PROPOSED

SMPTE RECOMMENDED PRACTICE — RP 87

Reference Carrier Frequencies, Pre-emphasis Characteristic and Audio and Control Signals for ¾-in Type A Helical-Scan Video Tape Cassette Recording

1. *Scope*

This practice specifies the reference frequencies for deviation of the frequency modulated carrier and the associated video pre-emphasis characteristic for ¾-in Type A helical-scan video tape cassette recording of 525-line NTSC monochrome and color television signals at a tape speed of 95.3 mm/s (3.752 in/s). In addition, the characteristics of the audio and control signals are specified.

2. *Video Signal*

2.1 Luminance Carrier Frequencies

2.1.1 Reference white level 5.4 ± 0.1 MHz

2.1.2 Reference sync level 3.8 ± 0.2 MHz

2.1.3 Reference white to sync level deviation 1.6 ± 0.1 MHz

2.2 Recording Current Characteristics

2.2.1 FM luminance carrier recording current shall be adjusted to produce maximum playback level. A high-pass filter having the characteristic shown in Fig. 1 shall be inserted into the FM signal path.

2.2.2 The down-converted chrominance signal of the AM chrominance carrier recording shall be 688.374 ± 0.200 kHz. The recording current shall be that at which the playback signal level is 10 to 14 dB below the peak luminance level of color bars at 75% color saturation.

2.3 Luminance Signal Pre-emphasis Characteristics

2.3.1 The pre-emphasis is shown in Graph A and defined as the impedance response of the four-terminal network in Fig. 2.

2.3.2 Pre-emphasis is introduced to the video signal prior to the modulator.

3. *Audio Signal*

3.1 Recording Characteristics

3.1.1 High-frequency time constant of 50 μs

3.1.2 Low-frequency time constant of 3180 μs

3.2 Bias Current. With a sine-wave recording signal of 1 kHz, the bias current shall be increased from the value producing maximum reproduced signal output to a level which results in the signal output dropping 0.5 dB.

3.3 Reproducer Operating Level. The reproducing volume indicator (vu meter) shall deflect to the scale reference level (0 dB) when playing back a tape recorded with a 1000 Hz sine-wave short-circuit tape flux per unit track width of 100 nWb/m.

4. *Control Signal*

4.1 Polarity. A positive-going pulse shall be obtained at the plus terminal of the control-track head on playback where there is a change from south to north in the polarity of the magnetic tape. The reference pulse shall be the positive-going pulse as shown in Fig. 3.

4.2 Recording Current Waveform. The rise time shall be less than 200 μs.

NOTE: In addition to this practice, there is available Draft American National Standard Dimensions and Location of Records for ¾-in Type A Helical-Scan Video Tape Cassette Recording, C98.21.

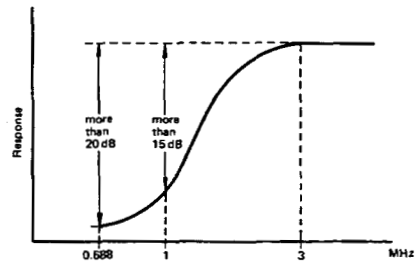
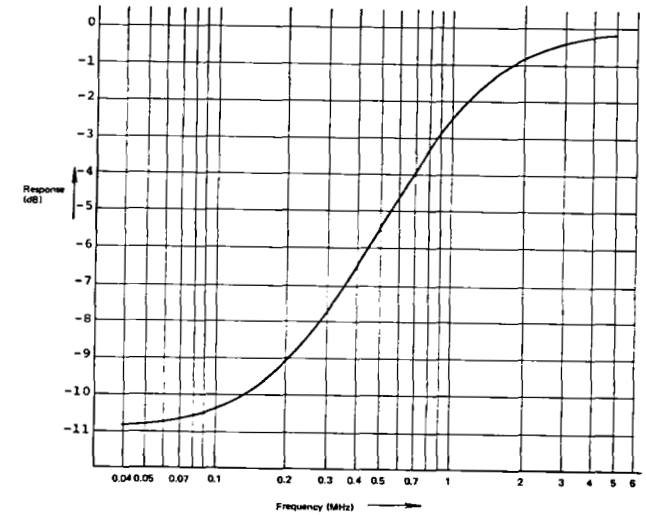
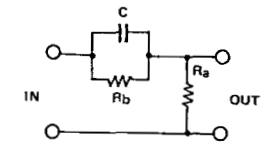


Fig. 1
FM High-Pass Filter

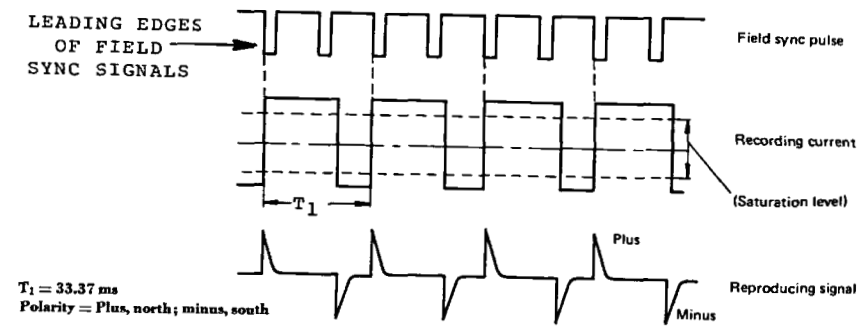


Graph A
Video Pre-emphasis Characteristic Response for Fig. 2



$T = R_aC = 0.60\ \mu s \pm 0.05\ \mu s$
$X = R_a/R_b\ 2.5 \pm 0.3$

Fig. 2



$T_1 = 33.37$ ms
Polarity = Plus, north; minus, south

Fig. 3
Control Signals Waveform and Polarity

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Reference Carrier Frequencies and Pre-emphasis Characteristic for ½-in Type A Helical-Scan Video Tape Recording

1. *Scope*

This practice specifies the reference frequencies for deviation of the frequency modulated carrier and the associated video pre-emphasis characteristic for ½-in Type A helical-scan video tape recording of 525-line NTSC monochrome and color television signals. (The relationship between the pre-emphasis characteristic of the recording circuit and the de-emphasis characteristic of the playback circuit shall be such that the overall video signal frequency characteristics of input and output (recording and playback) are flat.)

2. *Carrier Reference Frequencies*

2.1 This practice is suitable for both color and monochrome signals.

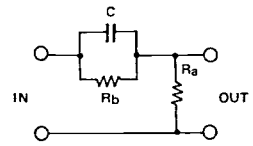
2.2 Recorded FM carrier frequencies for reference video signal levels:

(a) Reference white level 4.5 +0.2 —0.1 MHz

(b) Sync tip level 3.1 +0.2 —0.1 MHz

3. *Pre-emphasis Characteristic*

3.1 The characteristic is described in the figure and defined as the normalized transfer characteristic of the following four-terminal network:



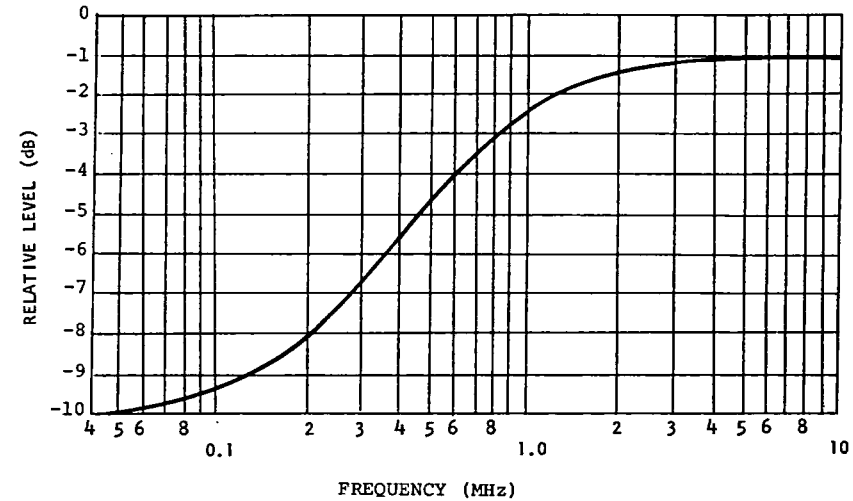
$$T = R_b C = 0.65 \pm 0.05\ \mu s$$

$$X = \frac{R_b}{R_a} = 1.8 \pm 0.3$$

where C is capacitance in farads, R is resistance in ohms, T is time constant in seconds, and X is high-frequency emphasis.

3.2 The pre-emphasis shall be inserted prior to the modulator in the recording circuit. Both the pre-emphasis and de-emphasis circuits for video signals shall be provided in the video signal circuits and the characteristics of the circuits are assumed to be flat within the passband. If the circuit characteristics are not flat, the emphasis may be changed to a value which is considered equivalent to the above-mentioned value.

NOTE: In addition to this practice, there is available Draft American National Standard Dimensions and Location of Records and Basic Electrical Parameters for ½-in Type A Helical-Scan Video Tape Recording, C98.25.



Video Pre-emphasis Characteristic