

totally forgotten how to maintain it because he hasn't seen it for six months. The answer that the CBC had to come up with about a year ago was to establish a "fireman" squad, on duty 24 hours a day, that travels across Canada back and forth to help people. It is difficult, but we think we will lick the problem.

**Mr. Luther:** The problem could be solved perhaps by making the equipment less reliable? [laughter]

**Mr. Rainger:** I'd like to mention something which happened almost accidentally in the BBC, where there was this problem exactly. We had a man designing equipment to monitor broadcasting services. They were very complicated digital devices and presented just this sort of maintenance problem. And it became known that "Harry" designed this equipment, so everybody rang up Harry when it went wrong.

After a time, they began to use a teletype to get answers to their maintenance problems. Now, it occurs to me that the next step along the road is to write a computer pro-

gram which has diagnostic routines built into it; that seems relatively easy to do. Now anybody can ring up this computer and the computer can print out the answer.

**Mr. Diermann:** I would like to put a little bit of oil on the water of maintainability of digital equipment. Yes it's true, as Marcel Auclair said, that when the performance of a piece of digital equipment decays, you won't know about it for quite a while because the error correction works harder and harder until all of a sudden it crashes. There is no graceful decay; it decays very, very fast. On the other hand, the service and maintenance of digital equipment — even if you don't have diagnostics — is indeed a great deal easier. We have a piece of digital videodisk recording equipment in our product line, and we definitely notice that it's much easier to bring up the signal system to working condition, because you simply have to ask the question, "Does it go or doesn't it go?" There is nothing in between. So I think we are making a mistake if in general we associate digital

equipment with an increased degree of difficulty of maintenance.

**Mr. West:** that may very well be the last word. I want, on behalf of the audience, to thank the panel, and on behalf of the panel, to thank the audience. At this point, I'd like to turn the microphone over to Fred Remley who has a few closing remarks for the conference. Fred?

**Mr. Remley:** Thank you, Don. I think we should take an opportunity to acknowledge the effort on the part of the San Francisco section that went into planning this conference. Don Lincoln had to leave early to inspect his transmitter tower, but Carlos Kennedy is still here. Carlos, of course, is responsible for this excellent program and Don for the general arrangements. I think the 820 persons who registered for the conference all agree that it seems much longer than just two days, but at the same time we have learned more than we would learn in any normal two-day period, and that's good. I thank you all. We'll see you in Toronto next year. Good afternoon.

# Standards & Recommended Practices

## Proposed American National Standards

Proposed revisions of three American National Standards are published here for a trial period and public review: PH22.161, Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film; PH22.162, Dimensions of Magnetic Striping of 16-mm Motion-Picture Film Perforated 8 mm Type S, (1-4); and PH22.163, Dimensions of Magnetic Striping of 35-mm Motion-Picture Film Perforated 8-mm Type S, 5R.

Comments should be addressed to Alex E. Alden, manager of Engineering Services, at Society Headquarters before 1 October 1979. The proposals have been submitted to American National Standards Committee PH22. All comments received through *Journal* publication will be reviewed prior to conclusion of action by that committee.

## Reaffirmed American National Standards

The American National Standards Institute approved reaffirmation of four American National Standards on 9 May 1979: PH22.76-1960, Threaded Lens Mounts for 16-mm and 8-mm Motion-Picture Cameras; PH22.94-1973, Dimensions of Image Areas and Mounts for Slides and Opaques for Television; PH22.117-1968, Spectral Diffuse Density of Photographic Sound Record on Three-Component Subtractive Color Films; and PH22.181-1973, Location of Super 8 Printed Area on 16-mm Motion-Picture Film, Perforated Super 8 (1-3). — Alex E. Alden, Manager of Engineering Services

## Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film

PH22.161  
Revision of  
PH22.161-1968

### 1. Scope

This standard specifies the location and dimensions of the magnetic recording stripe and the balance stripe applied to 8-mm motion-picture film with one row of 8-mm Type S perforations.

### 2. Dimensions

2.1 The location and dimensions of the magnetic recording stripe and the balance stripe shall be as given in the figure and table.

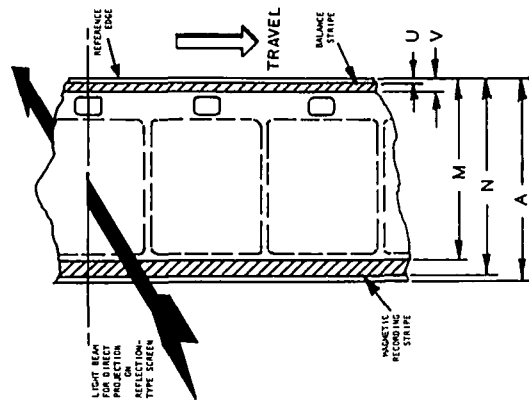
2.2 The magnetic stripe shall be on the side of the film which will be toward the light source when used on a projector arranged for direct front projection on a reflection-type screen.

2.3 The magnetic stripe shall be adjacent to the unperforated edge and is intended for the sound record. The narrow stripe adjacent to the perforated edge is a balance stripe. The balance stripe may be a stripe of magnetic or non-magnetic material of such thickness that the balance and recording stripes project above the surface of the film to substantially the same degree.

### 3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 8-mm Motion-Picture Film Perforated 8-mm Type S (Super 8), 1R, PH22.149-1975.

NOTE: Notwithstanding the tolerance on Dimensions M and N, the width of the stripe, Dimension N minus M, shall be 0.0250 in (0.635 mm) minimum.



Film As Seen Looking Toward Lens

Dimensions	Inches	Millimeters
A	0.314	nom 7.98
M*	0.285 ± 0.002	7.24 ± 0.05
N*	0.312 ± 0.002	7.92 ± 0.05
U	0.003 ± 0.003	0.08 ± 0.08
V	0.015 ± 0.003	0.38 ± 0.08

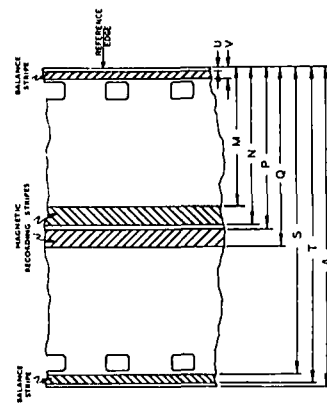
\*See Note.

## Dimensions of Magnetic Striping of 16-mm Motion-Picture Film Perforated 8-mm Type S, (1-4)

PH22.162  
Revision of  
PH22.162-1968

### 1. Scope

This standard specifies the location and dimensions of the magnetic recording stripes and the balance stripes applied to 16-mm motion-picture film with two rows of 8-mm Type S perforations in positions 1 and 4.



### 3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated Super 8, (1-4), PH22.168-1973.

NOTE 1: Tolerances for the recording stripes are specified to permit usage of a single wide stripe or two separate stripes. If two stripes are used, the amount of separation between the stripes should be sufficient to permit slitting within the requisites of the standard without obtaining undesirable feather edges of magnetic material. The separation required is determined by laboratory practice.

NOTE 2: Notwithstanding the tolerance on Dimensions M and N, the width of the stripe, Dimension N minus M, shall be 0.0250 in (0.635 mm) minimum.

Dimensions	Inches	Millimeters
A	0.628	nom 15.95
M*	0.285 ± 0.002	7.24 ± 0.05
N*	0.312 ± 0.002	7.92 ± 0.05
P†	0.316 ± 0.002	8.02 ± 0.05
Q	0.343 ± 0.002	8.71 ± 0.05
S	0.613 ± 0.003	15.57 ± 0.08
T	0.625 ± 0.003	15.88 ± 0.08
U	0.003 ± 0.003	0.08 ± 0.08
V	0.015 ± 0.003	0.38 ± 0.08

\*See Note 2.

†The millimeter conversion is approximate to that Dimension P minimum equals Dimension N maximum.

# Dimensions of Magnetic Striping of 35-mm Motion-Picture Film Perforated 8-mm Type S, 5R

PH22.163  
Revision of  
PH22.163-1968

### 1. Scope

This standard specifies the location and dimensions of the magnetic recording stripes and the balance stripes applied to 35-mm motion-picture film with four rows of 8-mm Type S perforations and one row of special perforations.

### 2. Dimensions

**2.1** The location and dimensions of the magnetic recording stripes and balance stripes shall be as given in the figure and table.

**2.2** The magnetic striping material shall be applied to the surface of the film away from a camera or projector lens, for example, toward the light source of a projector arranged for direct front projection on a reflection-type screen.

**2.3** The stripes designated as "recording" are made of a magnetic material and are intended for the sound record. The balance stripes may be stripes of magnetic or nonmagnetic material of such thickness that the balance and recording stripes project above the surface of the film to substantially the same degree.

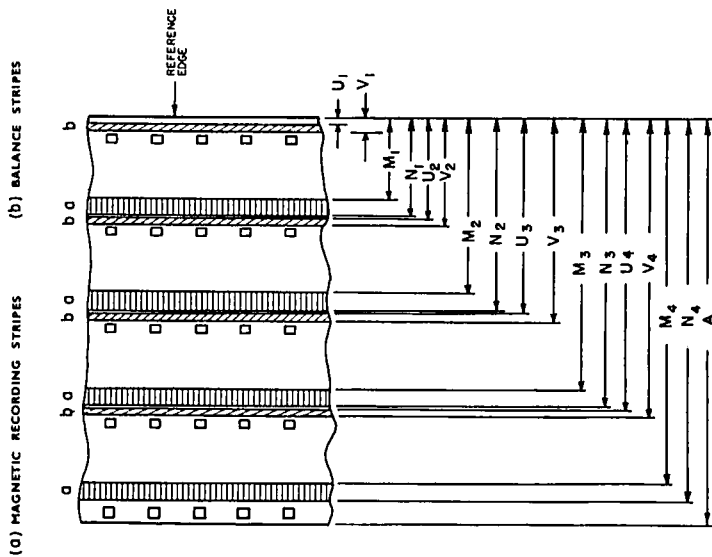
### 3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 35-mm Motion-Picture Film Perforated Super 8, 5R-1667 (1-3-5-7-0), PH22.165-1973.

**NOTE 1:** The width and edge-to-perforation distance of the 8-mm slit strip shall be in accordance with ANSI PH22.165-1973. The location of the magnetic recording and balance stripes shall be in accordance with Proposed American National Standard Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film, PH22.161. Consequently, it is not possible to take full advantage of the tolerance of both the slit width and the location of the magnetic recording and balance stripes.

**NOTE 2:** Tolerances for the recording stripes and balance stripes are specified to permit usage of a single wide stripe or two separate stripes where they are adjacent. If two stripes are used, the amount of separation between the stripes should be sufficient to permit slitting within the requisites of the standard without obtaining undesirable feather edges of magnetic material. The separation required is determined by laboratory practice.

**NOTE 3:** Notwithstanding the tolerance on Dimensions  $M_1$ ,  $N_1$ ,  $M_2$ ,  $N_2$ ,  $M_3$ ,  $N_3$ ,  $M_4$ , and  $N_4$ , the width of the stripe, Dimension  $N$  minus  $M$ , shall be 0.0250 in (0.635 mm) minimum.



Dimensions	Inches	Millimeters
A	1.377 nom	34.98 nom
$M_1^*$	0.315 ± 0.002	8.00 ± 0.05
$M_2^*$	0.629 ± 0.002	15.98 ± 0.05
$M_3^*$	0.943 ± 0.002	23.95 ± 0.05
$M_4^*$	1.257 ± 0.002	31.93 ± 0.05
$N_1^*$	0.342 ± 0.002	8.69 ± 0.05
$N_2^*$	0.656 ± 0.002	16.66 ± 0.05
$N_3^*$	0.970 ± 0.002	24.64 ± 0.05
$N_4^*$	1.284 ± 0.002	32.61 ± 0.05
$U_1$	0.033 ± 0.003	0.84 ± 0.08
$U_2$	0.347 ± 0.003	8.81 ± 0.08
$U_3$	0.661 ± 0.003	16.79 ± 0.08
$U_4$	0.975 ± 0.003	24.76 ± 0.08
$V_1$	0.045 ± 0.003	1.14 ± 0.08
$V_2$	0.359 ± 0.003	9.12 ± 0.08
$V_3$	0.673 ± 0.003	17.09 ± 0.08
$V_4$	0.987 ± 0.003	25.07 ± 0.08

\*See Note 3.