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.

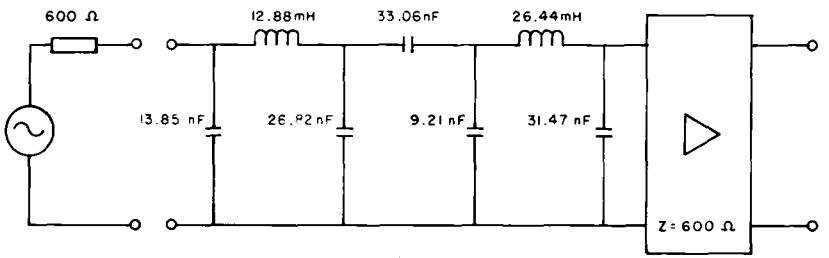

Fig. 3
Sample Weighting Network

SMPTE RECOMMENDED PRACTICE

RP 121-1983

Tape Dropout Specifications for 1-in Types B and C Video Tape Recorder/Reproducer

1. *Scope*

1.1 This practice defines the parameters for tape dropouts encountered in the reproduced FM signal of 1-in Types B and C video magnetic recorder/reproducers.

1.2 This practice is intended as an aid in the evaluation of dropout characteristics of magnetic tape, not as a specification for recorder/reproducer set-up.

2. *Basic Parameters*

Basic parameters of the recorder/reproducer are defined in the following documents:

Type B Recorder/Reproducer

Basic parameters	ANSI C98.15M-1980
Carrier frequencies and pre-emphasis	RP 84-1980
Audio frequency response and operating level	ANSI C98.17M-1980
Record dimensions	ANSI C98.16M-1980
Tracking-control record	RP 83-1980

Type C Recorder/Reproducer

Basic parameters	ANSI V98.18M-1983
Audio frequency response and reference level	ANSI C98.20M-1979
Record dimensions	ANSI V98.19M-1983
Video record parameters	RP 86-1979
Tracking-control record	RP 85-1979

3. *Definition*

For the purpose of this document, a dropout is a momentary random reduction of the recovered frequency modulated RF playback signal that is sufficient to cause a substantial impairment in the video output signal of a 1-in Type B or Type C tape recorder/reproducer.

4. *Specifications*

The signal level reduction to be classified as a dropout must be at least 5 microseconds in duration and have an RF level reduction of 16 dB or more.

5. *Measurement Conditions*

When dropout measurements are conducted, the pole tip protrusion and tape tension of the video recorder/reproducer shall be as follows:

Pole Tip Protrusions: Type B 30 ± 5 micrometers; Type C 60 ± 10 micrometers

Tape Tension: Tape tension for the recorder/reproducer shall be in accordance with the manufacturer's published specifications.

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SMPTE RECOMMENDED PRACTICE — RP 120-1983

Measurement of Intermodulation Distortion in Motion-Picture Audio Systems

1. *Scope*

This practice specifies the technique of measuring, by the intermodulation method, the signal distortion introduced by motion-picture audio systems.

2. *Test Method*

2.1 An arrangement of apparatus as shown in Fig. 1 may be used for the measurement of intermodulation distortion.

2.2 The signal supplied to the audio system under test shall consist of a linear combination of a low frequency, nominally 60 Hz; and a high frequency, nominally 7000 Hz. The amplitude of the high-frequency signal shall be 12 ± 1 db below that of the low frequency. The test signals shall be not more than ±3 percent from the nominal frequencies to be used. Neither frequency shall contain more than 0.5 percent harmonic distortion. The peak amplitude of the complex wave at either the input or the output of the audio system under test shall be specified along with the measurement results.

3. *Test Equipment*

3.1 A block diagram of an acceptable intermodulation analyzer is shown in Fig. 2. The output of the analyzer shall be calibrated to provide an indication of percentage modulation of the high-frequency component after removal of the low-frequency component. The meter should be sensitive to modulating frequencies in the range from approximately 10 to 400 Hz.

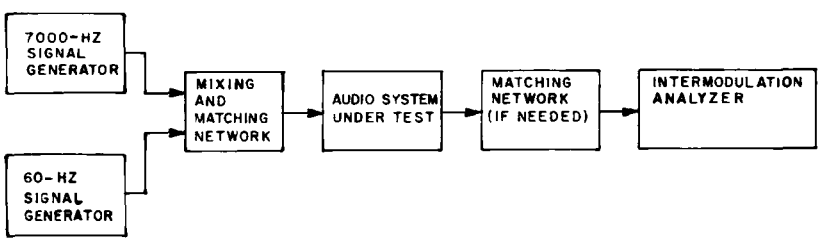

Fig. 1

Arrangement of Intermodulation Test Apparatus to Determine Distortion in Audio Systems

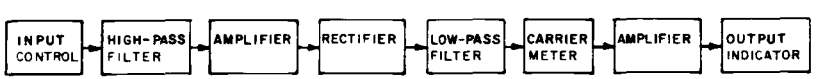

Fig. 2

Acceptable Intermodulation Analyzer

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Appendix

(The Appendix is not a part of this SMPTE Recommended Practice, but is included for information purposes only.)

The method of measuring distortion by intermodulation was originally developed as a means for controlling the quality of variable-density audio tracks. Previous documents described the use of intermodulation tests for this purpose. Variable-density audio tracks have now become obsolete. However, a variation of the original intermodulation test, with a high frequency of 7000 Hz instead of the original 2000 Hz, is commonly used in the measurement of distortion in audio systems. It is this version of the test which is described in this practice. Those wishing to use the intermodulation test for control and evaluation of variable-density audio tracks are urged to consult the references listed below.

References:

Frayne, J. G. and Scoville, R. R. Analysis and measurement of distortion in variable-density recording. J. SMPE. 32: 648-673: 1939 June.

Frayne, J. G. and Wolfe, Halley. Sound Recording. John Wiley & Sons. New York. Chapter 21; 1949.

LeBel, G. J. An experimental study of distortion. J. Aud. Eng. Soc. 2: 215-218; 1954 October.

MacDonald, J. R. The calibration of amplitude modulation meters with a heterodyne signal. Proc. IRE. 32: 1515-1518; 1954 October.

Read, G. W. and Scoville, R. R. An improved intermodulation measuring system. J. SMPE. 50: 162-173; 1948 February.

Warren, W. J. and Hewlett, W. R. An analysis of the intermodulation method of distortion measurement. Proc. IRE. 36: 457-466; 1948 April.

IEC Publication 268-3, Sound System Amplifiers, Clause 20.4, Intermodulation Distortion, pp. 61, 63, and 65.

SMPTE RECOMMENDED PRACTICE — RP 122-1983

Dimensions of Cemented Splices on 8-mm Type S Motion-Picture Film, Projection Type

1. *Scope*

This practice specifies the dimensions of cemented splices on 8-mm Type S motion-picture film primarily intended for projection.

2. *Dimensions*

2.1 The dimensions shall be as given in the figure and table. The position of the splice is defined by Dimensions C and D.

2.2 The film width at the splice shall not exceed 8.08 mm (0.318 in). If the film has been widened during scraping, the extra material shall be removed.

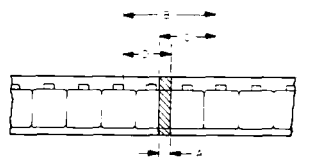
2.3 The spliced films shall not be offset by more than 0.05 mm (0.002 in). Dimension G, as measured by the difference in the alignment of the reference edge side of the perforation holes on either side of the spliced halves.

2.4 The angle between the respective edges of the spliced film shall be 180° ± 8'. Thus, the spliced film shall be aligned to the extent that, when one portion of the film is placed against a straight edge, the other portion will not deviate more than 0.35 mm (0.014 in) in 15.2 cm (6 in).

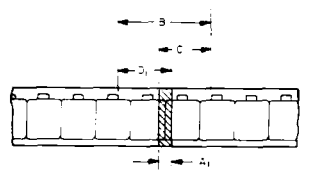
NOTE: The splice should never cut into or include a perforation.

Dimensions	Millimeters	Inches
A	1.40 ± 0.20	0.055 ± 0.008
A_1	1.40 ± 0.38	0.055 ± 0.015
B*	11.53 ± 0.03	0.454 ± 0.001
C	7.19 ± 0.10	0.283 ± 0.004
C_1	6.48 ± 0.18	0.255 ± 0.007
D	5.79 $^{+0.03}_{-0.10}$	0.228 $^{+0.001}_{-0.004}$
D_1	6.48 ± 0.18	0.255 ± 0.007
E	0.30 max	0.012 max
G	0.05 max	0.002 max

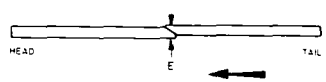
*Dimension B is based on a perforation pitch of 4.23 mm (0.1667 in). Allowance has been made for .2% film shrinkage



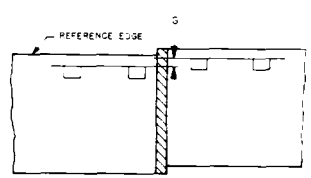
RECOMMENDED SPLICE METHOD



OPTIONAL SPLICE METHOD



OVERALL THICKNESS AT SPLICE



ENLARGEMENT OF ALIGNMENT DIMENSION

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Appendix

(The Appendix is not a part of this SMPTE Recommended Practice, but is included for information purposes only.)

A1. Splices for 8-mm Type S films have been made narrower than conventional 8-mm splices because narrower splices are less conspicuous on the screen and are less likely to affect the usual curvature of the film as it follows the bends in its path through cine machinery.

A2. Dimension B controls the longitudinal registration of the two films being spliced. It is measured to the perforations that are most commonly used for registration on splicing blocks and to the nearer edges of these perforations because they are the edges generally used.

A3. In the figure, the splice is arranged with the perforations at the top in order to show them as they appear on most splicers. Bevelled splices are recommended, especially for films which will be run over magnetic heads. However, if unbevelled overlap splices are made, it is desirable to orient the films in splicing so that a magnetic head scanning the film would, at a splice, drop down onto the trailing film rather than bump up onto it.

A4. The scraped area should be limited as closely as possible to the area covered by the overlapping film, in order to prevent the appearance of a white line on the screen.

A5. Cemented splices are not preferred over taped splices for use in continuous-loop systems.

SMPTE RECOMMENDED PRACTICE — RP 123-1983

Dimensions of Tape Splices on 8-mm Type S Motion-Picture Film, Projection Type

1. *Scope*

This practice specifies the dimensions of mated cut splices on 8-mm Type S motion-picture film made with an adhesive tape and intended only for projection.

2. *Dimensions*

2.1 The dimensions shall be as given in the figures and table and apply to a freshly-made splice.

2.2 The mated cut of the film shall fall within the area defined by Dimensions A, C, and D. However, if the mated cut is not a straight cut made on one frameline, the cut configuration shall intrude into only one of the two adjoining picture frames.

2.3 The spliced films shall not be offset by more than 0.05 mm (0.002 in). Dimension G, as measured by the difference in the alignment of the reference side edge of the perforation holes on either side of the spliced halves.

2.4 The angle between the respective edges of the spliced film shall be 180° ± 8'. Thus, the spliced film shall be aligned to the extent that, when one portion of the film is placed against a straight edge, the other portion will not deviate more than 0.35 mm (0.014 in) in 15.2 cm (6 in).

2.5 Except as described in 2.6 below, the dimensions of the tape applied to secure the splice shall be such as not to interfere with the film dimensions (especially perforations) as specified in American National Standard Dimensions for 8-mm Motion-Picture Film Perforated 8-mm Type S, 1R, ANSI PH22.149-1981, and fall within the area described by Dimension F. The width of the adhesive material should encompass the full width of the film on one side; however, on the second side, it may exclude the perforation area and the sound stripe area.

2.6 If the tape used to form a splice is wrapped around the film, either film edge may be used as the wrap-around edge. However, if the perforated edge is used, it is recommended that the splice add no more than 0.05 mm (0.002 in) to the film width. The overall width of the spliced area should not exceed 8.10 mm (0.319 in). If the film is trimmed after the wrap-around splice has been made, the film width shall not be less than 7.92 mm (0.312 in) and shall not affect the perforated edge of the film. Wrap-around splices are not preferred inasmuch as they interfere with the reproduction of magnetic audio records, and should be used only when additional strength is required such as for continuous-loop systems.

NOTE 1: The splice should have a negligible gap between the mated cuts of the film ends and there should not be any film overlap at the splice. (See Appendix A6.)

NOTE 2: Films joined with tape splices are not acceptable for use as originals in commercial printing operations or those intended for magnetic striping. (See SMPTE Recommended Practice on Dimensions of Cemented Splices on 8-mm Type S Motion-Picture Film, Projection Type, RP 122-1983, for such usage.)

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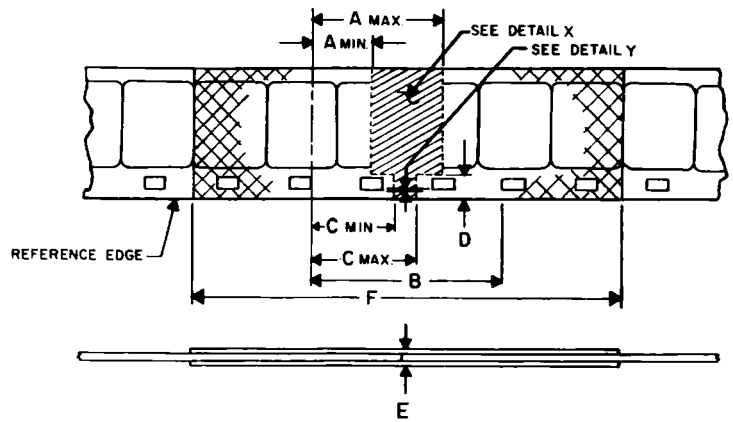
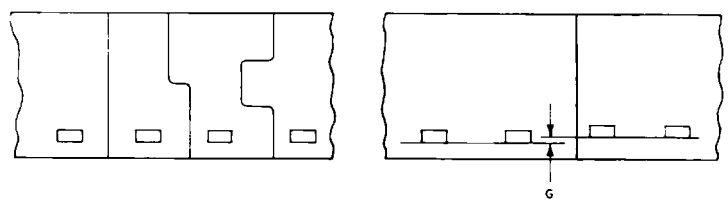


OVERALL THICKNESS AT SPLICE



DETAIL X — TYPICAL SPLICE CUT CONFIGURATIONS

DETAIL Y — ALIGNMENT DIMENSION SPECIFICATION

Dimensions	Millimeters	Inches
A	3.66 min	0.144 min
	7.90 max	0.311 max
B*	11.53 ± 0.03	0.454 ± 0.001
C	5.00 min	0.197 min
	6.55 max	0.258 max
D	1.57 min	0.062 min
E	0.25 max	0.010 max
F	25.4 max	1.00 max
G	0.05 max	0.002 max

*Dimension B is based on a perforation pitch of 4.23 mm (0.1667 in). Allowance has been made for .2% film shrinkage.