SMPTE 197-2003
Revision of
ANSI/SMPTE 197-1998

SMPTE STANDARD

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.

SMPTE 166-1999, Motion-Picture Film (8-mm Type S) — Exposure Control and Stock Identification — Sound and Silent Camera Cartridge Notches

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).

Approved
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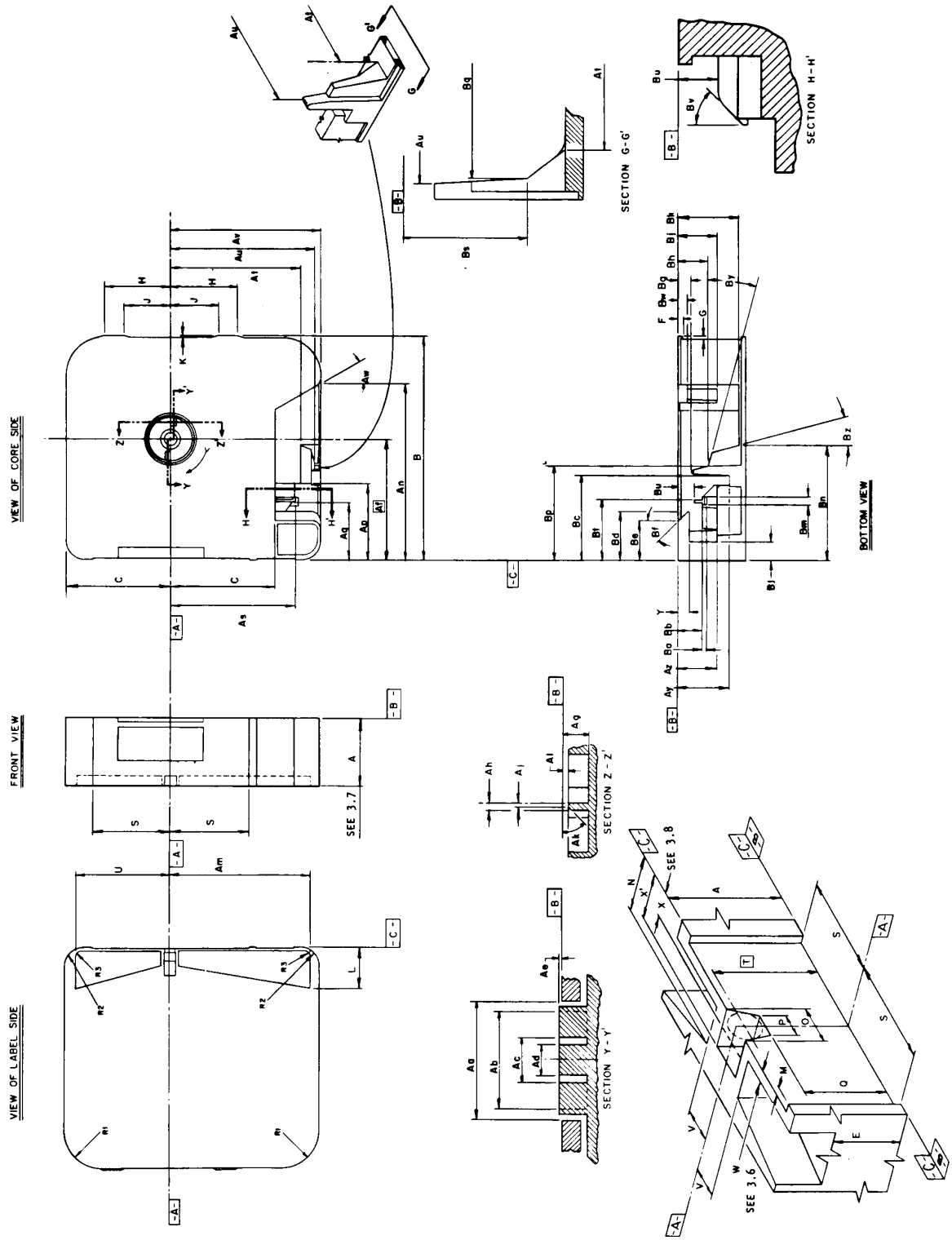

Figure 1 – Cartridge

Figure 2 – Camera-locating slot

Table 1 – Dimensions

Dimensions	Inches	Millimeters
A	0.944 min 0.980 max	23.98 min 24.89 max
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	0.007 ± 0.005	0.18 ± 0.13
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 basic	22.10 basic
U	1.225 min	31.12 min
V	0.125 max	3.18 max
W	see 3.6	
X	0.070 min	1.78 min
X1	0.158 min	4.01 min
Y	0.151 ± 0.012	3.84 ± 0.30

Dimensions	Inches	Millimeters
Aa	0.680 max	17.27 max
Ab	0.575 min	14.60 min
Ac	0.327 max	8.31 max
Ad	0.264 max	6.71 max
Ae	0.030 max	0.76 max
Af	1.608 basic	40.84 basic
Ag	0.100 min	2.54 min
Ah	0.040 ± 0.005	1.02 ± 0.13
Aj	0.020 max	0.51 max
Ak	45° nom	45° nom
Al	0.030 max	0.76 max
Am	1.835 min	46.61 min
An	2.340 min	59.44 min
Ap	1.032 max	26.21 max
Aq	0.733 ± 0.008	18.62 ± 0.20
As	1.710 ± 0.012	43.43 ± 0.30
At	1.730 min	43.94 min
Au	1.890 min	48.01 min
Av	2.000 ± 0.010	50.80 ± 0.25
Aw	30° $^{+1^\circ}_{-5^\circ}$	30° $^{+1^\circ}_{-5^\circ}$
Ay	0.620 min	15.75 min
Az	0.502 min	12.75 min

Dimensions	Inches	Millimeters
Ba	0.060 ± 0.008	1.52 ± 0.20
Bb	0.319 ± 0.008	8.10 ± 0.20
Bc	1.152 min	29.26 min
Bd	0.660 max	16.76 max
Be	0.533 max	13.54 max
Bf	45° nom	45° nom
Bg	0.162 ± 0.015	4.11 ± 0.38
Bh	0.347 min	8.81 min
Bj	0.502 min	12.75 min
Bk	0.840 min	21.34 min
Bl	0.260 max	6.60 max
Bm	0.093 ± 0.015	2.36 ± 0.38
Bn	1.550 max	39.37 max
Bp	1.280 max	32.51 max
Bq	1.888 min	47.96 min
Bs	0.658 min	16.71 min
Bt	0.787 max	19.99 max
Bu	0.200 min	5.08 min
Bv	45°	45°
Bw	0.151 ± 0.012	3.84 ± 0.30
By	15° ± 2°	15° ± 2°
Bz	15° ± 2°	15° ± 2°

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.

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 SMPTE 166.

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

SMPTE 198-2003, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Aperture, Pressure Pad and Film Position

SMPTE 199-2003, Motion-Picture Film (8-mm Type S) — 50-Ft Model 1 Sound Camera Cartridge — Pressure Pad Flatness and Camera Aperture Profile

SMPTE 200M-2003, Motion-Picture Equipment (8-mm Type S) — Model 1 Camera Cartridge — Camera Run Length, Perforation Cutout and End-of-Run Notch