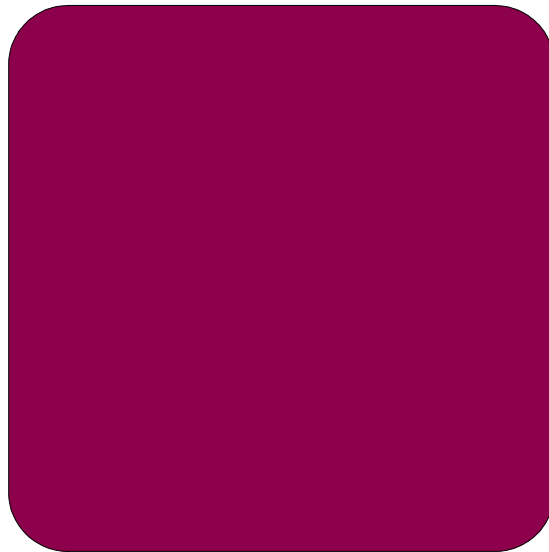# owner's manual

**hp** digital projectors
xb31 & sb21

i n v e n t

English • version 13.05.02

owner's manual for the
**hp** digital projector xb31 and sb21

# table of contents

xb31 sb21

# Personal Safety

⚠CAUTION!   PREVENT EYE INJURY. Do not look into the projector's lens when the lamp is on. Do not point the remote control's laser light at your own, or anyone else's, eyes.

⚠CAUTION!   AVOID BURN HAZARD. The lamp gets hot during normal operation. Allow it to cool down for 30 minutes before changing lamp!

⚠CAUTION!   CUT HAZARD. If the bulb is broken, use caution while removing the bulb assembly to avoid injury.

⚠CAUTION!   PREVENT ELECTRICAL SHOCK. Do not expose to rain or moisture. Do not open or disassemble projector, except as instructed by this manual.

⚠WARNING!  MERCURY HAZARD. This projector's bulb contains a small amount of mercury. If the lamp breaks, adequately ventilate the area where the breakage occurred. The projector bulb may require special handling and disposal at end-of-life.

# Protecting Your Projector

**Do:**

- Connect projector's cables before turning the projector ON.
- Allow the projector to complete its cooling cycle after turning the Power OFF (refer to page 14).
  CAUTION: Unplugging the projector while the fan is running reduces lamp life.
- Turn off and unplug the projector before cleaning.
- Use a soft, dry cloth to clean the projector's housing.
- Use camera-lens cleaning materials and procedures to clean the lens.
- Disconnect the power plug from AC outlet if the projector isn't being used for an extended period of time.
- Allow the projector to cool-down for at least 30 minutes before changing the lamp. Follow instructions provided with replacement lamp or in this manual.
- Lamp failure may produce a loud popping sound. This is normal and should not cause concern. The projector will not turn back on until the lamp module has been replaced.
- Reset the "Lamp Hour" monitor from the On Screen Display "Management" menu tab after replacing the lamp module (refer to page 26).
- Refer to page 39 for warranty and support information.

**Don't:**

- Unplug the projector while the fan is running.
- Block the projector's ventilation openings.
- Use abrasive cleaners, waxes, or solvents for your cleaning.
- Clean the lens with detergent.
- Use in very hot, cold, or humid environments.
- Use or store in dusty or dirty conditions.
- Use in a strong magnetic field.
- Place the projector in direct sunlight.

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## Projector Features

**xb31** **sb21**

**The hp digital projector xb31 is an XGA single chip 0.7" DLP™ projector with these outstanding features:**

- True XGA, 1024 x 768 addressable pixels
- 1500 comparable lumens
- Approximately 3.5 lbs (1.6 kg) compact design
- Single chip DLP™ technology
- SXGA compression and VGA, SVGA re-sizing
- 156 watts (W) user-replaceable P-VIP lamp module
- NTSC3.58/NTSC4.43/PAL/PAL-M/PAL-N/SECAM and HDTV compatible
- Full function remote with mouse control and laser pointer
- High-tech VESA M1-DA connection for digital and analog video connectivity
- High definition TV (HDTV) compatibility
- User-friendly multilingual On Screen Display (OSD) menu
- Advanced electronic keystone correction
- User-friendly control panel
- Built-in 2 watt audio speaker
- Carrying case and cables included (refer to page 6)

**The hp digital projector sb21 is an SVGA single chip 0.55" DLP™ projector with these outstanding features:**

- True SVGA, 800 x 600 addressable pixels
- 1000 comparable lumens
- Approximately 2.2 lbs (1 kg) compact design
- Single chip DLP™ technology
- XGA compression and VGA re-sizing
- 132 watts (W) user-replaceable P-VIP lamp module
- NTSC3.58/NTSC4.43/PAL/PAL-M/PAL-N/SECAM and HDTV compatible
- Full function remote with mouse control and laser pointer
- High-tech VESA M1-DA connection for digital and analog video connectivity
- High definition TV (HDTV) compatibility
- User-friendly multilingual On Screen Display (OSD) menu
- Advanced electronic keystone correction
- User-friendly control panel
- Carrying case and cables included (refer to page 6)

## Package Contents

The hp digital projectors come with the following items. Please check to make sure your unit is complete. If anything is missing contact your dealer immediately.

| **xb31** | **sb21** | **xb31** **sb21** |
|---|---|---|
| Projector with lens cap | Projector with lens cap | Carrying Case |
| Composite Video Cable | 2.5 mm Mini Phone Jack for Composite Video Cable | Power Cord |
| S-video Cable | USB Mini-B 5-pin to S-video Input Cable | Mi-A to VGA and USB Cable |
| Audio Cable | | Battery x2 |
| | | Remote Control with Mouse Function and Laser Pointer |
| | | Owner's Manual on Compact Disc (CD ROM) |
| | | Quick Start Card |
| | | Warranty/Support Information Data Sheet |

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# Projector Overview



**xb31**

1. Control Panel
2. Power Connector
3. I/O Connection Ports
4. Zoom Ring
5. Focus Ring

6. Remote Control Receivers (front & back)
7. Elevation Button
8. Elevation Foot
9. Lens Cap



**sb21**

1. Control Panel
2. Power Connector
3. I/O Connection Ports
4. Focus Ring

5. Remote Control Receivers (front & back)
6. Elevation Button
7. Elevation Foot
8. Lens Cap

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## Control Panel

1. Power (ON/OFF) Button
2. Lamp Warning Indicator Light
3. Temperature Warning
   Indicator Light
4. Source Button
5. Menu (ON/OFF) Button
6. Auto Image Button
7. Four Directional Select Buttons

**xb31** **sb21**

## Back Panel Features
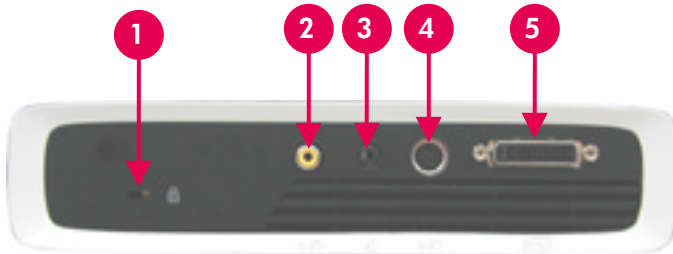
**xb31**

1. Kensington™ Lock Hole
2. Composite Video Input
3. Audio Input
4. S-Video Input
5. VESA M1-DA Analog RGB / Digital / HDTV /
   Component Video / USB Mouse Input
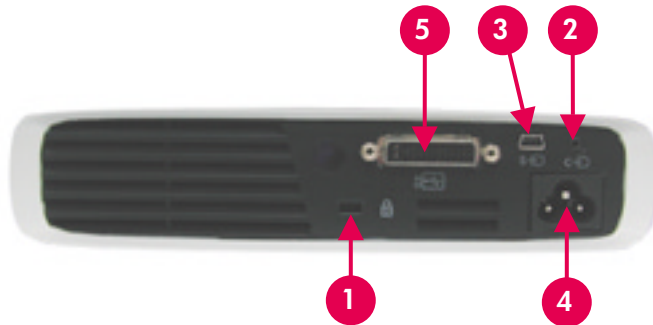
**sb21**

1. Kensington™ Lock Hole
2. Composite Video Input
3. S-Video Input
4. Power Connector
5. VESA M1-DA Analog RGB / Digital / HDTV /
   Component Video / USB Mouse Input

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# Remote Control With Mouse & Laser Pointer

Transmit
Indicator Light

Multi-Directional Selector

Projector Power
Page Up
Laser Pointer

Right Mouse Button
Hide Image
Page Down
Keystone Correction

Volume ( + / - )

Zoom In / Zoom Out

Source
Freeze

Menu

Left Mouse Button

**CAUTION!**
**PREVENT EYE INJURY.**
Do not point the remote
control's laserlight at
anyone's eyes.

**NOTE:** Connect the USB
cable when using
the remote control
mouse features.

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## Connecting the hp digital projector xb31 to a computer

Connect the power cord to the projector and a power outlet.

Connect the black end of the video cable to the projector.

Connect the blue end of the video cable to the PC; optionally, to have the remote control function as a mouse, connect the USB connector to the PC.

Start the projector; after a 30-second warm-up it will search for a video signal.

If no video signal is found, you may need to set up the PC to send a video signal out the video port.

**CAUTION!**
Unplugging the projector while the fan is running may reduce lamp life.

**NOTE:** For best performance, configure the display mode of your computer's graphic card to 1024×768 resolution. Ensure the timing of the display mode is compatible with the projector. Refer to the "hp xb31 compatibility modes" section on page 35.

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## Connecting the hp digital projector xb31 to other signal sources

Antenna

Digital Tuner Output

Video Output

S-video Output

1. Power Cord
2. Composite Video Cable
3. Audio Cable
4. S-video Cable
5. M1-A to HDTV / Component and USB Cable (optional accessory)

**CAUTION!**
Unplugging the projector while the fan is running may reduce lamp life.

**NOTE:** For best performance, configure the display mode of your computer's graphic card to 1024×768 resolution. Ensure the timing of the display mode is compatible with the projector. Refer to the "hp xb31 compatibility modes" section on page 35.

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## Connecting the hp digital projector sb21 to a computer

**sb21**



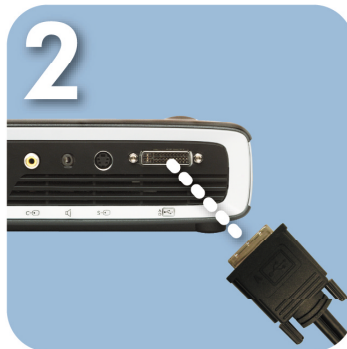Connect the power cord to the projector and a power outlet.



Connect the black end of the video cable to the projector.



Connect the blue end of the video cable to the PC; optionally, to have the remote control function as a mouse, connect the USB connector to the PC.



Start the projector; after a 30-second warm-up it will search for a video signal.



If no video signal is found, you may need to set up the PC to send a video signal out the video port.

**CAUTION!**
Unplugging the projector while the fan is running may reduce lamp life.

**NOTE:** For best performance, configure the display mode of your computer's graphic card to 800×600 resolution. Ensure the timing of the display mode is compatible with the projector. Refer to the "hp sb21 compatibility modes" section on page 37.

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## Connecting the hp digital projector sb21 to other signal sources

Video Output

3

2

S-video Output

Antenna

4

Digital Tuner Output

1

1. Power Cord
2. Composite Video Cable
3. S-video Cable
4. M1-A to HDTV / Component and USB
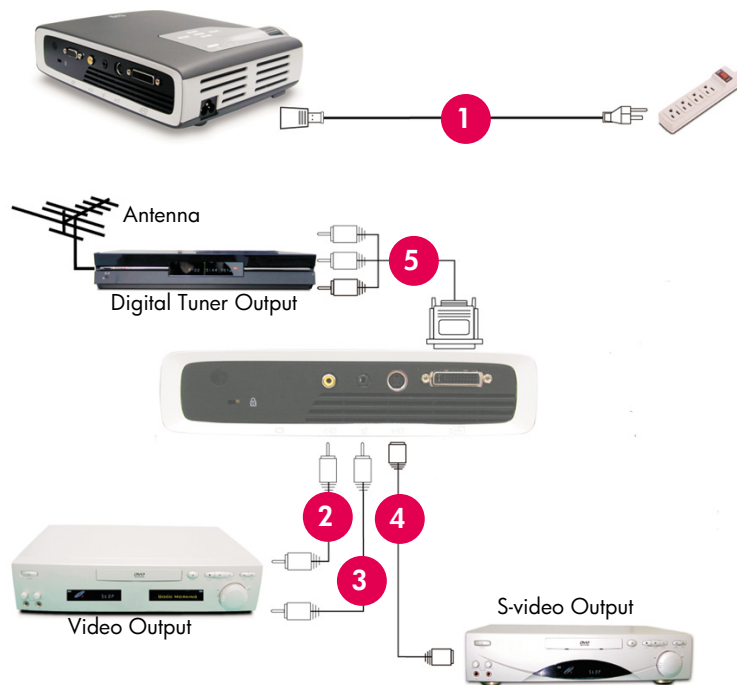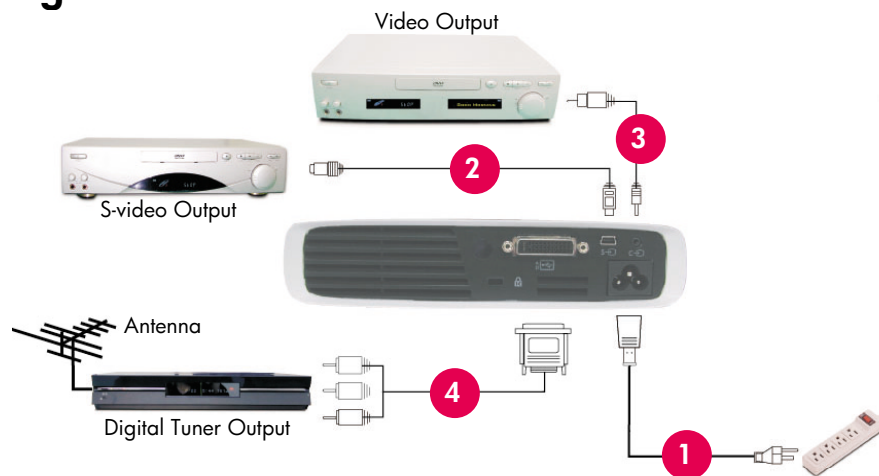   Cable (optional accessory)

**CAUTION!**
Unplugging the projector while the fan is running may reduce lamp life.

**NOTE:** For best performance, configure the display mode of your computer's graphic card to 800×600 resolution. Ensure the timing of the display mode is compatible with the projector. Refer to the "hp sb21 compatibility modes" section on page 37.

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# Turning the projector ON and OFF

## Turning the projector ON

1. Remove the lens cap ❶ by squeezing the cap's tabs and pulling forward.
2. Ensure that the power cord and signal cables are securely connected to the projector and the signal source (computer, notebook, video player, etc.).
3. Turn the projector ON by pressing the Power ON/OFF button on the control panel. ❷
  • The cooling fan turns on.
  • The hp start-up screen will be displayed for 30 seconds and the blue Power Indicator Light will light up.
4. Turn on your signal source. The projector will detect your source automatically.
  • If the screen displays "Waiting for Signal" make sure the signal cables are securely connected.
  • If multiple signal sources are connected, use the "Source" button on the Remote Control or Control Panel to switch to the desired input.
  • When the Lamp Indicator Light ❸ is ON, replace the lamp.
  • When the Temp Indicator Light ❹ is ON, it indicates that the projector has overheated. The projector's lamp will automatically turn OFF. Press the "Power ON/OFF" button and allow the projector to complete its cool-down cycle. Then you can restart the projector and continue your presentation. If the problem persists, contact hp support: (www.hp.com/support/digitalprojectors).
  • When the Temp Indicator Light ❹ FLASHES, the projector has detected a failure in the cooling system. Press the "Power ON/OFF" button and allow the projector to complete its cool-down cycle. Contact hp support: (www.hp.com/support/digitalprojectors).

## Turning the projector OFF

1. Press the Power ON/OFF button. The projector lamp will turn off and the cooling fan will run for the duration of the cool-down cycle.
  • The blue Power Indicator Light will blink until the cool-down cycle is complete.
  • The blue Power Indicator Light will then turn OFF and the cooling fan will stop.
2. Disconnect the power cord from the electrical outlet and the projector.

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# Turning the projector ON and OFF (continued)
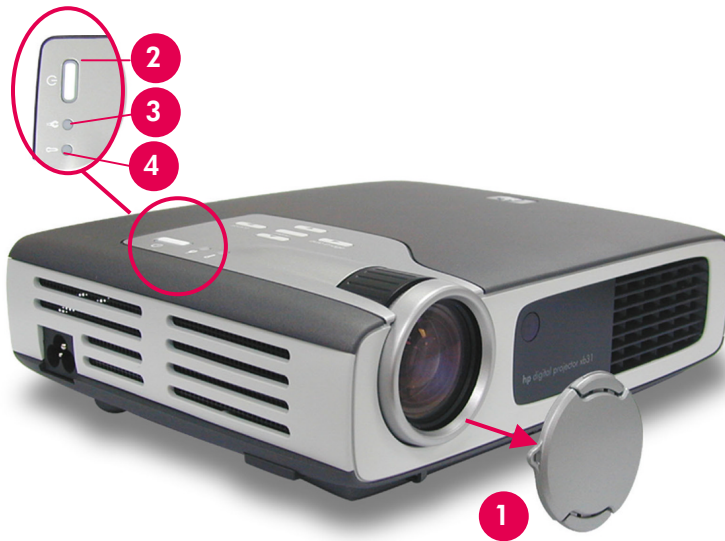
**CAUTION!** Unplugging the projector while the fan is running may reduce lamp life.

**NOTE:** Turn on the projector before turning on the signal source.

**NOTE:** When the blue Power Indicator Light is blinking the unit cannot be turned ON or OFF. The projector will not respond to any user input.

**NOTE:** The model shown is the hp xb31.

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# Adjusting the projected image

## Adjusting the display angle

**To raise the projector display angle:**

1. Press and hold the elevation button ❶.

2. Raise the projector to the desired display angle ❷, then release the button to lock the elevation foot into position.

**To lower the projector display angle:**

1. Press and hold the elevation button ❶.

2. Lower the projector, then release the button to lock the elevation foot into its retracted position.

**Leveling the Projector**

Use the rear elevation foot adjustment ❸ for aligning the projector to the screen.

## Adjusting the display angle (continued)



**xb31**

1   Elevation Button

2   Elevation Foot

3



**sb21**

Elevation Button

1

2   Elevation Foot

3

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## Adjusting the hp xb31 zoom and focus

Zoom is adjusted by rotating the zoom ring.

Rotate the focus ring until the image is clear.

The projector will focus at distances from 1.14 m to 12 m (3.7 feet to 39.4 feet).
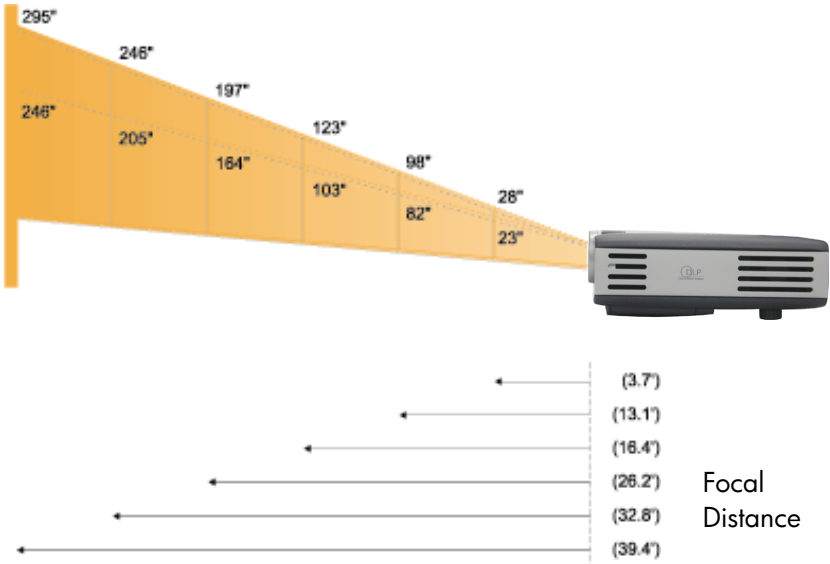
**xb31**

Zoom Ring     Focus Ring

## Projected image size (diagonal)

### Calculating the Projected Image Size

The screen diagonal dimension can be approximated by using one of these formulas:

<u>Zoomed out</u>

7.5*Distance(ft.)=Diagonal(in.)

0.625*Distance(m)=Diagonal(m)

*or*

<u>Zoomed in</u>

6.25*Distance(ft.)=Diagonal(in.)

0.52*Distance(m)=Diagonal(m)

**For example:**

If your xb31 is 10 feet from the screen, the approximate zoomed out screen diagonal dimension will be 7.5*10 = 75 inches.

Focal Distance

| Screen (Diagonal) | Max. | 28″ | 98″ | 123″ | 197″ | 246″ | 295″ |
|---|---|---|---|---|---|---|---|
| | Min. | 23″ | 82″ | 103″ | 164″ | 205″ | 246″ |
| Screen Size | Max.(WxH) | 22.4″x16.8″ | 78.4″x58.8″ | 98.4″x73.8″ | 157.6″x118.2″ | 196.8″x147.6″ | 236.0″x177.0″ |
| | Min.(WxH) | 18.4″x13.8″ | 65.6″x49.2″ | 82.4″x61.8″ | 131.2″x98.4″ | 164.0″x123.0″ | 196.8″x147.6″ |
| Focal Distance | | 3.7′ | 13.1′ | 16.4′ | 26.2′ | 32.8′ | 39.4′ |

**NOTE:** This graph is for user's reference only.

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sb21

## Adjusting the hp sb21 focus

Rotate the focus ring until the image is clear.
The projector will focus at distances from 1.0 m to 12 m (3.3 feet to 39.4 feet).
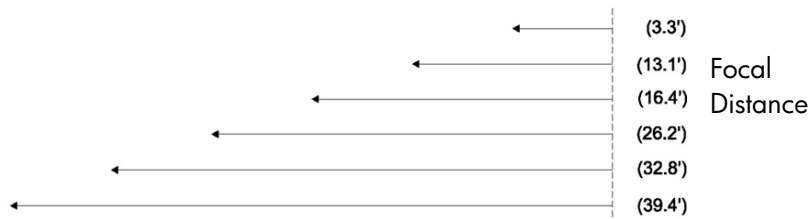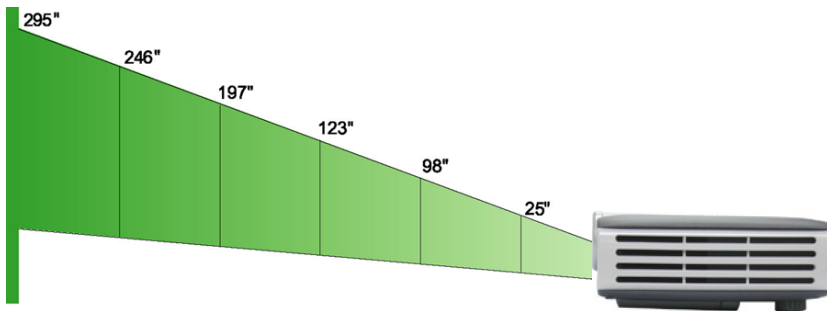
Focus Ring

## Projected image size (diagonal)



**Calculating the Projected Image Size**

The screen diagonal dimension can be approximated by using one of these formulas:
$7.5*Distance(ft.)=Diagonal(in.)$
$0.625*Distance(m)=Diagonal(m)$

**For example:**

If your sb21 is 10 feet from the screen, the approximate screen diagonal dimension will be $7.5*10 = 75$ inches.

| Screen (Diagonal) | 25″ | 98″ | 123″ | 197″ | 246″ | 295″ |
|---|---|---|---|---|---|---|
| Screen Size (wxh) | 20.0″x15.0″ | 78.4″x58.6″ | 98.4″x73.8″ | 157.6″x118.2″ | 196.8″x147.6″ | 236.2″x177.2″ |
| Focal Distance | 3.3′ | 13.1′ | 16.4′ | 26.2′ | 32.8′ | 39.4′ |

**NOTE:** This graph is for user's reference only.

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# Control panel & remote control

xb31  sb21

The projector's functions are controlled via the Control Panel and the Remote Control, and the On Screen Display (OSD).

## Control Panel

1. Power (ON/OFF) Button
2. Lamp Warning Indicator Light
3. Temperature Warning Indicator Light
4. Source Button
5. Menu (ON/OFF) Button
6. Auto Image Button
7. Four Directional Select Buttons
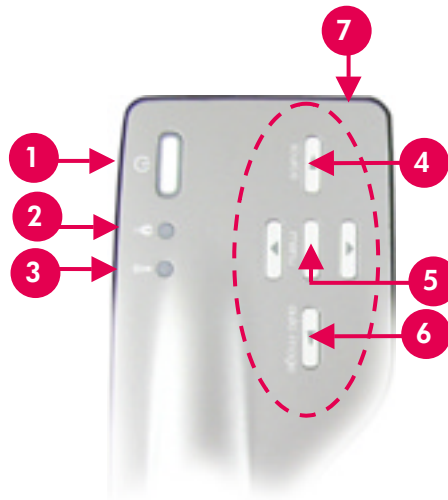
**Power ON/OFF Button**

• Refer to "Turning the Projector ON and OFF" on pages 14-15.

**Source Button**

• Press the "Source" button to choose the appropriate signal source - RGB, DVI-Digital, DVI-Analog, S-Video, Composite, Component and HDTV sources.

NOTE: This button will not function when the OSD menu is displayed.

**Auto Image Button**

• Press the "Auto Image" button to automatically synchronize the projector to the input source.
NOTE: This button will not function when the OSD menu is displayed.

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# On Screen Display Menus

The projector has multilingual On Screen Display (OSD) menus that allow you to make image adjustments by changing a variety of settings.

xb31  sb21

## How to operate

• Press the "Menu" button on the Remote Control or Control Panel to open the OSD.

• Press the ◄ ► buttons to display the contents of the desired menu tab. The selected tab's title will change from dark blue to white.

• Press the ▲ ▼ buttons to select the desired menu item. When an item is selected, the color of the item will change from light blue text on a dark blue background to white text on an orange background. Adjust the settings with the ◄ ► buttons.

• Press the ▲ button until no menu items are highlighted. Then either -

  Press the ◄ ► buttons to display the contents of additional Menu tabs

  or

  Press the "Menu" button. The OSD menu will close and the projector will automatically save the new settings.

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## "Language" Menu

To open the "Language" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "Language" menu tab.

3. Press the ▲ ▼ buttons to select the desired language.

4. Press the "Menu" button to finalize the selection.

**NOTE:** The hp sb21's OSD does not include an Audio menu.

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## "All Images" Menu

To open the "All Images" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "All Images" menu tab.

3. Press the ▲ ▼ buttons to select one of the following items:

### Brightness

• Press the ◀ button to darken the image.

• Press the ▶ button to lighten the image.

### Contrast

The contrast controls the degree of difference between the lightest and darkest parts of the picture.

• Press the ◀ button to decrease the contrast.

• Press the ▶ button to increase the contrast.

### Image Optimization

Image Optimization can be incrementally adjusted between 0 and 10. Click on the slider bar to adjust.

• Setting 10 will maximize brightness and contrast

• Setting 0 will maximize color reproduction quality

### Color Temp

With the higher temperature, the image looks colder.  With the lower temperature, the image looks warmer.

• Press the or ◀ ▶ button to decrease or increase the color temperature.

### Keystone (Keystone Correction)

Corrects image distortion caused by the projector's elevation angle. (±16 degrees)

### Zoom

• Press the ▶ button to magnify an image up to 9 times.

• Press the ◀ button to reduce the image magnification.

### Aspect Ratio

Aspect ratio type can be adjusted to 4:3 or 16:9.

### Reset this menu

Choose "Yes" to return the display parameters on this menu to their factory default settings.

**NOTE:** The hp sb21's OSD does not include an Audio menu.

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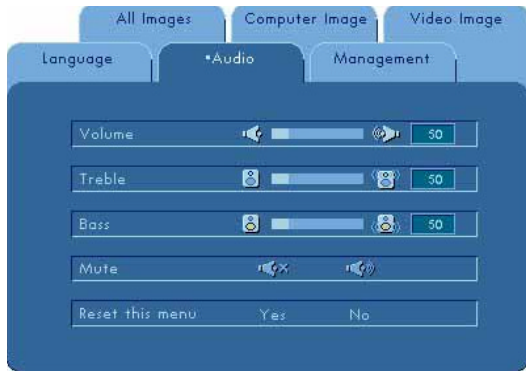
## "Audio" Menu

To open the "Audio" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "Audio" menu tab.

3. Press the ▲ ▼ buttons to select one of the following items:

**Volume**

- Press the ◀ button to decrease the volume.
- Press the ▶ button to increase the volume.

**Treble**

The treble setting controls the higher frequencies of your audio source.

- Press the ◀ button to decrease the treble.
- Press the ▶ button to increase the treble.

**Bass**

The Bass setting controls the lower frequencies of your audio source.

- Press the ◀ button to decrease the bass.
- Press the ▶ button to increase the bass.

**Mute**

- Choose the left icon to mute the projector's speaker.
- Choose the right icon to activate the projector's speaker.

**Reset this menu**

Choose "Yes" to return the audio parameters of this menu to their factory default settings.

**NOTE:** The hp sb21's OSD does not include an Audio menu.

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**xb31** **sb21**

**NOTE:** This message is displayed when an image source other than computer VGA is selected via the **Source** button or the auto detection function.
The "Computer Image" parameters cannot be adjusted when this message is displayed.
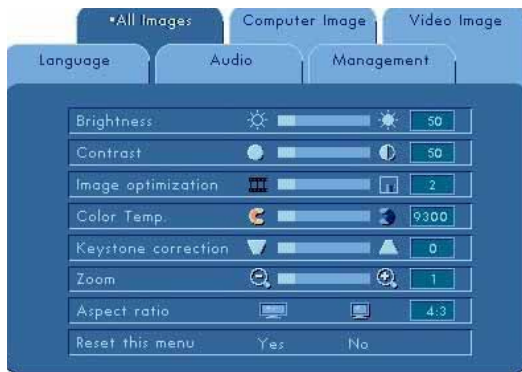
## "Computer Image" Menu

To open the "Computer Image" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "Computer Image" menu tab.

3. Press the ▲ ▼ buttons to select one of the following items:

### Auto Image

The projector automatically adjusts frequency, tracking, horizontal and vertical position. With most signal sources, Auto Image provides the best results.

**NOTE:** The hp sb21's OSD does not include an Audio menu.

### Frequency

"Frequency" is the display data frequency. This should match the frequency of your computer's graphic card. When you experience a vertical flickering bar, use this function to make adjustments.

### Tracking

Choose "Tracking" to synchronize the signal timing of the display with that of the graphic card. When you experience an unstable or flickering image, use this function to correct it.

### Horizontal Position

• Press the ◀ button to move the image left.

• Press the ▶ button to move the image right.

### Vertical Position

• Press the ◀ button to move the image up.

• Press the ▶ button to move the image down.

### Reset this menu

Choose "Yes" to return the display parameters of this menu to their factory default settings.

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## "Management" Menu

To open the "Management" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "Management" menu tab.

3. Press the ▲ ▼ buttons to select one of the following items:

### Menu Location

Choose the Menu location on the display screen.

### Projection Direction

- ▢ Front-Desktop: The image used in standard desktop operation.

- ▢ Rear-Desktop: The image is reversed for projection from behind a translucent screen.

- ▢ Front-Ceiling: The image is turned upside down for ceiling-mounted projection.

- ▢ Rear-Ceiling: The image is reversed and turned upside down for ceiling-mounted projection from behind a translucent screen.

### Signal Type

Select the desired signal type - RGB, YCrCb and YPrPb sources.

### Lamp Hour

Displays the lamp's elapsed operating time (in hours).

### Reset Lamp Hours

Reset the lamp setting only when the lamp is replaced.

### Reset this Menu

Choose "Yes" to return the display parameters (except for Lamp Hours) on this menu to their factory default settings.

### Machine Reset

Choose "Yes" to return the display parameters (except for Lamp Hours) on ALL menus to their factory default settings.

NOTE: The hp sb21's OSD does not include an Audio menu.

**xb31** **sb21**



**NOTE:** This message is displayed when these settings cannot be adjusted for the image source selected via the **Source** button or the auto detection function (i.e. computer VGA or 480p).
The "Video Image" parameters cannot be adjusted when this message is displayed.

**xb31** **sb21**

## "Video Image" Menu

To open the "Video Image" menu:

1. Press the "Menu" button to open the On Screen Display (OSD) menus.

2. Use the ◀ or ▶ buttons to open the "Video Image" menu tab.

3. Press the ▲ ▼ buttons to select one of the following items:

### Color Saturation

The color setting adjusts a video image from black and white to fully saturated color.

- Press the ◀ button to decrease the amount of color in the image.

- Press the ▶ button to increase the amount of color in the image.

### Sharpness

Adjusting the sharpness of the image.

- Press the ◀ button to decrease the sharpness.

- Press the ▶ button to increase the sharpness.

### Tint

The tint adjusts the color balance of red and green.

- Press the ◀ button to increase the amount of green in the image.

- Press the ▶ button to increase the amount of red in the image.

### Reset this menu

Choose "Yes" to return the display parameters of this menu to their factory default settings.

**NOTE:** The hp sb21's OSD does not include an Audio menu.

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# Remote control

**Power ON/OFF Button**
• Refer to "Turning the Projector ON and OFF" on pages 14 and 15.

**"Hide" Button**
• Press the "Hide" button to project a black screen. Press the "Hide" button again to view the image.

**Multi-Directional Selector Controller ***
• This feature can be used as a mouse to control direction.

**Right Mouse Button ***

**Page Up (up) and Page Down (dn) Buttons ***
• Press the "up" or "dn" buttons to page up or page down, respectively.

**Laser Pointer Button**
• Press and hold the "Laser Pointer" button to activate the laser pointer.

**Menu Button**
• Press the "Menu" button to open the On Screen Display (OSD) menu and press the ◀ ▶ buttons to select the desired menu tabs. Press the ▼ button to go into the desired option's sub-menu. Press the ▲ button to return to main menu. To exit the OSD mode, press the "Menu" button again. The projector will automatically save any changes you have made.

**Source Button**
• Press the "Source" button to choose RGB, DVI-Digital, DVI-Analog, S-Video, Composite, Component and HDTV sources.

**Freeze Button**
• Press the "Freeze" button to freeze the screen image.

**Volume Up (+) and Volume Down (-) Buttons (hp xb31 only)**
• Press the "Volume +" or "Volume -" buttons to increase or decrease speaker volume.

**Keystone Correction Buttons**
• Press the "Keystone Correction" buttons to adjust image distortion caused by tilting the projector. (±16 degrees)

**NOTE:** Keystone Correction can cause distortion of text and graphics.

**Zoom In and Zoom Out Buttons**
• When you press the "Zoom" buttons, the zoom icon appears on the screen. Press the ▲ or ▼ buttons to zoom in or zoom out.
• The image can be magnified up to 9 times.

**Left Mouse Button ***
• The left mouse button is located on the back of the remote control.

\* To enable this function, the projector must be connected to the computer via the USB cable.

**xb31** **sb21**

**CAUTION**
LASER RADIATION - DO NOT STARE INTO BEAM
WAVE LENGTH: 650nm
MAX OUTPUT: <1mW
CLASS II LASER PRODUCT

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Transmit Indicator Light

Multi-Directional Selector

Projector Power
Page Up
Laser Pointer

Right Mouse Button
Hide Image
Page Down
Keystone Correction

Volume ( + / - )

Zoom In / Zoom Out

Source
Freeze

Menu

Left Mouse Button

Hewlett-Packard
3000 Hanover Street
Palo Alto, CA 94304
Model: L1517A

IE010200005

MANUFACTURED
JANUARY
2002

PRODUCT OF
USA

*COMPLIES WITH CFR 21 SUBCHAPTER J*

**CAUTION**
LASER RADIATION · DO NOT
STARE INTO BEAM

WAVE LENGTH: 658nm
MAX OUTPUT: <1mW

CLASS II LASER PRODUCT

**CAUTION!**
**PREVENT EYE INJURY.**
Do not point the remote control's laserlight at anyone's eyes.

**NOTE:** Connect the USB cable when using the remote control mouse features.

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# Troubleshooting

Consult this section if you are experiencing trouble with your projector. If the problem persists, please contact hp. Refer to Warranty and Support Information on page 39.

**Problem: No image is projected on screen.**

- Verify that the projector's power cord is plugged in and properly connected.
- Verify that all cables are properly installed and securely connected.
- Make sure you have removed the lens cap and that the blue Power Indicator Light is ON.
- Verify that the Lamp Indicator Light is OFF. If the Lamp Indicator Light is ON, the lamp module must be replaced. Refer to page 32 for the lamp module replacement procedure.
- Verify that the Temp Indicator Light is OFF. If it is ON, refer to page 14.
- If you are using a notebook computer, you may need to activate the external monitor port. Please consult the computer's manual for instructions. Key sequences for many computers are printed in your quick start guide.
- Check for damaged connector pins.
- Check that the projector's lamp hasn't burned out or been installed incorrectly.

**Problem: Partial, scrolling or incorrectly displayed image.**

- Press the "Auto Image" button on the projector or use the "Auto Image" function in the "Computer Image" menu of the On Screen Display (OSD).
- If you are using a computer:

  If the resolution of your computer is higher than 1024×768 for the hp xb31 or 800×600 for the hp sb21, the projector will re-size the image to match the output of the computer. If desired, you may reset your computer's display resolution to match these by following the steps provided in your computer's owner's manual. You may have to disable the computer's monitor to correctly display the new resolution.

- Switch the notebook's display to the "external display only" or "CRT only" mode following the instructions provided in your computer's owner's manual.
- If you experience difficulty in changing the resolution settings, or your monitor freezes, restart the computer and the projector.

**Problem: The notebook's screen is not displaying your presentation.**

- Some notebook PCs may deactivate their own screen when a second display device is in use. Refer to your computer's documentation for information. If you are using a notebook computer, you may need to activate the external monitor port. Please consult the computer's manual for instructions. Key sequences for many computers are printed in your quick start guide.

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## Troubleshooting (continued)

- *If you are using an Apple PowerBook™:*
  In Control Panels, open the PowerBook Display to select Video Mirroring "On."

**Problem: Image is unstable or flickering**

- Activate the "Auto Image" function.
- Adjust the "Tracking" variable in the "Computer Image" tab of the On Screen Display (OSD). Refer to page 25.
- Change the color settings of the computer's monitor (see page 27).

**Problem: Image has vertical flickering bar**

- Activate the "Auto Image" function.
- Adjust the "Frequency" variable in the "Computer Image" tab of the OSD (refer to page 25).
- Check and re-configure the display mode of your graphic card to make it compatible with the product (refer to pages 25, 35 and 37).

**Problem: Image is out of focus**

- Focus the image with the projector's Focus Ring.
- Make sure the projection screen is located approximately 1.0 m (3.3 feet)~12 m (39.4 feet) from the projector.

**Problem: The image is stretched when displaying 16:9 DVD.**

  The projector will automatically detect a 16:9 DVD source signal and adjust the aspect ratio to produce a full, 4:3-aspect-ratio screen display.

  If the projected image is distorted, adjust the aspect ratio by doing the following:

- Select 4:3 aspect ratio type on your DVD player if you are playing a 16:9 DVD.
- If you cannot select 4:3 aspect ratio type on your DVD player, select 4:3 for the "Aspect Ratio" variable in the "All Images" tab of the OSD (refer to page 23).

**Problem: Image is reversed**

- Change the "Projection Direction" parameter in the "Management" tab of the OSD (refer to page 26).

**Problem: Burned out Lamp**

- When the lamp module burns out it may make a loud popping sound. The projector will not turn back on until the lamp module has been replaced. Follow the lamp change procedure presented in this manual (page 30) and included with the replacement lamp.
- Remember to reset the "Lamp Hour" counter from the On Screen Display (OSD) "Management" menu tab after replacing the lamp (refer to page 26).

**NOTE:** Some notebook computers running NT 4.0 have difficulty sending a signal to an external display.

**xb31** **sb21**

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# Changing the lamp module

**xb31** **sb21**

Your projector will monitor the lamp's elapsed operating time, or "lamp hours." After 1000 lamp hours, the projector will display the following message at start-up:

> "The lamp has been in use for over 1000 hours.
> You may consider purchasing a spare bulb."

After 1500 lamp hours, the projector will display the following message at start-up:

> "The lamp has been in use for over 1500 hours.
> You should purchase a spare bulb."

**NOTE:** The projector's bulb contains mercury. It may require special handling at end-of-life.

**Procedure:**

1. If the projector has been in use -

   • Turn the power OFF by pressing the Power ON/OFF button.

   • Allow the projector to cool down for at least 30 minutes.

   • Disconnect the power cord.

2. Use screwdriver to remove the two screws from the cover.❶

3. Remove the cover.❷

4. xb31: Remove the two screws from the lamp module.❸
   sb21: Remove the three screws from the lamp module.❸

5. Use the lamp module's hinged handle to remove the lamp module.❹

   Reverse these steps to install the replacement lamp module.❹

6. Insure that the lamp module door is securely attached and flush with the unit. The unit will not operate with the door incorrectly installed.

7. Reset the "Lamp Hour" monitor from the On Screen Display (OSD) "Management" menu tab (refer to page 26).
   **NOTE:** If lamp module door is not securely fastened the lamp will not function.

**CAUTION!**
**AVOID BURN HAZARD.**
The lamp gets hot during normal operation. Allow it to cool down for 30 minutes before changing lamp!

**CAUTION!**
**CUT HAZARD.**
If the bulb is broken, use caution to avoid injury.

**WARNING!**
**MERCURY HAZARD.** This projector's bulb contains a small amount of mercury. If the lamp breaks, adequately ventilate the area where the breakage occurred. The projector bulb may require special handling and disposal at end-of-life.

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# Changing the lamp module (continued)

**NOTE:** For both the xb31 and the sb21 digital projectors, a
Phillips-head screwdriver is required for this procedure.
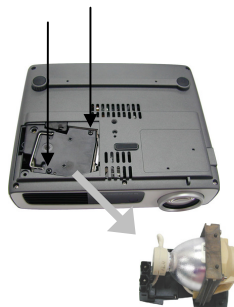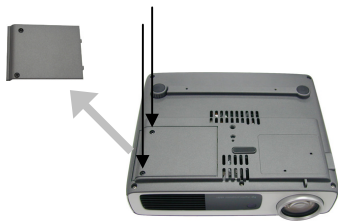
**xb31**
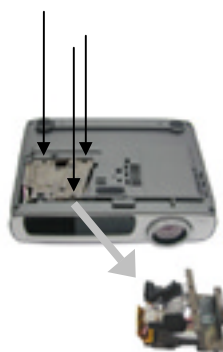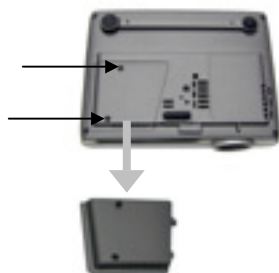
**sb21**

# hp xb31 specifications

xb31

| | |
|---|---|
| Light Engine | • Single Chip DLP™ Technology |
| Brightness | • 1500 comparable lumens |
| Contrast Ratio | • 1800:1 (Full On/Full Off) |
| Lamp | • 156 watt (W) user-replaceable P-VIP Lamp Module |
| Number of Pixels | • 1024 (H)×768 (V) |
| Displayable Colors | • 16.7 million |
| Projection Lens | • F/2.44~2.69, f=28.8~34.5 mm with optical 1.2:1 zoom and manual focus |
| Projection Screen Size | • 0.7~7.5 m (28~295 inches) Diagonal |
| Projection Distance | • 1.14~12 m (3.7~39.4 feet) |
| Video Compatibility | • NTSC 3.58/NTSC 4.43/PAL/PAL-M/PAL-N/SECAM and HDTV compatible |
| | • Composite video, S-video, and component video (via optional cable) |
| H. Frequency | • 15 kHz~100 kHz horizontal scan rate |
| V. Frequency | • 43 Hz~120 Hz vertical refresh rate |
| Power Supply | • Universal AC input 100~240V; Input Frequency 50/60 Hz |
| Power Consumption | • 220 watts |
| Uniformity | • 85% (JBMA) |
| I/O Connectors | • Power: AC power input socket |
| | • Computer Input: |
| | · One 35-pin VESA M1-DA for Analog RGB/Digital/ Component Video/HDTV/USB mouse |
| | • Video Input: |
| | · One Composite Video RCA input |
| | · One S-video input |
| | • Audio Input: |
| | · One phone jack for mono audio input |
| Weight | • 1.6 kg (3.5 pounds) |
| Dimensions (W×H×D) | • 226×183×67 mm (8.92×7.23×2.67 inches) |
| Environmental | • Operating Temperature: |

| Operating Temperature (°C) | Altitude (ft) |
|---|---|
| 10-40 | 0 ~ 2,500 |
| 10-35 | 2,500 ~ 5,000 |
| 10-30 | 5,000 ~ 7,000 |
| 10-28 | 7,000 ~ 10,000 |

• Storage Temperature: -20° C~60° C (-4° F~140° F) at 80% maximum humidity (0~40,000 ft)

| | |
|---|---|
| Safety Regulation | See page 38 for regulatory information |

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# hp xb31 compatibility modes

| Mode | Resolution | ANALOG | | DIGITAL | |
|---|---|---|---|---|---|
| | | V.Frequency (Hz) | H.Frequency (Hz) | V.Frequency (Hz) | H.Frequency (Hz) |
| VESA VGA | 640 x 350 | 70 | 31.5 | 70 | 31.5 |
| VESA VGA | 640 x 350 | 85 | 37.9 | 85 | 37.9 |
| VESA VGA | 640 x 400 | 85 | 37.9 | 85 | 37.9 |
| VESA VGA | 640 x 480 | 60 | 31.5 | 60 | 31.5 |
| VESA VGA | 640 x 480 | 72 | 37.9 | 72 | 37.9 |
| VESA VGA | 640 x 480 | 75 | 37.5 | 75 | 37.5 |
| VESA VGA | 640 x 480 | 85 | 43.3 | 85 | 43.3 |
| VESA VGA | 720 x 400 | 70 | 31.5 | 70 | 31.5 |
| VESA VGA | 720 x 400 | 85 | 37.9 | 85 | 37.9 |
| SVGA | 800 x 600 | 56 | 35.2 | 56 | 35.2 |
| SVGA | 800 x 600 | 60 | 37.9 | 60 | 37.9 |
| SVGA | 800 x 600 | 72 | 48.1 | 72 | 48.1 |
| SVGA | 800 x 600 | 75 | 46.9 | 75 | 46.9 |
| SVGA | 800 x 600 | 85 | 53.7 | 85 | 53.7 |
| VESA XGA | 1024 x 768 | 43.4 | 35.5 | 43.4 | 35.5 |
| VESA XGA | 1024 x 768 | 60 | 48.4 | 60 | 48.4 |
| VESA XGA | 1024 x 768 | 70 | 56.5 | 70 | 56.5 |
| VESA XGA | 1024 x 768 | 75 | 60.0 | 75 | 60.0 |
| VESA XGA | 1024 x 768 | 85 | 68.7 | - | - |
| * VESA SXGA | 1280 x 1024 | 60 | 63.95 | - | - |
| * VESA SXGA | 1280 x 1024 | 75 | 79.98 | - | - |
| MAC LC13" | 640 x 480 | 66.66 | 34.98 | - | - |
| MAC II 13" | 640 x 480 | 66.68 | 35 | - | - |
| MAC 16" | 832 x 624 | 74.55 | 49.725 | - | - |
| MAC 19" | 1024 x 768 | 75 | 60.24 | - | - |
| * MAC | 1152 x 870 | 75.06 | 68.68 | - | - |
| MAC G4 | 640 x 480 | 60 | 31.35 | - | - |
| MAC G4 | 640 x 480 | 120 | 68.03 | - | - |
| MAC G4 | 1024 x 768 | 120 | 97.09 | - | - |
| I MAC DV | 640 x 480 | 117 | 60 | - | - |
| I MAC DV | 800 x 600 | 95 | 60 | - | - |
| I MAC DV | 1024 x 768 | 75 | 60 | - | - |
| * I MAC DV | 1152 x 870 | 75 | 68.49 | - | - |
| * I MAC DV | 1280 x 960 | 75 | 75 | - | - |
| * I MAC DV | 1280 x 1024 | 75 | 90.9 | - | - |

"*" compressed computer image

**NOTE:** These projectors are compatible with the following computer operating systems: Windows 98/ME/ 2000/XP, MAC OS 9.0 and 10.0.

**NOTE:** Some notebook computers running NT 4.0 have difficulty sending a signal to an external display.

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## hp sb21 specifications

| | |
|---|---|
| Light Engine | • Single Chip DLP™ Technology |
| Brightness | • 1000 comparable lumens |
| Contrast Ratio | • 1800:1 (Full On / Full Off) |
| Lamp | • 132 watt (W) user-replaceable P-VIP Lamp Module |
| Number of Pixels | • 800 (H)×600 (V) |
| Displayable Colors | • 16.7 million |
| Projection Lens | • F/2.4, f=22.4 mm with manual focus |
| Projection Screen Size | • 0.6~7.5 m (25~295 inch) diagonal |
| Projection Distance | • 1m~12 m (3.3~39.4 ft) |
| Video Compatibility | • NTSC3.58/NTSC4.43/PAL/PAL-M/PAL-N/SECAM and HDTV compatible |
| | • Composite video, S-video capability, Component video (via optional cable) |
| H. Frequency | • 15 kHz~70 kHz horizontal scan rate |
| V. Frequency | • 43 Hz~85 Hz vertical refresh rate |
| Power Supply | • Universal AC input 100~240V ; Input Frequency 50/60 Hz |
| Power Consumption | • 160 watts |
| Uniformity | • 85% (JBMA) |
| I/O Connectors | • Power: AC power input socket |
| | • Computer Input: · One 35-pin VESA M1-DA for Analog RGB/Digital /Component Video/HDTV/USB mouse |
| | • Video Input: · One 2.5mm phone jack for Composite video input · One USB Mini-B 5-pin for S-video input |
| Weight | • 1 kg (2.2 pounds) |
| Dimensions (W×H×D) | • 200×141×60 mm (7.90×5.55×2.30 inches) |
| Environmental | • Operating Temperature: |

| Operating Temperature (°C) | Altitude (ft) |
|---|---|
| 10-40 | 0 ~ 2,500 |
| 10-35 | 2,500 ~ 5,000 |
| 10-30 | 5,000 ~ 7,000 |
| 10-28 | 7,000 ~ 10,000 |

• Storage Temperature: -20° C~60° C (-4° F~140° F) at 80% maximum humidity (0~40,000 ft)

| | |
|---|---|
| Safety Regulation | See page 38 for regulatory information |

## hp sb21 compatibility modes

sb21

| Mode | Resolution | ANALOG | | DIGITAL | |
|---|---|---|---|---|---|
| | | V.Frequency (Hz) | H.Frequency (Hz) | V.Frequency (Hz) | H.Frequency (Hz) |
| VESA VGA | 640 x 350 | 70 | 31.5 | 70 | 31.5 |
| VESA VGA | 640 x 350 | 85 | 37.9 | 85 | 37.9 |
| VESA VGA | 640 x 400 | 85 | 37.9 | 85 | 37.9 |
| VESA VGA | 640 x 480 | 60 | 31.5 | 60 | 31.5 |
| VESA VGA | 640 x 480 | 72 | 37.9 | 72 | 37.9 |
| VESA VGA | 640 x 480 | 75 | 37.5 | 75 | 37.5 |
| VESA VGA | 640 x 480 | 85 | 43.3 | 85 | 43.3 |
| VESA VGA | 720 x 400 | 70 | 31.5 | 70 | 31.5 |
| VESA VGA | 720 x 400 | 85 | 37.9 | 85 | 37.9 |
| SVGA | 800 x 600 | 56 | 35.2 | 56 | 35.2 |
| SVGA | 800 x 600 | 60 | 37.9 | 60 | 37.9 |
| SVGA | 800 x 600 | 72 | 48.1 | 72 | 48.1 |
| SVGA | 800 x 600 | 75 | 46.9 | 75 | 46.9 |
| SVGA | 800 x 600 | 85 | 53.7 | 85 | 53.7 |
| * VESA XGA | 1024 x 768 | 43.4 | 35.5 | 43.4 | 35.5 |
| * VESA XGA | 1024 x 768 | 60 | 48.4 | 60 | 48.4 |
| * VESA XGA | 1024 x 768 | 70 | 56.5 | 70 | 56.5 |
| * VESA XGA | 1024 x 768 | 75 | 60.0 | 75 | 60.0 |
| * VESA XGA | 1024 x 768 | 85 | 68.7 | - | - |
| MAC LC13" | 640 x 480 | 66.66 | 34.98 | - | - |
| MAC II 13" | 640 x 480 | 66.68 | 35 | - | - |
| * MAC 16" | 832 x 624 | 74.55 | 49.725 | - | - |
| * MAC 19" | 1024 x 768 | 75 | 60.24 | - | - |
| MAC G4 | 640 x 480 | 60 | 31.35 | - | - |
| * I MAC DV | 1024 x 768 | 75 | 60 | - | - |

"*" compressed computer image

**NOTE:** These projectors are compatible with the following computer operating systems: Windows 98/ME/2000/XP, MAC OS 9.0 and 10.0.

**NOTE:** Some notebook computers running NT 4.0 have difficulty sending a signal to an external display.

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# Regulatory information

**xb31**  **sb21**

This section presents information that shows how your digital projector complies with regulations in certain regions. Any modifications to your digital projector not expressly approved by Hewlett-Packard could void the authority to operate the digital projector in these regions.

**U.S.A.**

This digital projector has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This digital projector generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.  If this digital projector does cause harmful interference to radio or television reception (which can be determined by unplugging the unit), try the following:

- · Reorienting or relocating the receiving antenna.
- · Relocating the digital projector with respect to the receiver.
- · Connecting the digital projector's power cord to another power outlet.

**Connections to Peripheral Devices**

To maintain compliance with FCC Rules and Regulations, use properly shielded cables with this device.

For more information, consult your dealer, an experienced radio/television technician, or the following booklet, prepared by the Federal Communications Commission: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock Number 004-000-00345-4. At the first printing of this manual, the telephone number was (202) 512-1800.

## Japanese Notice

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

## DECLARATION OF CONFORMITY
According to ISO/IEC Guide 22 and EN 45014

**xb31** **sb21**

| | |
|---|---|
| **Manufacturer's Name:** | Hewlett Packard Company |
| **Manufacturer's Address:** | Hewlett Packard Company |
| | 1000 NE Circle Boulevard |
| | Corvallis, OR 97330-4239 |

Declares, that the product(s):

| | |
|---|---|
| **Product Name:** | Digital Projector |
| **Model Number(s):** | xb31, sb21 |
| **Product Options:** | All |

Conforms to the following Product Specifications:

**Safety:** IEC 60950: 1991 + A1, A2, A3, A4 / EN 60950: 1992 +A1, A2, A3, A4, A11, IEC 60825-1: 1993 + A1 / EN 60825-1: 1994 + A11 Class 1 LED

**EMC:** CISPR 22: 1997 /EN 55022: 1998, Class B [1]
CISRP 24: 1997 / EN 55024: 1998
IEC 61000-3-2: 1995 / EN 61000-3-2: 1995 + A1: 1998 + A2: 1998
IEC 61000-3-3: 1994 / EN 61000-3-3: 1995
FCC Title 47 CFR, Part 15 Class B / ANSI C63.4: 1992

**Equipment Class 2:** ETS 300-328 Technical requirements for Radio equipment
Notified Body Number: 0682
Notified Body Address: CETECOM ICT Services GmbH,
Untertuerkheimer Str. 6-10, D-66117 Saarbruecken

**Supplementary Information:**

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC, the EMC Directive 89/336/EEC and carries the CE marking accordingly.

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.

This device complies with Part 15 of the FCC Rules.  Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

[1] The product was tested in a typical configuration with Hewlett Packard Personal Computer peripherals.

Corvallis, OR, May 20, 2002

Section manager signature
European Contact:  Your local Hewlett Packard Sales and Service Office or
Hewlett Packard GmbH, Department ZQ/Standards Europe, Herrenberger
Strasse 140, D-7030 Boeblingen (FAX: +49-7031-143143).
USA Contact:  Hewlett Packard Co., Corporate Product Regulations Manager,
3000 Hanover Street, Palo Alto, CA 94304.  Phone:  (650) 857-1501.

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## Reference Safety Information

### Laser Safety

The remote controller used with the digital projector is certified as a Class 1 laser device according to the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard and International Standards IEC 825 / IEC 825-1 (EN 60825 / EN 60825-1). This device is not considered harmful, but the following precautions are recommended:

- Ensure proper use by reading and following the instructions carefully.
- If the unit requires service, contact an authorized hp service center – See page 37 for details.
- Do not attempt to make any adjustment to the unit.
- Avoid direct exposure to the laser beam – do not open the unit.

### LED Safety

The infrared port located on the right side of the digital projector is classified as a Class 1 LED (light-emitting diode) device according to International Standard IEC 825-1 (En 60825-1). This device is not considered harmful, but the following precautions are recommended:

- If the unit requires service, contact an authorized hp service center – See page 37 for details.
- Do not attempt to make any adjustment to the unit.
- Avoid direct eye exposure to the infrared LED beam. Be aware that the beam is invisible light and cannot be seen.
- Do not attempt to view the infrared LED beam with any type of optical device.

# Warranty & Support

Refer to warranty/support information data sheet enclosed with the projector or contact hp post-sales support at www.hp.com/support/digitalprojectors or call (in the US) 208-323-2551 or (in Canada) 905-206-4663.

hp offers telephone support world-wide. For the phone number of the customer care center nearest you, please visit the following URL:

http://productfinder.support.hp.com/tps/CLC?h_product=top&h_lang=en&h_region=emea&h_tool=phone

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[http://www.somanuals.com](http://www.somanuals.com)

[http://www.4manuals.cc](http://www.4manuals.cc)

[http://www.manual-lib.com](http://www.manual-lib.com)

[http://www.404manual.com](http://www.404manual.com)

[http://www.luxmanual.com](http://www.luxmanual.com)

[http://aubethermostatmanual.com](http://aubethermostatmanual.com)

Golf course search by state

[http://golfingnear.com](http://golfingnear.com)

Email search by domain

[http://emailbydomain.com](http://emailbydomain.com)

Auto manuals search

[http://auto.somanuals.com](http://auto.somanuals.com)

TV manuals search

[http://tv.somanuals.com](http://tv.somanuals.com)