CRYSTAL
S E R I E S

CX-52HD
CX-57HD

1080p High-Definition LCD Flat Panel Displays
with WideVision™

RUNCO

THE WORLD'S FINEST HOME THEATER PRODUCTS™

ONE YEAR LIMITED WARRANTY

For LCD Displays

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 <u>COVERED</u> UNDER THE TERMS OF THIS LIMITED WARRANTY:

SERVICE LABOR: 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 one (1) year from the effective date of delivery to the end user.

PARTS: Runco will provide new or rebuilt replacement parts for the parts that fail due to defects in materials or workmanship for a period of one (1) year 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.

WHAT IS <u>NOT COVERED</u> UNDER THE TERMS OF THIS LIMITED WARRANTY:

Image retention on LCD display panels is specifically excluded from coverage under this Limited Warranty. Image retention or staining of an image is the result of misuse of the product and therefore cannot be repaired under the terms of this Limited Warranty.

Normal viewing material such as television/satellite broadcasts, videotape or DVDs (not put into pause for extended periods of time) will not cause damage to your display under normal conditions. Many DVD players are also equipped with screen savers for this reason.

TO AVOID IMAGE RETENTION (Burn-in): Please ensure that still images are not left on your LCD display panel. Also ensure that images displayed in the 4:3 aspect ratio mode (black or gray stripes, but no picture information is present on the left and right edges of the screen) are used as infrequently as possible. This will prevent permanent retention on your LCD display panel, which can be seen permanently under certain conditions once burn-in has occurred.

The types of images to avoid include video games, still images and computer screens with stationary tool bars and icons. (This is why computers are equipped with screen savers – to prevent still images from burning into the monitor's phosphors after being displayed continuously for an extended period of time).

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. 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 OF WHICH YOUR RUNCO PRODUCT IS CAPABLE 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.

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.

COPYRIGHT AND TRADEMARKS:

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
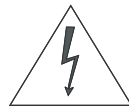
_____   _____
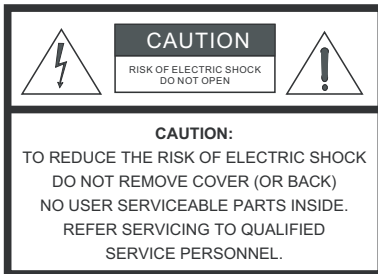
Phone   Fax

Important Safety Instructions

Thank you for your purchase of this quality Runco product! For best performance, please read this manual carefully as it is your guide through the menus and operation.

CAUTION
⚡ RISK OF ELECTRIC SHOCK DO NOT OPEN ⚠

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED
SERVICE PERSONNEL.

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.

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a dry cloth.

7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for the replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

11. Only use the attachments/accessories specified by Runco.

12. Use only with a cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Compliance Information

DECLARATION OF CONFORMITY:

Manufacturer's Name: Runco International, a subsidiary of Planar Systems, Inc.

Manufacturer's Address: 2900 Faber Street, Union City, CA 94587

  hereby declares that the products Model Numbers:

CX-52HD, CX-57HD

conform with the provisions of:

Council Directive 2004/108/EC on Electromagnetic Compatibility;

EN 55022 "Limits and methods of measurements of radio interference characteristics of information technology equipment" 1998;

EN 55024 "Limits and methods of measurements of immunity characteristics of information technology equipment" 1998;

   Including:
   - EN 61000-4-2 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test"
   - EN 61000-4-3 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 3: Radiated, Radio-Frequency, Electromagnetic Field Immunity Test"
   - EN 61000-4-4 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 4: Electrical fast transient/burst immunity test"
   - EN 61000-4-5 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 5: Surge immunity test"
   - EN 61000-4-6 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 6: Conducted disturbances induced by radio-frequency fields immunity test"
   - EN 61000-4-8 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 8: Conducted disturbances induced by power frequency magnetic fields immunity test"
   - EN 61000-4-11 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 11: Voltage dips, short interruptions and voltage variations immunity tests"

   And:
   - EN 61000-3-2 "Electromagnetic compatibility (EMC) Part 3, Section 2: Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)" 2000;
   - EN 61000-3-3 "Electromagnetic compatibility (EMC) Part 3, Section 3: Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current up to and including 16 A and not subject to conditional connection" 1995;

Council Directive 2006/95/EC and amended by M1 and C1 on Low Voltage Equipment Safety;

EN 60950 "Safety of information technology equipment, including electrical business equipment"

The Technical Construction file required by this Directive is maintained at the corporate headquarters of Planar Systems, Inc., 1195 NW Compton Drive, Beaverton, OR 97006.

Date of Declaration: October 2007

FCC PART 15:

NOTE: 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 instructions, 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 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.

INDUSTRY CANADA (ICES-003):

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

IMPORTANT RECYCLE INSTRUCTIONS

Hg Lamp(s) inside this product contain mercury. This product may contain other electronic waste that can be hazardous if not disposed of properly. Recycle or dispose in accordance with local, state, or federal Laws.

For more information, contact the Electronic Industries Alliance at WWW.EIAE.ORG.

For lamp specific disposal information check WWW.LAMPRECYCLE.ORG.

DISPOSAL OF OLD ELECTRICAL AND ELECTRONIC EQUIPMENT (Applicable throughout the European Union and other European countries with separate collection programs)

This symbol found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Table of Contents

List of Figures

Notes:

1. Introduction

This Owner's Manual describes how to install, set up and operate the Runco Crystal Series Model CX-52HD and CX-57HD Flat-Panel LCDs. Throughout this manual, the Runco CX-52HD and CX-57HD Flat-Panel LCDs are referred to simply as the "Crystal Series LCD."

Runco has prepared this manual to help home theater installers and end users get the most out of the Crystal Series LCD.

◀ *Target Audience*

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.

◀ *If You Have Comments About This Manual...*

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

◀ *Textual and Graphic Conventions*

- Remote control button identifiers are set in upper-case bold type; for example, "Press **EXIT** to return to the previous menu."

- 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 `[S4E0002`."

- All keys with functional names are initial-capped, set in bold type and enclosed in angle brackets. These keys are the following: **`<Enter>, <Spacebar>, <Control>, <Esc>`** and **`<Tab>`**.

- **`<Enter>`** indicates that you may press either the RETURN or ENTER key on your computer keyboard if it has both keys.

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

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

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 CX-52HD and CX-57HD Flat-Panel LCDs	3
Installation instructions	13
First-time configuration instructions	23
Advanced configuration instructions	39
Troubleshooting tips	47
Specifications for the CX-52HD and CX-57HD Flat-Panel LCDs	53

Runco presents the Crystal Series CX-52HD and CX-57HD Flat-Panel LCDs, perfect for those who demand our award-winning flat-panel performance along with advanced LCD technology and lightweight design.

The Crystal Series LCD incorporates the superb Vivix™ digital video processing that produces outstanding picture quality with a wide range of both standard and high definition source material. In addition, the handsome, anodized black-finish television is engineered with ISF™ calibration standards for the purest video performance.

The Crystal Series LCD offers PIP, PBP, closed captioning, Parental Control (V-Chip) functionality and multi-language support. The display includes an integrated stereo audio system incorporating surround sound technology and generous power amplification.

The advanced, TFT active-matrix liquid crystal display panel offers 1920 x 1080 resolution and includes Runco's discrete aspect ratio control with VirtualWide™ mode to fill the 16:9 screen with standard 4:3 images without loss of picture quality. Also included are discrete source, aspect ratio and power selection and an RS-232 interface for whole-house or automated control system integration.

The Crystal Series LCD is multimedia ready, with simple computer connections making gaming, Internet browsing and other computing activities quick and easy.

1.3 Description, Features and Benefits

The Crystal Series LCD offers these key features and benefits:

◄ *Key Features and Benefits*

- Native Resolution: 1920 x 1080 (16:9 Native Aspect Ratio)
- Multiple Aspect Ratios with VirtualWide™ Mode
- Less than 5 inches deep
- Two HDMI Inputs with High-bandwidth Digital Content Protection (HDCP)
- Exceptional detail and artifact-free video enhancement
- Runco video processing with 3:2 film detection circuitry

Your Crystal Series LCD 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.

◄ *Parts List*

- CX-52HD or CX-57HD LCD Display (with Table Stand)
- Remote Control Unit and two (2), AAA-size batteries
- AC Power Cord
- Warranty information and registration card
- Runco CX-52HD/CX-57HD Installation/Operation Manual (this document)

Optional Accessories:

- Wall Mount kit (part number 956-0093-00)

Notes:

2. Controls and Functions

Figure 2-1 shows the locations of the Crystal Series LCD controls and indicators.

◄ *Controls and Indicators*
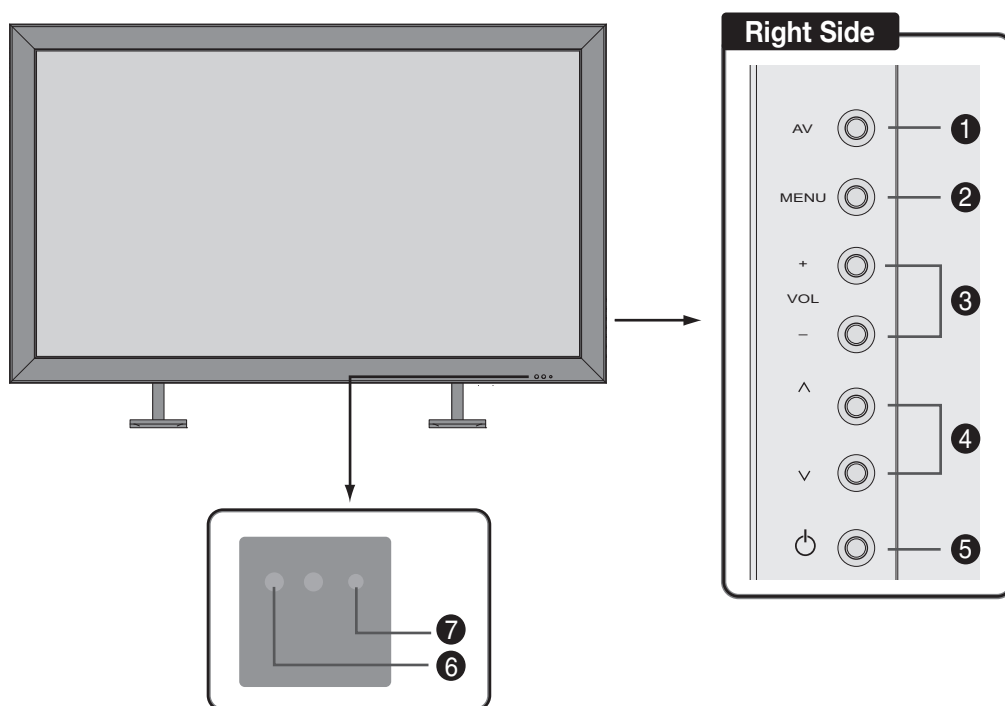
Figure 2-1. Crystal Series LCD Controls and Indicators

1. **AV Button (Input Source Selection)**
   To select a source, press the **AV** button (with no menus visible on-screen). Use the ▲ or ▼ button (see below) to highlight the desired input source and press **AV** again.

   When a menu is visible on-screen, this button operates identically to the **ENTER** button on the Crystal Series LCD remote control unit (refer to *Crystal Series LCD Remote Control* on page 9).

2. **MENU Selection Button**
   Press this button to access the on-screen display (OSD) controls, or to exit the current menu and return to the previous one.

3. **Volume Adjustment Buttons (VOL - / VOL +)**
   Use these buttons to adjust the sound volume. When a menu is visible on-screen, these buttons operate identically to the left- and right-arrow (◀ and ▶) buttons on the Crystal Series LCD remote control unit.

4. **▲ / ▼**
   When a menu is visible on-screen, these buttons operate identically to the up- and down-arrow (▲ and ▼) buttons on the Crystal Series LCD remote control unit.

5. **Power Button**

6. **Remote Control Sensor**

7. **Status Indicator LED**
   - Lights red to indicate that the Crystal Series LCD is in standby mode;
   - Lights green during power-on sequence and during normal operation;
   - Flashes green when the Crystal Series LCD receives a signal from the remote control.

Crystal Series LCD Inputs ➤ ***and Outputs***

Figure 2-2 shows the locations of the Crystal Series LCD inputs and outputs.
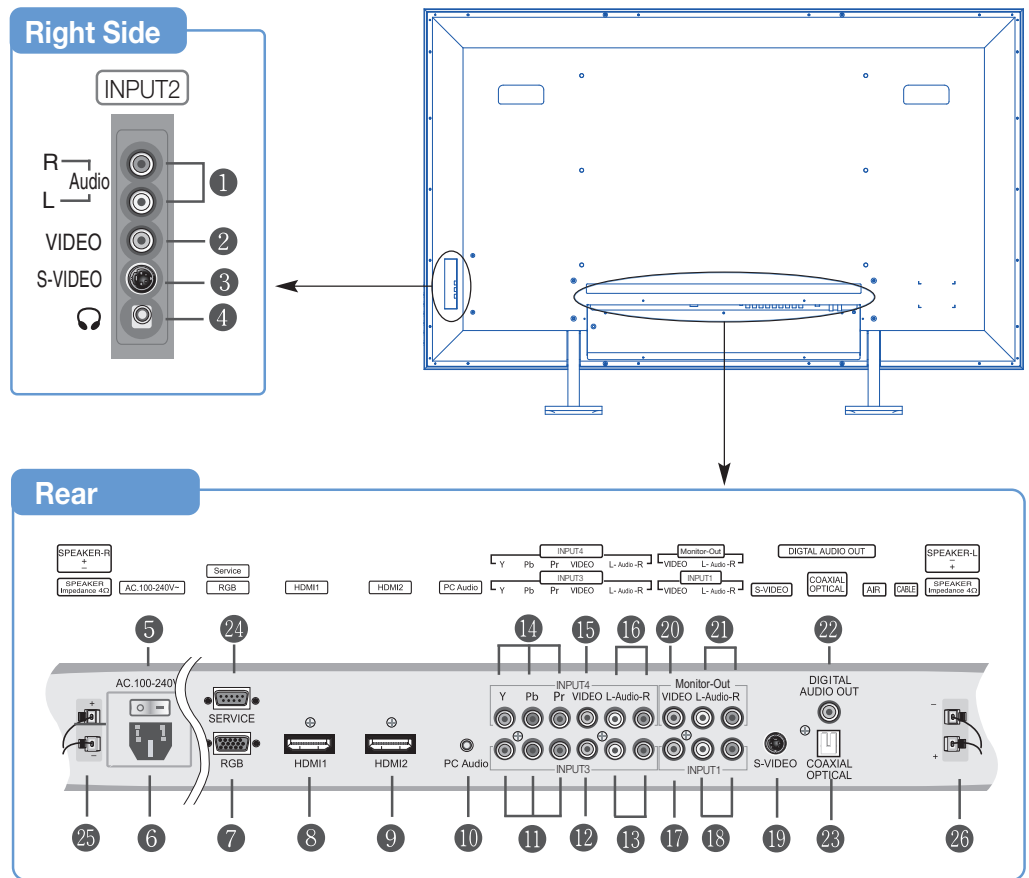

Figure 2-2. Crystal Series LCD Rear-Panel Inputs and Outputs

1. **INPUT2 Audio Input**

2. **INPUT2 Composite Video Input**
   Standard composite video input for connecting a VCR, camcorder, laser disc player or other composite video source.

3. **INPUT2 S-Video Input**
   Standard S-Video input for connecting a DVD player, satellite receiver or Super VHS (S-VHS) VCR.

4. **Headphone Jack**

5. **Main Power Switch**

6. **Power Input (100 to 240 VAC)**
   Connect the Crystal Series LCD to power here.

7. **RGB**
   A 15-pin VGA connection to a personal computer. The Crystal Series LCD automatically detects the signal resolution.

8. **HDMI1/Computer Input (Digital)**

9. **HDMI2/Computer Input (Digital)**

   Two, HDCP-compliant digital video inputs for connecting a DVD player, personal computer or HD tuner with a DVI or HDMI output.

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

10. **PC Audio Input**
    Connect the audio output from a personal computer here.

11. **INPUT3 Component Video (RCA connectors)**
    Standard-definition (480i/576i) or high-definition (720p/1080i), YPrPb component input. This is the input for component video from sources such as DVD players.

12. **INPUT3 Composite Video Input**

13. **INPUT3 Audio Input**
    Connect the audio output from your Input 3 source here.

14. **INPUT4 Component Video (RCA connectors)**
    Standard-definition (480i/576i) or high-definition (720p/1080i), YPrPb component input. This is the input for component video from sources such as DVD players.

15. **INPUT4 Composite Video Input**

16. **INPUT4 Audio Input**
    Connect the audio output from your Input 4 source here.

17. **INPUT1 Composite Video Input**

18. **INPUT1 Audio Input**
    Connect the audio output from your Input 1 source here.

19. **INPUT1 S-Video Input**

20. **Monitor-OUT (Composite Video)**

21. **Monitor-OUT (Audio)**

22. **DIGITAL AUDIO OUT (S/PDIF – Coaxial)**

23. **DIGITAL AUDIO OUT (TosLink – Optical)**

    Connect either #22 or #23 to the digital audio input of an A/V amplifier with a Dolby Digital® decoder.

24. **RS-232 CONTROL PORT**
    A female, 9-pin D-sub connector for interfacing with a PC or home theater automation/control system.

25. **SPEAKER OUTPUT (RIGHT)**

26. **SPEAKER OUTPUT (LEFT)**

    For connection of the right (25) and left (26) speakers. Connect a speaker with an impedance of 4 ohms.

Figure 2-3 shows the Crystal Series LCD remote control, and the paragraphs that follow describe its functionality.
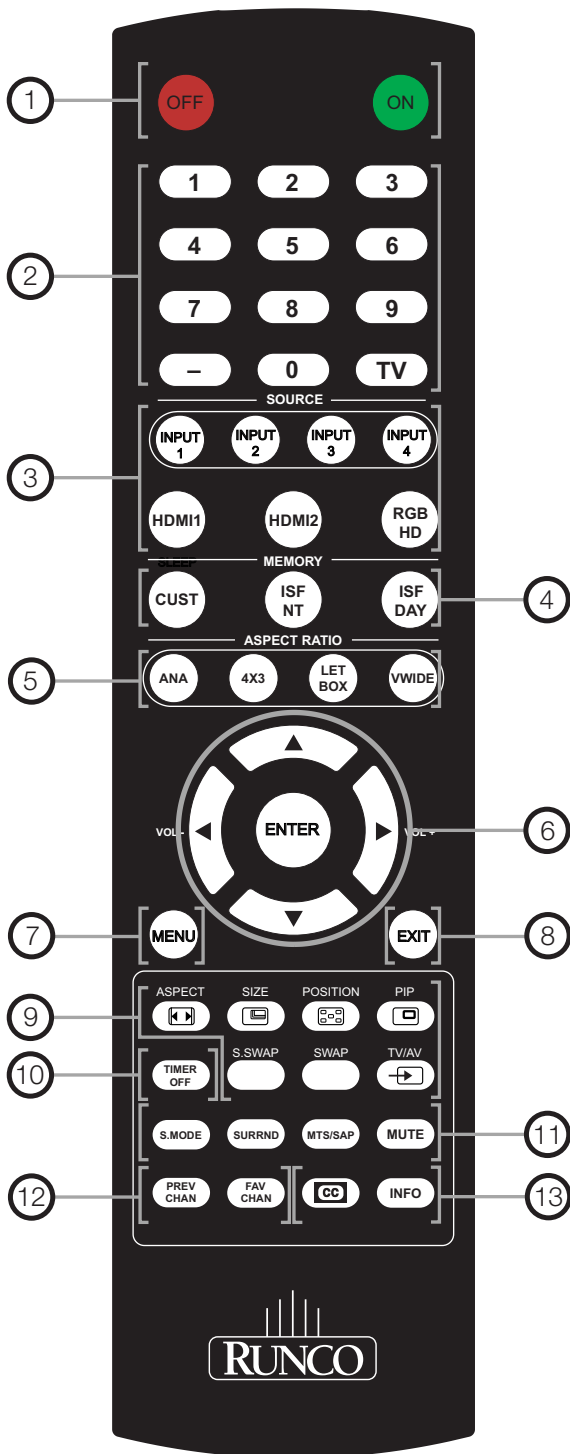
Figure 2-3. Crystal Series LCD Remote Control

1. **OFF / ON**
Use these buttons to turn the Crystal Series LCD on or off.

2. **Numeric Buttons**
Use these buttons to enter menu pass codes.

3. **Source Selection Buttons**

   INPUT 1
   Press this button to switch to Input 1.

   INPUT 2
   Press this button to switch to Input 2.

   INPUT 3
   Press this button to switch to Input 3.

   INPUT 4
   Press this button to switch to Input 4.

   ![Note icon] *Note*   *Input 1 and Input 2 have both S-Video and composite video connectors. Input 3 and Input 4 have both component and composite video connectors.*

   To specify which connection type you are using – or to switch from one to the other if equipment is connected to both – use the Input Selection menu under Setup (refer to **Input Selection** *on page 37).*

   HDMI 1 / HDMI 2
   Use these buttons to select a Digital Video input (HDMI 1 or HDMI 2).

   RGB HD
   Press this button to switch to the RGB HD input.

4. **Memory Preset Buttons**

   CUST
   Press to recall settings for the current input from the "Custom" memory preset.

   ISF NT (Night)
   Press to recall settings for the current input from the "ISF Night" memory preset.

   ISF DAY
   Press to recall settings for the current input from the "ISF Day" memory preset.

5. **Aspect Ratio Selection Buttons**

   ANA (16:9 Anamorphic)
   For 16:9 DVDs or HDTV program material.

   4X3 (Standard 4:3)
   The input signal is scaled to fit 4:3 display mode in the center of the screen.

   LETBOX (Letterbox)
   Image in letterbox format is enlarged to fit 16:9, full-screen display and the upper/lower portions are "blanked off."

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

6. **Arrow Buttons (▲, ◀, ▼, ▶)**
   Use these buttons to select items or settings, adjust settings or adjust sound volume.

   ENTER
   Press to select a highlighted menu item or confirm a changed setting.

7. **MENU**
   Press this button to access the on-screen display (OSD) controls, or to exit the current menu and return to the previous one.

8. **EXIT**
   Press this button to hide the OSD controls.

9. **Picture-In-Picture (PIP) Function Buttons**

   ASPECT
   Press to change the aspect ratio of the PIP window from 4:3 to 16:9 or vice versa.

   SIZE
   Press to choose from three PIP window sizes.

   POSITION
   Press to choose the PIP window position (top left, top right, bottom left or bottom right corner).

   PIP
   Press to change the PIP mode (picture-in-picture, picture-by-picture or off).

   P.MODE
   Press to recall settings for the PIP input from either the "ISF Night" or "ISF Day" memory preset.

   S.SWAP
   Press to switch between the main and PIP audio programs.

   SWAP
   Press to swap the main and PIP windows.

   TV/AV
   Press to switch to a different PIP video source.

10. **TIMER OFF Button**
Press this button to set the sleep timer. Press it repeatedly to scroll through the available options (Off, 10, 30, 60, 120 or 180 minutes).

11. **Sound Control Buttons**

S.MODE
Press this button repeatedly to scroll through the available Equalizer presets (Custom, Standard, Music, Film or Speech).

SURRND (Surround)
Press this button to turn Surround Mode on or off.

MTS/SAP
Press this button to select Mono or Stereo sound output.

MUTE
Press this button to mute the audio output to the speakers and headphones.

12. **PREV CHAN / FAV CHAN**
Not used.

13. **Miscellaneous Functions**

`CC`
Not used.

INFO
Press this button to view input signal information (source and resolution), audio format (mono or stereo) and current time.

3. Installation

To install batteries in the remote control:

◄ *Battery Installation*

1. Slide the battery cover in the direction of the arrow and remove it.

2. Insert the included batteries. Ensure that the polarities correctly match the ⊕ and ⊖ markings inside the battery compartment.

3. Slide the battery cover back on until it snaps into place.

> **Note** *1. Do not mix an old battery with a new one or different types of batteries.*
>
> *2. If you will not use the remote control for a long time, remove the batteries to avoid damage from battery leakage.*

• Do not drop the remote control or expose it to moisture or high temperature.

◄ *Notes on Remote Control Operation*

• The remote control may malfunction under a fluorescent lamp. If that occurs, move the LCD display away from the fluorescent lamp.

• Make sure that there is nothing obstructing the infrared beam between the remote control and the IR receiver on the LCD display.

> **Note** *The signal from the remote control can be reflected by walls or other surfaces.*

• If the effective range of the remote control decreases, or it stops working, replace the batteries with new ones.

• Ambient conditions may possibly impede the operation of the remote control. If this happens, point the remote control at the LCD display and repeat the operation.

3.2
Quick Setup

Table 3-1 gives a quick overview of the Crystal Series LCD 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	Mount the Crystal Series LCD on a wall (optional)	15
2	Connect signal sources to the Crystal Series LCD	15
3	Connect external controller to RS-232 port (optional)	21
4	Apply power to the Crystal Series LCD	23
5	Change the OSD language	23
6	If using the Crystal Series LCD with a PC, adjust PC display properties	24
7	Display calibration: adjust the following ***for each input***; save settings when finished: • Brightness • Contrast • Color level • Tint • Input position	27 through 38

Proper installation of your Crystal Series LCD will ensure the highest possible picture quality. Whether you are installing the Crystal Series LCD temporarily or permanently, you should take the following into account to ensure that it performs optimally.

You can either place the Crystal Series LCD on a table or in an entertainment center, or mount it on a wall.

If you do decide to wall-mount the Crystal Series LCD, ensure that the wall-mount bracket is installed according to the instructions included with it. The wall must be capable of supporting a redundant weight factor three (3) times the weight of the display, or be reinforced.

Runco recommends that this be done by a custom installation specialist.

Note | *Use only the Runco-approved wall-mount kit designed for your display.*

In general, minimize or eliminate light sources directed at the display. Contrast ratio in your images will be noticeably reduced if light directly strikes the display, 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.

Other considerations and tips that can help improve your installation:

- Keep the ambient temperature constant and below 35°C (95°F). Keep the display away from heating and/or air conditioning vents. Changes in temperature may cause drifts in the display circuitry, which may affect performance.

- Keep the Crystal Series LCD away from devices that radiate electromagnetic energy such as motors and transformers. Common sources of these include slide projectors, speakers, power amplifiers and elevators.

Proceed as follows to connect the Crystal Series LCD 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.

- Use the left audio input when connecting mono audio sources.

3.3
Installation Considerations

◄ *Wall-Mounting the Crystal Series LCD*

◄ *Ambient Light*

◄ *Other Considerations*

3.4
Connections to the Crystal Series LCD

Connecting the Crystal ➤
Series LCD to Source
Components

Connect your video sources to the Crystal Series LCD as shown and described in the sections that follow.

HDMI Connections: The Crystal Series LCD has two HDMI inputs for connecting a BD/HD-DVD/DVD player, DTV decoder, personal computer or any other device with an HDMI or DVI output. Connect such devices as shown in Figure 3-1.

![Tip icon] *Tip*

Use the HDMI 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 display.

![Note icon] *Note*

This Crystal Series LCD supports the VESA Display Data Channel (DDC) standard. This standard provides "Plug and Play" capability; the display and a VESA DDC-compatible computer communicate their setting requirements, allowing for quick and easy setup.

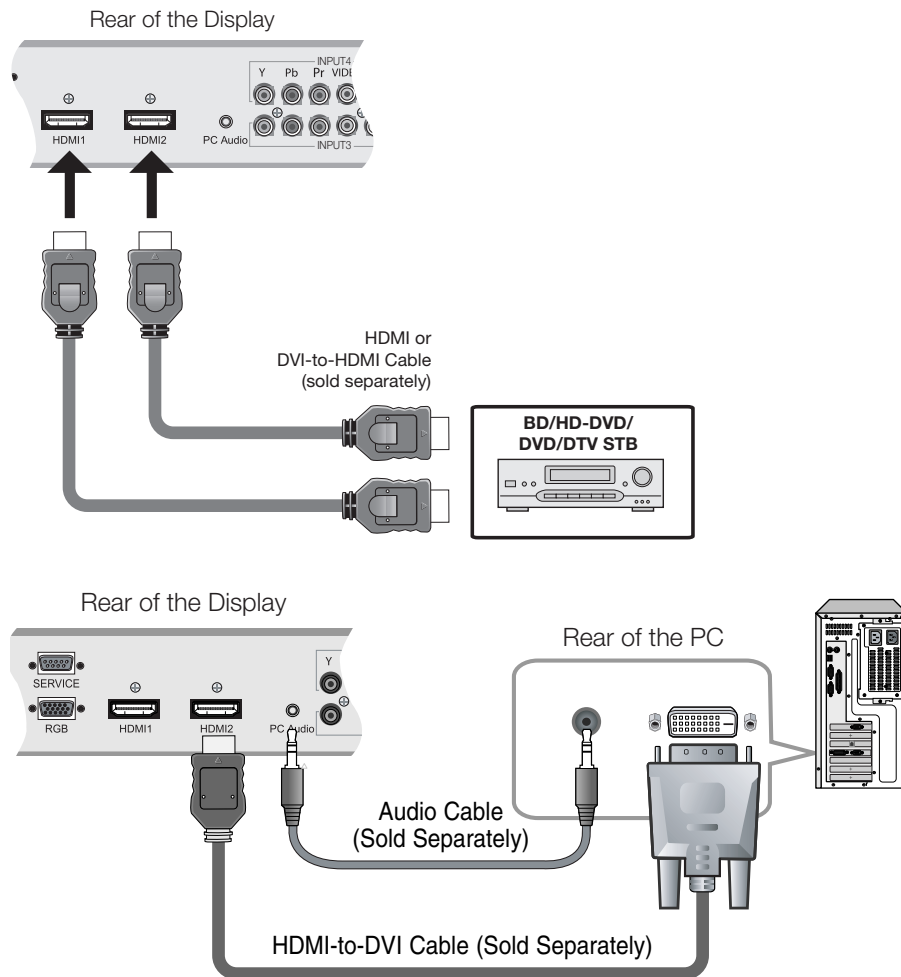*In order for Plug and Play to work correctly, you must turn on the display before you turn on the connected computer.*

Figure 3-1. HDMI Connections

RGB Connections: The Crystal Series LCD has an RGB input for connecting a personal computer; see Figure 3-2.
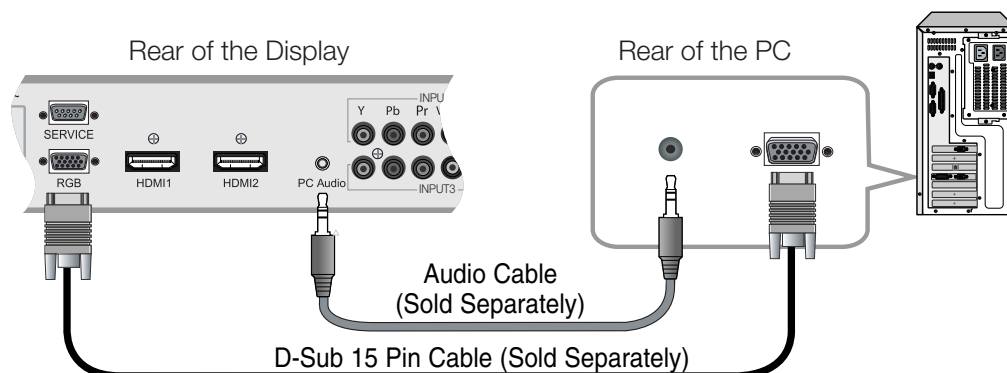

Figure 3-2. Analog RGB Connections

| ![Note] | 1. Refer to **Computer Signal Compatibility** on page 57 for a list of computer signals compatible with the Crystal Series LCD. Use with signals other than those listed may cause some functions not to work. |

Note

1. Refer to **Computer Signal Compatibility** on page 57 for a list of computer signals compatible with the Crystal Series LCD. Use with signals other than those listed may cause some functions not to work.

2. Some Macintosh computers may require a Macintosh video adapter. Contact your nearest authorized service center or dealer.

3. This Crystal Series LCD may not be able to display images from notebook computers in simultaneous (CRT/LCD) mode. Should this occur, switch the notebook computer to "CRT only" mode. If you are unsure how to do this, refer to your notebook computer's user manual.

Component Video Connections: If you have a DVD player or DTV decoder with a component (YPbPr) output, connect it to INPUT 3 or INPUT 4 of the Crystal Series LCD as shown in Figure 3-3.
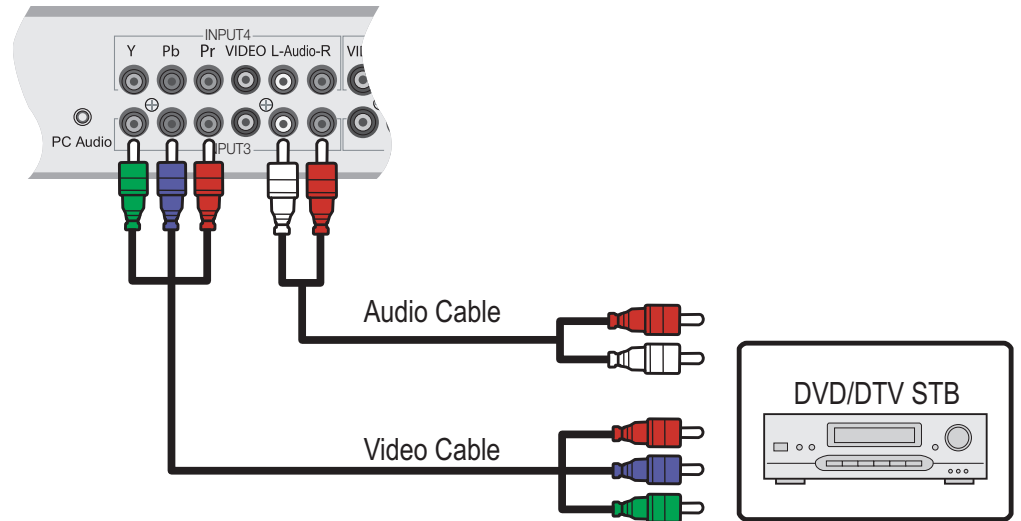

Figure 3-3. Component Video Connections

Composite/S-Video Connections: The Crystal Series LCD has two (2) S-Video and four (4) composite video inputs for connecting a VCR, camcorder, laser disc player or DVD player; see Figure 3-4.
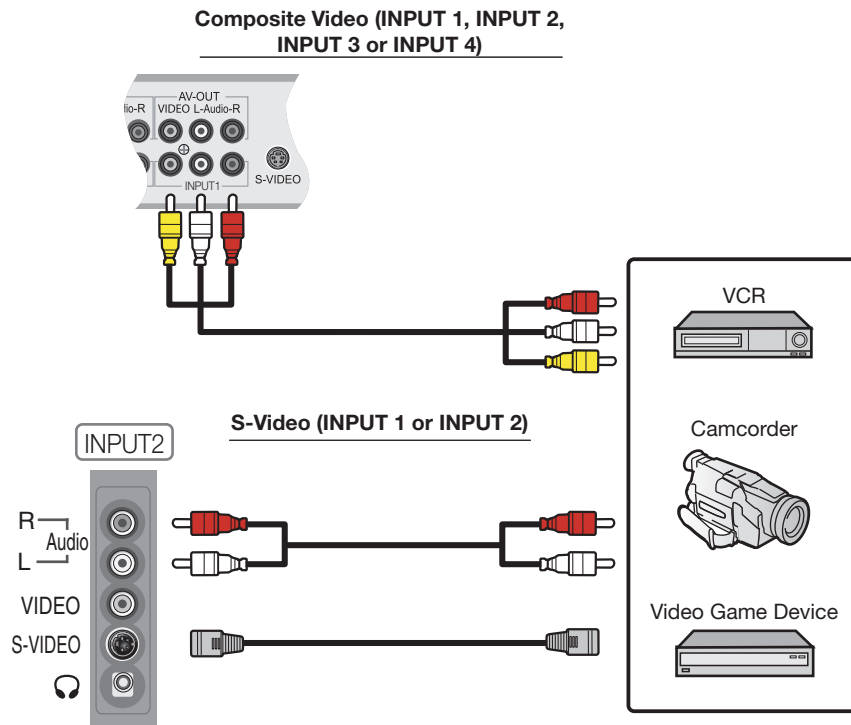

Figure 3-4. Composite and S-Video Connections

The Crystal Series LCD has stereo audio and Composite video outputs for connecting to a second VCR or other auxiliary equipment. Connect the Monitor-OUT audio and video jacks to the audio and video inputs of the VCR or other equipment as shown in Figure 3-5.

◄ *Monitor OUT Connection*

You can route either the main or picture-in-picture (PIP) source signal to the AV output. For more information, refer to **Monitor Out** on page 37.

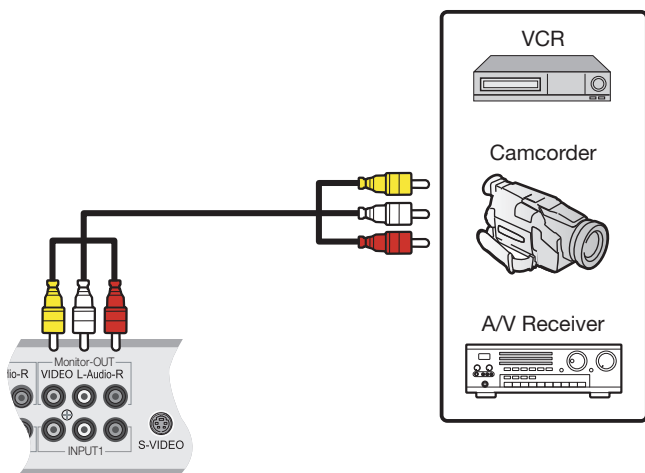|	
⚠ *Note*	*The audio output level is fixed. (The volume and mute controls affect only the speaker and headphone outputs.)*

Figure 3-5. Monitor-OUT Connections

You can connect a set of headphones to the Crystal Series LCD to watch a program without disturbing others. Connect them to the headphone output located at INPUT2; see Figure 3-6.

◄ *Connecting Headphones*
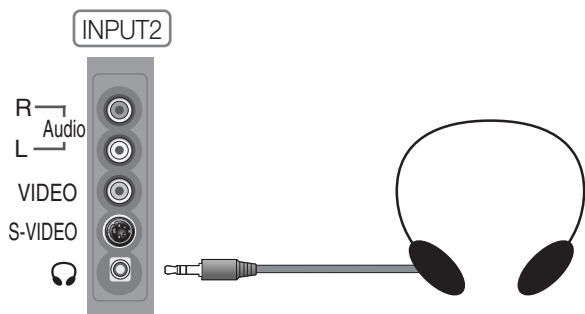
Figure 3-6. Connecting Headphones

Connecting External ➤
Speakers (Optional)

Connect the ⊕ (positive) and ⊖ (negative) speaker wires to the rear-panel SPEAKER-R and SPEAKER-L terminals; see Figure 3-7. **Maintain the correct polarity.** For more information, refer to the owner's manual for your speakers.
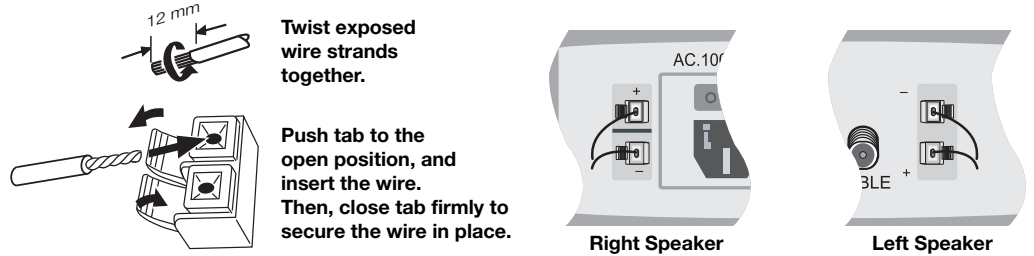
Figure 3-7. External Speaker Connection

Connecting to a Dolby ➤
Digital Amplifier

If your home theater has a Dolby Digital amplifier or receiver, connect the digital audio output from the Crystal Series LCD to the digital audio input of the amplifier/receiver as shown in Figure 3-8. The Crystal Series LCD supports both coaxial (S/PDIF) and optical (TosLink) digital audio connections.

> *Note* — *The audio output level is fixed. (The volume and mute controls affect only the speaker and headphone outputs.)*
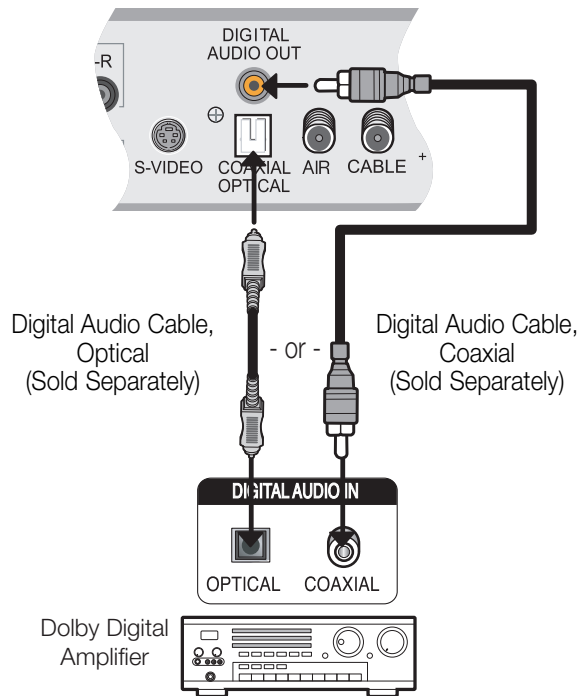
Figure 3-8. Digital Audio Connection

Use a straight-through RS-232 cable with a 9-pin male connector to connect a PC or home theater control/automation system (if present) to the RS-232 port on the Crystal Series LCD; see Figure 3-9.

◄ *RS-232 Controller Connection*

For more information about using this connection, refer to **Serial Communications** on page 49.

DB-9 Male

To PC or Automation/ Control System

SERVICE

RGB   HDMI1   HDMI2

Rear Panel

Connector Pin Assignments:

2	Transmit Data
3	Receive Data
5	Ground
1, 4, 6, 7, 8, 9	Not Connected
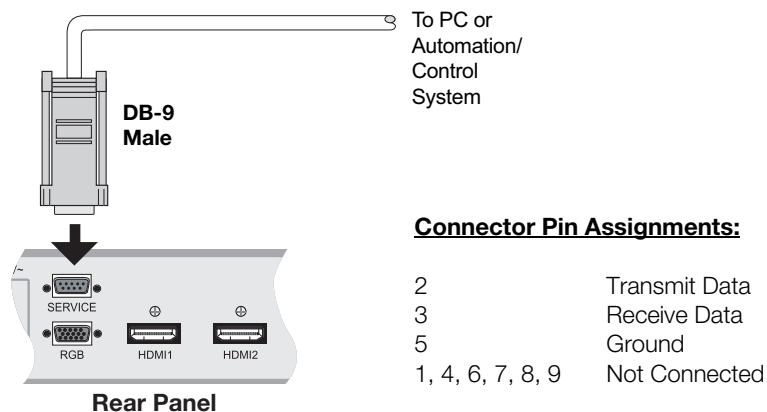
Figure 3-9. RS-232 Control System Connection

Notes:

4. Operation

1. Turn on your source components.

2. Plug the female end of the supplied power cord into the AC receptacle on the rear of the Crystal Series LCD (AC 100V ~ 240V). See Figure 2-2.

3. Connect the other end to your AC power source.

4. Turn on the main power switch at the rear of the display. The power indicator lights red to indicate that the Crystal Series LCD is in "standby" mode.

5. Press the **ON** button on the remote control to turn on the display (or press the power button on the side of the display). The power indicator lights solid green.

6. After a brief warm-up period (approximately 10 seconds), the Crystal Series LCD will display an image.
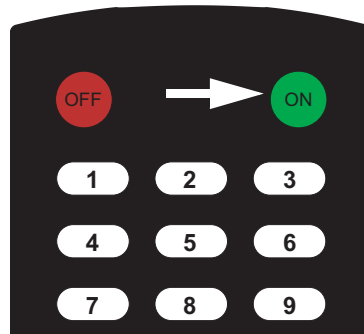
The Crystal Series LCD OSD language is initially set to English, but can also display the menus in French, Spanish, Portuguese or German. To change the OSD language:

1. Press **MENU**.

2. Select **Setup** from the Main Menu.

3. Select **OSD Language** from the Setup Menu.

4. Press ▲ or ▼ to highlight the desired language and press **ENTER**. The change takes effect immediately.

**4.2
Changing the OSD
Language**

4.3
Setting the PC Display Properties

To maximize image quality when using the Crystal Series LCD with a personal computer, you may need to adjust the display properties of your PC video card. To do this:

1. Choose Settings from the Windows Start menu and click on "Control Panel."

2. Double click on the **Display** icon.

3. Click the **Settings** tab on the display dialog box.

4. Set the Screen area to 1920x1080 pixels.

5. Click the **Advanced** button and click the **Monitor** tab on the dialog box. Set the Refresh Frequency to 60Hz and click **OK**.
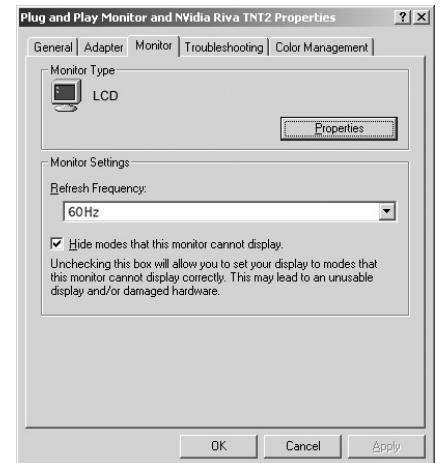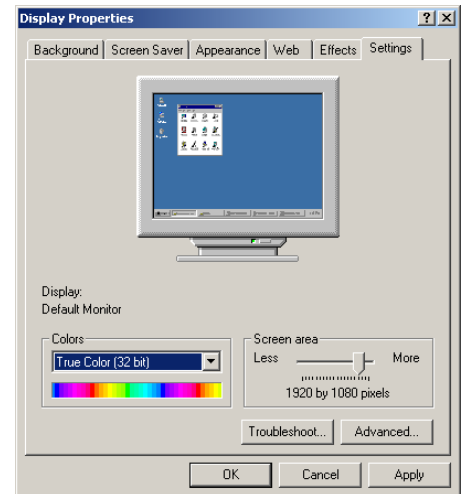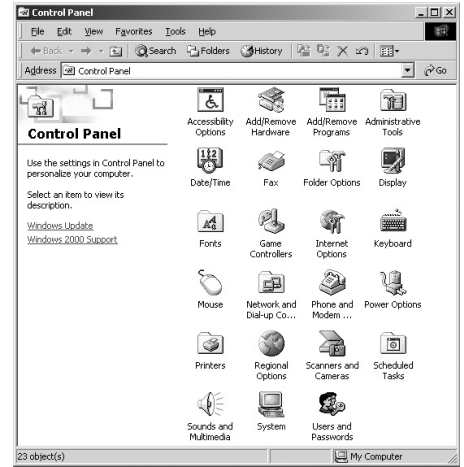
Note

1. *The maximum available resolution and vertical frequency is 1920x1080/60Hz or the maximum supported by your video card, whichever is lower. You can get the best picture at 1920x1080/60Hz.*

2. *The Crystal Series LCD supports 24-bit color (16,777,216 possible colors).*

4.4 Using the On-Screen Menus

To use the on-screen menus:

1. Press **MENU** to display the Main Menu.

2. To select a menu item, use the up- or down-arrow buttons (▲, ▼) on the remote control to highlight it.

3. Press **ENTER** or the right-arrow button (▶) to access that menu.

4. Use the up- or down-arrow buttons (▲, ▼) to select the setting you want to change. Then, press **ENTER** or the right-arrow button (▶).

5. Press the right- or left-arrow button (◀, ▶) to change that setting.

6. To return to the previous menu, press **MENU** or (◀).

The Crystal Series LCD OSD menus are arranged hierarchically, as shown in Figure 4-1. Depending on the selected input source and/or signal characteristics, some menu options may not be available.

Source	Input1		
	Input2		
	Input3		
	Input4		
	RGB		
	HDMI1		
	HDMI2		

Aspect Ratio	16:9
	4:3
	Letterbox
	VirtualWide

Picture Adjust	Brightness	0, 1, 2, 3 ... 100
	Contrast	
	Color	
	Tint	
	Sharpness	0, 5, 10, ... 100
	DNR	0, 10, 20, ... 100
	MPEG NR	0, 1, 2, 3 ... 63
	Backlight	0, 5, 10, 15, 20, ... 100
	Color Temp.	5400, 6500, 8500 or Custom
	Gamma	2.00, 2.02, 2.04 ... 2.40
	Save Settings	Custom
	Restore Settings	Custom, ISF Day, ISF Night

Audio	Balance	L10, L9, L8 ... 0 ... R8, R9, R10
	Equalizer	Standard, Music, Film, Speech or Custom
	Surround	(On/Off)
	Speaker	(On/Off)
	Audio Delay	0, 1, 2 ... 40 msecs.

Timer	Time	12:00 AM - 11:59 PM
	On Timer	Enable/Disable, Time, Input, Volume
	Off Timer	Enable/Disable, Time
	Sleep Timer	Off, 10, 30, 60, 120 or 180 minutes

Setup	OSD Language	English, Français, Español, Português or Deutsch	
	PC Mode Adjust	Auto Adjust	
		Clock	
		Phase	
		H. Position	
		V. Position	
		Factory Reset	
	Caption	Display	On / Off
		Digital	Service1, Service2, Service3 ... Service6
		Analog	CC1, CC2, CC3 or CC4 Text1, Text2, Text3 or Text4
		CC On Mute	Yes / No
		Digital Font Option	Control
			Font Size
			Font Style
			FG Color
			BG Color
			Edge Color
			FG Opacity
			BG Opacity
			Edge Style
	Parental Control	Parental Lock (On/Off), TV Rating, Movie Rating, Unrated (Allow/Block), Change PIN (default is 0000)	
	Letterbox Mode	Letterbox or Cinema Fill	
	Input Selection	Input 1/Input 2	Automatic, Video or S-Video
		Input 3/Input 4	Automatic, Video or Component
	Monitor Out	Main or PIP: Video	
	Overscan (not available with PC signals)	H. Overscan, H. Shift, V. Overscan, V. Shift	
	Input Label		
	HDMI Audio	HDMI or PC	
	RGB Signal	Video or PC	
	Film Mode	Off, 2:3, 2:2 or Auto	
	Auto Backlight	Off / On	
	OSD Timer	0, 10, 20 ... 60 sec.	
	Auto Off	0, 30, 60 or 120 min.	
	HDMI CSC	HDMI 1 / HDMI 2	Automatic, RGB or Component

ISF Calibration	Picture Adjust	Brightness	Automatic, RGB or Component
		Contrast	0, 1, 2, 3 ... 100
		Color	
		Tint	
		Sharpness	0, 5, 10, ... 100
		ADC Phase Adj.	0, 1, 2, 3 ... 63
		DNR	0, 10, 20, ... 100
		MPEG NR	0, 1, 2, 3 ... 63
		Backlight	0, 5, 10, 15, 20, ... 100
		Color Temp.	5400, 6500, 8500 or Custom
		Gamma	2.00, 2.02, 2.04 ... 2.40
		Black Level	0, 1, 2, 3 ... 64
		Save Settings	Custom, ISF Day, ISF Night
	White Balance	R/G/B Gain	
		R/G/B Offset	
	Blue Enable	(Enable/Disable)	
	Baud Rate	115200, 19200, 9600 or 2400	
	Serial Link	On / Off	
	Factory Reset		
	Splash Duration	0, 1, 2, 3, ... 60 secs.	

Figure 4-1. Crystal Series LCD OSD Menu Structure

The Main Menu is the starting point for accessing all Crystal Series LCD functions.

(The ISF Calibration menu is not accessible until you enter a passcode.)

Runco CX-52HD
Source
Aspect Ratio
Picture Adjust
Audio
Timer
Setup
ISF Calibration

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

The active source is indicated by an arrow (>) to its left; in this example, Input 1 is the active source.

> **Input1**
Input2
Input3
Input4
RGB
HDMI1
HDMI2

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.

The currently-selected aspect ratio is indicated by an arrow (>) to its left; in this example, 16:9 is selected.
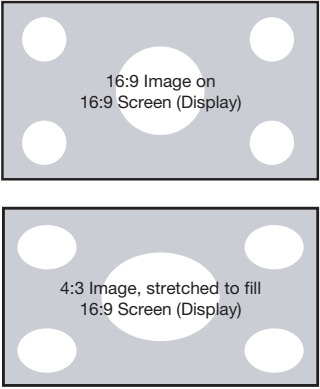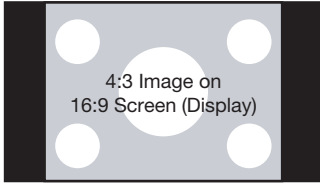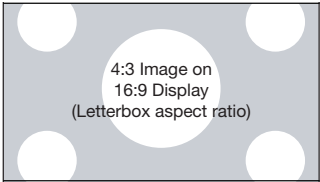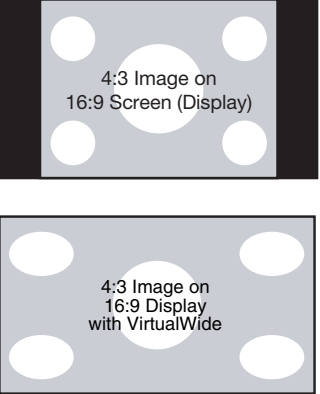
> **16:9**
4:3
Letterbox
VirtualWide

Note

The aspect ratio selection persists until you change it. (It is not saved independently for each input.)

Table 4-1. Aspect Ratio Settings

Aspect Ratio	Remote Control Key	Description	
16:9	ANA	16:9 Image on 16:9 Screen (Display)	Select 16:9 to view 16:9 DVDs and HDTV programs in their native aspect ratio.
		4:3 Image, stretched to fill 16:9 Screen (Display)	4:3 images are stretched horizontally to fit a 16:9 display.
4:3	4X3	4:3 Image on 16:9 Screen (Display)	4:3 scales the input signal to fit in the center of a 16:9 display. 4:3 is the aspect ratio used by computer monitors, standard television programming and most VHS video cassettes.
Letterbox	LET BOX	4:3 Image on 16:9 Display (Letterbox aspect ratio)	Letterbox mode scales (zooms in on) a 4:3 image linearly (by the same amount on all sides) to fill a 16:9 display. Letterbox is best suited for viewing LaserDisc movies or non-anamorphic DVDs on a 16:9 screen.
VirtualWide	VWIDE	4:3 Image on 16:9 Screen (Display)	VirtualWide scales a 4:3 image NON-linearly (more on the sides than in the center) to fit a 16:9 screen.
		4:3 Image on 16:9 Display with VirtualWide	

Use the controls in the Picture Adjust menu to calibrate your Crystal Series LCD for optimum picture quality.

The Crystal Series LCD 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.

◄ ***Picture Adjust***
Picture Adjust
Brightness
Contrast
Color
Tint
Sharpness
DNR
MPEG NR
Backlight
Color Temp.
Gamma
Save Settings
Restore Settings

![Note icon] **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 **Save Settings** on page 33.*

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 – Ovation Multimedia, Digital Video Essentials or AVIA 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.
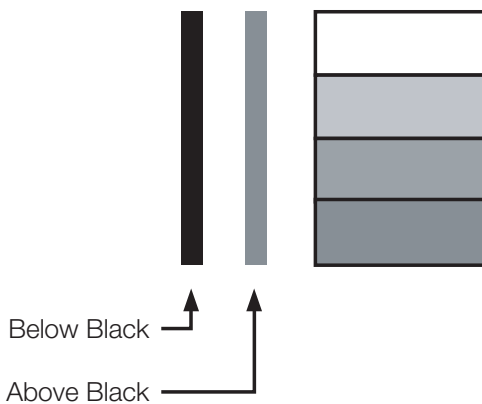

Below Black

Above Black

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 Adjust menu. Using the left- and right-arrow (◀ ▶) buttons, 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 from the Picture Adjust menu. Using the left- and right-arrow (◀ ▶) buttons, 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.
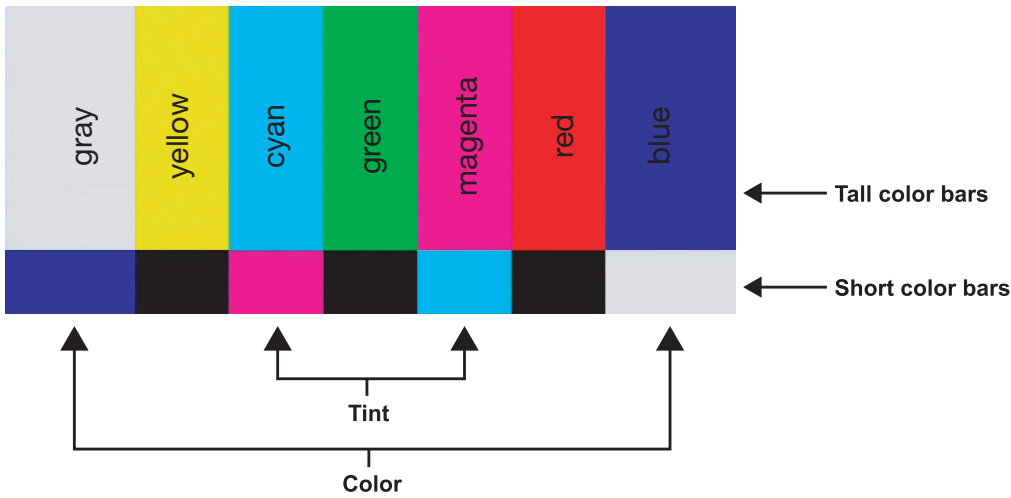
Figure 4-4. Typical Color Bar Pattern for Adjusting Color Saturation and Tint

Select Color from the Picture Adjust menu. 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:
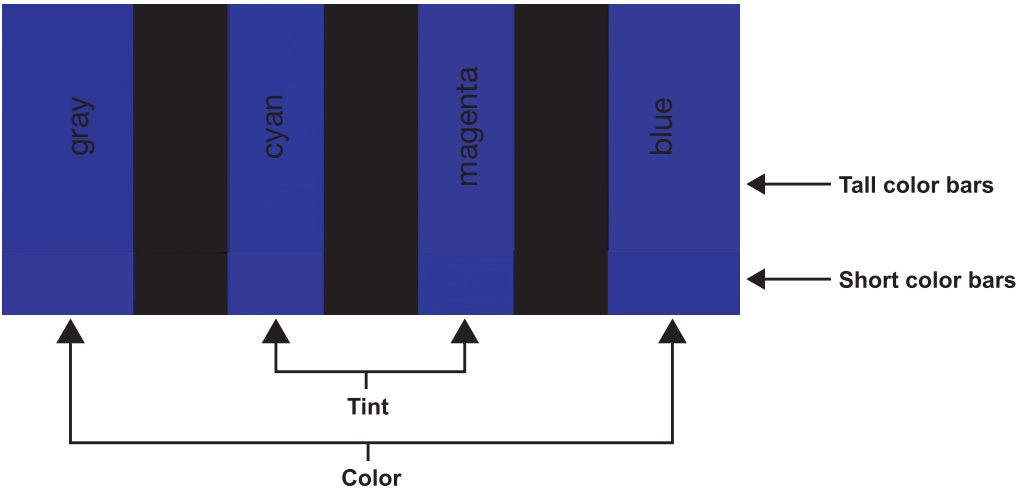
Tint: Tint or "hue" is essentially the ratio of red to green in the color portion of the image. When tint is decreased, the image appears redder; when it is increased the image appears greener. To set the tint, select Tint from the Picture Adjust menu. While looking at the color bar pattern through a 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 Adjust 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 different sized lines in the "sweep" patterns at the top and bottom. Lower the sharpness setting to eliminate them.
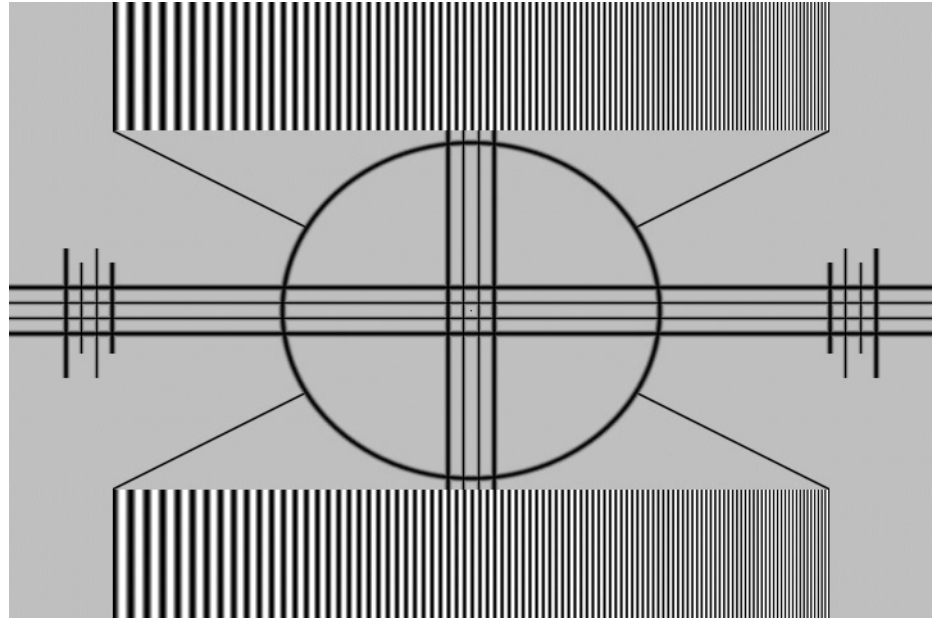

Figure 4-5. Typical Test Pattern for Adjusting Sharpness

DNR: To apply Digital Noise Reduction (DNR) to the input signal, select DNR from the Picture Adjust menu. Noise reduction is useful for clearing up noisy RGB images such as those from a PC. Adjust as desired using the left- or right-arrow buttons, keeping in mind that reducing noise (which reduces high frequencies) may also "soften" the image.

MPEG NR: Use the MPEG Filter to reduce or eliminate so-called "mosquito noise" in MPEG-compressed video signals (digital broadcasts or DVDs). Adjust as needed to minimize distortion around the edges of moving objects, moving artifacts around edges and/or blotchy noise patterns superimposed over the objects.

Backlight: The Backlight control changes the apparent brightness of the displayed image. Its effect is similar to that of a lamp intensity control on a projector.

Note	*The Backlight control is disabled when Auto Backlight (described on page 38) is set to On.*

Color Temperature: To choose a color temperature setting, select Color Temp. from the Picture Adjust menu and press **ENTER**. (Color temperature defines the "color of gray.") The choices are 5400K, 6500K, 8500K and Custom. The default setting, 6500K, is appropriate for most situations. Higher settings produce a "bluer" picture; lower ones impart a reddish hue to the image.

Each color temperature setting has six (6) "white balance" parameters associated with it (two each for red, green and blue). These are described later in this section; refer to **White Balance** on page 40.

Gamma: The Gamma control 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, Gamma allows you to lighten or darken the overall tone of your images without changing the extremes. All images will be more vibrant while still showing good detail in dark areas.

The default Gamma setting of 2.20 is appropriate for most typical home theater environments.

Save Settings: The Crystal Series LCD lets you save image quality settings for each input and supported resolution to a preset. You can recall this preset at a later time by simply pressing a button on the remote control or using the Restore Settings menu command (see below).

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:

- Brightness
- Contrast
- Color saturation
- Tint
- Sharpness
- Gamma
- Color temperature selection (5400, 6500, 8500 or Custom)

Restore Settings: To recall a preset, choose Restore Settings from the Picture Adjust menu and select "Custom," "ISF Day" or "ISF Night." Or, use the corresponding buttons on the remote control.

To adjust the Crystal Series LCD audio settings, select Audio from the Main Menu and press **ENTER**.

Balance: To adjust the left/right speaker balance, select Balance from the Audio Menu and press **ENTER**. Use the left- and/or right-arrow buttons to make one channel louder than the other.

Equalizer: The Crystal Series LCD has a five-band graphic equalizer that you can use to boost or cut certain audio frequencies. To use it, select Equalizer from the Audio menu and press **ENTER**. Select one of four equalizer presets – Standard (flat), Music, Film or Speech – or select Custom to create your own according to taste. The five frequency bands are 100, 300, 1000, 3000 and 10,000 Hertz (Hz).

◄ *Audio*

Audio
Balance
Equalizer
Surround
Speaker
Audio Delay

Surround: The Crystal Series LCD has a "surround sound" mode that simulates a multi-channel sound system. To use the surround mode, select Surround from the Audio menu and set it to On.

> **Note** *When Surround is set to On, the graphic equalizer is disabled.*

Speaker: To disable the speakers, select Speaker from the Audio menu, set it to Off and press **ENTER**. The effect is similar to using the **MUTE** button, except that the Crystal Series LCD "remembers" this setting if you turn off the display, then turn it back on.

Audio Delay: Use the Audio Delay control to correct audio/video synchronization issues that can occur with some types of source material. Select from 0 to 40 milliseconds of delay, as needed.

Timer ➤ To set the Crystal Series LCD's internal clock or configure the on/off timers, select Timer from the Main Menu and press **ENTER**.

Timer
Time
On Timer
Off Timer
Sleep Timer

Time: To set the Crystal Series LCD internal clock, select Time from the Timer menu and press **ENTER**. Then, use the up- or down-arrow button to select the hour of the day, AM/PM or the minute of the hour to set. Then, use the left- or right-arrow buttons to set that component of the time.

When finished, press **MENU** or **EXIT**.

On Timer: Use the On Timer to turn the Crystal Series LCD on at a specific time of day. You can also specify a source input and volume level.

Off Timer: Use the Off Timer to turn the Crystal Series LCD off at a specific time of day.

Sleep Timer: Use the Sleep Timer to turn off the Crystal Series LCD after a specified interval.

To set the Sleep Timer:

• Select Sleep Timer from the Timer menu and press **ENTER**. Use the right- or left-arrow button to select 10, 30, 60, 120 or 180 minutes. Then, press **MENU**.

– OR –

• Press the **TIMER OFF** button on the remote control repeatedly to select the desired timer interval.

Use the controls in the Setup menu to perform advanced image quality adjustments and access various other Crystal Series LCD features.

OSD Language: Select OSD Language from the Setup menu and press **ENTER**. Then, use the up- or down-arrow buttons to select the OSD language (English, French, Spanish, Portuguese or German). Press **ENTER** again to confirm your selection.

PC Mode Adjust: To improve the quality of displayed images from a computer or other VESA-compliant, RGB (480p or higher) source, select PC Mode Adjust and press **ENTER**.

- **Auto Adjust:** Auto Adjust automatically adjusts settings to optimize computer images. To execute Auto Adjust on command, select Auto Adjust and press **ENTER**.

> **Note**   *Auto Adjust may take some time to complete, depending on the characteristics of the incoming signal.*

- **Clock:** Use the up- or down-arrow buttons (▲, ▼) to highlight Clock. Then, use the right-arrow button (▶) to increase the pixel clock rate; use the left-arrow button (◀) to decrease it.

- **Phase:** Adjust the phase if the image shows shimmer or "horizontal 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.)

- **H Position:** Use the up- or down-arrow buttons (▲, ▼) to highlight H Position. Then, use the right-arrow button (▶) to shift the image to the right; use the left-arrow button (◀) to shift the image to the left.

- **V Position:** Use the up- or down-arrow buttons (▲, ▼) to highlight V Position. Then, use the right-arrow button (▶) to shift the image up; use the left-arrow button (◀) to shift the image down.

To restore the factory-default Clock, Phase and Position settings, select Factory Reset and press **ENTER**.

Caption: Select Caption from the Setup menu to control the display of closed captions when watching programs that contain them.

- **Display:** Select On or Off to control the display of closed captions.

- **Digital:** For digital TV broadcasts, select one of six captioning modes (Service1, Service2 ... Service6). Service1 usually contains the native-language captions; if a program is captioned in more than one language, those captions are carried on Service2 through Service6.

- **Analog:** Select one of four captioning modes: CC1, CC2, CC3 or CC4. CC1 usually contains the native-language captions; if a program is captioned in more than one language, those captions are carried on CC2, CC3 or CC4.

  The Crystal Series LCD also supports "text mode" captioning; to use this feature, select Text1, Text2, Text3 or Text4. The text modes, instead of displaying a few lines of captions somewhere on the picture, take over all or half of the screen to display scrolling text information. (The text modes are seldom used today, so most of the time

◀ *Setup*

Setup
OSD Language
PC Mode Adjust
Caption
Parental Control
Letterbox Mode
Input Selection
Monitor Out
Overscan
Input Label
HDMI Audio
RGB Signal
Film Mode
Auto Backlight
OSD Timer
Auto Off
HDMI CSC

there is no information there to see.) The text field is sometimes used for embedding Internet data (called Interactive TV Links, or ITV Links) in the captions.

- **CC On Mute:** To have the Crystal Series LCD show captions when the audio output is muted, set this option to Yes.

- **Digital Font Option:** Select Digital Font Option from the Caption menu to customize the appearance of closed captions in digital TV broadcasts.

  - **Control:** Select Program to view the closed captions as presented by the broadcaster. Or, select User to override the program's closed caption formatting.

  - **Font Size/Font Style:** These settings alter the size and typeface of closed captions.

  - **FG Color/BG Color/Edge Color:** These settings alter the text color, background color and text border color respectively.

  - **FG Opacity/BG Opacity:** These settings alter the degree to which the program "shows through" the captions.

  - **Edge Style:** This setting alters the text border style.

Parental Control: To block the display of television programs or movies based on their ratings, select Parental Control from the Setup menu and press **ENTER**. Enter the default Personal Identification Number (PIN) – **0000** – and press **ENTER** again.

- **Parental Lock:** This is the "master switch" for the parental controls. Set it to On on Off.

- **TV Rating:** Select TV Rating from the Parental Control menu to block television programs carrying a given rating, to prevent children from watching programs that are deemed inappropriate. These ratings and content labels have been established by the United States Federal Communications Commission (FCC) to help parents and other caregivers determine if a program is suitable for young viewers.

  To block programs carrying a given rating, use the up- or down-arrow to select a rating. Then, press the right-arrow button to require the PIN code to be entered to view a program with that rating. A lock icon (🔒) appears to indicate that the restriction is active.

  Table 4-2 describes the TV ratings and content categories. For more information, visit http://www.fcc.gov/parents/parent_guide.html.

Table 4-2. FCC Ratings and Content Categories

Rating/Category	Description
TV-MA	Mature Audience Only - graphic violence, explicit sexual content and/or offensive language
TV-14	Parents strongly cautioned - intense violence, sexual situations, coarse language and/or suggestive dialogue
TV-PG	Parental guidance suggested - violence, sexual situations, coarse language and/or suggestive dialogue
TV-G	General audience – suitable for children and adults
TV-Y7	Children 7 and up
TV-Y	Suitable for all children
FV	Fantasy violence or cartoon violence
D	Sexual dialogue

Table 4-2. FCC Ratings and Content Categories (continued)

Rating/Category	Description
L	Offensive language
S	Sexual content
V	Violence

- **Movie Rating:** Select Movie Rating from the Parental Control menu to block movies carrying a given rating, to prevent children from watching movies that are deemed inappropriate. These ratings have been established by the Motion Picture Association of America (MPAA) to help parents and other caregivers determine if a movie is suitable for young viewers.
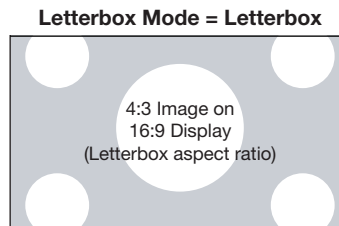
  To block movies carrying a given rating, press the right-arrow button to require the PIN code to be entered to view a movie with that rating. A lock icon (🔒) appears to indicate that the restriction is active.

  For more information on movie ratings, please visit http://www.mpaa.org/movieratings/.
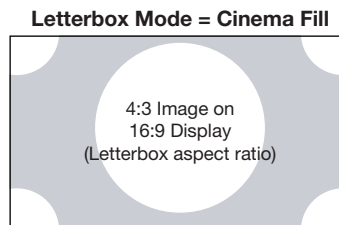
- **Unrated:** To allow or block access to unrated content, select Unrated from the Parental Control menu and select Allow or Block. Press **ENTER** to confirm your choice.

- **Change PIN:** The default PIN for accessing the parental controls or bypassing content restrictions is **0000**. Runco recommends changing this to something less obvious.

Letterbox Mode: Select Letterbox Mode from the Setup menu to change the zoom factor that takes effect when you select the Letterbox aspect ratio (refer to Table 4-1).

When you select Letterbox, the image is enlarged (zoomed in) by a factor of approximately 1.33.

When you select Cinema Fill, the zoom factor is approximately 1.77 (1.33 x 1.33).

Letterbox Mode = Letterbox

4:3 Image on
16:9 Display
(Letterbox aspect ratio)

Letterbox Mode = Cinema Fill

4:3 Image on
16:9 Display
(Letterbox aspect ratio)

Input Selection: Input 1 and Input 2 have both S-Video and Composite video connectors. Input 3 and Input 4 have both Component and Composite video connectors. To specify which connection type you are using – or to switch from one to the other if equipment is connected to both – select Input Selection from the Setup menu and press **ENTER**.

The default setting for all four AV inputs is **Automatic**. With this setting, the Crystal Series LCD searches for an active source on both connectors and displays the first one it detects. If equipment is connected to both, Automatic input selection triggers a switch when a source component is disconnected or powered off.

Monitor Out: If you have equipment connected to the AV OUT, select Monitor Out from the Setup menu to route either the main or PIP audio/video signals to that output.

Overscan (not available with PC signals): 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. Overscan effectively trims away these inactive, outer edges and enlarges the remaining portion of the image to fill the display area.

Use the on-screen slidebars to set the desired amount of horizontal and vertical overscan, as well as horizontal and vertical image shift.

These settings only affect 480i source material. For HDTV, DVDs and other video sources, Overscan is generally not necessary or desirable.

Input Label: You can give each Crystal Series LCD input a descriptive name. To do this, select Input Label from the Setup menu and choose one from the list.

HDMI Audio: If the HDMI source is a PC or other device that does not support audio output via HDMI, set HDMI Audio to PC.

If the source does support audio output via HDMI, set this option to HDMI to route the HDMI (digital) audio signal to the speakers when HDMI1 or HDMI2 is selected.

RGB Signal: The RGB input supports both DTV and VESA (computer) resolutions and signal timings. If the RGB source is a computer, select PC. If it is a DTV set-top box or other equipment with an RGB output, select Video.

Film Mode: To smooth out moving images from interlaced, standard-definition (SD) sources, select Film Mode and set it to Automatic.

In most cases, the Crystal Series LCD detects the proper "pull-down" rate and vertical frequency. However, if your source is jittery and/or tearing you may wish to specify the pull-down rate (2:2 or 3:2) to ensure stable processing for that source.

Auto Backlight: Select Auto Backlight from the Setup menu and set it to On to have the Crystal Series LCD adjust the Backlight setting automatically, according to the ambient light level in the viewing area.

OSD Timer: Use the ◄ or ► button to set the OSD Timer. This timer controls how long the menus remain on-screen after selecting them. Select from 0 to 60 seconds, in 10-second increments. When you set the OSD to 0, the menus remain on-screen until you hide them by pressing **EXIT**.

Auto Off: Set **Auto Off** to 30, 60 or 120 minutes to have the Crystal Series LCD go into standby mode when no source signal is present for the selected amount of time.

When **Auto Off** is set to zero (0) minutes (disabled), the Crystal Series LCD remains in normal operating mode, regardless of the presence or absence of an input sync signal.

HDMI CSC (Color Space Control): If the color space of the incoming signal on the HDMI1 or HDMI2 input is known, select HDMI CSC from the Setup menu and set it to RGB or Component.

In most situations, the **Auto** setting works well.

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

ISF Calibration
Picture Adjust
White Balance
Blue Enable
Baud Rate
Factory Reset
Splash Duration

![Note] *You must enter a passcode to access the ISF Calibration menu.*

Picture Adjust: The controls in this menu are identical to those in the main Picture Adjust menu, but are accessible only by entering the ISF Calibration menu passcode. This makes it possible to restore the picture quality settings to what they were when the Crystal Series LCD was installed, simply by recalling the "ISF Night" or "ISF Day" preset.

• **Brightness:** Refer to *Brightness* on page 29.

• **Contrast:** Refer to *Contrast* on page 30.

• **Color:** Refer to *Color Saturation* on page 31.

• **Tint:** Refer to *Tint* on page 31.

• **Sharpness:** Refer to *Sharpness* on page 32.

• **ADC Phase Adj.:** This control works similarly to the Phase adjustment for RGB signals (refer to *Phase* on page 35). Use it to improve the apparent sharpness of 720p and lower-resolution Component, S-Video or Composite sources. For best results, adjust ADC Phase while displaying a "Sharpness" pattern (Figure 4-5).

• **DNR:** Refer to *DNR* on page 32.

• **MPEG NR:** Refer to *MPEG NR* on page 32.

• **Backlight:** Refer to *Backlight* on page 32.

• **Color Temp.:** To choose a color temperature setting, select Color Temp. from the Picture Adjust menu and press **ENTER**. (Color temperature defines the "color of gray.") The choices are 5400K, 6500K, 8500K and Custom. The default setting, 6500K, is appropriate for most situations. Higher settings produce a "bluer" picture; lower ones impart a reddish hue to the image.

Each color temperature setting has six (6) "white balance" parameters associated with it (two each for red, green and blue). (The White Balance settings for the 5400K, 6500K and 8500K color temperatures are factory-set and cannot be changed.)

![Tip] *To create a "Custom" color temperature, select Custom from the Color Temp. menu and press* ***ENTER***. *Then, press* ***ENTER*** *a second time to go directly to the White Balance menu. (This shortcut is available only from the ISF Calibration menu.)*

• **Gamma:** Refer to *Gamma* on page 33.

• **Black Level:** This control compensates for incoming elevated black levels present in certain video signals. The default setting (32) results in a minimum black level of approximately 0 IRE. Adjust as needed to match the dynamic range of the source; increase the value if blacks appear elevated (dark gray). If blacks appear "crushed" (too dark), use a lower settting.

- **Save Settings:** For each input and supported resolution, the Crystal Series LCD lets you save image quality settings as presets that you can recall at a later time. You can create up to three presets – designated "Custom," "ISF Day" and "ISF Night" – per input and resolution.

  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:
  - Brightness
  - Contrast
  - Color saturation
  - Tint
  - Sharpness
  - Gamma
  - Color temperature selection (5400, 6500, 8500 or Custom)

  To save image settings to a preset, select Save Settings from the Picture Adjust menu and select "Custom," "ISF Day" or "ISF Night."

White Balance: To remove any trace of color from the white areas of the displayed image, set the Color Temp. to Custom. Then, choose White Balance from the ISF Calibration menu and press **ENTER**.

White Balance	
R Gain	100
G Gain	100
B Gain	100
R Offset	50
G Offset	50
B Offset	50

- **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.

> **Note** *Any white balance adjustments you make here are automatically stored as a "Custom" color temperature. The White Balance settings for the 5400K, 6500K and 8500K color temperatures are factory-set and cannot be changed. **Always set the Color Temp. to Custom before making any white balance adjustments, so you can see how those adjustments affect the image.***

Blue Enable: Blue Enable removes all red and green color information from the image, simulating a blue filter. You can use it instead of a blue filter when performing color and tint adjustments.

Baud Rate: Select Baud Rate from the ISF Calibration menu to set the data transfer rate of the Crystal Series LCD's RS-232 SERVICE port. (This setting must match the data rate of the device connected to the RS-232 input.)

Serial Link: Select Serial Link from the ISF Calibration menu to configure the RS-232 Service port (see Figure 3-9) for normal operation (On) or for software upgrades (Off).

Factory Reset: To reset all Crystal Series LCD settings to their factory defaults, select Factory Reset from the ISF Calibration menu and press **ENTER**. ***This command is not undoable. Use it with caution!***
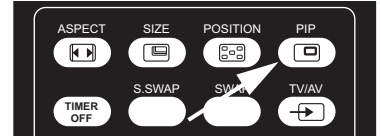
Splash Duration: Use Splash Duration to control how long the Crystal Series LCD splash screen remains on-screen after power-up; see Figure 4-6. To prevent this screen from appearing, set the Splash Duration to 0.
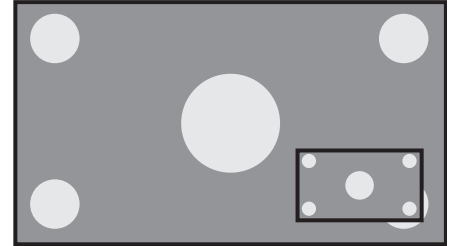

Figure 4-6. Crystal Series LCD Splash Screen
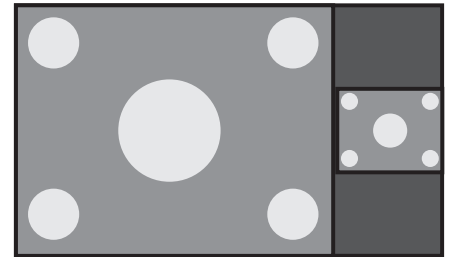
4.5
Using
Picture-In-Picture (PIP)

To use PIP, press the **PIP** () button.

The PIP window appears inside the main image window.

Press **PIP** again to switch to side-by-side PIP mode.

Press **PIP** again to turn PIP off.

Press the **TV/AV** button (⊞) to select a PIP signal source. For each source, Table 4-3 shows which of the other sources are available as a PIP source.

**Table 4-3. Available Main and PIP Source Combinations**

		PIP Input Source								
		INPUT1	INPUT2	INPUT3		INPUT4		RGB	HDMI1	HDMI2
				VIDEO	COMP	VIDEO	COMP			
Main Input Source	INPUT1	–	√	√	√	√	√	√	√	√
	INPUT2	√	–	√	√	√	√	√	√	√
	INPUT3 VIDEO	√	√	–	–	√	√	√	√	√
	INPUT3 COMP	√	√	–	–	√	√	√	√	√
	INPUT4 VIDEO	√	√	√	√	–	–	√	√	√
	INPUT4 COMP	√	√	√	√	–	–	√	√	√
	RGB	√	√	√	√	√	√	–	–	–
	HDMI1	√	√	√	√	√	√	–	–	–
	HDMI2	√	√	√	√	√	√	–	–	–

Notes:

1. *"√" means that that source is available as a PIP source when that input is selected; "–" means that it is not.*

2. *The Crystal Series LCD cannot display the same source in both the main and PIP windows, nor can it display RGB and HDMI (digital) signals simultaneously.*

Changing the PIP Position ➤ To change the PIP window position, press the **POSITION** (▣) button on the remote control repeatedly until the window is in the desired position.
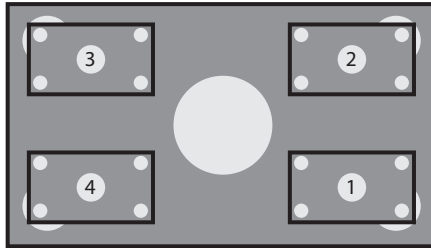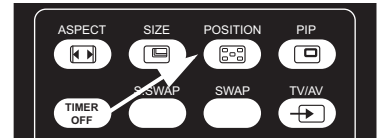
Changing the PIP Size ➤ To change the PIP window size, press the **SIZE** (▣) button on the remote control repeatedly to achieve the desired window size.
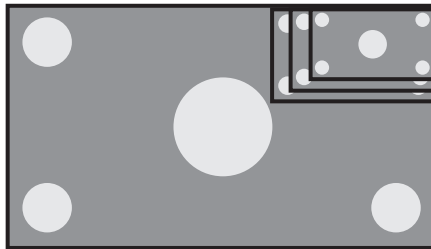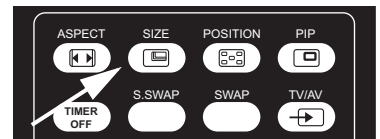
Changing the PIP Aspect Ratio ➤ To change the aspect ratio of the PIP window from 4:3 to 16:9 or vice versa, press the **ASPECT** (▣) button on the remote control.

Refer to Table 4-1 for more information about aspect ratios.
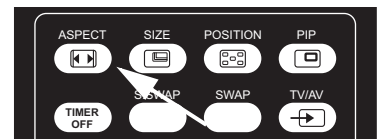
To swap the main and PIP images, press the **SWAP** button on the remote control.
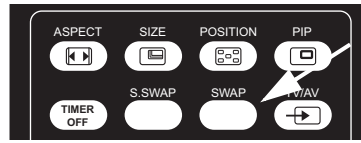
◄ *Swapping the Main and PIP Images*
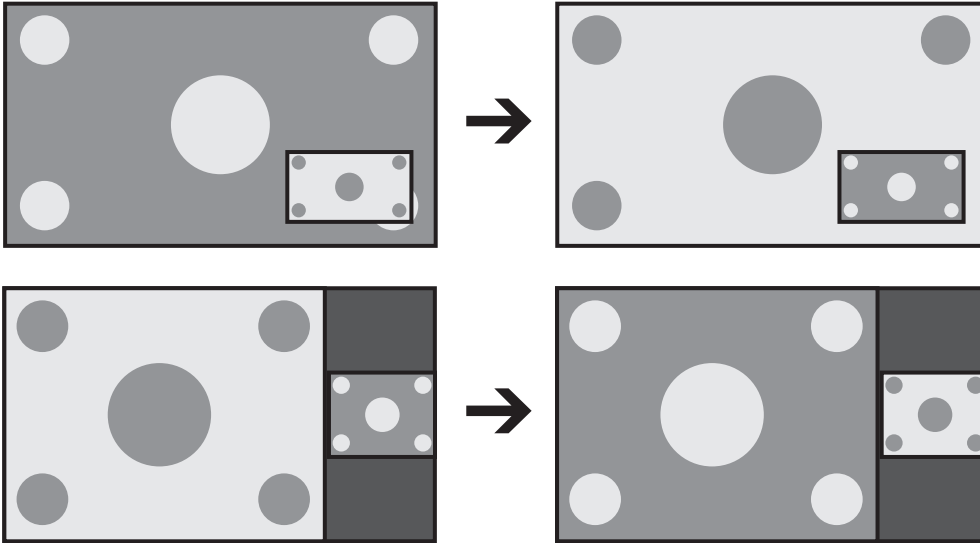
To swap the main and PIP audio programs, press the **S.SWAP** button on the remote control.
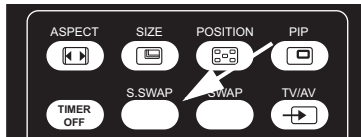
◄ *Swapping the Main and PIP Audio Programs*

Notes:

5. Maintenance and Troubleshooting

Regular cleaning will extend the life and performance of the Crystal Series LCD. Before cleaning, be sure to unplug the power cord from the power outlet.

Do not under any circumstances use solvents such as benzene or thinner to clean the Crystal Series LCD. Doing so may cause deterioration or peeling of paint from the display or remote control unit.

Wipe the display and remote control gently with a soft cloth. In case of excessive dirt buildup, dampen a soft cloth with a diluted neutral cleaning detergent. Wring the cloth thoroughly, then wipe the component and dry it with a dry soft cloth.

After dusting, wipe the screen gently using a soft cloth (cotton, flannel etc.). Do not use tissue or coarse fabric. The screen surface is easily scratched; do not rub it or hit it with a hard object.

If you clean the surface of the screen with a wet cloth, do not allow water droplets on the surface to enter into the product; this may cause a malfunction.

As a general rule, use a vacuum cleaner about once a month to clean the vents on the rear panel of the display of dust buildup (set the vacuum cleaner to its weakest setting when doing this). If not removed, accumulated dust can cause the internal temperature to increase, resulting in possible breakdown or fire.

Table 5-1 provides some general guidelines for troubleshooting problems you may encounter with the Crystal Series LCD. If the suggested solutions fail to resolve the problem or if you encounter an issue not described here, please contact your Runco dealer or Runco Technical Support.

Table 5-1. Troubleshooting Chart

Symptom	Possible Cause(s)	Solution
The display does not turn on after initial installation.	• The Crystal Series LCD is not plugged in or the AC outlet is not active. • The remote control batteries have run out.	• Ensure that the Crystal Series LCD is plugged in and that the AC outlet is active. • Replace the batteries.
The display is on, but there is no picture.	• Incorrect source selection. • Source component is not turned on. • Source component is connected incorrectly or not at all.	• Select the correct source. • Turn on the source component. • Check video connections to source component.

Table 5-1. Troubleshooting Chart (continued)

Symptom	Possible Cause(s)	Solution
Picture is okay, but there is no sound.	• Audio output is muted. • Volume setting is too low. • Source component is connected incorrectly or not at all. • Speakers are connected incorrectly or not at all. • Audio settings are incorrect.	• Press the **MUTE** button on the remote control. • Turn up the volume. • Check audio connections to source component. • Check speaker connections (Figure 3-7). • Check the following settings: Speaker (page 34) and HDMI Audio (page 38). For HDMI audio souces, ensure that the audio output format is "PCM" (refer to the manual for the source component).
Image is too bright and/or lacks definition in the bright areas of the image.	• Contrast is set too high.	• Lower the contrast setting.
Image appears "washed out" and/or dark areas appear too bright.	• Brightness is set too high.	• Lower the brightness setting.
Colors in the image are swapped; for example, reds appear blue or vice versa.	• The Red/Pr, Green/Y or Blue/Pb outputs from the source are connected to the wrong inputs on the Crystal Series LCD.	• Ensure that the source outputs are connected to the correct Crystal Series LCD input.
RGB-HD images appear "noisy."	• Clock and Phase settings need adjustment.	• Manually adjust Clock and Phase settings, or perform an Auto-Adjust (refer to *PC Mode Adjust* on page 35).
"Invalid mode" appears on-screen.	• The resolution and frequency of the video card in the computer are not compatible with the Crystal Series LCD.	• Select a compatible resolution and vertical frequency (refer to *Computer Signal Compatibility* on page 57).
The image is too large or too small.	• Image size needs adjusting.	• Adjust the image size (refer to *PC Mode Adjust* on page 35).

6. Serial Communications

To interface the Crystal Series LCD 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 3-9. (Use a straight-through cable.)

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 match that of the Crystal Series LCD RS-232 port. To check the baud rate setting, select Baud Rate from the ISF Calibration menu (refer to page 40).

6.1
RS-232 Connection and Port Configuration

- Commands are in ASCII format and are not case-sensitive.

- A carriage return is not required after a command.

- When you send a valid command, the Crystal Series LCD executes it and acknowledges it with a right-bracket character (`]`) followed by the four-digit numeric code you sent; for example, `]0002`.

- When you send an invalid command (one followed by values outside the valid range for that command), the Crystal Series LCD ignores it and returns `>MAX` or `<MIN` instead of the four-digit code.

- When you send an unrecognized/misspelled command, the Crystal Series LCD ignores it and returns `-N/A` instead of the four-digit code.

6.2
Serial Command Syntax

Table 6-1 lists the RS-232 command set.

Table 6-1. Serial Commands

Command			Description
[	S3A	0###	Set audio volume to ### (= 000-100)
Example: `[S3A0075` sets volume to 75			
[	+3A		Audio volume up
[	-3A		Audio volume down
[	S3E	000#	Audio mute (speakers/headphones) 0 = not muted, 1 = muted
Example: `[S3E0001` mutes the audio output			
[	S4A	000#	Main input selection 1 = Input1 2 = Input2 3 = Input3 4 = Input4 6 = RGB 8 = HDMI1 9 = HDMI2
Example: `[S4A0006` selects RGB			

Table 6-1. Serial Commands (continued)

Command			Description
[	+4A		Select "next" Main AV input
[	S4E	000#	Aspect ratio selection 0 = 4:3 (Standard) 1 = VirtualWide 2 = Letterbox 3 = 16:9 (Anamorphic)
Example:			[S4E0002 selects Letterbox
[	S4G	000#	PIP Input selection 1 = Input1 2 = Input2 3 = Input3 4 = Input4 6 = RGB 8 = HDMI1 9 = HDMI2
Example:			[S4G0003 selects PIP Input3
[	+4G		Select "next" PIP AV input
[	SAB	000#	Power on/off control 0 = standby, 1 = on
Example:			[SAB0001 turns unit on
[	SCA	000#	Caption on/off 0 = off 1 = on
Example:			[SCA0000 turns caption off
[	SDA	000#	Set PIP mode 0 = OFF 1 = PIP 2 = PBP
Example:			[SDA0002 selects PBP
[	SDB	000#	Set PIP size 0 = small 1 = medium 2 = large
Example:			[SDB0001 selects medium PIP size
[	SDE	000#	Set PIP aspect ratio 0 = 4:3 1 = 16:9
Example:			[SDE0001 selects 16:9 aspect ratio PIP window

Table 6-1. Serial Commands (continued)

Command			Description
[	SDF	000#	Set PIP window position 0 = Top/Left 1 = Top/Right 2 = Bottom/Left 3 = Bottom/Right
Example: [SDF0001 positions PIP window in upper-right corner of display area			
The following serial commands are meant to emulate buttons on the remote control. Each button has its own serial command, so effectively it is as if you were using the IR remote only you'll be doing so via serial commands. These commands provide active OSD responses just like the IR remote. Each command begins with [key followed by the four-digit number of the button. No carriage return is necessary. The response you receive from the unit if the command is valid will be a right-bracket (]) followed by the four-digit numeric code you sent. (For example, the 'ON' command is [key0015; the response will be]0015). All commands are in ASCII.			
[	key	0002	OFF
		0015	ON
[	key	0004	Number 1
		0005	Number 2
		0006	Number 3
		0008	Number 4
		0009	Number 5
		0010	Number 6
		0012	Number 7
		0013	Number 8
		0014	Number 9
		0035	Number "–"
		0017	Number 0
[	key	0105	INPUT1
		0027	INPUT2
		0028	INPUT3
		0001	INPUT4
		0102	HDMI1
		0101	HDMI2
		0019	RGB HD
[	key	0003	CUSTOM

Table 6-1. Serial Commands (continued)

Command			Description
		`0062`	ISF NIGHT
		`0031`	ISF DAY
[	key	`0040`	16:9 (ANA)
		`0043`	4:3
		`0039`	LETTERBOX
		`0126`	VIRTUALWIDE
[	key	`0007`	Right-Arrow key
		`0016`	Down-Arrow key
		`0018`	Up-Arrow key
		`0011`	Left-Arrow key
		`0046`	ENTER
[	key	`0026`	MENU
[	key	`0100`	EXIT
[	key	`0063`	PIP ASPECT RATIO
		`0047`	PIP SIZE
		`0034`	PIP POSITION
		`0032`	PIP
		`0037`	TIMER OFF
		`0052`	S.SWAP
		`0033`	SWAP
		`0036`	TV/AV
[	key	`0053`	S.MODE
		`0054`	SURROUND
		`0024`	MTS/SAP
		`0091`	MUTE
[	key	`0044`	CLOSED CAPTION (on/off)
		`0055`	INFO

7. Specifications

Table 7-1 lists the Crystal Series LCD specifications.

Table 7-1. Crystal Series LCD Specifications

Native Resolution:	1920 x 1080
Screen Size:	**CX-52HD =** 52 in. (diagonal) **CX-57HD =** 57 in. (diagonal)
Screen Aspect Ratio:	16:9
Available Aspect Ratios:	4:3, Letterbox, 16:9, VirtualWide™
DTV Compatibility:	480i/p, 576i/p, 720p, 1080i, 1080p
ISF Settings:	Yes
Contrast Ratio:	**CX-52HD =** 2000:1 **CX-57HD =** 1200:1
Data/Graphics Compatibility:	Refer to Table 7-2
Vivix Processing:	3:2 or 2:2 pull down
Inputs:	Multiple input combinations with up to (4) Composite Video (2) S-Video (2) Component Video (2) HDMI w/HDCP (1) RGB (15-pin D-sub) (1) RS-232 Control (5) Analog Audio (4 stereo RCA pairs + 3.5-mm stereo mini jack)
Outputs:	(1) Composite Video (1) Analog Audio (stereo RCA pair) (1) Stereo headphone (3.5-mm stereo mini jack) (1) Digital Audio (S/PDIF, RCA coaxial) (1) Digital Audio (TosLink optical)
Audio System:	10W RMS x 2 Stereo Amplifier
Discrete IR Control:	Source, power and aspect ratios
Power Requirements:	100 to 240 VAC, 50/60Hz
Power Consumption:	**CX-52HD =** 350 watts (1194.5 BTUs/hour) **CX-57HD =** 400 watts (1365.2 BTUs/hour)
Operating Environment:	40ºF to 95ºF (5ºC to 35ºC); 20% to 80% humidity (non-condensing)
Dimensions:	**CX-52HD =** see Figure 7-1 **CX-57HD =** see Figure 7-2
Weight (including stand):	**CX-52HD =** 89.5 lbs. (40.60 kg) **CX-57HD =** 118.0 lbs. (53.52 kg)

Table 7-1. Crystal Series LCD Specifications (continued)

Regulatory Approvals:	Complies with FCC, CE, C-Tick, NRTL, GOST, MIC, SABS, RoHS, China RoHS
Limited Warranty:	One (1) year parts and labor from the date of delivery to the end user.
Specifications are subject to change without notice.	

Figure 7-1 and Figure 7-2 show the Crystal Series LCD dimensions (all dimensions are in inches).
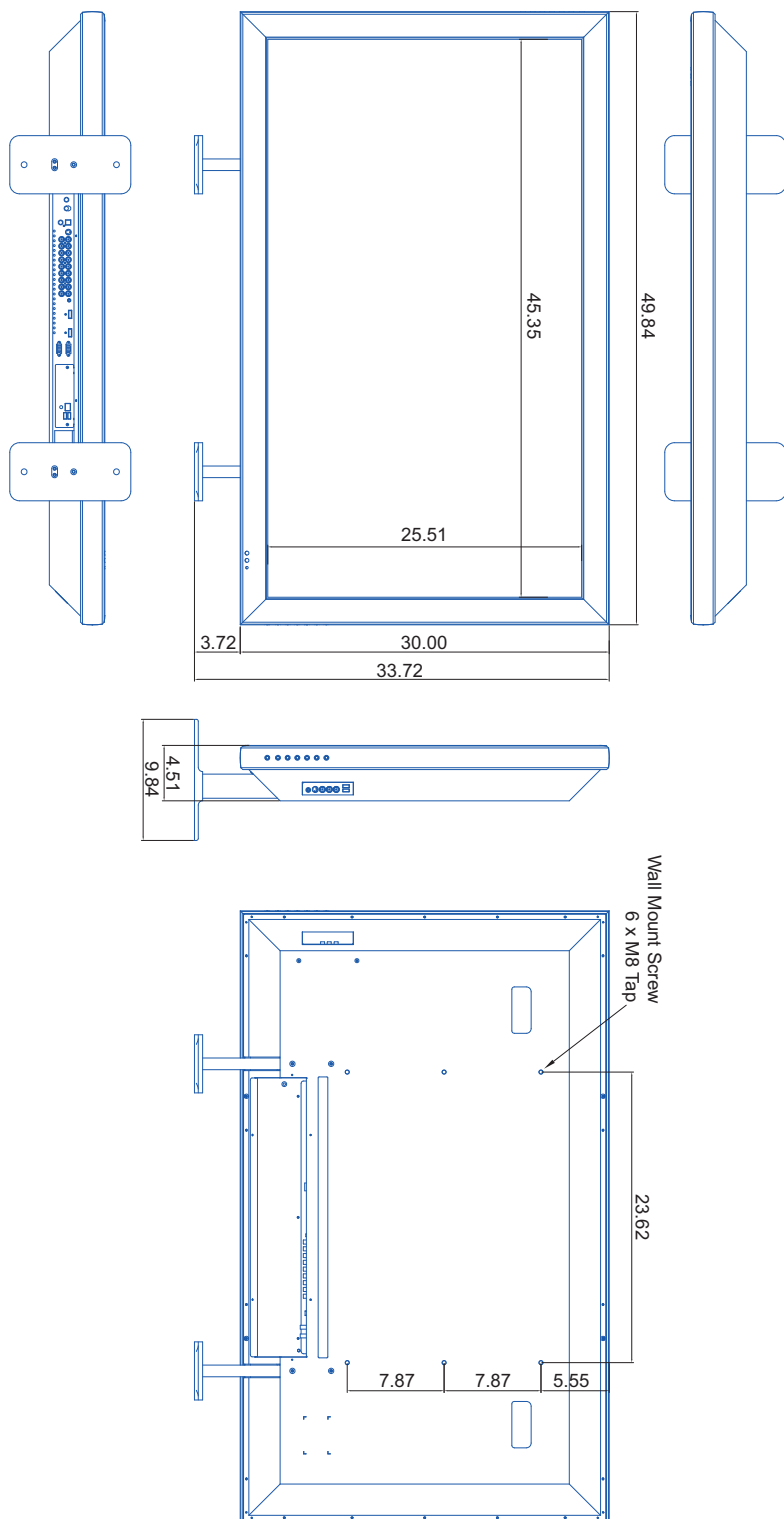
7.2
Crystal Series LCD Dimensions

Figure 7-1. CX-52HD Dimensions

49.21

53.70

27.64

3.72

32.13

35.85

4.51

9.84

Wall Mount Screw
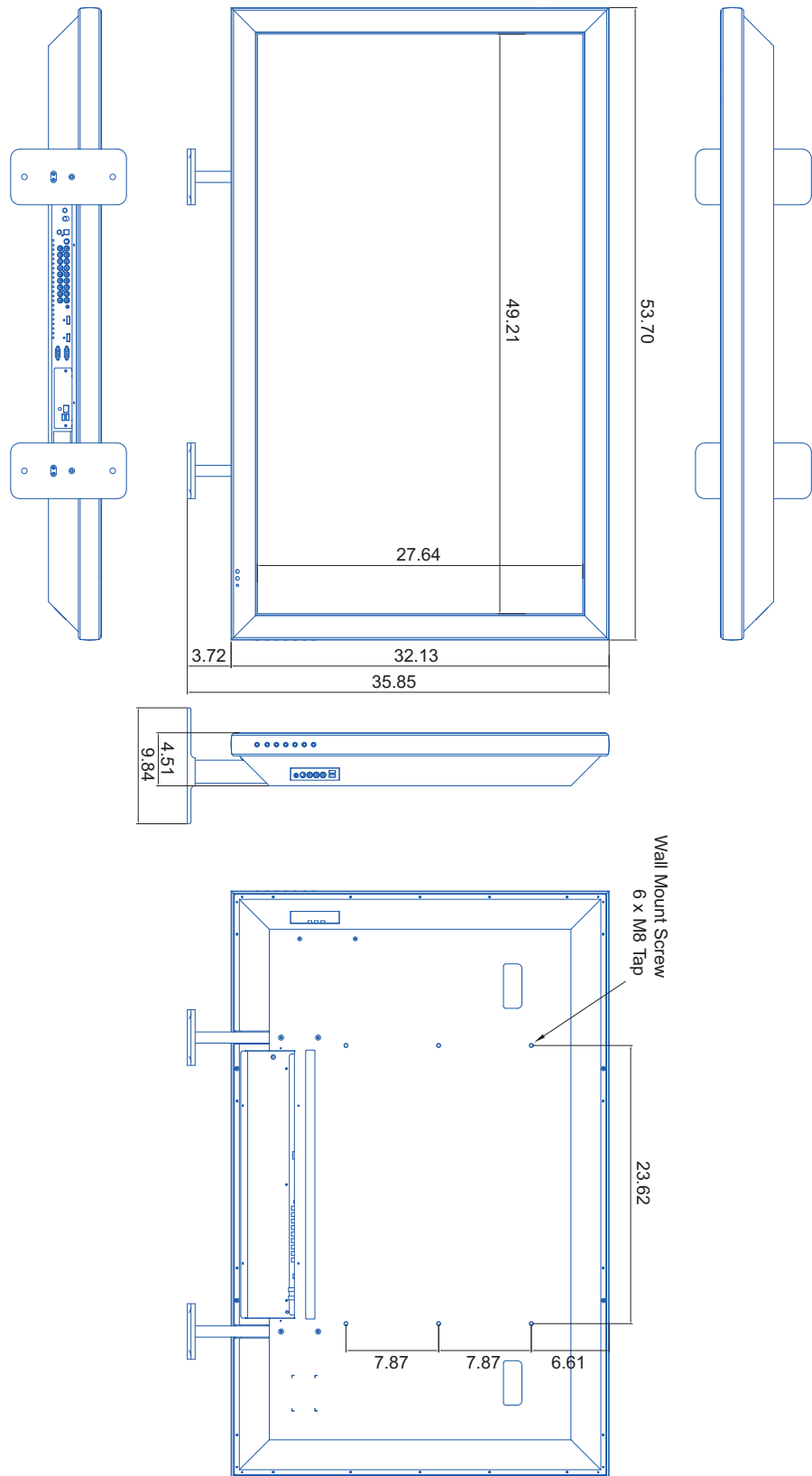6 x M8 Tap

23.62

7.87 7.87 6.61

Figure 7-2. CX-57HD Dimensions

The Crystal Series LCD can display video signals from a variety of computer sources via its RGB-HD and HDMI inputs.

Table 7-2 lists the signal types that are compatible with the Crystal Series LCD, and indicates which of those are VESA standards.

7.3
Computer Signal Compatibility

Table 7-2. Computer/Video Signal Compatibility Chart

Signal Type	Mode		Vertical Frequency (Hz)	Horizontal Frequency (kHz)	RGB	HDMI
VESA	640x350	85	85.00	31.28	√	–
VESA	640x400	85	85.00	35.78	√	–
VESA	640x480	60	60.00	29.82	√	√
MAC	640x480	67	66.70	35.00	√	√
MAC	640x480	72	72.80	37.90	√	√
MAC	640x480	75	75.00	37.50	√	√
VESA	800x600	56	56.00	35.20	√	√
VESA	800x600	60	60.30	37.90	√	√
VESA	800x600	72	72.20	48.70	√	√
VESA	800x600	75	75.00	46.90	√	√
VESA	1024x768	60	60.00	48.40	√	√
VESA	1024x768	70	70.10	56.50	√	√
VESA	1024x768	75	75.00	60.00	√	√
VESA	1280x768	60	60.00	47.70	√	–
VESA	1280x1024	75	75.00	80.17	√	√
VESA	1600x1200	60	60.00	74.52	√	√
VESA	1920x1080	60	60.00	67.50	√	√
Note: *The Crystal Series LCD may not be able to display images from notebook computers in simultaneous (CRT/LCD) mode. Should this occur, switch the notebook computer to "CRT only" mode. If you are unsure how to do this, refer to your notebook computer's user manual.*						

Notes:

020-0713-00 Rev. B
January 2008