

## 3.0 Installation

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**IMPORTANT:** The projector's power plug was designed for a single phase, 3 wire source. The power plug shipped with the projector may have to be changed to meet electrical codes for local authorities. It is the user's responsibility to contact an electrician with current knowledge of electrical codes in the country of use.

**WARNING:** Hughes-JVC will ***not be responsible*** for any hazards caused by ***unlicensed personnel*** changing the original single phase, 3 wire design.

### 3.1 Before Installation - Location Considerations

The Model 230 is an advanced projector that delivers a premium image if set up correctly. Improper setup and location will cause problems later during the image adjustment section. Carefully observe the requirements in this section to set up the projector correctly.

Prior to installing the projector, consider the following:

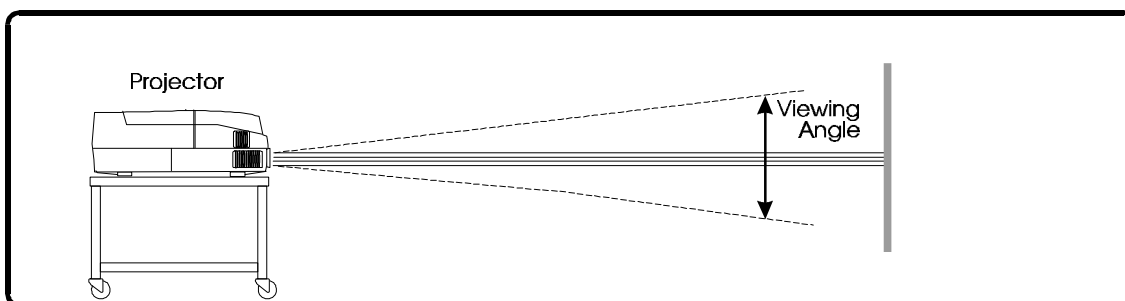
- Table or Ceiling mounting
- Projector-to-Screen Alignment
- Screen Size
- Seating Arrangements
- Lens type Selection
- Physical Access
- Heat Dissipation

## 3.2 Projector-to-Screen Alignment

Set the projector to the proper distance from the screen as determined by the screen width and lens ratio illustration (see Section 3.3). The Lens Pattern illustrated in Figure 3-4 will help determine the optimal screen widths and throw distances for the zoom lens.

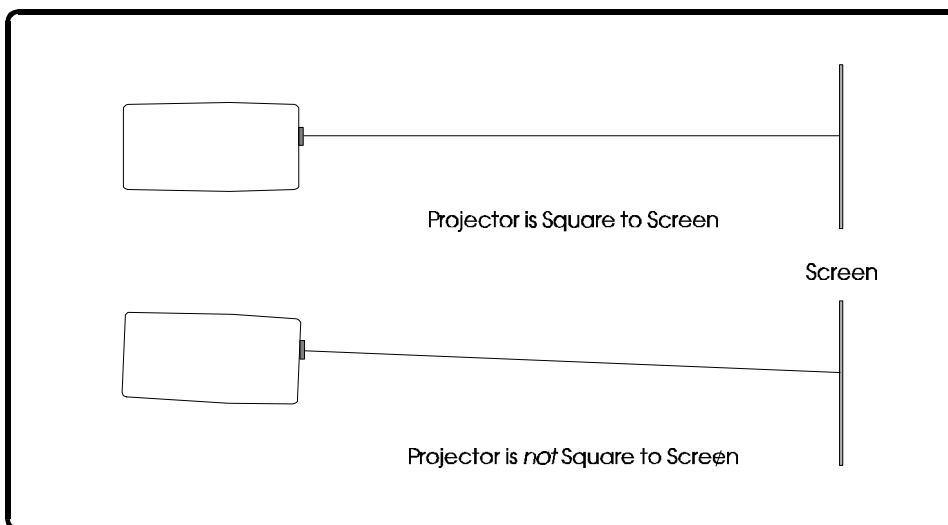
The maximum *projector-to-screen* vertical tilt angle and horizontal tilt angle for a table or ceiling mount is shown in Table 3-1. Any tilt greater than the maximum results in a severe keystone error that cannot be corrected by the Keystone adjustment.

The Model 230 Projector can be used upright or downright at any angle from 5° to 85°. Due to voids in the prism fluid, avoid angles within 5° of the vertical, upward or downward.



**Figure 3-1.** Maximum projector-to-screen vertical tilt angle depends on the lens used (Table 3-1).

Verify that the projector is as square to the screen as possible (see Table 3-1).



**Figure 3-2.** The projector should be as square to the screen (side to side) as possible (Table 3-1).

### 3.3 Lens Throw Distance and Screen Width

Throw distance is the distance from the projector lens to the closest point on the screen. Screen width is the maximum width of picture that can be displayed (*Figure 3-3*).

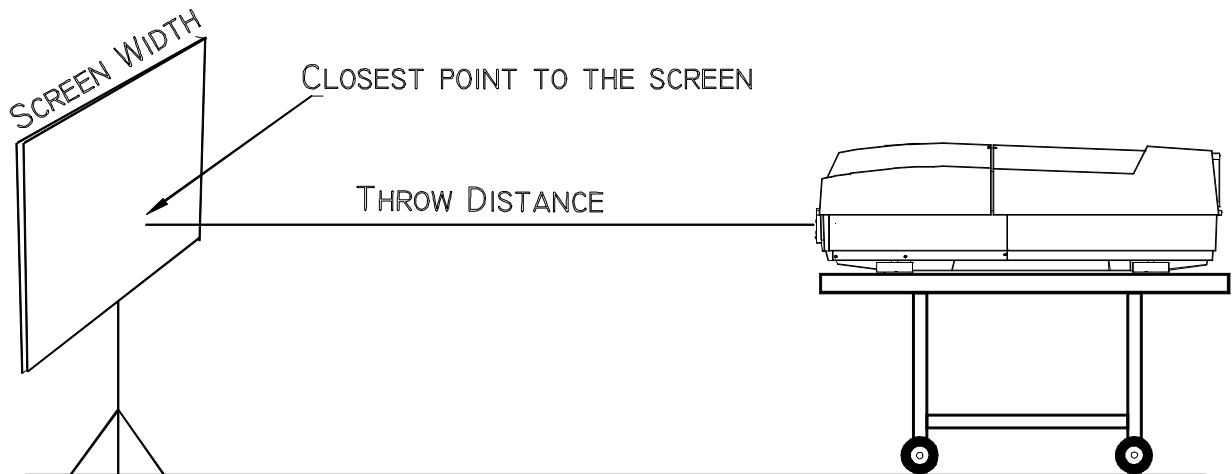
Throw distances from 2.6 to 5.1 times screen width are available with the zoom lens. See Table 3-1 and Figure 3-4 for information on optional lenses.

**NOTE ON CHANGING LENSES:** Refer to the Service Manual when changing from the Zoom lens to a fixed lens or from a fixed lens to the Zoom lens.

**Table 3-1. Lens Dynamics**

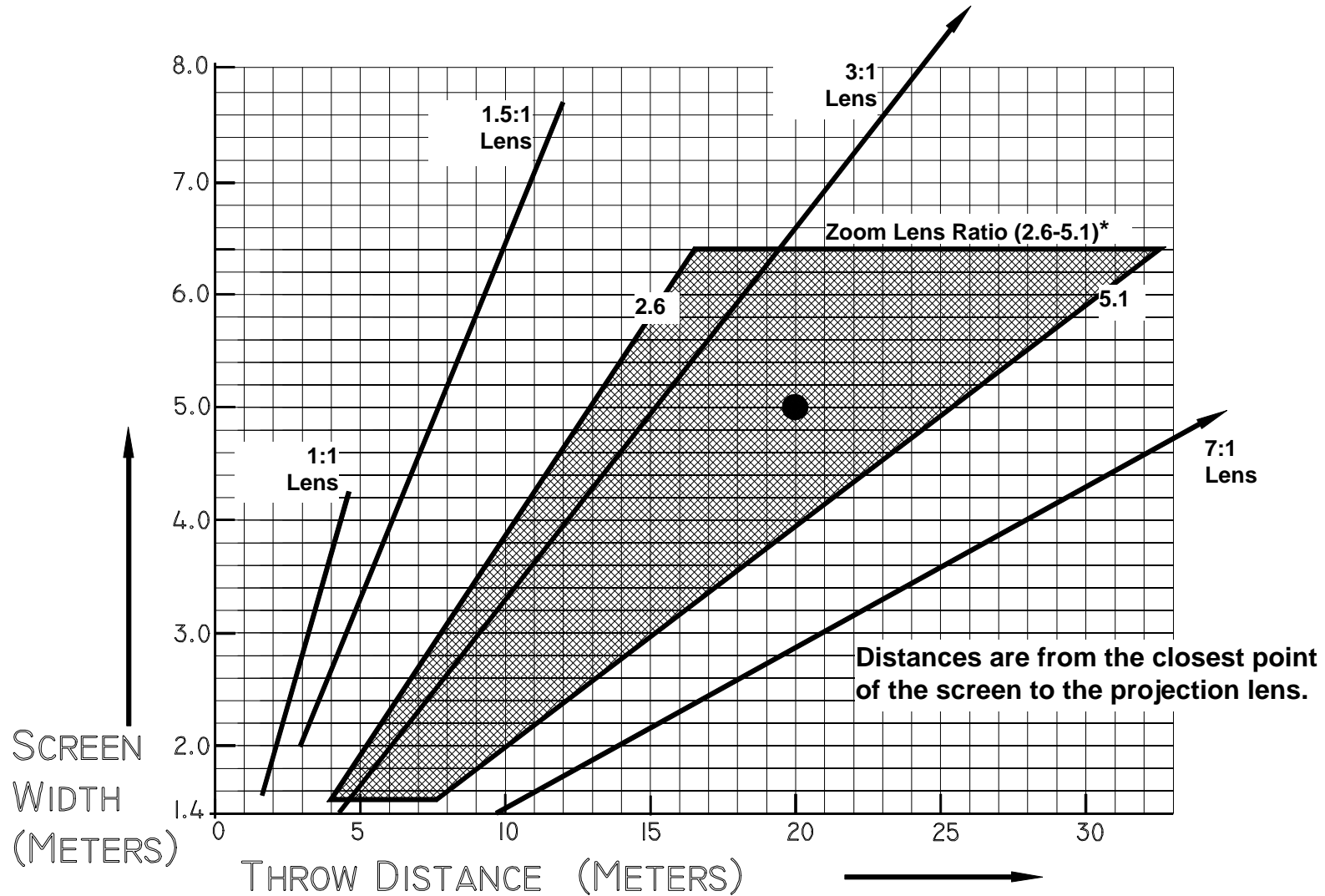
LENS TYPE	THROW	SCREEN WIDTH	MAXIMUM PROJ. TO SCREEN TILT*
Zoom	4.0 - 32 m	1.5 - 6.4 m	±5° Horiz, ±15° Vert
1:1	1.63 - 4.42 m	1.56 - 4.24 m	±2° Horiz, ±7° Vert
1.5:1	3.0 - 12.0 m	1.9 - 7.7 m	±3° Horiz, ±10° Vert.
3:1	2.0 - ~	.6 - ~	±5° Horiz, ±15° Vert
7:1	10.0 - ~	1.37 - ~	±5° Horiz, ± 15° Vert

\*Nominal 31.5 ~ 64 kHz. At higher frequencies the range will be lower.



**Figure 3-3.** Throw distance and Screen Width.

Figure 3-4. Lens Pattern for Model 230. All dimensions are in meters.

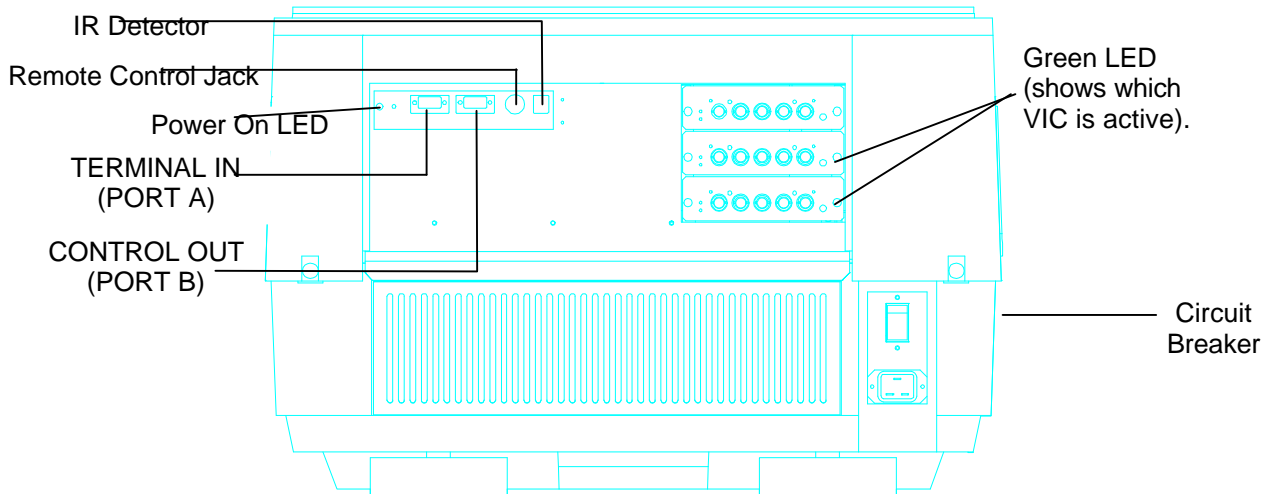


The Zoom lens can be used for any screen width *and* throw distance points that fall inside the shaded zoom lens outline as shown on the above pattern.

\*Zoom Lens numbers represent the ratio of throw distance to screen width. Thus, a throw distance of 20 and a screen width of 5 falls inside the shaded area where the large dot is.

## 3.4 System Connections

Figure 3-6 shows the projector's rear panel connections.



**Figure 3-6.** Rear panel connections for Model 230.

**Power Connections:** Verify that the projector is connected to a 220-240V, 20A single-phase, 50-60 Hz AC power source. Installation should be performed by an electrician with current knowledge of electrical codes in the country of use.

**Stromversorgung:** Der projektor muß an eine Wechselstromquelle mit 220-240 V, 20 A, einphasig, 50-60 Hz angeschlossen werden. Der Anschluß and die Stromquelle sollte von einem Elektriker vorgenommen werden, der mit den zum Zeitpunkt der installation geltenden elektrischen Vorschriften des Einsatzlandes vertraut ist.

**Alimentation électrique:** Vérifier que le projecteur est branché sur une alimentation entre 220 V et 240 V c.a., 50-60 Hz, monophasée, 20 A. La connexion au bloc d'alimentation doit être effectuée par un électricien au courant des derniers codes électriques en date utilisés dans le pays d'installation.

**Terminal or Remote Control:** Verify that the remote control tether is connected to the phone jack (or a VT100 Control Terminal is connected to the RS-232 jack on the projector back panel marked "Terminal In"). The other port marked "Control Out" can also be used but must be selected from the Comm Setup menu. The projector can also be controlled by an optional Technician Remote (connected to the phone jack or operating as an IR) which provides for setup functions to be accessed instantly by keys on the remote instead of navigating through the menu tree.

**Infrared (IR) Windows:** The projector has two IR windows—one in front and one in back. These windows receive projector control signals from the IR remote.

## 3.5 Sources

The projector accommodates a wide range of formats from standard composite to a multitude of computer graphics standard, etc. It is critical to set up the projector's source files to accommodate this range. Key parameters are the horizontal and vertical scan rates, interlaced or non-interlaced scanning, and plus/minus sync levels. The projector can handle up to 20 sources in one channel. The correct projector source file is matched and automatically selected for the source being received by the projector.

**Types of Standard Composite Signals:** There are a number of different standards for composite :

1. NTSC 3.58/4.43--The most common for US consumer television
2. PAL and SECAM--Standards used in Europe and Asia
3. RS-170--Closed circuit monochrome

These standards differ in relation to parameters such as signal timing and the encoding scheme for the image information.

**Red, Green and Blue Analog Signals:** The most common input is separate red, green and blue (RGB) analog signals. The sync signals for RGB analog sources can be separate horizontal and vertical, composite (horizontal and vertical combined) or included with the green analog signal (sync on green).

**Signal Inputs:** The projector allows the source(s) to be connected directly to the projector via appropriate connecting cables. Signal input jacks are located on the projector's rear panel (see Figure 3-8).

Verify that the source input is connected to the appropriate VIC (Video Input Card) input at the rear of the projector. Connect R, G, B, H, V inputs to the appropriate jacks on the rear panel. RGBHV is the standard VIC that is supplied with the projector. Other VIC options are available for NTSC, PAL, SECAM, HDTV, and S-VHS (see Options in Chapter 1).

**NOTE:** Connect composite sync (H/V) to the H input on the rear panel.

If using an Extron switcher, connect it to either Port A or Port B. A switcher can be connected to either port but only one switcher can be used. The switcher must be selected under Comm Setup (refer to Section 4.4, Navigating the Menu-Video Switchers).

If using a communications controller such as an AMX or Crestron, connect it to either port A or port B. Use only one controller per projector.