Film-Tech

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Lucasfilm Ltd., through its THX Theatre Alignment Program ("TAP") and in cooperation with members of the Distribution and Exhibition communities, has established the following guidelines for the operation of motion picture theatres.

These guidelines state the optimum conditions for the operation of motion picture theatres, and do not necessarily represent current standard operating conditions and practices.

Recommended Guidelines
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 movie-going experience. To assist the industry in improving the quality of motion picture presentation and theatre performance, the THX Theatre Alignment Program (TAP) is proposing the following guidelines for adoption by the industry.

These guidelines are not being proposed for the purpose of evaluating theatres or as a condition for membership in NATO.

About The Guidelines

The guidelines are divided into five areas – 1. Film Presentation, 2. Digital Image Presentation, 3. Theatre Environment and Presentation, 4. Sound Quality, and 5. Theatre Maintenance and Operations. They have been created with an emphasis on providing audiences with the best possible presentation quality and movie-going experience.

The guidelines 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 the guidelines 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 Guidelines

I.   Film Presentation

A.   Print Condition

New release prints, both 35mm and 70mm, should be exhibited for the first seven days of release with no more that "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 are 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.

B. Viewing Conditions and Image Quality:

1. Screen illumination

Screen luminance at the center of the screen should be 16fL ± 2fL. Screen luminance at the edges of the screen (5% in from each edge) should be not less than 75% and not more than 90% 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 10fL.

The white point of the image on the screen should be 5400° Kelvin +600° -200°.

Reference: American National Standard ANSI/SMPTE 196M-1995
                        SMPTE RP 98-1995

2. 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. These groups of lines are called "line pairs per millimeter" (lp/mm). The following should apply:

Center resolution: greater than or equal to 68 lp/mm.
Side resolution: greater than or equal to 56 lp/mm.
Corner resolution: greater to or equal to 40 lp/mm.

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

Reference: SMPTE Engineering Guideline / EG 5-1995
                        SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

3. Image geometry (skewing, geometric distortion, keystone distortion, etc.)

The geometry of a projected image is most noticeable in the following: titles, scrolling end-credits, images with straight parallel lines, and scenes of the horizon. Excessive horizontal and vertical projection angles are usually the cause of image geometry distortion.

Image distortion caused by the horizontal or vertical projection angle should not exceed 5% (3% is the maximum preferred).

Reference: SMPTE Engineering Guideline / EG 18-1994

4. 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 Recommended Practice / RP 105-1995
                        SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

5. Screen image (Image quality, aspect ratios & dimensions)

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

35mm (1.66:1):	0.464" x 0.825"	12.62mm x 20.96mm
35mm Flat image (1.85:1):	0.446" x 0.825"	11.33mm x 20.96mm
35mm Anamorphic image (2.39:1):	0.690" x 0.825"	17.53mm x 20.96mm
70mm image (2.2:1):	0.870" x 1.912"	22.10mm x 48.56mm

The projected image on the screen should have sharp edges, and the corners should be square (90° angles). The dimensions listed above should correspond to the placement of the masking when the 35-PA test film is projected on to the screen. <u>Note</u>: The screen size limitations, aperture plate dimensions, masking placement and image distortion should not cause the projected image to be cropped more than 5% (3% cropping is the maximum preferred).

Reference: 35mm: ANSI/SMPTE 195-1993
70mm: American National Standard ANSI/SMPTE 152-1989
SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

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.

Reference: SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

7. Framing

Framing must be highly accurate in the 35mm Anamorphic (2.39:1) 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 & 1.66:1) 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. Although the dominant non-anamorphic format for North America is 1.85:1, many films produced in other parts of the world use 1.66:1 as their main projection format.

Predetermine the proper aspect ratio for each film by setting the masking, lens, aperture plate and framing knob to the proper position. Each projected image should match the proper SMPTE aspect ratios & dimensions.

Reference: 35mm: ANSI/SMPTE 195-1993
70mm: American National Standard ANSI/SMPTE 152-1989
SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

8. 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, gargle or thumping.

II. Digital Image Presentations

A. Image Artifacts

The visual requirement for digital image presentations is for visual transparency with the studio digital master.   However, the compression systems used in distributing digital images for presentation in theatres can create visible artifacts, either from details lost in the compression process or from the introduction of unrelated new details.   Digital playback and projection systems also can produce artifacts unfamiliar to film viewers.

Digital images do not degrade with time; it is expected that no artifacts will be visible during the run of a digital presentation.

See Glossary of Terms below for definitions relating to digital system and compression artifacts.

Glossary of Terms Related To
Digital System and Compression Artifacts

a.   Blocking – a grid of small square density variations which may be seen when the eye tracks a fast moving, detailed object, or during dissolves and fades. The blocky grid remains fixed while the object moves beneath it.

b.   Ringing – appears as ripples around sharp edges. The edges do not appear sharply defined, but have closely spaced lighter and darker edges added.

c.   Mosquito Noise – small bright dots, which may be seen buzzing around at the edges of text, logos and other sharply, defined objects.

d.   Screen Door – the appearance of fine streaks or noise that appear to remain stationary while objects move beneath it.

e.   Wavy Noise – a regular change in the position of fine details as though viewed through small heat waves in the air, most often seen during slow pans across highly detailed objects such as crowds in a stadium.

f.   Blurring – an artifact where individual image frames are blurred together, causing loss of resolution and motion smear.

g.   Edge "Busy-ness" – sharp edges that jump about rapidly in very small steps, a jittery appearance to fine detail.

h.   Freeze Frames – a hesitation in the motion of the image where a frame is repeated several times, sometimes with a jump to resume the action in its original timeline.

B. Viewing Conditions and Image Quality:

1. Screen illumination

Screen luminance at the center of the screen should be 12fL ± 1fL. Screen luminance at the edges of the screen (5% in from each edge) should be not less than 75% and not more than 90% 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 9fL. The white point of the image on the screen should be 6500° Kelvin ± 300°.

Reference: Proposed revision to ANSI/SMPTE 196M-1995

2. 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. It can be measured as the Modulation Transfer Function (MTF) by using the THX resolution test images. The following applies for all types of lens formats:

Center resolution: greater than or equal to 90% MTF at 25 lp/mm.
Side resolution: greater than or equal to 80% MTF at 25 lp/mm.
Corner resolution: greater than or equal to 75% MTF at 25 lp/mm.

3. Image geometry (skewing, geometric distortion, keystone distortion, etc.)

The geometry of a projected image is most noticeable in the following: titles, scrolling end-credits, images with straight parallel lines, scenes of the horizon, etc. Excessive horizontal and vertical projection angles are usually the cause of image geometry distortion. Image distortion caused by the horizontal or vertical projection angle should not exceed 5% (3% is the maximum preferred).

Reference: SMPTE Engineering Guideline / EG 18-1994

4. Vertical (jump) and Horizontal unsteadiness (weave)

Jump is the vertical motion of the projected image. Weave is the horizontal motion of the projected image. In digital projection, jump and weave are intrinsic to the mastering process and are not determined by the playback system. The following should apply:

Jump: less than 0.10%
Weave: less than 0.15%

Reference: SMPTE RP 105-1995
               SMPTE RP 27.4-1994

5. Screen image

Digital images should have the same projected dimensions as film presentations. The desired condition is to project the full digital image without cropping. The screen image should have sharp edges, and the corners should be square (90° right angles). The screen size limitations, aperture plate dimensions, masking placement and image distortion should not cause the projected image to be cropped more than 5% (3% cropping is the maximum preferred).

III. Theatre Environment and Presentation

1. 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.

To obtain a good "stereo image", the installation of a perforated screen is imperative.

2. 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 will reduce image contrast. Room surfaces should not reflect significant light onto the screen. Surfaces of objects behind the screen should not reflect light through the screen perforations into the seating area (shiny conduit, light fixtures, junction boxes, etc). To eliminate distracting reflections, all surfaces located behind a perforated screen should be covered with masking or spray painted flat black.

Exit signs, regardless of placement, should not cast stray light on the screen (which may mean shielding signs where necessary). The entrance and exit doors of an auditorium should be arranged so that direct sun light and/or lobby light can not shine directly on the screen at any time during feature presentations. Strictly adhere to all local and state safety codes and regulations.

3. Light source within field of view

The luminance of light sources within the fields 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. Strictly adhere to all local and state safety codes and regulations.

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

4. Masking (condition and placement)

Theatres should have masking cloth or drapery, and it should be in good condition without rips or tears. If operable, the masking should adjust to the proper aspect ratios & dimensions (1.85:1, 2.39:1, 1.66:1, etc.). Left and right side masking, when in place, should 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 masking in front of the loudspeakers should be acoustically transparent. The edges of masking should be parallel and consistent with the correct projected image dimensions. The proper placement of the masking should be determined while the 35-PA test film or its digital equivalent is projected on to the screen. <u>Note</u>: The screen size limitations, aperture plate dimensions, masking placement and image distortion should not cause the projected image to be cropped more than 5% (3% cropping is the maximum preferred). Adhere to SMPTE aspect ratios & dimensions.

Reference: 35mm: ANSI/SMPTE 195-1993
                     70mm: American National Standard ANSI/SMPTE 152-1989
                     SMPTE RP 40-1995 / 35-PA & 35-IQ Test Film

5. *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 at certain angles to maximize impact and minimize discomfort. The horizontal viewing angle (field of vision) from the most distant seat should be no less than 26° (36° recommended). The vertical viewing angle from the first row should not exceed 35°.

Seating should be arranged so that it provides all patrons a comfortable field of view. To keep the viewing angle distortion at a minimum, all seats should be contained within a 45° Iso-Deformation line, as defined in EG18-1994.

Efforts should be made to avoid designing auditoriums that locate seats in areas that are outside the preferred viewing angles and/or outside the loudspeaker coverage zones.

Reference: SMPTE Engineering Guideline EG 18-1994

6. *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. Riser seating should be regarded as an important consideration for future theatre designs.

Reference: SMPTE Engineering Guideline EG 18-1994

7. *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 box office along with the duration of the intermission. When appropriate, the word "INTERMISSION" should appear on the screen, along with the duration of the intermission.

IV. Sound Quality:

1. Digital sound format

All motion picture theatres should be equipped to properly reproduce at least one type of digital audio. The minimum type of amplifier and speaker arrangement should be a 5.1 audio system (Left, Center, Right, Left Surround, Right Surround and Subwoofer). The backup for the digital audio system should be the standard 35mm stereo variable-area optical sound track.

2. Level (loudness)

Each screen channel of a theatre's sound system should play at a sound pressure level of 85dBC at the standard fader setting. This level 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 manufacturer's specifications). Overly loud trailers or commercials may need compensation downwards, but every effort should be made to play features at the standard fader setting.

Reference: The standardized dubbing stage sound pressure level (SPL) of 85 dBC
              The 1999-2000 TASA Standard (Trailer Audio Standards Association)
              35mm: SMPTE 214
              SMPTE 202M-1998
              SMPTE RP 200-1999
              SMPTE Engineering Guideline EG 18-1994

3. Frequency range and equalization

Frequency range can be defined as the limits of a sound system to reproduce frequencies from low bass to high treble (also defined as bandwidth). Equalization over the frequency range is adjusted at the equalizer in the cinema processor. The equalizer along with calibrated gain settings allows the sound system to reproduce a smooth range of frequencies from bass to treble as outlined in the reference standards. Each theatre should be equalized to the "X" curve (ISO 2969). Excessive equalization should be avoided.

A calibrated A-chain (projector and preamplifier) should include a properly aligned azimuth and a preamplifier/cell output that has been adjusted for full frequency response. Follow the manuals of your cinema processor and projector for the proper setup and alignment of the A-chain system.

The B-chain (equalizers, power amplifiers, loudspeakers, and room acoustics) frequency response and gain settings should meet the reference standards as outlined in 202M and RP200. Follow the manual of your cinema processor to specifically align your cinema audio system.

To maintain the sound quality after the sound system has been equalized and calibrated, install tamper proof devices over the gain controls and amplifier knobs. Most amplifier manufacturers sell tamper proof caps for their products.

Reference: 35mm: SMPTE 214M-1994
                70mm: SMPTE 217-1985
                SMPTE RP 97-1997
                SMPTE RP 68-1997
                SMPTE 202M-1998
                SMPTE RP 200-1999
                ISO 2969
                SMPTE Engineering Guideline EG 18-1994

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.

Speed fluctuations at the digital audio reader will sometimes cause the digital audio processor to "drop out" producing a "gargle" sound.

Reference: Audio Engineering Society Standards AES 5
                SMPTE RP97-1997

5. Stereo coverage

To obtain a good "stereo image", the installation of a perforated screen is imperative. The left channel and right channel loudspeakers should be mounted slightly inside the left and right edges of the widest screen image. These speakers should be located behind the screen but not behind the masking or curtains. The center channel loudspeaker should be located behind the center of the screen. Acoustically transparent masking should be used any time the masking covers the left and right speakers.

To obtain a good "stereo image", the installation of a perforated screen is imperative.

6. Headroom, speakers and audio channels.

The headroom for digital audio is 20db in any one channel. The sound system should be capable of reaching this level without clipping, distorting or overloading the amplifier or speaker. Each component in the sound system should be capable of reproducing the frequency responses as described in the SMPTE standards.

The array of surround loudspeakers should have a coverage pattern that is uniform within ± 2db over the entire seating area (this includes the left, right and back surround channels).

Reference: 35mm: SMPTE 214-1994
                70mm: SMPTE 217-1985
                SMPTE 202M-1998
                SMPTE RP 200-1999
                SMPTE Engineering Guideline EG 18-1994

7. Acoustics (reverberation and echoes)

Reverberation and echoes are destructive to dialogue intelligibility and should be minimized in theatres. The proper decay times for reverberation vary from room to room based on the cubic volume of the specific auditorium. Depending on the size of the room, the acceptable range for reverberation should be from 0.5 to 2 seconds, never exceeding 2 seconds. The theatre should be absent of all audible echoes.

Reference: SMPTE Engineering Guideline EG 18-1994

8. Background noise (HVAC, lobby, sound system)

Noises originating from HVAC systems, generators, chillers, compressors, etc. should not mask or interfere with the cinema sound system. The sound system should not have audible problems such as hums, hiss, crackles, pops, etc. Hinges on auditorium doors and seats should not create noise.

Maximum background noise levels in an auditorium should not exceed NC-30. Intrusive external noises should not be audible in the auditorium (trains, planes, road noises, etc.)

Reference: American Society of Heating, Refrigeration, and Air Conditioning Engineers
(ASHRAE) Guidebook
SMPTE RP 141-1995
SMPTE Engineering Guideline EG 18-1994

9. Sound "bleed-through" / Wall isolation & transmission

One of the most overlooked items in newly designed theatres is the quality of the demising walls. Noise from one auditorium entering into adjacent auditoriums is a common problem found in many multiplexes. The design of a demising wall with a high STC rating will stop this type of intrusive noise. Care must also be taken to minimize audible flanking paths around the walls and doors.

All intrusive noises should be less than NC-30, and no pure tones from adjacent auditoriums should be audible.

Reference: SMPTE Engineering Guideline EG 18-1994

V. 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, box office sign, 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, box office 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. Adhere to the all building codes and government requirements (including ADA requirements).

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. Box office

Theatre box offices should be located near the front entrance of a theatre complex where applicable. Box offices should have signs indicating the feature(s), showtime(s), rating(s), sound formats and admission price(s). Box offices for multiplexes should have easy-to-read signs that indicate when and where tickets can be purchased for each feature.

The sidewalk in front of the box office 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 box office or theatre entrance. Adhere to ADA requirements.

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. Adhere to ADA requirements.

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 all 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.

Please adhere to the service and quality guidelines set by the National Association of Concessionaires (NAC).

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 lettering of the titles should be coordinated and have a neat appearance.

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

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 68° and cool to 76° (these suggestions are dependent on local climates).

Adhere to ADA access and seating requirements. 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 is picked up and spills are mopped up between shows. Trash receptacles should be easily accessible.

Auditoriums should be monitored by theatre staff during all presentations.

9. Auditorium lighting

Auditoriums should have ceiling lights and/or wall lights that illuminate the seating area. In addition, there should be walkway lights on the floor or on the aisle-seats of each row that illuminate the aisles. Aisles and stairways should be illuminated during the feature presentation.

The interior lighting of an auditorium should be sufficiently reduced during feature presentation so as not to interfere with the projected image on the screen. The house lights should be dimmed *before* the image is projected onto the screen. The house lights may be raised to an acceptable level during the end credits for the safety of the patrons exiting the auditorium.

Note: The dimming system for the auditorium lights can cause an electrical noise (low frequency buzz) that can interfere with the sound system. Precautions should be taken to eliminate this potential noise source.

10. Seats

Auditorium seats should be arranged in parallel rows facing the screen as detailed in SMPTE EG 18-1994 (curving the rows where possible). Stadium seating should be regarded as an important consideration for future theatre designs. Seats should be in good condition with no broken parts (armrests, seat backs, bottom cushions, seat anchors, etc.). Seats should have a minimum width of 20 inches (bigger is better). Space between rows of seats should be as great as possible but not less than 36 inches for fixed-back seats, and not less than 38 inches for rocker seats.

Avoid locating an aisle in the visual center of the auditorium. Prime seats should not be sacrificed for aisles (i.e: aisles in the center of the seating area). Investigate other possibilities, such as: adding two aisles, one on the far left and one on the far right side of the auditorium. If a single aisle is your only option locate the aisle as far away from the center as possible.

Adhere to all local, state and ADA codes and requirements.

11. Theatre Staff

Theatre employees should be courteous, efficient, knowledgeable, 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 stands 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 displayed at the box office and those recorded on the theatre's phone message system. All advertisements should clearly indicate the sound format and the image format (if projected in 70mm or Digital Image) for each feature.

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 that potentially threatens the safety of the audience and/or staff. This should include a proper program for the safe evaluation of the theatre as worked out between management and local safety officials.