VX

VIDEO XTREME

VX-2c

**Digital Light Processing Projector
and DHD Controller**

RUNCO

THE WORLD'S FINEST HOME THEATER PRODUCTS™

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INTRODUCTION

» Introduction to the Runco Video Xtreme™ VX-2c 3-Chip DLP Projector

Runco steps into the future once again with the Video Xtreme™ VX-2c projection system. The VX-2c is among the first DLP™ projectors to offer a 16:9 native resolution, 3-chip system for home theater.

The VX-2c optical light engine utilizes three of Texas Instruments' advanced HD-2 DMD's™ featuring 1280 x 720 high definition resolution and 12 degree mirror tilt for the finest black level performance. Unlike previous single-chip implementations of the HD-2, no color wheel is required in a 3-chip system, reducing mechanical complexity and compromises to color spectrum purity. The VX-2c is also Runco's smallest 3-chip chassis ever, easily fitting where many 3-chip projectors have not gone before, enhanced further by horizontal and vertical lens shift for maximum installation flexibility even in the most difficult situations.

The impressive brightness inherent in 3-chip systems is further bolstered by the improved contrast capabilities of the HD-2 chip design, offering the best of both worlds.

The VX-2c is provided with Runco's next generation, all digital DHD Video Controller for unprecedented video processing, scaling and aspect ratio control.

The VX-2c package represents a new level of performance and value in 3-chip projection systems and is feature-filled for both ease of operation and custom installation sophistication.

» The features you'll enjoy include:

• Native Resolution: 1280 x 720
• 3-Chip System with 16:9 Native Aspect Ratio
• DVI Input with HDCP
• HDTV Ready
• Multiple Lens Options for Throw Distance Flexibility
• Next Generation All Digital DHD Video Controller

Contents of the package:

• 3-Chip Projection System
• (2) AC Power cords (projector/controller)
• (1) 16.5' DVI cable
• (1) DHD remote control with (2) AAA batteries
• (1) 3mm Hex Driver
• (1) User's manual
• (1) DHD bracket
• (1) Warranty information and registration card

Options:

• Ceiling mount unit
• Tilt mount unit

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WARNINGS & SAFETY PRECAUTIONS

WARNING

FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

CAUTION: TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT REMOVE COVER. DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS, UNLESS THE PRONGS CAN BE FULLY INSERTED. REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH-VOLTAGE COMPONENTS INSIDE. NO USER-SERVICEABLE PARTS EXCEPT LAMP UNIT. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

High brightness light source. Do not stare into the beam of light, or view directly. Be especially careful that children do not stare directly into the beam of light.

WARNING

The cooling fan in this projector continues to run for about 90 seconds after the projector is turned off. During normal operation, when turning the power off always use the power (OFF) button on the projector or on the remote control. Ensure the cooling fan has stopped before disconnecting the power cord. The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible.

DURING NORMAL OPERATION, NEVER TURN THE PROJECTOR OFF BY DISCONNECTING THE POWER CORD. FAILURE TO OBSERVE THIS WILL RESULT IN PREMATURE LAMP FAILURE.

PRODUCT DISPOSAL

This projector utilizes tin-lead solder, high intensity discharge lamp (HID lamp) containing a small amount of mercury. Disposal of these materials may be regulated due to environmental considerations. For disposal or recycling information, please contact your local authorities or, if you are located in the United States of America, the Electronic Industries Alliance: www.eiae.org.

INFORMATION

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. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operation manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and the receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

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DECLARATION OF CONFORMITY

RUNCO PROJECTOR, MODEL VX-2c
This device complies with Part 15 of the FCC rules. Operation is subject to the following 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.

WARNING

Some IC chips in this product include confidential and/or trade secret property belonging to Texas Instruments. Therefore you may not copy, modify, adapt, translate, distribute, reverse engineer, reverse assemble or discompile the contents thereof.

INTELLECTUAL PROPERTY RIGHTS
----- IMPORTANT -----
READ BEFORE USING THE PRODUCT

- Digital Light Processing, DLP, Digital Micromirror Device and DMD are trademarks of Texas Instruments.
- Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- PC/AT is a registered trademark of International Business Machines Corporation in the United States.
- Adobe Acrobat is a trademark of Adobe Systems Incorporated.
- Macintosh is a registered trademark of Apple Computer, Inc. in the United States and/or other countries.
- All other company or product names are trademarks or registered trademarks of their respective companies.

SAFETY TIPS

Please read and follow the safety precautions listed below to ensure the equipment is free from damage, and to ensure that no injury will occur as a result of improper use.

· Do not insert any object, especially metal or liquids, into the Projector or DHD Controller.
· Do not place any objects containing water or any other liquid on top of the Projector or DHD Controller.
· Do not place the units in direct sunlight, near heaters or in extremely dusty or humid locations.
· Do not install this system outdoors or otherwise exposed to the elements.
· Do not place heavy objects on top of the Projector or Controller.
· If the power cord is damaged or frayed in any way, electrical shock and/or fire may result. Please do not place objects on the power cord, and keep the cord away from heat-emitting devices. Should the power cord become damaged in any way, please contact your Runco Dealer for a replacement cord.
· Do not remove the cover of the Projector or DHD Controller for any reason. If any problems arise with the unit, please contact a Runco Dealer or Runco International for service. Removing the covers will void the warranty.

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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. Please read this consumer protection plan carefully and retain it with your other important documents.

This is a LIMITED WARRANTY as defined by the U.S. Consumer Product Warranty and Federal Trade Commission Improvement Act.

WHAT IS COVERED UNDER THE TERMS OF THIS WARRANTY:
SERVICE LABOR: Runco will pay for service labor by an approved Runco 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.

PARTS (Not including projector 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 the warranty. Such replacement parts are then subsequently warranted for the remaining portion (if any) of the original warranty period.

LAMP: Six months or 1000 hours (which ever comes first).

WHAT IS NOT COVERED UNDER THE TERMS OF THIS WARRANTY:
This warranty only covers failure due to defects in materials and workmanship that occur during normal use and does not cover normal maintenance. This warranty does not cover cabinets or any appearance item; any damage to laser discs; 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 warranty.

CAUTION:
DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM IMPROPER INSTALLATION OR SETUP IS SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. IT IS IMPERATIVE THAT INSTALLATION AND SETUP WORK BE PERFORMED ONLY BY AN AUTHORIZED RUNCO DEALER TO PROTECT YOUR RIGHTS UNDER THIS WARRANTY. THIS WILL ALSO ENSURE THAT YOU ENJOY THE FINE PERFORMANCE YOUR RUNCO PRODUCT IS CAPABLE OF PROVIDING WHEN INSTALLED AND CALIBRATED BY RUNCO AUTHORIZED PERSONNEL.

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.

TO OBTAIN SERVICE, CONTACT YOUR RUNCO DEALER:
Repairs made under the terms of the Limited Warranty covering your Runco International 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. If, solely in Runco's judgement, location of product to be repaired is beyond normal operating distance of the closest Runco Authorized Service Center, 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.

ADDITIONAL INFORMATION:
To locate the name and address of the nearest Runco Authorized Service location, or for additional information about this warranty, please call, write or visit our website:

<div align="center">

CUSTOMER SERVICE DEPARTMENT
RUNCO INTERNATIONAL
2900 Faber Street
Union City, CA 94587
Ph: (510) 324-7777 / Fax: (510) 324-9300 / Toll Free (800) 23-RUNCO
www.runco.com

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PROJECTOR ISOMETRIC VIEW

Lens

Intake Vent

Exhaust Vent

Input Panel

PROJECTOR REAR PANEL

Vacuum
Fluorescent Display

DVI Input

PROGRAM PORT

DHD INPUT

CAUTION
RISK OF ELECTRIC SHOCK.
DO NOT REMOVE SCREWS.

THIS COVER TO BE REMOVED BY QUALIFIED
SERVICE PERSONNEL ONLY.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO
NOT REMOVE COVER, NO USER-SERVICEABLE PARTS
INSIDE. CONTACT YOUR RUNCO DEALER FOR SERVICE.

ENTER

MENU

STANDBY / POWER

Power Button and
Status LED

ON / OFF

AC Main
Switch

AC IN
120V 60HZ

RUNCO
RUNCO INTERNATIONAL
UNION CITY, CA

VX-2c DIGITAL PROJECTOR
MADE IN USA

DLP
A TEXAS INSTRUMENTS TECHNOLOGY

Control Panel

AC Power In

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DHD CONTROLLER DESCRIPTION

1. **RUNCO ICON**
   When the Red light is displayed the unit is in Standby, when Blue light is displayed the unit is On.

2. **POWER BUTTON**
   Press once to toggle on from Standby mode to On mode, a second time to place into Standby mode.
   For a discreet on or off command, you can use the direct access buttons on the remote control.

3. **IR RECEIVER**
   Receives the IR commands from the remote.

4. **VACUUM FLORESCENT DISPLAY**
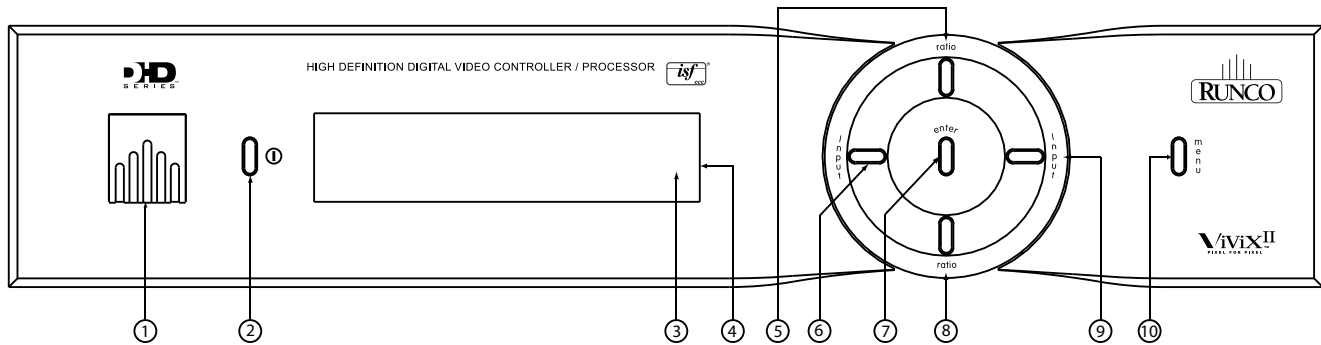   Reads out all relevant status information of the DHD at all times. Can be used instead of the On Screen Display.
   Indicates the model number, current source, scan rate (resolution) and aspect ratio.

5. **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 will toggle you through aspect ratios in the following order:
   Anamorphic → Standard (4:3) → Letterbox → VirtualWide

6. **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 will toggle you through the different sources, in the order of:
   HD Pass Thru 2 → HD Pass Thru 1 → DVI 2 → DVI 1 → HD/RGB2 → HD/RGB1
   → Component SD → S-Video 2 → S-Video 1 → Composite

7. **ENTER BUTTON**
   When an item is highlighted on the On-Screen Display, the ENTER button will select the item.

8. **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 will toggle you through the different aspect ratios.
   VirtualWide → Letterbox → Standard (4:3) → Anamorphic

9. **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 will toggle you through the different sources, in the order of:
   Composite → S-Video 1 → S-Video 2 → Component SD → HD/RGB 1 → HD/RGB 2 → DVI 1
   → DVI 2 → HD Pass Thru 1 → HD Pass Thru 2

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

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REAR PANEL
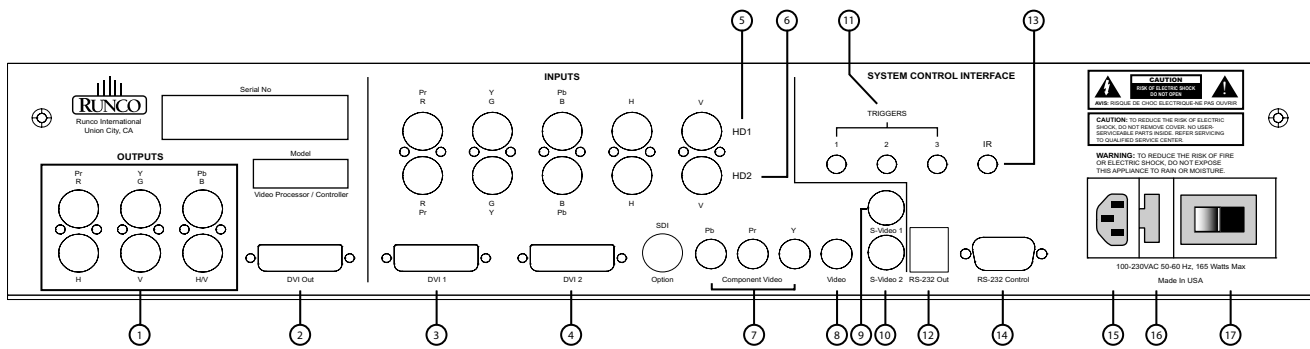
OUTPUTS:

1. **ANALOG OUTPUTS (BNC Connectors)** (This output is not used when married to the VX-2c)
   The various output lines used to drive the analog input of the display device. Individually, the jacks are: V=vertical sync, H=horizontal sync, B=Blue, G=Green, R=Red. Connect these to the corresponding projector inputs.

2. **DVI OUT**
   The DVI digital link used to drive the digital input of an HDCP compliant display device. Connect to the projector's DVI inputs.

INPUTS:

3. **DVI 1 (Digital)**
   DVI input #1, HDCP compliant.

4. **DVI 2 (Digital)**
   DVI input #2, HDCP compliant.

5. **HD 1 (Analog BNC connectors)**
   High Definition input #1, can be RGB(HV) or YPrPb, 480p, 720p, 480i, 576i or 1080i.

6. **HD 2 (Analog BNC connectors)**
   High Definition input #1, can be RGB(HV) or YPrPb, 480p, 720p, 480i, 576i or 1080i.

7. **COMPONENT INPUT (RCA connectors)**
   Standard Definition (480i/576i) Component (YPrPb) input. This is the input for component video from sources such as DVD players. (For best results do not run DVD player in progressive mode).

8. **COMPOSITE INPUT (RCA connector)**
   This is the input for Composite Video input from sources such as Laser disc players, VCRs and other miscellaneous video sources.

9. **S-VIDEO 1 INPUT**
   This is the input for S-video #1 from sources such as Satellite receivers, S-VHS VCR's and DVD players.

10. **S-VIDEO 2 INPUT**
    This is the input for S-video #2 from sources such as Satellite receivers, S-VHS VCR's and DVD players.

11. **TRIGGERS 1/2/3 (Outputs)**
    Connection for 3 different 12V trigger controlled devices.

12. **RS-232 OUT (RJ-11 Connector)**
    For future use.

13. **IR**
    Wired input from an external remote control.

14. **RS-232 CONTROL**
    Connection for an external RS-232 controller device to place the DHD under system automation control.

15. **POWER INPUT (100-230v)**
    Plug in main power here.

16. **MAIN FUSE**
    This is the main AC input fuse. (Main Fuse: 5mm x 20mm, 500mA, 250V, Slow Blow)

17. **MAIN POWER SWITCH**
    Disconnects or applies main power to the processor.

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REMOTE CONTROL DESCRIPTION

(1) ON/OFF
Switches Power ON/OFF. (This does not operate when POWER/STANDBY indicator of the main unit is off.)

(2) IR OUTPUT INDICATOR
Illuminates when a button in pressed, indicating that an IR signal is being transmitted.

(3) ENTER BUTTON
When an item is highlighted on a menu, pressing ENTER will select that item.

(4) CURSOR (▲ / ▼ / ◄ / ►)
Use these buttons to select items or settings and to adjust settings or switch the display patterns.
UP Button: When no menus are present on-screen, the UP button will toggle through aspect ratios in the following order: (RATIO)
Anamorphic → Standard (4:3) → Letterbox → VirtualWide

LEFT Button: When no menus are present on-screen, the LEFT button will toggle through the different sources in the following order: (INPUT)
HD Pass Thru 2 → HD Pass Thru1 → DVI 2 → DVI 1 → HD/RGB2 → HD/RGB 1 → Component SD → S-Video 2 → S-Video 1 → Composite

DOWN Button: When no menus are present on-screen, the RIGHT button will toggle through the different sources in the following order: (RATIO)
 VirtualWide → Letterbox → Standard (4:3) → Anamorphic

RIGHT Button: When no menus are present on-screen, the RIGHT button will toggle through the different sources in the following order: (INPUT)
Composite → S-Video 1 → S-Video 2 → Component SD → HD/RGB 1 → HD/RGB 2 → DVI 1 → DVI 2 → HD Pass Thru 1 → HD Pass Thru 2

(5) LIGHT BUTTON
Press this to illuminate the buttons. (*Not available on all models.)

(6) MENU BUTTON
Pressing this button will access the OSD controls. Press this button during the display of the sub-menu to return to the previous menu.

(7) VIDEO BUTTON
Press this button to select VIDEO (composite video) as the source.

(8) COMP BUTTON
Press this button to select Component SD (480i/576i) input.

(9) DIRECT ACCESS BUTTONS
These red buttons to the right hand-side will allow you direct access to an aspect ratio, or selection of a number in certain cases. These buttons are:

      ANA - selects Anamorphic aspect ratio   LETBOX - selects Letterbox aspect ratio
      4x3 - selects Standard 4:3 aspect ratio   V-WIDE - selects VirtualWide aspect ratio

(10) S-VID 1 and S-VID 2 BUTTONS
Press this button to select between S-Video 1 and S-Video 2 inputs.

(11) HD1 and HD2 BUTTONS
 Press this button to select between HD1 (High Definition) signal and HD2 signal inputs. Auto detect component input, YPbPr or RGBHV.

(12) DVI 1 and DVI 2 BUTTONS
10 Press this button to select between DVI1 signal and DVI2 signal input.
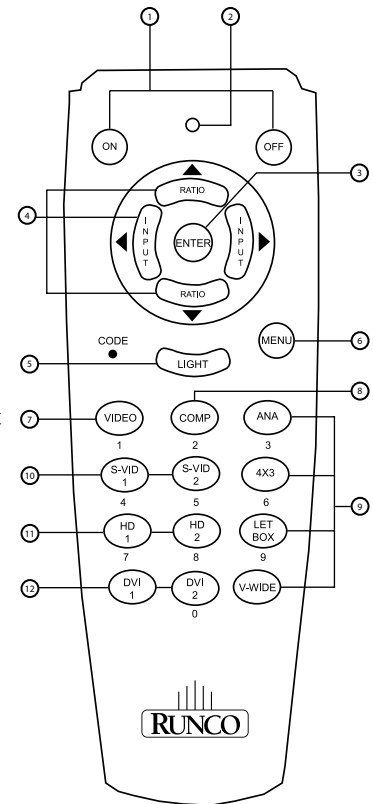
The VX-2c is designed to receive only digital input signals directly from the companion DHD Controller/Processor. All signal sources should be connected to the appropriate inputs on the rear panel of the DHD. The signal from the DHD is then output to the VX-2c projector through a Runco Proprietary (RP) DVI cable. Please note that it is NOT POSSIBLE to connect a signal source with DVI output directly to the VX-2c. It MUST be routed through the DHD for proper operation.

DHD Controller Rear View
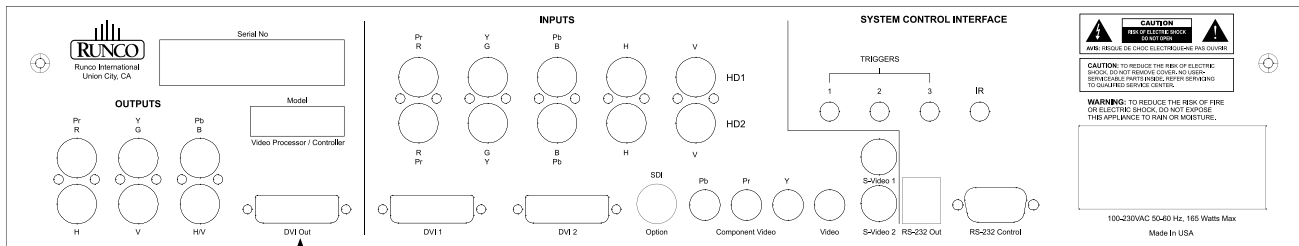
Runco Proprietary (RP) DVI Cable

VX-2c Projector Rear View
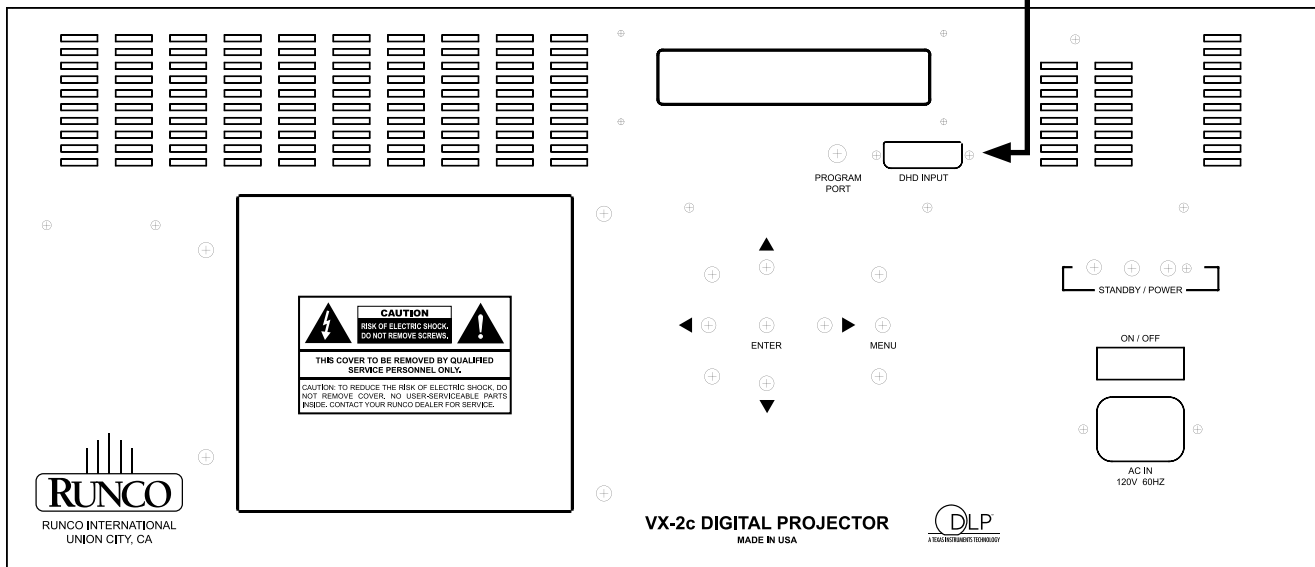
Follow the steps on page 16 to ensure proper installation of the VX-2c projector and DHD Controller.

Follow the steps below ensure proper installation of the VX-2c projector and DHD Controller.

Step I

Connection:
1. Connect Power to Both Projector and DHD controller
2. Connect DVI output from the DHD to projector DVI in
3. Connect Video (Composite), S-Video to1 or 2, Component 480i (RCA) input, HD signals to HD1 or HD2 (BNC), DVI
4. Turn ON the system from the DHD controller or use the DHD remote.

Step II

From the Projector:
1. Press Menu to select Main window. Use the Up or Down arrow to select Lens Adj.
2. Adjust Lens shift, Zoom, and Focus for desired screen size.
3. Press Menu to go back to Main window and select Preference for Picture Orientation.
4. Select for projector mount configuration (Floor Front, Ceiling Front, Floor Rear, or Ceiling Rear)

Step III

Calibration and Setup:
1. Make sure you have picture on the screen from all connected sources.
   Note: The system must be setup first by using S-Video or Component 480i (RCA input) preferably Component 480i first.
2. Select Component SD from the DHD controller.
3. Using a test disc and select the Pluge pattern for Brightness and 10-step gray scale for Contrast
4. From the DHD controller, select Calibration, press Enter and under ISF Night select Input Image.
5. Adjust for correct Brightness and Contrast.
6. Select 80 IRE from test disc.
   Go to projector.
7. Press Menu to select Main window. From Main window select Image and press Enter.
8. Select Contrast and press Enter.
   Under Contrast you have Red, Green, and Blue selection.
9. Use the Up and Down arrow to select Green or Blue and press Enter. The cursor will blink from the selected color. Use the UP or Down arrow to adjust. Pres Enter when done to store the number.
   Note: Decrease the value to set for desired temperature.
10. Select 20 or 30 IRE window for low-end adjustment
11. Select Brightness and adjust RED, Green, or Blue for D6500. Note: Decrease the value to set for D6500.
12. Select color bar from test disc.
13. From the DHD controller select Calibration, press Enter and under ISF Night select Input Image and select Color and press Enter
14. Use the Blue Filter (required) and adjust for correct color setting.
* From this point on, the Projector should not be touched and all other adjustments for other sources must be done at the DHD Controller.
15. For other NTSC sources, select Calibration, press Enter. Under ISF Night, select Input Image and adjust for correct Brightness, Contrast, Color, Tint, and sharpness.

Step IV

HD and DVI Setup:
From DHD controller
1. For HD input and DVI, select Calibration press Enter and under ISF Night select Input Image for video adjustments.
2. Select Input Color for white balance adjustments.

While there are many different ways to connect your source equipment to your DHD Controller, the examples below are the most common.

ANALOG INPUTS:
• Composite Video Input
Composite video is the most common type of signal used, but is also the lowest in picture quality. Many sources have outputs that are limited to composite video, such as some VCR's and camcorders; others such as Laser Disc players actually produce slightly better results when using composite video.

• S-Video Input
S-video is the second-best type of signal that can be used, but is MUCH better than composite video. Using such sources as Satellite receivers, high-quality VCRs and DVD players (with no component output) will produce a MUCH cleaner and sharper signal.

• Component Input
Component video is the best type of signal that can be used. The most common sources that use component outputs are DVD players, and it is highly recommended that component be used when possible. Component video goes one step beyond S-video in picture quality; chroma (color) information is more resolved and the overall picture appears more well-defined. (be sure to shut off progressive scan on your DVD player)

• HD1 / HD2
These are High Definition Analog inputs to connect the outputs of high definition sources such as HD tuners and set top boxes, HD satellite receivers, etc. These inputs will accept signals as RGB, RGBHV or Component Video (YPrPb).

DIGITAL INPUTS:
• DVI 1 / DVI 2
These are High Definition Digital inputs. Runco recommends using these digital inputs whenever possible. Using the DVI 1 and DVI 2 inputs ensures the highest video quality because the signal is carried in the digital domain throughout the entire signal path, from source component output, through the DHD and finally into the projector. This maintains maximum signal purity.

Use these inputs to connect Digital High Definition sources that have a DVI output, such as HD tuners and set top boxes, satellite receivers, DVD players, etc.

ISF Calibration
The VX-2c/DHD system 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 there is a need to calibrate each and every input separately.

When beginning calibration of the DHD, it is imperative that at least one of the analog SD inputs (Composite, S-Video, RCA Component) be calibrated first. In doing this, the projector is calibrated to the controller. After one of the SD inputs is calibrated, calibration of the HD analog or DVI sections can follow.

Once the initial settings have been completed, the "front panel display" (color, tint, sharpness, etc.) can be adjusted for each aspect ratio. The calibration procedures for these adjustments are outlined in "picture quality adjustments".

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LENS SHIFT RANGE

Lens Option 1: Throw Distance 1.2 - 1.4 x Width of Screen	Example: 56" x 100" Screen TD = 120" to 140" lens to screen
When only Vertical or only Horizontal Shift is used: Maximum. Vertical Shift ↑ = 60% of screen height (.60 x height) Maximum. Vertical Shift ↓ = 24% of screen height (.24 x height) Maximum Horizontal Shift = 10% of screen width (.10 x width)	0.24 X 56" = 13.44" up or down 0.10 X 100" = 10.0" left or right
Amount of Horizontal Shift when Vertical is @ maximum: Maximum Horizontal Shift < 5% of screen width (.05 x width)	0.05 X 100" = 5.0" left or right
Amount of Vertical Shift when Horizontal is @ maximum: Maximum Vertical Shift ↑ < 10% of screen height (.10 x height) Maximum Vertical Shift ↓ < 10% of screen height (.10 x height)	0.10 X 56" = 5.6" up or down

Lens Option 2: Throw Distance 1.4 - 1.77 x Width of Screen	Example: 56" x 100" Screen TD = 140" to 177" lens to screen
When only Vertical or only Horizontal Shift is used: Maximum. Vertical Shift ↑ = 60% of screen height (.60 x height) Maximum. Vertical Shift ↓ = 24% of screen height (.24 x height) Maximum Horizontal Shift = 13% of screen width (.13 x width)	0.24 X 56" = 13.44" up or down 0.13 X 100" = 13.0" left or right
Amount of Horizontal Shift when Vertical is @ maximum: Maximum Horizontal Shift < 5% of screen width (.05 x width)	0.05 X 100" = 5.0" left or right
Amount of Vertical Shift when Horizontal is @ maximum: Maximum Vertical Shift ↑ < 10% of screen height (.10 x height) Maximum Vertical Shift ↓ < 10% of screen height (.10 x height)	0.10 X 56" = 5.6" up or down

Lens Option 3: Throw Distance 1.77 - 2.35 x Width of Screen	Example: 56" x 100" Screen TD = 177" to 235" lens to screen
When only Vertical or only Horizontal Shift is used: Maximum. Vertical Shift ↑ = 60% of screen height (.60 x height) Maximum. Vertical Shift ↓ = 24% of screen height (.24 x height) Maximum Horizontal Shift = 16% of screen width (.16 x width)	0.24 X 56" = 13.44" up or down 0.16 X 100" = 16.0" left or right
Amount of Horizontal Shift when Vertical is @ maximum: Maximum Horizontal Shift < 5% of screen width (.05 x width)	0.05 X 100" = 5.0" left or right
Amount of Vertical Shift when Horizontal is @ maximum: Maximum Vertical Shift ↑ < 10% of screen height (.10 x height) Maximum Vertical Shift ↓ < 10% of screen height (.10 x height)	0.10 X 56" = 5.6" up or down

Explanation:
- 0% shift is when the image center is even with the projector lens center. (Also known as zero-degree projection-angle)
- Shifting beyond the maximum values above will cause image loss in corners or edges.
- When Vertical Shift is maximum, Horizontal shift can only be adjusted 5% left or right in example above.
- The maximum diagonal movement of the image is expressed as shift in 2 directions, this is the maximum combination of adjustment. (ex. Up & Left, Down & Right, Up & Right, Down & Left)
- Throw distance does not affect image quality.
- Lens shift does not affect image quality if within above limits.

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Lens Option 4: Throw Distance 2.35 - 3.60 x Width of Screen	**Example: 56" x 100" Screen** TD = 235" to 360" lens to screen
When only Vertical or only Horizontal Shift is used: Maximum. Vertical Shift ↑ = 60% of screen height (.60 x height) Maximum. Vertical Shift ↓ = 24% of screen height (.24 x height) Maximum Horizontal Shift = 16% of screen width (.16 x width)	0.24 X 56" = 13.44" up or down 0.16 X 100" = 16.0" left or right
Amount of Horizontal Shift when Vertical is @ maximum: Maximum Horizontal Shift < 5% of screen width (.05 x width)	0.05 X 100" = 5.0" left or right
Amount of Vertical Shift when Horizontal is @ maximum: Maximum Vertical Shift ↑ < 10% of screen height (.10 x height) Maximum Vertical Shift ↓ < 10% of screen height (.10 x height)	0.10 X 56" = 5.6" up or down

Lens Option 5: Throw Distance 3.60 - 5.70 x Width of Screen	**Example: 56" x 100" Screen** TD = 360" to 570" lens to screen
When only Vertical or only Horizontal Shift is used: Maximum. Vertical Shift ↑ = 60% of screen height (.60 x height) Maximum. Vertical Shift ↓ = 24% of screen height (.24 x height) Maximum Horizontal Shift = 16% of screen width (.16 x width)	0.24 X 56" = 13.44" up or down 0.16 X 100" = 16.0" left or right
Amount of Horizontal Shift when Vertical is @ maximum: Maximum Horizontal Shift < 5% of screen width (.05 x width)	0.05 X 100" = 5.0" left or right
Amount of Vertical Shift when Horizontal is @ maximum: Maximum Vertical Shift ↑ < 10% of screen height (.10 x height) Maximum Vertical Shift ↓ < 10% of screen height (.10 x height)	0.10 X 56" = 5.6" up or down

Lens Option 6: Throw Distance 0.67 Fixed x Width of Screen	**For rear screen installations.** **Contact Runco Technical Support**

Explanation:
- 0% shift is when the image center is even with the projector lens center. (Also known as zero-degree projection-angle)
- Shifting beyond the maximum values above will cause image loss in corners or edges.
- When Vertical Shift is maximum, Horizontal shift can only be adjusted 5% left or right in example above.
- The maximum diagonal movement of the image is expressed as shift in 2 directions, this is the maximum combination of adjustment. (ex. Up & Left, Down & Right, Up & Right, Down & Left)
- Throw distance does not affect image quality.
- Lens shift does not affect image quality if within above limits.

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Example of Horizontal and Vertical Lens Shift

VERTICAL LENS SHIFT (UP OR DOWN)

Note: This is a general example of Vertical Lens Shift. Each lens type will vary. No particular lens was used in this example.

150% Height Lens Shift (1.5 x H)

100% Height Lens Shift (1.0 x H)

50% Height Lens Shift (0.5 x H)

Screen Center

0%

Base plate to center of lens Approx. 5-6" (depends on the amount of lens shift)
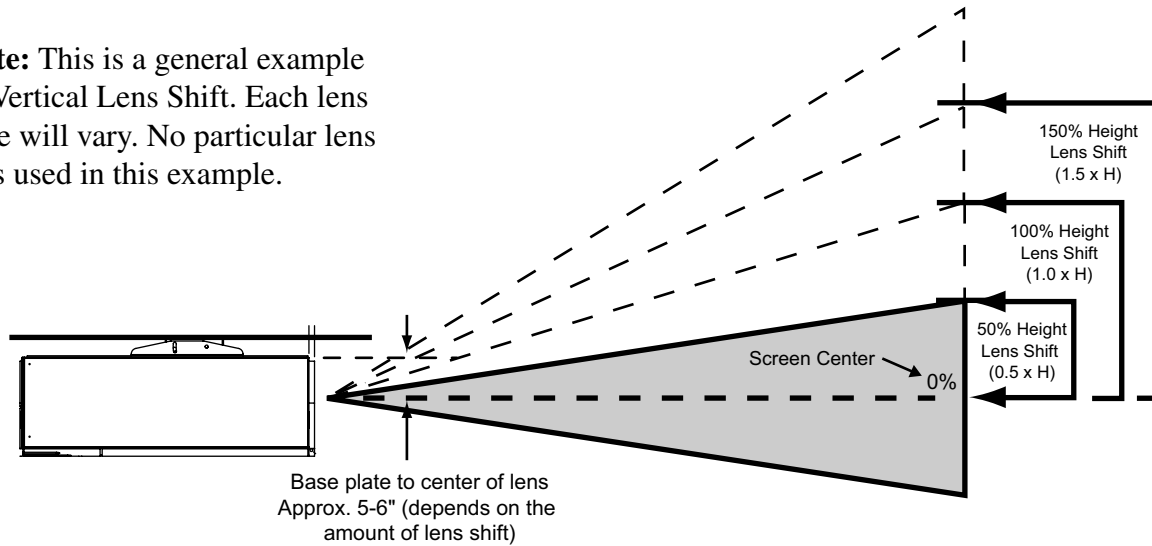
HORIZONTAL LENS SHIFT (LEFT OR RIGHT)

150% Width Lens Shift (1.5 x W)

100% Width Lens Shift (1.0 x W)

50% Width Lens Shift (0.5 x W)

Screen Center

0%

Screen Width (W)
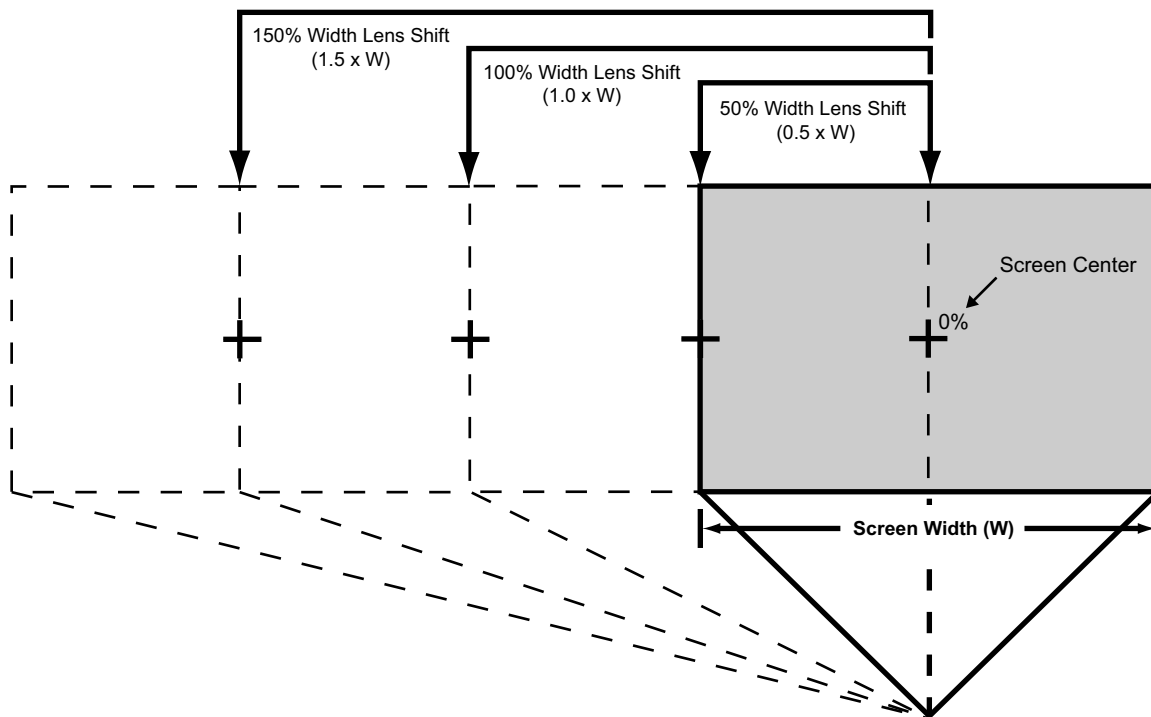
Note: This is a general example of Horizontal Lens Shift. Each lens type will vary. No particular lens was used in this example.

16
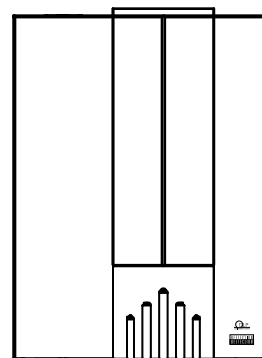
» PROJECTOR CONTROL

Once the VX-2c and DHD controller have been properly installed and connected, you are ready to perform set-up and calibration procedures. All setup and calibration parameters are accessed and adjusted through the VX-2c fluorescent display menu system.

The VX-2c/DHD system 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.

The VX-2c menu system is organized to provide for a logical, step by step approach to both setup and operation.

To begin, press the "Menu" button on the rear panel of the VX-2c. This will bring up the fluorescent display menu and you may then proceed as follows:

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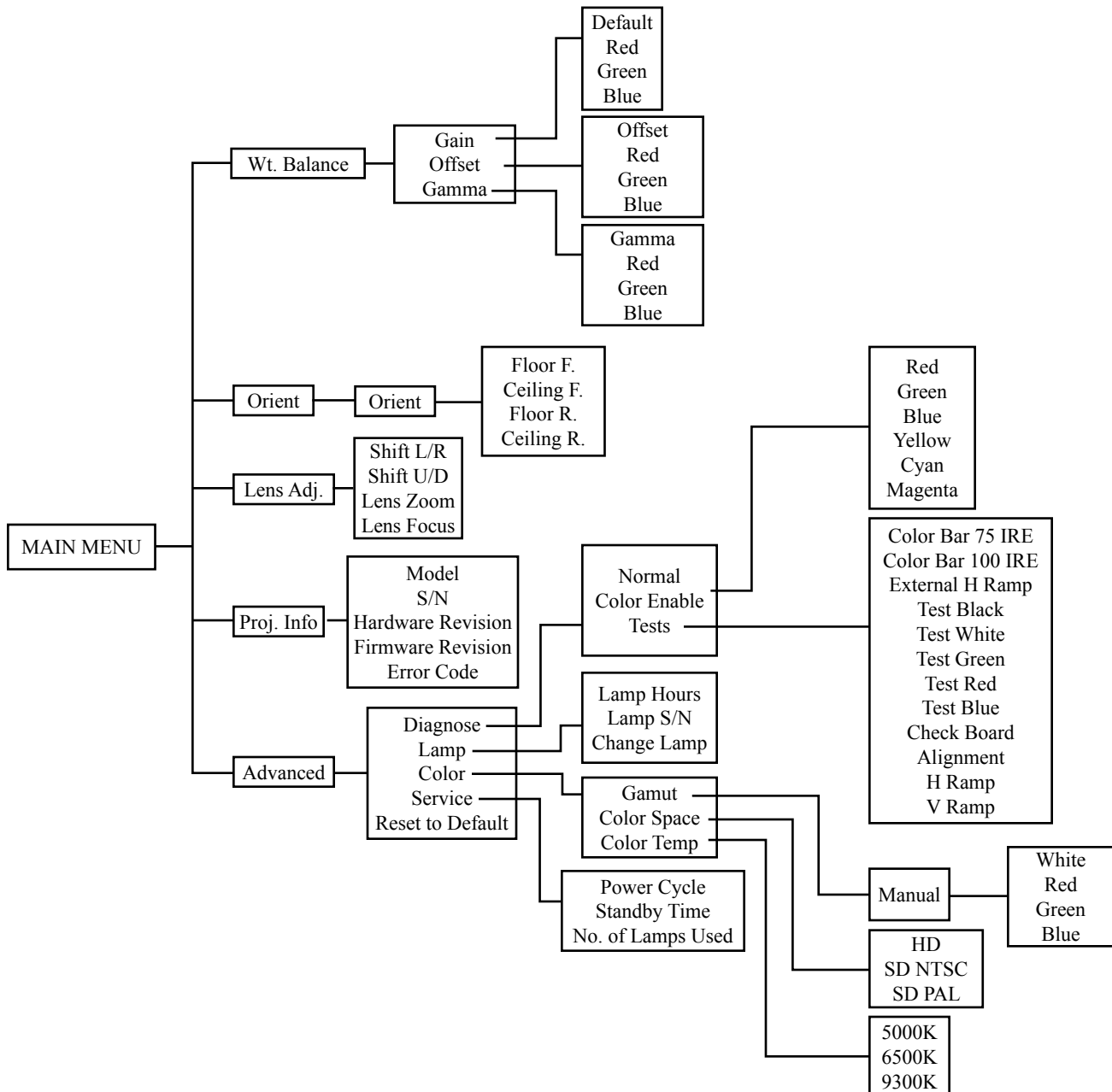
MAIN MENU

Main Menu Wt. Balance Orient Lens Adj. Proj. Info Advanced	

MAIN MENU	Opening screen
Wt. Balance	Press ENTER to access the White Balance Settings menu
Orient	Press ENTER to access the Orientation Setting menu
Lens Adj.	Press ENTER to access the Lens Adjustment setting menu
Proj. Info	Press ENTER to access the Projector Status menu
Advanced	Press ENTER to access the Advanced Settings menu

This is the first menu that will appear when "MENU" is selected. The above diagram depicts the main menu.

There are five option items in the Main menu:
    Wt. Balance: Adjusting Contrast, Brightness, and Gamma
    Orient: Adjusting Picture Orientation (FF, CF, RF, and CR)
    Lens Adj. : Adjusting Lens shift, Lens Zoom, and Lens Focus.
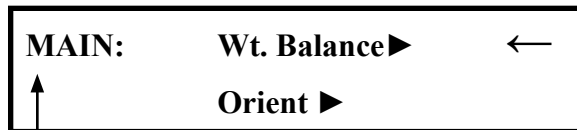   **Proj. Info:** Checking the projector status
    Advanced: This window is used for optimization and service info.

When the MENU button is pressed the following will be displayed on the Vacuum Florescent Display. Arrows indicates highlighted option to be selected:

MAIN:	**Wt. Balance▶**	**←**
	Orient ▶	

Main menu is currently selected.

Selectable options in main menu.
Note: Due to limitation of the display, only two options can be displayed at a time

* Press the MENU key to call up the MAIN window.
* Use the UP or DOWN button to move to your selection.
* Press the ENTER button to activate your selection.
* Press MENU to exit.

Note: Due to limitation of the display, only two options can be displayed at a time.

Wt. Balance Gain Offset Gamma	

Wt. Balance	Indicates you are on the Image Settings menu
Gain	Press ENTER to access the Contrast Setting menu
Offset	Press ENTER to access the Brightness Setting menu
Gamma	Press ENTER to access the Gamma Setting menu

From the Main menu use the Up or Down arrow to select "**Wt. Balance**" and press the Enter button to call up the Wt. Balance options.

There are three options Gain, Offset, Brightness, and Gamma.
Use the Up or Down button to indication your selection and press the Enter button to make your selection.
Each selection has separate adjustment for Red, Green , and Blue.
Press the Enter button on selected item. A cursor will blink, use the up or down arrow keys to make your adjustment.
Press Enter to store the change.
18 Press the Menu button to exit.

| **Orient** | Preference | Indicates you are on the Preference Settings menu |
| Orient | Orient | Press ENTER to select the Orientation setting menu |

Use Preference window to select projector picture orientation

From the Main menu use the Up or Down arrow to select "**Orient"** and press the Enter button to call up the Orient display. The Orient display allows selection of Picture Orientation options.

There are four options:

        Floor F.: Floor Front configuration.
        Ceiling F.: Ceiling Front configuration
        Floor R.: Floor Rear configuration
        Ceiling R.: Ceiling Rear configuration

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Lens Adj.	Lens Adj.	Indicates you are on the Lens setting menu
Shift L/R	Shift L/R	Press ENTER to Shift the lens Left and Right by using the Left and Right arrows
Shift U/D	Shift U/D	Press ENTER to Shift the lens Up and Down by using the Up and Down arrows
Lens Zoom	Lens Zoom	Press ENTER to Focus the lens by using the Up and Down arrows
Lens Focus	Lens Focus	Press ENTER to Zoom the lens by using the Up and Down arrows

Use the Lens Adj. display to make lens adjustments

From the Main menu use the Up or Down arrow to select "**Lens Adj."** and press the Enter button to call up the Lens Adj. Options.

There are four options:

        Shift L/R: Shift the image (mechanically) left or right.
        Shift U/D: Shift the image (mechanically) up or down.
        Lens Zoom: Decrease or Enlarge the image size (mechanically).
        Lens Focus: Adjusting the image focus.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

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Proj. Info	
Proj. Info	Indicates you are on the Status reading menu
Model	Reports the Projector Model
S/N	Reports the Projector Serial Number
Hardware Revision	Reports the Projector Hardware Revision number
Firmware Revision	Reports the Projector Firmware Revision number
Error Code	Reports the last Projector Error Code received

Proj. Info
Model
S/N
Hardware Revision
Firmware Revision
Error Code

From the Main menu use the Up or Down arrow to select "**Proj. Info"** and press the Enter button to call up the Status options.

There are five options:
> **Model:** VX-2c should be displayed.
> **S/N:** Projector serial number identification.
> **Hardware Rev.:** Projector hardware revision.
> **Firmware Rev.:** Current firmware revision.
> **Error Code:** System error code

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Under Advanced there are five sub-windows

Advanced
Diagnose
Lamp
Color
Reset to Default
Service

Advanced	
Advanced	Indicates you are on the Advanced Settings menu
Diagnose	Press ENTER to access the Diagnostics menu
Lamp	Press ENTER to access the Lamp Settings menu
Color	Press ENTER to access the Color Settings menu
Reset to Default	Press ENTER to set the Presets back to their Factory Default settings and then confirm YES or NO with the arrows and ENTER key
Service	Press ENTER to access the Service Functions Menu

From the Main menu use the Up or Down arrow to select "**Advanced"** and press the Enter button to call up the Advanced options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

OPERATIONAL INSTRUCTIONS

<table>
<tr><td rowspan="2" align="center">Gain
Red

Green

Blue</td><td>Gain</td><td>Indicates you are in the Contrast Setting Menu</td></tr>
<tr><td>Red</td><td>Press ENTER to change the Red Contrast setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
<tr><td></td><td>Green</td><td>Press ENTER to change the Green Contrast setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
<tr><td></td><td>Blue</td><td>Press ENTER to change the Blue Contrast setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
</table>

From the Image menu use the Up or Down arrow to select "**Contrast"** and press the Enter button to call up the Contrast options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

<table>
<tr><td rowspan="2" align="center">Brightness
Red

Green

Blue</td><td>Brightness</td><td>Indicates you are in the Brightness Setting Menu</td></tr>
<tr><td>Red</td><td>Press ENTER to change the Red Brightness setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
<tr><td></td><td>Green</td><td>Press ENTER to change the Green Brightness setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
<tr><td></td><td>Blue</td><td>Press ENTER to change the Blue Brightness setting by using the UP and DOWN arrows to Increase or Decrease the value</td></tr>
</table>

From the Image menu use the Up or Down arrow to select "**Brightness"** and press the Enter button to call up the Brightness options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Gamma Red Green Blue	Gamma	Indicates you are in the Gamma Setting Menu
	Red	Press ENTER to change the Red Gamma setting by using the UP and DOWN arrows to Increase or Decrease the value
	Green	Press ENTER to change the Green Gamma setting by using the UP and DOWN arrows to Increase or Decrease the value
	Blue	Press ENTER to change the Blue Gamma setting by using the UP and DOWN arrows to Increase or Decrease the value

From the Image menu use the Up or Down arrow to select "**Gamma"** and press the Enter button to call up the Gamma options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Orientation Floor F. Ceiling F. Floor R. Ceiling R.	Orientation	Indicates you are in the Projector Orientation Setting menu
	Floor F.	Press ENTER to Set the projector to Front Projection mode
	Ceiling F.	Press ENTER to Set the projector to Inverted Front Projection mode
	Floor R.	Press ENTER to Set the projector to Rear Projection mode
	Ceiling R.	Press ENTER to Set the projector to Inverted Rear Projection mode

From the Preference menu use the Up or Down arrow to select "**Orientation"** and press the Enter button to call up the Orientation options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

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<table>
<tr><td rowspan="5" style="vertical-align: middle; text-align: center;">Diagnose
Normal
Color Enable
Tests</td></tr>
<tr><td>Diagnose</td><td>Indicates you are in the Diagnostics menu</td></tr>
<tr><td>Normal</td><td>Press ENTER to return all Diagnostic Tests to their Normal mode</td></tr>
<tr><td>Color Enable</td><td>Press ENTER to individually Enable each Color</td></tr>
<tr><td>Tests</td><td>Press ENTER to access External front end board and Internal DLP Test Modes</td></tr>
</table>

From the Advanced menu use the Up or Down arrow to select "**Diagnose"** and press the Enter button to call up the Diagnose options.

There are three options:

Normal: Return to normal video viewing

Color Enable: Red, Green, Blue, Yellow, Cyan, Magenta from the active video

Tests: Color Bar 75 IRE, Color Bar 100 IRE, External H Ramp, Test Black, Test White, Test Green, Test Red, Test Blue, Check Board, Alignment, H Ramp and V Ramp

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

<table>
<tr><td rowspan="5" style="vertical-align: middle; text-align: center;">Lamp
Lamp Hours
Lamp S/N
Change Lamp</td></tr>
<tr><td>Lamp</td><td>Indicates you are in the Lamp Settings menu</td></tr>
<tr><td>Lamp Hours</td><td>Press ENTER to return the accumulated lamp operation hours</td></tr>
<tr><td>Lamp S/N</td><td>Press ENTER to return the Lamp Serial Number</td></tr>
<tr><td>Change Lamp</td><td>Press ENTER to indicate that the lamp has been changed and the hours counter is to be reset to zero</td></tr>
</table>

From the Advanced menu use the Up or Down arrow to select "**Lamp"** and press the Enter button to call up the Lamp options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Color Gamut Color Space Color Temp	**Color**	Indicates you are in the Color Settings menu
	Gamut	Press ENTER to access the Gamut settings menu
	Color Space	Press ENTER to access the Color Space settings menu
	Color Temp	Press ENTER to access the Color Temperature setting menu

From the Advanced menu use the Up or Down arrow to select "**Color"** and press the Enter button to call up the Color options.

There are three options:

      Gamut: Manual, projector white balance calibration for D6500K

      Color Space: Hi-Def, SD NTSC, SD PAL

      Color Temp: 5000K, 6500K, 9300K

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Reset to Default	**Reset to Default**	This display will Reset all of the projector settings back to the original factory default.

Service Power Cycle Standby Time No. of Lamps Used	**Service**	Indicates you are in the Service Information menu
	Power Cycle	Press Enter to return the number of Power Cycles the unit has undergone
	Standby time	Press Enter to return the amount of Standby Time the unit has undergone
	No. of lamps used	Press Enter to return the number of Lamp Changes the unit has undergone

From the Advanced menu use the Up or Down arrow to select "**Service"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

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Color Enable	Red Green Blue Yellow Cyan Magenta

Color Enable	Indicates you are in the Color Enable menu
Red	Press ENTER to turn Red On
Green	Press ENTER to turn Green On
Blue	Press ENTER to turn Blue On
Yellow	Press ENTER to turn Red Off
Cyan	Press ENTER to turn Blue Off
Magenta	Press ENTER to turn Green Off

From the Diagnose menu use the Up or Down arrow to select "**Color Enable"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Ext Test	Color Bar 75 IRE Color Bar 100 IRE External H Ramp

Ext Test	Indicates you are In the External front end board Test mode
Color Bar 75 IRE	Press ENTER to display the high brightness color bars
Color Bar 100 IRE	Press ENTER to display the low brightness color bars
External H Ramp	Press ENTER to display the External Horizontal Ramp test image

From the Diagnose menu use the Up or Down arrow to select "**Ext Test"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Tests	Test Black Test White Test Green Test Red Test Blue Check Board Alignment H Ramp V Ramp

Tests	Indicates you are In the Internal DLP Test mode
Test Black	Press ENTER to display a full Black screen
Test White	Press ENTER to display a full White screen
Test Green	Press ENTER to display a full Green screen
Test Red	Press ENTER to display a full Red screen
Test Blue	Press ENTER to display a full Blue screen
Check Board	Press ENTER to display a Checker Board pattern
Alignment	Press ENTER to display an Alignment crosshatch pattern
H ramp	Press ENTER to display a Horizontal Grey Ramp
V ramp	Press ENTER to display a Vertical Grey Ramp

From the Diagnose menu use the Up or Down arrow to select "**Int Test"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Gamut Manual

Gamut	Indicates you are in the Gamut Settings menu
Manual	Puts Gamut setting into Manual mode

From the Color menu use the Up or Down arrow to select "**Gamut"** and press the Enter button to call up the Manual option.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

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Color Space HD SD NTSC SD PAL	

Color Space	Indicates you are in the Color Space setting menu
HD	Press ENTER to select the HD Color Space
SD NTSC	Press ENTER to select the SD NTSC Color Space
SD PAL	Press ENTER to select the SD PAL Color Space

From the Color menu use the Up or Down arrow to select "**Color Space"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

Color Temp 5000K 6500K 9300K	

Color Temp	Indicates you are in the Color Temperature setting menu
5000K	Press ENTER to select a 5000K Color Temperature
6500K	Press ENTER to select a 6500K Color Temperature
9300K	Press ENTER to select a 9300K Color Temperature

From the Color menu use the Up or Down arrow to select "**Color Temp"** and press the Enter button to call up the Service options.

Use the Up or Down button to indication your selection and press the Enter button to make your selection. Press the Menu button to exit.

<table>
<tr><td>Manual
White
Red
Green
Blue</td><td>Manual</td><td>Indicates you are in the Manual Gamut setting mode using a calibrated colorimeter. Note that changes are not made till you EXIT this menu</td></tr>
<tr><td></td><td>White X=0.XXX</td><td>Press ENTER to change the White X value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>White Y=0.YYY</td><td>Press ENTER to change the White Y value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Red X=0.XXX</td><td>Press ENTER to change the Red X value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Red Y=0.YYY</td><td>Press ENTER to change the Red Y value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Green X=0.XXX</td><td>Press ENTER to change the Green X value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Green Y=0.YYY</td><td>Press ENTER to change the Green Y value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Blue X=0.XXX</td><td>Press ENTER to change the Blue X value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
<tr><td></td><td>Blue Y=0.YYY</td><td>Press ENTER to change the Blue Y value using the Left and Right arrows to select the digit to change and the Up and Down arrows to change, then ENTER to effect</td></tr>
</table>

COLOR SPACE COORDINATES FOR REFERENCE					
GAMUT	**X**	**Y**	**GAMUT**	**X**	**Y**
EBU red	0.64	0.33	NTSC red	0.67	0.33
EBU green	0.29	0.6	NTSC green	0.21	0.71
EBU blue	0.15	0.06	NTSC blue	0.14	0.08
SMPTE C red	0.635	0.340	Graphics red	0.628	0.346
SMPTE C green	0.305	0.595	Graphics green	0.268	0.588
SMPTE C blue	0.155	0.070	Graphics blue	0.15	0.07

Procedure:
1. Set up PR or Milori color meter
2. Enter manual Gamut setting menu
3. Measure X and Y values of White
4. Enter measured values by scrolling to the digit to be changed, use the up and down keys to change it and then moving to the next digit. Hit ENTER to save the numbers.
5. Repeat the above procedure with the red, green and blue values exit the Gamut setting menu all the way back to NORMAL to establish the changes

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The following is a basic troubleshooting guide that can assist you in resolving typical problems may result in normal operation. If you have encountered problems that are not listed in this guide, please contact your Runco dealer for assistance.

PROBLEM	POSSIBLE CAUSE	SOLUTION
The Projector does not turn on after initial installation. The Power LED on the front of the Controller stays red after the power button is pressed.	· The DVI cable is not connected between the Controller and Projector, or is connected improperly. · The projector is not plugged in, or its AC outlet is not active. Look at its power LED and see if it is illuminated.	· Ensure it is firmly plugged into both the Controller and the Projector. · Verify that the AC outlet is active, or that the Projector is plugged in.
The Projector and Controller are both on, but there is no video image on-screen.	· The Controller is on the wrong source. · The Controller is on the correct source, but the source itself is off.	· Press MENU on the Projector's remote, and look to see which source is active (the arrow will be pointing to the active source). Select the correct source as appropriate. · Turn on the source. It is recommended that all sources be turned on first BEFORE the VX-2c.
The Projector is producing a 'split screen' or an otherwise scrambled image.	· A progressive scan DVD is plugged into Component input rather than the RGB/Component input.	· Only NTSC/PAL can be input to the Component input. Progressive scan must go into RGB/Component.
The image appears too bright, and there is a loss of definition in the brightest areas of the image.	· Contrast is set too high. · The DVD player is set for a high-level output. · The video signal has not been terminated properly somewhere in the system.	· Turn down the CONTRAST level on the Controller. · Set the DVD player for a nominal output (no boost or gain). · Ensure all video signals are terminated in 75 Ohms.
The image appears too 'washed out', or the darkest areas of the image appear too bright.	· Brightness is set too high. · The DVD player may be set for too high of a brightness level.	· Turn down the BRIGHTNESS level on the Controller. If possible, use a PLUGE pattern to set the brightness level properly. · Set the DVD player for a nominal output (no boost or gain).
The colors of the image appear abnormal	· The Red, Green and/or Blue outputs of the Controller or inputs to the Projector are reversed. · The Pr and Pb inputs on the Component input on the Controller are reversed	· Check the cable connections on the back of the Controller or on the Projector.
The Projector will not turn back on after it was powered-down, or the image disappears during operation.	· The Projector will not turn on for two minutes after power-down to protect its bulb. · The bulb has failed	· Wait two minutes until the LED on the front of the Controller turns red.

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RS-232 COMMUNICATIONS

Baud rate: 19200 (fixed)
Bits: 8
No Parity

All protocol in ASCII format

RS-232 input connector pin numbers: TxD= Pin# 2, RxD= Pin# 3, GnD= Pin# 5

Command format (single command): command value (i.e. brightness 100).
NOTE: A space (not an underscore) or comma may be used between the command and its value.

Command string format: command, command value, command etc.
(i.e. COMPOSITE, BRIGHTNESS 100, ANAMORPHIC, <CR>)

NOTE: In between commands, a comma or space may be used

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

Other notes:

• For command strings, a maximum of 255 characters can be used in a single string.

• PARAMETER min/max refers to a function's minimum and maximum value range.
  Inputting values above or below their range may cause unpredictable (but not fatal) results.

Command	Parameter (min/max)	Value Stored?	Description
POWER	0/1	NA	Turns DHD On and Off
ON	NA	NA	Turns DHD Controller on
OFF	NA	NA	Turns DHD Controller 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
DVI1	NA	YES	Selects the DVI 1 input
DVI2	NA	YES	Selects the DVI 2 input
HD1Pass	NA	YES	Selects the HD 1 Pass Thru input
HD2Pass	NA	YES	Selects the HD 2 Pass Thru input
OUT43	NA	YES	Selects the output screen
OUT169	NA	YES	Selects the output screen
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
RGBNN	NA	YES	Outputs color space RGB w/negative, negative sync
RGBPP	NA	YES	Outputs color space RGB w/positive, positive sync
RGBS	NA	YES	Outputs color space RGB w/embedded sync on green
YUV	NA	YES	HD YUV output color space
IHPOS	-100/100	YES	Sets a value for horizontal position input
IVPOS	-100/100	YES	Sets a value for vertical position input
IWIDTH	-100/100	YES	Sets the value for width input
IHEIGHT	-100/100	YES	Sets the value for height input
OVERSCAN	0/10	YES	Sets the overscan value in %
OHPOS	-100/100	YES	Sets the value for width output
OVPOS	-100/100	YES	Sets the value for height output
OWIDTH	-100/100	YES	Sets the value for width output
OHEIGHT	-100/100	YES	Sets the value for height output
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
NIGHT	NA	YES	Selects the ISF Night setting
DAY	NA	YES	Selects the ISF Day setting
CUSTOM1	NA	YES	Sets the value per client
CUSTOM2	NA	YES	Sets the value per client
TRIGGER	1/3	YES	Sets the trigger
BKGND	-100/-100	YES	Sets the background color for letterbox

Command	Parameter (min/max)	Value Stored?	Description
IHPOS?	NA	NA	Returns input horizontal position value
IHEIGHT?	NA	NA	Returns input vertical height value
OHPOS?	NA	NA	Returns output horizontal position value
OHEIGHT?	NA	NA	Returns output vertical 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 serial number
DATE?	NA	NA	Returns the date of mfg
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 preset ISF day or night
POWER?	NA	NA	Returns power status
ASPECTIN?	NA	NA	Returns the input source aspect
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
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

VX-2c PROJECTOR SPECIFICATIONS	
Projector Type:	Digital Light Processing™ (DLP™), 3-chip, 16:9 HD-2, DMD™
Native Resolution:	1280 x 720 (16:9)
Aspect Ratios:	Determined by supplied processor
Video Standards:	Determined by supplied processor
DTV Compatibility:	Determined by supplied processor
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):	Lens Option 1: Zoom 1.20–1.40 x width Lens Option 2: Zoom 1.40–1.77 x width Lens Option 3: Zoom 1.77–2.35 x width Lens Option 4: Zoom 2.35–3.60 x width Lens Option 5: Zoom 3.60–5.70 x width Lens Option 6: 0.67 x width (for rear-screen applications only)
Horizontal and Vertical Offset:	Varies per lens - See Page 14 & 15
Light Output:	CSMS** Specifications: Home Theater Calibration:1227 ANSI Lumens; 52.1 Foot-Lamberts (fL); 2500 ANSI Lumens*
Contrast Ratio:	CSMS** Contrast Ratio: 217:1; 2800:1 ANSI
Lamp:	275W UHP
Lamp Life:	2000 hours @ 6500º Kelvin
Controller Interface:	(1) DVI Connector
12V Output:	See Controller for Specifications
Power Requirements:	100 – 240V AC, 50/60 Hz, 510W
Operating Environment:	40° – 95° F, (5° – 35° C), 0% – 90% Humidity (non-condensing)
Dimensions (w/out feet):	Width: 20 7/8 in. (530.20 mm) Depth: 27 7/8 in. (708.00 mm) Height: 8 7/8 in. (225.40 mm), with feet 9 7/8 in. (250.80 mm) Weight: 81 lbs. (36.8 kg) (without lens)
Regulatory Approvals:	Complies with FCC, CE, C-Tick
Limited Warranty:	Projector: (2) Two years parts and labor from the date of delivery to the end user Lamp Warranty: 1000 hours or (6) six months, which ever comes first..

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DHD™ DIGITAL CONTROLLER SPECIFICATIONS

Aspect Ratio:	Anamorphic, Letterbox, VirtualWide, 4:3 (on either 16:9 or 4:3 screens)
Input Standards:	NTSC/PAL
Output Resolution:	720P
Outputs:	(1) HD - R (Pr), G (Y), B (Pb), H, V; (1) DVI w/HDCP
Inputs:	(1) Composite, (2) S-Video, (1) Component (480i or 576i), (2) RGBHV/Component HD, (2) DVI Digital w/HDCP
Control Options:	Discrete infrared remote, (2) RS-232, (1) 9-pin connector, (1) RJ-11, Front panel controls
Screen Trigger/Masking Outputs:	(3) 12V DC, 1/8A
Bandwidth:	150 Mega Samples/Second (MSPS)
Power Requirements:	100-230V AC (auto-sensing), 50/60 Hz, 160W
Operating Environments:	41°-95°F (5°-35°C); 0-90% Humidity (non-condensing)
Dimensions:	Width: 17 1/2 in. (443 mm) Depth: 11 3/16 in. (284 mm) Height: 3 3/4 in. (95.25 mm) Weight: 13 lbs. (5.9 kg)
Regulatory Approvals:	Complies with FCC Class B, CE, C-Tick
Limited Warranty:	Service Labor and Parts: Runco warrants the product for two years from the date of delivery to the end user.

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