standards and recommended practices

Draft American National Standards

Four Draft American National Standards are published here for a trial period and public review. The documents cover specifications for the Model II super 8 camera cartridge in the same manner that PH22.159 covers the Model I cartridge.

PH22.188, Specifications for Camera Run Length of Film in Super 8 Model II Motion-Picture Film Camera Cartridges (50-ft Capacity)

PH22.189, Location of Film Loaded in Super 8 Model II Motion-Picture Camera Cartridges

PH22.190, Dimensions and Characteristics for Super 8 Model II Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications

PH22.191, Dimensions and Location of Slots, Projections and Cartridge Hole for Indicating Film Speed, Color Balance and Film Identification for Super 8 Model II Motion-Picture Film Camera Cartridge.

Comments should be addressed to Alex E. Alden, Staff Engineer, at Society Headquarters before 1 June 1974. The proposals have been submitted to American National Standards Committee PH22. Consequently, all comments received through *Journal* publication will be reviewed prior to conclusion of action by the Committee.—Alex E. Alden, *Staff Engineer*

Draft American National Standard

Specifications for Camera Run Length of Film in Super 8 Model II Motion-Picture Film Camera Cartridges (50-ft Capacity)

PH22.188

1. Scope

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

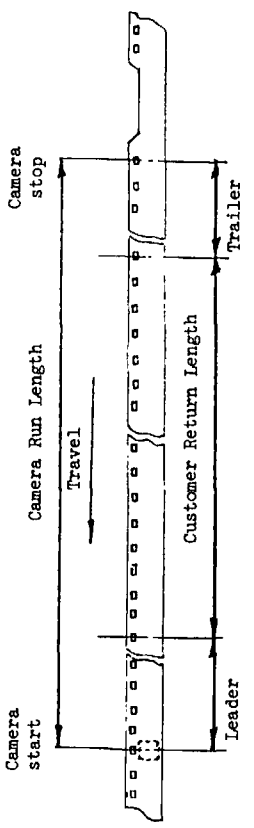
1.2 The purpose of this standard is to provide a uniform basis for the operation of footage counters in cameras.

2. Specifications

2.1 The camera run length of film may vary between 3,670 perforation pitches (15.5 m or 51 ft) and 3,710 perforation pitches (15.7 m or 51.5 ft). (See Note 1.) The overall length of the film is to be determined by the manufacturer to provide the camera run length specified.

2.2 A complete film as returned to the customer shall contain a minimum customer return length of 3,600 perforation pitches (15.2 m or 50 ft). The customer return length shall be that portion of the camera run length available for subject 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.)

2.3 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 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.



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NOTE 1: 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 American National Standard Dimensions for 8 mm Motion-Picture Film, Perforated Super 8, 1R-1667, PH22.149-1967.

NOTE 2: *In addition to this standard, there are available* the following Draft American National Standards relating to super 8 Model II film camera cartridges:

PH22.189, Location of Film Loaded in Super 8 Model II Motion-Picture Camera Cartridges

PH22.190, Dimensions and Characteristics of Super 8 Model II Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications

PH22.191, Dimensions and Location of Slots, Projections and Cartridge Hole for Indicating Film Speed, Color Balance and Film Identification for Super 8 Model II Motion-Picture Film Camera Cartridge

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes 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).

Draft American National Standard

Location of Film Loaded in Super 8 Model II Motion-Picture Camera Cartridges

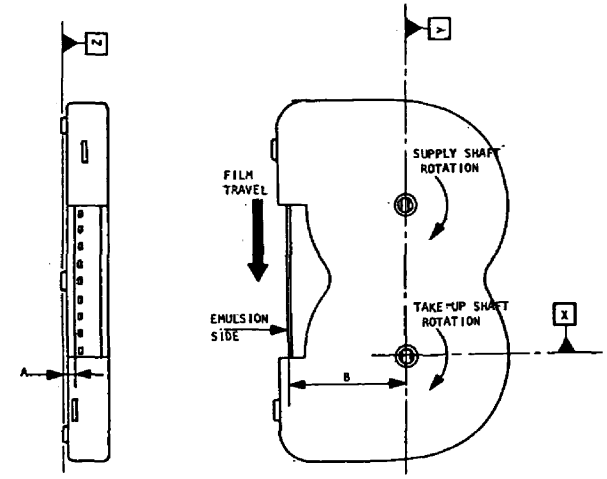
1. Scope

This standard specifies the location of the film loaded in super 8 Model II motion-picture camera cartridges.

2. Dimensions

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

2.2 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.)



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.

THIS PROPOSAL IS PUBLISHED FOR COMMENT ONLY

2.3 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.

2.3.1 Datum Plane Z (primary) is established from the extremities of the three seating bosses (lugs).

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

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

NOTE: In addition to this standard, there are available the following Draft American National Standards relating to super 8 Model II film camera cartridges:

PH22.188, Specifications for Camera Run Length of Film in Super 8 Model II Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.190, *Dimensions and Characteristics of Super 8* Model II Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications

PH22.191, Dimensions and Location of Slots, Projections and Cartridge Hole for Indicating Film Speed, Color Balance and Film Identification for Super 8 Model II Motion-Picture Film Camera Cartridge

Draft American National Standard

Dimensions and Characteristics for Super 8 Model II Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications

PH22.190

1. Scope

This standard specifies the external dimensions for the cartridge-camera fit and core specifications for super 8 Model II film camera cartridges.

2. Dimensions and Characteristics

2.1 The dimensions shall be as given in the figures and tables and apply to an assembled cartridge containing a film load.

2.2 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.

2.2.1 Datum Plane Z (primary) is established from the extremities of the three seating bosses (lugs) 1, 2 and 3 (Dimension L).

2.2.2 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.

2.2.3 Datum Plane X (tertiary) is also established coincident with the axis of the cartridge take-up core opening, Dimension W_2.

2.3 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.

2.4 The centerline for the supply shaft, Dimension F, also applies to the identification side view.

2.5 If tape is used to seal the cartridge, it should fall within the values established by Dimensions A_1, A_2, C and D.

2.6 The coaxiality of the core post, Dimension f, and the core drive openings, Dimensions j and k (Figure 2), with the openings in the cartridge, Dimensions W_2 and J (Figure 1), should be within 0.4 mm (0.016 in).

2.7 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.

2.8 Dimensions a, b and d (Figure 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.

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

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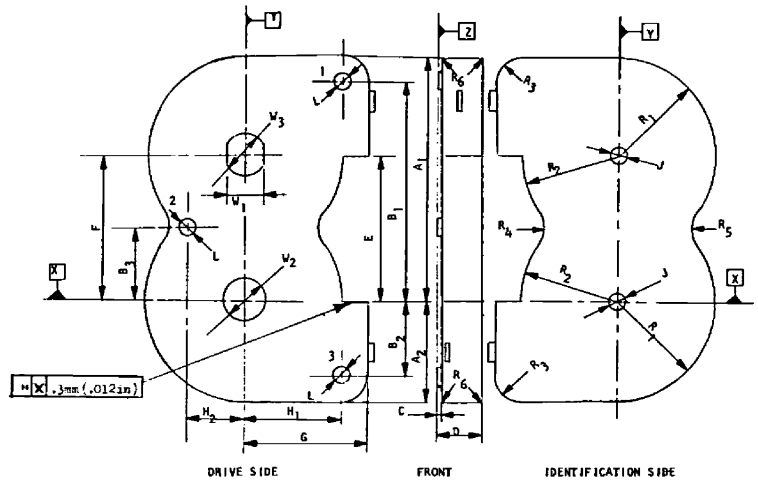

FIGURE 1

TABLE 1

Dimensions	Millimeters*	Inches
A_1†	72.5 ± 0.45	2.854 ± 0.018
A_2	29.5 ± 0.3	1.16 ± 0.01
B_1	65.5 ± 0.3	2.58 ± 0.01
B_2	22.5 ± 0.3	0.89 ± 0.01
B_3	21.5 ± 0.3	0.85 ± 0.01
C†	0.30 + 0.00 − 0.20	0.012 + 0.000 − 0.008
D†	13.30 + 0.65 − 0.20	0.524 + 0.026 − 0.008
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
H_1	29.3 ± 0.3	1.15 ± 0.01
H_2	17.5 ± 0.3	0.69 ± 0.01
J (diameter)†	7.0 ± 0.20	0.276 ± 0.008
$L_{1,2,3}$ (diameter)	5.3 max	0.21 max
W_1†	12.0 + 0.15 − 0.00	0.472 + 0.006 − 0.000
W_2 (diameter)†	12.0 + 0.15 − 0.00	0.472 + 0.006 − 0.000
W_3 (diameter)†	12.4 ± 0.10	0.488 ± 0.004
R_1	29.5 ± 0.3	1.16 ± 0.01
R_2	28.5 ± 0.3	1.12 ± 0.01
R_3	8.0 ± 0.3	0.31 ± 0.01
R_4	10.0 ± 0.3	0.39 ± 0.01
R_5	10.0 ± 0.3	0.39 ± 0.01
R_6	1.0 max	0.04 max

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

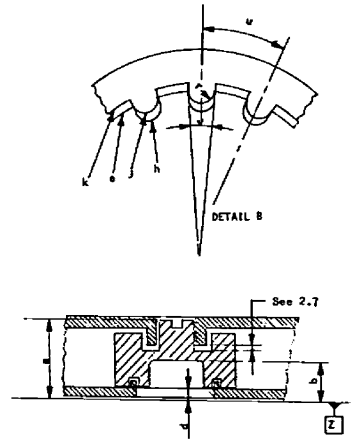

FIGURE 2A
SECTION OF CARTRIDGE CONTAINING CORE (See 2.6)

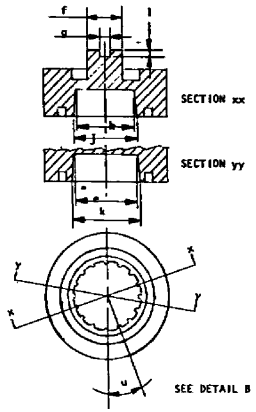

FIGURE 2B
NOTE: HIDDEN LINES NOT SHOWN

FIGURE 2

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 + 0.0 − 0.2	0.217 + 0.000 − 0.008
g	1.2 ± 0.2	0.05 ± 0.008
h (diameter)†	9.0 + 0.2 − 0.0	0.354 + 0.008 − 0.000
j (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 values intentionally carried an additional decimal place.

NOTE 1: In addition to this standard, there are available the following Draft American National Standards relating to super 8 Model II film camera cartridges:

PH22.188, Specifications for Camera Run Length of Film in Super 8 Model II Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.189, Location of Film Loaded in Super 8 Model II Motion-Picture Camera Cartridges

PH22.191, Dimensions and Location of Slots, Projections and Cartridge Hole for Indicating Film Speed, Color Balance and Film Identification for Super 8 Model II Motion-Picture Film Camera Cartridge

NOTE 2: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of any patent rights in connection therewith. The patent holder has, however, filed a statement that it will not assert any claims for infringement which necessarily result from compliance with this standard. Details may be obtained from the publisher.

No representation or warranty is made or implied that this is the only waiver that may be required to avoid infringement in the use of this standard.

Appendix

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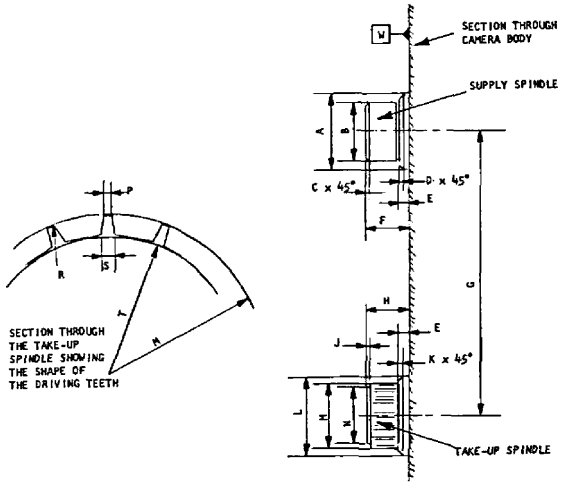
Figure 3 and Table 3 provide dimensions and specifications to aid in camera design.



Datum Plane W engages the three bosses forming Datum Plane Z of the cartridge

FIGURE 3

TABLE 3

Dimensions	Millimeters*	Inches
A (diameter)	11.95 $^{+0.00}_{-0.03}$	0.470 $^{+0.000}_{-0.001}$
B (diameter)	8.96 $^{+0.00}_{-0.04}$	0.353 $^{+0.000}_{-0.002}$
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	0.28 ± 0.004
L (diameter)	11.95 $^{+0.00}_{-0.03}$	0.470 $^{+0.000}_{-0.001}$
M (diameter)	9.96 $^{+0.000}_{-0.040}$	0.392 $^{+0.0000}_{-0.0016}$
N (diameter)	8.6 $^{+0.00}_{-0.10}$	0.339 $^{+0.000}_{-0.004}$
P	0.35 ± 0.10	0.138 ± 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.

Draft American National Standard

Dimensions and Location of Slots, Projections and Cartridge Hole for Indicating Film Speed, Color Balance and Film Identification for Super 8 Model II Motion-Picture Film Camera Cartridge

PH22.191

1. Scope

1.1 This standard specifies the dimensions and location of cartridge slots, projections and a hole for the super 8 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. Dimensions and Characteristics

2.1 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.

2.2 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.

2.3 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.

2.4 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 Draft American National Standard Dimensions and Characteristics for Super 8 Model II Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications, PH22.190.

2.5 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.

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

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

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

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

2.7 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.

2.8 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 (Figure 2) and the film type and speed should also be contained within the area specified.

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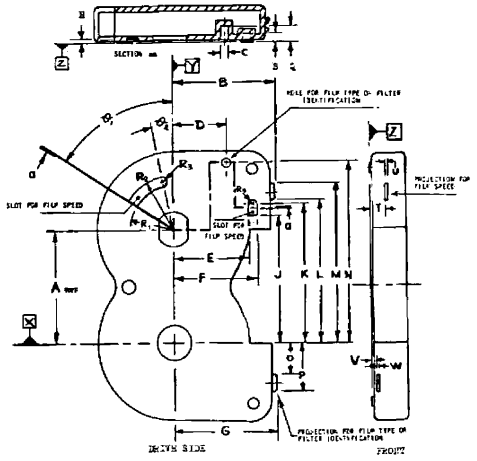

FIGURE 1

Table 1
Angles and Dimensions

Dimensions	Millimeters*	Inches
A	43.0 ref	1.69 ref
B	38.5 + 0.0 − 0.3	1.52 + 0.00 − 0.01
C (diameter)	3.0 min	0.12 min
D†	21.0 ± 0.2	0.827 ± 0.008
E†	27.8 ± 0.2	1.094 ± 0.008
F†	30.8 ± 0.2	1.213 ± 0.008
G	38.5 + 0.0 − 0.3	1.52 + 0.00 − 0.01
H†	1.35 min	0.053 min
J	See Table 2	
K	52.5 min	2.07 min
L	55.5 ± 0.4	2.18 ± 0.02
M	61.5 ± 0.4	2.42 ± 0.02
N†	68.00 ± 0.35	2.677 ± 0.014
O	12.5 ± 0.4	0.49 ± 0.02
P	18.5 ± 0.4	0.73 ± 0.02
Q†	6.0 min	0.236 min
R_1	16.1 ± 0.3	0.63 ± 0.01
R_2	19.9 ± 0.3	0.78 ± 0.01
R_3†	1.9 ± 0.3	0.075 ± 0.012
R_4	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	0.06 min
V	1.1 ± 0.3	0.04 ± 0.01
W	1.5 min	0.06 min
Angles		
θ_1	See Table 2	
θ_2	10 ± ½ degrees	

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

Table 2
Dimensions Controlling Film Speed Values

Film Speed DIN	Film Speed ASA	θ_1* Degrees	J† Millimeters**	J† Inches	T‡ Millimeters	T‡ 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 ± ½ degree
†Tolerance for all values ± 0.1 mm (0.004 in)
‡Tolerance for all values ± 0.3 mm (0.012 in)
**Millimeter dimensions are primary.

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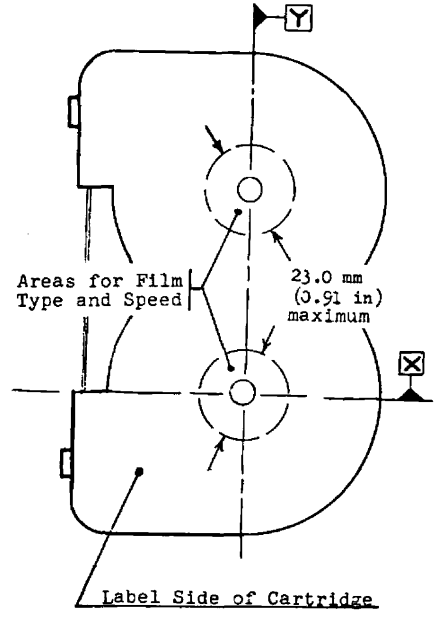

Figure 2
Cartridge Area for Visible Information or Product Identification