ball-bearing rollers for extreme sensitivity. The two movements make it possible to obtain very accurate zero positioning.

Magazines and Take-up

The printer is built to receive altered S-series Mitchell magazines, 400 ft, 1000 ft and bipack, either 35mm or 16mm. The 16mm film size is symmetrically placed in the center of the modified 35mm magazines. All magazines are easily attached and removed.

This unique Oxberry mechanism utilizes an electrical-mechanical system that eliminates the usual problems encountered with spring-belt take-ups. A torque motor is mounted on each of the four spindles. One pair handles forward movement and the other pair handles reverse. The change of operating conditions is accomplished automatically when the printer is shifted from forward to reverse or vice versa. The nondriving pair of motors is electrically energized to provide braking action to keep the film under proper tension. The take-up accommodates 400-ft, 1000-ft or bipack magazines for 35mm or 16mm film. Tension control may be adjusted to provide proper torque. Figure 9 shows how the film travels through the camera and projector.

It is expected that the new concepts employed in the optical, mechanical and electrical systems of this printer, the new features added to it and the major improvements made in its other components will provide greater precision, an increased range of application, and simplified setup and shooting procedures.

motion-picture standards

Proposed American Standards

Two Proposed American Standards, PH22.31, Motion-Picture Safety Film, and PH22.113, 16mm Flutter Test Film, Magnetic Type, are published here for a three-month period of trial and comment.

PH22.31 was initiated by the Film Dimensions Committee as a revision of Z22.31-1946, Motion-Picture Safety Film. Since this standard referred to Z38.3.1-1943, American Standard Definition of Safety Photographic Film, which was replaced by PH1.25-1956, it was thought desirable to revise Z22.31-1946. Published here is a second draft; the first was objected to on the grounds that films having widths greater than 35mm should be included and that it was indefinite as to whether the standard applied to the use or the manufacture of motion-picture film. It should be noted that films having widths greater than 16mm have been excluded for reasons given in the notes of the standard.

PH22.113 is a result of the efforts of the Magnetic Recording Subcommittee which undertook the responsibility of specifying a magnetic sound test film for use in determining the presence of flutter in 16mm magnetic sound reproducers. Work on this standard began in 1952 and after many modifications and comments concerning dimensions, flutter content and film compliance, this version was approved by the members of the Sound and Standards Committees.

All comments should be sent to J. Howard Schumacher, Staff Engineer, prior to May 15, 1958. If no adverse comments are received, the proposals will then be submitted to ASA Sectional Committee PH22 for further processing as American Standards.—*J.H.S.*

Proposed American Standard

Motion-Picture Safety Film

PH22.31

Rev. Z22.31-1946

1. Scope

1.1 This standard specifies the American Standard defining safety photographic film and the motion-picture films which shall comply with this standard.

2. Safety Film

2.1 The term "safety film" as applied to motion-picture film shall comply with American Standard PH1.25-1956, Definition of Safety Photographic Film, or the latest revision thereof approved by the American Standards Association, Incorporated.

2.2 All motion-picture and magnetic film, regardless of width, shall be manufactured so as to meet the definition of safety photographic film.

2.3 Only safety film shall be made available for and used in 16mm and 8mm motion-picture cameras and projectors.

NOTES

1. *35mm nitrate motion-picture film is no longer* manufactured in the U.S. However, there are existing nitrate films still in use or in storage and there are others existing or of future manufacture which may be imported. There is no intent in this standard to limit the use of such 35mm nitrate films, but by designating them as "nonstandard" it is intended to emphasize that the hazard involved in their handling requires the observance of adequate precautions and safeguards. (See "Standards of the National Board of Fire Underwriters for Storage and Handling of Cellulose Nitrate Motion Picture Film as Recommended by the National Fire Protection Association," NBFU Pamphlet No. 40, November 1953.)

2. Nitrate film, because of its attendant fire hazards, has never been manufactured in the U.S. in the 16mm and 8mm widths since these are traditionally for amateur and nontheatrical use. However, small quantities of nitrate film may be in existence as a result of foreign import or from slitting operations of certain intermediate laboratory processing films. The purpose of ¶2.3 is therefore to classify and designate as nonstandard the handling or use of all such film.

NOT APPROVED

Proposed American Standard

16mm Flutter Test Film, Magnetic Type

PH22.113

1. Scope

This standard specifies a 3000 cps magnetic sound test film for use in determining the presence of flutter in 16mm magnetic sound reproducers.

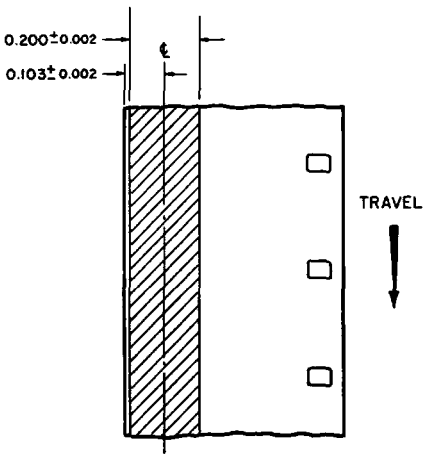
2. Test Film

2.1 The test film shall have an originally recorded, 200-mil width, magnetic sound record, the location and dimensions to be in accordance with American Standard PH22.97-1956, 200-Mil Magnetic Sound Record on 16mm Film, Perforated One Edge, or the latest revision thereof approved by the American Standards Association, Incorporated, and as shown in the drawing.

2.2 The recorded frequency shall be 3000 ± 25 cps with a film rate of 24 perforations per second (approximately 36 ft per minute).

2.3 The recording shall be made at 100% modulation level with a tolerance of + 0 — 2 db. 100% modulation is defined as the recording head current at which 3% total harmonic distortion occurs at a signal frequency of 1000 cps.

2.4 The total rms flutter of the sound recorder shall not exceed 0.1% and the flutter amplitude, at any single flutter rate, shall not exceed 0.05% (as defined in American Standard Z57.1-1954, Method of Determining Flutter Content of Sound Recorders and Reproducers, or the latest revision thereof approved by the American Standards Association, Incorporated).



3. Film Stock

The film stock shall be of the low-shrinkage safety type, cut and perforated in accordance with American Standard PH22.12-1953, Dimensions for 16mm Film, Perforated One Edge, or the latest revision thereof approved by the American Standards Association, Incorporated.

4. Length of Film

The film shall be supplied in 100-ft and 400-ft lengths.

5. Identification

The film shall have identification markings at both ends.

APPENDIX

(This Appendix is not a part of Proposed American Standard 16mm Flutter Test Film, Magnetic Type, PH22.113, but is included to facilitate its use.)

It is recognized that there are certain desirable features in a test film of this kind which will simplify its use in measuring flutter. Because of the variety of flutter measuring meters, one such feature is reasonable uniformity of the reproduce level throughout the length of the test film. It is recommended that the *long term variations measurable by a VU type meter* shall be less than ± 1 db from the initial level specified in ¶2.3.

Reproduce level variations of short term duration, as for example those resulting from drop-outs, cause some difficulty in the use of this film but these do not lend themselves today to precise manufacturing specifications. It is recommended that the manufacturer exercise the maximum care to minimize these variations.

NOT APPROVED