(F) The bus controller responds with [ACK] and a further [TEN]. (Since the last message was a 'virtual-machine-select' message, a further virtual machine control message is expected by the bus controller (see Note 1).

(G) The supervisory level of the tributary 80A0/80A1 sends:

[STX] [BC] [START] [B.CK]

to the bus controller (see Note 1).

(H) The bus controller system service level identifies the destination of [80A0/80A1 — virtual-machine 2] from its linkage directory. The address is found to be 80AC/80AD.

(I) The bus controller issues [BREAK] followed by the select address 80AC.

(J) 80AC/80AD tributary supervisory level responds with [ACK].

(K) The bus controller then sends:

[STX] [BC] [START] [B.CK]

to tributary 80AC/80AD.

(L) The supervisory level of tributary 80AC/80AD responds with [ACK] and passes the control message to the system service level parser.

(M) The system service level parser passes the [START] command to the telecine virtual machine.

Note 1: The messages in (E) and (G) might be concatenated into the single 'hybrid' command:

[STX] [BC] [virtual-machine-select] [2] [START] [B.CK]

in order to limit protocol overhead. In this case the message contained in (F) would not be necessary.

5.2.2 A tally response [STARTED] from the telecine virtual machine tributary 80AC/80AD is to be sent to telecine control panel virtual machine CP2 attached to the interface bus through tributary 80A0/80A1.

(A) The telecine virtual machine passes the [STARTED] tally to the system service level of tributary 80AC/80AD.

(B) The system service level instructs the supervisory level of 80AC/80AD to raise the service request flag (SVC).

(C) The bus controller, as part of its normal poll sequence, polls 80AD and receives [SVC].

(D) The bus controller issues the select address 80AC, followed by [TEN] to the supervisory level of 80AC/80AD.

(E) The bus controller receives the tally:

[STX] [BC] [STARTED] [B.CK]

from 80AC/80AD.

(F) The bus controller system service level determines the destination (80A0/80A1 — virtual machine 2) from its system service level linkage directory.

(G) The bus controller issues [BREAK] and the select address 80A0.

(H) 80A0/80A1 supervisory level responds with [ACK].

(I) The bus controller sends:

[STX] [BC] [virtual-machine-select] [2] [B.CK]

to tributary 80A0/80A1 (see Note 2).

(J) The tributary 80A0/80A1 responds with [ACK], and sets the logical switch in its system service level to select telecine control panel virtual machine CP2.

(K) The bus controller sends tally:

[STX] [BC] [STARTED] [B.CK]

to tributary 80A0/80A1 supervisory level (see Note 2).

(L) The supervisory level of tributary 80A0/80A1 responds with [ACK] and passes the control message to the system service level parser.

(M) The system service level parser passes [STARTED] tally to the telecine control panel virtual machine CP2.

Note 2: The messages in (I) and (K) might be concatenated into a single hybrid command thus:

[STX] [BC] [virtual-machine-select] [2] [STARTED] [B.CK]

in order to limit protocol overhead.

5.2.3 It should be noted that further commands to the same virtual machine, and which follow immediately on the sequences detailed in 5.2.1 will omit steps (E) and (F) since no further changes are needed in the virtual machine selection.

Similarly, 5.2.2 steps (I) and (J) will be omitted under the same circumstances.

Cinematography — Motion-picture camera cartridge, 8 mm Type S, Model I (capacity 60 m) — Cartridge-camera interface and sprocket drive — Dimensions and specifications

1 Scope and field of application

This International Standard lays down the dimensions of the 8 mm Type S Model I (capacity 60 m (200 ft)) motion-picture film camera cartridge and gives cartridge-camera interface specifications. This International Standard also lays down the dimensions of the sprocket drive opening and critical dimensions of the sprocket. In addition, the driving force, direction of drive and recommended drive ratio for 8 mm Type S (capacity 60 m (200 ft)) motion-picture film camera cartridge are specified.

An optional means of retaining the film supply until the cartridge is placed in the camera is described.

2 Dimensions

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

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

2.3 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.

2.3.1 Datum plane A is coincident with the centre 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 the circle is such that it applies regardless of feature size (RFS) of the locating slot. (See the annex, clause A.3.)

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

2.4.1 Datum feature B is the unnotched, unlabelled surface of the cartridge extending 50,8 mm (2.00 in) basic below and 41,53 mm (1.635 in) basic above the datum plane A. It is the primary datum feature and relates the cartridge to the datum reference plane by having a minimum of three points in contact with the first datum plane B.

2.4.2 Datum feature C is the front seating surface of the cartridge, extending 50,8 mm (2.00 in) basic below and 41,53 mm (1.635 in) basic above datum plane A. It is the secondary datum feature and relates the cartridge to the datum reference frame having a minimum of two points in contact with the second datum plane C.

2.5 Dimensions *L*, *N*, *U*, A_m, *V*, *M*, *W* and R_3, 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 from the perpendicular to the datum plane B sufficiently to allow proper mould release when the cartridge is manufactured in a moulding process.

2.6 The thickness of the wall of the cartridge used for notching, dimension *W*, shall be sufficient to withstand a force of at least 10 N (2.2 lbf), while deflecting no more than 1 mm (0.04 in).

NOTE — For the purpose of measurement, the force is applied by a solid round pin of nominal diameter 1,3 mm (0.05 in) centred 0,8 mm (0.03 in) nominally, above or below the film speed or filter notch coincident with basic dimension *T* on datum feature C.

2.7 Dimension *A* specifies the normal overall thickness of the cartridge, extending from the bottom edge of the cartridge to the light lock rib (dimension *U*), and within the light lock channel (dimension D_9).

2.8 Some cartridge manufacturers may desire to provide a means of retaining the film supply and take-up spools until the cartridge is placed in the camera. One method employs a spool locking device which is activated by a lock pin extending through datum feature B. Such a device should be designed to unlock the spools when the lock pin is depressed by seating the cartridge on the datum reference plane B (camera mechanism plate). The lock pin should be located within a zone from 12,7 mm (0.05 in) basic from datum plane A to 33 mm (1.3 in) basic from datum plane A within dimension *B*. The force required to hold the lock pin coincident with datum plane B shall not exceed 5,4 N (20 oz). The initial force to depress the lock pin may be significantly higher than the force required to hold the lock pin coincident with the datum plane B.

2.9 Dimension M is measured from datum plane C.

2.10 The sprocket axis shall be located within 0,25 mm (0.010 in) of the true centre formed by datum plane A and basic dimension A_f.

2.11 Dimensions C_a, C_b, C_c and C_m, are diameters.

2.12 Dimensions B_t, B_u and B_v, define an optical guide provided to facilitate film loading at the time of cartridge manufacture.

3 Take-up drive

3.1 The direction of rotation for the core shall be "clockwise" (right-hand drive) the same as the sprocket when viewed from the sprocket side of the cartridge.

3.2 After disengagement of any film locking device, the cartridge shall operate with a nominal torque of $9{,}2 \times 10^{-3}$ N·m (1.3 ozf·in) with a permissible range of $7{,}1 \times 10^{-3}$ N·m (1.0 ozf·in) to $10{,}6 \times 10^{-3}$ N·m (1.5 ozf·in). (See the annex, clause A.2.)

To enable cameras to automatically distinguish between the 8 mm Type S [capacity 60 m (200 ft)] cartridge and the 15 m (50 ft) capacity sound and silent cartridges, a spring-loaded drive plate is incorporated in the sprocket of the 60 m (200 ft) capacity cartridge. The spring-loaded drive plate will react axially against the sprocket drive mechanism of the camera with a nominal force of 3,9 N (14 ozf) with a permissible range of 2,8 N (10 ozf) to 5,0 N (18 ozf), when the spring-loaded drive plate is depressed to within 0,5 mm (0.02 in) from datum plane B.

NOTE – Four driving lugs are shown in the sprocket, and it is recommended that the camera sprocket driver be designed in such a way as to present a plane surface for the four lugs to bear against.

3.3 When operating the cartridge loaded with film without a magnetic sound stripe, proper film transport requires that all of the camera's film transport mechanisms, including those for recording sound, be activated. [This may not be required when using the 15 m (50 ft) capacity silent cartridge.]

4 Bibliography

ISO 1780, *Cinematography – Motion-picture camera cartridge, 8 mm Type S, Model I – Aperture, camera aperture profile, film position, pressure pad and pressure pad flatness – Dimensions and specifications.* [1]

ISO 3024, *Cinematography – Motion-picture camera cartridge, 8 mm Type S, Model I – Camera run length, perforation cut-out and end-of-run notch in film – Specifications.*

ISO 3067, *Cinematography – Motion-picture camera cartridge, 8 mm Type S, Model I – Notches for film speed, film identification and colour-balancing filter – Dimensions and positions.*

1) At present at the stage of draft. (Revision of ISO 1780-1975.)

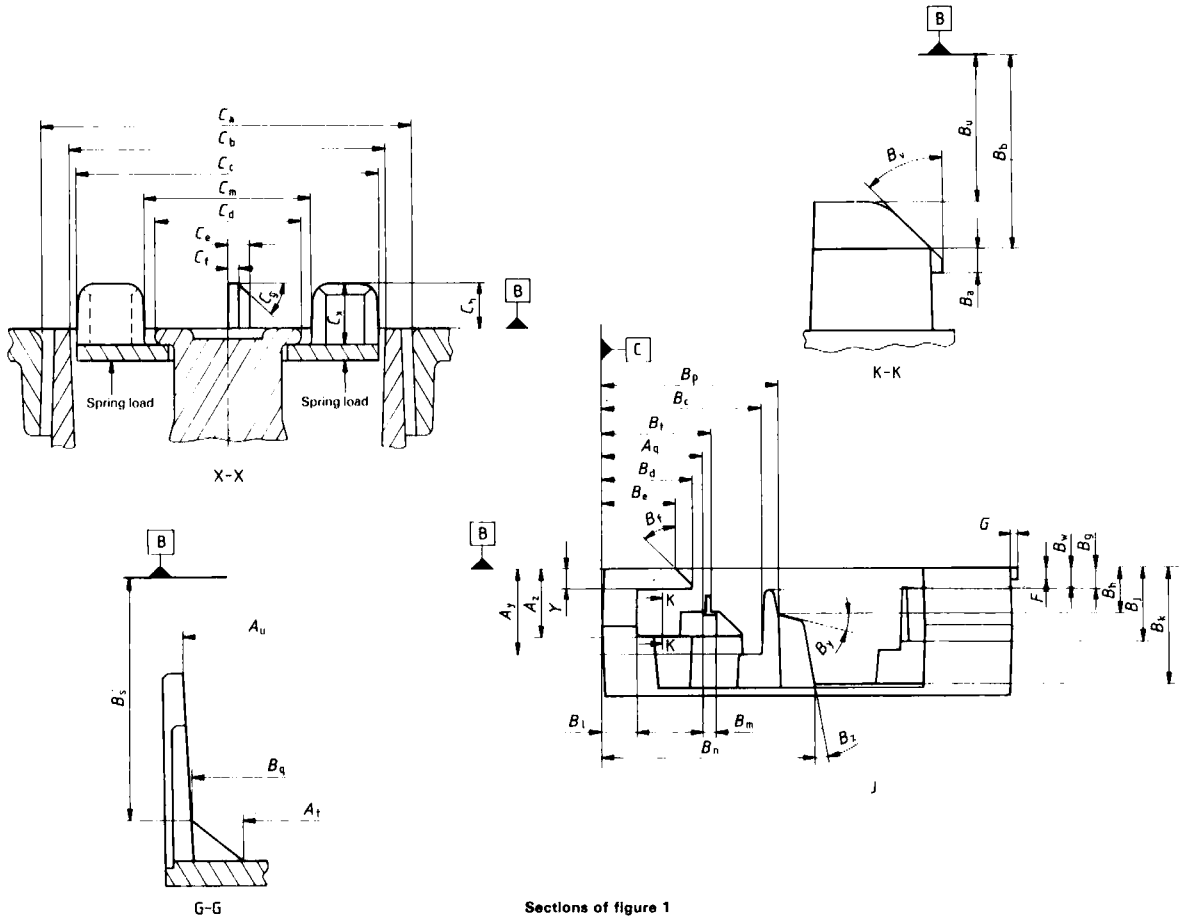
Table 1 – Dimensions*

Dimensions	mm	Dimensions	mm
A	24,23 ± 0,25	B_n	8,81 min.
B	75,9 ± 0,3	B_j	12,75 min.
C	35,31 ± 0,25	B_k	21,34 min.
E	19,81 max.	B_l	6,60 max.
F	2,3 ± 0,3	B_m	2,36 ± 0,38
G	1,5 ± 0,3	B_n	39,37 max.
H	22,4 ± 0,8	B_p	32,51 max.
J	15,5 ± 0,8	B_q	47,96 min.
K	0,38 ± 0,25	B_s	16,71 min.
L	11,94 min.	B_t	19,99 max.
M	0,18 ± 0,13	B_u	5,08 min.
N	4,50 min.	B_v	45°
O	3,91 ± 0,10	B_w	3,84 ± 0,30
P	3,61 ± 0,10	B_y	15° ± 2°
Q	19,56 ± 0,25	B_z	15° ± 2°
R_1	12,7 ± 2,5	C_a	17,53 max.
R_2	6,4 ± 1,3	C_b	14,10 min.
R_3	4,06 max.	C_c	12,70 min.
R_4	1,27 min.	C_d	6,71 max.
R_5	1,02 max.	C_e	0,51 max.
R_6	6,4 min.	C_f	1,02 ± 0,38
S	25,9 ± 0,3	C_g	45° nom.
T**	22,10	C_h	2,29 ± 1,27
U	31,12 min.	C_j	2,03 ± 0,25
V	3,18 max.	C_k	1,65 ± 0,38
W	See 3.6	C_l	27,28 max.
Y	3,84 ± 0,30	C_m	7,87 max.
A_f**	40,84	C_n	45°
A_m	46,61 min.	C_p	42,98 ± 0,38
A_n	59,44 min.	C_q	50,42 ± 0,76
A_p	26,21 max.	C_r	4,70 max.
A_q	18,62 ± 0,20	C_s	42,04 ± 0,51
A_s	43,43 ± 0,30	C_t	4,19 ± 0,51
A_t	43,94 min.	C_u	15° ± 5°
A_u	48,01 min.	C_v	13° ± 5°
A_v	50,80 ± 0,25	C_w	25° ± 5°
A_w	$30° {}^{+1°}_{-5°}$	C_x	2,54 min.
A_y	15,75 min.	C_y	7,87 ± 0,51
A_z	12,75 min.	C_z	165,10 ϕ max.
B_a	1,02 ± 0,20	D_a	83,19 max.
B_b	8,10 ± 0,20	D_b	2,39 ± 0,51
B_c	29,26 min.	D_c**	31,65
B_d	16,76 max.	D_d	33,02 ± 0,38
B_e	13,54 max.	D_e**	133,02
B_f	45° nom.	D_f***	15° ± 2°
B_g	4,11 ± 0,38	D_g	5,46 ± 0,20

* All dimensions given in imperial units are shown in the annex.

** Basic dimension – No tolerance intended.

*** In three places.



Sections of figure 1

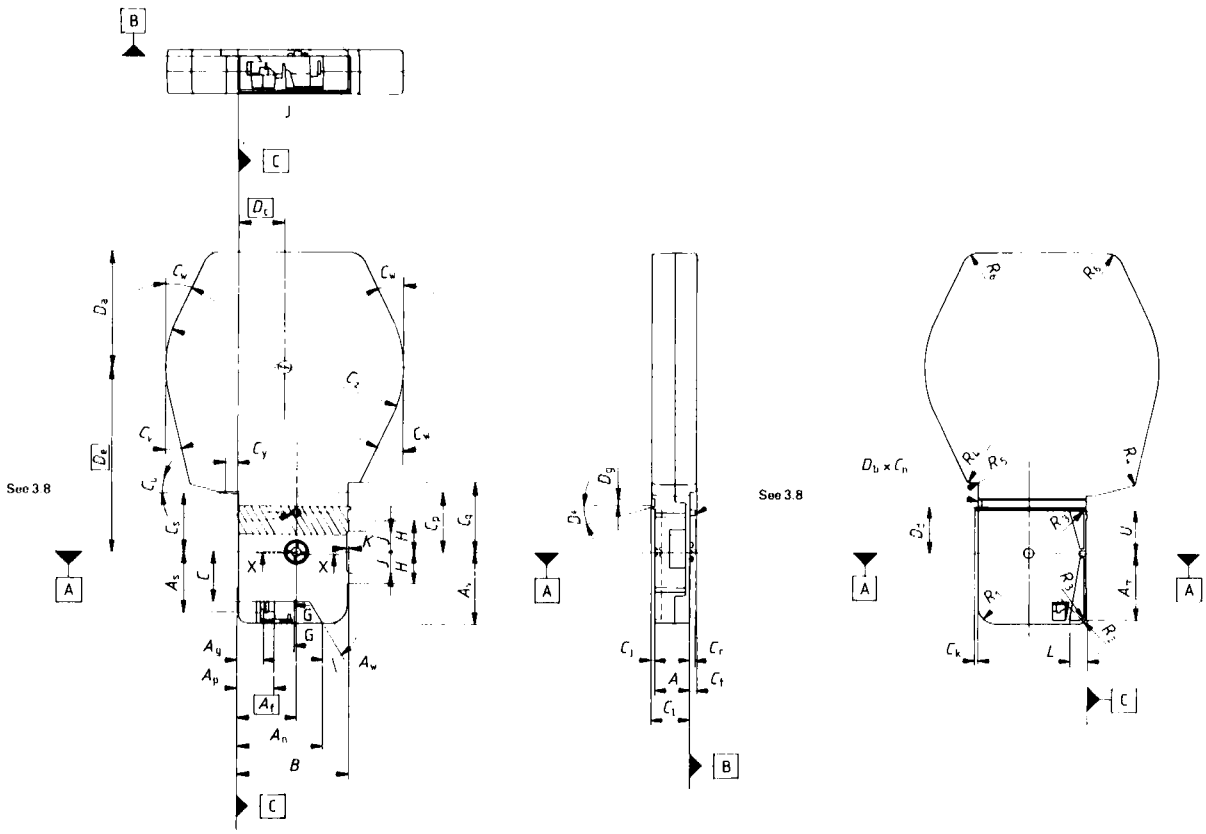


Figure 1 – Cartridge

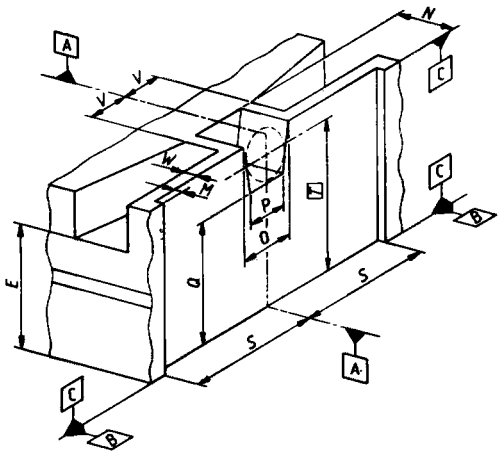


Figure 2 — Camera-locating slot

Annex

(This annex forms part of the standard.)

A.1 In designing the sprocket driver, consideration should be given to the fact that tooth-on-tooth engagement of the sprocket lug on the camera drive pin is a possibility.

A.2 It is recommended that the sprocket be tendency driven (by some form of slip-drive mechanism) with a drive ratio of at least one turn of the sprocket driver for every fourteen strokes of the pull-down claw when no slippage occurs.

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.

Table 2 — Inch dimensions

Dimensions	in	Dimensions	in
A	0.954 ± 0.010	B_h	0.347 min.
B	2.99 ± 0.01	B_i	0.502 min.
C	1.390 ± 0.010	B_k	0.840 min.
E	0.780 max.	B_l	0.260 max.
F	0.09 ± 0.01	B_m	0.093 ± 0.015
G	0.06 ± 0.01	B_n	1.550 max.
H	0.88 ± 0.03	B_p	1.280 max.
J	0.61 ± 0.03	B_q	1.888 min.
K	0.015 ± 0.010	B_s	0.658 min.
L	0.470 min.	B_t	0.787 max.
M	0.007 ± 0.005	B_u	0.200 min.
N	0.177 min.	B_v	45°
O	0.154 ± 0.004	B_w	0.151 ± 0.012
P	0.142 ± 0.004	B_y	15° ± 2°
Q	0.770 ± 0.010	B_z	15° ± 2°
R_1	0.50 ± 0.10	C_a	0.690 max.
R_2	0.25 ± 0.05	C_b	0.555 min.
R_3	0.160 max.	C_c	0.500 min.
R_4	0.050 min.	C_d	0.264 max.
R_5	0.040 min.	C_e	0.020 max.
R_6	0.25 min.	C_f	0.040 ± 0.015
S	1.02 ± 0.01	C_g	45° nom.
T*	0.870	C_h	0.090 ± 0.050
U	1.225 min.	C_j	0.080 ± 0.010
V	0.125 max.	C_k	0.065 ± 0.015
W	See 3.6	C_l	1.074 max.
Y	0.151 ± 0.012	C_m	0.310 max.
A_t*	1.608	C_n	45°
A_m	1.835 min.	C_p	1.692 ± 0.015
A_n	2.340 min.	C_q	1.985 ± 0.030
A_p	1.032 max.	C_r	0.185 max.
A_q	0.733 ± 0.008	C_s	1.655 ± 0.020
A_s	1.710 ± 0.012	C_t	0.165 ± 0.020
A_t	1.730 min.	C_u	15° ± 5°
A_u	1.890 min.	C_v	13° ± 5°
A_v	2.000 ± 0.010	C_w	25° ± 5°
A_w	$30° {}^{+1°}_{-5°}$	C_x	0.100 min.
A_y	0.620 min.	C_y	0.310 ± 0.020
A_z	0.502 min.	C_z	6.500 ϕ max.
B_a	0.040 ± 0.008	D_a	3.275 max.
B_b	0.319 ± 0.008	D_b	0.094 ± 0.020
B_c	1.152 min.	D_c*	1.246
B_d	0.660 max.	D_d	1.300 ± 0.015
B_e	0.533 max.	D_e*	5.237
B_f	45° nom.	D_f**	15° ± 2°
B_g	0.162 ± 0.015	D_g	0.215 ± 0.008

* Basic dimension — No tolerance intended.

** In three places.