

# **Moving Image Formats and Guides**

# Film Formats - 35mm

## 35mm (1893 - present)

- Base Material – B&W: Acetate, nitrate, polyester plastic film / Color: Acetate or polyester plastic film
- Size: 35mm (1.38") wide

## Risks

- Prone to acetate breakdown/vinegar syndrome;
- Prone to damages like torn sprocket holes, damaged splices, scratches, and mag stock breakdown.



# Film Formats – 9.5mm

## 9.5mm (1922 - 1950s)

- Base Material – Acetate or polyester plastic film
- Size: 9.5mm (0.37") wide

## Risks

- If cellulose acetate is base, prone to acetate breakdown/vinegar syndrome.
- Prone to damages like torn sprocket holes, damaged splices, scratches, and mag stock breakdown.



# Film Formats - 16mm



## 16mm (1923 - present)

- Base Material – Acetate or polyester plastic film
- Size: 16mm (0.63") wide

## Risks

- If cellulose acetate is base, prone to acetate breakdown/vinegar syndrome.
- Prone to damages like torn sprocket holes, damaged splices, scratches, and mag stock breakdown.



# Film Formats - 8mm

## 8mm (1932 - present)

- Base Material – Acetate plastic film
- Size: 8mm (0.31") wide

## Risks

- If cellulose acetate is base, prone to acetate breakdown/vinegar syndrome.
- Prone to damages like torn sprocket holes, damaged splices, scratches, and mag stock breakdown.



# Film Formats – Super 8mm

## Super 8mm (1965 - present)

- Base Material – Acetate or polyester plastic film
- Size: 8mm (0.31") wide

## Risks

- If cellulose acetate is base, prone to acetate breakdown/vinegar syndrome.
- Prone to damages like torn sprocket holes, damaged splices, scratches, and mag stock breakdown.



# Optical Formats – Compact Disc (CD)

## Compact Disc (CD) (1982 - present)

- Base Material – Polycarbonate plastic disc
- Size: 120mm (4.7") diameter; 1.2mm thick

## Risks

- Surface scratches, gouges, and smudges can inhibit playback of the disc.
- Disc rot can occur when aluminum layer oxidizes, leading to the loss of data.
- Should be regularly checked for data degradation.
- Should be stored in cool, dry, and dark conditions.



# Optical Formats – DVD

## DVD (1995 - present)

- Base Material – Polycarbonate plastic disc
- Size: 120mm (4.7") diameter; 1.2mm thick

## Risks

- Surface scratches, gouges, and smudges can inhibit playback of the disc.
- Should be regularly checked for data degradation.
- Should be stored in cool, dry, and dark conditions.





# Video Formats - VHS

- VHS (short for Video Home System) is a standard for consumer-level analog video recording on tape cassettes
- Popular from 1976-1996
- Multiple variations:
  - Super-VHS / ADAT / SVHS-ET / Digital8 / Hi8
  - VHS-C / Super VHS-C / Betamax
  - W-VHS / Digital-VHS (high-definition)



# Video Formats– Betamax

## Betamax (1975 - late 1980s)

- Base Material – Polyester magnetic tape
- Tape width: ½"
- Cassette: 6⅛" × 3¾" × 1"

## Risks

- Susceptible to damage from mold, binder deterioration, and other physical and biological issues.



# Video Formats– Betamax

IDENTIFYING  
MARKS ▶



**PRIMARY USAGE** ▶ The Betamax format was developed for the consumer, industrial, and educational markets. Although Betamax lost in the consumer marketplace in the US, this format was considered to be technically superior to VHS and was used extensively in schools, community media centers, and by artists.

**RISKS** ▶ Due to its sheer age, Betamax is at great risk of signal loss due to problems with the physical material, and from hardware and media obsolescence. See Risks.



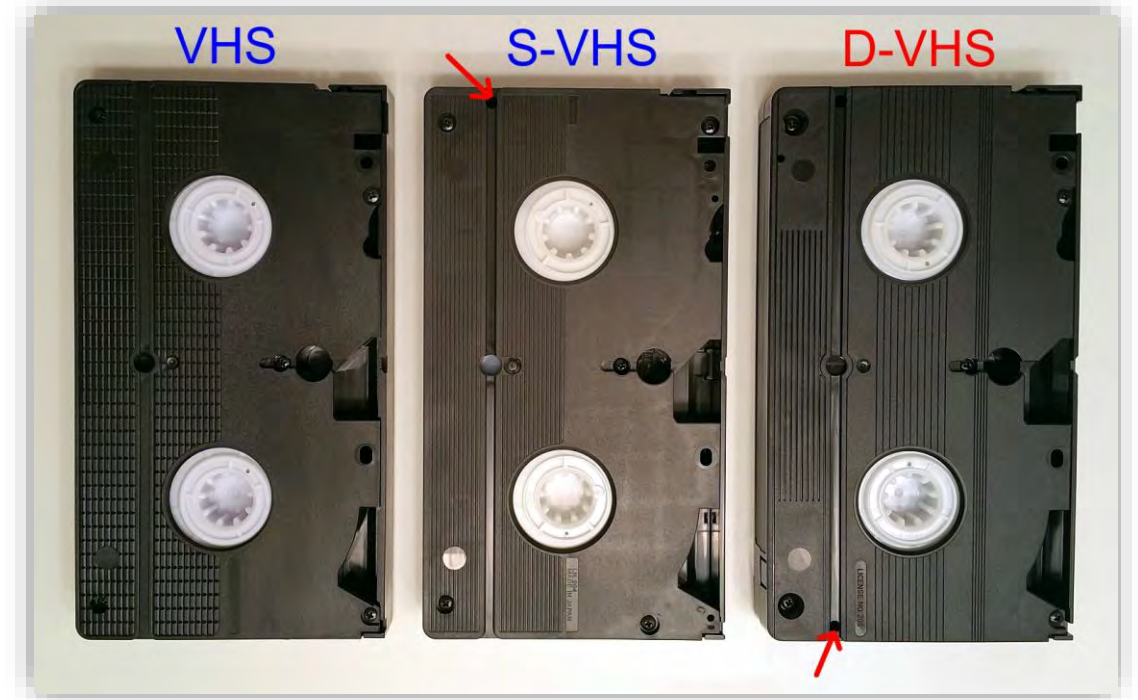
# Video Formats– VHS/S-VHS/D-VHS

## VHS / S-VHS (1976 - present) / (1987 - late 1990s)

- Base Material – Polyester magnetic tape
- Tape width: ½"
- Cassette: 187mm × 103mm × 25mm

### Risks

- Susceptible to damage from mold, binder deterioration, and other physical and biological issues.
- **Older VHS tapes are susceptible to signal loss due to age**



# Video Formats – VHS / S-VHS



S-VHS will not play in standard VHS decks. Users can choose multiple speeds for recording on tapes from 10 – 120 minutes long.

**PRIMARY USAGE** ▶ The VHS format was developed for the consumer market, whereas S-VHS was geared towards consumer, industrial, and educational markets. VHS was initially used as a camera and mastering format, but more recently has been used primarily for distribution (for multiple viewing copies/dubs). S-VHS was also used as a camera and mastering format. In art and education sectors, it was largely supplanted by digital video in the 1990s.



# Video Formats– Betacam/Betacam SP

## Betacam / Betacam SP (1982 - present) / (1986 - present)

- Base Material – Polyester magnetic tape
- Tape width: 1/2"
- Cassette, small: 6 3/4" × 4 3/8" × 1 1/5"
- Cassette, large: 10 5/8" × 6 3/8" × 1 1/4"

## Risks

- Susceptible to damage from mold, binder deterioration, and other physical and biological issues.



# Video Formats – Betacam/BetacamSP



**TAPE PLAYERS/RECORDERS** ▶ BetacamSP (Superior Performance) has technical advantages over Betacam. Betacam decks are no longer in production, but BetacamSP decks continue to be manufactured in a limited line. Betacam and BetacamSP are referred to as 'upward compatible': Betacam tapes can be played in BetacamSP decks, but tapes recorded in BetacamSP will not play in standard Betacam decks. Also, most newer decks in the Betacam family, such as Digital Betacam decks, will play BetacamSP tapes. Betacam and BetacamSP tape stocks are still available.



# Video Formats– Video8 / Hi8

## Video8 / Hi8 (1984 - late 2000s) / (1989 - 2007)

- Base Material – Polyester magnetic tape
- Tape width: 8mm
- Cassette: 3 $\frac{2}{3}$ " × 2 $\frac{3}{8}$ " ×  $\frac{1}{2}$ "

## Risks

- Tape is prone to stretching.
- Hi8 ME tapes are especially prone to durability problems.
- Is susceptible to damage from mold, binder deterioration, and other physical and biological issues.





# Video Formats – Hi8



**RISKS** ► With any newer video format, it is difficult to predict how long this format will be supported. Digital 8 has a marginal market share when compared to mini-DV. In terms of physical characteristics, digital tape has the same issues with deterioration as analog tape. Hi8 are made from thin tape that is subject to stretching. The shorter tapes – 30 and 60 min. - are more durable than the longer tapes. Users have reported dropout soon after the first recording. Metal Evaporated (ME) tape particularly is reported to have durability problems. Unfortunately, due to the size, the decks are not as durable as those of larger formats, are difficult to work on, and thus are more expensive to repair relative to their cost. These factors may affect the availability of decks as these formats are phased out. See Risks.

**CONDITION ASSESSMENT** ► Most Digital 8 can be played back for examination of picture and sound quality; however, if dropout or other tape problems are observed, playback should stop until the point of re-mastering. See Condition Assessment.

**CONSERVATION ACTIONS** ► Although these formats are relatively new, they are fragile and do not appear to have a very long shelf life. The need for re-mastering will need to be evaluated. See Conservation Actions.



# Video Formats– Video8



**PRIMARY USAGE** ▶ The Video8 format was developed for the consumer market, where it was widely used through the late 1980s and 1990s. Hi8 was geared towards consumer, industrial, and educational markets. Usage of Hi8 in industrial and educational markets has decreased as use of digital formats (such as MiniDV) has increased. However, for much of the 1990s, Hi8 was a popular format for artists, community video centers, the media arts, and colleges/universities. In the consumer market Video8 is the lowest cost format, followed by Hi8, with digital formats priced higher. This may account for the format's continuing popularity.



# Video Formats– D-2

## D-2 (1988 - 2000s)

- Base Material – Polyester magnetic tape
- Tape width:  $\frac{3}{4}$ "
- Cassette, small:  $6\frac{3}{4}$ "  $\times$   $4\frac{1}{4}$ "  $\times$   $1\frac{1}{3}$ "
- Cassette, medium:  $10$ "  $\times$   $5\frac{7}{8}$ "  $\times$   $1\frac{1}{3}$ "

## Risks

- Tape is prone to stretching.
- Hi8 ME tapes are especially prone to durability problems.
- Is susceptible to damage from mold, binder deterioration, and other physical and biological issues.



# Video Formats– D-3

## D-3 (1991 - present)

- Base Material – Polyester magnetic tape
- Tape width: ½"
- Cassette: 8¼" × 4⅞" × 1"

## Risks

- Is subject to the same concerns as analog tapes, stretching, breaking, drop-outs, mold, binder deterioration, and unintended recording.
- Is subject to the threat of obsolescence.



# Video Formats

## - D3 Tape



**COMMON MANUFACTURERS/BRANDS** ▶ Panasonic and others.

**TAPE PLAYERS/RECORDERS** ▶ D3 is a relatively new format, so decks are in use, are still being produced and marketed, and are readily available. However, the decks are very expensive so in-house playback is not available within the non-profit cultural community.

**PRIMARY USAGE** ▶ D3 was developed for the high-end professional market, with longer tapes and costs somewhat less than with D2. D3 has been used as a mastering format in such areas as advertising, television programming, and corporate applications. Artists working within a television setting may have mastered to D3.

**RISKS** ▶ It is difficult to predict how long D3 will be supported, considering the "format



# Video Formats– Digital Betacam

## Digital Betacam (1993 - present)

- Base Material – Polyester magnetic tape
- Tape width: ½"
- Cassette, small: 6⅛" × 3¾" × 1"
- Cassette, large: 9⅓" × 5⅔" × 1"

## Risks

- Is subject to the same physical issues as analog tapes—stretching, breaking, drop-outs, mold, binder deterioration, and unintended recording.



# Video Formats– DVCAM

## DVCAM (1996 - present)

- Base Material – Polyester magnetic tape
- Tape width: ¼"
- Cassette, small: 2½" × 1⅞" × ½"
- Cassette, large: 4⅞" × 3" × ½"

## Risks

- Is subject to the same physical issues as analog tapes—stretching, breaking, drop-outs, mold, binder deterioration, and unintended recording.



# Video Formats – DVCAM



## **TAPE VARIATIONS AND/OR IDENTIFYING FEATURES**

► Tapes are generally bluish gray and are labeled as DVCAM in the upper right-hand corner. Large cassettes generally have a black anti-static cover, whereas small cassettes generally have a light blue anti-static cover.

**TAPE PLAYERS/RECORDERS** ► DVCAM is a relatively new format, so decks are in use, are still being produced and marketed, and are readily available.





# Video Formats– MiniDV

## MiniDV (1995 - late 2000s)

- Base Material – Polyester magnetic tape
- Tape width: ¼"
- Cassette: 2½" × 1⅞" × ⅔"

## Risks

- Is subject to the same physical issues as analog tapes—stretching, breaking, drop-outs, mold, binder deterioration, and unintended recording.
- Format's thin tape makes size and durability also a concern



# Video Formats – MiniDV



**TAPE VARIATIONS AND/OR IDENTIFYING FEATURES** ▶ This format was originally called DV, but is commonly known as MiniDV. Tape cassettes are generally labeled in the lower left hand (Sony) or on a sticker on the right side (Panasonic). Note that all MiniDV designations for Panasonic tapes are on stickers or the packaging, and may be covered with labels that list title or production information.

**COMMON MANUFACTURERS/BRANDS** ▶ Sony, Panasonic, and others.



# Video Formats– DVCPPro

## DVCPRO (1995 - present)

- Base Material – Polyester magnetic tape
- Tape width:  $\frac{1}{4}$ "
- Cassette, medium:  $3\frac{4}{5}$ "  $\times$   $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ "
- Cassette, large:  $4\frac{7}{8}$ "  $\times$  3"  $\times$   $\frac{1}{2}$ "

## Risks

- Is subject to the same physical issues as analog tapes—stretching, breaking, drop-outs, mold, binder deterioration, and unintended recording.



# Video Formats – DVCPRO



**PRIMARY USAGE** ► The DVCPRO format was developed by Panasonic for industrial, educational, and professional markets. It is used for electronic news gathering, cable television, and other field production, including independent production. One of the first small digital formats, it was initially popular, but more recently has lost ground to other DV products.



# Video Formats – DVCPro



**RISKS** ▶ The DVCPro format uses the same tape width and compression rate as DVCAM, but the cassette housing is different, and it is not fully compatible with other digital video (DV) products. DVCPro decks will play MiniDV and DVCAM tapes; however, few DVCAM decks will play DVCPro tapes. Considering these “format wars,” the future of DVCPro is unknown. In terms of physical characteristics, digital tape has the same issues with deterioration as analog tape, and the size and durability of DVCPro is a concern. However, DVCPro is a higher quality product than older mini formats, such as Hi8. See Risks.

