

**Library of Congress Television Preservation Hearing  
Warner Bros. Television  
March 26, 1996**

The preservation and protection of television elements is varied and complicated due to the large amount of material and the multiple forms of media that can be used to produce, finish, and deliver programming for television.

The issues relating to public access and specific budgets will not be addressed here as they are Time-Warner and Warner Bros. Corporate matters. However, the following is what Warner Bros. is currently doing to protect and preserve our various television elements.

1. Old Shows (Originating on Black and White Film)

These are protected by black and white fine grain masters most of which are composite, and some of these contain the original commercials as aired. We have the original negatives as well, and in many cases, magnetic masters and/or separate sound track negatives. Many of these classic Warner Bros. shows from the 1950s such as "77 Sunset Strip" and "Maverick" have also been mastered to D-1 digital videotape.

2. Old Shows (Originating on Color Film)

The explosive growth of the international television market has caused an extensive remastering program to be undertaken. New interpositive elements are being created from the original negatives to meet the technical specifications of the program. Therefore, because historically television materials were not protected because of budget constraints, these new interpositives will now be added to the Archive library. This affects series as well as M.O.W.s, and in some cases, perennial classics such as "Roots" are also protected by silver separation Y.C.M.s.

3. Old Shows (Originating on Videotape)

The older 2" and 1" video-originated shows have been re-recorded to D-1 or DCT and any video original material in the library is part of an ongoing process of evaluation and re-recording as necessary.

Any magnetic sound restoration or preservation for film material in the above categories takes place at the Warner Hollywood Sound Archives Facility, which was built for the overall Archives and Preservation program and does both feature and television work.

4. New Production

New production has a comprehensive production standard that must be adhered to. The standard was written with the understanding that it covers not only current production

#### 4. New Production (Continued)

delivery but future asset management and archive issues as well. This includes the use of 35mm negative which must be cut regardless of whether the show was finished on video or not. Guidelines that relate to the use of 3-perf and 16mm (both of which must also be cut), as well as shows that originate on video also have specific standards for both video and audio production and delivery. A current copy of this standard will be attached to this submission for the Library's reference.

A related issue is that of a video-only finish even though the original is photographed on film. The production standard was created partially to ensure that the original negative is cut under almost all conditions. However, Warner Bros. has done tests on shows that we own, almost entirely by acquisition, wherein we successfully completed the reconstruction of uncut negative for shows finished on video, unfortunately, at a very high cost.

#### 5. The Future

As you already know, Warner Bros. has constructed a state-of-the-art Archive Facility on the Burbank lot. The cut original negative and master video elements that are created for television are stored here as well as the materials from the classic television years that we are most fortunate to have.

Additionally, Warner Bros. is exploring the impact and use of new technologies including digital storage systems, new production formats and techniques, technologies in development and ways to solve the problems relating to the preservation and restoration of older video elements due to continuing machine and format obsolescence.

This is being done at Warner Bros. as a comprehensive project that includes all phases of production, distribution, archives, and preservation and the potential use of the emerging new technologies for all of these related areas.

**WARNER BROS.  
SUPER 16mm TV PRODUCTION  
FORMAT POLICY**

**SUPER 16mm TV PRODUCTION FORMAT POLICY**

The required format for delivery of television projects originating on Super 16mm film to Warner Bros. Technical Operations is as follows:

**Super 16mm Film Elements**

Super 16mm can be an acceptable alternative provided that its use has received prior approval from Warner Bros. corporate management and should be shot 1.33:1 protected for 1.78:1 in accordance with Attachment "A". Whether or not the show is finished on videotape, a fully cut A & B negative is required. The A & B negative can be used for simple opticals and a final cut 35mm blow-up composite negative for all other opticals must also be delivered on a prompt basis to assure timely delivery of the PAL transfers. Also, it should be noted that for original PAL transfers from Super 16mm negative, the negative must be cut A & B. The 16mm negative cutting must be accomplished efficiently and economically so as not to adversely affect the savings realized by initially using Super 16mm.

Careful composition in the camera must ensure that such things as electronic repositioning are utilized only when absolutely necessary. When electronic fixes are needed, complete justification as well as documentation of the work performed must be provided upon delivery. This is essential for the proper creation of current PAL masters as well as the re-creation of future format masters. The type of telecine masters must be approved by Warner Bros. Technical Operations. WBTO will provide standard Super 16mm alignment test films to all approved transfer facilities.

**1995/96  
WARNER BROS.  
TV PRODUCTION FORMAT POLICY**

## WARNER BROS. TV PRODUCTION FORMAT POLICY

The required format for delivery of television projects originating on film to Warner Bros. Technical Operations is as follows:

### Film Elements

- A. 35mm 4-perf negative composed in the camera for 1.33:1 but protected for 1.78:1 in accordance with Attachment "A". Whether or not a show is finished on video tape, a fully cut negative including A & B cut negative for simple opticals and a final cut composite negative for all other opticals, must be delivered on a prompt basis to assure timely delivery of the PAL transfers.
- B. The acceptable alternative is a 35mm 3-perf negative shot 1.33:1 protected for 1.78:1 in accordance with Attachment "B". As above, whether or not the show is finished on videotape, a fully cut negative including A&B negative for simple opticals and a final cut composite negative for all other opticals must be delivered on a prompt basis to assure timely delivery of the PAL transfers. The 3-perf negative cutting must be accomplished efficiently and economically so as not to adversely affect the savings realized by initially using 3-perf. Also, since it is a non-standard format, there are additional costs as well as edit list accuracy problems associated with 3-perf that must be addressed.

The reference attachments both have the approval of Panavision and Arriflex and were prepared with their cooperation. This new ground glass specification will be on file with each company.

Whether 3- or 4-perf is used, careful composition in the camera must ensure that such things as electronic repositioning are utilized only when absolutely necessary. When electronic fixes are needed, complete justification as well as documentation of the work performed must be provided upon delivery. This is essential for the proper creation of current PAL masters as well as the re-creation of future format masters. The type of telecine masters must be approved by Warner Bros. Technical Operations. WBTO will provide standard 3-perf and 4-perf alignment test films to all approved transfer facilities.

- C. The use of Super 16mm as a third alternative is only acceptable with the express prior approval of Warner Bros. corporate management and the cut Super 16mm negative must be delivered as in 35mm production. Should the use of Super 16mm be approved, further specifications and information will be provided separately.

### Video Elements

A final edited 525 ("NTSC") component digital master or clone and a 625 ("PAL") recorded component digital master or clone transferred from the cut original negative and recorded in accordance with California Video Center's specifications (Attachment "C"), is to be delivered to California Video Center upon completion of an episode/production. Preferred component

digital formats are Digital Betacam and DCT. D1 will be accepted if selected post-production facility does not have the ability to output video to Digital Betacam or DCT. Regardless of which tape format is used, track configuration is domestic stereo on Tracks 1 and 2 and fully filled foreign music and effects on Tracks 3 and 4. These elements are the primary ones used to meet domestic and foreign distribution requirements.

For taped programs, all editing (on-line) and assembly must be completed in component and on component digital tape (Attachment "C") when available at a selected post-production facility. For the 1995/96 season, D-2 tape (Attachment "D") is acceptable where component digital tape is not available. However, if the program was originally taped on component digital tape, final delivery must also be on component digital tape and all editing must be done in digital component. Track configuration is the same as above. Also as above, all music and effects tracks must be fully filled to meet foreign delivery requirements.

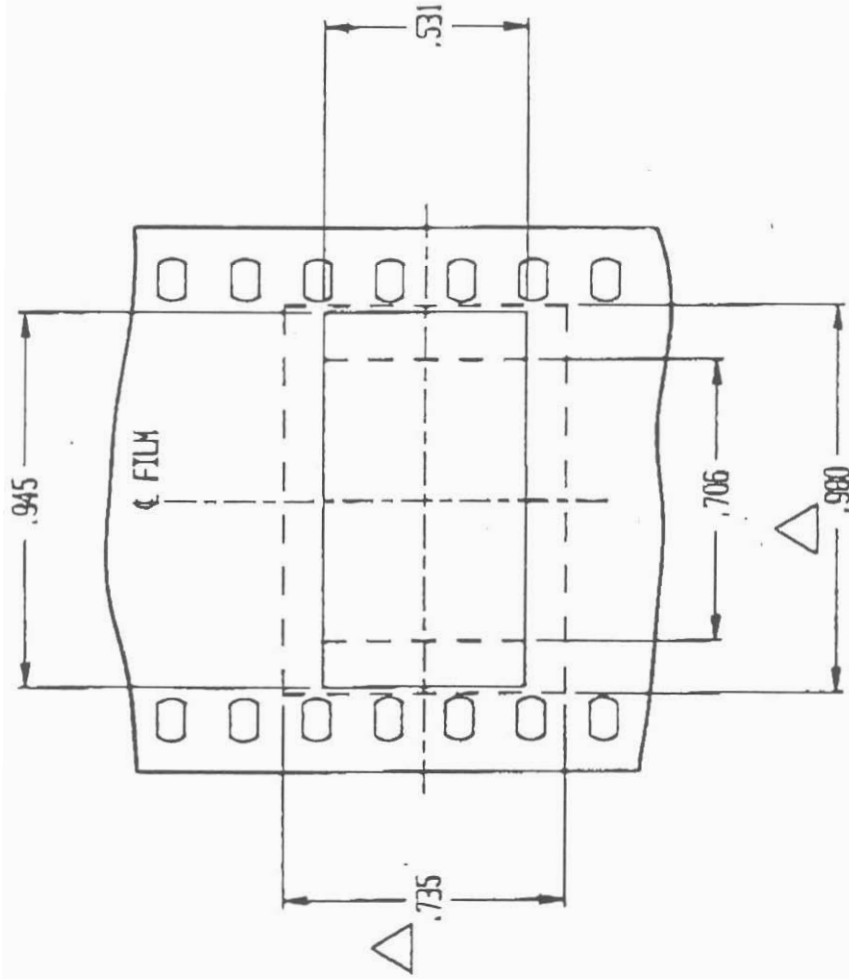
### Sound Elements

A separate 24-track sound master conforming to specifications in Attachment "E" or a 6-track 35mm sound master conforming to specifications in Attachment "F", must be delivered along with the cut negative. All foreign version music and effects tracks must be fully filled. The original sound of each episode/production can then be protected and/or utilized in any future release format.

### Labeling For Video And Audio Elements

Minimum requirements are noted in Attachment "G"

SUPER PANAVISION 35  
4 PERF



.945 X .531 (1.78:1) = .502 SQ"  
 .706 X .531 (1.33:1) = .375 SQ"

HOTV 1.78:1, & 1.33:1  
TRANSMITTED

VIEWING THROUGH LENS



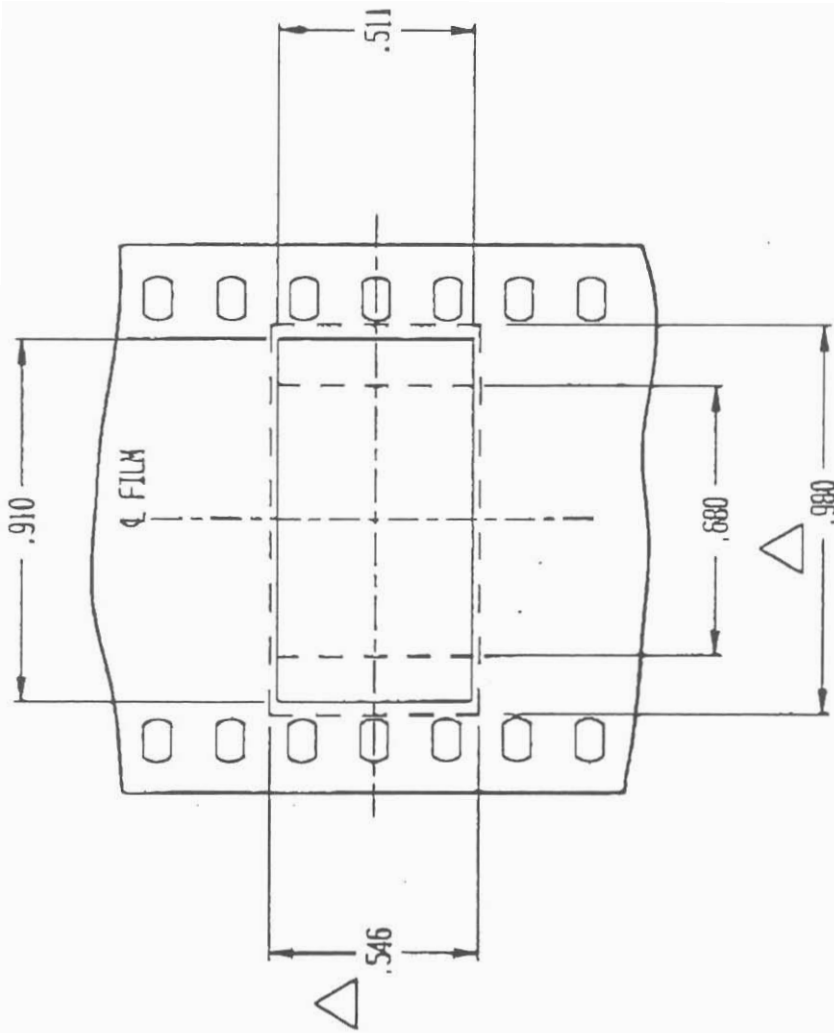
CAMERA APERTURE

32E7



SUPER PANAVISION 35

3 PERF



.910 X .511 (1.78:1) = .465 SF"  
.680 X .511 (1.33:1) = .347 SF"

HDTV 1.78:1, & 1.33:1  
TRANSMITTED

△ : CAMERA APERTURE

VIEWING THROUGH LENS

PANAVISION 1/21/93

32D6

## ATTACHMENT "C"

**CALIFORNIA VIDEO CENTER DIGITAL COMPONENT TAPE STANDARDS**

Recording Format: SMPTE D-1 Format  
Sony Digital Betacam format  
Ampex DCT format

Tape: Extended play "thin" tapes (i.e. 11 micron) shall not be used

Tracks: A. Digital video and 4 channels of digital audio;  
B. Analog audio (cue channel)  
C. LTC continuous, matching VTTC, DFTC with PGM start at 01:00:00:00  
D. Continuous control track

Cassette: Lengths:

	D-1	DCT	Digital Betacam
L	94 minutes	208 minutes	124 minutes
M	34 minutes	94 minutes	n/a
S	6 minutes	32 minutes	40 minutes

Cassette must not show any physical signs of stress (cracks, debris)  
Stock must not show any physical signs of stress (edge damage, debris, etc.)  
Cassette should be transported in shipping case

Reference Tape: Sony DR5-1A, DR2-2A (D1)  
Sony current Digital Betacam  
Ampex current DCT

Digital Video: RS-125M, 13.5(Y)/6.75(R-Y,B-Y), 8-bit  
Picture should be centered in the digital active line  
Peak white (100 ire) will be at digital 235 base 10  
Video shall not exceed 100 ire, at digital 235 base 10  
Black shall be at digital 16 base 10  
Color difference blanking is at digital 128; peaks at 16 and 240 (base 10)

Digital Audio: 48 kHz sampled, synchronized to video, 20 bits/sample  
Channels 1,2,3,4: AES/EBU format  
1 kHz tone at 0 VU shall reproduce at 0 dB in unity on all channels  
Levels shall be maintained such that the headroom of the system is not exceeded  
NO DIGITAL CLIPPING  
Audio shall not be Dolby encoded

RF: RF envelope maximum/minimum points shall not vary by more than 10%  
A/B/C/D/E/F/G/H Channels shall not vary by more than 10% (D-1)  
Audio RF level shall be less than or equal to 1/4RF level of video  
Video and Audio RF and CTL shall be recorded continuously on the tape.

Errors: Errors shall not exceed the capability of error correction circuitry  
At no time shall concealment be necessary

Audio format: Ch 1 & 2 Stereo Left & Right, in phase  
Ch 3 & 4 M & E Left & Right, in phase w/Ch 1 & 2  
Cue: utility channel  
Time Code: matching LTC/VTTC

## ATTACHMENT "D"

**CALIFORNIA VIDEO CENTER DIGITAL COMPOSITE TAPE STANDARDS**

NOTE: Accepted only for taped programs originating on composite or analog tape.

- Tape: Sony Metal Tape (1500 Oe) or equivalent  
Standard thickness (14 micron) tape shall be standard  
Extended play "thin" tapes (i.e. 11 micron) shall not be used
- Tracks: A. Digital video and 4 channels of digital audio;  
B. Analog audio (cue channel)  
C. LTC continuous, matching VITC  
D. Continuous control track
- Cassette: L-size: 208 minutes max  
M-size: 94 minutes max  
S-size: 32 minutes max  
Cassette must not show any physical stress (cracks, debris)  
Stock must not show any physical signs of stress (edge damage, etc.)
- Reference Tape: Sony ER-5
- Digital Video: 4 Fsc sample rate, 8 bit/1, Q axis sampling  
100% luminance will reproduce at 100 ire in UNITY  
Video shall not exceed 100 ire, at digital 200 base 10  
Blanking shall be at digital 60 base 10  
Sync tips shall be at digital 4 base 10  
Signal shall be recorded with zero Sch phase.
- Digital Audio: 48 kHz sampled, synchronized to video, 20 bits/sample  
Channels 1,2,3,4: AES/EBU format  
1 kHz tone at 0 VU shall reproduce at 0 dB in unity on all channels  
Levels shall be maintained such that the headroom of the system is not exceeded  
NO DIGITAL CLIPPING  
Audio shall not be Dolby encoded
- RF: RF envelope maximum/minimum points shall not vary by more than 20%  
A/B/C/D channels shall not vary by more than 20%  
Audio RF level shall be less than or equal to 1/4 RF level of video  
Video and Audio RF and CTL shall be recorded continuously on the tape.
- Errors: Errors shall not exceed the capability of error correction circuitry  
At no time shall concealment be necessary
- Audio format: Ch 1 & 2: Stereo Left & Right, in phase  
Ch 3 & 4: M & E Left & Right, in phase w/Ch 1 & 2  
Cue: utility channel  
Time Code: matching LTC/VITC

**ATTACHMENT "E"****THE 24 TRACK CONSOLIDATED RECORDED AUDIO MASTER (CRAM)**

This element should be recorded at 15 inches per second. All four acts of a show will fit one 14 inch reel-5000 ft. load, including the teaser, main title, the four acts of the show, the trailer, the end credits, the Warner Bros. logo, and all the program blacks (silence) in between. At the head of the reel there should be 30 seconds each of the following calibration tones: 1KHZ, 10KHZ, 100HZ and the Dolby tone. This should be on all 24 tracks of the 2 inch tape. The following are the track configurations for all shows. Remember all tracks, except the two channels of time code, are to be Dolby A encoded.

- Track (or Channel):
1. Left Stereo Laugh Track (if applicable)
  2. Right Stereo Laugh Track (if applicable)
  3. Left Dialogue Mix
  4. Right Dialogue Mix
  5. Left Music Mix
  6. Right Music Mix
  7. Left Sound Effects Mix
  8. Right Sound Effects Mix
  9. Left Composite Mix (Dialogue, Music, Effects)  
(This track is used in the making of the 35mm 4-track mag.)
  10. Right Composite Mix (Dialogue, Music, Effects)  
(This track is used in the making of the 35mm 4-track mag.)
  11. Left Filled Effect & Foley
  12. Right Filled Effect & Foley
  13. Mono Mix of Laugh Track (if applicable)
  14. Mono Mix of Dialogue  
(This track is used in the making of the 35mm 4-track mag.)
  15. Mono Mix of Music  
(This track is used in the making of the 35mm 4-track mag.)
  16. Mono Mix of Sound Effects
  17. Mono Composite Mix (Dialogue, Music, Effects)
  18. Mono Mix of Filled Effects & Foley  
(This track is used in the making of the 35mm 4-track mag.)
  19. Blank (no audio)
  20. Mono Mix of Dialogue Guide Track
  21. Blank (no audio)
  22. EBU timecode (used in the PAL mastering process)
  23. 59.95 Sync Tone
  24. SMPTE Drop Frame Time Code (DFTC)

ATTACHMENT "F"

WARNER BROS. 35 mm 6 TRACK SOUND MASTER

Track 1      Left Dialogue  
Track 2      Right Dialogue  
Track 3      Left Music  
Track 4      Right Music  
Track 5      Left Sound Effects  
Track 6      Right Sound Effects

Dolby "A" or S.R

- 547 -

6

32A8

2.1

## ATTACHMENT "G"

WARNER BROS. LABELING FOR VIDEO AND AUDIO TAPE

1. "Name of Show"
2. "Episode #"
3. "Running Time"
4. "Audio Config"
5. "Dolby Encoded Type"
6. "Date of Completion"
7. "Version"
8. "Television Standard"
9. "Aspect Ratio"
10. "Part (number) of (number)"

**PAL ADDENDUM**

10/2/95

GENERAL

- Color bars should be of the type 100/0/75/0 (White Bar/Black Bar/Colour Max/Colour Min) per CCIR Rec. 471, and be identified as such (i.e. "100/0/75/0") superimposed over bars
- Time code shall be an 8 field PAL/EBU time code locked to video (both LTC and VITC).
- VITC shall be recorded on lines 19 and 21, both fields at 80 IRE.
- Line 23 is reserved for closed captioning.
- Setup: Picture areas with no light on them or which are black should be at or near 0 IRE. Negative excursions of pedestal are not allowed.
- Horizontal blanking shall be 11.8 usec. or less on masters.
- Warner Bros. release elements must be 12 usec. or less.
- Front porch shall be 1.5 usec +/- 0.15 usec.
- Vertical blanking shall be 25 lines or less. This is overall blanking = line number + blanking before line 1; i.e. line 622.5 through line 22.5 = 25. Note that lines are counted differently in PAL than in NTSC. Line number does not equal vertical blanking.  
Transfers should be conducted in rooms with a 6500 degree Kelvin monitor incorporating EBU phosphors.

COMPOSITE PAL

- NTSC. Line number does not equal vertical blanking. Composite video signals shall be 625/50 and conform to CCIR report 624-1.
- Timing shall conform to CCIR Recommendation 472-1.

COMPOSITE DIGITAL PAL

- Video shall not exceed 100 ire, at digital 211 base 10
- Blanking shall be at digital 64 base 10.
- Sync tips shall be at digital 1 base 10

COMPONENT DIGITAL

- No changes from spec