A7. One possible network for the realization of the weighting characteristic of Table 1 is shown in Fig. 3. This network is derived from CCIR Recommendation 468-2-1978.

A8. Some voltmeter amplifiers may clip the signal if the noise reading approaches full scale, giving incorrect noise readings. If possible, the noise reading should be made below two-thirds of full scale. Also, in order to increase the accuracy of the measurement, the noise reading should be above one-third of full scale.

A9. The objective of the measurement in 4.2.3 is to ensure that the noise of the system is at least 10 dB lower than film plus system noise, thus ensuring the integrity of the film signal-to-noise ratio.

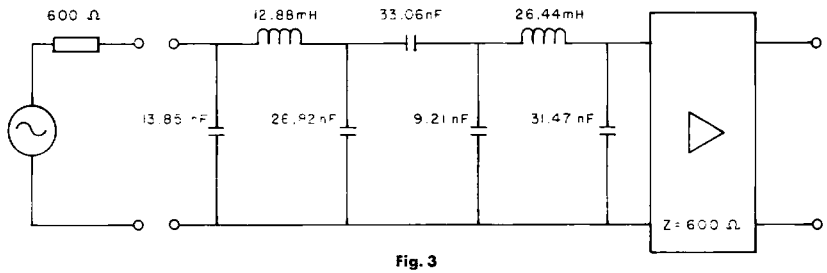


Fig. 3
Sample Weighting Network

Cinematography — Spools, daylight loading type for 16 mm motion-picture cameras — Dimensions

1 Scope and field of application

1.1 This International Standard specifies the dimensions and characteristics of daylight loading spools of nominal capacities 15 m (50 ft), 30 m (100 ft), 60 m (200 ft) and 120 m (400 ft) for 16 mm motion-picture film.

NOTE — The dimensions specified in this International Standard are in substantial agreement with those given for microfilm camera supply and take-up spools in ISO 1116 (see the annex).

1.2 Spools for high-speed cameras should be carefully balanced and are not necessarily covered by this International Standard.

2 Reference

ISO 1116, *Microcopying — 16 mm and 35 mm microfilms, spools and reels.*

3 Dimensions and characteristics

3.1 The spindle and keyway holes shown in the figure shall be incorporated in both flanges[1] and shall be aligned. (Some laboratories use 35 mm rewind equipment for winding 16 mm film; often the spindles on this equipment have long keys.) A second keyway, in the corner of the spindle hole opposite the required keyway, is optional, but if used, shall be incorporated in both flanges.

3.2 If rivet heads or other fastening devices extend beyond the outer surfaces of the flanges, they shall lie at a diameter larger than the minimum K diameter and shall be within the boundaries defined by other portions of the volume of rotation diagram.

3.3 Dimension F refers to a slot in the spool core for attaching the film. The slot sides, starting immediately adjacent to each flange and running a minimum distance 6,0 mm (0.24 in) from each flange toward the other, shall be straight, parallel and 0,7 to 1,5 mm (0.03 to 0.06 in) apart. The slot sides may diverge over remaining (central) portions of the slot.

3.4 Dimensions J and J_1 represent the thickness and effective thickness respectively of the spool within the K diameter area which is centred on the spindle hole axis of each flange.

3.5 A reference plane of rotation for each flange is defined by a plane perpendicular to the axis of the spindle and coincident with the surface of a flat 15,0 mm (0.59 in) diameter support which is in contact with the flange and centred on the spindle hole axis of the flange.

The dimension P is the distance measured outwardly from this reference plane[2] of rotation to the farthest plane of rotation described by any point on the flange outside the K diameter area when the spool is rotated on an accurate, tight-fitting spindle. This includes rivets or other fastening devices, variations in flange thickness, flatness, and lateral run-out of the flanges.

Selection of a dimension P value is dependent upon the thickness of the material used for the flanges. According to the flange material thickness:

a) the K diameter area may be depressed (with P greater than zero), or

b) the outside surfaces of the flanges may be flat from spindle hole area to periphery (with P equal to zero), or

c) in the case of flanges made of very thin material, the K diameter area may be raised rather than recessed (effectively, P less than zero).

3.6 The maximum effective thickness of spools (including all the characteristics mentioned in 3.5) outside the K diameter area has not been stated because it is a function of a spool's specific J_1 value between the 15,0 mm (0.59 in) diameter reference zones on each flange. The largest overall effective thickness, however, will be $J_{1\,max} + 2\,P_{max} = 19{,}5$ mm (0.77 in).

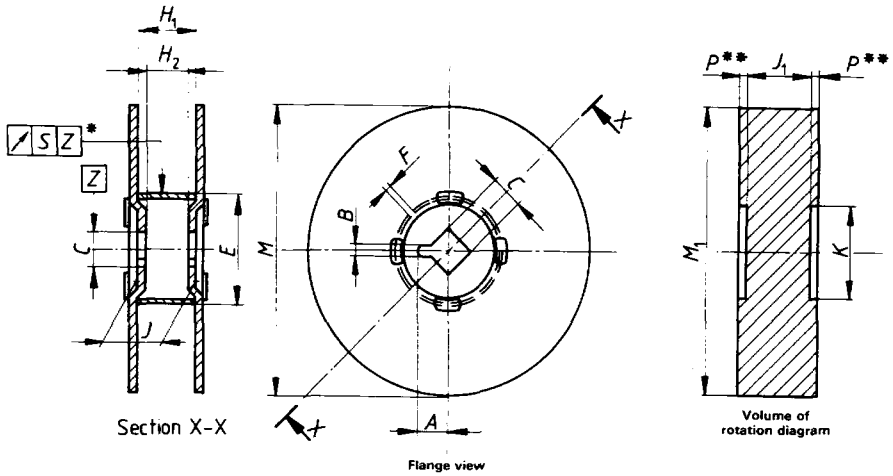
3.7 The eccentricity of the core with respect to the spindle hole axis, Z, shall not exceed a total radius variation (total indicator reading) of 0,8 mm (0.03 in) for all spool sizes.

3.8 Flanges shall be opaque and their surfaces shall have low reflectance characteristics.

NOTE — When the loaded camera is viewed from the side, with the lens to the left and the bottom of the housing downward (regardless of whether or not the spool loading mechanism is visible from that side), both the supply and take-up spools rotate in a clockwise direction.

1) Some spools exist which have one flange with the construction recommended in 3.1, but the other flange with a round hole which has a diameter equal to dimension C. This older design is recognized temporarily, but is not recommended for future construction.

2) The reference plane from which P is measured is not necessarily coincident with all points within the K diameter area but only needs to be coincident with those which are in contact with the reference support which has a diameter smaller than K.



* See 3.7

** See 3.5 for explanation of *P*.

Figure – Daylight loading spools for 16 mm motion-picture cameras

Table – Dimensions for daylight loading spools for 16 mm motion-picture cameras

Dimension	Nominal spool size, m				mm	in
A	15	30	60	120	7,6 $^{-1,0}_{0}$	0.30 $^{-0.04}_{0}$
B	15	30	60	120	3,1 $^{-0.4}_{0}$	0.12 $^{-0.02}_{0}$
C (see 3.1)	15	30	60	120	8,05 $^{-0.15}_{0}$	0.317 $^{-0.006}_{0}$
E	15	30	60		32,0 ± 0.5	1.26 ± 0.02
				120	54,0 ± 0.5	2.13 ± 0.02
F	15	30	60	120	0,7 $^{-0.8}_{0}$	0.03 $^{-0.03}_{0}$
H_1	15	30	60	120	16,05 $^{-0.35}_{0}$	0.632 $^{-0.014}_{0}$
H_2	15	30	60	120	16,00 min.	0.630 min.
J and J_1	15	30	60	120	18,5 $^{0}_{0.4}$	0.73 $^{0}_{0.02}$
K	15	30	60		25,5 min.	1.00 min.
				120	38 min.	1.5 min.
M and M_1	15				71,5 $^{0}_{1.0}$	2.81 $^{0}_{0.04}$
		30			92,0 $^{0}_{1.0}$	3.62 $^{0}_{0.04}$
			60		126,0 $^{0}_{1.0}$	4.96 $^{0}_{0.04}$
				120	169,0 $^{0}_{1.0}$	6.65 $^{0}_{0.04}$
P (see 3.5)	15	30	60	120	0,50 max.	0.020 max.
S (see 3.7)	15	30	60	120	0,8	0.03

Annex

(This annex does not form part of the standard.)

Spools for microfilm often employ offset drive holes and/or a drive slot as described in ISO 1116. Such holes are optional in spools described in ISO 1019 covering spools for motion-picture films. Manufacturers who might wish to make a single type of spool for both purposes would need to take the drive holes or slot into account when planning the size of fastening devices and the size of the *K* diameter area described in this International Standard. That is, the minimum diameter of the *K* area (and thus the circle described by the inner edges of fastening devices, if any) would have to be large enough [about 28,5 mm (1.12 in) minimum] to avoid interference with a drive slot.