ANSI V98.31M-1983

American National Standard
for video recording— ¾-in type E helical scan— small video cassette

Approved April 4, 1983

Secretariat: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the dimensions of a video cassette for use with a ¾-in Type E helical-scan video tape recording cassette system, operating at a tape speed of 95.3 mm/s (3.75 in/s).

2. Reference Standard

The following American National Standard is intended to be used in conjunction with this standard:

ANSI C98.21M-1980, Dimensions and Location of Records for ¾-in Type E Helical-Scan Video Tape Cassette Recording

3. Datum Planes

3.1 Datum Plane A is the plane determined by Spots A, B, and C in Fig. 5.

3.2 Datum Plane B is the plane that includes the center of Datum Holes (a) and (b) and is orthogonal to Datum Plane A. Datum Holes (a) and (b) are specified in Fig. 2.

3.3 Datum Plane C includes Datum Hole (a) and is orthogonal to both Datum Planes A and B.

4. Dimensions

4.1 The dimensions necessary for the interface of equipment shall be as specified in the figures and table.

4.2 The metric dimensions are primary.

5. Measurement Environment

The temperature shall be 20 ± 1°C (68 ± 2°F) with a relative humidity of 50 ± 2 percent.

Table 1
Dimensional Tolerances Not Otherwise Specified

Millimeters			Inches		
Over	To	Tolerances	Over	To	Tolerances
0.0	4.0	± 0.2	0.000	0.157	± 0.008
4.0	16.0	± 0.3	0.157	0.630	± 0.012
16.0	63.0	± 0.4	0.630	2.480	± 0.016
63.0	250.0	± 0.5	2.480	9.843	± 0.020

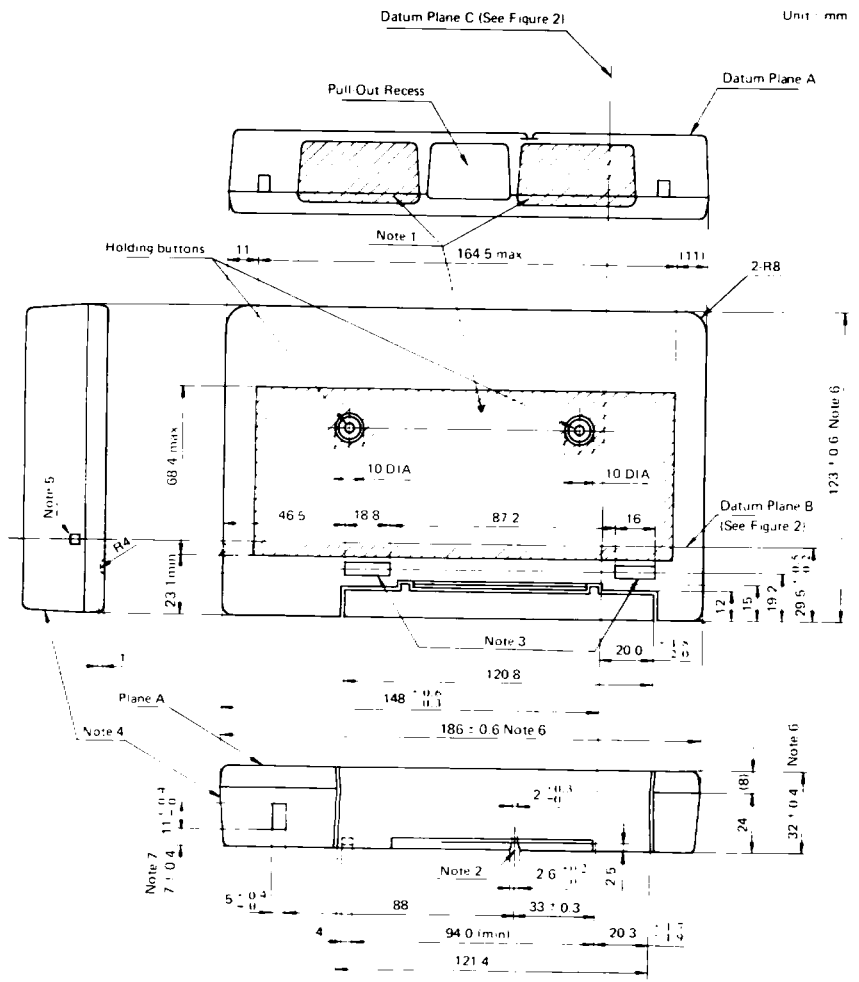

Fig. 1
Top View of Video Cassette

NOTES:

1. Hatched area shows the label area and/or window area.
2. Guide groove.
3. Holding groove.
4. The outer edges should be slanted, but not more than 5° from vertical.
5. An adaptor recess should be on both sides.
6. These dimensions are inspected by using limit gauges.
7. The dimension shall be specified from Datum Plane A. (See Fig. 5.)

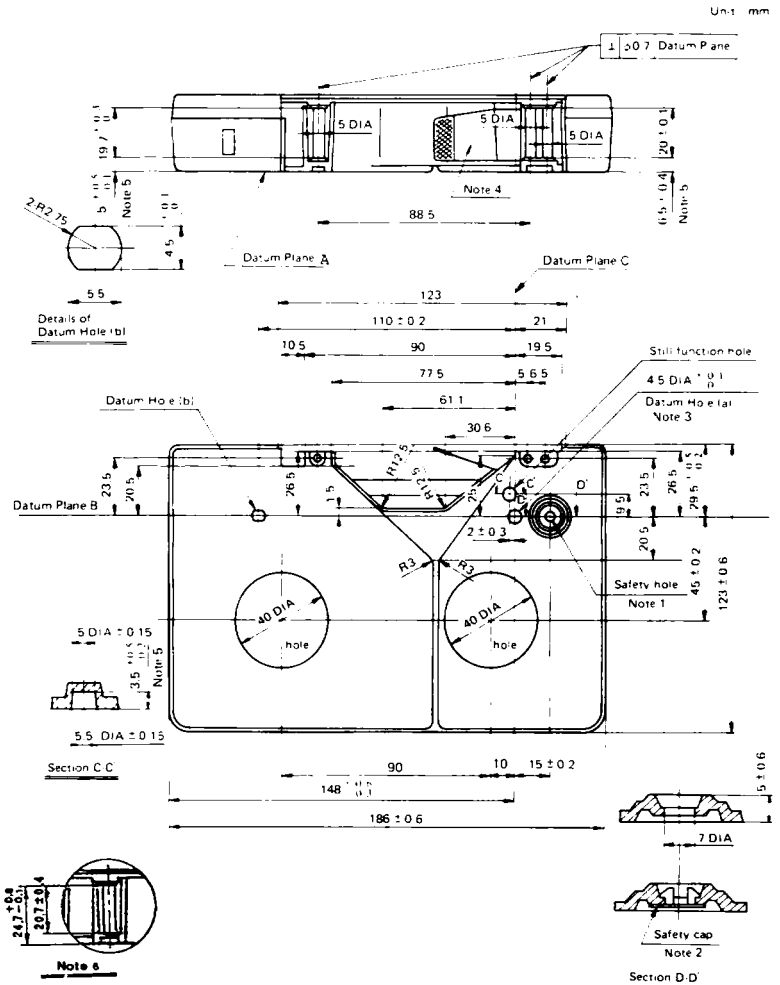

Fig. 2
Bottom View of Video Cassette

NOTES:

1. Recording is possible when the hole is covered.
2. The cap must not protrude from Datum Plane A.
3. Datum Hole (a) is primary.
4. Tape holder.
5. These dimensions are specified from Datum Plane A. (See Fig. 5.)
6. The tape guide of supply side specified in the figure may also be used.

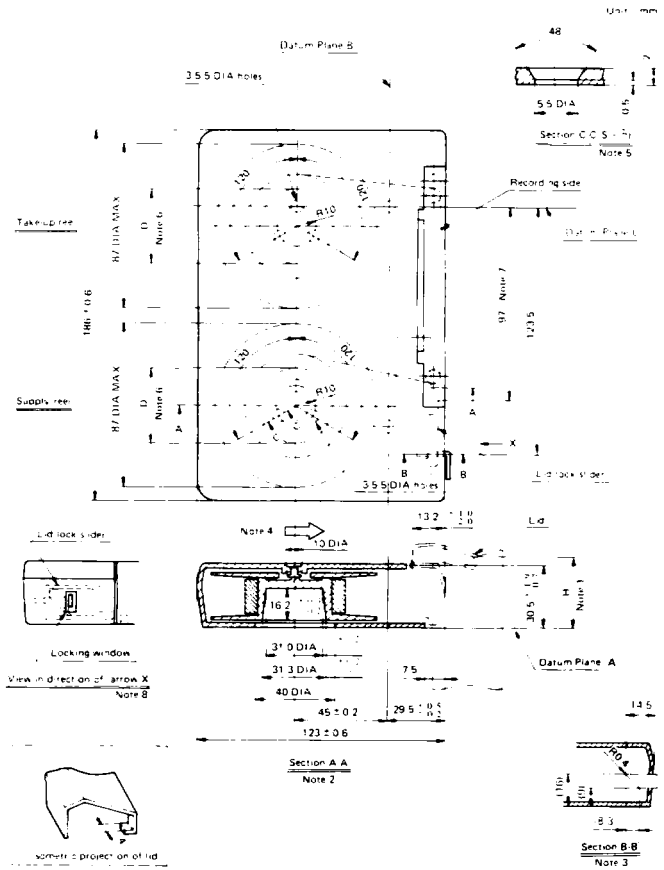

Fig. 3
Location of Reels and Protecting Lid

NOTES:

1. The protecting lid of the cassette shall open (height H) more than 35 mm (1.38 in). Height H is measured from Datum Plane A. Recorder/player unit shall be designed to open the protecting lid (height H) between 30 and 35 mm (1.18 and 1.38 in) during operation.
2. The protecting lid opens as shown in Section A-A' when the cassette is inserted into the recorder/player. Maximum force to open the lid shall be 0.981 N (100 gf).
3. Section B-B' shows the relationship between the cassette and the unlocking lever of the recorder/player.
4. The arrow shows the direction of cassette insertion.
5. Hole for drive pin.
6. The supply and take-up reels are of two types:

   Hub diameter (D) of Type I reels: 38 mm (1.50 in)
   Hub diameter (D) of Type II reels: 59 mm (2.32 in)

7. Distance when the lid is locked.
8. Suggested design.

Unit : mm

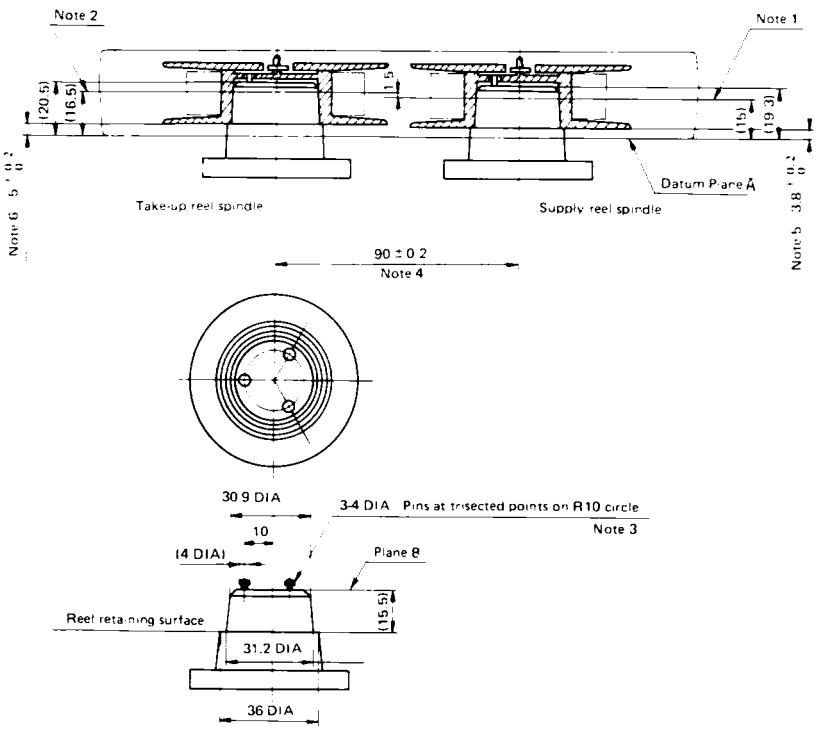

Fig. 4
Relationship between Reels and Spindles

NOTES:

1. Center of tape on supply reel when cassette is inserted in recorder/player.
2. Center of tape on take-up reel when cassette is inserted in recorder/player.
3. Pins of the reel spindle drive the reel and can be pressed down to the level of Plane B.
4. Distance between centers of two reel spindles.
5. Distance between reel retaining surface of supply reel and Datum Plane A of cassete when cassette is inserted in recorder/player.
6. Distance between reel retaining surface of take-up reel and Datum Plane A of the cassette when cassette is inserted in recorder/player.

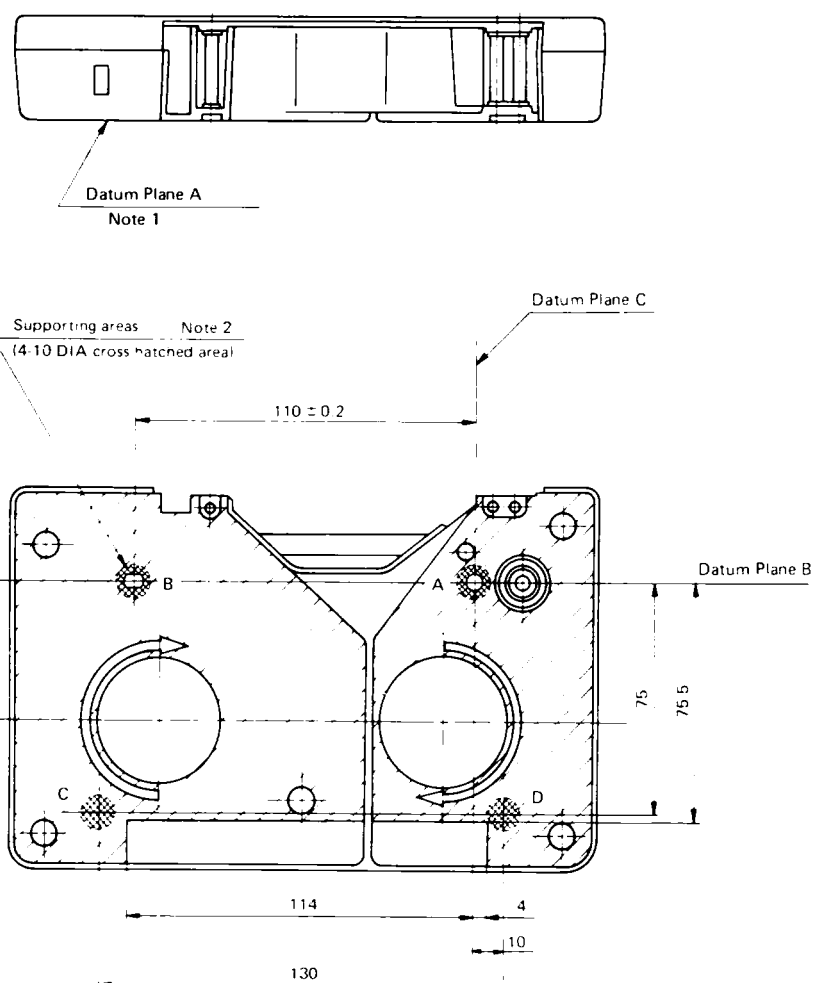

Fig. 5
Flatness of Bottom Surface of Cassette

NOTES:

1. Datum Plane A is determined by Datum Spots A, B, and C.
2. Datum Spot D shall be coplanar within 0.2 mm (0.008 in) of Datum Plane A.
3. Flatness of the hatched area shall be coplanar within 0.5 mm (0.020 in) of Datum Plane A.

ANSI V98.18M-1983
Revision of ANSI C98.18M-1979

American National Standard for video recording— 1-in type C helical scan— basic system and transport geometry parameters

Approved April 4, 1983 Secretariat: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the general video record system, video pole tip locations, scanner parameters, scanner-guide locations, tape tension, and test conditions for 1-in Type C helical-scan video tape recorders operating on the 525/60 monochrome or NTSC color systems.

2. Reference Documents

The following American National Standards and SMPTE Recommended Practices are intended to be used in conjunction with this standard:

ANSI C98.19M-1979, Dimensions and Location of Records for 1-in Type C Helical-Scan Video Tape Recording

ANSI C98.20M-1979, Frequency Response and Reference Level of Recorders and Reproducers for Audio Records for 1-in Type C Helical-Scan Video Tape Recording

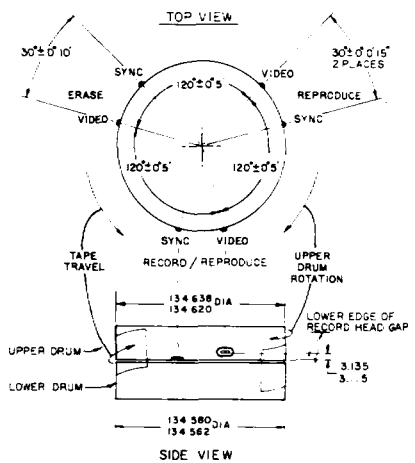

Fig. 1
Pole Tip Locations and Drum Dimensions

The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. The patent holder has, however, filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. Details may be obtained from the publisher.

No representation or warranty is made or implied that this is the only license that may be required to avoid infringement in the use of this standard.

V98.24M, Dimensions of Video Magnetic Tape Reels for 1-in Helical Scan Video Recorders (available from the Society of Motion-Picture and Television Engineers)

ANSI V98.25M-1982, Dimensions of 1-in Video Magnetic Recording Tape

SMPTE RP 85-1979, Tracking Control Record for 1-in Type C Helical-Scan Video Tape Recording

SMPTE RP 86-1979, Video Record Parameters for 1-in Type C Helical-Scan Video Tape Recording

3. General Specifications

3.1 Dimensions in the metric system are primary.

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

Temperature for drum diameter	23 ± 0.5° C
Temperature for other tests	23 ± 1 C
Relative humidity	50 ± 2 percent
Barometric pressure	86 to 106 kPa (860 to 1060 mbar)
Conditioning before testing	24 h

4. Video and Sync Record System

4.1 Exactly one field of video shall be recorded during each scanner revolution. The record shall be divided into two parts, video and sync.

4.2 The video record shall contain all active picture lines and sufficient vertical sync information for playback synchronization. Information not contained in the video record is defined as the vertical-interval dropout. (See ANSI C98.19M-1979.)

4.3 The sync record shall contain a number of horizontal TV lines during the vertical interval including those of the vertical-interval dropout and sufficient overlap of information for playback switching. (See ANSI C98.19M-1979.)

4.4 Recording of the sync record shall be optional; however, no other information shall be recorded in the allotted tape area.

5. Scanner Pole Tips

5.1 There shall be six circumferential pole tip locations as shown in Fig. 1, top-view. When an operational pole tip is not required, a suitable nonfunctional tip shall be placed in the same location.

5.2 Each tip projection shall be 0.06 ± 0.03 mm, measured from the outer surface of the upper drum to the end of the pole tip.

5.3 The axial distance between each video head pole tip and its associated sync head pole tip shall be as shown in Fig. 1, side view.

6. Scanner Guides

6.1 Location of the tape entrance and exit guides shall provide a tape wrap angle such that the video record vertical-interval dropout is 10.00 ± 0.25 horizontal lines due to loss of head-to-tape contact, with no electronic switching of the recording signal. Start and end of the vertical-interval dropout shall be measured at the half-amplitude points of the RF envelope.

6.2 The helix angle formed by the scanner and all associated tape guides shall be 2° 35'29" ± 2".

7. Drum Diameter and Tape Tension

Effective drum diameter, tape tension, helix angle, and tape speed completely determine the video record track angle. Different methods of design and/or minor variations in drum diameter and tape tension will produce equivalent recordings for interchange purposes. Values and operating conditions specified in this standard will produce the reference value of track angle. (See ANSI C98.19M-1979.)

7.1 The actual upper drum diameter shall be 134.620 + 0.018 — 0.000 mm.

7.2 The actual lower drum diameter shall be 134.580 + 0.000 — 0.018 mm.

7.3 The upper drum section shall rotate in synchronism with the video tips.

7.4 The center span tape tension shall be 1.7 ± 0.3 N.