5 Track usage

5.1 When a single program record is used, it shall be placed on the audio 1 track.

5.2 When two tracks are used for stereo recording, the left channel shall be recorded on the audio 1 track and the right on audio 2 track.

5.3 A cue signal or time and control code shall be placed on audio 3 track.

6 Program audio head phasing

When the same signal is recorded on two tracks, the tracks shall be so phased that when reproduced with a full-track head, they will be additive.

Annex A (informative)
Bibliography

ANSI/SMPTE 15M-1992, Television Analog Recording — 1-in Type B Helical Scan — Basic System Parameters

SMPTE RECOMMENDED PRACTICE

RP 83-1992
Revision of RP 83-1987

Specifications of Tracking Control Record for 1-in Type B Helical-Scan Television Analog Recording

1 Scope

This practice specifies the recorded relationships among the tracking control signal, the edit pulse signal, and the video signal for 1-in type B helical-scan video tape recordings.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below:

ANSI/SMPTE 16M-1992, Television Analog Recording — 1-in Type B Helical Scan — Records

EIA Industrial Electronics Tentative Standard No. 1, Color Television Studio Picture Line Amplifier Output Drawing

CCIR Report 624-3 (MOD F), Characteristics of Television Systems

3 Dimensions

3.1 The recorded relationships among the tracking control signal, the edit pulse signal, and the video signal shall be as specified in figure 1.

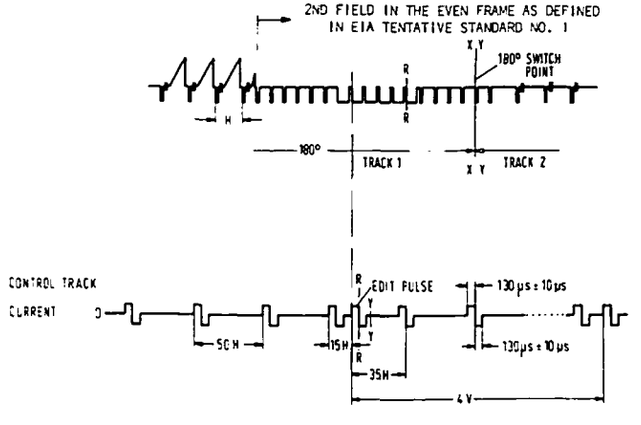

Figure 1 – Position and waveform of control track and edit pulse 525 line–60 field systems (NTSC)

Approved November 1, 1991

3.2 The position of the field synchronizing signal on the video tracks shall be as specified in ANSI/SMPTE 16M-1992.

3.3 The signal recorded on the control track shall consist of a series of tracking pulses and additional editing pulses as indicated in figure 1.

3.4 The polarity of the tracking pulses shall be as follows: If the tracking pulses on the tape are regarded as discrete magnets, the leading part of the pulses constitute a magnet whose south-seeking pole points in the direction of tape motion.

3.5 The amplitude of the control signal current flowing through the recording head shall be such that the tape is driven to the verge of saturation.

3.6 The edit pulse shall be coincident with the second field of the even frame, as defined in EIA Industrial Electronics Tentative Standard No. 1.

3.7 The edit and control pulses shall be 130 μs ± 10 μs in width.

3.8 The rise time of the signal shall be no longer than 10 μs.

Annex A (informative)
Bibliography

ANSI/SMPTE 15M-1992, Television Analog Recording — 1-in Type B Helical Scan — Basic System Parameters

SMPTE RECOMMENDED PRACTICE

RP 84-1992
Revision of RP 84-1987

Reference Carrier Frequencies and Preemphasis Characteristics for 1-in Type B Helical-Scan Television Analog Recording

1 Scope

This practice specifies the video reference frequencies to which the carrier is deviated and the associated video preemphasis for 1-in type B helical-scan television tape recording. (The video deemphasis to be used in reproduction is specified indirectly by requiring a flat input-to-output video response along with a specified preemphasis in recording.)

2 Electrical parameters

2.1 Modulation system

The video information shall be recorded in the form of an rf signal frequency modulated by the video signal. The instantaneous frequencies of the rf signal shall vary linearly with respect to the amplitude of the modulating signal.

2.2 Characteristic frequencies

The instantaneous frequencies of the rf signal corresponding to characteristic levels of the video signal shall be as specified in table 1.

2.3 Preemphasis and deemphasis

The time constants of the video emphasis networks shall be as defined in table 2.

Table 1 – Video levels

Video levels	MHz
Synchronization tip	7.06 nom
Blanking	7.90 ± 0.05
Peak white	10.00 ± 0.05

Table 2 – Time constants

Time constants	ns
t_1	240
t_2	600

Annex A (informative)
Transmission characteristics of the signal chain

The transmission characteristics of the signal chain of a television tape recorder may be defined by one of two methods which are in agreement:

A.1 Definition of the recording chain

For reference purposes, an ideal recording chain is defined as consisting of (a) a modulator having a flat frequency response with respect to the modulating video frequencies, (b) an rf section having a transfer characteristic that produces constant amplitude alternating magnetic flux in the video head pole tips when driven by an alternating signal from the modulator having constant amplitude, and (c) a video preemphasis network inserted before the modulation stage.

The preemphasis is then defined by the frequency and phase characteristic of a network, such as that shown in figure 1, fed from a low-impedance source and feeding a high-impedance load.

The ideal recording chain described above is intended to be taken as a basis for producing reference tapes to be used for the alignment of television tape recorders.

When using present-day recording chains, the following points should be considered:

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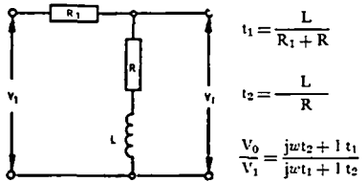
An approximately linear relationship exists between the magnetic flux emanating from the video head pole tips and the rf current flowing through the video head windings.



$$t_1 = \frac{L}{R_1 + R}$$

$$t_2 = \frac{L}{R}$$

$$\frac{V_0}{V_1} = \frac{j\omega t_2 + 1}{j\omega t_1 + 1}\frac{t_1}{t_2}$$

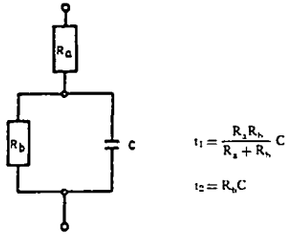
Figure A.1 – Preemphasis

The amplitude of the recording current in the video heads should be such as to produce maximum rf output in replay at the frequency corresponding to mid-gray level.

A.2 Definition of the playback chain

The deemphasis characteristic is introduced following the demodulator in the signal playback circuitry. (To obtain a flat input-to-output video response over the passband of interest, a complementary video preemphasis characteristic is introduced ahead of the frequency modulator stage during recording.)

The video deemphasis curves are defined as the normalized impedance of the two-terminal network, as shown in figure



$$t_1 = \frac{R_a R_b}{R_a + R_b} C$$

$$t_2 = R_b C$$

Figure A.2 – Deemphasis

A.2 where t_1 and t_2 are time constants in microseconds, R is resistance in ohms, and C is capacitance in microfarads.

The deemphasis network is introduced following the demodulator in the signal playback circuitry. (To obtain a flat input-to-output video response over the passband of interest, a complementary preemphasis network is introduced ahead of the frequency modulator stage during recording.)

This definition assumes that all preemphasis and deemphasis are placed in the video portion of the signal path and that the response of the rf portion of the signal path is flat over the passband of interest. Ideally, the magnitude of the remnant flux on a recorded tape should be independent of frequency over the frequency range of interest, but since there is no practical way of measuring it, the most practical approach is to ensure that the recording current in the video heads is independent of frequency over the passband of interest.

Annex B (informative)
Bibliography

ANSI/SMPTE 15M-1992, Television Analog Recording — 1-in Type B Helical Scan — Basic System Parameters

PROPOSED SMPTE STANDARD

SMPTE 154
Revision of
ANSI/SMPTE 154-1988

for Motion-Picture Film (8-mm Type S) —

Projectable Image Area and Projector Usage

1 Scope

1.1 This standard specifies the maximum dimensions of the film image area intended for projection and its relative position to the reference edge and the perforations of 8-mm type S motion-picture film, as specified in ANSI/SMPTE 149.

1.2 This standard also specifies the projection frame rate for 8-mm type S motion-picture film.

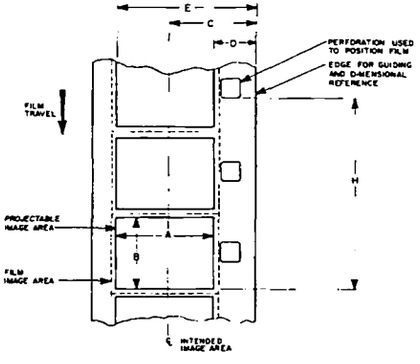
2 Emulsion and film position

2.1 For original reversal film, the emulsion side shall be toward the projection lens. For prints, the emulsion position is dependent upon the process of preparation and either emulsion-to-light-source or emulsion-to-projection-lens *orientation may be encountered. The actual* emulsion position should be indicated on the leader and film container by notation or diagram.

2.2 The perforation used for the film-positioning device shall be two perforations following the perforation adjacent to the projected aperture when the positioning device is at the end of its stroke (the minus-2 position). This location coincides with that of the positioning device required for 8-mm type S camera original films and thereby improves steadiness through cancellation.

3 Dimensions

The dimensions shall be as given in figure 1 and table 1.



NOTE – Film as seen from projector light source looking toward lens.

Figure 1 – Projectable image area

Table 1 – Specifications

Dimensions	Inches	Millimeters
A	0.209 ref	5.31 ref
B	0.158 max	4.01 max
C[1]	0.170 ref	4.32 ref
D	0.063 min	1.60 min
E	0.278 max	7.06 max
H[2]	0.389 nom	9.88 nom

[1] See annex A.1.
[2] See annex A.3.