, and the core drive openings, dimensions j and k (Fig. 2), with the openings in the cartridge, dimensions  $W_2$  and J (Fig. 1), should be within 0.4 mm (0.016 in).

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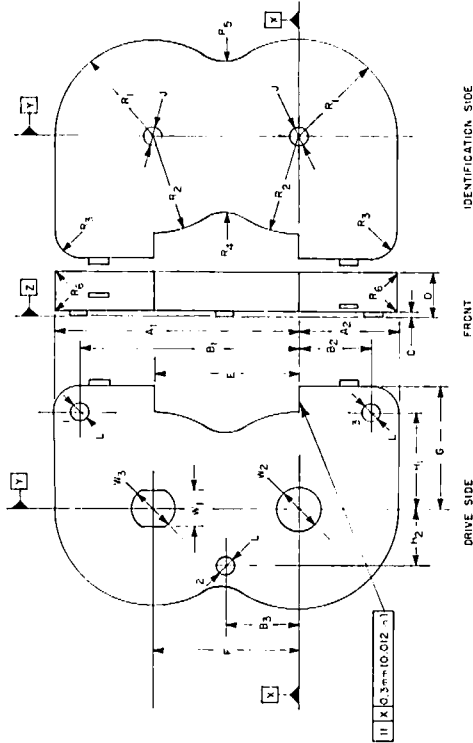


Fig. 1

Table 1

Dimensions	Millimeters*	Inches
A1†	72.5 ± 0.45	2.854 ± 0.018
A2	29.5 ± 0.3	1.16 ± 0.01
B1	65.5 ± 0.3	2.58 ± 0.01
B2	22.5 ± 0.3	0.89 ± 0.01
B3	21.5 ± 0.3	0.85 ± 0.01
C†	0.30 ± 0.00	0.012 ± 0.000
D†	13.30 ± 0.65	0.524 ± 0.026
E	43.0 ± 0.3	1.69 ± 0.01
F	43.0 ± 0.15	1.69 ± 0.006
G†	36.5 ± 0.20	1.437 ± 0.008
H1	29.3 ± 0.3	1.15 ± 0.01
H2	17.5 ± 0.3	0.69 ± 0.01
J (diameter)†	7.0 ± 0.20	0.276 ± 0.008
L <sub>1, 2, 3</sub> (diameter)	5.3 max	0.21 max
W1†	12.0 ± 0.15	0.472 ± 0.006
W2 (diameter)†	12.0 ± 0.15	0.472 ± 0.006
W3 (diameter)†	12.4 ± 0.10	0.488 ± 0.004
R <sub>1</sub>	29.5 ± 0.3	1.16 ± 0.01
R <sub>2</sub>	28.5 ± 0.3	1.12 ± 0.01
R <sub>3</sub>	8.0 ± 0.3	0.31 ± 0.01
R <sub>4</sub>	10.0 ± 0.3	0.39 ± 0.01
R <sub>5</sub>	10.0 ± 0.3	0.39 ± 0.01
R <sub>6</sub>	1.0 max	0.04 max

\*The metric system is primary for this standard. †The value intentionally carried an additional decimal place.

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ANSI/SMPTE 190M-1988

Appendix

(This Appendix is not part of the American National Standard, but is included for information only.)

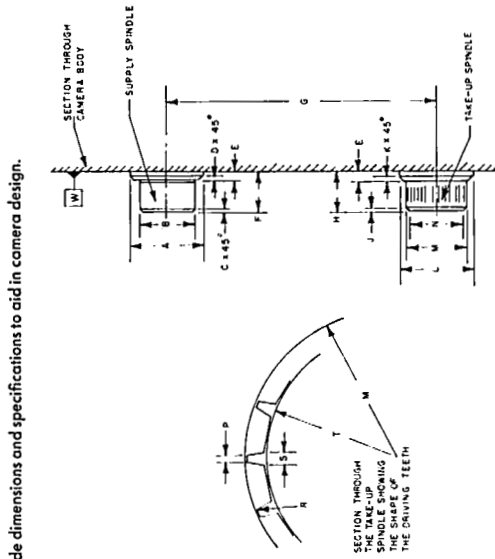


Fig. 3 DATUM PLANE N ENGAGES THE THREE BOSSES FORMING DATUM PLANE Z OF THE CARTRIDGE

Table 3

Dimensions	Millimeters*	Inches
A (diameter)	11.95 ± 0.00	0.470 ± 0.000
B (diameter)	8.96 ± 0.00	0.353 ± 0.000
C	0.50 ± 0.010	0.020 ± 0.0004
D	0.70 ± 0.010	0.028 ± 0.0004
E	1.90 ± 0.03	0.075 ± 0.001
F	6.70 ± 0.30	0.264 ± 0.012
G	43.00 ± 0.05	1.693 ± 0.002
H	7.65 ± 0.20	0.301 ± 0.008
J	0.50 ± 0.10	0.020 ± 0.004
K	0.70 ± 0.10	0.028 ± 0.004
L (diameter)	11.95 ± 0.03	0.470 ± 0.001
M (diameter)	9.96 ± 0.040	0.392 ± 0.0016
N (diameter)	8.6 ± 0.10	0.339 ± 0.004
P	0.35 ± 0.10	0.014 ± 0.004
R	0.10 max	0.004 max
S	0.40 ± 0.10	0.016 ± 0.004
T (diameter)	8.70 ± 0.10	0.343 ± 0.004

\*The metric system is primary for this standard.

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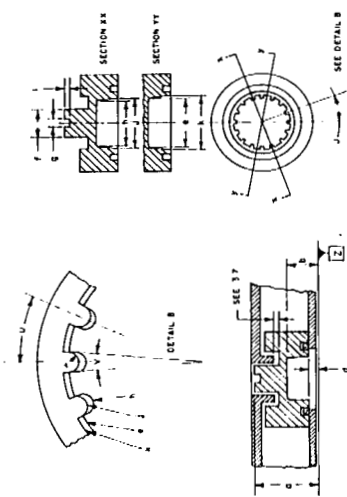


Fig. 2 SECTION OF CARTRIDGE CONTAINS CORE (SEE 3.6)

Table 2

Dimensions	Millimeters*	Inches
a†	12.8 ± 0.3	0.504 ± 0.012
b†	7.2 ± 0.2	0.283 ± 0.008
d†	2.2 ± 0.2	0.087 ± 0.008
e (diameter)†	10.1 ± 0.1	0.398 ± 0.004
f (diameter)†	5.5 ± 0.2	0.217 ± 0.008
g	1.2 ± 0.2	0.05 ± 0.008
h (diameter)†	9.0 ± 0.0	0.354 ± 0.000
i (diameter)†	9.2 ± 0.1	0.362 ± 0.004
k (diameter)†	10.3 ± 0.1	0.406 ± 0.004
l	1.2 ± 0.2	0.05 ± 0.008
r	one half the value derived from v	
u	22½ degrees nominal	
v	10 ± ½ degrees	

\*The metric system is primary for this standard.  
† Inch value intentionally carried an additional decimal place.

3.7 Regardless of the method of constructing the light trap, a clearance of 1.0 to 1.7 mm (0.04 to 0.07 in) is required during rotation.

3.8 Dimensions a, b, and d (Fig. 2) are measured as the cartridge is supplied by the manufacturer and apply whether or not a spring is used to load the core toward datum plane Z.

3.9 The minimum torque required for the take-up spindle at the start of drive should be 0.00343 newton meters.

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ANSI/SMPTE 190M-1988

# American National Standard for motion-picture equipment (8-mm type S) — model II camera cartridges — slots, projections and cartridge hole

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## 1. Scope

**1.1** This standard specifies the dimensions and location of cartridge slots, projections, and a hole for the 8-mm type S model II motion-picture film camera cartridge to preset cameras in accordance with the effective film speed and insert or exclude a color-balancing filter.

**1.2** This standard also describes the area available for visible film identification.

## 2. Referenced American National Standards

This standard is intended for use in conjunction with the following American National Standards: ANSI/SMPTE 188M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges (15-m Capacity)—Camera Run Film Length  
ANSI/SMPTE 189M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Loaded Film Location  
ANSI/SMPTE 190M-1988, Motion-Picture Equipment (8-mm Type S)—Model II Camera Cartridges—Cartridge-Camera Fit and Core

## 3. Dimensions and Characteristics

**3.1** The location of the hole, slots, and projections for effective film speeds and for film sensitivity identification shall be as specified in the figures and tables.

**3.2** The dimensions for the film spectral sensitivity (filter) hole or projection apply if the cartridge is loaded with a color film balanced for tungsten-light exposure. This hole or projection is not included if the cartridge is loaded with color film for daylight exposure.

**3.3** The two slots and the projection used to specify the film speed and the hole and the projection used to identify the inclusion of a tungsten-type film load are mutually independent and redundant in the cartridge to allow design flexibility for choice of use in cameras.

**3.4** The dimensions and specifications of the external characteristics of the camera cartridge and the location of the datum planes used for dimensional reference are specified in ANSI/SMPTE 190M-1988.

**3.5** Datum planes used for dimensioning are coincident with the surfaces that engage mating camera parts when the cartridge is properly aligned in the camera. The datum planes are mutually perpendicular.

**3.5.1** Datum plane Z (primary) is established from the extremities of the three seating bosses (lugs) 1, 2, and 3.

**3.5.2** Datum plane Y (secondary) is established coincident with the axes of the cartridge take-up core opening and the supply core opening.

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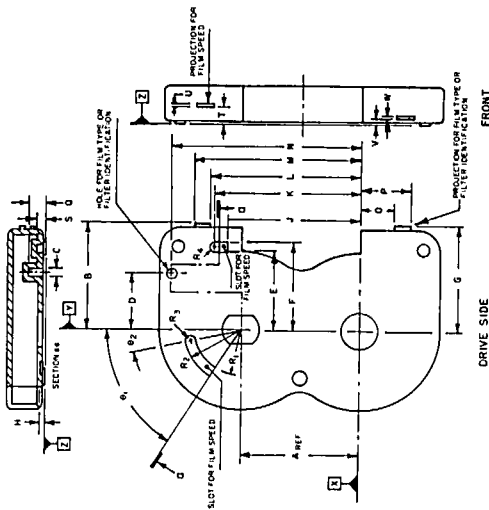


Fig. 1

Table 1  
Angles and Dimensions

Dimensions	Millimeters*	Inches
A	43.0	ref
B	+ 0.0	+ 0.00
C	38.5	- 0.01
D	3.0	min
Df	21.0 ± 0.2	0.827 ± 0.008
Ef	27.8 ± 0.2	1.094 ± 0.008
Ff	30.8 ± 0.2	1.213 ± 0.008
G	38.5	+ 0.00
H†	1.35	- 0.01
J	See Table 2	0.053
K	52.5	min
L	55.5 ± 0.4	2.07 ± 0.02
M	61.5 ± 0.4	2.19 ± 0.02
N†	68.00 ± 0.35	2.42 ± 0.02
O	12.5 ± 0.4	2.677 ± 0.014
P	18.5 ± 0.4	0.49 ± 0.02
Q†	6.0	0.73 ± 0.02
R <sub>1</sub>	16.1 ± 0.3	0.63 ± 0.01
R <sub>2</sub>	19.9 ± 0.3	0.78 ± 0.01
R <sub>3</sub> †	1.9 ± 0.3	0.075 ± 0.012
R <sub>4</sub>	1.5 ± 0.3	0.06 ± 0.01
S†	2.7 ± 0.2	0.106 ± 0.008
T	See Table 2	
U	1.5	min
V	1.1 ± 0.3	0.06
W	1.5	min
θ <sub>1</sub>	See Table 2	0.04 ± 0.01
θ <sub>2</sub>	10 ± 1/2 degrees	0.06

\*Millimeter dimensions are primary.  
†Inch value intentionally carried on additional decimal place.

**Table 2**  
Dimensions Controlling Film Speed Values

DIN	Film Speed ISO (ASA)	$\theta_1^*$ Degrees	J†		T‡	
			Millimeters**	Inches	Millimeters	Inches
13	16	22	51.0	2.01	11.6	0.457
14	20	26	50.5	1.99	10.85	0.427
15	25	30	50.0	1.97	10.1	0.398
16	32	34	49.5	1.95	9.35	0.368
17	40	38	49.0	1.93	8.6	0.339
18	50	42	48.5	1.91	7.85	0.309
19	64	46	48.0	1.89	7.1	0.280
20	80	50	47.5	1.87	6.35	0.250
21	100	54	47.0	1.85	5.6	0.220
22	125	58	46.5	1.83	4.85	0.191
23	160	62	46.0	1.81	4.1	0.161
24	200	66	45.5	1.79	3.35	0.132
25	250	70	45.0	1.77	2.6	0.102
26	320	74	44.5	1.75	1.85	0.073
27	400	78	44.0	1.73	1.1	0.043

\*Tolerance for all values  $\pm 1/2$  degree.  
 †Tolerance for all values  $\pm 0.1$  mm (0.004 in).  
 ‡Tolerance for all values  $\pm 0.3$  mm (0.012 in).  
 \*\*Millimeter dimensions are primary.

**3.5.3** Datum plane X (tertiary) is also established coincident with the axis of the cartridge take-up core opening.

**3.6** The corners of two slots for film speed may be rounded to 0.10 mm (0.004 in) radius maximum.

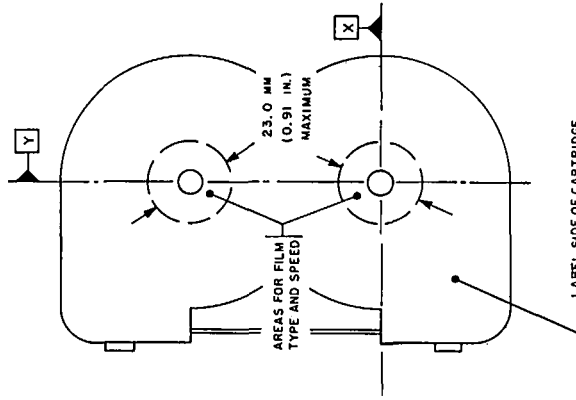
**3.7** The top and bottom corners of the projections for film speed and film identification may be rounded to 1.5 mm (0.06 in) maximum.

**3.8** If visual inscription of film data such as film name, number, and length of load is to be provided, it should be on the label side of the cartridge (Fig. 2) and the film type and speed should also be contained within the area specified.

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**Fig. 2**  
Cartridge Area for Visible Information or Product Identification