Errata and Addendum

There is given below information to correct data regrettably not properly given in the original *Journal* publication.

MARCH

On p. 240, Technical Note by Hal Magargle,

For: (footnote) Reed switches
Read: reed switches.
For: Herback
Read: Herbach.

On p. 216, paper by Hans Schmid,

For: **Fig. 2. Illustration of field-time waveform distortion, FD = (a/2). . . .**
Read: **Fig. 2. Illustration of field-time waveform distortion, Fd.** *FD* = 2*a* if half-field pulse consists of half-line pulses on alternate lines; . . .

On p. 216, col. 3, line 28,

For: ". . . 2% is equally objectionable to a line-. . ."
Read: ". . . 2% is equally objectionable as a line-. . ."

On p. 220, Appendix II, add the following table to Fig. 25.

System . . .	t_1	t_2	t_3	t_4	t_5
General . . .	8T	$\frac{8T}{3}$	$\frac{8T}{7}$	$\frac{8T}{5}$	1 − 8T
US 525 . . .	1	.33	.14	.2	0 μs
625; 5MHz .	.8	.27	.11	.16	.2 μs

In "The Care and Handling of Magnetic Tape," by Matthew Hoey (*Jour.*, March 1968, pp. 286, 288, 290) the captions for Figs. 3 and 4 (p. 290) were incorrect. The illustrations, with correct captions, appear below.

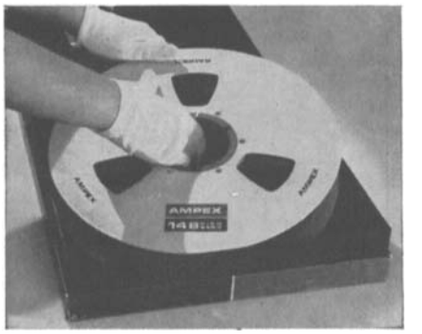

Fig. 3. Proper handling of magnetic tape includes lifting the reel of tape from its container by the hub and lower flange.

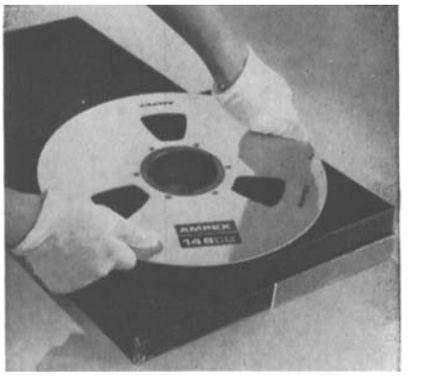

Fig. 4. The wrong way to remove tape from its box. Improper handling of tape reels damages the flanges and thus shortens the life of the tape.

DECEMBER 1967

On p. 1212, USA Standard, PH22.151–1967, in the table, under the "Inches" column, second line,

For: 0.1644
Read: 0.1664

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standards and recommended practices

Approved USA Standards

On January 29, 1968 the United States of America Standards Institute approved five new USA Standards. These Standards dealing with camera cartridges used with the super 8 system, are: PH22.159.1, USA Standard Specifications for Super 8 Motion-Picture Film Cartridge-Camera Fit; PH22.159.2, USA Standard Specifications for Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge; PH22.159.3, USA Standard Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile; PH22.159.4, USA Standard Dimensions and Characteristics of the Take-up Core Drive for Super 8 Motion-Picture Film Camera Cartridges; and PH22.159.5, USA Standard Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft. Capacity).

Inasmuch as compliance with USA Standards is purely voluntary, these standards will become truly effective only when broad publicity is given to their existence. USASI and the SMPTE would appreciate any personal influence to promote the use of these standards where such action is appropriate and proper. Copies of the Standards may be obtained for a nominal fee from the United States of America Standards Institute, 10 E. 40th Street, New York City, 10016—*A.E.A.*

May 1968 Journal of the SMPTE Volume 77

USA standard

Approved January 29, 1968

Specifications for

USAS
PH22.159.1–1968

UDC 778.533:771.332

Sponsor
Society of Motion Picture
and Television Engineers, Inc.

Super 8 Motion-Picture Film Camera Cartridge and Cartridge-Camera Fit

1. Scope

This standard specifies the dimensions of the super 8 motion-picture film camera cartridge and cartridge-camera fit.

2. Dimensions

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

2.2 The dimensions apply to an assembled cartridge with a film load.

2.3 The datum planes used for dimensioning are mutually perpendicular. Datum planes B and C are coincident with the surfaces that engage mating camera parts, and Datum plane A is coincident with the intended centerline of the camera cartridge locating pin when the cartridge is properly aligned in the camera.

2.3.1 Datum plane A is coincident with the centerline of the camera-locating slot.

2.3.2 Datum plane B is the seating surface on the un-notched, unlabeled side of the cartridge.

2.3.3 Datum plane C is the seating surface on the front of the cartridge.

2.4 All dimensions apply to a cartridge seated onto the locating pin of a cartridge-holding fixture for gauging purposes, and held along Datum plane C with pressure exerted against the rear surface.

2.5 Dimension T and Datum plane A form the centerlines of the camera-locating pin.

2.6 The locating pin shall have a maximum diameter of 0.140 in. (3.56mm).

2.7 Dimensions L, N, U, and V, measured from Datum planes A and C to the depth of Dimension E, as shown in the top view, describe the extent of both triangular recessed areas. The inboard wall of the recessed area, defined by Dimensions L and N, shall be a straight plane.

NOTE 1: Placement of film data, such as name, number, and length of load, and the inclusion of any notches, should be in accordance with Draft USA Standard Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification, PH22.166.

NOTE 2: In addition to this standard, there are available the following documents relating to super 8 film camera cartridges:

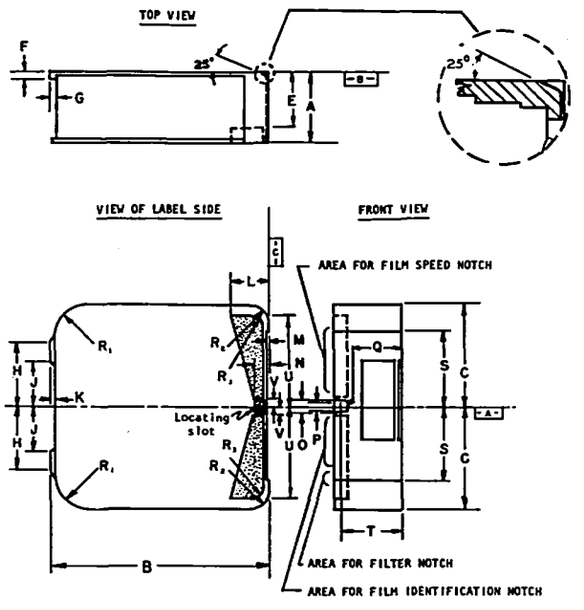
PH22.159.2-1968, Specifications for the Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge

PH22.159.3-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile

PH22.159.4-1968, Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges

PH22.159.5-1968, Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.166, Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification



Dimensions	Inches	Millimeters
A	0.954 ± 0.010	24.23 ± 0.25
B	2.99 ± 0.01	75.9 ± 0.3
C	1.390 ± 0.010	35.31 ± 0.25
E	0.780 max	19.81 max
F	0.09 ± 0.01	2.3 ± 0.3
G	0.06 ± 0.01	1.5 ± 0.3
H	0.88 ± 0.03	22.4 ± 0.8
J	0.61 ± 0.03	15.5 ± 0.8
K	0.015 ± 0.010	0.38 ± 0.25
L	0.470 min	11.94 min
M	0.005 ± 0.003	0.13 ± 0.08
N	0.177 min	4.50 min
O	0.154 ± 0.004	3.91 ± 0.10
P	0.142 ± 0.004	3.61 ± 0.10
Q	0.770 ± 0.010	19.56 ± 0.25
R_1	0.50 ± 0.10	12.7 ± 2.5
R_2	0.25 ± 0.05	6.4 ± 1.3
R_3	0.160 max	4.06 max
S	1.02 ± 0.01	25.9 ± 0.3
T	0.870 nom	22.10 nom
U	1.225 min	31.12 min
V	0.125 max	3.18 max

USA standard

Approved January 29, 1968

Specifications for

Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge

USAS
PH22.159.2–1968

UDC 778.533:771.332

Sponsor
Society of Motion Picture and Television Engineers, Inc.

1. Scope

This standard specifies the dimensions and location of the cartridge aperture and pressure pad as well as the position of the motion-picture film in the aperture of the super 8 cartridge.

2. Dimensions

2.1 The dimensions shall be as given in the figures and tables.

2.2 The dimensions apply to the cartridge immediately after it has been loaded with fresh motion-picture film.

2.3 The datum planes used for dimensioning are mutually perpendicular. Datum planes B and C are coincident with the surfaces that engage mating camera parts, and Datum plane A is coincident with the intended centerline of the camera cartridge locating pin when the cartridge is properly aligned in the camera.

2.3.1 Datum plane A is coincident with the centerline of the camera-locating slot.

2.3.2 Datum plane B is the seating surface on the un-notched, unlabeled side of the cartridge.

2.3.3 Datum plane C is the seating surface on the front of the cartridge.

2.4 Dimensions T and U denote the lateral location of the film in the cartridge before insertion in the camera. After insertion, Dimension T becomes 0.060 in. (1.52mm) minimum and Dimension U becomes 0.050 in. (1.27mm) minimum.

2.5 All dimensions in Table 1, except Dimensions A and C, apply at the front surface of the pressure pad. A draft of 5 degrees to the recess area is permitted as well as an inside or outside radius of 0.005 in. (0.13mm) at all corners to provide satisfactory mold release.

2.6 Dimension A denotes the space available from Datum plane C for penetration of the camera film alignment guide wings or the camera claw into the recessed area of the cartridge pressure pad.

2.7 Dimension B is the operating position of the cartridge pressure pad when seated by the camera aperture plate to provide proper positioning of the film emulsion plane and unrestricted film transport.

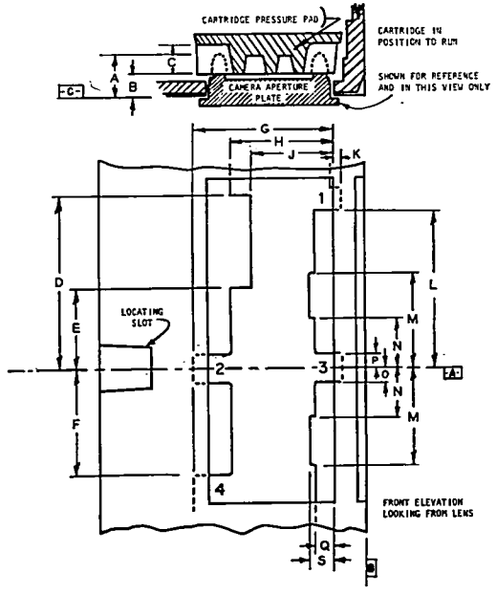


Fig. 1. Cartridge Pressure Plate

Table 1

Dimensions	Inches	Millimeters
A	0.140 ± 0.010	3.56 ± 0.25
B	0.077 ± 0.005	1.96 ± 0.13
C	0.090 min	2.29 min
D	0.540 min	13.72 min
E	0.260 max	6.60 max
F	0.360 ± 0.020	9.14 ± 0.51
G	0.455 min	11.56 min
H	0.365 max	9.27 max
J	0.300 max	7.62 max
K	0.000 min	0.00 min
L	0.540 ± 0.015	13.72 ± 0.38
M	0.300 min	7.62 min
N	0.140 max	3.56 max
O	0.058 ± 0.022	1.47 ± 0.56
P	0.038 ± 0.022	0.97 ± 0.56
Q	0.055 min	1.40 min
S	0.090 min	2.29 min

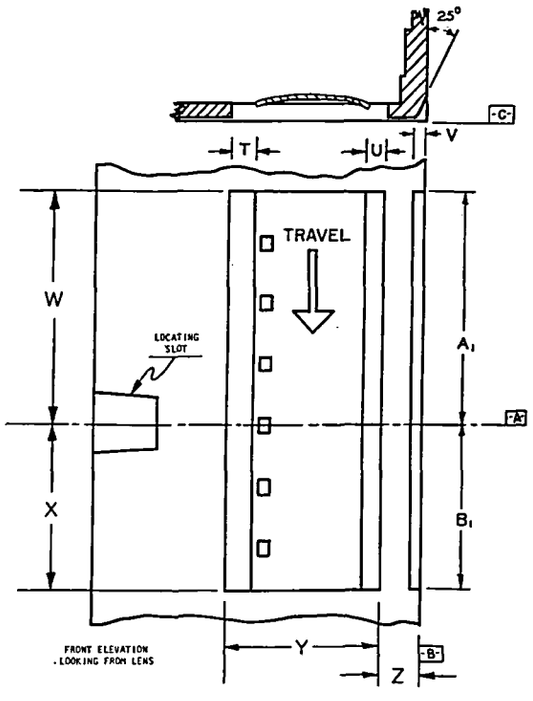


Fig. 2. Cartridge Aperture Opening and Film Position

Table 2

Dimensions	Inches	Millimeters
T	0.050 min	1.27 min
U	0.040 min	1.02 min
V	0.061 ± 0.006	1.55 ± 0.15
W	0.648 ± 0.006	16.46 ± 0.15
X	0.451 ± 0.006	11.46 ± 0.15
Y	0.451 ± 0.004	11.46 ± 0.10
Z	0.111 ± 0.003	2.82 ± 0.08
A_1	0.642 min	16.31 min
B_1	0.445 min	11.30 min

NOTE 1: Three lugs, Nos. 1, 2, and 3, on the pressure pad touch the camera aperture plate and thereby determine the film plane alignment and the clearance allowed for the thickness of the film. The required clearance is defined in USA Standard Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile, PH22.159.3-1968. Lug No. 4 does not touch the camera aperture plate because the corresponding boss of the camera plate provides a clearance of 0.004 to 0.008 in. (0.10 to 0.20mm). See Appendix A5.

NOTE 2: In addition to this standard, there are available the following documents relating to super 8 film camera cartridges:

PH22.159.1-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge and Cartridge-Camera Fit

PH22.159.3-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile

PH22.159.4-1968, Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges

PH22.159.5-1968, Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.166, Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification

Appendix

(This Appendix is not a part of USA Standard Specifications for Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge, PH22.159.2-1968, but is included to facilitate its use.)

A1. A force of 8 to 14 ounces must be exerted on the pressure pad for proper seating against the camera aperture plate.

A2. The two cutout areas in the pressure pad permit the use of fingers for side-guiding. A force of 1½ to 2½ ounces per finger is adequate to ensure picture steadiness.

A3. The pressure pad need not be a cutout to conform to this standard provided there is sufficient recess from the front surface of the pressure pad, as shown by Dimension C, to allow for camera claw and camera aperture guide finger penetration as defined in 2.6 above.

A4. The cartridge pressure pad recess, defined by Dimensions D, E, and J, is available for camera claw film transport engagement. The perforation used for the film vertical registration at its stopping position is specified in USA Standard Dimensions of Camera Aperture Image on Super 8 Motion-Picture Film, PH22.157-1967, as minus 2 from the perforation adjacent to the image formed by the camera aperture. The horizontal centerline of the camera aperture should nominally coincide with Datum plane A.

A5. Lug No. 4 is included on the pressure pad although it serves no function after the cartridge is properly inserted in the camera. It does, however, aid in seating the pressure pad and prevents the film from being pinched at the bottom of the cartridge aperture opening.

USA standard

Approved January 29, 1968

USAS
PH22.159.3–1968
UDC 778.533:771.332
Sponsor
Society of Motion Picture and Television Engineers, Inc.

Specifications for

Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile

1. Scope

This standard specifies the dimensions and characteristics necessary for the appropriate flatness of super 8 film cartridge pressure pads as well as the required clearances for motion-picture film in the aperture area.

2. Dimensions

2.1 The dimensions shall be as given in the figure and tables and shall apply to a cartridge that is fully assembled but does not contain film.

2.2 Datum surface A passes through the center of the cartridge locating slot and forms the centerline of the picture aperture area.

2.3 The zero plane is to be established by Surfaces 1, 2, and 3, as defined by 0.060-in. (1.52mm) circles, dimensionally centered as shown in the figure.

2.4 Dimension G specifies the clearance for film in the picture aperture area. The dimensions are based on a film thickness of 0.0058 ±0.0002 in. (0.147 ± 0.005mm).

2.5 The upper and lower pad areas extend from Dimension C to the top and bottom of the cartridge aperture opening.

2.6 Dimension H is intended to apply from the film surface of a flat cartridge pressure pad.

2.7 The plus values given for the pressure pad film surface flatness tolerances are to be directed toward the lens.

2.8 Surface 4 of the cartridge pressure pad and Boss 4 of the camera aperture are established to aid in seating the cartridge pressure pad to the camera aperture plate. They serve no function once the pressure pad is in operating position.

NOTE 1: It is considered good practice to relieve the camera aperture plate above and below the picture area to allow a clearance for film transport and minimize the possibility of film pinching. Dimension F specifies the amount of recess for this purpose.

NOTE 2: The surfaces 1, 2, and 3, shown to establish the zero plane for the purposes of measurements of the super 8 film cartridge pressure pad film surface flatness, are circles having a diameter of 0.060 in. (1.52mm). The actual camera aperture plate bosses may deviate from this shape and size.

NOTE 3: It is intended that the cartridge pressure pad be flat, or be molded as a flat plane. Pits or depressions, however, which do not interfere with the film flatness, are acceptable. Bumps or protrusions are not acceptable. Tolerances for the flatness on the super 8 film cartridge pressure pad film surface are specified to account for slight warpage in molding if the pressure pad is made from a plastic material.

NOTE 4: In addition to this standard, there are available the following documents relating to super 8 film camera cartridges:

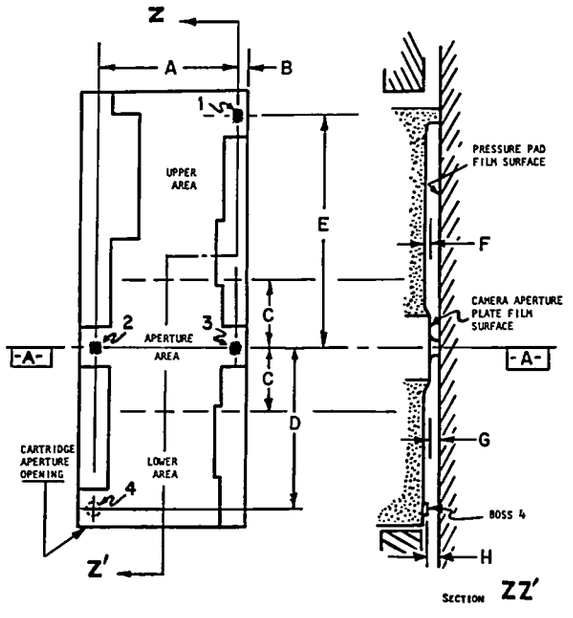
PH22.159.1-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge and Cartridge-Camera Fit

PH22.159.2-1968, Specifications for the Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge

PH22.159.4-1968, Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges

PH22.159.5-1968, Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.166, Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification



CARTRIDGE APERTURE OPENING WITH PRESSURE PAD IN POSITION

CAMERA APERTURE PLATE IN POSITION

Table 1

Dimensions	Inches	Millimeters
A	0.378 ± 0.001	9.60 ± 0.03
B	0.030 + 0.002 − 0.000	0.76 + 0.05 − 0.00
C	0.153 nom	3.89 nom
D	0.393 ± 0.001	9.98 ± 0.03
E	0.590 ± 0.001	14.99 ± 0.03
F	0.005 min	0.13 min
G	0.0065 min 0.0070 max	0.165 min 0.178 max
H	0.004 min	0.10 min

Table 2

Flatness Tolerances on Pressure Pad Film Surface

Areas	Inches	Millimeters
Aperture Area (within Dimension C)	+ 0.0000 − 0.0010	+ 0.000 − 0.025
Upper Area	+ 0.002 − 0.002	+ 0.05 − 0.05
Lower Area	+ 0.002 − 0.004	+ 0.05 − 0.10

USA standard

Approved January 29, 1968

USAS
PH22.159.4–1968

UDC 778.533:771.332

Sponsor
Society of Motion Picture
and Television Engineers, Inc.

Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges

1. Scope

This standard specifies the dimensions of the take-up core drive opening and critical dimensions of the take-up core as well as the driving force, direction of drive, and recommended drive ratio for super 8 motion-picture film camera cartridges.

2. Dimensions

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

2.2 The datum planes used for dimensioning are mutually perpendicular. Datum planes B and C are coincident with the surfaces that engage mating camera parts, and Datum plane A is coincident with the intended centerline of the camera cartridge locating pin when the cartridge is properly aligned in the camera.

2.2.1 Datum plane A is coincident with the centerline of the camera-locating slot.

2.2.2 Datum plane B is the seating surface on the un-notched, unlabeled side of the cartridge.

2.2.3 Datum plane C is the seating surface on the front of the cartridge.

2.3 The dimensions apply to the cartridge immediately after it has been loaded with film prior to insertion in the camera.

2.4 The core axis shall be located within 0.010 in. (0.25mm) of the true center formed by Datum plane A and Dimension F.

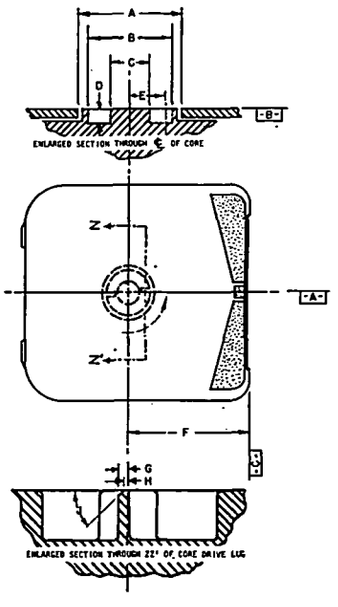
2.5 The core should be fitted so that its axial position will be within the tolerance of 0.015 in. (0.38mm) from the nominal position. The nominal axial position of the outer surface of the core is coincident with Datum plane B.

2.6 Dimension E is the suggested radius to the centerline of the area of the core drive lug to be engaged by a camera driver pin having a nominal diameter of 0.062 in. (1.57mm). (See Appendix A1.)

2.7 Dimensions A, B, and C are diameters.

3. Core Drive

3.1 A nominal torque of 0.85 ounce (force)-inch with a permissible range of 0.5 to 1.5 ounce (force)-inches (61 gram (force)-centimeters with a permissible range of 36 to 108 gram (force)-centimeters) from start of run is required to drive the core. (See Appendix A2.)



Dimensions	Inches		Millimeters	
A	0.680	max	17.27	max
B	0.575	min	14.60	min
C	0.264	max	6.71	max
D	0.100	min	2.54	min
E	0.234	nom	5.94	nom
F	1.608		40.84	
G	0.040	± 0.005	1.02	± 0.13
H	0.020	max	0.51	max
J	45°	nom	45°	nom

3.2 The direction of drive for the core shall be clockwise when viewed from the core side of the cartridge.

NOTE 1: Although two driving lugs are shown in the core and are recommended, only one is essential for satisfactory operation.

NOTE 2: In addition to this standard, there are available the following documents relating to super 8 film camera cartridges:

PH22.159.1-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge and Cartridge-Camera Fit

PH22.159.2-1968, Specifications for the Cartridge Aperture and Pressure Pad and Position of the Film in the Super 8 Motion-Picture Film Camera Cartridge

PH22.159.3-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile

PH22.159.5-1968, Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity)

PH22.166, Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification

Appendix

(This Appendix is not a part of USA Standard Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges, PH22.159.4-1968, but is included to facilitate its use.)

A1. In designing the camera driver, consideration should be given to the fact that tooth-on-tooth engagement of the core lug on the camera driver pin is a possibility.

A2. It is recommended that the core be tendency driven (by some form of slip-drive mechanism) with a drive ratio of one turn of the core for every fifteen strokes of the pull-down claw.

USA standard

Approved January 29, 1968

Specifications for

USAS

PH22.159.5–1968

UDC 778.533:771.531.1/.3

Sponsor
Society of Motion Picture
and Television Engineers, Inc.

Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity)

1. Scope

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

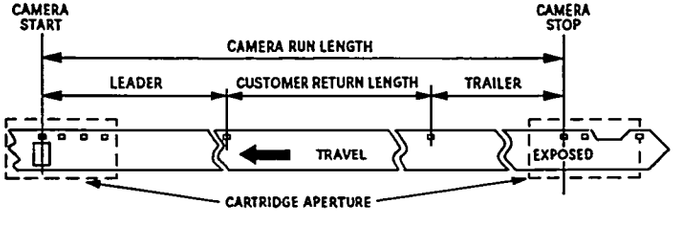
1.2 The purpose of this standard is to provide a uniform basis for the operation of footage counters in cameras.

2. Specifications

2.1 The camera run length of film may vary between 3,666 perforation pitch intervals (50.9 ft or 15.514 m) and 3,710 perforation pitch intervals (51.5 ft or 15.708 m). (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 pitch intervals. The customer return length shall be that portion of the camera run length available for subject matter which starts at least 29 perforation pitch intervals (approximately 4.8 in. or 123mm) after the frame which forms the camera aperture, as the cartridge is supplied by the manufacturer, and ends at least 37 perforation pitch intervals (6.2 in. or 157mm) short of the limit as provided by a perforation cutout. (See Appendix.)

2.3 The end of the film shall have a visual marking in the frame area, and the perforations shall be cut out so that the final portion of the film stops in the film cartridge aperture providing the user with visual confirmation that all the film has been exposed.



NOTE 1: A nominal pitch, based on 72 perforation pitch intervals per foot, of 0.1667 in. (4.234mm) is assumed for all comparisons of the number of perforation pitch intervals in a given film length. This assumption is based on USA Standard Dimensions for 8mm Motion-Picture Film, Perforated Super 8, 1R-1667, PH22.149-1967.

NOTE 2: In addition to this standard, there are available the following documents relating to super 8 film camera cartridges:

PH22.159.1-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge and Cartridge-Camera Fit

PH22.159.2-1968, Specifications for the Cartridge Aperture and Pressure Pad and Position of Film in the Super 8 Motion-Picture Film Camera Cartridge

PH22.159.3-1968, Specifications for Super 8 Motion-Picture Film Camera Cartridge Pressure Pad Flatness and Camera Aperture Profile

PH22.159.4-1968, Dimensions and Characteristics of the Take-Up Core Drive for Super 8 Motion-Picture Film Camera Cartridges

PH22.166, Specifications for Super 8 Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification

Appendix

(This Appendix is not a part of USA Standard Specifications for Camera Run Length of Film in Super 8 Motion-Picture Film Camera Cartridges (50-Ft Capacity), PH22.159.5-1968, but is included to facilitate its use.)

The lengths of the leader and trailer are necessary to make sure 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.