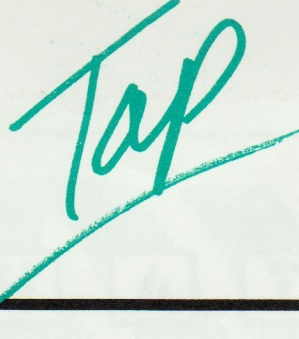




***WORKING TOGETHER FOR EXCELLENCE***  
*Some Background on TAP*  
*And the Standards for Motion Picture Exhibition*

*by Ross Hering and Jane Mutony*  
*Lucasfilm Ltd.*

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# Working Together for Excellence

## Some Background on TAP And the Standards for Motion Picture Exhibition



by Ross Hering and Jane Mutony  
Lucasfilm Ltd.

A very significant event occurred this year that should have a positive impact on the quality of motion picture presentation in theatres everywhere; NATO adopted a comprehensive set of criteria and standards for the exhibition of motion pictures in indoor theatres. Lucasfilm Ltd.'s Theatre Alignment Program (TAP), in conjunction with NATO and six distributors, developed the *Criteria and Standards for Presentation Quality for Indoor Theatres*. (See Appendix A for a complete reprint of the standards.)

The standards are quite detailed and comprehensive. They cover just about every aspect of the moviegoing experience from print condition to lobby cleanliness. The standards are divided into three general categories — Print Condition, Technical Aspects of Presentation, and Theatre Maintenance and Operation — and give detailed specifications for optimum performance and operation in each of these categories. This document includes existing technical standards created long ago by organizations such as SMPTE, AHSRAE, and AES. In addition, it includes many new standards that were created for aspects of the moviegoing experience for which no previous guidelines existed.

NATO ratified these standards as "a set of goals concerning presentation quality and theatre performance." As goals, the standards should be quite useful as quantitative and qualitative guidelines for the design, construction, and operation of movie theatres. Adherence to these standards can only result in an improved moviegoing experience for theatre patrons everywhere.

### What is TAP?

TAP is Lucasfilm Ltd.'s Theatre Alignment Program — a post-production quality control service that specializes in the manufacture and exhibition of motion pictures, specifically 70mm releases. TAP was created in 1983 as an in-house program to quality control the 70mm release of "Return of the Jedi." The original goal of the program was to improve the quality of motion picture presentation, and this remains TAP's primary goal today. Because of the success of the operations that TAP developed and implemented for "Jedi" and the combined releases of "Indiana Jones and the Temple of Doom" and "Star Trek III" in 1984, TAP began to offer its services to all distributors for films other than Lucasfilm's.

Because of TAP's work with producers, distributors, and exhibitors, and because of our vast experience with movie theatres, we have become recognized as experts on the variety of issues concerning motion picture presentation. Our continuing search for ways to improve presentation quality led us to the idea of creating a comprehensive set of standards for all aspects of the movie-going experience. It was clear, however, that a project like this affects the entire industry and must, therefore, include the support and participation of Exhibition and Distribution.

## Getting Down to Business

The idea for creating a comprehensive set of standards for the exhibition of motion pictures had been tossed around in many different forms by TAP beginning as early as 1986. As our Print Condition and Theatre Performance Operation was being developed and refined, we began to solicit ideas from distributors and exhibitors about the concept of a comprehensive set of standards for the exhibition of motion pictures. TAP hosted a meeting at ShoWest in 1988 to discuss this concept in further detail. In May of 1988, Bill Kartoian and Donald Fox of NATO met with Ross Hering and Jane Mutony of TAP. The result was an agreement where NATO and six distribution companies (Buena Vista, MGM/UA, Paramount, 20th Century Fox, Universal and Warner Bros.) would sponsor and work with TAP to research and develop standards. Now the fun would begin!

This project involved primarily three people from Lucasfilm: Ross Hering, Jane Mutony and Tom Holman. Working together, we researched existing technical standards, identified areas for which no standards existed, created new standards and developed procedures for testing the validity of the standards. The

process of working together with Exhibition and Distribution basically involved circulating drafts of the standards document to NATO board members and the presidents of the six distribution companies for feedback. Three non-NATO exhibitors were also included in this process. Comments from everyone were incorporated and revisions were made by TAP.

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*It was clear that a project like this affects the entire industry and must, therefore, include the support and cooperation of Exhibition and Distribution.*

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At ShowEast in October 1988, TAP hosted a meeting with representatives from NATO, the non-NATO exhibitors, and the distributors to discuss the current version of the standards. Additional input was given and the standards appeared to be ready for adoption. The final step before adoption, however, was to ensure that each standard was realistic and could indeed be achieved by existing movie theatres. It was decided that the standards would be tested in 12 auditoriums spread out over six theatre complexes.

## Testing the Standards

When selecting theatres in which to test the criteria, we strived to get a representative sample of new and old theatres as well as large nationwide circuits and smaller regional independents. In addition, all theatres had to be NATO members. No tests were conducted without prior permission of the circuits,

and theatre names were not used when presenting the results.

The testing program was conducted in two phases. The first phase of the program consisted of taking detailed technical measurements in the auditoriums and projection booths by properly equipped and trained technicians. Many of the testing procedures were modifications of current industry procedures, and the tests took an average of five hours per auditorium. The second phase of the program consisted of observations being made from the auditoriums and lobbies by TAP theatre evaluators. No evaluation took place later than four days after the technician test, and six auditoriums were evaluated the day after the technician test.

The reason for conducting a two-phase test like this was to get both the facts (the objective perspective) as well as the patrons' point of view (the subjective perspective). All the data from both phases of the testing program was collated and summarized by TAP. The results were presented at ShoWest in February 1989. In all but one case, we found that the theatre complexes and specific auditoriums were capable of attaining the standards as written. The standards were, therefore, confirmed to be valid. The one standard that no auditorium achieved had to do with seat placement relative to the center of the screen. This standard was removed from the final document. NATO adopted the *Criteria and Standards for Presentation Quality for Indoor Theatres* at its Spring board meeting in April 1989.

Two highlights of the document are the standard for Print Condition and the standard for Sound Format. ("All motion picture theatres should be equipped to properly reproduce standard 35mm stereo variable-area optical soundtracks.") The fact that NATO and several major distributors sponsored the crea-

tion of these standards, and the fact that NATO adopted them, represents a significant change in the perception of the industry about presentation quality. It is also an example of what can be accomplished when different facets of the industry work together on a project.

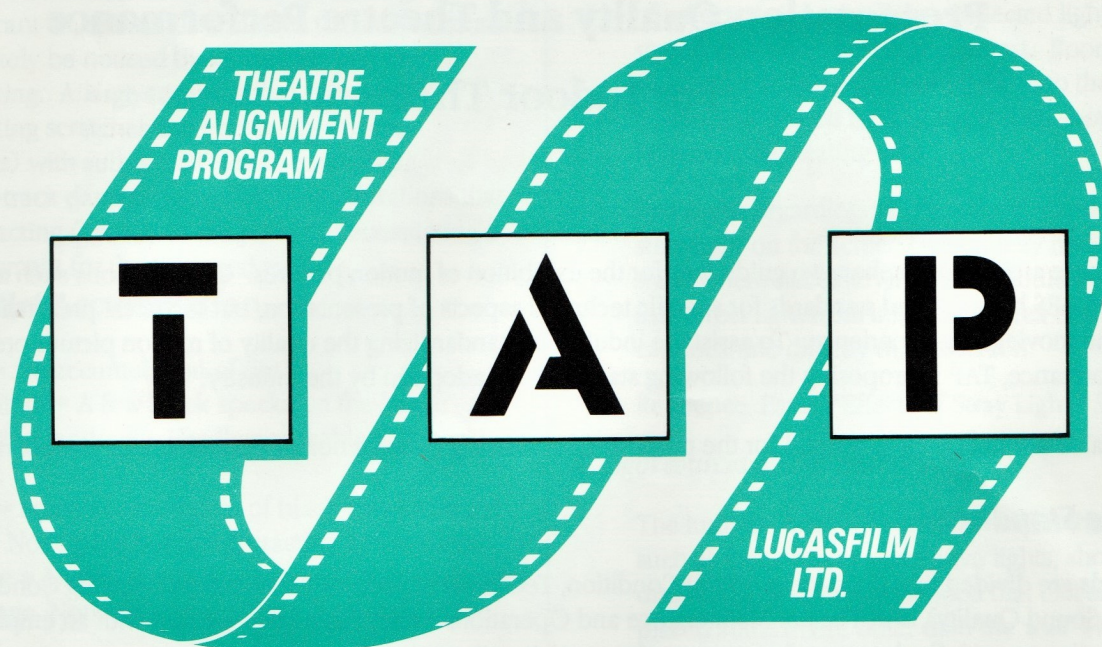
There now exists a set of comprehensive standards for the exhibition of motion pictures. Although this document is detailed and comprehensive, there are a few aspects of the movie-going experience that were not covered. In ad-

dition, advances in technology will undoubtedly make some of these current standards obsolete someday. This document must therefore be viewed as something that can be amended and updated where and when required. This way it will continue to best serve the needs of an industry that is constantly changing.

## Summary

NATO's adoption of these standards is the culmination of a process that

began three years ago. Essential to the creation of the standards was the financial support and participation of NATO and the six distribution companies. In addition, the hard work of the TAP staff — Tom Holman of Lucasfilm, the service technicians who conducted the theatre tests, and the TAP theatre evaluators — must be acknowledged. Thank you to everyone who was involved in this process.



**WHEREAS** Lucasfilm, Ltd., through its Theatre Alignment Program ("TAP"), in cooperation with various members of the Distribution and Exhibition community, including the National Association of Theatre Owners ("NATO"), has promulgated certain goals for the operation of motion picture theatres, and

**WHEREAS** it is recognized by all parties that the criteria and standards which are part of these goals state the optimum conditions for the operation of motion picture theatres, and do not necessarily represent current standard operating conditions and practices, and

**WHEREAS** NATO has consistently and continuously advocated and promoted improving presentation quality and theatre performance by its members,

**NOW THEREFOR BE IT RESOLVED** that NATO hereby adopts the Proposed Criteria and Standards for Presentation Quality and Theatre Performance for Indoor Theatres (Revised March, 1989) as the goals its members should endeavor to achieve in the operation of their theatres.

# **Criteria and Standards**

## **For**

### **Presentation Quality and Theatre Performance**

#### **For Indoor Theatres**

#### ***Purpose***

At present, there are no comprehensive guidelines for the exhibition of motion pictures. Organizations such as SMPTE, ASHRAE, and AES have created standards for specific technical aspects of presentation, but technical presentation is just a portion of the moviegoing experience. To assist the industry in standardizing the quality of motion picture presentation and theatre performance, TAP is proposing the following standards for adoption by the industry.

These standards are not being proposed for the purpose of evaluating theatres nor as a condition for membership in NATO.

#### ***About The Standards***

The standards are divided into three areas—Print Condition, Technical Aspects of Presentation (Viewing Conditions/Image Quality and Sound Quality), and Theatre Maintenance and Operations. They have been created with an emphasis on providing audiences with the best possible presentation quality and moviegoing experience.

The standards state the optimum conditions in given categories and, therefore, represent goals. In some instances, the optimum has been compromised to accommodate the safety of patrons. In instances where standards may conflict with state and/or local codes (such as zoning, building, fire, safety, and health codes), the codes should always take precedence and be adhered to.

## **The Standards**

### ***I. Print Condition***

New release prints, both 35mm and 70mm, should be exhibited for the first seven days of release with no more than "very minor" cumulative print damage and black dirt accumulation. During the next fourteen days of release, cumulative print damage and black dirt accumulation should not exceed "minor." See Glossary of Terms below for definitions relating to print damage and black dirt accumulation.

### ***Glossary of Terms Related To Print Damage and Black Dirt Accumulation***

**Cumulative Print Damage** (Includes scratching, splices, and sound-track damage)

- a. None = No scratches, splices, or sound-track damage to date.
- b. Very minor = A scratch or a few scratches appearing for no more than a few seconds that are hardly noticeable and not distracting.
- c. Minor = Scratches appearing for a few seconds that are only noticeable if looking for them specifically and not distracting. Splice(s) with no loss of visual or sound continuity. Sound-track damage present for a few seconds that is not distracting.

- d. Notable = Scratches appearing for more than a few seconds that can be noticed by any viewer and are mildly distracting. Splice(s) with some loss of continuity. Sound-track damage present for more than a few seconds that is mildly distracting.
- e. Significant = Continuous scratches that would more than likely be noticed by all viewers and are distracting. A large accumulation of mildly distracting scratches can also be significant. Splice(s) with substantial loss of continuity. Sound-track damage present for long durations that is distracting (usually to the point of necessitating a replacement for the damaged reels.)

### **Black Dirt Accumulation**

- a. None = No accumulation of dirt.
- b. Very minor = A few black specks on the image appearing randomly. Hardly noticeable to the viewer.
- c. Minor = Some accumulation of black specks on the image. Noticeable but not distracting to the viewer.
- d. Notable = Moderate accumulation of black specks on the image. Noticeable and mildly distracting to the viewer.
- e. Significant = Heavy accumulation of black specks on the image. Very noticeable and distracting to the viewer.

## **II. Technical Aspects of Presentation**

### **Viewing Conditions and Image Quality:**

#### **1. Screen illumination**

Screen luminance at the center of the screen should be  $16 \text{ fL} \pm 2 \text{ fL}$ . Screen luminance at the edges of the screen (5% in from each edge) should not be less than 75% and not more than 85% of that at the center. The distribution of screen illumination should be symmetrical about the geometric center of the screen, and no portion of the illuminated area should be less than 10 fL.

Reference: American National Standard ANSI/SMPTE 196M-1986

#### **2. Screen condition**

Motion picture theatre screens should be free of rips, tears, discoloration, or other blemishes. Any seams in a screen, either vertical or horizontal, should not be obtrusive when an image is projected.

#### **3. Reflected and Stray light on screen**

Screen luminance of a blank screen (no projected image or light) when the theatre is operating normally (auditorium lights set for presentation) should be free of reflected and stray light. Reflected light on the screen may obscure image contrast. Room surfaces should not reflect significant light onto the screen. Surfaces of objects behind the screen should not reflect light onto the seating area.

Exit signs, regardless of placement, should not cast stray light on the screen (which may mean shielding signs where necessary). Doors should be arranged so that direct light from adjacent spaces or out-of-doors cannot shine directly on the screen.

Reference: Estes, "Effects of Stray Light," SMPTE Journal

#### **4. Light sources within field of view**

The luminance of light sources within the field of view, such as exit signs or decorative lights, should not be distracting. It is recommended that exit signs be placed somewhere other than the wall where the screen is located. Where the placement and illumination of exit signs are mandated by state and local building and fire codes, one should adhere to the codes.

One should avoid placing shiny objects in places where they can reflect screen light to the seating area. Glossy finishes should not be used in the front parts of the auditorium as they can cause glare.

#### **5. Image focus**

Resolution (focus) is the apparent sharpness determined by the ability of a system to reproduce a specified number of equally spaced black lines and white spaces in groups which are at right angles to each other. The following should apply:

Center resolution: greater than or equal to 68 lines/mm.

Side resolution: greater than or equal to 56 lines/mm.

Corner resolution: greater than 40 lines/mm.

This requirement applies to all formats, including those requiring use of anamorphic or other focal length adapters.

Reference: SMPTE EG 5-1982

## 6. *Shutter ghost (image streaking)*

Shutter ghost (travel ghost) is the streak or blur that occurs to an image resulting from any vertical motion of film in the gate as the projector shutter opens. With high contrast images, no shutter ghost should be visible on any part of the screen at any time.

## 7. *Vertical (jump) and Horizontal unsteadiness (weave)*

Jump is the vertical motion of the projected image. Weave is the horizontal motion of the projected image. The following should apply:

Jump: less than 0.20%

Weave: less than 0.25%

Reference: SMPTE RP 105-1981

## 8. *Masking (condition, placement)*

Theatres should have masking cloth or drapery, and it should be in good condition without rips or tears. If operable, it should adjust to at least the Flat (1.85:1) and the Scope (2.35:1) aspect ratios. Left and right side masking, when in place, should create parallel edges for the image. The top and bottom masking, when in place, should also create parallel edges for the image. Projected images should fill the screen and no blank screen surfaces should be visible.

If masking covers loudspeakers, the portion of the masking in front of the loudspeakers should be acoustically transparent. The edges of masking should be parallel and consistent with the correct projectable image dimensions.

## 9. *Screen image size and viewing angle distortion*

A motion-picture image should be as large as possible within the dimensions of the auditorium and be presented to an audience at certain angles to maximize impact and minimize discomfort. The image angle (the horizontal field of vision) from the most distant seat should be no less than 26°, with 36° recommended.

Seating should be arranged so that it provides all patrons a comfortable field of view. The viewing angle distortion should be less than 45°. Viewing angle distortion is defined by iso-deformation lines described in the reference.

Reference: SMPTE Engineering Guideline 18

## 10. *Sight lines and floor pitch*

Sight lines, floor pitch, seat back tilt, and viewer comfort all interact. Auditorium floors should be constructed so that all seats have unobstructed sight lines to the screen and provide comfortable fields of view. (See #9, Screen image size and viewing angle distortion.)

Reference: SMPTE Engineering Guideline 18

## 11. *Screen image*

The desired condition is to project precisely the following image dimensions:

|                            |                |
|----------------------------|----------------|
| 35mm Flat image (1.85:1):  | 0.447 x 0.825" |
| 35mm Scope image (2.35:1): | 0.700 x 0.839" |
| 70mm image (2.2:1):        | 0.870 x 1.912" |

The screen image should have sharp edges, and the corners should be square (90° right angles). Cropping more than 5% of the projectable image is undesirable.

## 12. *Image geometry (skewing, geometric distortion, keystoneing, etc.)*

Geometry of the projected image is most noticeable on titles, especially moving titles, on architectural shots having straight parallel lines, or on the horizon. Too great a distortion in display is undesirable.

Reference: SMPTE Engineering Guideline 18

## 13. *Framing*

Framing must be highly accurate in the 35mm Scope (2.35:1) and 70mm (2.2:1) formats because white lines caused by negative splices may sometimes be visible if the framing is off more than a few percent. Framing errors on non-black-masked prints in the 35mm Flat (1.85:1) format cause composition errors. The image should be framed so that the top and bottom masking are within 3% of the picture height from the frame lines.

## 14. *Splice quality/changeover quality between reels*

Splices and changeovers between reels of a print may be noticeable, but should not interrupt continuity or be distracting to audiences. Distractions include interruptions to the image such as jumping, loss of continuity, or the brief appearance of opaque splices (black horizontal flashes). Interruptions to the sound may include silence, a loud pop, clicking, or thum

## 15. Interruptions in feature

Features should be presented without interruption. Theatre management has an obligation to respond quickly to interruptions in a feature. This should include a method or procedure for quickly determining, addressing, and informing audiences about the source of interruptions. In the event of a prolonged interruption (more than five minutes), theatre management should make an announcement to the audience about the nature of the problem and give an estimate as to how long it will take to resume the show.

If there is an intermission in a feature, this should be indicated at the boxoffice along with the duration of the intermission. When appropriate during the feature, the word *intermission* should appear on the screen along with the duration of the intermission.

### Sound Quality:

#### 1. Sound format

All motion picture theatres should be equipped to properly reproduce standard 35mm stereo variable-area optical sound tracks.

#### 2. Level (loudness)

Each channel of a theatre's sound system should play at a sound pressure level of 85 dBC at a standard fader setting. This is measured for each channel using a Sound Pressure Level Meter when pink noise is injected into the sound system. Operators should play features at the standard fader setting (as set forth on the sound system manufacturers' specifications). Overly loud trailers may need compensation downwards, but every effort should be made to play features at standard fader settings.

Reference: The standardized dubbing stage sound pressure level (SPL) of 85 dBC

#### 3. Frequency range and balance

Frequency range is the limit from low bass to high treble over which the sound system works. Balance over the range is the adjustment of the sound system so that it reproduces all frequencies from bass to treble according to the reference standards.

The A-chain (projector and preamplifier) and B-chain (equalizers, power amplifiers, loudspeakers, and room acoustics) frequency response should meet the reference standards.

Reference: 35mm: SMPTE 214, 70mm: SMPTE 217

#### 4. Wow and flutter

Wow and flutter are speed variations in sound reproduction and are audible as a wavering pitch. Wow and flutter should not be audible to audiences.

Reference: Audio Engineering Society Standard AES 5

#### 5. Stereo coverage

If the conditions under screen image (see #9, Screen image size and viewing angle distortion) are met and the screen loudspeakers are mounted just inside the masking for the format in use, stereo should be perceived throughout the auditorium.

#### 6. Maximum undistorted sound pressure level

The maximum sound pressure level in the 70mm format should be greater than 105 dB in any one channel without power amplifier overload, called clipping. In the 35mm format, maximum unclipped sound pressure level should be greater than 97 dB.

#### 7. Surround system

The surround loudspeaker array coverage should be uniform within  $\pm 2$ dB over the seating area. The requirements for screen loudspeakers (see #3, Frequency range and balance) should apply to the array of surround speakers as much as possible. The maximum undistorted sound pressure level (see #6, Maximum undistorted sound pressure level) should also apply to the array of surround loudspeakers.

#### 8. Acoustics (reverberation and echos)

Reverberation and echos are destructive to dialogue intelligibility and should be minimized in theatres. Reverberation will vary depending upon the room volume, and is naturally longer in larger room volumes. The acceptable range for reverberation should be from 0.5 to 2 seconds, never exceeding 2 seconds.

#### 9. *Background noise (HVAC, lobby, employees, sound system)*

Background noise such as noise from the HVAC system or sound system should not interfere with the sound quality in auditoriums. No sound system problems such as hum, hiss, crackle, pops, etc., should be audible to audiences. Hinges on auditorium doors and seats should not create noise. Maximum background noise should not exceed NC-30 or be lower than NC-25.

Reference: American Society of Heating, Refrigeration, and Air Conditioning Engineers Guide, SMPTE RP-141

#### 10. *Sound "bleed-through"*

Sound from adjacent auditoriums is expected to be the most common intrusive noise, and it should be minimized so that it does not interfere with the sound quality. All intrusive noises should be less than NC-30, and no pure tones from adjacent auditoriums should be audible. (See #9, Background noise.)

### III. *Theatre Maintenance & Operations*

#### 1. *Marquees/Attraction panels and Exterior signs*

Theatres should have the means to identify the feature(s) currently showing (marquees/attraction panels, boxoffice signs, etc.). Where applicable, the marquees/attraction panels should be lit at night so that titles are legible in the dark. It is recommended that the rating(s) of the feature(s) be indicated.

For all exterior signs (including marquees/attraction panels, boxoffice signs, one-sheet frames, etc.) all words and titles should be spelled correctly. The letters of all words, titles, and phrases should be the same color, size and style.

#### 2. *Parking facility*

A parking facility is desirable for all theatres. Where parking is mandated by state and local zoning and building codes, adhere to the codes.

Parking should be adequately lit for safety and so patrons can easily identify their vehicles at night. Parking facilities should be free of debris.

#### 3. *Boxoffice*

Theatre boxoffices should be located near the front entrance of a theatre complex where applicable. Boxoffices should have signs indicating the feature(s),

showtime(s), rating(s), and admission price(s). The conditions under Attraction panel/Exterior signs (see #1, Marquees/Attraction panels and exterior signs) should apply to boxoffice signs. Boxoffices for multiplexes should have signs that indicate where tickets are purchased for the different features.

The sidewalk in front of the boxoffice and theatre entrance should be free of obstructions, hazards of any type, and debris.

Lines of ticket holders should be supervised by a theatre employee, be clearly distinguished from the line to buy tickets, and not obstruct the boxoffice or theatre entrance.

#### 4. *Lobby*

Refreshment stands should be located in the theatre lobby, and the sale of all refreshments should take place here during presentation. Lobbies should provide easy access to the auditorium(s), the refreshment stand, and the restrooms. Lobbies should have the means to display promotional materials (standees, one-sheets, etc.). They should also have an adequate number of trash containers.

#### 5. *Restrooms*

Theatre complexes should have restroom facilities for both men and women that are easily accessible from the lobby. Restrooms should be clean, well lit, and free of offensive odor. They should have running water and be supplied at all times with toilet paper, soap, and should also have some means for patrons to dry their hands. Restrooms should be monitored periodically by theatre management. Adhere to state and local health and sanitation codes.

#### 6. *Refreshment Stand (cleanliness, organization, efficiency)*

Refreshment stands should be located in the theatre lobby. Refreshment stands should be designed and adequately staffed to minimize the wait of patrons. Patrons should be served as quickly as possible within five minutes of approaching the refreshment stand. All counters should be free of debris and not wet or sticky. Condiments, napkins, and straws should be easily accessible. All drinks served should have lids.

Where the National Association of Concessionaires (NAC) has set guidelines for service or quality of product, adhere to these guidelines.

## 7. Auditorium identification

Auditoriums in a multiplex should be identified at the entrance. It is recommended that they be identified with the feature title. All titles should be spelled correctly. The letter of titles should be coordinated and have a neat appearance.

## 8. Auditorium (maintenance, cleanliness, temperature)

Many variables such as temperature, humidity, and drafts affect the comfort of motion picture audiences. The temperature in auditoriums should be comfortable; heat to a minimum of 68° and cool to 76°.

The aisles should be free of obstructions, hazards of any type, and debris. The floor between the rows of seats should be clean and dry. It is recommended that all large debris be picked up and spills be mopped up between shows.

Auditoriums should be monitored by theatre staff during all presentations.

## 9. Auditorium lighting

Auditoriums should have lights (wall, ceiling or both) that illuminate the interior. In addition, there should be lights (on the floor or on the aisle seats of the rows) that illuminate the aisles.

The interior lighting of an auditorium (house lights) should be sufficiently reduced during feature presentation so as not to interfere (cast a glare, cause loss of contrast, etc.) with the projected image on the screen. (See page 2, #3.) House lights should be dimmed *before* the image is projected onto the screen, and may be raised to an acceptable level during the end credits for the safety of exiting patrons. Aisle lights should remain on during the presentation to assist patrons entering and exiting the auditorium.

## 10. Seats

Auditorium seats should be arranged in parallel rows facing the screen and follow the conditions detailed under Screen image size and viewing angle distortion. (See page 3, #9.) Seats should be in good condition with no broken arm rests, seat backs, or bottom

cushions. Seats should have a minimum width of 20 inches. Space between rows of seats should be as great as possible but not less than 36 inches for fixed-back seats, and no less than 38 inches for rocker seats.

For auditoriums with more than 250 seats, prime seating should not be sacrificed for aisles (i.e.: aisles in the center of the seating area).

## 11. Theatre staff

Theatre employees should be courteous, efficient, knowledgeable, and clean and neat in their appearance. They should also be easily identifiable as theatre employees. There should be an adequate number at both the refreshment stand so that patrons do not wait more than five minutes for service. There should be employees in the lobby to direct patrons to the correct auditoriums and to assist with questions. Theatre managers should be easily identifiable and accessible.

## 12. Showtimes

Theatres should begin the presentation (when the first moving image is projected onto the screen) no earlier than the advertised showtime and no later than five minutes after the advertised showtime. Showtimes advertised in newspaper ads should be correct and match those on a theatre's recorded phone message.

A theatre's recorded phone message should give correct information, be clear and easily understood, and contain a number to call for further information (by-pass number).

## 13. Emergencies

All theatres should have an established and documented method for paging patrons in life-threatening emergencies as well as established and documented procedures for handling any incident which potentially threatens the safety of the audience and/or staff. This should include a proper program for the safe evacuation of the theatre as worked out between management and local safety officials.





## THEATRE ALIGNMENT PROGRAM

July 1990

Dear Theatre Manager:

The Theatre Alignment Program (TAP) is currently preparing for the July 13 release of the Walt Disney classic **THE JUNGLE BOOK**. The enclosed information will assist you with your presentation.

The 35mm Service Instructions detail the proper procedures to conduct a comprehensive technical alignment of your projection and sound equipment. **We encourage you to have your theatre aligned before the release date in order to optimize your technical presentation.** Also enclosed is a letter from Peter Schneider, Disney Sr. VP Feature Animation, regarding the presentation of this film and TAP's "CRITERIA AND STANDARDS FOR PRESENTATION QUALITY AND THEATRE PERFORMANCE," which were published in the National Association of Theatre Owners' 1989 *Encyclopedia of Exhibition*.

**THE JUNGLE BOOK** is a five reel picture. The running time is 78 minutes.

### IMAGE FORMAT

**THE JUNGLE BOOK** was photographed "FLAT" with an aspect ratio of 1.85:1. Utilize SMPTE 35-PA test film to ensure that the projected image is not cropped excessively.

### SOUND FORMAT

The optical soundtrack is Dolby® Stereo. For Dolby® model CP-55 and model CP-200 stereo processors, the proper playback setting is **format 04**. For Dolby® model CP-50 stereo processors, select the proper playback setting by depressing the following buttons on the right side of the CP-50 unit; Optical, Dolby® Film, Stereo, and Optical Surround in (the top four buttons). For Dolby® model CP-100 stereo processors, consult your service technician for the proper playback setting. The fader should be set at the standard of 7. For other stereo processors, refer to the operation section of the instruction manual for the proper playback setting.

If you have any questions concerning the technical presentation of **THE JUNGLE BOOK** or TAP, please call the TAP HOTLINE 800 545-2525. Thank you for your assistance.

Sincerely,

Jane C. Mutony  
Director  
Theatre Alignment Program

enclosures

Walt Disney's  
**The Jungle Book**

July 1990

Dear Theater Manager and Projectionist:

We are pleased that you are presenting Walt Disney's classic "The Jungle Book" in your theater. This was the last animated feature personally supervised by Walt himself, and has been a perpetual crowd-pleaser since its original release in 1967. We're depending on you to give this very special film the best possible presentation for the maximum enjoyment of your audience.

Our 35mm prints are designed to be screened at the SMPTE standard of 16 footlamberts for screen illumination. For this re-issue, the film composition has been re-positioned for the 1:85 aspect ratio.

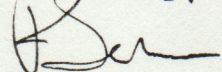
We are pleased to present the picture for the first time in true Dolby Stereo. The tracks have been re-mixed from the original stereo session masters to achieve this effect. The optical soundtrack contains important information on all channels, including surrounds. For the satisfaction of your patrons, it is most advantageous to play the movie at the standard fader setting, normally a "7" on a Dolby system.

The optical sound track is compatible with mono sound systems. If you have a mono sound system, please raise the level of your fader the equivalent of 2-3db's higher than your normal setting for the playback of mono prints.  
Automated Film Handling Mechanism

If you are using a platter, please use clear tape rather than opaque tape to join the reels of your print when building it up. Be careful to mark your joins on the edge of the film and not to mark your image when identifying the joins. Although these procedures may take some extra time, they are plainly in the interest of the audience.

Thank you for your attention. If you have any questions or problems with your presentation of "The Jungle Book", please call the toll-free TAP HOTLINE at 1-800-545-2525.

Sincerely,



Peter Schneider  
Sr. Vice President  
Feature Animation



### 35mm Service Instructions

Follow these instructions to prepare your theatre to deliver the best technical presentation of **THE JUNGLE BOOK**.

### TEST FILMS AND REQUIRED EQUIPMENT

1. Picture Test Films: SMPTE 35-PA (commonly called RP-40 after the document which specifies it). This test film is required to check focus, jump and weave, cropping, and shutter ghosts per the following instructions. The SMPTE 35-VT test film is better for shutter ghost testing than 35-PA.

2. Sound Test Films: The following test films are required to set sound head lateral adjustment, to check the scanning beam uniformity, to set stereo cell separation, and to set azimuth and focus: SMPTE P35-BT buzz track test film, SMPTE P35-SB scanning beam uniformity test film, Dolby® Cat. No. 97 test film, and Dolby® Cat. No. 69 Pink Noise test film, Dolby® Cat. No. 151 Surround Level test film, and for mono, SMPTE P35-SF-A, and P35-MF.

3. Equipment:

Screen brightness meter calibrated in footlamberts

Dual trace oscilloscope capable of XY operation

1/3-octave-band Real Time Spectrum Analyzer (essential for stereo, useful for mono)

Voltmeter, DC and AC

Pink Noise Generator (Dolby® Cat. No. 85 Card)

Adjustment tools as required for each projector

### PICTURE QUALITY

1. Projected image: **THE JUNGLE BOOK** was photographed "FLAT," at 1.85:1 in 35mm. Use RP-40 to adjust image cropping to maximize displayed picture area consistent with parallel edges. (See 8 below.)

To display the correct image area on the screen, two factors are involved: screen masking and aperture plate cutting. Project RP-40. Start without an aperture plate and adjust the masking and lens focal length if necessary to produce the largest picture that will fit within the available screen area. For "FLAT" pictures, the projectable image dimensions are .825 x .446." Pull in any adjustable masking so that these projected image dimensions are masked off consistent with parallel edges. Finally, install the aperture plate. If the image spills more than 6" onto the masking, cut a new aperture plate. Be sure that the edges of the plate are sharp and not fuzzy and that it is firmly in place and does not wiggle.

2. Screen brightness: Adjust to SMPTE standard 16 fL center, and 12 fL 10% in from all the edges measured with a screen brightness meter from the center seat of the theatre with no film in the projector(s). The distribution of light should be even with no apparent hot spots or dark areas. For high gain screens and unusual theatre configurations, see SMPTE RP-98. Multiple projectors to be used during changeover shall match at center screen within 2 fL. Change the bulbs and clean the lamphouse as necessary.

Films are made to a nationally and internationally standardized viewing screen brightness. Ad-

ditionally, they are monitored at the laboratory at these standards. If you are unable to meet the standard, please take what measures are necessary within your organization to change the required components to meet these standards.

3. Check for flicker which shall not be noticeable on a sample reel (you can look at the screen with no film in the projector). If condition 2 above is met, shutter rate flicker should not be objectionable, so other sources of fluctuation, usually the lamp stability, should be examined if variation of brightness with time is observed.

4. Color temperature: Check for  $5400^{\circ} \pm 400^{\circ}$  Kelvin. Projectors used during changeover should match within a total range of  $400^{\circ}$  Kelvin. Xenon lamp sources should match this easily. There is no easy way to check this without a three-color color temperature meter, but you can check by eye that the projectors match reasonably well.

5. Stray light: Check for less than 1% of that measured in 2 above. This can be measured with the projection lens capped for stray light due to sources in the room, and by using the method in SMPTE PH.22-196-1978 for light from the projection lens illuminating the wrong part of the screen. Make certain that lighting sources such as exit lights, lobby lights when the doors are open, audience lights, and especially sunlight cannot reach the screen. Correct if at all possible.

6. Sharpness: Check that at least 48 horizontal and vertical line pairs/mm of the targets of the 35-PA test film are visible at center, 34 line pairs/mm at the edges, minimum. The focus shall not drift with time or temperature.

7. Jump: Check for less than 0.2% (one vertical square equals 0.6% on 35-PA). Weave: Check for less than 0.25% (one horizontal square equals 0.5% on 35-PA).

8. Cropping: Check for less than 10% of any dimension. Image distortion such as keystone shall yield a difference in width or height over the size of the picture no more than 5% of any dimension.

9. Check for no visible shutter ghost on 35-VT, or, if unavailable, on a reel of the film. Check all parts of the screen as some shutter ghosts occur only in parts of the screen.

**10. TRIPLE CHECK the film path for scratching film. Scratches visible to the audience are often used to justify why the industry should change over to all video; patrons are not paying to see a scratched print. They do notice it, and they don't come back to a theatre that repeatedly scratches film!**

## **SOUND QUALITY — STEREO THEATRES**

(If you are aligning a mono theatre, see the section "Mono Theatres" below.)

### **A. A-Chain Alignment**

1. Visually inspect the optical sound slit to ensure that a clean image of it is projected on the film. If it appears fuzzy or curved, correct the problem by cleaning or changing the lens assembly or exciter bulb. Check that the exciter bulb is correctly positioned with respect to the lens

assembly to ensure a maximum and constant scanning beam illumination.

2. Use an oscilloscope to check that the voltage to the exciter bulb is correct and that the AC content is less than 1 Volt peak-to-peak (AC on the exciter lamp will cause hum in all channels of the sound system).
3. Ensure that no extraneous light source can reach the solar cell, especially light from the lamp-house. Extraneous light will produce a hum in all channels of the sound system.
4. Visually inspect the solar cell for the accumulation of dirt and or oil. Clean if required. If possible, adjust the solar cell until it almost touches the film plane. If the cell is too far from the film, crosstalk will result. If too near, film and cell damage can occur. An optimum separation is about the thickness of a penny from the cell to the film.
5. Set the sound system to mono reproduction and listen to SMPTE buzz track test film P35-BT. Adjust the sound lateral guide so that both tones are as small as possible (pushing film in will produce one tone while pulling it out will produce another). The optimum is that midpoint where either no tone is heard or both tones are heard at a low level.
6. Thread and play the Dolby® stereo cell alignment test film Cat. No. 97. The Cat. No. 97 has Left and Right signals alternating at about 15 millisecond intervals; adjust triggering of a dual trace oscilloscope displaying the two channels so that several bursts of each channel's tone shows on the screen. Move cell laterally across the film plane until there is a minimum and equal crosstalk Left to Right and Right to Left (it should be possible to achieve better than 20 dB separation each way). Note that it may be necessary to stop the projector to make the mechanical adjustment.

When satisfactory results are obtained, lock the settings. If any prints with misaligned soundtracks are encountered, the guide roller should be moved, not the cell alignment.

7. Thread and play the Dolby® Tone side of the Dolby® test film Cat. No. 69 (the side with the symmetrical waveform as opposed to the random noise side). Select format 01 (mono), and adjust the left and right optical preamplifier gain controls so the meters read approximately Dolby® level. (This is an approximate setting only, and will be repeated with greater accuracy later. If the tone cannot be made to reach the Dolby® level marks on the left and right meters, raise the exciter lamp voltage or check for any obstructions in the sound optics.)
8. Check that the right track is connected to the right amplifier by placing a business card into the light path and observe which meter drops first. The right track is the track nearer the edge of the film.
9. Thread and play the Pink Noise side of the Dolby® test film Cat. No. 69. With an oscilloscope connected as above, switch the oscilloscope to XY mode. With a real time analyzer connected to left and right channels in turn, adjust focus for maximum high frequency on the real-time analyzer and rotate the slit for best azimuth as seen on the oscilloscope. Since the focus and azimuth settings are somewhat interdependent, repeat the adjustments once again to check for optimum settings.

10. When azimuth and high frequency response have been optimized optically, then obtain flat hf response in left and right channels using the optical preamplifier hf controls. The response should be flat up to a limit determined by the slit size, with a rapid fall above a certain frequency. Attempt to achieve a flat frequency response without any peaks. Different results will be obtained from projector to projector, but in all cases a response flat to 10 kHz should be obtained. In cases of a poor high frequency response, correct the optics.

11. Re-thread Dolby® Tone side of Cat. No. 69 loop and adjust preamplifier gain controls left and right so that the meters indicate Dolby® level.

12. Repeat the above steps for all projectors.

### **B. B-Chain Alignment**

1. The acoustical frequency response of the sound system measured in the auditorium must be adjusted according to ISO 2969. Please refer to the sound system processor installation manual to obtain the detailed instructions to meet this standard. If the instructions lack such an explanation, call the manufacturer of your sound system processor for instruction on how to meet this international standard.

2. For Dolby Stereo theatres, the equipment should be adjusted using the normal method with a fader setting of 7. When playing the Dolby® Pink Noise Generator (Cat No. 85 card), each channel should produce 85 dBC as measured in turn on a slow reading meter. Confirm the surround level setting with the Dolby® Cat. No. 151 Surround Level test film. Other sound system makes shall be adjusted so the normally used fader setting yields 85 dBC for each channel. This movie has been carefully made and tested before audiences at this fader setting. We find it far more common for films to be played too soft rather than too loud, so please ensure that it is played at this level. If there are too many complaints that the film is too loud, try turning it down in small increments until the complaints are resolved.

3. Clipping/Distortion: None should be audible when reproducing the film at the standard fader setting. Please make certain there are no rattles, buzzes, scraping voice coils, or the like while reproducing the film at several dB above the normal fader setting. If there are bad drivers, the best procedure is to replace them, or, failing that, to disconnect them and report the facts to the district manager and TAP.

4. In theatres equipped with Dolby® CP-50 or CP-55 cinema processors *and* subwoofer speakers, set up and adjust the system according to the method in the relevant manual.

5. In theatres equipped with Dolby® CP-200 cinema processors, set up and adjust the Cat. No. 160 optical subwoofer controls as described in the CP-200 manual. If the theatre is equipped with wide-range speakers (such as Altec A4, A5) on Le and Re channels, set the switch located on Cat. No. 142 to off.

### **C. Playback**

Please be sure to select format 04, Dolby® Stereo optical with surrounds, for the playback of this Dolby® Stereo print.

## **SOUND QUALITY — MONO THEATRES**

### **A. A-Chain Alignment**

1. Visually inspect the optical sound slit to ensure that a clean image of it is projected on the film. If it appears fuzzy or curved, correct the problem by cleaning or changing the lens assembly or exciter bulb.

Check that the exciter bulb is correctly positioned with respect to the lens assembly to ensure a maximum and constant scanning beam illumination.

2. Use an oscilloscope or voltmeter to check that the voltage to the exciter bulb is correct and that the AC content is small (AC on the exciter lamp will cause hum in all channels of the sound system).

3. Ensure that no extraneous light source can reach the solar cell, especially light from the lamp-house. Extraneous light will produce a hum in all channels of the sound system.

4. Visually inspect the solar cell for the accumulation of dirt and or oil, clean if required. If possible, adjust the solar cell until it almost touches the film plane. If the cell is too far from the film, crosstalk will result. If too near, film and cell damage can occur. An optimum separation is about the thickness of a penny for the cell to the film.

5. Set the sound system to mono reproduction and listen to SMPTE buzz track test film P35-BT. Adjust the sound lateral guide so that both tones are as small as possible (pushing film in will produce one tone while pulling it out will produce another). The optimum is that midpoint where either no tone is heard or both tones are heard at a low level.

6. Splice a loop of one record of SMPTE P35-SB test film (approximately 30' long). Play it so that the snake track image starts nearest the edge and moves toward the picture image. Measure the scanning beam uniformity with a voltmeter connected to the output of the preamplifier, and adjust the scanning beam uniformity according to the instructions provided by the equipment manufacturer.

7. Play SMPTE P35-SF-A 9 kHz Sound Focus and Azimuth test film and adjust azimuth and focus for maximum output measured on an oscilloscope or voltmeter connected to the output of the preamplifier.

8. If you have a spectrum analyzer available, play the Pink Noise side of Dolby® Cat. No. 69 test film, and adjust the preamplifier hf controls for the response shown in Fig. 1, A-Chain characteristic.

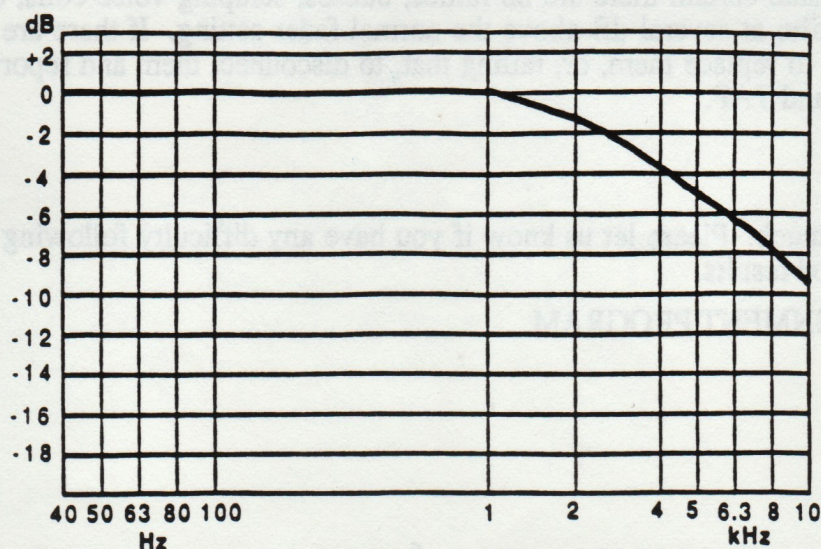


Figure 1 - A-Chain Frequency Response Characteristic for Mono Theatres

If you do not have a spectrum analyzer, use SMPTE P35-MF Multifrequency Test Film and adjust the preamplifier for the same response as above.

### B. B-Chain Alignment

1. If you have a spectrum analyzer available, inject Pink Noise into the system after the preamplifier output, such as at the top of the volume control. Adjust any available equalizer, filter network, crossover, or the like, for Curve N electro-acoustic response shown in Figure 2.

If you do not have a spectrum analyzer available, monitor the quality of reproduction from the film, and compare it to SMPTE test film ASTR-6, theatre sound test film, both of which should sound intelligible and of high quality.

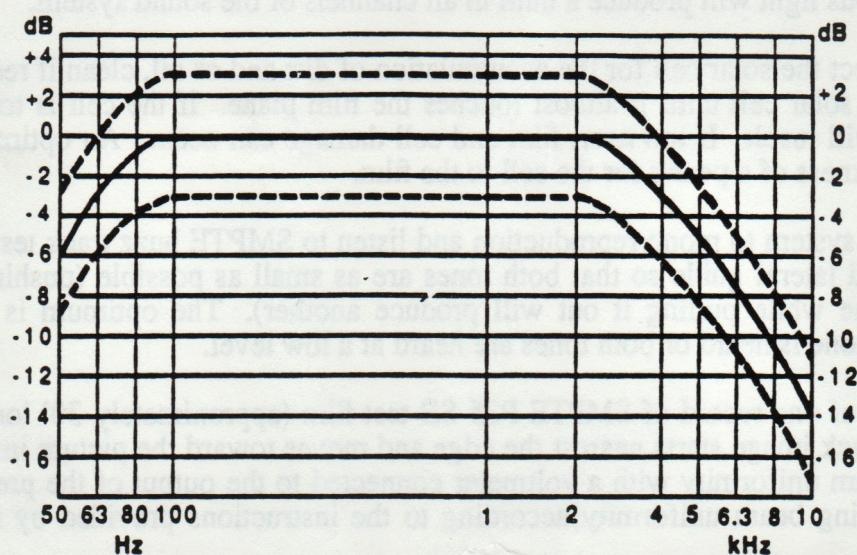


Figure 2 - B-Chain Frequency Response Characteristic for Mono Theatres

2. Adjust the combination of preamplifier gain, fader setting, and power amplifier gain, so that the standard fader setting produces 85 dBC slow-reading sound pressure level from a Dolby® Cat. No. 69 Pink Noise test film.

3. Clipping/Distortion: None should be audible when reproducing the film at the standard fader setting. Please make certain there are no rattles, buzzes, scraping voice coils, or the like while reproducing the film at several dB above the normal fader setting. If there are bad drivers, the best procedure is to replace them, or, failing that, to disconnect them and report the facts to the district manager and TAP.

Thank you very much. Please let us know if you have any difficulty following these directions and obtaining good results.

**THEATRE ALIGNMENT PROGRAM**

800 545-2525

## **ATTENTION PROJECTIONIST:**

*A stereo* trailer for  
**DUCKTALES: THE MOVIE  
TREASURE OF THE LOST LAMP**  
will be attached to your print of  
**THE JUNGLE BOOK.**

**Be sure to keep the trailer attached  
and play it in *stereo*.**

**Your Division/District Manager is aware of this  
request. Please call him or her with any  
questions.**