Cinema Source™

Specifying Projection Screens in Six Easy Steps

CinemaSource,
18 Denbow Rd., Durham, NH 03824
www.cinemasource.com

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For information contact: The CinemaSource Press, 18 Denbow Rd. Durham, NH 03824

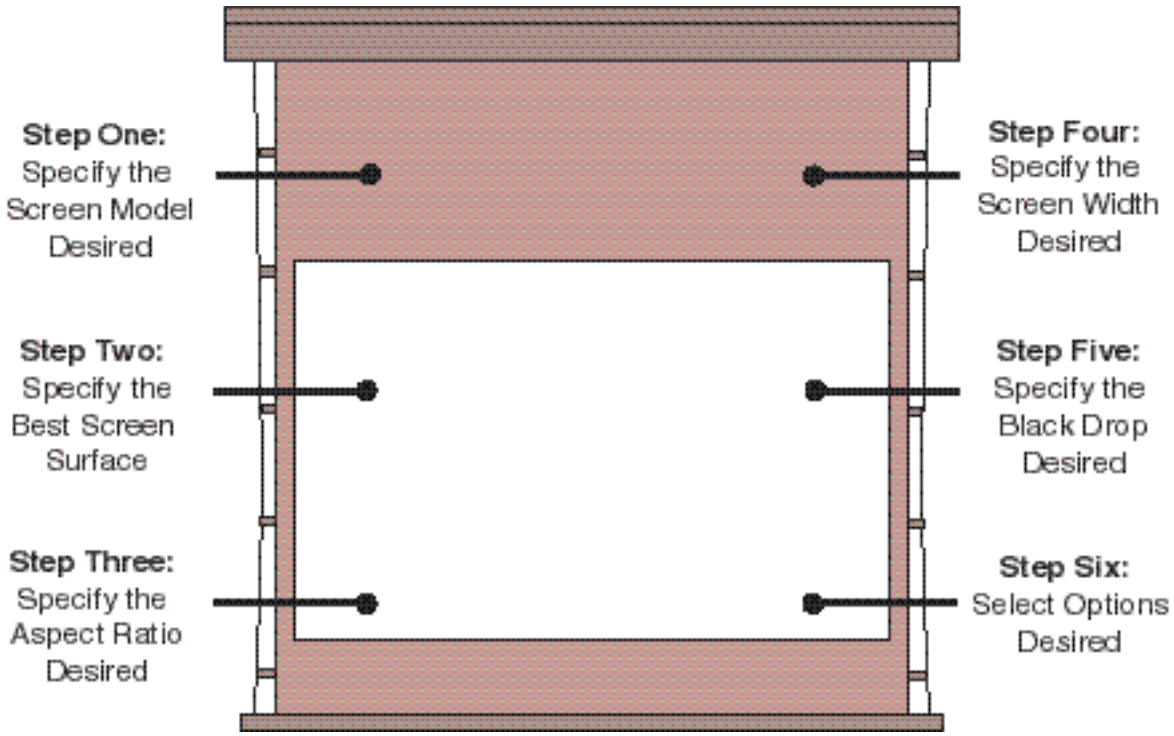
Specifying Projection Screens in Six Easy Steps

Specifying Screens

Chapter 10: Glossary

CHAPTER NINE: Specifying Home Theater Screens

Specifying Front Projected Home Theater Screens In Six Easy Steps



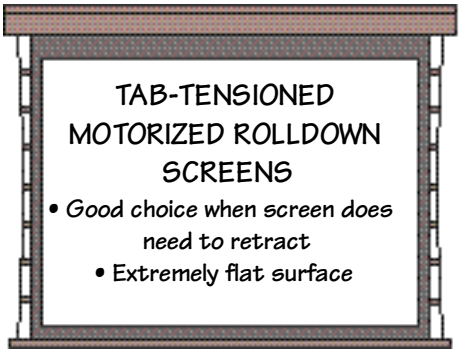
STEP ONE

Specify The Screen Model Desired

HIGH GAIN CURVED SCREENS

- Good choice for environments with high ambient light
- Has restricted viewing cone

TAB-TENSIONED MOTORIZED ROLLDOWN SCREENS

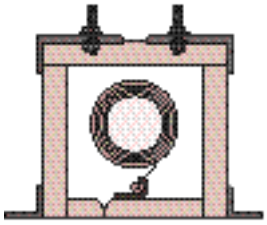


- Good choice when screen does need to retract
- Extremely flat surface

FIXED FLAT SCREENS

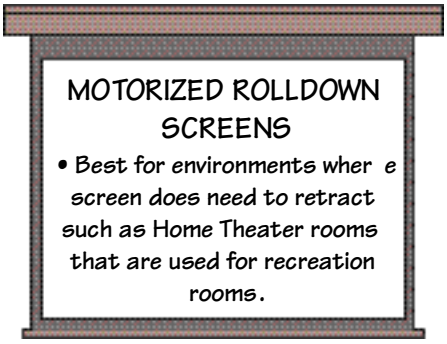
- For environments where screen doesn't have to retract such as dedicated Home Theater rooms
- Surface is stretched per fectly flat

FLUSH CEILING MOUNTED SCREENS



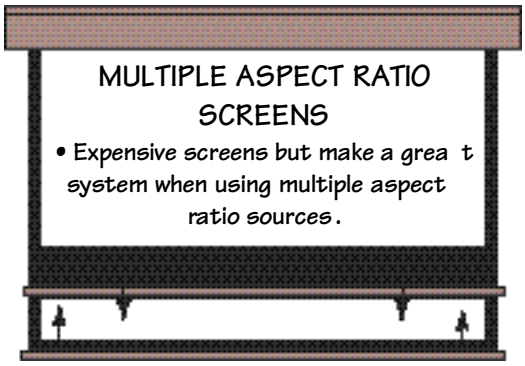
- Good choice when it is desired tha t screen assembly be hidden from view

MOTORIZED ROLLDOWN SCREENS

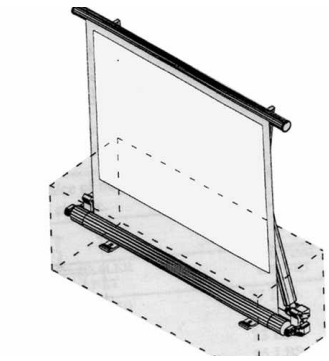


- Best for environments wher e screen does need to retract such as Home Theater rooms that are used for recreation rooms.

MULTIPLE ASPECT RATIO SCREENS



- Expensive screens but make a grea t system when using multiple aspect ratio sources.



• FIOOR RETRACTABLE SCREENS

- Good choice for environments wher e there is not possible to "hang" a standard screen
- Designed to rise upwards

STEP TWO

Specify The Best Screen Surface

PERFORATED MATERIAL, Gains from .8 to 1.8 - Acoustically transparent materials are available from all the screen manufacturers and are a good choice when using very bright displays such as LCD, DLP and D-ILA models. For more information, see our discussion in Chapter One.

BLACK LEVEL ENHANCEMENT MATERIAL, Gains from .8 to .95 - Both Stewart and Da-Lite offer materials that a less than unity gain and are designed to increase the black level of the display device. These surfaces were designed to overcome the lack of deep blacks in most current CRT/DLP projectors.

MATTE WHITE MATERIAL, Gain= 1 - Matte white screens are the safe alternative for all front projection display devices. Most home theater installers tend to avoid them, however, because they are relatively low in brightness. Most installers put CRT projectors on screens with gains from 1.3 to 2.0 and LCD/DLP/DILA projectors on either high gain surfaces (2.0 to 3.1) or the Black Level Enhancement Surfaces.

IMAGING SCIENCE FOUNDATION MATERIAL, Gain= 1.3 - The ISF has approved two surfaces for their certification. Offered as Stewart's StudioTek 130 material and Da-Lite's CinemaVision material, both of these 1.3 gain materials offer excellent color rendition with a complete absence of hotspotting. These materials are a favorite with installers who are designing for optimum video display performance in darkened home theater rooms.

HIGH GAIN FLAT SURFACES, Gains= from 2.0 to 3.1 - These materials are very bright but, it is best to use them with solid state imaging devices, i.e. LCD, DLP, DILA, etc. CRT projectors tend to "hot spot" when high gain materials such as these are used.

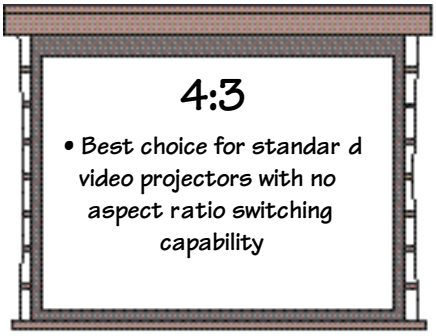
ULTRA HIGH GAIN CURVED SCREENS, Gains = from 11 to 13 - Vutec's Ultra-High Gain Curved Screen line, this material has been carefully developed and improved over many years to achieve not only a maximum gain of 13.2 on-axis, but to maximize the breath of viewing area. It is truely the world's brightest front view screen material and is an excellent choice when dealing with very high ambient light conditions.

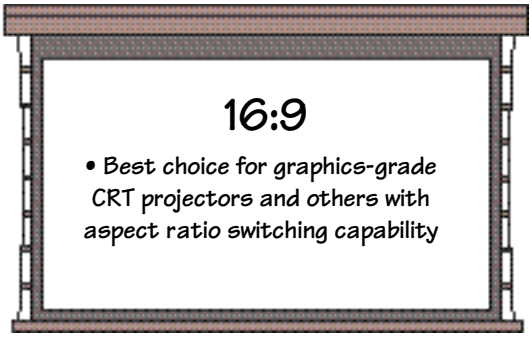
Hotspotting can be a problem on high gain screens when using CR T-based video projectors . Recommended materials hav e gains from 1.0 to 2.0

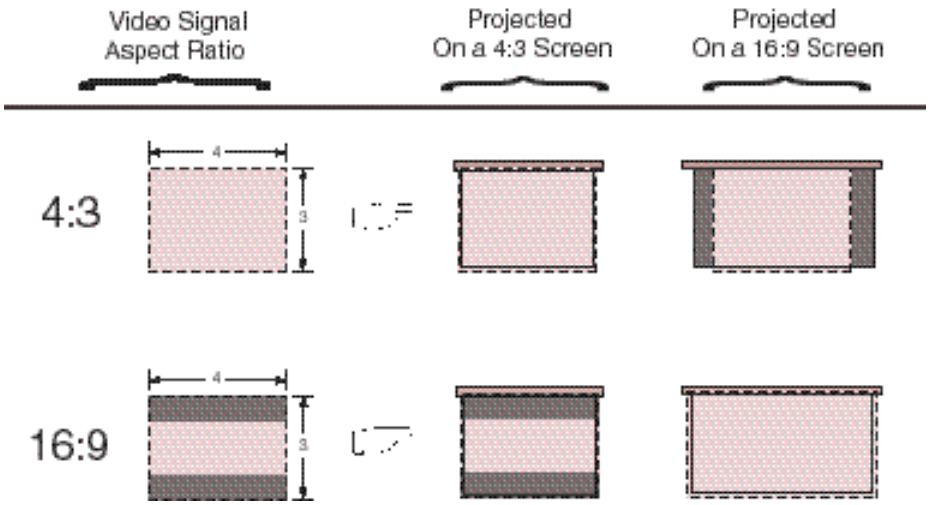
Solid state imaging video projectors, i.e. LCD, DLP, DILA, can be used on higher gain screen materials

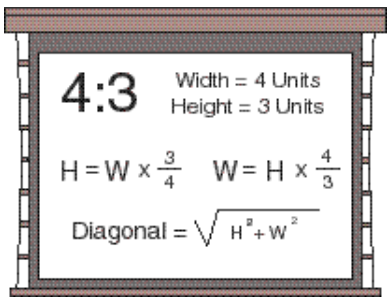
STEP THREE

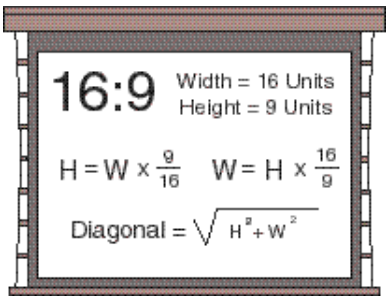
Specify The Aspect Ratio Desired

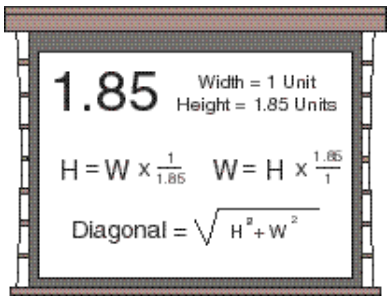










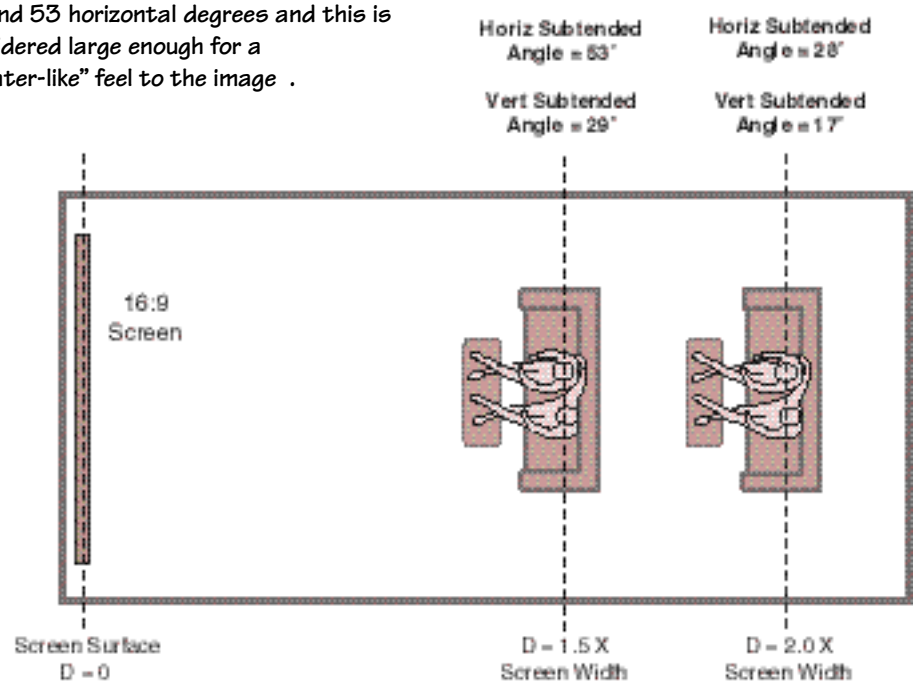


STEP FOUR

Specify Screen Width Desired

A)

• The principal viewer(s) should be seated 1.5 to 2 screen widths from the screen. In this range, the picture subtends between 28 and 53 horizontal degrees and this is considered large enough for a "theater-like" feel to the image .



B)

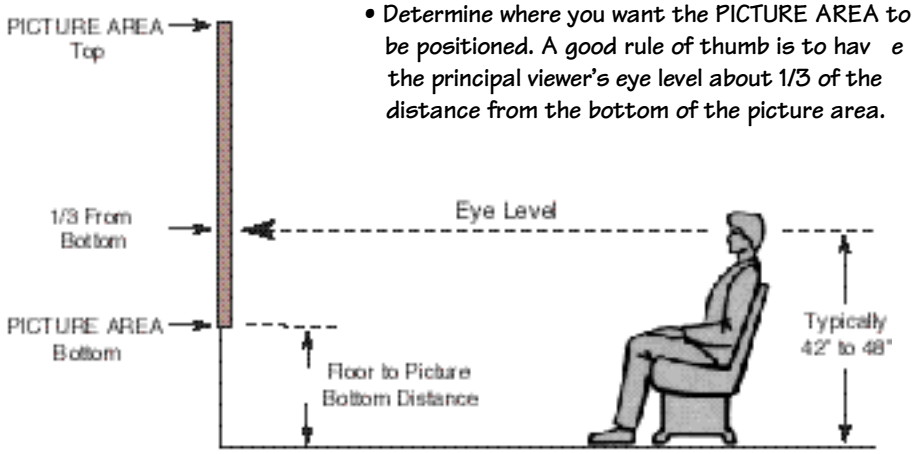
• Once you know the screen width (from above) and aspect r atio, you can calculate the screen size . Verify that the screen brightness is over 6 ft-lamberts. If the number is lower than 6, or there is a lot of ambient light in the room, consider a smaller screen or higher gain surface.

$$\text{Screen Brightness (in Foot-Lamberts)} = \frac{\text{Projectors Light Output (in ANSI Lumens)}}{\text{Screen Size (in Square Feet)}} \times \text{Screen Gain}$$

STEP FIVE

Specify The Black Drop Desired

A)

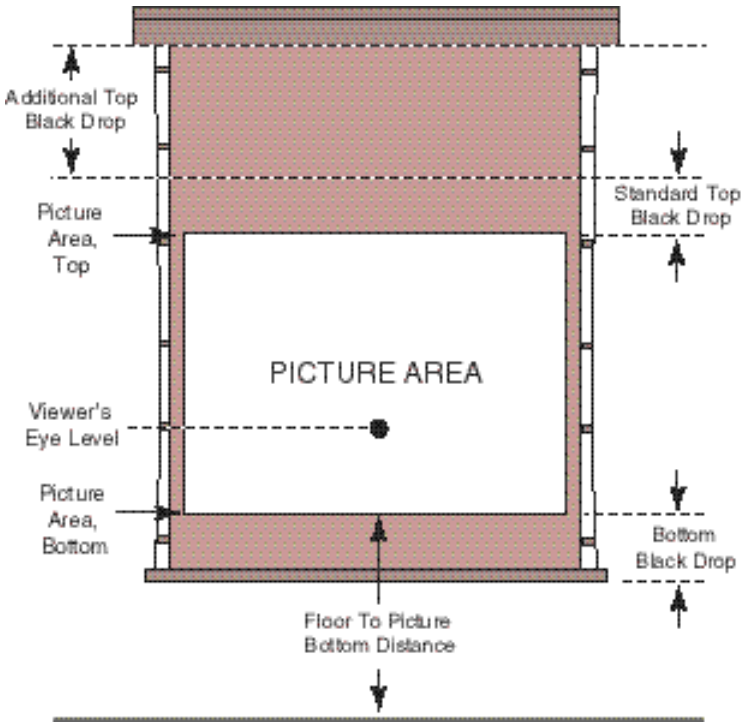


- Determine where you want the PICTURE AREA to be positioned. A good rule of thumb is to have the principal viewer's eye level about 1/3 of the distance from the bottom of the picture area.

B)

- Once you know the position of the picture area in relation to the floor, you can work out the black drop necessary to position the screen correctly in the room.

Note: On tab-tensioned screens, the black drop distances need to be determined precisely because the screen surface rolls out of the housing completely. On non-tab tensioned models, excess top black drop can be ordered and adjusted on-site .



Specify Options (If Desired)

1) 220 Volt Motor: For international applications, 220V 50hz motors can be specified.

2) Reverse Roll: The motorized screens can be specified “reverse roll”. This allows the screen material to roll off the front of the roller drum and is commonly used to clear obstructions near the screen mounting surface.

3) Motor On “The Other Side”: The motors and electrical connections are typically mounted on the left side of the screen housings. Upon request the manufacturers can usually mount the motor assembly and electrical connections on the other side.

4) Black Backing: For applications where the screen will be lowered in front of a strong light source, such as a window, for example, some screens are too thin to be opaque. Check with the manufacturer as to the light blocking capability of the material that you want..

5) Custom Housing Colors: The standard housing colors are white, black, and bronze. Typically for an additional fee, housings can be specified with custom powder coated finishes.

6) Velvet Finish: The stretched flat screens can be ordered with “velvet wrap” for an additional fee. This process actually wraps the standard frame with velvet textured material. It is a popular option for those that find the reflection off the standard black anodized objectionable.

7) Perforated Leader: For those that what to hide a center channel speaker behind the screen, but don’t want to use perforated material. The black leader at the top or the bottom of the screen can be specified as perforated material for an additional fee.

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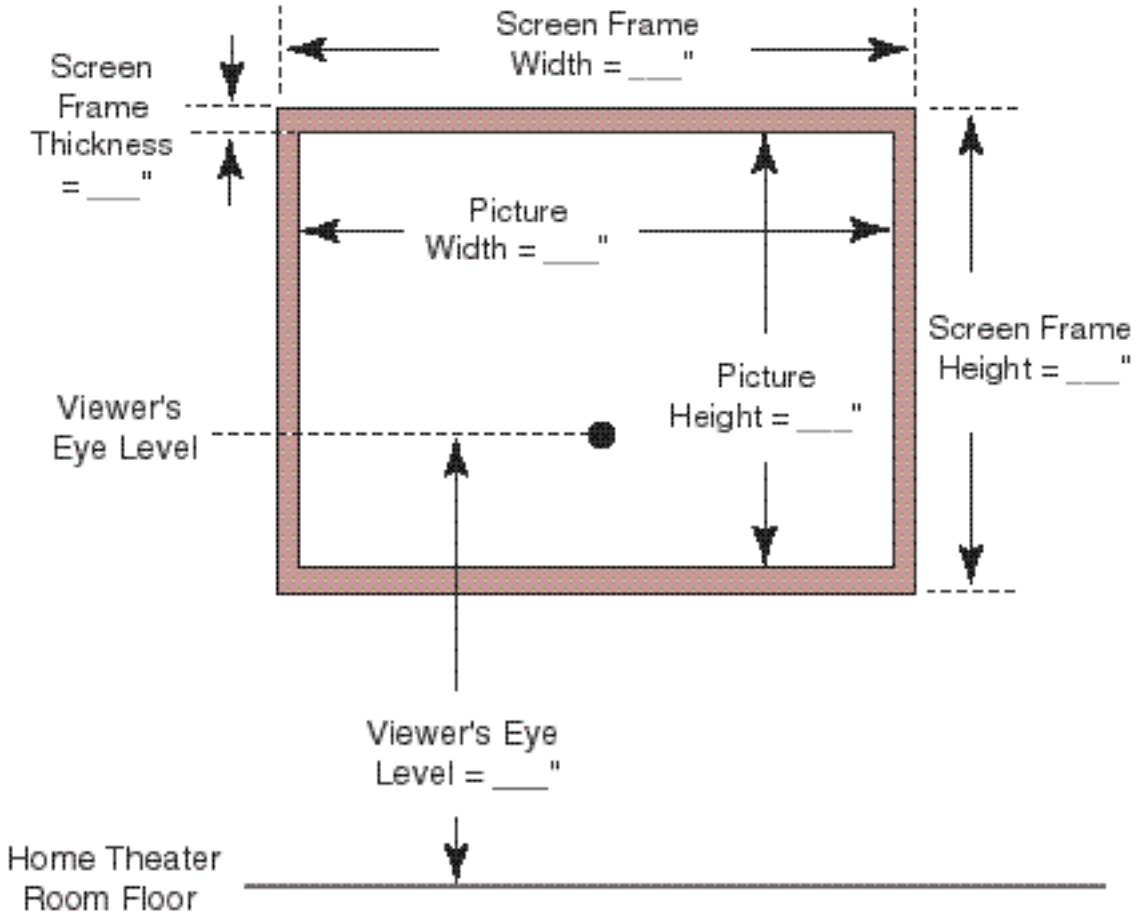
FLAT SCREEN DIMENSIONS FORM



SCREEN MANUFACTURER = _____

SCREEN MODEL = _____

SCREEN ASPECT RATIO = _____

SCREEN SURFACE = _____

FRAME = _____

SPECIAL INSTRUCTIONS = _____

Signature and Date = _____

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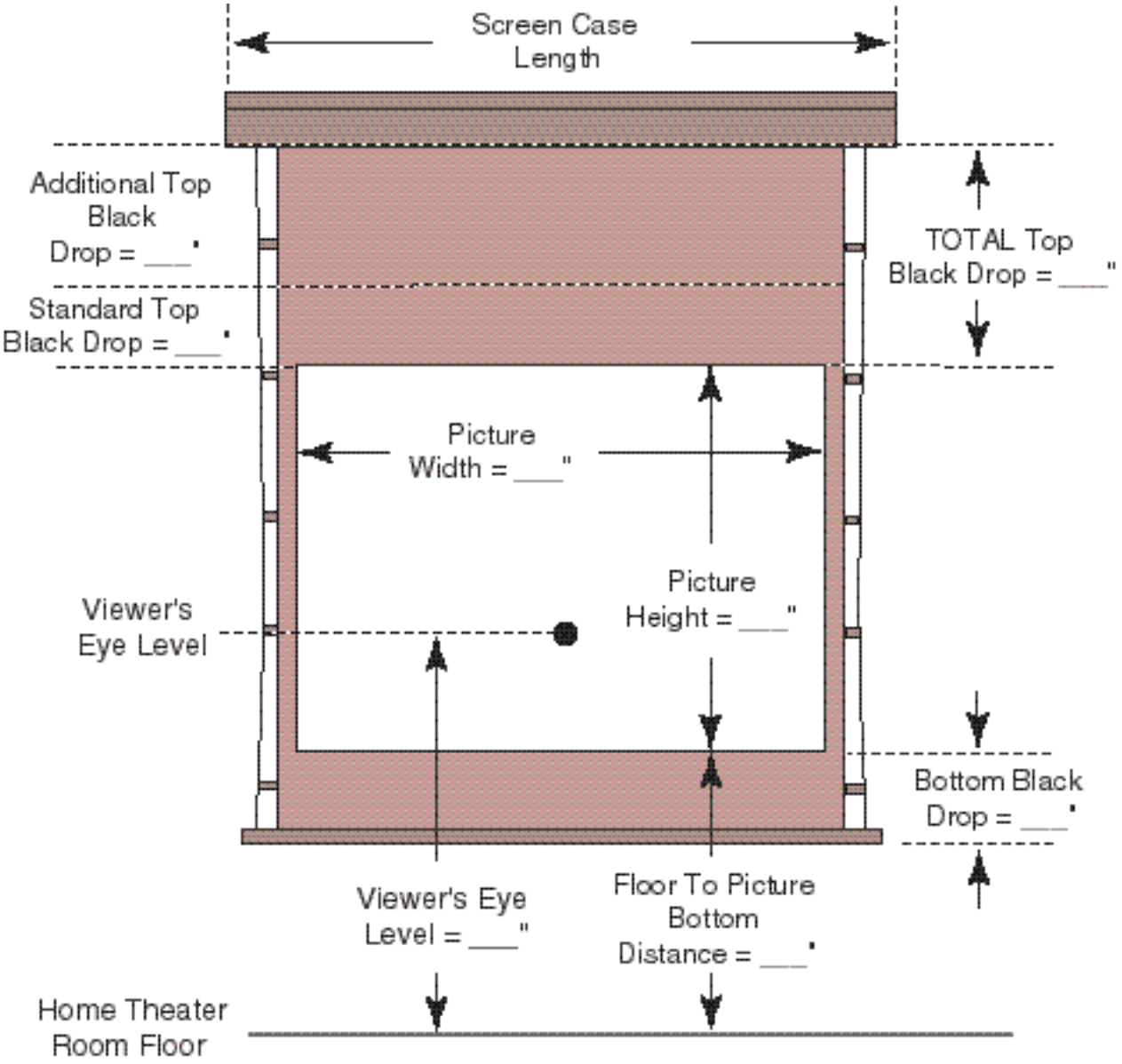
ROLLDOWN SCREEN DIMENSIONS FORM



SCREEN MANUFACTURER = _____

SCREEN MODEL = _____

SCREEN ASPECT RATIO = _____

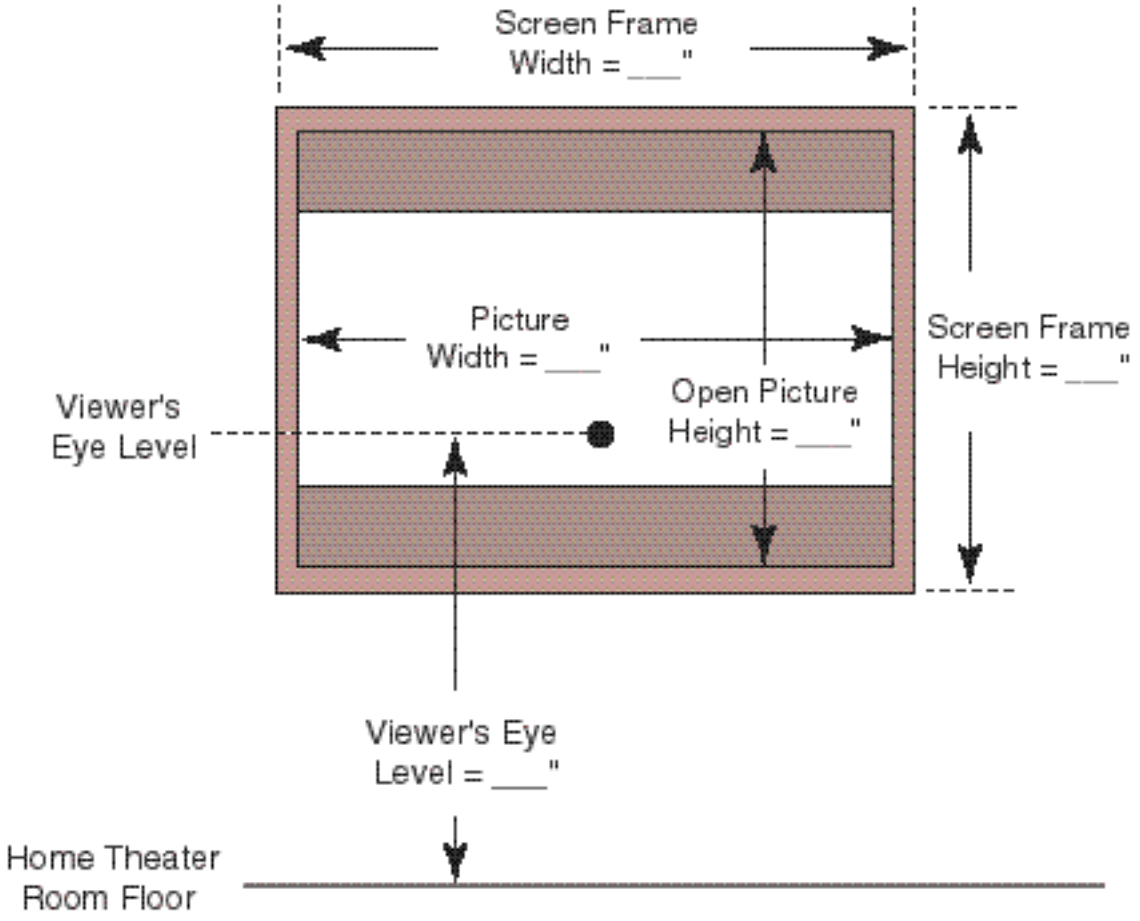
SCREEN SURFACE = _____

CASE COLOR = _____

SPECIAL INSTRUCTIONS = _____

Signature and Date = _____

VERTICAL VARIABLE ASPECT RATIO SCREEN DIMENSIONS FORM



SCREEN MANUFACTURER = _____

SCREEN MODEL = _____

OPEN SCREEN ASPECT RATIO = _____

CLOSED SCREEN ASPECT RATIO = _____

SCREEN SURFACE = _____

FRAME = _____

SPECIAL INSTRUCTIONS = _____

Signature and Date = _____

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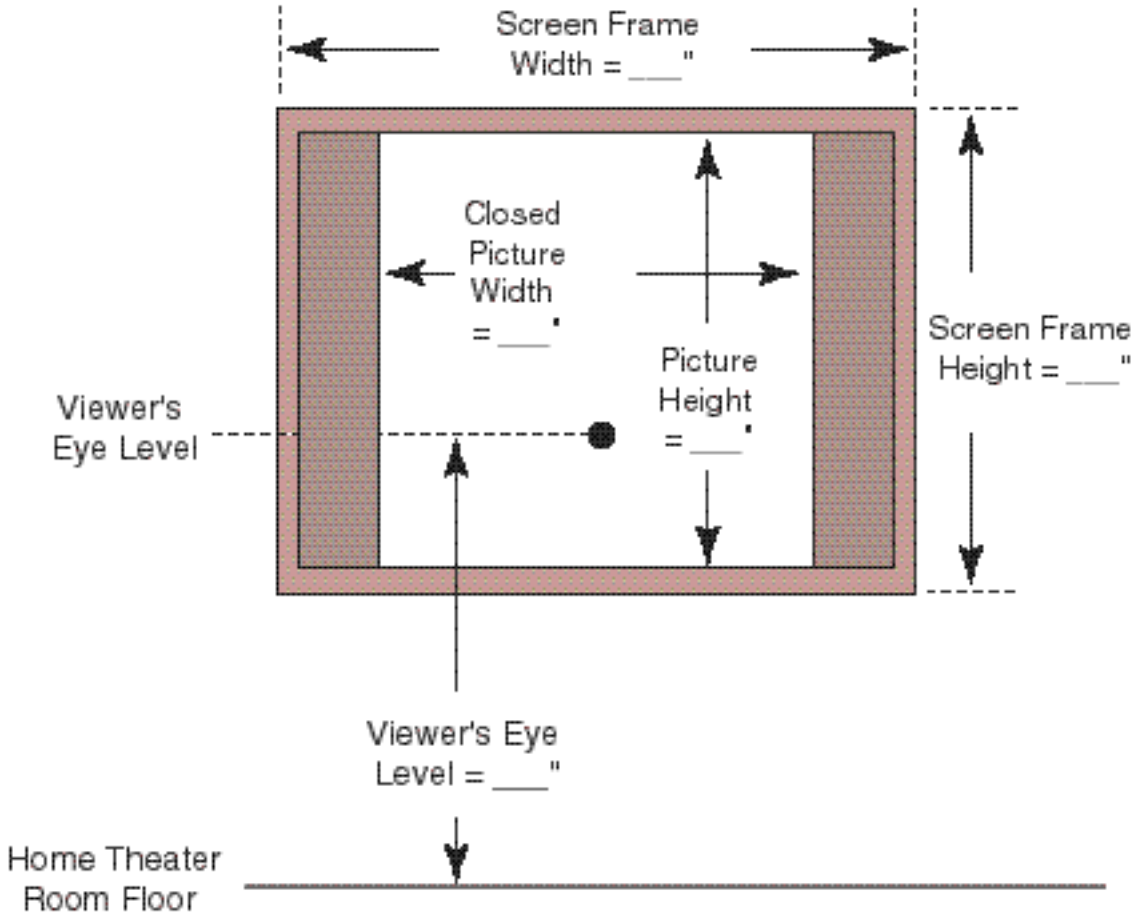
HORIZONTAL VARIABLE ASPECT RATIO SCREEN DIMENSIONS FORM



SCREEN MANUFACTURER = _____

SCREEN MODEL = _____

OPEN SCREEN ASPECT RATIO = _____

CLOSED SCREEN ASPECT RATIO = _____

SCREEN SURFACE = _____

FRAME = _____

SPECIAL INSTRUCTIONS = _____

Signature and Date = _____

CHAPTER TEN: Screen Terminology Glossary

Ambient Light: The light in a viewing room produced by sources other than the screen

Aspect Ratio: The numeric relationship between a screen's height and width. Generally speaking an aspect ratio defines a "shape".

Black Drop: On a rolldown flat screen this is the area that is black on the top or bottom of the picture areas.

Brightness: A viewer's subjective response to a display's luminance

Contrast ratio: The numeric relationship between the brightest and darkest portions of a video display. It is generally expressed in foot-lamberts as a ratio of max/min.

CRT: Cathode ray tube, a vacuum tube where electrons are drawn to phosphor targets via high voltage potentials. This is the technology behind standard "picture" tube-type televisions.

DLP: Digital light processor, a technology based on the Texas Instruments DMD micromirror imaging chips. These chips have a field of reflecting mirrors that can be modulated to produce video images.

Foot-Lambert: A unit of luminance equivalent to 1 lumen per square foot.

Fresnel Lens: A device constructed of a large number of closely spaced concentric circles cut into an optical surface. The circles are cut so that they reduce the incident bend angles of the projection source and collomate the light into one beam.

Gain: A measurement of the amount of light radiating perpendicularly from a screen. Unity gain (a gain of 1) is generally standardized via a block of magnesium carbonate.

LCD: Liquid Crystal Display, a technology of video display that uses liquid crystal "shutters" to modulated the light passing through the imaging chips. Also refered to as "Transmissive LCD technology".

Lens Speed: The ability of a lens to pass light. Expressed in a ratio, it is the focal length of the lens divided by the effective diameter of the lens. A fast lens passes more light and gets a lower rating.

Lumen: The quantity of visible light falling on a 1 square foot surface of a sphere 1 foot in radius as radiated by a source of 1 standard candle. This specification is often used to rate the light output of video projectors. Look for ANSI lumen ratings, it is a standardized measurement.

Luminance: The brightness of a light source measured in foot-lamberts.

Pixel: A picture element. On digital devices, images are usually constructed of pixels fields divided into rows and columns.

Resolution: The limit of a display's ability to present fine detail. "Optical resolution" is usually the number of lines seen, "video resolution" is usually the number of "line pairs" seen.

Scan Lines: A CRT-based video display creates images by rapidly sweeping electron beam across a phosphor target. As these lines are swept from top to bottom they create scan lines.

Throw Distance: The distance from the screen surface to a video display device. This is an important number used in the installation of a video display.

Viewing Angle: An angle that specifys a particular viewing location measured from a perpendicular from the screen surface.

NOTES: