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OWNER'S OPERATING MANUAL



VX-2i

Digital Light Processing Projector



THE WORLD'S FINEST HOME THEATER PRODUCTS™

TWO YEAR LIMITED WARRANTY

For Projectors, Video Processors and Controllers

Congratulations on your purchase of a Runco video product and welcome to the Runco family! We believe Runco produces "The World's Finest Home Theater Products." With proper installation, setup and care, you should enjoy many years of unparalleled video performance.

This is a LIMITED WARRANTY as defined in the Magnuson-Moss Warranty Act. Please read it carefully and retain it with your other important documents.

WHAT IS COVERED UNDER THE TERMS OF THIS LIMITED WARRANTY:

SERVICE LABOR: Runco will pay for service labor by Runco Authorized Service Center when needed as a result of manufacturing defect for a period of two (2) years from the effective date of delivery to the end user (excluding the lamp).

PARTS: (Not including the lamp) Runco will provide new or rebuilt replacement parts for the parts that fail due to defects in materials or workmanship for a period of two (2) years from the effective date of delivery to the end user. Such replacement parts are then subsequently warranted for the remaining portion (if any) of the original warranty period.

PROJECTOR LAMP: Runco will pay for service labor by a Runco Authorized Service Center when needed as a result of a manufacturing defect for a period of six (6) months or 1000 hours, which ever comes first, from the effective date of delivery to the end user. In addition, Runco will provide a new or rebuilt replacement lamp for the lamp that fails due to defects in materials or workmanship for a period of six (6) months or 1000 hours, which ever comes first, from the effective date of delivery to the end user. Such replacement lamps are then subsequently warranted for the remaining portion (if any) of the original warranty period.

WHAT IS NOT COVERED UNDER THE TERMS OF THIS LIMITED WARRANTY:

This Limited Warranty only covers failure due to defects in materials and workmanship that occur during normal use and does not cover normal maintenance. This Limited Warranty does not cover cabinets or any appearance items; failure resulting from accident, misuse, abuse, neglect, mishandling, misapplication, faulty or improper installation or setup adjustments; improper maintenance, alteration, improper use of any input signal; damage due to lightning or power line surges, spikes and brownouts; damage that occurs during shipping or transit; or damage that is attributed to acts of God. In the case of remote control units, damage resulting from leaking, old, damaged or improper batteries is also excluded from coverage under this Limited Warranty.

CAUTION: THIS LIMITED WARRANTY ONLY COVERS RUNCO PRODUCTS PURCHASED FROM RUNCO AUTHORIZED DEALERS. ALL OTHER PRODUCTS ARE SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY. MOREOVER, DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM IMPROPER INSTALLATION OR SETUP IS SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY.

RIGHTS, LIMITS AND EXCLUSIONS:

Runco limits its obligations under any implied warranties under state laws to a period not to exceed the warranty period. There are no express warranties. Runco also excludes any obligation on its part for incidental or consequential damages related to the failure of this product to function properly. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. So the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

EFFECTIVE WARRANTY DATE:

This warranty begins on the effective date of delivery to the end user. For your convenience, keep the original bill of sale as evidence of the purchase date.

IMPORTANT -- WARRANTY REGISTRATION:

Please fill out and mail your warranty registration card. It is imperative that Runco knows how to reach you promptly if we should discover a safety problem or product update for which you must be notified.

CONTACT A RUNCO AUTHORIZED SERVICE CENTER TO OBTAIN SERVICE:

Repairs made under the terms of this Limited Warranty covering your Runco video product will be performed at the location of the product, during usual working hours, providing location of product is within normal operating distance from a Runco Authorized Service Center. In some instances it may be necessary for the product to be returned to the Runco factory for repairs. If, solely in Runco's judgment, location of product to be repaired is beyond normal operating distance of the closest Runco Authorized Service Center, or the repair requires the unit be returned to the Runco factory, it is the owner's responsibility to arrange for shipment of the product for repair. These arrangements must be made through the selling Runco Dealer. If this is not possible, contact Runco directly for a Return Authorization number and shipping instructions. Runco will return product transportation prepaid in the United States, unless no product defect is discovered. In that instance, shipping costs will be the responsibility of the owner.

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ADDITIONAL INFORMATION:

To locate the name and address of the nearest Runco Authorized Service Center, or for additional information about this Limited Warranty, please call or write:

RUNCO INTERNATIONAL, INC.
Attn: Customer Service Department
2900 Faber Street
Union City, CA 94587
Ph: (510) 324-7777
Fax: (510) 324-9300
Toll Free: (800) 23-RUNCO

RUNCO VIDEO-PRODUCT INFORMATION
RETAIN THIS INFORMATION FOR YOUR RECORDS

Model Purchased

Date

Serial Number

Runco Authorized Dealer Name

Address

City

State/Province

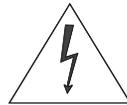
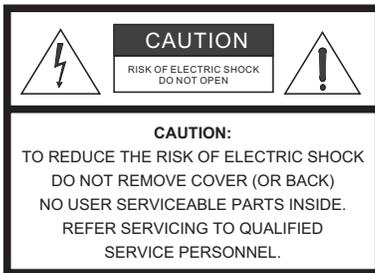
Postal Code

Phone

Fax

Safety Precautions

Thank you for your purchase of this quality Runco video projector! It has been designed to provide you with the quality of video that is expected in a home theater. For the best performance, please read this manual carefully as it is your guide through the menus and operation.



WARNING

This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This equipment 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.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Do not use this equipment near water, outdoors or otherwise exposed to the elements.
5. Clean only with a dry cloth.
6. Do not block any ventilation openings.
7. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
8. Do not defeat the safety feature of the polarized or grounding type plug. A polarized type plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for the replacement of the obsolete outlet.
9. The 12V trigger only outputs DC 12V signal for triggering. Do not connect to any other power input or output. This could cause damage to this unit.
10. Only use accessories specified by Runco International.
11. Keep the packing material in case the equipment should ever need to be shipped.
12. Unplug this projector during lightning storms or when it will not be used for an extended period of time.
13. The lamp becomes extremely hot during operation. Allow the projector to cool down for approximately 45 minutes prior to removing the lamp assembly for replacement. Do not operate lamps beyond the rated lamp life. Excessive operation of lamps beyond rated life could cause them to explode in rare occasions.
14. Refer all servicing to qualified service personnel. Servicing is required when the projector has been damaged in any way, objects have fallen or spilled into the projector, the projector has been exposed to rain or moisture, does not operate normally, or has been dropped.

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Notes:

1. Introduction

This Owner's Manual describes how to install, set up and operate the Runco VX-2i DLP Projector. Throughout this manual, the Runco VX-2i DLP Projector is referred to simply as the "VX-2i."

Runco has prepared this manual to help home theater installers and end users get the most out of the VX-2i.

Runco has made every effort to ensure that this manual is accurate as of the date it was printed. However, because of ongoing product improvements and customer feedback, it may require updating from time to time. You can always find the latest version of this and other Runco product manuals on-line, at www.runco.com.

Runco welcomes your comments about this manual. Send them to techpub@runco.com.

Text Conventions: The following conventions are used in this manual, in order to clarify the information and instructions provided:

- Remote and built-in keypad button identifiers are set in upper-case bold type; for example, "Press **EXIT** to return to the previous menu."
- All keys with functional names are initial-capped, set in bold type and enclosed in angle brackets. These keys are the following: **<Return>**, **<Spacebar>**, **<Control>**, **<Esc>** and **<Tab>**.
- **<Return>** indicates that you may press either the RETURN or ENTER key on your keyboard if it has both keys.
- Computer input (commands you type) and output (responses that appear on-screen) is shown in monospace (fixed-width) type; for example: "To change the aspect ratio to Letterbox, type `LETTERBOX <Return>`."

In addition to these conventions, underlining, boldface and/or italics are occasionally used to highlight important information, as in this example:



*A carriage return **must** be used after each command or string.*

1.1 About This Manual

◀ Target Audience

◀ If You Have Comments About This Manual...

◀ Textual and Graphic Conventions

Graphic Conventions: These symbols appear in numerous places throughout the manual, to emphasize points that you must keep in mind to avoid problems with your equipment or injury:



Tip

TIPS highlight time-saving short cuts and helpful guidelines for using certain features.



Note

NOTES emphasize text with unusual importance or special significance. They also provide supplemental information.



Caution

CAUTIONS alert users that a given action or omitted action can degrade performance or cause a malfunction.



WARNING

WARNINGS appear when a given action or omitted action can result in damage to the equipment, or possible non-fatal injury to the user.



DANGER!

DANGER appears when a given action can cause severe injury or death.

1.2 Using This Manual

Use the following table to locate the specific information you need in this manual.

If you need...	... Turn to page:
Information about obtaining service	iv
General information about the VX-2i DLP Projector	3
Installation instructions	11
First-time configuration instructions	25
Advanced configuration instructions	34
Troubleshooting tips	39
VX-2i DLP Projector specifications	45

Runco steps into the future once again with the Video Xtreme™ VX-2i Digital Light Processing (DLP™) Projector, one of the first DLP projectors to offer a 16:9 native resolution, 3-chip system for home theater.

The VX-2i optical light engine utilizes three advanced, 16:9 Digital Micromirror Device™ (DMD™) chips featuring 1280 x 720, high-definition resolution and 12-degree mirror tilt for unsurpassed black level performance. Unlike previous, single-chip DLP implementations, no color wheel is used. This reduces mechanical complexity and compromises to color spectrum purity. The impressive brightness inherent in 3-chip systems is further bolstered by the improved contrast capabilities of the VX-2i light engine design, offering the best of both worlds.

The VX-2i is equipped with an embedded, all-digital signal processor/controller featuring advanced Vivix II™ video processing, superb scaling and aspect ratio control. Runco's exclusive LiveLink™ DVI cable system circuitry is integrated into the projector to preserve HD signal quality over long runs. The VX-2i is enhanced further by significant horizontal and vertical lens shift capability for maximum installation flexibility.

The VX-2i produces an impressive 2500 ANSI lumens of light output (CSMS™ light output of 52.1 ft-Lamberts). The VX-2i's 16:9 native aspect ratio DMD array makes it ideal for widescreen viewing, while its 3-chip, 1280 x 720 native resolution produces crisp, crystal clear high-definition images with richly saturated colors, deep black levels and natural, highly refined detail.

This advanced design provides pure digital connections from input to light engine for absolutely stellar pictures. In addition, Runco's multiple aspect ratio control includes its unique VirtualWide™ mode for viewing standard video formats in widescreen without loss of image quality.

For uncompromising widescreen reproduction of movies originally filmed in the CinemaScope™ 2.35:1 format, the VX-2i can be equipped with Runco's CineWide™ with AutoScope™ system, which maintains constant vertical height on the screen just as in a movie theater. When a viewer transitions from 1.78:1 (16:9) program material to 2.35:1, the image simply gets wider while full height is maintained.

Discrete IR and RS-232 control make custom installation seamless, while discrete source and aspect ratio selection accommodate any automation control system.

The VX-2i offers these key features and benefits:

- Native Resolution: 1280 x 720 (16:9 Native Aspect Ratio)
- 3-chip Digital Light Processing (DLP™) system
- Two DVI Inputs with High-bandwidth Digital Content Protection (HDCP)
- HDTV Ready
- Multiple Lens Options for Throw Distance Flexibility

1.3 Description, Features and Benefits

◀ Key Features and Benefits

Parts List ➤ Your VX-2i is shipped with the following items. If any items are missing or damaged, please contact your Runco dealer or Runco Customer Service at (800) 23-RUNCO.

- VX-2i DLP Projector
- Remote Control Unit and two (2), AAA-size batteries
- AC Power Cord
- (1) Warranty information and registration card
- Runco VX-2i Owner's Operating Manual (this document)

Optional Accessories:

- CineWide™ with AutoScope™ system (anamorphic lens and motorized mount)
- Ceiling mount kit
- LiveLink™ DVI Cabling System

2. Controls and Functions

Figure 2-1 shows the key VX-2i components.

2.1 VX-2i at a Glance

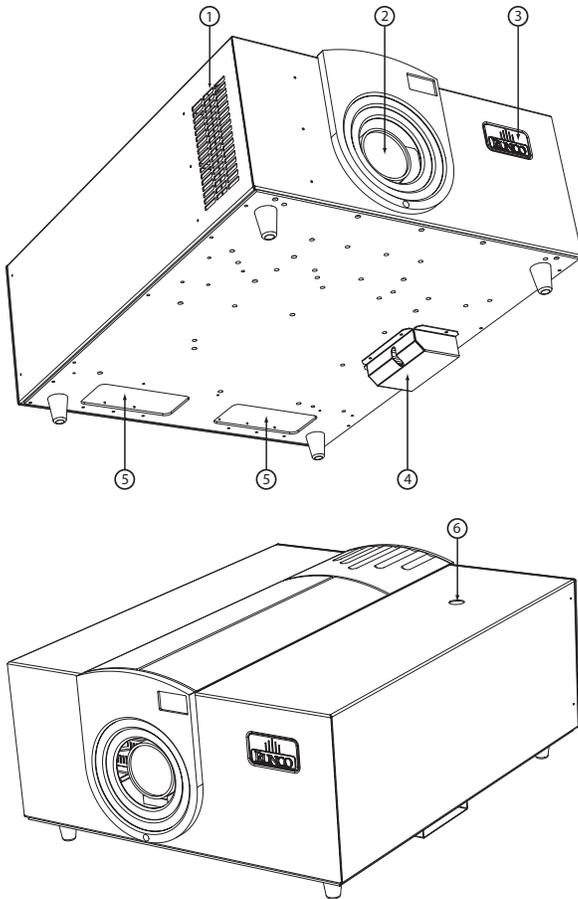


Figure 2-1. VX-2i Front/Bottom/Side View

1. **INTAKE VENT**
2. **LENS**
3. **RUNCO LOGO**
The logo can be rotated to match the projector orientation: inverted (ceiling-mounted) or upright. To rotate the logo, grip it at the sides, pull it away from the projector and rotate it 180 degrees.
4. **EXHAUST VENT**
5. **CABLE OPENINGS**
Pass cables through these openings.
6. **IR SENSOR**

2.2 VX-2i Rear Panel

Figure 2-2 shows the VX-2i rear panel.

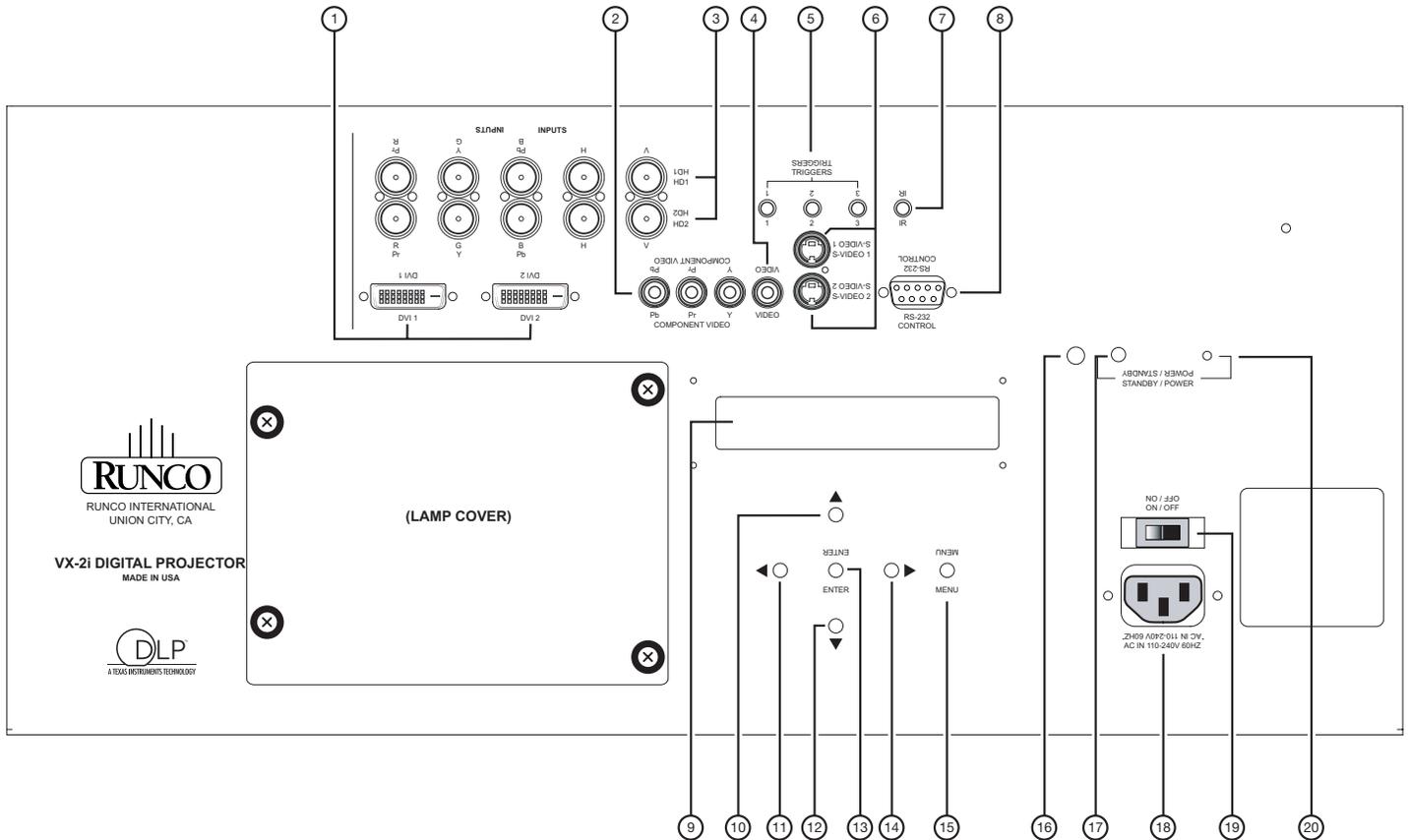


Figure 2-2. VX-2i Rear Panel

1. **DVI 1 / DVI 2 (Digital)**
Two, HDCP-compliant digital video inputs for connecting a DVD player or HD tuner with a DVI or HDMI output.
2. **COMPONENT VIDEO (RCA connectors)**
Standard Definition (480i/576i) Component (YPrPb) input. This is the input for component video from sources such as DVD players.



Tip

For best results, do not run your DVD player in progressive mode.

3. **HD1 / HD2 (Analog BNC connectors)**
Five, BNC connectors for connecting either RGB or component high-definition television signals. The VX-2i automatically detects the signal format: RGB(HV) or YPrPb, 480p, 720p, 480i, 576i or 1080i.
4. **COMPOSITE VIDEO INPUT**
Standard composite video input for connecting a VCR, laser disc player or other composite video source.

5. 12-VOLT (800 mA) TRIGGER OUTPUTS

Connection for up to three (3), 12-volt trigger-controlled devices. These can be retractable screens, screen masks or the Runco CineWide with AutoScope system.

6. S-VIDEO 1 / S-VIDEO 2

Two, standard S-Video inputs for connecting a DVD player, satellite receiver or Super VHS (S-VHS) VCR.

7. IR

Wired input from an external remote control.

8. RS-232 CONTROL PORT

A female, 9-pin D-sub connector for interfacing with a PC or home theater automation/control system.

9. VACUUM FLUORESCENT DISPLAY

Can be used instead of the On-Screen Display (OSD). Displays currently-selected menu or -- if no menu is selected -- the current source, signal format (NTSC or PAL), input resolution and aspect ratio.

10. UP BUTTON

Use to direct select aspect ratios or move the menu cursor up in the On-Screen Display. When no menus are present on-screen, the **UP** button toggles you through aspect ratios in the following order:

Anamorphic - Standard (4:3) - Letterbox - VirtualWide - Cinema - Virtualwide 2.35

(Virtualwide 2.35 is available only on CineWide-equipped projectors. For more information about aspect ratios, refer to Table 4-1.)

11. LEFT BUTTON

Used to direct select inputs or move the menu cursor left in the On Screen Display. When no menu is present on-screen, the **LEFT** button toggles you through the different sources, in this order:

DVI 2 - DVI 1 - HD/RGB2 - HD/RGB1 - Component SD - S-Video 2 - S-Video 1 - Composite

12. DOWN BUTTON

Use to direct select aspect ratios or move the menu cursor down in the On-Screen Display. When no menu is present on-screen, this button toggles you through the different aspect ratios, in this order:

Virtualwide 2.35 - Cinema - VirtualWide - Letterbox - Standard (4:3) - Anamorphic

13. ENTER BUTTON

When an item is highlighted on the On-Screen Display, the **ENTER** button selects the item.

14. RIGHT BUTTON

Used to direct select inputs or move the menu cursor right in the On Screen Display. When no menus are present on-screen, the **RIGHT** button toggles you through the different sources, in this order:

Composite - S-Video 1 - S-Video 2 - Component SD - HD/RGB 1 - HD/RGB 2 - DVI 1 - DVI 2

15. MENU BUTTON

Pressing the **MENU** button brings up the main menu. Also, if you are in an adjustment mode or function, pressing **MENU** brings the menu back one level.

16. IR SENSOR

Receives the IR commands from the remote.

17. POWER BUTTON

Press once to turn on the VX-2i. Press it again to put it into Standby mode. For a discrete on or off command, you can use the direct access buttons on the remote control.

18. POWER INPUT (100 to 240 VAC)

Connect the VX-2i to power here.

19. MAIN POWER SWITCH

Disconnects or applies power to the VX-2i.

20. POWER/STANDBY LED

**2.3
VX-2i Remote Control**

Figure 2-3 shows the VX-2i remote control, and the paragraphs that follow describe its functionality.

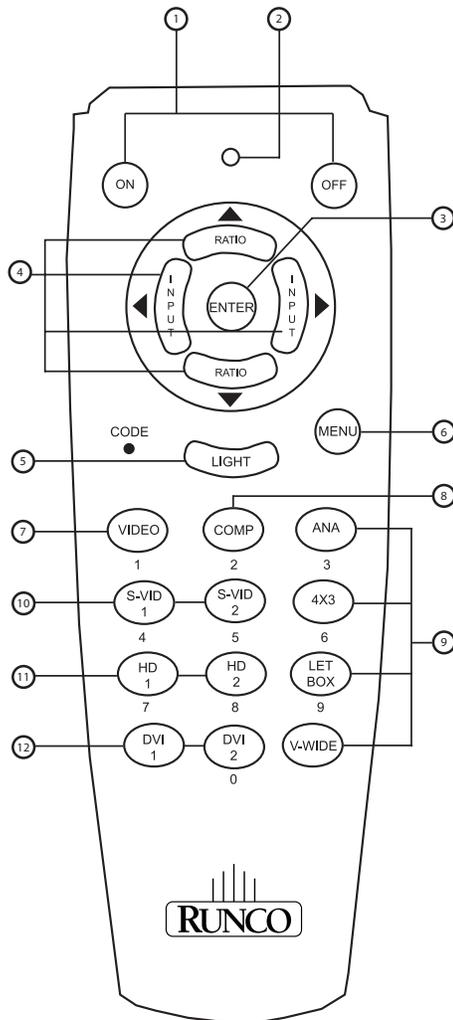


Figure 2-3. VX-2i Remote Control Functions

1. **ON / OFF**
Press to turn the projector on or off.
2. **IR OUTPUT INDICATOR**
Lights when a button is pressed to indicate that an IR signal is being transmitted.
3. **ENTER**
Press to select a highlighted menu item or confirm a changed setting.
4. **Cursor Keys (▲, ◀, ▼, ▶)**
Use these buttons to select items or settings, adjust settings or switch display patterns.

When no menus are present on-screen, the **UP** and **DOWN** buttons toggle through the available aspect ratios, in this order:

UP Button = Anamorphic - Standard (4:3) - Letterbox - VirtualWide - Cinema - Virtualwide 2.35

DOWN Button = Virtualwide 2.35 - Cinema - VirtualWide - Letterbox - Standard (4:3) - Anamorphic

**Note**

Virtualwide 2.35 is available only on CineWide-equipped projectors. For more information about aspect ratios, refer to Table 4-1.

Likewise, the **LEFT** and **RIGHT** buttons toggle through the different source inputs, in this order:

LEFT Button = DVI 2 - DVI 1 - HD/RGB2 - HD/RGB 1 - Component SD - S-Video 2 - S-Video 1 - Composite

RIGHT Button = Composite - S-Video 1 - S-Video 2 - Component SD - HD/RGB 1 - HD/RGB 2 - DVI 1 - DVI 2

5. **LIGHT**
Press to illuminate the buttons. (Not available on all models.)
6. **MENU**
Press this button to access the OSD controls, or to exit the current menu and return to the previous one.
7. **VIDEO (1)**
Press to select Composite video input as the source or to enter the numeric character "1."
8. **COMP (Component) (2)**
Press to select Component SD (480i/576i) video input as the source or to enter the numeric character "2."

9. **Aspect Ratio Selection Buttons**

Use the red buttons to select an aspect ratio directly or to enter numeric characters, as follows:

ANA (Anamorphic) (3)

For 16:9 DVDs.

4X3 (Standard 4:3) (6)

The input signal is scaled to fit 4:3 display mode in the center of the screen.

LETBOX (Letterbox) (9)

Image in letterbox format is enlarged to fit 16:9 full screen display and the upper/lower portions are “blanked off.”

V-WIDE (VirtualWide)

4:3 image is enlarged NON-linearly in horizontal direction to fit 16:9 full screen display.

10. **S-VID 1 (4) / S-VID 2 (5) (S-Video)**

Press to select an S-Video input or to enter the numeric character “4” or “5.”

11. **HD 1 (7) / HD 2 (8)**

Press to select a HD (RGBHV or YPbPr component) input or to enter the numeric character “7” or “8.”

12. **DVI 1 / DVI 2 (0)**

Press to select a Digital Video input. Press **DVI2** to enter the numeric character “0.”

3. Installation

To install batteries in the remote control, press up on the battery cover retainer clip and lift off the cover. Install the two AAA batteries with the correct polarity and then replace the cover.

- Make sure that the battery polarities are correct when installing the batteries.
- Do not mix an old battery with a new one or different types of batteries.
- If you will not use the remote control for a long time, remove the batteries to avoid damage from battery leakage.
- Make sure that there is nothing obstructing the infrared beam between the remote control and the IR receiver on the projector.
- If the effective range of the remote control decreases, or it stops working, replace the batteries with new ones.
- The remote control may fail to operate if the infrared remote sensor is exposed to bright sunlight or fluorescent lighting.
- Ambient conditions may possibly impede the operation of the remote control. If this happens, point the remote control at the projector, and repeat the operation.
- The Ø icon appears on the screen when a button for an unavailable function is pressed.

3.1 Remote Control

◀ *Notes on Batteries*

◀ *Notes on Remote Control Operation*

3.2 Quick Setup

Table 3-1 gives a quick overview of the VX-2i installation process. The sections following this one provide detailed instructions.



Note

Installation should be performed by a qualified custom video installation specialist.

Table 3-1. Installation Overview

Step	Procedure	For Details, Refer to page...
1	Choose a location for the projector	13
2	Connect signal sources to the projector	20
3	Connect external controller to RS-232 port (optional)	24
4	Connect other home theater components to 12-volt trigger outputs (optional)	24
5	Apply power to the projector	24, 25
6	For rear-screen and/or ceiling-mount installations, select the proper picture orientation	25
7	Lens adjustments: projected image size (zoom), position (shift) and focus	17, 26
8	Projector calibration: adjust the following for each input , starting with Component SD; save settings when finished: <ul style="list-style-type: none"> • Aspect ratio • Brightness • Contrast • Color level • Tint • Input position 	28 through 34

Proper installation of your projector will ensure the quality of your display. Whether you are installing a projector temporarily or permanently, you should take the following into account to ensure your projector performs optimally.

Choose the installation type that best suits your needs: front or rear screen, floor mount or inverted mount. Table 3-2 compares these various installation methods.

Table 3-2. Projector Installation Options

Advantages	Considerations
Front Screen, Floor Mount Installation	
<ul style="list-style-type: none"> • Easy to set up • Can be moved or changed quickly • Easy to access 	<ul style="list-style-type: none"> • Shares floor space with audience
Front Screen, Inverted Mount (ceiling) Installation	
<ul style="list-style-type: none"> • Does not take up audience space • Projector is unobtrusive • Projector cannot be accidentally moved 	<ul style="list-style-type: none"> • Installation is more permanent • Projector access is more difficult
Rear Screen, Floor Mount Installation	
<ul style="list-style-type: none"> • Projector is completely hidden • Projector is easily accessed • Usually good ambient light rejection 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher
Rear Screen, Inverted Mount (ceiling) Installation	
<ul style="list-style-type: none"> • Projector is completely hidden • Usually good ambient light rejection 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher
Rear Screen, Floor Mount with Mirror	
<ul style="list-style-type: none"> • Projector is completely hidden • Usually good ambient light rejection • Requires less space behind screen than other rear screen installations 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher

3.3 Installation Considerations

◀ Installation Type

Screen Type and Size ➤ **Front Screen Installations:** In front screen installations the projector and audience are positioned in front of the screen, which can be flat or curved; see Figure 3-1.

Flat screens are recommended with this projector. They offer a gain of about 1 with a viewing angle just less than 180°. This type of screen reflects incident light equally in all directions so the audience can see the display from various angles.

Curved screens have a gain greater than 1 with a viewing angle much less than 180 degrees. This type of screen does not reflect incident light equally in all directions; instead, it is concentrated in a viewing cone. The audience sitting within the viewing cone area sees a brighter image than those sitting just outside this area. Runco generally does not recommend use of curved screens due to excessive brightness and uncorrectable geometrical distortion.

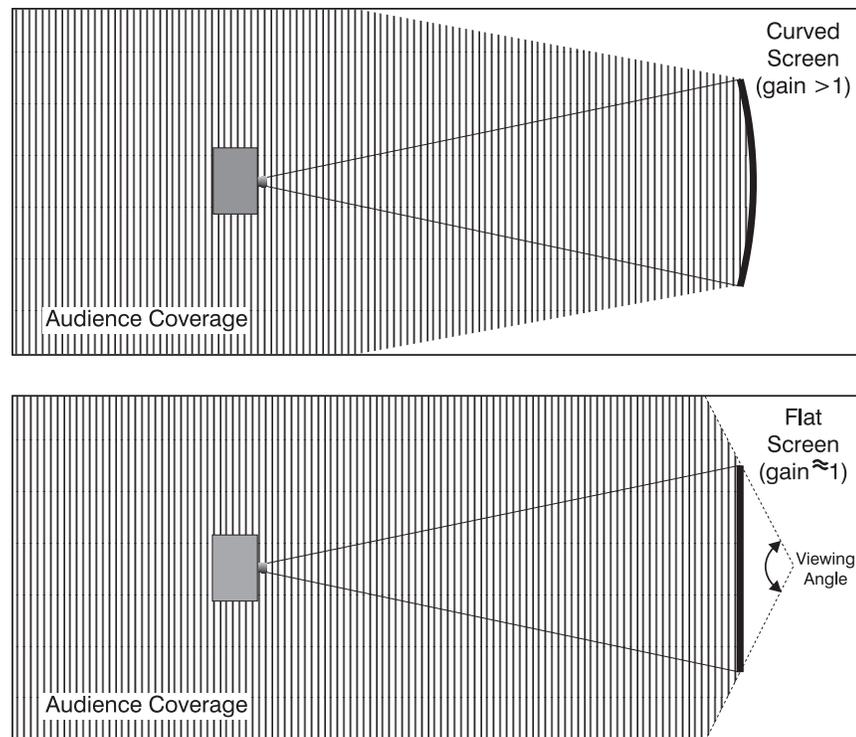


Figure 3-1. Flat vs. Curved Screens

Rear screen installations: There are two basic types of rear screens: diffused and optical.

A diffusion screen has a surface that spreads the light striking it. Purely diffused screens have a gain of less than 1. The main advantage of the diffused screen is its wide viewing angle, similar to that of a flat screen for front screen projection. This type of screen is suitable when a wide viewing angle is required but there is low ambient room lighting.

Optical screens take light from the projector and redirect it to increase the light intensity at the front of the screen. This reduces it in other areas. A viewing cone similar to that of a curved, front-screen installation is created. This type of screen is better suited for brightly lit rooms where the audience is situated within the viewing cone.

Screen Size: Choose a screen size that is appropriate for your lens and application. The size of the room and viewing distance are the defining factors; a rule of thumb is that the primary viewing distance be 1.5 times the screen width.

To fill a screen with an image, the aspect ratio of the screen should be equal to the aspect ratio of the image (expressed as the ratio of its width to its height). Standard video from a VCR has a 4:3 or 1.33:1 aspect ratio. For example, to display a VCR output with a 4:3 aspect ratio onto a 10-foot (3.05-meter) high screen, the width of the screen must be at least 13.3 feet (4 meters).

In general, minimize or eliminate light sources directed at the screen. Contrast ratio in your images will be noticeably reduced if light directly strikes the screen, such as when a shaft of light from a window or floodlight falls on the image. Images may then appear washed out and less vibrant.

◀ Ambient Light

Other considerations and tips that can help improve your installation:

◀ Other Considerations

- Keep the ambient temperature constant and below 35°C (95°F). Keep the projector away from heating and/or air conditioning vents. Changes in temperature may cause drifts in the projector circuitry, which may affect performance.
- Keep the projector away from devices that radiate electromagnetic energy such as motors and transformers. Common sources of these include slide projectors, speakers, power amplifiers and elevators.

Throw distance is the distance measured from the front of the projector to the screen. This is an important calculation in any projector installation as it determines whether or not you have enough room to install your projector with a desired screen size and if your image will be the right size for your screen.

◀ Throw Distance

You can quickly estimate the throw distance by taking the width of the screen and multiplying it by the lens throw ratio; see Figure 3-2. The result of this calculation tells you roughly how far back the projector should be positioned from the screen in order to project a focused image large enough to fill the screen.

Estimating Throw Distance

Throw Distance (TD) = Screen Width (w) × Lens Throw Ratio

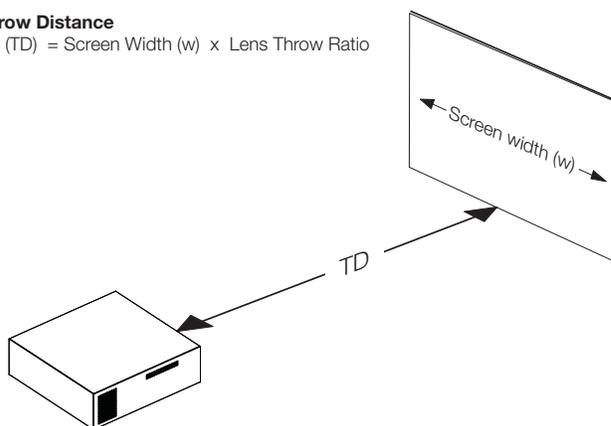


Figure 3-2. Estimating Throw Distance

Table 3-3 lists the available lens options for the VX-2i and their associated throw ratios.

Table 3-3. VX-2i Lens Options

Lens Option (Note 2)	Throw Ratio (Throw Dist. ÷ Screen Width)	Throw Distance Range (in inches, with 100-inch Wide Screen)	
		Minimum	Maximum
Proteus A	0.64 (Fixed)	For rear-screen installations only. Contact Runco Technical Support for more information.	
Proteus B	1.22 - 1.44	122	144
Proteus C	1.45 - 1.76	145	176
Proteus D	1.82 - 2.39	182	239
Proteus D with CineWide	1.34 - 1.75	134	175
Proteus E	2.42 - 3.57	242	357
Proteus E with CineWide	1.78 - 2.62	178	262
Proteus F	3.63 - 5.72	363	572
Proteus F with CineWide	2.67 - 4.20	267	420

Notes:

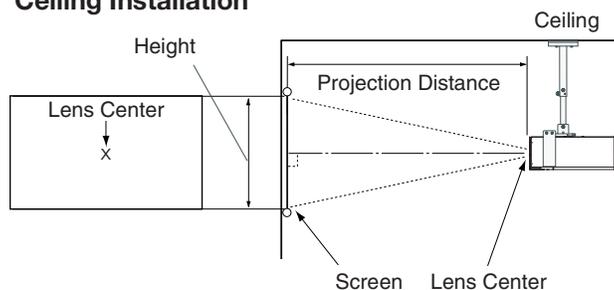
1. Throw distance does not affect image quality, provided these ranges are taken into account.
2. Only the Proteus D, E and F lenses can be used with the optional CineWide (secondary anamorphic) lens. Doing so affects the throw distances as shown here.

Proper placement of the projector relative to the screen will yield a rectangular, perfectly-centered image that completely fills the screen.

Ideally, the projector should be positioned perpendicular to the screen and in such a way that the lens center and screen center are aligned with each other, as shown in Figure 3-3.

◀ Vertical and Horizontal Position

Ceiling Installation



Floor Installation

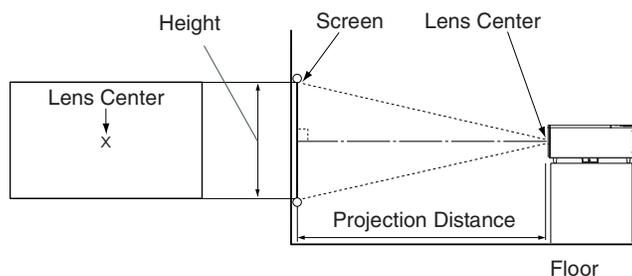


Figure 3-3. Projector Placement

If it is not possible to align the projector and screen as shown in Figure 3-3, you can use the lens shift controls to center the image on the screen. Lens shift is generally expressed as a percentage of the screen height or width, as shown in Figure 3-4 and Figure 3-5.

◀ Vertical and Horizontal Lens Shift

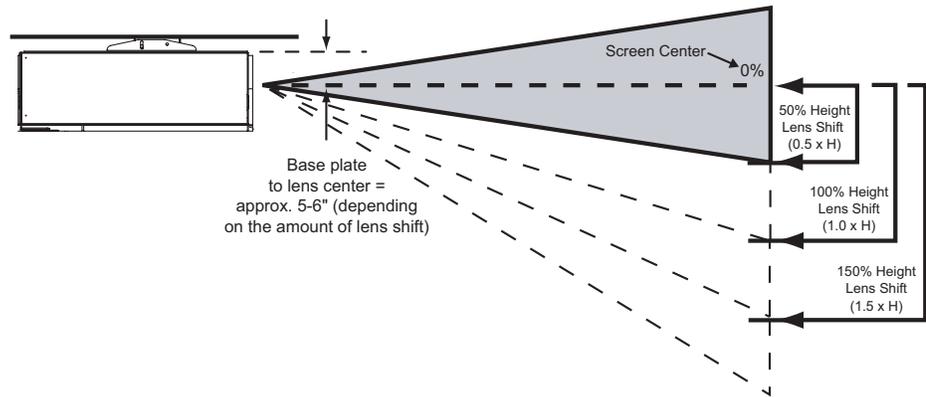
Vertical Lens Shift: The VX-2i provides up to 80% of downward vertical lens shift. For example, with a 96 x 54-inch (16:9) screen, you can shift the image up to 43.20 inches (1.10 meters) below the screen center. (Upward vertical lens shift is not possible.)

Horizontal Lens Shift: The VX-2i zoom lenses (Proteus B through F) allow up to 10% of horizontal lens shift in either direction (left or right). For example, with a 96 x 54-inch (16:9) screen, you can shift the image up to 9.60 inches (24.38 cm) left or right of the screen center. (Horizontal lens shift is not possible with the Proteus A lens.)



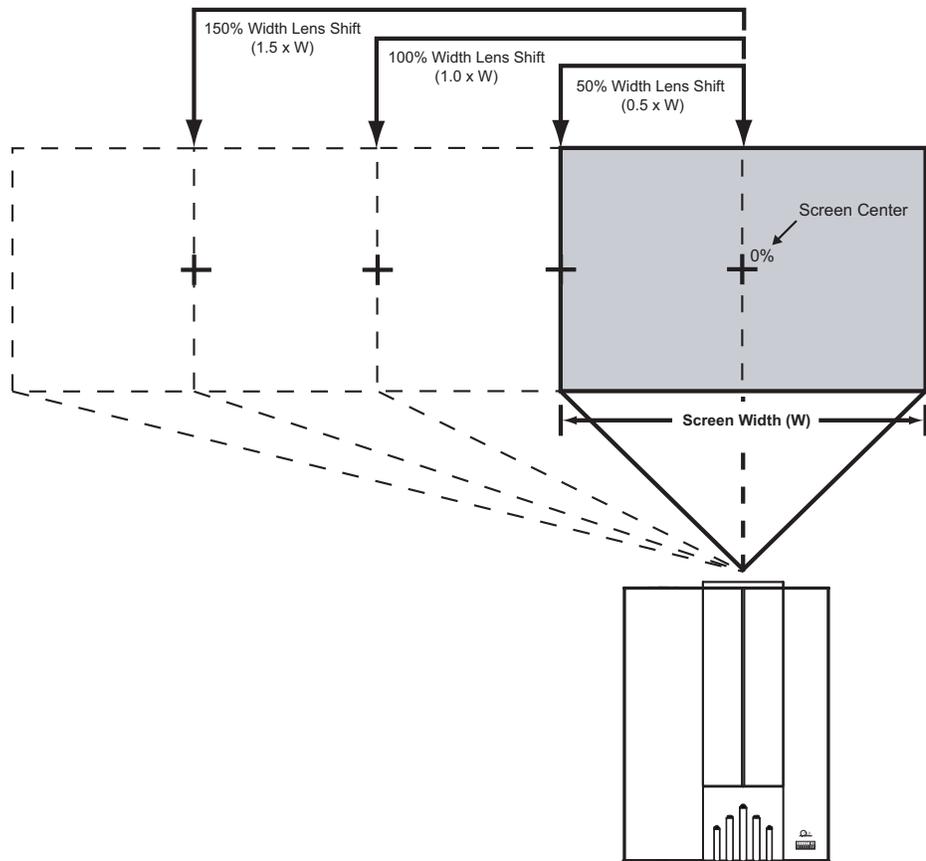
Note

1. With no vertical or horizontal lens shift, the lens center and screen center are aligned with each other.
2. Vertical shift limits are percentages of the screen height. Horizontal shift limits are percentages of the screen width.
3. **Vertical lens shift figures apply to ceiling mount configurations.** For floor installations (where the projector is upright), reverse the up/down vertical offset percentages.



Note: This is a general example of lens shift. Lenses vary in their shift capabilities. No particular lens is used in this example.

Figure 3-4. Vertical Lens Shift



Note: This is a general example of lens shift. Lenses vary in their shift capabilities. No particular lens is used in this example.

Figure 3-5. Horizontal Lens Shift

If the screen is significantly higher or lower than the projector, you can also tilt the projector at a slight angle. In a ceiling installation, you do this by adjusting the ceiling mount.

If you do this, you may need to shift the image using the on-screen display (OSD) controls, to compensate. For detailed instructions, refer to **Using the On-Screen Menus** on page 26.

There are several methods for mounting the projector. Depending on your chosen installation, one method may be more suitable than another.

Floor Mounting: In typical front and rear screen installations, the projector can be mounted to a secure and level surface such as a table or cart. Carts are useful when moving a projector during a presentation or from site to site. If possible, lock the wheels when it's in position to prevent it from being moved during a presentation.

Ceiling Mounting: The projector can also be inverted and suspended from the ceiling using a specially designed ceiling mount fixture. This type of mounting is recommended for fixed installations and for those that want the projector out of sight or have a limited space for projector and audience.



Note

Use only the Runco-approved ceiling mount kit designed for your projector.

In rear screen applications where space behind the projector is limited, a mirror may be used to fold the optical path, as shown in Figure 3-6. The position of the projector and mirror must be accurately set. If you are considering this type of installation, contact your dealer for assistance.

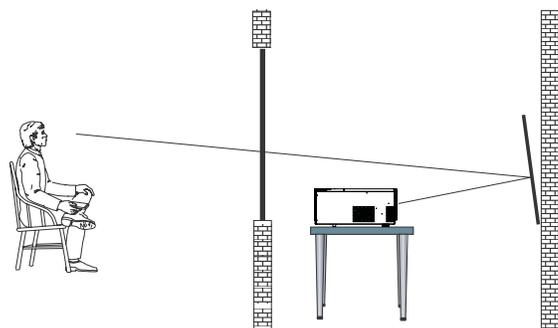


Figure 3-6. Folded Optics

◀ **Adjusting the Projection Angle**

◀ **Mounting**

◀ **Folded Optics**

3.4 Connections to the VX-2i

Proceed as follows to connect the VX-2i to your video sources, external controller(s) -- if present -- and AC power.

When connecting your equipment:

- Turn off all equipment before making any connections.
- Use the correct signal cables for each source.
- Ensure that the cables are securely connected. Tighten the thumbscrews on connectors that have them.

Connector Panel Access ➤ To access the connector panel, pull firmly on the cable access cover to open it.

Connecting the VX-2i to Source Components ➤ Connect your video sources to the VX-2i as shown and described in the sections that follow.

DVI Connections: See Figure 3-7.



Tip

Use the DVI inputs whenever possible. This ensures the highest video quality because the signal is carried in the digital domain throughout the entire signal path, from source component output into the projector.

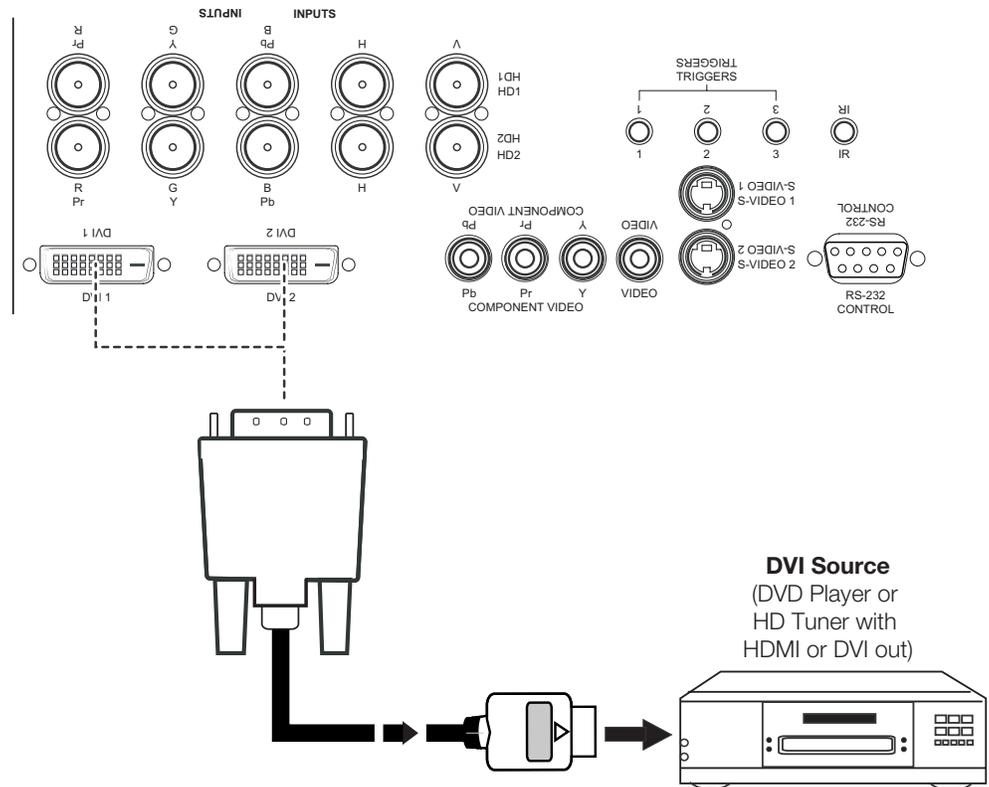


Figure 3-7. DVI Source Connections

Digital (DTV) RGB Connections: See Figure 3-8.

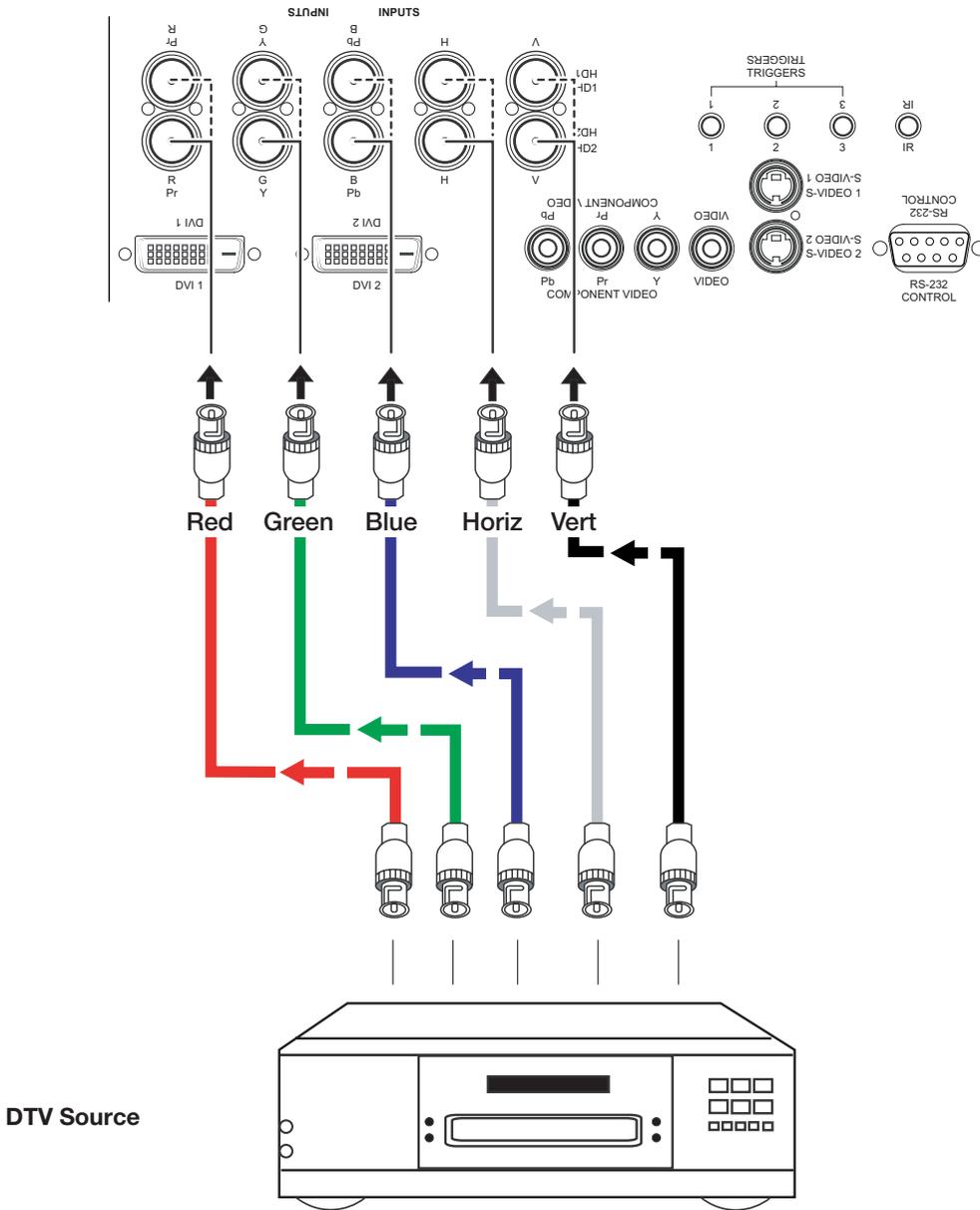


Figure 3-8. Digital (DTV) RGB Connections

Analog (Computer) RGB Connections: See Figure 3-9.

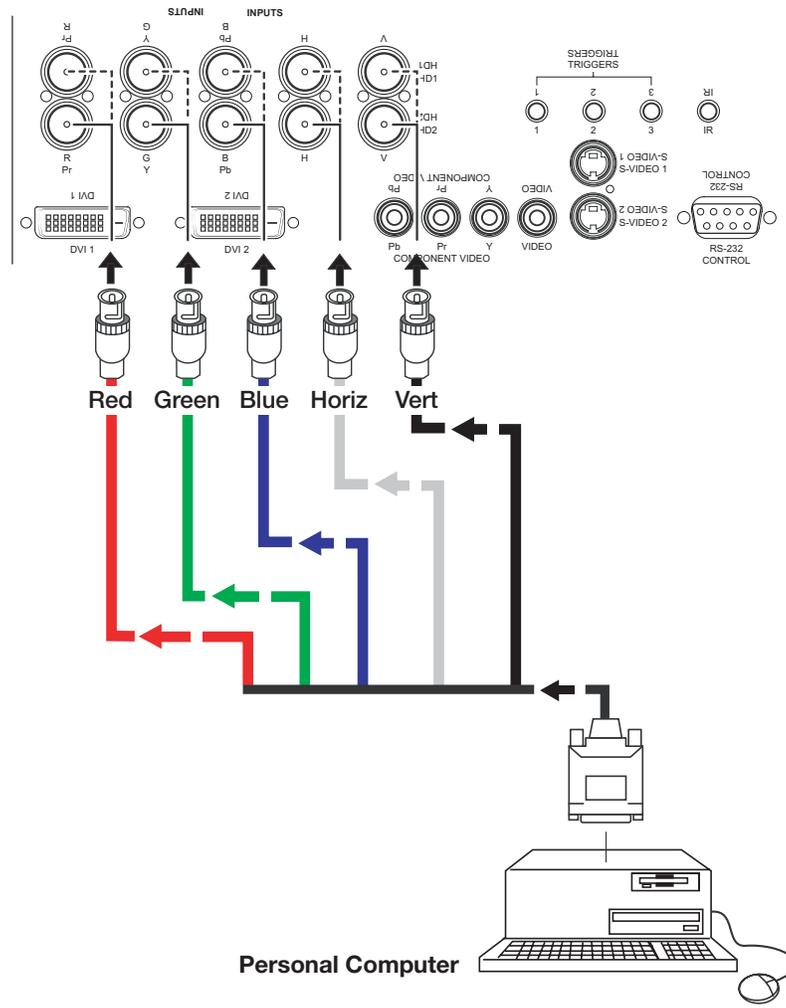


Figure 3-9. Analog RGB Connections

Composite/S-Video/Component Video Connections: See Figure 3-10.

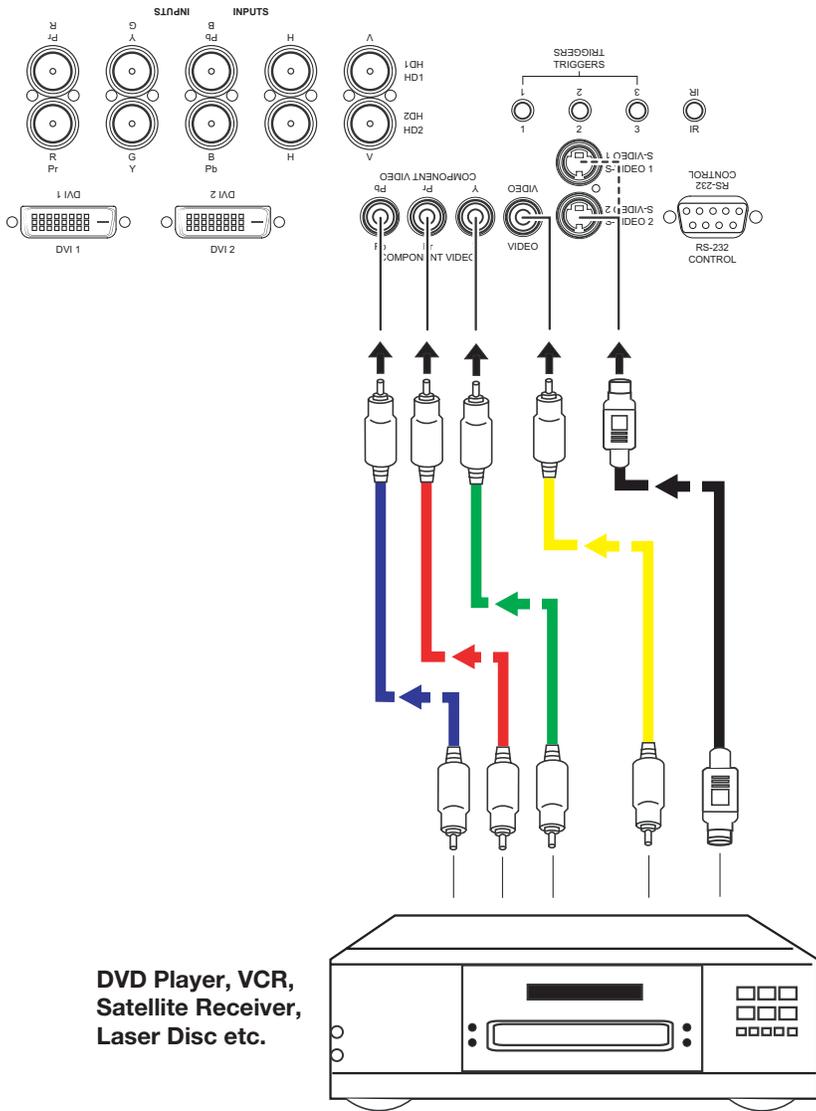


Figure 3-10. Composite, S-Video and Component Video Connections

RS-232 Controller Connection ➤

Use a standard, 9-pin RS-232 cable to connect a PC or home theater control/automation system (if present) to the RS-232 CONTROL port on the VX-2i; see Figure 3-11.

For more information about using this connection, refer to **Serial Communications** on page 41.

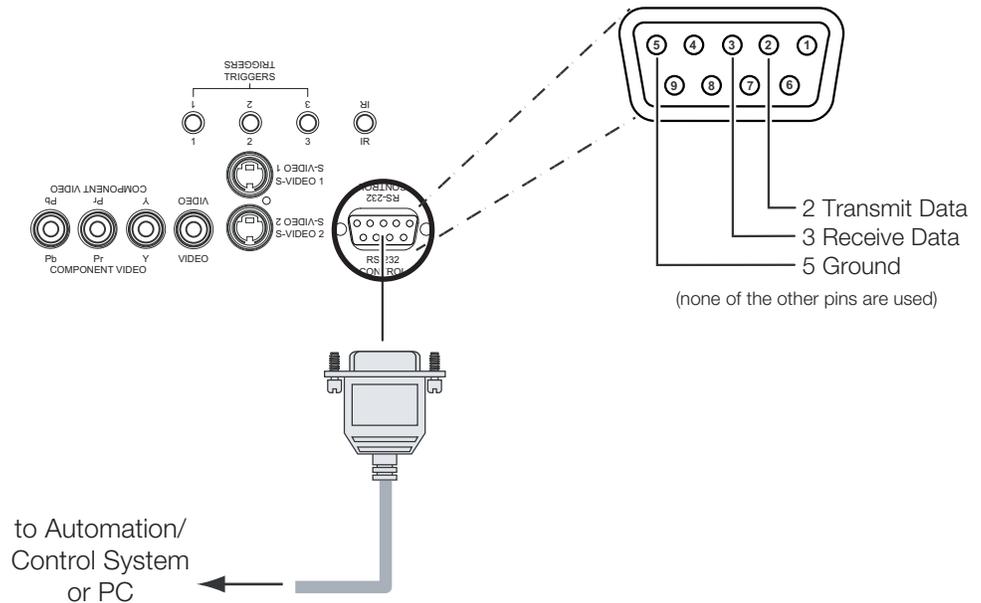


Figure 3-11. RS-232 Control System Connection

Connecting 12-Volt Trigger Outputs to External Theater Components ➤

If your VX-2i is equipped with a CineWide with AutoScope system, or if your home theater contains other devices that respond to 12-volt triggers (such as retractable screens or screen masks), connect them to the 12-volt trigger outputs as shown in Figure 3-12.

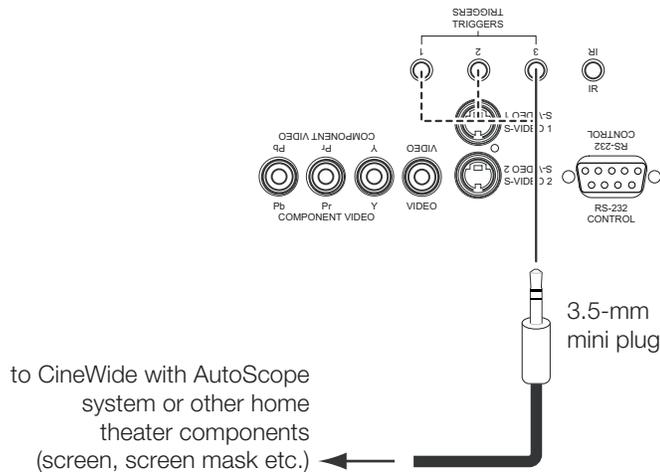


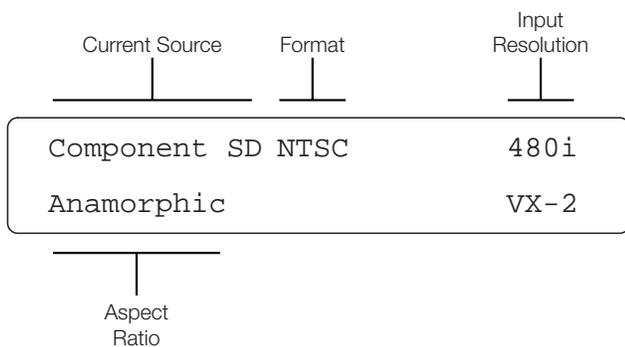
Figure 3-12. Connecting 12-Volt Trigger Outputs

Connecting to AC Power ➤

Plug the female end of the power cord into the AC receptacle on the rear of the VX-2i (AC 100V ~ 240V). Then, connect the other end to your AC power source.

4. Operation

1. Turn on the main power switch on the projector.
2. Press the **ON** button on the remote control -- or the **POWER** button on the VX-2i rear panel -- to turn on the projector. The vacuum fluorescent display on the VX-2i rear panel briefly displays "Starting Display."
3. When the projector is ready for use, the fluorescent display indicates the active source, signal format (NTSC or PAL), input resolution and aspect ratio; for example:



By default, the VX-2i is configured for a "floor/front" installation, in which the projector is installed upright and in front of the screen. If it is installed behind the screen and/or mounted on a ceiling, you must change the picture orientation. To do this:

1. Press **MENU** and enter the Service Menu passcode.
2. Select Service from the Main Menu.
3. Select Display Device from the Service Menu.
4. Select Installation from the Display Device menu.
5. Choose Floor/Rear, Ceiling/Front or Ceiling/Rear, to match the installation method.



Note

You must enter a passcode to access the Service menu.

4.1 Turning on the Power

4.2 Adjusting the Picture Orientation

4.3 Lens Adjustments

To access the motorized lens controls, select Display Device from the Service Menu, then select Lens from the Display Device menu. The Lens menu gives you a great deal of control over the picture size, position and focus:

- Focus** ➤ To focus the projected image, use the cursor buttons to highlight “In” or “Out.” Then, press and hold the **ENTER** button.

- Zoom** ➤ To make the picture smaller (zoom out), use the cursor buttons to highlight the minus sign (-). Then, press and hold the **ENTER** button.

To enlarge the picture (zoom in), use the cursor buttons to highlight the plus sign (+). Then, press and hold the **ENTER** button.

- Shift** ➤ To change the projected image position, use the cursor buttons to highlight “Left,” “Right,” “Up” or “Down.” Then, press and hold the **ENTER** button to shift the image in that direction.

4.4 Using the On-Screen Menus

Press the **MENU** button on either the remote control or the rear panel to display the Main Menu, shown below. To select a menu item, use the UP and DOWN buttons on either the remote control or the rear panel to highlight it. Press **ENTER** to confirm your selection.

The VX-2i OSD menus are arranged hierarchically, as shown in Figure 4-1.

Input Source	Composite
	S-Video 1
	S-Video 2
	Component SD
	HD/RGB 1
	HD/RGB 2
	DVI 1
Aspect Ratio	DVI 2
	Anamorphic
	Standard 4:3
	Letterbox
	VirtualWide
Picture	Cinema
	Virtualwide 2.35
	Brightness
	Contrast
	Color
	Tint
Input Position	Sharpness
	Left/Right
	Up/Down
	Width
	Height
ISF Presets	Overscan
	Recall ISF Night
	Recall ISF Day
	Recall/Save Custom 1
	Recall/Save Custom 2
Information <small>(read-only)</small>	Reset to Factory Default
	Serial Number
	Hardware
	Firmware
	Date

Note: Virtualwide 2.35 is available only on VX-2i projectors equipped with the CineWide option (secondary anamorphic lens).

Calibration	ISF Night - Display Color	Gain
		Offset
		Gamma
		Lamp Power
	ISF Night - Input Image	Color Temp
		Brightness
		Contrast
		Color
	ISF Night - Input Color	Tint
		Sharpness
		Gain
		Offset
	ISF Day - Display Color	Gamma
		Lamp Power
		Color Temp
		Brightness
	ISF Day - Input Image	Contrast
		Color
		Tint
		Sharpness
ISF Day - Input Color	Gain	
	Offset	
	Gamma	
	Lamp Power	
Output Shift	Color Temp	
	Left/Right	
	Up/Down	
	Width	
Splash Configure	Height	
	Owner Name	
	ISF Calibrated	
	ISF Other	
	OSD Position	

Service	Test Video	Grey Bars 1	
		Grey Bars 2	
		Color Bars 1	
		Color Bars 2	
	Language	English	
		French	
		German	
		Spanish	
	Remote Control	Primary	
		Secondary	
	Display Device	Installation	Picture Orientation
			Lamp Hours (View/Reset)
		Lens	Focus
			Zoom
			Shift
		Diagnostics	Red Only
			Green Only
			Blue Only
			75 IRE Color Bars
			100 IRE Color Bars
Horiz. Grey Ramp			
Vert. Grey Ramp			
Checkerboard			
Alignment Grid			
HD Format	HD/RGB 1		
	HD/RGB 2		
Triggers	1 / 2 / 3		
Miscellaneous	Menu Mode		
	Timeout		
	Side Bar Color		
	System Reset		

Figure 4-1. VX-2i OSD Menu Structure

Main Menu ➤ The Main Menu is the starting point for accessing all projector functions.

Runco Video
Input Source
Aspect Ratio
Picture
Input Position
ISF Presets
Information
Calibration
Service

(The Calibration and Service menus are hidden and not accessible until you enter a passcode.)

Input Source ➤ From the Main Menu, select Input Source to choose a video signal source.

Input Source
> Composite
S-Video 1
S-Video 2
Component SD
HD/RGB 1
HD/RGB 2
DVI 1
DVI 2

The active source is indicated by an arrow (>) to its left; in the example at left, Composite is the active source.

Aspect Ratio ➤ To change the aspect ratio (size and shape) of the projected image, select Aspect Ratio from the Main Menu and press **ENTER**. Select the appropriate aspect ratio for the type of program material being viewed; refer to Table 4-1.

Aspect Ratio
<input checked="" type="checkbox"/> Anamorphic
<input type="checkbox"/> Standard 4:3
<input type="checkbox"/> Letterbox
<input type="checkbox"/> VirtualWide
<input type="checkbox"/> Cinema
<input type="checkbox"/> Virtualwide 2.35

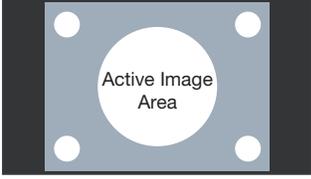
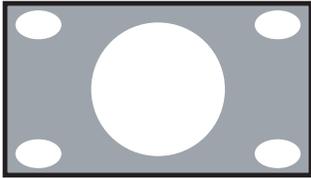
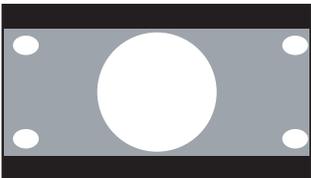
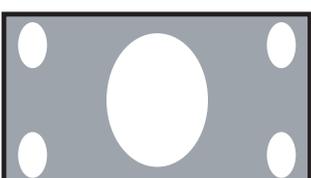
The currently-selected aspect ratio is indicated by a “☒” to its left; in the example at right, Anamorphic is selected.



Note

*When you change the aspect ratio, save the change to a preset afterwards. Otherwise, the change will be lost when a different input is selected. (The aspect ratio is saved for each input and resolution separately.) For information about saving settings, refer to **ISF Presets** on page 34.*

Table 4-1. Aspect Ratio Settings

Aspect Ratio	Remote Control Key	Description	
Anamorphic	ANA		<p>The image is compressed vertically, but anamorphic software will appear properly proportioned. This is best suited for use with 16:9 DVDs and HDTV programming.</p>
Standard 4:3	4X3		<p>The input signal is scaled to fit in the center of the 16:9 screen. 4:3 is the aspect ratio used by computer monitors, standard television programming and most VHS video cassettes.</p>
Letterbox	LET BOX		<p>The image in the Letterbox mode is stretched vertically; the top and bottom portions are "blanked off." Letterbox is best suited for LaserDisc movies or non-anamorphic DVDs.</p>
VirtualWide	V-WIDE		<p>A 4:3 image is transformed into a 16x9 image.</p>
Cinema	--		<p>The image in the Letterbox mode is enlarged to a 16x9 image and the upper and lower portions are compressed.</p>
Virtualwide 2.35	--		<p>A 2.35 image is stretched vertically in both directions to fill a 16:9 image. Virtualwide 2.35 is available only on VX-2i projectors equipped with the CineWide option (secondary anamorphic lens).</p>

Picture ➤ Use the controls in the Picture Menu to calibrate your VX-2i for optimum picture quality.

Picture
Brightness
Contrast
Color
Tint
Sharpness

The VX-2i has been designed to incorporate setup and calibration standards established by the Imaging Science Foundation (ISF). The ISF has developed carefully crafted, industry-recognized standards for optimal video performance and has implemented a training program for technicians and installers to use these standards to obtain optimal picture quality from Runco video display devices. Accordingly, Runco recommends that setup and calibration be performed by an ISF certified installation technician.

All signal types require separate processing. Therefore, you need to calibrate each input separately. Runco recommends calibrating the VX-2i inputs in the following order:

1. Component SD
2. S-Video 1 / S-Video 2
3. Composite
4. HD/RGB 1 / HD/RGB 2
5. DVI 1 / DVI 2



Note

*When you change a picture quality setting, save the change to a preset afterwards. Otherwise, the change will be lost when a different input is selected. (Picture quality settings are saved for each input and resolution separately.) For information about saving settings, refer to **ISF Presets** on page 34.*

Although it may be possible to obtain satisfactory picture quality using the naked eye and regular program material, Runco recommends using the following calibration tools for best results:

- External test pattern source -- Sencore VP401 Multimedia Video Generator, Ovation Multimedia test DVD or equivalent.
- A blue filter (provided with many test DVDs), for color level and tint adjustments.

Connect your test pattern source to the input that you are calibrating and proceed as follows. **Perform the adjustments in the order listed here.**

Brightness: On your external test pattern source, select a PLUGE pattern. (PLUGE is an acronym for "Picture Line-Up Generation Equipment.") Figure 4-2 shows a typical PLUGE pattern.

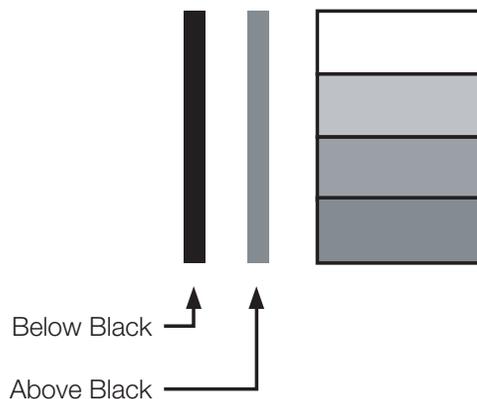


Figure 4-2. Typical PLUGE Pattern for Adjusting Brightness

PLUGE patterns vary but generally consist of some combination of black, white and gray areas against a black background. The example above includes two vertical bars and four shaded boxes.

Select Brightness from the Picture menu and press **ENTER**. Adjust the brightness so that:

- The darkest black bars disappear into the background.
- The dark gray areas are barely visible.
- The lighter gray areas are clearly visible.
- The white areas are a comfortable level of true white.
- The image contains only black, gray and white (no color).

Contrast: On your external test pattern source, select a stepped, gray-bar pattern like the one shown in Figure 4-3.

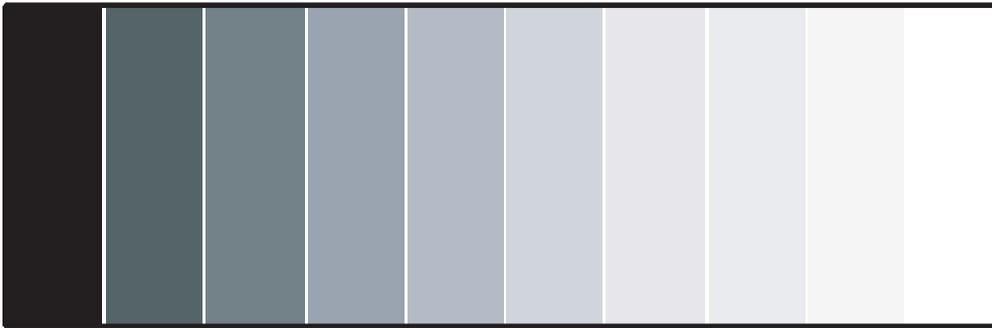


Figure 4-3. Typical Gray Bar Pattern for Adjusting Contrast

Select Contrast and press **ENTER**. Adjust the contrast to a point just below which the white rectangle starts to increase in size.



Note

Brightness and contrast controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

Color Saturation: On your external test pattern source, select a color bar pattern like the one shown in Figure 4-4.

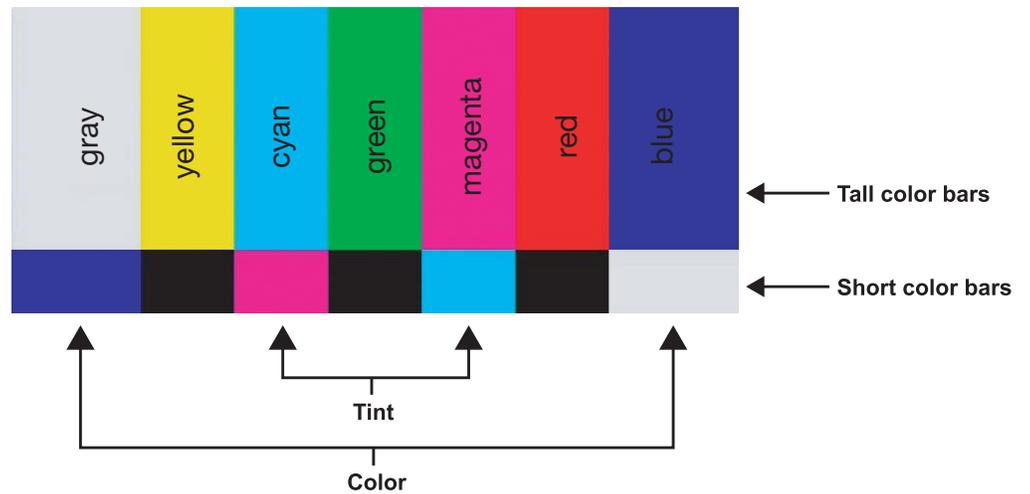
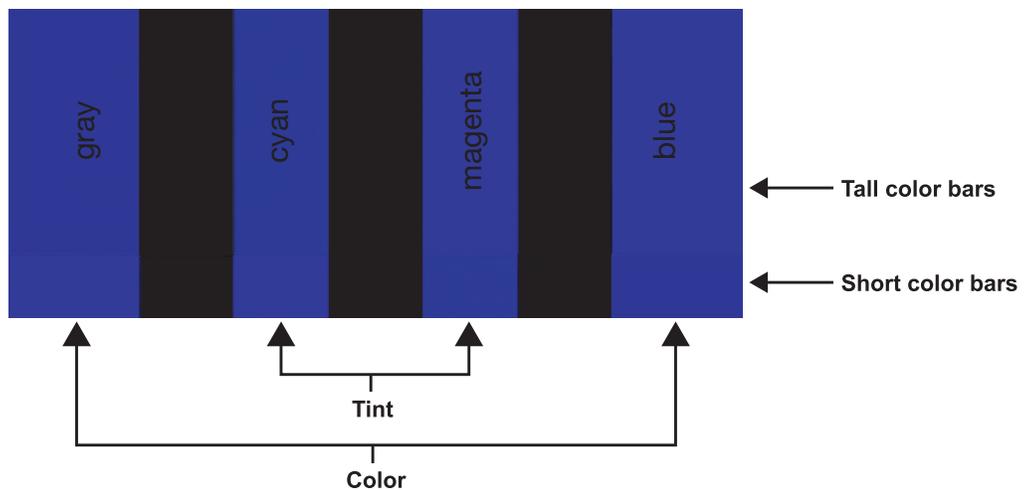


Figure 4-4. Typical Color Bar Pattern for Adjusting Color Saturation and Tint

Select **Color** and press **ENTER**. While looking at the color bar pattern through a blue filter, adjust the color saturation level until the outermost (gray and blue) color bars appear to be a single shade of blue:



Tint: Tint or “hue” is essentially the ratio of red to green in the color portion of the image. When tint is decreased, the image appears redder; when it is increased the image appears greener. To set the tint, select **Tint** and press **ENTER**. While looking at the color bar pattern through a blue filter, adjust the tint level until the cyan and magenta color bars (on either side of the green bar) appear to be a single shade of blue.



Note

Like the brightness and contrast controls, the color and tint controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

Sharpness: “Sharpness” is the amount of high-frequency detail in the image. To adjust sharpness, select Sharpness from the Picture menu and press **ENTER**. On your external test pattern source, select a pattern like the one shown in Figure 4-5. Adjust as needed, looking for white edges around the transitions from black to gray and differently-sized lines in the “sweep” patterns at the top and bottom. Lower the sharpness setting to eliminate them.

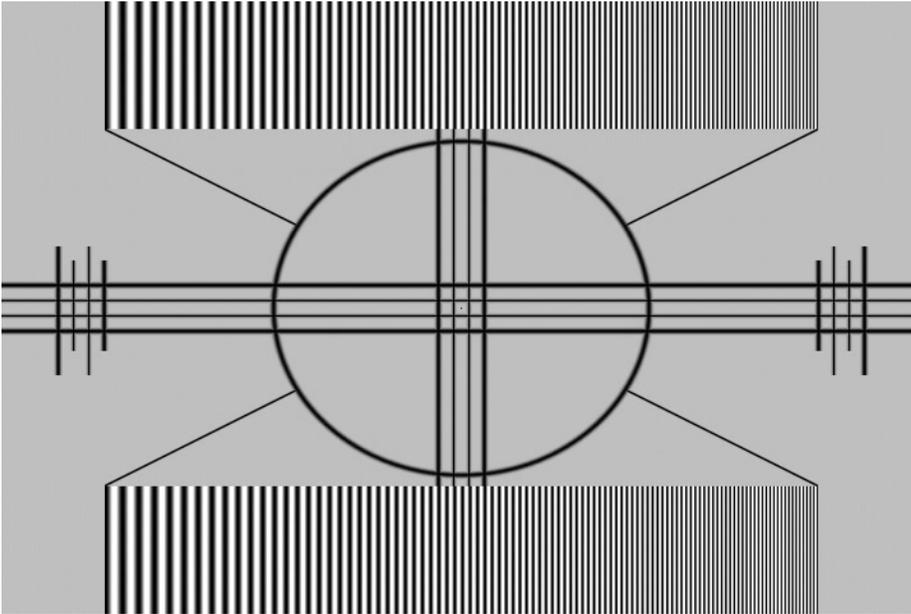


Figure 4-5. Typical Test Pattern for Adjusting Sharpness

Use the controls in the Input Position Menu to fine-tune the aspect ratio and image position for the current source.



Note

*When you change an input position setting, save the change to a preset afterwards. Otherwise, the change will be lost when a different input is selected. (The input position settings are saved for each input and resolution separately.) For information about saving settings, refer to **ISF Presets** on page 34.*

Left/Right: Select Left/Right from the Input Position menu to shift the projected image horizontally. Use the right or up cursor button to shift the image to the right; use the left or down button to shift it to the left.

Up/Down: Select Up/Down from the Input Position menu to shift the projected image vertically. Use the right or up cursor button to shift the image upward; use the left or down button to shift it downward.

Width: Select Width from the Input Position menu to change the projected image width. Use the right or up cursor button to increase the width; use the left or down button to decrease it.

Height: Select Height from the Input Position menu to change the projected image height. Use the right or up cursor button to increase the height; use the left or down button to decrease it.

◀ **Input Position**

Input Position
Left/Right
Up/Down
Width
Height
Overscan

Overscan: Image Overscan pushes the outside edge of the active picture area of the video signal out beyond the edge of the display area.

Some television programs are produced based on the assumption that older television sets may not display the outer edges of the broadcast picture area. Over scan effectively trims away these inactive, outer edges and enlarges the remaining portion of the image to fill the display area.

Select from 1% to 10% of Overscan, as desired.

For HDTV, DVDs and other video sources, Overscan is generally not necessary or desirable.

ISF Presets ➤

ISF Presets	
<input checked="" type="checkbox"/>	ISF Night
<input type="checkbox"/>	ISF Day
<input type="checkbox"/>	Custom 1 Save
<input type="checkbox"/>	Custom 2 Save
Factory Default	

For each input, the VX-2i lets you save image quality settings as presets that you can recall at a later time. You can create up to four presets per input and resolution. Use the ISF Presets menu to recall saved image presets, or to save image settings in the “Custom 1” or “Custom 2” memory location. The currently-selected preset is indicated by a “☒” to its left; in the example shown here, ISF Night is selected.

You should save changes to any of the following settings to a preset; otherwise they will be lost when a new input source or resolution is selected:

- Aspect ratio
- Picture quality settings (brightness, contrast, color saturation, tint and sharpness)
- Input position (image position, width, height and overscan percentage)

To reset all image presets to their factory defaults, select Factory Default and press **ENTER**.

Information ➤

Information	
Serial Number	
Hardware	
Firmware	
Date	

Select Information from the Main Menu to see information that uniquely identifies your projector: its serial number, the installed hardware and firmware versions and the firmware version build date. Should you ever need to contact Runco Technical Support, this information will help them answer your questions or resolve product performance issues.

Calibration ➤

Calibration	
ISF Night	
Display Color	
Input Image	
Input Color	
ISF Day	
Display Color	
Input Image	
Input Color	

Use the Calibration menu to perform advanced picture quality adjustments. **This menu should be used by ISF-certified technicians only.**



Note

You must enter a passcode to access the Calibration menu.

The changes you make here take effect immediately; you do not need to save them. To recall the ISF Night or ISF Day settings, select “ISF Night” or “ISF Day” from the ISF Presets menu (see above).

ISF Night - Display Color: Use the Display Color settings to change the characteristics of the output signal. These settings are global (independent of any particular input).

- **Gain:** Use the Gain controls to correct color imbalances in the bright areas of the image. A good way to do this is to use a test pattern consisting mostly of solid white areas, such as an 80 IRE “window” pattern. If the white areas contain traces of red, green or blue, decrease the Gain for that color.
- **Offset:** Use the Offset controls in the White Balance sub-menu to correct color imbalances in the dark areas of the image. A good way to do this is to use a test pattern consisting mostly of dark gray areas, such as a 30 IRE “window” pattern. If the gray areas contain traces of red, green or blue, decrease the Offset for that color.
- **Gamma:** “Gamma” is a global setting that determines how gray shades are displayed between minimum input (black) and maximum input (white) for all signals. A good gamma setting helps to optimize blacks and whites while ensuring smooth transitions for the “in-between” values utilized in other grays. Unlike “Brightness” and “Contrast” controls, the overall tone of your images can be lightened or darkened without changing the extremes and all images will be more vibrant while still showing good detail in dark areas.

In all but the most unusual situations, the appropriate “Color Temp” selection (see below) will produce accurate colors and a satisfying contrast level. However, it is sometimes necessary to adjust the red, blue and green gamma curves individually. To do this, select Gamma from the Display Color sub-menu and use the left- and right-arrow buttons to manipulate the on-screen slidebars.

- **Lamp Power:** Select Lamp Power from the Display Color Menu to adjust the lamp output level. You can choose to run the lamp as bright as possible (“1”; this is the default setting) or you can choose the lower setting (“0”). Generally, lower lamp output can prolong the life of the lamp, but decreases brightness.
- **Color Temp:** Select Color Temp from the Display Color menu to adjust the color temperature. The default setting is appropriate for most situations. Higher settings produce a “bluer” picture.

ISF Night - Input Image: The Input Image controls are similar to those in the Picture menu, but are accessible only by entering the Calibration menu passcode. This makes it possible to restore the picture quality settings to what they were when the projector was installed, simply by recalling the “ISF Night” preset.

ISF Night - Input Color: The Input Color controls are similar to those in the Display Color menu (see above), but can be set independently for each input.

- **Gain/Offset:** Refer to ISF Night - Display Color, above.
- **Chroma Delay:** use the Chroma Delay control to correct a mis-aligned image from a Composite, S-Video or Component video source. Chroma delay in an image causes color shifts to occur to the left of the vertical edge transitions, producing artificial shadows or a “halo” effect. If necessary, adjust this setting to eliminate them.
- **Phase:** Adjust the phase if the image (usually from an RGB source) shows shimmer or “noise.” Pixel phase adjusts the phase of the pixel sampling clock relative to the incoming signal. The effect of this control is similar to that of a tracking control on a VCR.

For best results, use a good test pattern such as a smooth gray consisting of a clear pattern of black and white pixels, or a similar “half on, half off” graphic image. (You may notice that you can stabilize the image at more than one point. Use either setting in this case.)

ISF Day - Display Color: Refer to *ISF Night - Display Color*.

ISF Day - Input Image: Refer to *ISF Night - Input Image*.

ISF Day - Input Color: Refer to *ISF Night - Input Color*.

Output Shift: The controls in the Output Shift menu are similar to those in the Input Position menu, except that they change the characteristics of the output signal (so the change is visible no matter which input is selected).

Splash Configure: Use the Splash Configure menu to customize the appearance of the start-up message that appears on the vacuum fluorescent display upon power-up. You can have the VX-2i display the owner's name, your name, the phrase "ISF Calibrated" and/or any other string, up to 20 characters in length.

Use the up or down cursor button to select a character. Use the right and left cursor buttons to change the cursor position. Press MENU when you have finished entering text. Then, check the "Splash Enable" box to have the VX-2i display the information you enter here when it is turned on.

OSD Position: Select OSD Position, press ENTER and use the arrow buttons to change the size and position of the OSD controls.

Service ➤

Use the Service menu to access advanced projector configuration settings. **This menu should be used by ISF-certified technicians only.**



Note

You must enter a passcode to access the Service menu.

Test Video: Select Test Video from the Service Menu to access the internal test patterns on the VX-2i. Four patterns are available, consisting of white/gray or colored bars. These are useful for calibrating other theater source components (DVD player, HD tuner etc.) that have their own picture controls.

Press **MENU** to exit test pattern mode.

Language: Select Language from the Service menu and press the up- or down-arrows to select the OSD Language (English, French, Spanish or German).

Remote Control: The Remote Control menu shows you the primary and secondary infrared (IR) codes to which the VX-2i will respond. By default, both are set to 17. You can change these codes if either:

- Another device in the theater (a DVD player, for example) is responding to commands from the VX-2i remote control in ways that are unpredictable or undesirable.
- You have multiple VX-2i projectors and want to control them independently, as opposed to broadcasting commands from a single remote to all of them. In this scenario, you can use multiple remotes programmed to use different IR codes. Or, you can use a single remote and change the IR code as needed to address a specific projector.



Tip

Use the rear-panel keypad to change a projector IR code. Then, change the code sent by the remote to match as described below.

When you change a remote code on the VX-2i, you must re-program your remote control to send that same code. To do this:

1. Using a straightened paper clip or similar object, press and hold the **CODE** button on the remote control for approximately three seconds, or until the red LED on the remote lights solid red.
2. Enter a new two-digit code between 00 and 31 inclusive. Include a leading zero for single-digit codes; for example, enter 9 as “09.”
3. The LED turns off to confirm the code change. If you enter an invalid code, the LED flashes for three or four seconds. Try again, entering a valid code.

Display Device: The options in the Display Device menu allow you to change the picture orientation, reset the lamp timer, perform lens adjustments and access additional test patterns.

- **Installation:** Select Installation from the Display Device menu to change the picture orientation to suit the method of installation (Floor Front, Floor Rear, Ceiling Front or Ceiling Rear).

This menu page also displays the number of hours that the lamp has been in service, and lets you reset the counter (which is recommended after you replace the lamp; refer to **Lamp Replacement** on page 39).

- **Lens:** Select Lens from the Display Device menu to access the motorized lens controls. Refer to **Lens Adjustments** on page 26.
- **Diagnostics:** Select Diagnostics from the Service menu to access additional test patterns for calibration or measurement purposes:
 - Select **Red**, **Green** or **Blue** to display only the selected color (simulating a filter of that color).
 - Select **75** or **100** to display color bars (75 IRE or 100 IRE).
 - Select **Horz** or **Vert** to display a horizontal or vertical gray ramp.
 - Select **Checks** to display a 15-segment checkerboard pattern.
 - Select **Align** to display a white grid against a black background (useful for verifying proper image or screen alignment).

HD Format: If for some reason the VX-2i does not properly detect the incoming signal format (color space) on the HD1 or HD2 inputs, specify it here (RGB or YUV). Otherwise, leave it set to **Auto**.

Triggers: Select Triggers from the Service menu to configure the 12-volt trigger outputs. You can assign one or more trigger outputs to each aspect ratio. Those triggers are then activated by selecting that aspect ratio.

If your projector is equipped with the Runco CineWide with AutoScope system, assign at least one trigger output (the same one to which the lens motor is connected) to the Cinema and Virtualwide 2.35 aspect ratios.

Miscellaneous: Select Miscellaneous from the Service menu to set the following options:

- **Menu Mode:** This is the manner in which the OSD menus appear and disappear when you press MENU. Choose one of the following:

0 = No transition; menus abruptly appear and disappear.

1 = Menus fade in and out.

2 = "Checkerboard" dissolve; menus appear and disappear in sections.

3 = "Window shade" effect; menus are drawn on a diagonal from top left to bottom right, and retract in the opposite direction.

- **Timeout - Short/Long:** These settings control how long the OSD menus stay on screen. Select a time-out period of from 2 to 60 seconds.
- **Side Bar Color:** This controls the color of the inactive image area. The range is from -100 (black) to 100 (white).

The inactive image area is on either side of the active image area when using the Standard 4:3 aspect ratio, and above and below the active image area when using the Letterbox aspect ratio.

System Reset: To reset ALL projector settings (including image settings) back to their factory defaults, choose System Reset from the Service menu. Select Confirm to continue or Back to cancel. ***This action is not undoable. Use it with caution!***

5. Maintenance and Troubleshooting

The lamp should be replaced when it reaches the end of its life (typically 2000 hours), or sooner if a noticeable degradation in brightness occurs. Contact your Runco dealer to obtain a replacement lamp.

5.1 Lamp Replacement

1. Turn off the projector and unplug the power cord. Allow the projector to cool down for approximately 45 minutes prior to removing the lamp assembly for replacement.
2. Loosen the four rear Lamp Cover screws and remove the cover.
3. Remove the two lamp assembly mounting screws.
4. Grasp the lamp assembly handle and pull gently, removing the lamp module from the projector housing.
5. Install the new lamp module.
6. Replace the lamp cover and re-tighten all screws.
7. Reset the Lamp Hour counter. To do this, select Service from the Main Menu, then Display Device, then Installation. Use the cursor buttons to highlight Reset under "Lamp Hours" and press **ENTER**.

Table 5-1 provides some general guidelines for troubleshooting problems you may encounter with the VX-2i. If you encounter an issue not described here, please contact Runco Technical Support.

5.2 Troubleshooting Tips

Table 5-1. Troubleshooting Chart

Symptom	Possible Cause(s)	Solution
The projector does not turn on after initial installation. The power LED lights red after you press the power button.	<ul style="list-style-type: none"> • The VX-2i is not plugged in or the AC outlet is not active. 	<ul style="list-style-type: none"> • Ensure that the VX-2i is plugged in and that the AC outlet is active.
The projector is on, but there is no video image on-screen.	<ul style="list-style-type: none"> • Incorrect source selection. • Source component is not turned on. 	<ul style="list-style-type: none"> • Select the correct source. • Turn on the source.
A projected image from a DVD is split or otherwise scrambled.	<ul style="list-style-type: none"> • DVD player is set to progressive scan mode. 	<ul style="list-style-type: none"> • Turn off progressive scan on the DVD player. • Connect the DVD player to the HD/RGB 1 or HD/RGB 2 input.
Image is too bright and/or lacks definition in the bright areas of the image.	<ul style="list-style-type: none"> • Contrast is set too high. 	<ul style="list-style-type: none"> • Lower the contrast setting.
Image appears "washed out" and/or dark areas appear too bright.	<ul style="list-style-type: none"> • Brightness is set too high. 	<ul style="list-style-type: none"> • Lower the brightness setting.

Table 5-1. Troubleshooting Chart (continued)

Symptom	Possible Cause(s)	Solution
Colors in the image are swapped; for example, reds appear blue or vice versa.	<ul style="list-style-type: none"> • The Red/Pr, Green/Y or Blue/Pb outputs from the source are connected to the wrong inputs on the VX-2i. 	<ul style="list-style-type: none"> • Ensure that the source outputs are connected to the correct VX-2i input.
The projector will not turn back on after it was powered down, or the image disappears during operation.	<ul style="list-style-type: none"> • The projector will not turn on for two minutes after power-down, to protect the lamp. • The lamp has failed. 	<ul style="list-style-type: none"> • Wait two minutes until the LED at the front of the VX-2i turns red.

6. Serial Communications

To interface the VX-2i with a home theater automation/control system or a PC running terminal emulation software, connect it to your control system or PC as shown in Figure 3-11.

Configure the RS-232 controller or PC serial port as follows: no parity, 8 data bits, 1 stop bit and no flow control. Set the baud rate to 19200, to match that of the VX-2i RS-232 port.

Serial commands to the VX-2i take the following form:

- Commands are not case-sensitive.
- For a single command that takes no parameters, type the command followed by a carriage return; for example, to set the aspect ratio to Letterbox, type `LETTERBOX <Return>`.
- For a single command that takes a parameter, type the command, a space or a comma and the desired value followed by a carriage return; for example, to set the brightness to -10, type `BRIGHTNESS -10 <Return>` or `BRIGHTNESS,-10 <Return>`.
- You can also send a string of multiple commands on a single line, separated by commas. For example, `COMPOSITE , BRIGHTNESS 100 , ANAMORPHIC <Return>` switches to the Composite video input, sets the brightness to 100 and sets the aspect ratio to Anamorphic. Command strings can be up to 255 characters long.

Table 6-1 lists the RS-232 command set. The “Parameter (min/max)” column shows the valid parameter ranges, or “NA” for commands that take no parameters.

When you enter a valid command, the VX-2i executes it and acknowledges it with a plus sign on the command line (+ >). When you enter an invalid command -- one that is misspelled or followed by values outside the valid range for that command -- the VX-2i ignores it and returns a minus sign (- >).

Table 6-1. Serial Commands

Command	Parameter (min/max)	Value Stored?	Description
POWER	0/1	NA	Turns projector on and off
ON	NA	NA	Turns projector on
OFF	NA	NA	Turns projector off
COMPOSITE	NA	YES	Selects the Composite video input
SVIDEO1	NA	YES	Selects the S-Video 1 input
SVIDEO2	NA	YES	Selects the S-Video 2 input
COMPONENT	NA	YES	Selects the Component input
HD1	NA	YES	Selects the RGB HD 1 input
HD2	NA	YES	Selects the RGB HD 2 input

6.1 RS-232 Connection and Port Configuration

6.2 Serial Command Syntax

Table 6-1. Serial Commands (continued)

Command	Parameter (min/max)	Value Stored?	Description
DVI1	NA	YES	Selects the DVI 1 input
DVI2	NA	YES	Selects the DVI 2 input
OUT169	NA	YES	Sets the output screen to 1.78:1 (16:9)
OUT235	NA	YES	Sets the output screen to 2.35:1
ANAMORPHIC	NA	YES	Selects the Anamorphic aspect ratio
STANDARD	NA	YES	Selects the Standard (4:3) aspect ratio
LETTERBOX	NA	YES	Selects the Letterbox aspect ratio
VIRTUALWIDE	NA	YES	Selects the VirtualWide aspect ratio
CINEMA	NA	YES	Selects the Cinema aspect ratio
INTELLI235	NA	YES	Selects the Virtualwide 2.35 aspect ratio
RGBNN	NA	YES	Outputs color space RGB with negative, negative sync
RGBPP	NA	YES	Outputs color space RGB with positive, positive sync
RGBS	NA	YES	Outputs color space RGB with embedded sync on green
YUV	NA	YES	HD YUV output color space
PHASE	0/3	YES	Adjusts phase
IHPOS	-100/100	YES	Sets a value for horizontal input position
IVPOS	-100/100	YES	Sets a value for vertical input position
IWIDTH	-100/100	YES	Sets the value for input width
IHEIGHT	-100/100	YES	Sets the value for input height
OVERSCAN	0/10	YES	Sets the overscan percentage
OHPOS	-100/100	YES	Sets the value for output horizontal position
OVPOS	-100/100	YES	Sets the value for output vertical position
OWIDTH	-100/100	YES	Sets the value for output width
OHEIGHT	-100/100	YES	Sets the value for output height
BRIGHTNESS	-100/100	YES	Sets a value for brightness
CONTRAST	-100/100	YES	Sets a value for contrast
COLOR	-100/100	YES	Sets a value for color
TINT	-100/100	YES	Sets a value for tint
SHARPNESS	-6/6	YES	Sets a value for sharpness

Table 6-1. Serial Commands (continued)

Command	Parameter (min/max)	Value Stored?	Description
NIGHT	NA	YES	Loads "ISF Night" image preset
DAY	NA	YES	Loads "ISF Day" image preset
CUSTOM1	NA	YES	Loads "Custom 1" image preset
CUSTOM2	NA	YES	Loads "Custom 2" image preset
TRIGGER	1/3	YES	Assigns trigger to currently-selected aspect ratio
BKGND	-100/100	YES	Sets the background color for letterbox or 4:3 aspect ratio (-100 = black; 100 = white)
IHPOS?	NA	NA	Returns input horizontal position value
IHEIGHT?	NA	NA	Returns input height value
OHPOS?	NA	NA	Returns output horizontal position value
OHEIGHT?	NA	NA	Returns output height value
COLOR?	NA	NA	Returns color setting value
ASPECT?	NA	NA	Returns current aspect ratio
INPUT?	NA	NA	Returns active input
OUTRES?	NA	NA	Returns output resolution
SERIALNUM?	NA	NA	Returns projector serial number
DATE?	NA	NA	Returns projector manufacture date
IVPOS?	NA	NA	Returns input vertical position value
OVERSCAN?	NA	NA	Returns overscan percentage
OVPOS?	NA	NA	Returns output vertical position value
BRIGHTNESS?	NA	NA	Returns brightness setting value
TINT?	NA	NA	Returns tint setting value
PRESET?	NA	NA	Returns currently-selected preset (ISF Day, ISF Night, Custom 1 or Custom 2)
POWER?	NA	NA	Returns power status
ASPECTIN?	NA	NA	Returns the input source aspect ratio
SWVER?	NA	NA	Returns software version number
IWIDTH?	NA	NA	Returns input horizontal width value
PHASE?	NA	NA	Returns phase setting value
OWIDTH?	NA	NA	Returns output horizontal width value
CONTRAST?	NA	NA	Returns contrast setting value

Table 6-1. Serial Commands (continued)

Command	Parameter (min/max)	Value Stored?	Description
SHARPNESS?	NA	NA	Returns sharpness setting value
BKGND?	NA	NA	Returns background setting value
INRES?	NA	NA	Returns input resolution
ASPECTOUT?	NA	NA	Returns output screen size
HWVER?	NA	NA	Returns hardware version number

7. Specifications

Table 7-1 lists the VX-2i specifications.

Table 7-1. VX-2i Specifications

Projector Type:	Digital Light Processing (DLP), 3-chip, 16:9 DMD
Native Resolution:	1280 x 720 (16:9)
Aspect Ratios:	4:3, Letterbox, 16:9 Anamorphic, VirtualWide, Cinema, VirtualWide 2.35
Video Standards:	NTSC, PAL
DTV Compatibility:	480p, 720p, 1080i
Scan Frequency:	Horizontal: 15 - 100 kHz Vertical: 28 - 78 Hz
Picture Size (16:9 Screen):	Recommended Width: 72 - 120 in. Maximum Width: 250 in.
Throw Distance (Factor x Screen Width):	Proteus A: Fixed 0.64 (for rear-screen applications only) Proteus B: Zoom 1.22-1.44 x width Proteus C: Zoom 1.45-1.76 x width Proteus D: Zoom 1.82-2.39 x width (1.34-1.75 with CineWide) Proteus E: Zoom 2.42-3.57 x width (1.78-2.62 with CineWide) Proteus F: Zoom 3.63-5.72 x width (2.67-4.20 with CineWide)
Horizontal and Vertical Offset:	Proteus A lens: None All other lenses: Horizontal -- 10% of screen width left or right of center Vertical (when ceiling-mounted) -- 80% of screen height below center; 0% of screen height above center Vertical (when floor-mounted) -- 0% of screen height below center; 80% of screen height above center

7.1 VX-2i Specifications

Table 7-1. VX-2i Specifications (continued)**Brightness and Contrast:****Cinema Standards Measurement System (CSMS) Specifications**

- Brightness: 52.1 foot-Lamberts (fL)
- Contrast Ratio: 217:1

These measurements are taken from the projector in a controlled, home theater environment. All measurements are made to ANSI/NAPM IT7.228-1997 specifications using the Photo Research PR-650 SpectraColorimeter and Minolta LS-100 Luminance Meter, Video Essentials test DVD and a 1.3 gain, 72-inch wide screen. The projector is calibrated to a color temperature of 6,500K and has a minimum of 150 hours of usage.

The foot-Lambert (fL) is the unit of measurement used in commercial movie theaters to express image brightness at the screen surface. The Society of Motion Picture and Television Engineers (SMPTE) specifies 16 fL as the target image brightness for film-based projectors using an open gate (without film in the projector). More importantly, today SMPTE specifies 12 fL as the target image brightness in Digital Cinema theaters. The foot-Lambert measurement is dependent on screen size, screen gain and projector light output.

Home Theater Calibration Specifications

- Light Output: 1227 ANSI Lumens
- Contrast Ratio: 217:1

These specifications are obtained by calibrating the projector as described above for CSMS measurements.

Industry-Standard Specifications

- Light Output: 2500 ANSI Lumens
- Contrast Ratio: 2800:1

These are typical projector brightness and contrast specifications found in most companies' sales literature. Runco includes these measurements in its literature to allow for direct comparison with other manufacturers' projectors. These measurements are typically taken at 9,000K to 13,000K to get expected performance data when the projector is used in professional, commercial and industrial displays.

Lamp:	275 Watts
Estimated Lamp Life:	2000 hours
Inputs:	(1) Composite; (2) S-Video; (1) Component; (2) HD-R (Pr), G (Y), B (Pb), H, V; (2) DVI w/HDCP
Control Options:	<ul style="list-style-type: none"> - Built-in keypad - Discrete infrared remote - Serial commands via RS-232
Trigger Outputs:	3 x 12 VDC, 800 mA
Bandwidth:	150 Mega Samples/Second (MSPS)
Power Requirements:	100 to 240 VAC (auto-sensing), 50/60 Hz, 610 Watts
Operating Environment:	41°F to 95°F (5°C to 35°C), 0% to 90% humidity (non-condensing)
Dimensions:	See Figure 7-1
Weight (without lens):	65 lbs. (29.48 kg)
Regulatory Approvals:	Complies with FCC, CE C-Tick

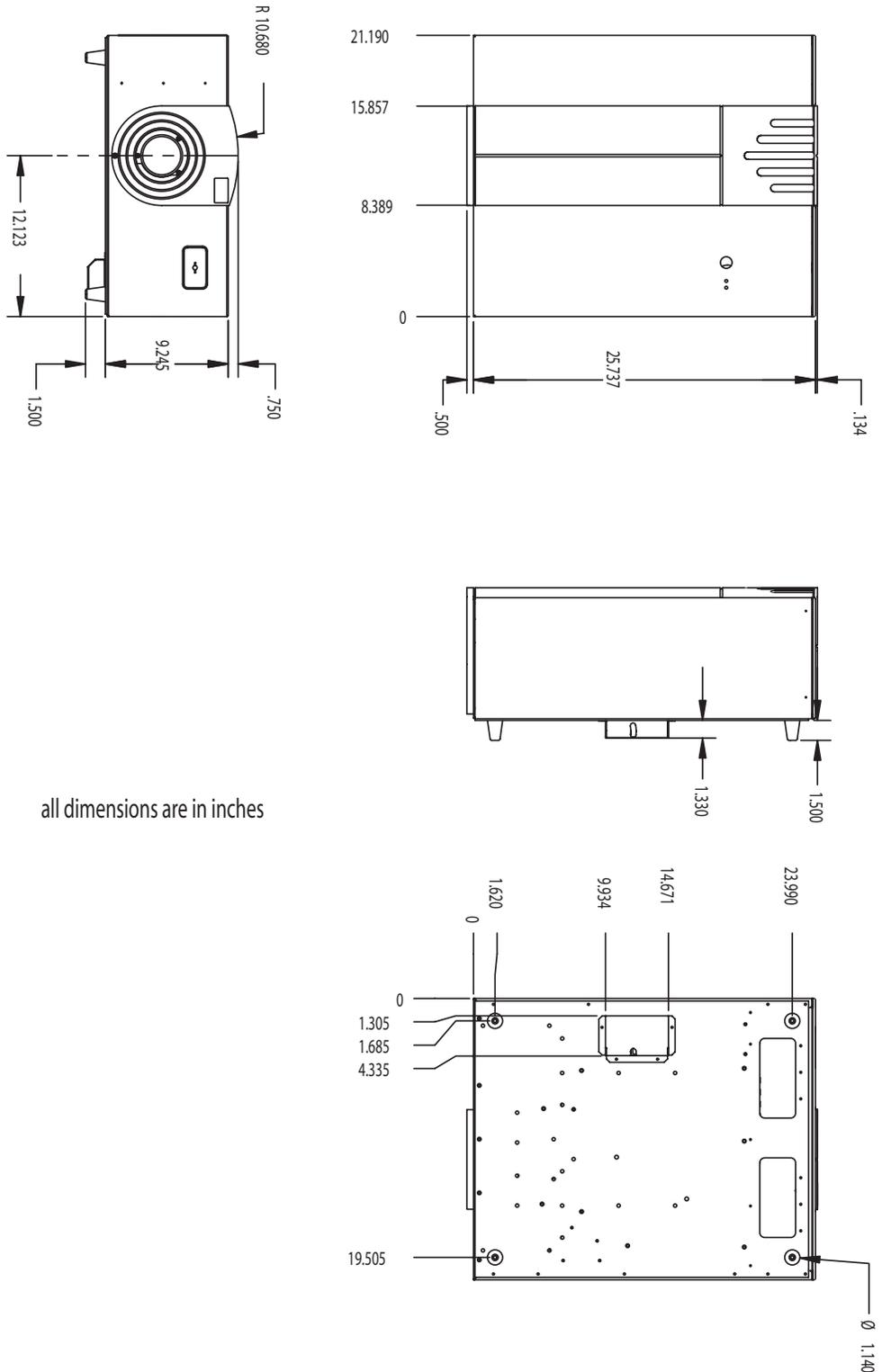
Table 7-1. VX-2i Specifications (continued)

Limited Warranty: Projector: Two (2) years parts and labor from the date of delivery to the end user.
Lamp: 1000 hours or six (6) months, whichever comes first.

Specifications are subject to change without notice.

7.2 VX-2i Dimensions

Figure 7-1 shows the VX-2i dimensions.



all dimensions are in inches

Figure 7-1. VX-2i Dimensions



SERIAL NUMBER
RUMA-011155
rev 11-04-05