Standards and Recommended Practices

Approved American National Standards

The American National Standards Institute approved three American National Standards on April 6, 1992: ANSI/SMPTE 197-1992, Motion-Picture Film (8-mm Type S) — 50-ft Model 1 Sound Camera Cartridge — Cartridge, Cartridge-Camera Interface and Take-Up Core; ANSI/SMPTE 198-1992, Motion-Picture Film (8-mm Type S) — 50-ft Model 1 Sound Camera Cartridge — Aperture, Pressure Pad and Film Position; and ANSI/SMPTE 199-1992, Motion-Picture Film (8-mm Type S) — 50-ft Model 1 Sound Camera Cartridge — Pressure Pad Flatness and Camera Aperture Profile. Copies of ANSI/SMPTE 197 are available from Headquarters for $13.00 and ANSI/SMPTE 198 and ANSI/SMPTE 199 for $10.00.

Approved SMPTE Recommended Practices

Three SMPTE Recommended Practices were approved by the Society: RP 78-1992, Specifications for Azimuth Test Film for 16-mm Audio Projectors, Magnetic Type; RP 128-1992, Specifications for Audio Level and Multifrequency Test Film for 70-mm Striped Six-Track Release Print Audio Reproducers, Magnetic Type; and RP 163-1992, Television — System Service Messages. RP 78 and RP 128 are available from Headquarters for $10.00 and RP 163 for $16.00.

Proposed SMPTE Standard

Published here for a trial period and public review is Proposed SMPTE Standard SMPTE 196M, Motion-Picture Film — Indoor Theater and Review Room Projection — Screen Luminance and Viewing Conditions. A proposed revision of ANSI/SMPTE 196M1986, the proposal will be submitted to the American National Standards Institute for approval as an American National Standard if no adverse comments are received from publication. Comments should be addressed to Sherwin H. Becker, Director of Engineering, at Society Headquarters prior to January 1, 1993. Copies of the proposal are available for $10.00.

— Sherwin H. Becker, Director of Engineering

SMPTE STANDARD **ANSI/SMPTE 197-1992**
Revision of ANSI/SMPTE 197-1986

for Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Cartridge, Cartridge-Camera Interface and Take-Up Core

1 Scope

This standard specifies the dimensions of the 8-mm type S 50-ft model 1 sound motion-picture film camera cartridge and cartridge-camera interface. Also specified are 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. An optional means of retaining the film supply scroll configuration until the cartridge is placed in the camera is also described.

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 166-1988, Motion-Picture Film (8-mm Type S) — Sound and Silent Camera Cartridge Notches — Exposure Control and Stock Identification

3 Dimensions

3.1 The dimensions shall be as given in the figures and table.

3.2 The dimensions apply to an assembled cartridge with a film load at the time of manufacture.

3.3 Datum planes B, C, and A are referred to as first, second, and third, respectively. These planes, which are used for dimensioning, are mutually perpendicular and are jointly called a datum reference frame.

3.3.1 Datum plane A is coincident with the center of a circle located by basic dimension T. The circle is in contact with edges of the locating slot defined by dimensions A, O, P, and Q. The diameter of this circle is such that it applies regardless of feature size (RFS) of the locating slot. (See annex A.3.)

3.4 Datum features B, C, and A are primary, secondary, and tertiary, respectively.

3.4.1 Datum feature B is the unnotched, unlabeled surface of the cartridge. It is the primary datum feature and relates the cartridge to the datum reference frame by having a minimum of three points contact the first datum plane, B.

3.4.2 Datum feature C is the front seating surface of the cartridge. It is the secondary datum feature and relates the cartridge to the datum reference frame by having a minimum of two points contact the second datum plane, C.

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Table 1 – Dimensions

Dimensions	Inches	Millimeters	Dimensions	Inches	Millimeters	Dimensions	Inches	Millimeters
A	0.944 min 0.980 max	23.98 min 24.89 max	Aa	0.680 max	17.27 max	Ba	0.060 ± 0.008	1.52 ± 0.20
B	2.99 ± 0.01	75.9 ± 0.3	Ab	0.575 min	14.60 min	Bb	0.319 ± 0.008	8.10 ± 0.20
C	1.390 ± 0.010	35.31 ± 0.25	Ac	0.327 max	8.31 max	Bc	1.152 min	29.26 min
E	0.780 max	19.81 max	Ad	0.264 max	6.71 max	Bd	0.660 max	16.76 max
F	0.09 ± 0.01	2.3 ± 0.3	Ae	0.030 max	0.76 max	Be	0.533 max	13.54 max
G	0.06 ± 0.01	1.5 ± 0.3	Af	1.608 basic	40.84 basic	Bf	45° nom	45° nom
H	0.88 ± 0.03	22.4 ± 0.8	Ag	0.100 min	2.54 min	Bg	0.162 ± 0.015	4.11 ± 0.38
J	0.61 ± 0.03	15.5 ± 0.8	Ah	0.040 ± 0.005	1.02 ± 0.13	Bh	0.347 min	8.81 min
K	0.015 ± 0.010	0.38 ± 0.25	Aj	0.020 max	0.51 max	Bj	0.502 min	12.75 min
L	0.470 min	11.94 min	Ak	45° nom	45° nom	Bk	0.840 min	21.34 min
M	0.007 ± 0.005	0.18 ± 0.13	Al	0.030 max	0.76 max	Bl	0.260 max	6.60 max
N	0.177 min	4.50 min	Am	1.835 min	46.61 min	Bm	0.093 ± 0.015	2.36 ± 0.38
O	0.154 ± 0.004	3.91 ± 0.10	An	2.340 min	59.44 min	Bn	1.550 max	39.37 max
P	0.142 ± 0.004	3.61 ± 0.10	Ap	1.032 max	26.21 max	Bp	1.280 max	32.51 max
Q	0.770 ± 0.010	19.56 ± 0.25	Aq	0.733 ± 0.008	18.62 ± 0.20	Bq	1.888 min	47.96 min
R_1	0.50 ± 0.10	12.7 ± 2.5	As	1.710 ± 0.012	43.43 ± 0.30	Bs	0.658 min	16.71 min
R_2	0.25 ± 0.05	6.4 ± 1.3	At	1.730 min	43.94 min	Bt	0.787 max	19.99 max
R_3	0.160 max	4.06 max	Au	1.890 min	48.01 min	Bu	0.200 min	5.08 min
S	1.02 ± 0.01	25.9 ± 0.3	Av	2.000 ± 0.010	50.80 ± 0.25	Bv	45°	45°
T	0.870 basic	22.10 basic	Aw	30° $^{+1°}_{-5°}$	30° $^{+1°}_{-5°}$	Bw	0.151 ± 0.012	3.84 ± 0.30
U	1.225 min	31.12 min	Ay	0.620 min	15.75 min	By	15° ± 2°	15° ± 2°
V	0.125 max	3.18 max	Az	0.502 min	12.75 min	Bz	15° ± 2°	15° ± 2°
W	see 3.6							
X	0.070 min	1.78 min						
X^1	0.158 min	4.01 min						
Y	0.151 ± 0.012	3.84 ± 0.30						

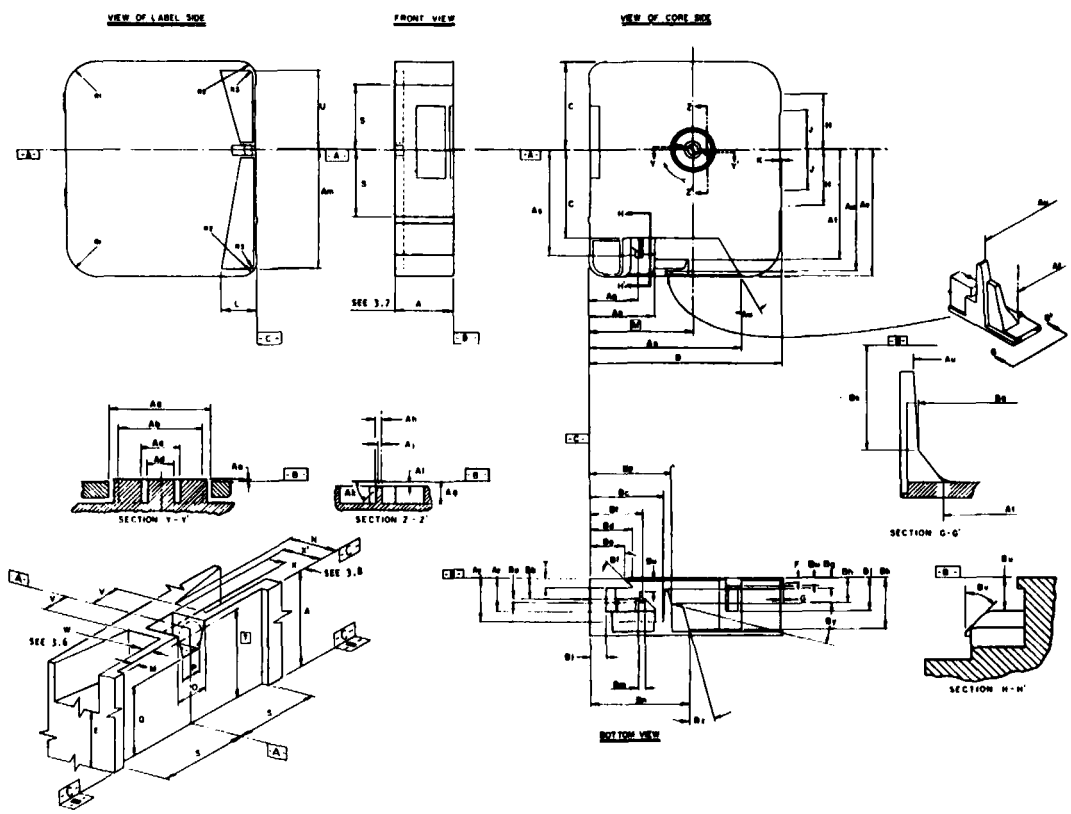

Figure 1 – Cartridge

Figure 2 – Camera-locating slot

3.5 Dimensions L, N, U, Am, V, M, W, and R3, measured from datum planes A and C to the depth of dimension E, as shown in the view of the label side, describe the extent of both triangular recessed areas. The inboard wall of the recessed area, defined by dimensions L and N, shall be a smooth surface and may be tilted sufficiently from the perpendicular to datum plane B to allow proper release from a mold, when the cartridge is manufactured in a molding process.

3.6 The thickness of the wall of the cartridge used for notching, dimension W, shall be sufficient to withstand a force of at least 2.2 lbf (10 N), while deflecting no more than 0.04 in (1.0 mm). (For purposes of measurement, the force is applied by a solid round pin of nominal 0.05-in (1.3-mm) diameter centered 0.03 in (0.8 mm) nominally above or below the film speed or filter notch coincident with basic dimension T on datum feature C.)

3.7 Dimension A specifies the normal overall thickness of the cartridge.

3.8 Some cartridge manufacturers may desire to provide a means of retaining the film supply scroll configuration until the cartridge is placed in the camera. One method employs a film locking slide which is activated by the camera locating pin. The film is released when the cartridge is inserted in the camera. Dimension X specifies the minimum depth of the camera locating slot as the cartridge is received from the manufacturer, that is, the distance from datum plane C to the end of the slide. Dimension X' is the minimum distance from datum plane C to the end of the slide after the cartridge is positioned in the camera. A camera locating pin having a maximum diameter of 0.140 in (3.56 mm) and a length of 0.155 in ± 0.003 in (3.94 mm ± 0.08 mm) from datum plane C shall be sufficient to activate the film locking slide. (See annex A.5.) Allowance must be provided within the camera to accommodate a bowing of the notched, labeled side of the cartridge cover of up to a maximum of 1.009 in (25.63 mm) from datum plane B. The labeled side of the cartridge is shown in figure 1.

3.9 Dimensions B and M are measured from datum plane C. Dimensions C, J, H, and S are measured from datum plane A.

3.10 The take-up core axis shall be located within 0.010 in (0.25 mm) of the true center formed by datum plane A and basic dimension Af.

3.11 Dimensions Aa, Ab, Ac, and Ad are diameters.

3.12 Dimensions Bt, Bu, and Bv define an optional guide provided to facilitate film loading at the time of cartridge manufacture.

3.13 Placement of the film data, such as name, number, and length of load, and the inclusion of any notches, shall be in accordance with ANSI/SMPTE 166-1988.

4 Take-up core drive

4.1 The direction of rotation for the take-up core shall be clockwise when viewed from the core side of the cartridge. (See annex A.5.)

4.2 After disengagement of any core anti-backup device, the cartridge shall operate with a nominal torque of 0.85 ounce-force inch with a permissible range of 0.5 ozf·in to 1.5 ozf·in (6.0×10^{-3} newton meters with a permissible range of 3.5×10^{-3} N·m to 10.6×10^{-3} N·m) as applied to the cartridge. (See annex A.2).

4.3 To avoid interference with core or film, the force applied to the supply side of the cartridge by a gasket surrounding the identification window shall not exceed 1 lbf (4.5 N) to the identification window area.

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

Annex A (informative)
Additional data

A.1 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.

A.2 It is recommended that the core be tendency driven (by some form of slip-drive mechanism) with a drive ratio of at least one turn of the core for every fifteen strokes of the pull-down claw.

A.3 To provide a consistent method of measurement, it is recommended that a cartridge gauging fixture be used which incorporates datum surfaces, a locating pin, and means of exerting locating forces on appropriate surfaces of the cartridge. Drawings for a suitable cartridge-holding fixture may be obtained from the Society of Motion Picture and Television Engineers, 595 West Hartsdale Avenue, White Plains, NY 10607.

A.4 The camera locating pin should be capable of withstanding a force sufficient to activate the film locking slide.

A.5 If an anti-backup mechanism is employed, such as described in 3.8, the mechanism should be capable of disengagement when the cartridge is placed in the camera, permitting the core to turn silently.

Annex B (informative)
Bibliography

ANSI/SMPTE 198-1992, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Aperture, Pressure Pad and Film Position

ANSI/SMPTE 199-1992, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Pressure Pad Flatness and Camera Aperture Profile

ANSI/SMPTE 200M-1988, Motion-Picture Equipment (8-mm Type S) — Model 1 Camera Cartridge — Camera Run Length, Perforation Cutout and End-of-Run Notch

SMPTE STANDARD

ANSI/SMPTE 198-1992
Revision of
ANSI/SMPTE 198-1986

for Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Aperture, Pressure Pad and Film Position

1 Scope

This standard specifies the dimensions and location of the cartridge aperture and pressure pad as well as the position of the film in the aperture of 8-mm type S 50-ft model 1 sound motion-picture film camera cartridges.

2 Dimensions

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

2.2 The dimensions apply to an assembled cartridge with a film load at the time of manufacture.

2.3 The datum planes and datum features used for dimensioning are as defined in ANSI/SMPTE 197-1992.

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 (1.52 mm) minimum and dimension U becomes 0.050 in (1.27 mm) 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 (0.13 mm) 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 measured from datum plane C and determines the operating position of the cartridge pressure pad.

NOTE - Three lugs, Nos. 1, 2, and 3, on the pressure pad are intended to 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 ANSI/SMPTE 199-1992. Lug No. 4 should not touch the camera aperture plate. (See annex A.5.)

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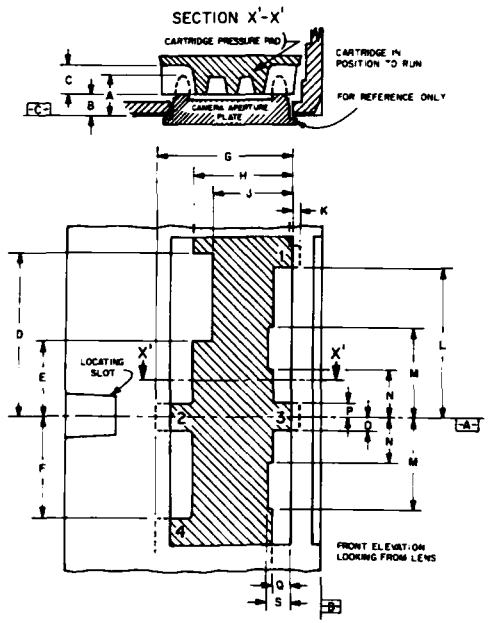

Figure 1 – Cartridge pressure pad

Table 1 – Pressure pad dimensions

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

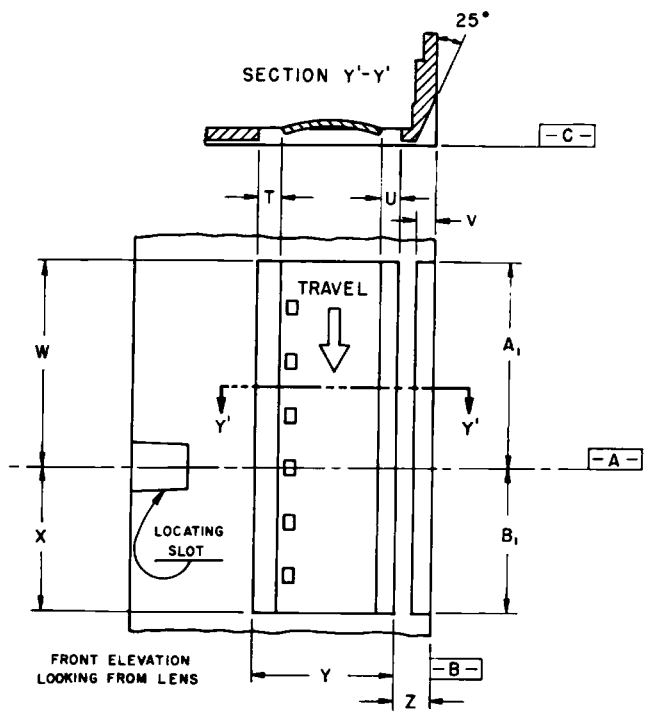

Figure 2 – Cartridge aperture opening and film position

Table 2 – Aperture opening and film position dimensions

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

Annex A (informative)
Additional data

A.1 A force of 8 oz to 14 oz (2.2 N to 3.9 N) must be exerted on the pressure pad for proper seating against the camera aperture plate.

A.2 The two cut-out areas in the pressure pad permit the use of fingers for side-guiding. A force of 1.5 oz to 2.5 oz (0.42 N to 0.70 N) per finger is adequate to ensure picture steadiness.

A.3 Although sufficient recess from the front surface of the pressure pad to allow for camera claw and camera aperture guide finger penetration, as defined by dimension C and 2.6 must be provided, additional portions of the pad surface may be recessed also.

A.4 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 ANSI/SMPTE 157-1988 as minus 2 from the perforation adjacent to the image formed by the camera aperture. The horizontal centerline of the camera aperture should coincide nominally with datum plane A.

A.5 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 prevent the film from being pinched at the bottom of the cartridge aperture opening.

A.6 To provide a consistent method of measurement, it is recommended that a cartridge gauging fixture be used which incorporates datum surfaces, a locating pin, and means of exerting locating forces on appropriate surfaces of the cartridge. Drawings for a suitable cartridge-holding fixture may be obtained from the Society of Motion Picture and Television Engineers, 595 West Hartsdale Avenue, White Plains, NY 10607.

Annex B (informative)
Bibliography

ANSI/SMPTE 157-1988, Motion-Picture Film (8-mm Type S) — Camera Aperture Image and Usage

ANSI/SMPTE 166-1988, Motion-Picture Film (8-mm Type S) — Sound and Silent Camera Cartridge Notches — Exposure Control and Stock Identification

ANSI/SMPTE 197-1992, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Cartridge, Cartridge-Camera Interface and Take-Up Core

ANSI/SMPTE 199-1992, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Pressure Pad Flatness and Camera Aperture Profile

ANSI/SMPTE 200M-1988, Motion-Picture Equipment (8-mm Type S) — Model 1 Camera Cartridge — Camera Run Length, Perforation Cutout and End-of-Run Notch

SMPTE STANDARD

ANSI/SMPTE 199-1992
Revision of
ANSI/SMPTE 199-1986

for Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Pressure Pad Flatness and Camera Aperture Profile

1 Scope

This standard specifies the dimensions and characteristics necessary for the appropriate flatness of the cartridge pressure pads as well as the required clearances for the film in the aperture area in 8-mm type S 50-ft model 1 sound motion-picture film camera cartridges.

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 197-1992, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Cartridge, Cartridge-Camera Interface and Take-Up Core

3 Dimensions

3.1 The dimensions shall be as given in figure 1 and tables 1 and 2 and shall apply to a cartridge that is fully assembled but does not contain film.

3.2 Datum plane A, which is used for dimensioning, shall be established in accordance with ANSI/SMPTE 197-1992.

3.3 Dimensions relative to the surface of the pressure pad are measured from a plane established through surfaces 1, 2, and 3, as defined by 0.060-in (1.52-mm) circles dimensionally centered. (See figure 1.)

3.4 Dimension G specifies the clearance for film in the camera aperture area, based on dimension T, the thickness of the film in the center of the picture area.

3.4.1 Dimension G′ specifies the extension of the camera aperture plate boss points (corresponding to 1, 2, and 3) beyond the aperture plate plane at the aperture opening.

3.5 The upper and lower pad areas extend from dimension C to the top and bottom of the cartridge pressure pad within dimension K.

3.6 Dimension H is intended to apply from a plane as described by 3.3.

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

3.8 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.

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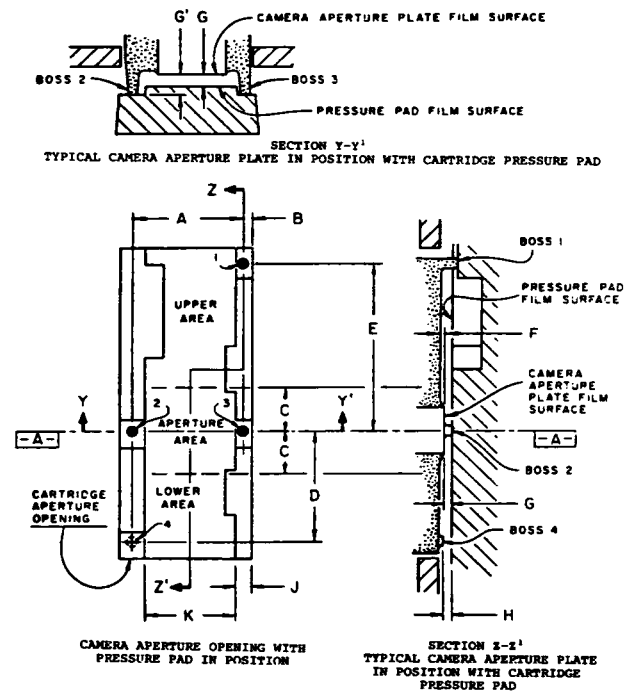

Figure 1 – Camera aperture

Table 1 – Pressure pad dimensions

Dimensions	Inches		Millimeters	
A	0.378	± 0.001	9.60	± 0.3
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	T + 0.0007 T + 0.0012	min max	T + 0.018 T + 0.030	min max
G′	0.0065 0.0070	min max	0.165 0.178	min max
H	0.004	min	0.10	min
J	0.055	min	1.40	min
K	0.310	max	7.87	max

Table 2 – Flatness tolerances on pressure pad film surface

Areas	Inches	Millimeter
Aperture area (within dimension C)	+ 0.0058 –T + 0.0048 –T	+ 0.147 –T + 0.122 –T
Upper area	+ 0.0078 –T + 0.0038 –T	+ 0.198 –T + 0.097 –T
Lower area	+ 0.0078 –T + 0.0018 –T	+ 0.198 –T + 0.046 –T

NOTE – Table dimensions are measured from the zero plane defined by surfaces 1, 2, and 3. (See figure 1 and notes 3 and 4.)