# SMPTE RECOMMENDED PRACTICE

RP 11-1994
Revision of RP 11-1984

# Tape Vacuum Guide Configuration and Position for Quadruplex Video Magnetic Tape Recording



## 1 Scope

This practice specifies the tape vacuum guide configuration and position for quadruplex video recordings on 2-in magnetic tape, and the test conditions for verifying these parameters.

## 2 Mechanical dimensions

**2.1** The radius of the tape vacuum guide (dimension $R_1$) shall be 1.0334 in + 0.0000 in – 0.0004 in (26.248 mm + 0.000 mm – 0.010 mm).

**2.2** The radius of the entrance contour (dimension $R_2$) shall be 0.156 in + 0.000 in – 0.005 in (3.96 mm + 0.00 mm – 0.13 mm).

**2.3** The arc of the vacuum guide (dimension A) shall be 1.940 in ± 0.005 in (49.28 mm ± 0.13 mm).

## 3 Guide position for recordings

The center of curvature of the vacuum guide shall lie between the axis of rotation of the video pole tips and the vacuum guide (see figure 1). The extension of a line joining the center of curvature of the vacuum guide and the axis of rotation of the heads shall intersect the tape at the midpoint of its width. The distance (eccentricity) between the center of curvature of the vacuum guide and the axis of rotation of the heads shall be zero when the radius $R_1$ has its maximum permitted value (see 2.1) and shall increase by the same amount by which the radius $R_1$ decreases from its maximum permitted value. Table 1 shows an example of such dimensional dependence. The dimensions are based on a nominal tape thickness of 0.0014 in (0.036 mm) and a radius of rotation of the magnetic head pole tips of 1.0329 in minimum to 1.0352 in maximum (26.236 mm minimum to 26.294 mm maximum).

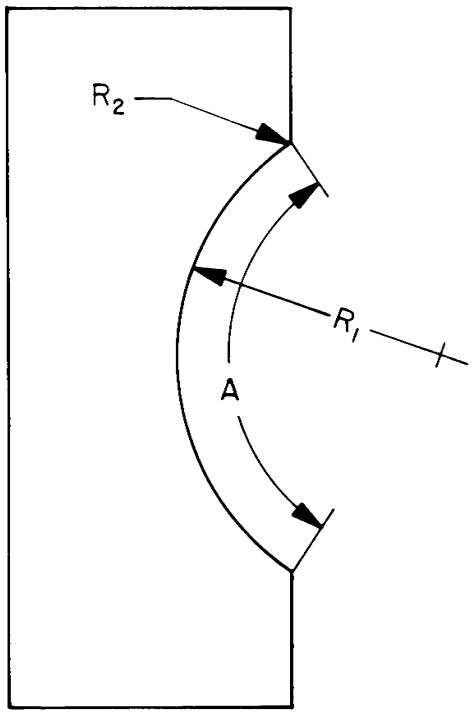


**Figure 1 – Tape vacuum guide configuration**

**Table 1 – Specifications**

| Vacuum guide radius | | Eccentricity | |
|---|---|---|---|
| Inches | Millimeters | Inches | Millimeters |
| 1.0334 | 26.248 | 0.0000 | 0.000 |
| 1.0333 | 26.246 | 0.0001 | 0.003 |
| 1.0332 | 26.243 | 0.0002 | 0.005 |
| 1.0331 | 26.241 | 0.0003 | 0.008 |
| 1.0330 | 26.238 | 0.0004 | 0.010 |



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## 4 Test conditions

Tests and measurements made on the recorder to check the requirements of this practice shall be made under the following atmospheric conditions:

Temperature for drum diameter: 23°C ± 0.5°C (73°F ± 1°F)

Temperature for other tests: 23°C ± 1°C (73°F ± 2°F)

Relative humidity: (50 ± 2)%

Barometric pressure: 86 kPa to 106 kPa (860 mbar to 1060 mbar)

Conditioning before testing: 24 h

**Annex A** (informative)
**Interchangeability**

Achievement of tape reproducing interchangeability requires, among other things, that means be provided to accommodate variations of (a) the radius of rotation of the magnetic head pole tips, (b) the radius of the vacuum guide, and (c) tape thickness. These effects are compensated by the stretching of the tape into a slot cavity in the vacuum guide by virtue of the radius of rotation of the magnetic head pole tips projecting beyond the unstretched oxide surface of the tape as held in the vacuum guide. Over the limits normally encountered, the stretching provides automatic compensation if the vacuum guide is positioned to give the minimum geometric distortion in the reproduced picture.