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SMPTE ENGINEERING GUIDELINE

EG 24-1995

Revision of EG 24-1991

Video and Audio Alignment Tapes and Procedures for 1-in Type C Helical-Scan Television Analog Recorders



Page 1 of 6 pages

1 Scope

This guideline describes the use of a manufacturer's alignment tape(s) intended for aligning type C television analog recorders to SMPTE specifications.

2 Normative references

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

ANSI S4.6-1982 (R1992), Method of Measuring Recorded Flux of Magnetic Sound Records at Medium Wavelengths

ANSI/IEEE 152-1992, Audio Program Level Measurement

ANSI/SMPTE 12M-1995, Television, Audio and Film — Time and Control Code

ANSI/SMPTE 19M-1991, Television Analog Recording — 1-in Type C — Records

ANSI/SMPTE 20M-1991, Television Analog Recording — 1-in Type C Recorders and Reproducers — Longitudinal Audio Characteristics

ANSI/SMPTE 26M-1995, Video Recording — 1-in Helical-Scan Recorders — Raw Stock for Reference Tapes

EIA -189-A, Encoded Color Bar Signal

IEEE Std 205-1958 (R1972), Method of Measurement of Television Luminance Signal Levels

NAB Standard for Magnetic Tape Recording and Reproducing (Reel-to-Reel)

SMPTE RP 85-1991(R1995), Tracking-Control Record for 1-in Type C Helical-Scan Television Tape Recording

SMPTE RP 86-1991 (R1995), Video Record Parameters for 1-in Type C Helical-Scan Television Tape Recording

IEC Publication 94, Magnetic Tape Sound Recording and Reproduction Systems: Dimensions and Characteristics

ITU-R Report 624-4 (MOD F), Characteristics of Television Systems

3 General specifications

3.1 Recorder

The recorder used to record this tape shall comply with ANSI/SMPTE 19M.

3.2 Record dimensions

The dimensions of pertinent records making up this tape shall conform to ANSI/SMPTE 19M.

3.3 Tape stock

The tape stock shall be as specified in ANSI/SMPTE 26M.

3.4 Tracking control signal

The tracking control signal shall conform to SMPTE RP 85, except that the tolerance specified in clause 3.1 shall be tightened to ± 0.4 ms.

3.5 Time and control code

Time and control code, if provided, shall conform to ANSI/SMPTE 12M, and shall be recorded on audio 3 record. The reference flux level for time and control code shall be as defined in ANSI/SMPTE 20M.

4 Audio

4.1 General notes

4.1.1 Test equipment

Properly calibrated test equipment including, but not limited to, an rms voltmeter as specified in ANSI/IEEE 152, or equivalent, is essential for the following tests.

4.1.2 Procedures

All adjustments must be made with due attention to the machine manufacturer's instructions.

4.1.3 Audio calibration

The short circuit tape flux on the tape shall be determined by means of the calibrated short-gap ferromagnetic core reproducer technique. This technique is described in ANSI S4.6 and the following references:

McKnight, J.G. Flux and flux-frequency response measurements and standardization in magnetic recording. *Journal of the SMPTE*. 78(6): 457-472; June 1969.

Lovick, R. C.; Bartow, R. E.; and Scheg, R. F. Recording and calibration of super-8 magnetic reproducer test films. *Journal of the SMPTE*. 78(6): 473-481; June 1969.

4.2 Confidence heads

All audio adjustments should be made to the confidence/monitor heads as well as the main record/play heads to ensure maximum quality in all modes of operation.

4.3 Audio signal specifications

The following specifies the various generic signals which might be used on a tape. If signal other than these are used on a tape, the nature of the actual signals shall be carefully and fully defined.

4.3.1 Recorded audio flux level

The recorded reference level shall conform to ANSI/SMPTE 20M, except that the short circuit flux recorded on the tape of each frequency shall be within ± 0.5 dB of the level specified. The tolerance, ± 0.5 dB, may be extended to ± 2.0 dB provided the manufacturer supplies a calibration chart with the tape (see annex A).

4.3.2 Audio test calibration

The calibration values in decibels furnished with the tapes shall represent the levels to be added algebraically to the reproducer output level when the particular tape is reproduced. With the addition of these values, the output level of the reproducer in decibels will be that which would have resulted if the short circuit flux on the tape at a given frequency had been exactly as specified in ANSI/SMPTE 20M.

4.3.3 Audio flutter

The unweighted flutter content of the recording shall not exceed 0.1% rms, when measured in accordance with NAB Standard for Magnetic Tape Recording and Reproducing (Reel-to-Reel).

4.3.4 Signals

All recorded signals shall conform to ANSI/SMPTE 20M unless otherwise specified.

4.3.5 Reference level tone

The reference level tone shall be 100 Hz $\pm 2\%$ recorded at the reference flux level.

4.3.6 Pink noise

Pink noise, if recorded, shall be 10 dB below reference level.