

# Meeting of Working Group on One-Inch Nonsegmented Helical Recording

As a result of a proposal to the SMPTE that it take some positive action toward standardization of one-inch helical video recorders now being supplied for broadcast applications, the SMPTE Committee on Video Recording and Reproducing Technology has established two working groups to review the situation.

An organizational meeting held in San Francisco at the Society's recent Winter Conference showed that there was a strong interest on the part of the users and manufacturers of one inch VTRs in participating in such a standards forum, and two working groups were set up to study the segmented and the nonsegmented formats now in existence.

The group assigned to the nonsegmented (one field per head pass) format is chaired by F. M. Remley, Technical Director of Broadcasting, for the University of Michigan. This working group held its first meeting at CBS headquarters in New York City on

23-24 February and included experts from all major television networks, ABC, CBS, CBC, NBC, PBS and Group W; industrial users such as AT & T Co., Prudential Insurance Co. of America; and manufacturers' representatives from Ampex, Sony, NEC, IVC, Recortec, Bosch-Fernseh, RCA and Philips.

The two days of meetings covered the areas of tape geometry, number and type of ancillary tracks and various alternatives related to editing. User needs have been defined sufficiently to charge a subcommittee of manufacturers' technical experts to respond to these needs.

It is SMPTE policy to issue no technical specifications resulting from committee deliberations until reasonable agreement has been achieved, at which time a written draft of the proposal is submitted or made available to all interested parties.

## Standards & Recommended Practices

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### Approved American National Standards

On 30 December 1976, the American National Standards Institute approved four American National Standards: PH22.4-1976, Dimensions of 35-mm Motion-Picture Projection Reels; PH22.147-1976, Dimensions of Motion-Picture Projection Reels for Combination 70/35-mm Projectors; PH22.192-1976, Dimensions of Shipping Reels for 35-mm Motion-Picture Prints; and PH22.193-1976, Dimensions of Large-Capacity Reels for 35-mm Motion-Picture Projection. Two of these standards, PH22.4 and PH22.147, are editorial revisions of earlier issues and do not reflect technical changes. PH22.4 has been modified to indicate clearly that the 2000-ft capacity reel is the only reel used for 35-mm theatrical projection although the 1000- and 3000-ft reels are generally used for television applications. PH22.192 and PH22.193 specify the two types of reels used in handling 35-mm release prints.

Inasmuch as compliance with American National Standards is purely voluntary, standards will become truly effective when broad publicity is given to their existence. ANSI and SMPTE would appreciate any personal influence to promote the use of these standards where such action is appropriate. Copies of the standards may be obtained for a nominal fee from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

### Proposed Withdrawal of American National Standards

The Society's Standards Committee has accepted the recommendation of the Committee on Film Technology that two American National Standards be withdrawn because they no longer reflect actual practices. The motion-picture films specified

are not being manufactured: PH22.141-1974, Dimensions for 32-mm Motion-Picture Film, 2R, and PH22.142-1974, Dimensions for 32-mm Motion-Picture Film, 4R.

Comments on the proposed withdrawal should be addressed to Alex E. Alden, Manager of Engineering Services, at Society Headquarters, prior to 1 June 1977.

The recommendation has been submitted to American National Standards Committee PH22. All comments received through *Journal* publication will be reviewed before conclusion of action by that committee. — Alex E. Alden

### SMPTE Working Groups Formed

Several Engineering Committee working groups have been formed by the Society. Prospective members are invited to contact Alex E. Alden at Society Headquarters.

(a) Color Bar Pattern. A working group to consider a proposed modification of the color bar pattern specified by EIA RS-189-A. The modification is intended to increase the accuracy of monitor adjustment.

(b) One-Inch Helical Tape. Two working groups to consider possible standardization of one-inch helical video tape format, both segmented and nonsegmented.

(c) Time Code. A working group to consider the standardization of a time code suitable for all motion-picture formats.

(d) High-Definition TV. A study group to review and consider new developments in the general area of high-definition television systems.

(e) Digital Video and Audio. Two working groups to consider potential areas of standardization for digital video systems and digital audio as it pertains to television systems. — AEA

# American National Standard dimensions of 35-mm motion-picture projection reels

Approved December 30, 1976

Secretariat: Society of Motion Picture and Television Engineers

Page 1 of 2 pages

## 1. Scope

1.1 This standard specifies the dimensions of three capacities of 35-mm motion-picture projection reels for motion-picture and television applications.

1.1.1 For theatrical application, the 2000-ft (610-m) capacity reel shall be preferred.

1.1.2 For television application, the 3000-ft (914-m) capacity reel shall be preferred.

1.1.3 The 1000-ft (305-m) capacity reel is in general use for laboratory and television applications. It should not be used in theatrical projection as a take-up reel because the tension on the 2-in (50.8-mm) core would be excessive.

1.2 This standard does not apply to shipping reels.

Dimensions	Inches	Millimeters
A (2000 ft)	15.00 + 0.00 - 0.05	381.0 + 0.0 - 1.3
A (3000 ft)	16.90 + 0.00 - 0.05	429.3 + 0.0 - 1.3
A (1000 ft)	9.90 + 0.00 - 0.20	251.5 + 0.0 - 5.1
B (2000 ft)	5.00 ± 0.10	127.0 ± 2.5
B (3000 ft)	5.00 ± 0.10	127.0 ± 2.5
B (1000 ft)	1.95 ± 0.10	49.5 ± 2.5
C	1.530 + 0.075 - 0.030	38.86 + 1.90 - 0.76
C <sub>1</sub>	1.885 + 0.075 - 0.030	47.88 + 1.90 - 0.76
C <sub>2</sub>	1.625 + 0.075 - 0.030	41.28 + 1.90 - 0.76
D	0.317 + 0.002 - 0.000	8.05 + 0.05 - 0.00
E	0.150 ± 0.010	3.81 ± 0.25
F	2.25 min	57.2 min
G	0.265 ± 0.002	6.73 ± 0.05
H	0.782 nom	19.86 nom
J	0.375 nom	9.52 nom
K	0.505 + 0.003 - 0.000	12.83 + 0.08 - 0.00
L	0.035 min	0.89 min
M	0.75 min	19.0 min

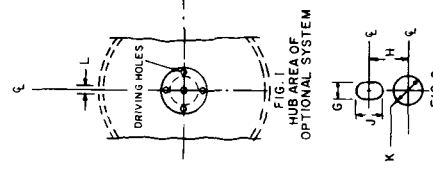


FIG. 1  
HUB AREA OF  
OPTIONAL SYSTEM

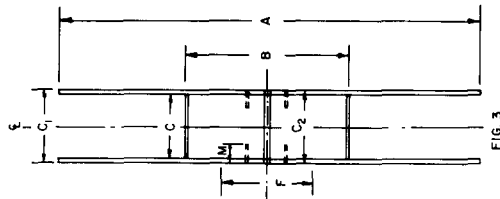


FIG. 3  
ENLARGED VIEW  
OF HOLE IN BOTH FLANGES  
(PREFERRED SYSTEM)

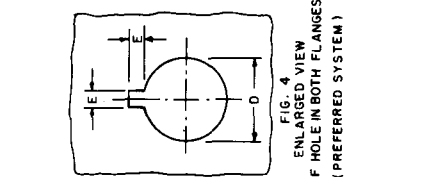


FIG. 4  
ENLARGED VIEW  
OF HOLE IN BOTH FLANGES  
(PREFERRED SYSTEM)

2. Dimensions  
2.1 The dimensions shall be as given in the figures and table.

2.2 Dimension F defines the area over which the reel thickness, specified by Dimension C<sub>2</sub>, applies.

2.3 Dimension M in Fig. 3 indicates a clearance for the driving pin in the reel hub.

2.4 Figures 1 and 2 illustrate an optional spindle hole as used with larger reels and the four driving holes intended for use on spindles whose diameter is 0.500 + 0.000 — 0.005 in (12.70 + 0.00 — 0.13 mm) and driven by a drive pin of 0.250-in (6.35-mm) nominal diameter, engaging in one of the four driving holes.

2.5 Figure 4 illustrates the standard spindle hole for use with 5/16-in spindles.

NOTE: Dimensions of other reels are specified in American National Standard Dimensions of Motion-Picture Projection Reels for Combination 70/35-mm Projectors, PH22.147-1976; Dimensions of Shipping Reels for 35-mm Motion-Picture Prints, PH22.192-1976; and Dimensions of Large-Capacity Reels for 35-mm Motion-Picture Projection, PH22.193-1976.

A1. Specifications for the reels are based on good engineering design of film winding equipment and on minimum tension variation between hub and rim. Film tension in the projector feed and take-up mechanism should be kept low to avoid perforation damage. In order to maintain low tension where a constant-torque clutch device is used, it is necessary to keep the quotient B/A (hub diameter B divided by flange diameter A) as large as possible. The ratio for the 2000-ft capacity reel is 3:1 maintaining a low initial film tension to final film tension.

A2. In designing reels of the size and weight described in this standard, it is the practice to chamfer the spindle hole to facilitate placing the reel on the spindle. The degree of chamfer should be in accordance with good engineering practice, and should not reduce the bearing surface of the spindle hole on the spindle to the point of endangering reel stability.

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

The option of 5/16- or 1/2-in reel spindles is made so that existing equipment may be used.

PH22.4-1976

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# American National Standard dimensions of motion-picture projection reels for combination 70/35-mm projectors

Approved December 30, 1976 Secretariat: Society of Motion Picture and Television Engineers

Page 1 of 2 pages

## 1. Scope

1.1 This standard specifies the dimensions of 35- and 70-mm motion-picture projection reels intended for use on combination 70/35-mm projectors and rewinds.

1.2 This standard does not apply to shipping reels.

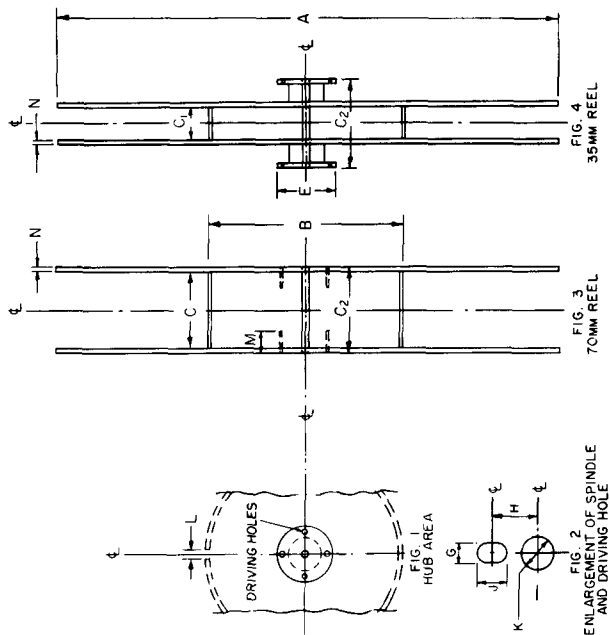


FIG. 2  
ENLARGEMENT OF SPINDLE  
AND DRIVING HOLE

FIG. 3  
70MM REEL

FIG. 4  
35MM REEL

## 2. Dimensions

- 2.1 The dimensions of the reels shall be as given in the figures and table.
- 2.2 Fig. 2 indicates the location and size of the spindle hole and the four driving holes which appear on both flanges.
- 2.3 Dimension M in Figure 3 indicates a clearance for the driving pin in the reel hub.

2.4 The reels are intended to be used on spindles whose diameter is  $0.500 \pm 0.000$  —  $0.005$  in ( $12.70 \pm 0.00$  —  $0.13$  mm) and to be driven by a drive pin of  $0.250$ -in ( $6.35$ -mm) nominal diameter, engaging in one of the four driving holes.

2.5 The centerlines indicated for Figs. 3 and 4 are coincident.

	Dimensions	Inches	Millimeters
A	(4000-ft [1219-m] capacity)	$21.75 \pm 0.03$	$552.4 \pm 0.8$
B	(4000-ft [1219-m] capacity)	$8.00 \pm 0.03$	$203.2 \pm 0.8$
C		$2.87 \pm 0.03$	$72.9 \pm 0.8$
C <sub>1</sub>		$1.50 \pm 0.00$	$38.1 \pm 0.0$
C <sub>2</sub>		$3.41 \pm 0.03$	$86.6 \pm 0.8$
E		2.50 min	63.5 min
G		$0.265 \pm 0.002$	$6.73 \pm 0.05$
H		0.782 nom	19.86 nom
J		0.375 nom	9.52 nom
K	(diameter)	$0.505 \pm 0.002$	$12.83 \pm 0.05$
L	(threading slot)	0.060 nom	1.52 nom
M		0.75 min	19.0 min
N	(flange thickness)	0.27 nom	6.9 nom

NOTE: Dimensions of other reels are specified in American National Standard Dimensions of 35-mm Motion-Picture Projection Reels, PH22.4-1976; Dimensions

of Shipping Reels for 35-mm Motion-Picture Prints, PH22.192-1976; and Dimensions of Large-Capacity Reels for 35-mm Motion-Picture Projection, PH22.193-1976.

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. Specifications for the reels are based on good engineering design of film winding equipment and on minimum tension variation between hub and rim. For the usual uncompensated, constant torque slip take-up, complete interchangeability may require some adjustment in the take-up and hold-back tensions of the projector when changing between 70- and 35-mm films to maintain the 5:4 ratio in running speeds.

hole to facilitate placing the reel on the spindle. The degree of chamfer should be in accordance with good engineering practice, and should not reduce the bearing surface of the spindle hole on the spindle to the point of endangering reel stability.

A3. A 2400-ft (732-m) capacity reel having an overall flange diameter of  $16.87 \pm 0.03$  in ( $428.5 \pm 0.8$  mm) and a hub diameter of  $5.00 \pm 0.03$  in ( $127.0 \pm 0.8$  mm) is also in general use.

A2. In designing reels of the size and weight described in this standard, it is the practice to chamfer the spindle

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# American National Standard dimensions of shipping reels for 35-mm motion-picture prints

Approved December 30, 1976  
Secretariat: Society of Motion Picture and Television Engineers

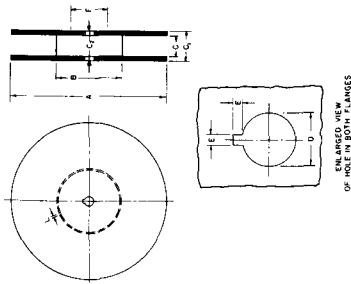
Page 1 of 2 pages

## 1. Scope

This standard specifies the dimensions of shipping reels for 35-mm motion-picture prints having a nominal film capacity of 1000 and 2000 ft (305 and 610 m).

## 2. Dimensions

- 2.1** The dimensions shall be as given in the figure and table.
- 2.2** Dimension F defines the area over which the reel thickness, specified by Dimension C, applies.



Dimensions	Inches	Millimeters
A 1000 ft (305 m)	9.90 ± 0.00	251.5 ± 0.0
A 2000 ft (610 m)	14.50 ± 0.03	368.3 ± 0.8
B 1000 ft (305 m)	1.95 ± 0.10	49.5 ± 2.5
B 2000 ft (610 m)	4.10 ± 0.15	104.1 ± 3.8
C	1.53 ± 0.03	38.9 ± 0.8
C <sub>1</sub>	1.885 ± 0.030	47.88 ± 0.76
C <sub>2</sub>	1.625 ± 0.030	41.28 ± 0.76
D	0.317 ± 0.002	8.05 ± 0.05
E	0.150 ± 0.010	3.81 ± 0.25
F	2.25 min	57.2 min
L	0.035 nom	0.89 nom

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NOTE: Dimensions of other reels are specified in American National Standard Dimensions of 35-mm Motion-Picture Projection Reels; PH22.4-1976; Dimensions of Motion-Picture Projection Reels for Combination 70/35-

mm Projectors, PH22.147-1976; and Dimensions of Large-Capacity Reels for 35-mm Motion-Picture Projection, PH22.193-1976.

## Appendix

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The use of shipping reels with small hubs (those resulting in a flange-to-hub ratio of 3:1 or greater) on projectors already adjusted for reels with large hubs (flange-

to-hub ratio of 3:1 or less) can subject film tension to drastic increases which may result in perforation damage by the hold-back sprocket.

# American National Standard dimensions of large-capacity reels for 35-mm motion-picture projection

Approved December 30, 1976

Secretariat: Society of Motion Picture and Television Engineers

Page 1 of 2 pages

## 1. Scope

1.1 This standard specifies the dimensions of large-capacity 35-mm motion-picture projection reels having nominal film capacities of at least 4300 ft (1300 m).

1.2 The standard does not apply to shipping reels.

## 2. Dimensions

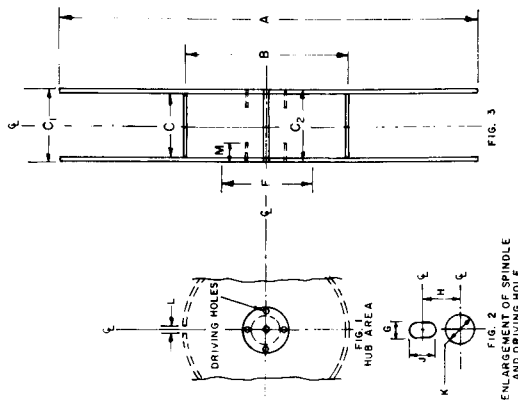
2.1 The dimensions shall be as given in the figures and table.

2.2 Dimension F defines the area over which the reel thickness, specified by Dimension C, applies.

2.3 Dimension M in Fig. 3 indicates a clearance for the driving pin in the reel hub.

2.4 The reels are intended to be used on spindles whose diameter is  $0.500 \pm 0.000$  —  $0.005$  in ( $12.70 \pm 0.00$  —  $0.13$  mm) and to be driven by a drive pin of  $0.250$ -in ( $6.35$ -mm) nominal diameter, engaging in one of the four driving holes.

NOTE: Dimensions of other reels are specified in American National Standard Dimensions of 35-mm Motion-Picture Projection Reels, PH22.4-1976; Dimensions of Motion-Picture Projection Reels for Combination 70/35-



mm Projectors, PH22.147-1976; and Dimensions of Shipping Reels for 35-mm Motion-Picture Prints, PH22.192-1976.

Nominal Capacity	Flange Diameter	Dimensions	Inches	Millimeters
4300 ft (1300 m)	21 in (533 mm)	A	$21.00 \pm 0.06$	$533.4 \pm 1.5$
		B	$7.00 \pm 0.03$	$177.8 \pm 0.8$
5600 ft (1700 m)	24 in (610 mm)	A	$23.70 \pm 0.06$	$602.0 \pm 1.5$
		B	$8.00 \pm 0.03$	$203.2 \pm 0.8$
5800 ft (1775 m)	$24\frac{1}{2}$ in (622 mm)	A	$24.50 \pm 0.06$	$622.3 \pm 1.5$
		B	$8.00 \pm 0.03$	$203.2 \pm 0.8$
		C	$1.530 \pm 0.030$	$38.86 \pm 0.76$
		C <sub>1</sub>	$1.885 \pm 0.075$	$47.88 \pm 1.90$
		C <sub>2</sub>	$1.625 \pm 0.175$	$41.28 \pm 4.44$
		F	$2.25$ min	$57.2$ min
		G	$0.265 \pm 0.002$	$6.73 \pm 0.05$
H	$0.782$ nom	$19.86$ nom		
J	$0.375$ nom	$9.52$ nom		
K	$0.505 \pm 0.003$	$12.83 \pm 0.08$		
L	$0.035$ nom	$0.89$ nom		
M	$0.75$ min	$19.0$ min		

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

**A1.** Specifications for the reels are based on good engineering design of film winding equipment and on minimum tension variation between hub and rim. Film tension in a projector feed and take-up mechanism should be kept low to avoid perforation damage. In order to maintain low tension where a constant-torque clutch device is used, it is necessary to keep the quotient B/A (hub diameter B divided by flange diameter A) as large as possible. In this standard, the quotient is 0.333, which maintains the initial film tension to final film tension within the 3:1 ratio.

**A2.** In designing reels of the size and weight described in this standard, it is the practice to chamfer the spindle

hole to facilitate placing the reel on the spindle. The degree of chamfer should be in accordance with good engineering practice, and should not reduce the bearing surface of the spindle hole on the spindle to the point of endangering reel stability.

**A3.** Although this standard does not preclude reels of other diameters or design, the rim-to-hub ratio referred to in A1 remains a factor of consideration for any projector with an uncompensated constant-torque clutch in the feed or take-up mechanism.

**A4.** To minimize perforation damage, projector operators using large-capacity reels are cautioned against allowing film slack to accumulate.

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