Margay

WN-5040-720

User Guide

WN-5040-720
Margay
50" Display Wall Unit

User Guide

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If any Product fails to conform to the written warranty, Clarity's exclusive liability and Buyer's exclusive remedy will be, at Clarity's option, to repair, replace or credit Buyer's account with an amount equal to the price paid for any such defective Product returned by Buyer during the warranty period, provided that: (a) Buyer promptly notifies Clarity in writing that such Product failed to conform, furnishes an explanation of any alleged deficiency and obtains from Clarity a return authorization; and (b) Clarity is satisfied that claimed deficiencies actually exist and were not caused by accident, misuse, neglect, alteration, improper installation, repair or improper testing. Clarity will have a reasonable time to make repairs, to replace Products or to credit Buyer's account.

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Feedback About Manuals

Clarity Visual Systems, Inc., is constantly striving to provide the best product available at a reasonable cost. Part of *this* Clarity product is the manual. If you have found an error in this manual, or if you would like to make any comments about it, you may use this form.
This form is used with the
 MARGAY USER GUIDE, PART NUMBER **070-0148-04** DATED **26 APRIL 2005**

You may fax this form to Clarity Visual Systems, **Attention: Manuals** at +1 503 570 4657.
Or you may email comments and corrections to Manuals@ClarityVisual.com. If you use email, please mention the 070- part number listed above.

What I like about this manual: (We love to read this part.)

What I don't like about this manual: (We read this part, too.)

Error(s) I found in the manual: (Yipes! We thought we were perfect.)

In future manuals of this type, I wish you would …

Thank you for taking the time to help us improve.

Contents

1 Basic Information About Margay

1.1 Accessories For Margay

Check what you received with the Margays

The number in (parentheses) is the quantity you should have for each Margay.

1. Screen Support (1 for each Margay on the bottom row; shipped per order, not per display)
2. Front screws, (2)
3. Long side-to-side bolts (1), washers (4), and wing nut (1)
4. Short side-to-side bolts (1), washers (4), and wing nut (1)
5. Vertical screws, ¼"-20 bolts (2)
6. Suction Cup (1)
7. VGA cable (1)
8. DVI cable (1)
9. AC power cord (1)
10. Remote Control (1), with batteries installed
11. Screens Shims (6 or more)

1. Screen Support (may vary in design) One of these for each Margay *on the bottom row.*

2. Front screw

3. Long side-to-side bolt

4. Short side-to-side bolt

5. Vertical screw ¼–20 bolt
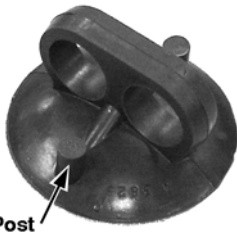
Post

6. Suction Cup

7. VGA cable

8. DVI cable
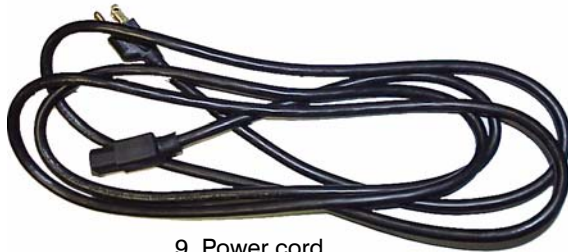
9. Power cord

10. Remote Control

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1.2 Your Safety and Margay's Safety

The fully assembled display weighs about 68 lbs (30.8 kg). When assembling a wall, you will need two people to handle the Margay.

⚠ WARNING
The lamp needs very high voltages to start, around **15,000 volts**.

⚠ WARNING
The lamp gets very hot. Allow it to cool before removing it.

⚠ WARNING
The lamp produces lots of light and **UV radiation** (ultra-violet) as well. UV light can damage your retinas. After the light leaves the lamp and passes through the DLP optical engine, there is no significant UV, although the light will be very bright.

⚠ WARNING
There is no electrical interlock on the screen. Opening the screen does *not* turn off the high voltage to the lamps. s

Opening the rear cover *does* turn off the high voltage to the lamp. However, the lamp will still be very hot.

. The plug on the power cord serves as the disconnect for this product. No user serviceable parts inside. All parts replacement is done at the module level by a qualified service technician.

⚠ CAUTION
There are no user serviceable parts inside. Refer all repair and maintenance to a qualified service technician.

. Static electricity can damage sensitive electronic components.

• Always use a grounding strap with handling the electronics module or the optical engine if there are exposed components.
• When shipping these parts, *do not* use styrofoam "peanuts." These carry static electricity and can damage the parts. Use an anti-static bag, or, if

that is not available, wrap the electronics module in aluminum foil.

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WARNING

Hazardous voltage inside. Can shock, burn or cause death.

Disconnect power cord before servicing this unit.
Refer to service manual for details.

No user serviceable parts inside. Refer all service to qualified serviceman.

ℏ   334-0100-00

⚠ WARNING

High intensity light.
Do not look into the projection lens while unit is on.

⚠ WARNING

Possible UV Exposure.
Use protective eye wear while operating with screen removed.   334-0077-00

WARNING	TURN OFF POWER SWITCH BEFORE OPENING COVER. HOT LAMP INSIDE. ALLOW AT LEAST 15 MINUTES FOR LAMP TO COOL BEFORE REPLACING. RISK OF EXPLOSION. HANDLE BULB WITH CARE. SEE USER'S MANUAL FOR LAMP REPLACEMENT.	
AVERTISSMENT	COUPER L'ALIMENTATION ELECTRIQUE AVANT OUVERTURE DE LA FACE AVANT. ATTENTION, LA LAMPE EST CHAUDE. LAISSER REFROIDIR AU MOINS 15 MINUTES AVANT SON REMPLACEMENT. RISQUE D'EXPLOSION. MANIPULER L'AMPOULE AVEC PRECAUTION. SE REFERER AU MANUEL DE L'UTILISATEUR POUR TOUT REMPLACEMENT DE LA LAMPE.	
WARNUNG	DEM ÖFFNEN DES DENKELS-STROM ABSCHALTEN. VORSICHT-EXPLOSIONS GEFAHR-LAMPE IST HEIß. WARTE WENIGSTENS 15 MIN. FÜR DIE LAMPE ZUM ABKÜHLEN. VORSICHT MIT DER LAMPE BEIM HANTIEREN. FOLGE ANWEISUNGEN FÜR DEN LAMPEN WECHSEL IM REPARATUR MANUAL.	

334-0078-00

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2 Installing

2.1 What You Will Do

The series of steps here give only a basic outline of the installation process. See the specific sections for details (page numbers in parentheses).

Installation

1. Unpack the Margays. Leave the screens in their containers. You won't need the screens for a while.
2. If it was purchased, install the VIM (Video Input Module) in each Margay. (10)
3. If it was purchased, install the Big Picture key in each Margay. (12)
4. Build the wall of Margays, leaving the screens off. (14)
5. Connect the Margays to power (26), picture source (22 & 24) and communication. (28)
6. Install the screens, starting with the bottom row. (32)

Configuration

1. Align each optical engine to the screen. (38)
2. Adjust Margay to each of the inputs you will use: analog computer (44), digital (48), video (50).
3. Color balance the wall. (52)
4. Set up Big Picture, if you are using it. (54)
5. Save your work. (62)

2.2 Installing the VIM (Video Input Module)

It is easier to install the VIM board in Margays before they get stacked in a wall.

The Video Input Module option is installed in the field.
You will install the VIM (Video Input Module) in the Margay's electronics module. (The electronics module is the part the receives all the input and output cables.)

If the electronics module is installed in the Margay, you will remove it partially.

1. Turn off the AC power to the Margay and remove the power cord.
2. Open the door on the right side of Margay (as viewed from the front) exposing the electronics module.
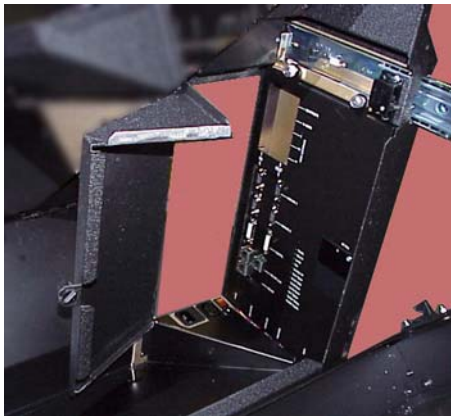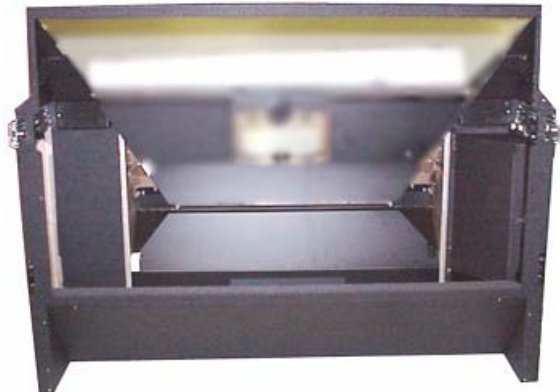
3. Loosen the two screws at the top of the electronics module.

4. Pull the module up and partly out.
   a. It may take a bit of maneuvering to get the connectors at the bottom to come up with the module.
   b. Do this carefully so you do not damage the connectors. All connectors are latched in place. They aren't particularly delicate, but they won't stand very rough treatment.
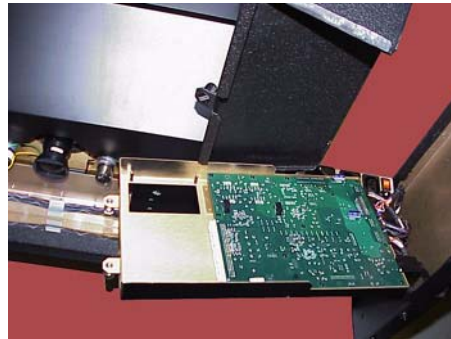
5. Install the VIM in the electronics module.

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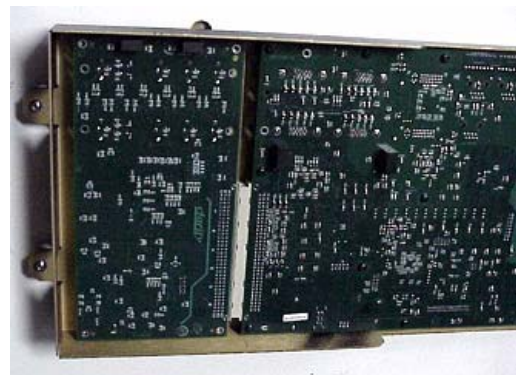
6. Put in the four screws. Be sure the VIM is pressed
   well into the socket.
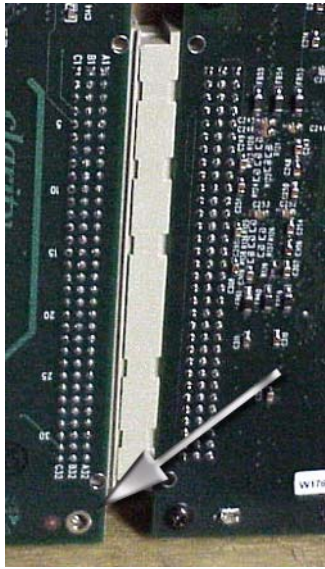
One of 4 screws.

7. Put the electronics module back in place and
   secure it with the two screws.
8. Reconnect power, if you removed it earlier.

2.3 Installing the Big Picture Key

Clarity's Big Picture™ key allows a wall of Margays to spread one picture over the entire wall.

The Big Picture key is installed in the field. You can install the Big Picture key without removing the electronics module.

1. Open the door to the electronics module.
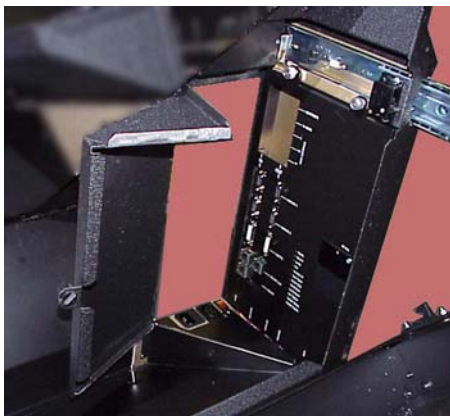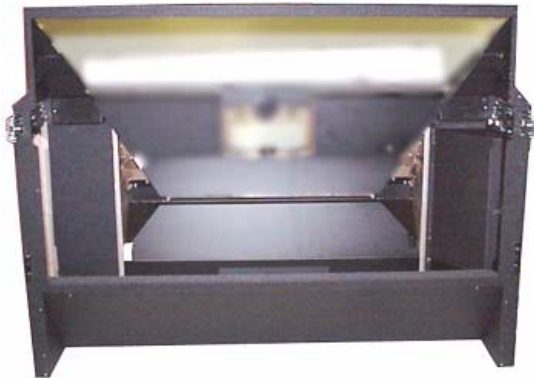
2. Remove the cover of the Big Picture key socket.
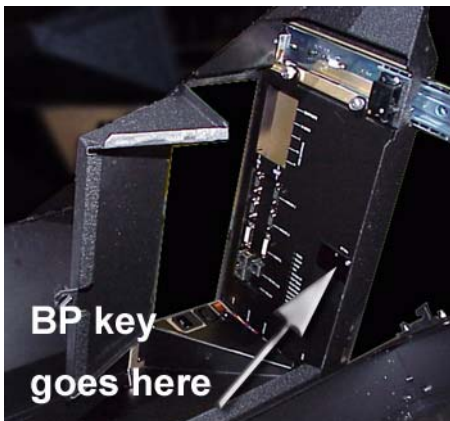
3. Plug the BP key into its socket.
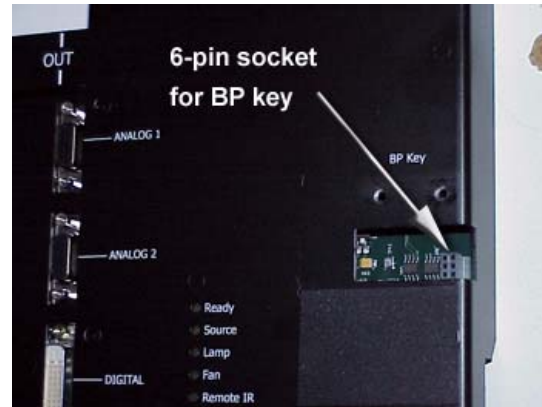
⚠ **CAUTION**

Be sure all six pins go in the socket holes. If the key is installed incorrectly, the entire electronics module may not function at all.
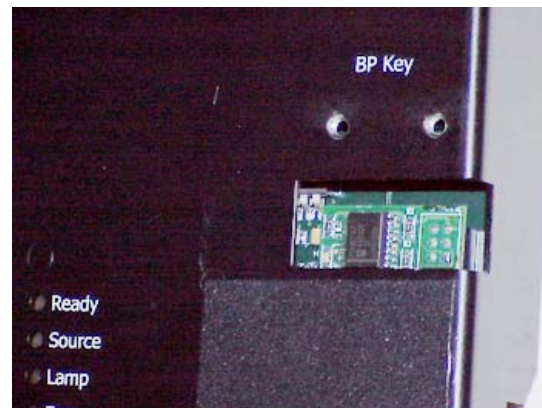
4. Replace the BP key cover.

✎ The Big Picture key can be installed while the Margay has power. However, the key will not take effect (Big Picture will not work) until power is cycled on again.

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2.4 Building the Wall, First Row

It is most important to make the first row straight. Do not put the screens on yet.

Laying the first row

1. Set the first row of Margays side by side *without the screens*. Bolt them *loosely* together near the bottom with the long side-to-side bolts, washers and wingnuts.

2. Attach the screen supports to the front edge of the first row. The screen support only mounts one way and is used on the bottom row only. It provides a stop or rest for the bottom screens.

3. Check the straightness of this row. This first row *must be absolutely straight*.

✎ Do not use your eye alone to judge straightness. Use a tightly stretched string or a very long level. It is ok if the row is not level, as would be the case in a tilted wall, but it must be straight.

4. Use shims under the Margays to make the row straight vertically.

5. When the row is straight, tighten the bolts holding them together. Then *check straightness one more time*.

6. Go to next section (page 16).

Why is straight so important?

All Clarity display that stack must have a straight first row. If the first row is not straight, the arrangement gets worse as the wall goes up, and the screens won't align properly.

Margay is a little more critical of straightness, because its screens have almost no mullions.

The *mullion* is the outside border of the screen. In most Clarity products this is a narrow edge of metal that holds the screen in place. In Margay the mullion is a thin piece of tape.

The advantage of this "mullion-less" screen is that the finished wall will have almost no black lines between images on the screens.

First row with screen supports in place

Using string to see that the row is straight

Screen support bolt, two at each end

Side-to-side bolt with wing nut at bottom of neighbor Margays

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2.4.1 Building the Wall, Second Row and Up

If the first row is straight and solid, the rest of the rows will be easier.

Continuing to build the wall

1. Stack another row of Margays on the first row. As you stack, be careful with the pins that align the rows.

2. As each Margay is placed in the second row, secure it to the lower unit with two Front screws.
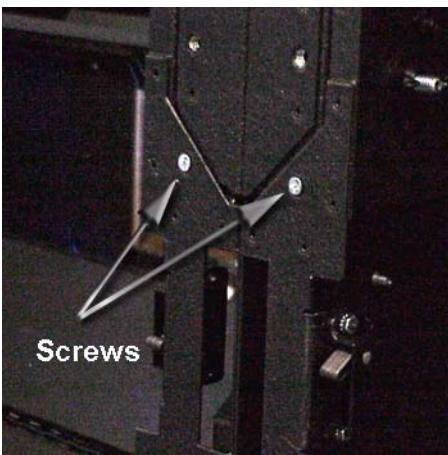
3. Then bolt the Margays top-to-bottom through the top-to-bottom hole using the Vertical bolts, ¼"-20.
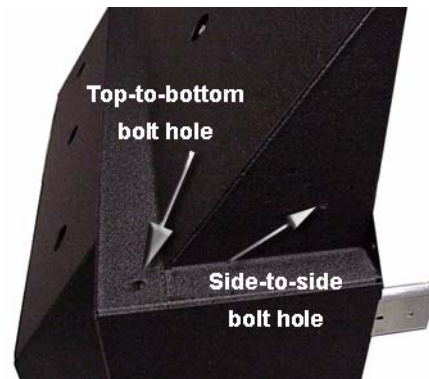
4. Bolt this row side-to-side as you did the first row. This time the bolts will go through four Margays, two in the first row, two in the second rows. The

end of the row has shorter side-to-side bolts to secure just two Margays together.
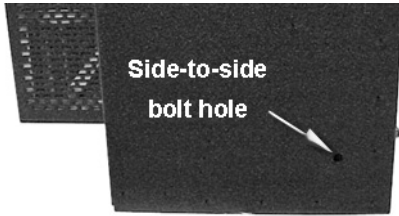
5. Check straightness of this second row.

6. Continue in this way with the rest of the rows, checking straightness as you go.

Make sure the fronts of the units are flush with each other. This will make screen alignment easier.
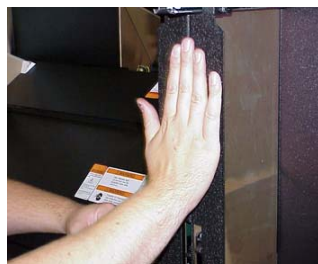
⚠ *CAUTION*

For high walls, over 2 units high, and for all tilted walls, see the safety instruction below.

Safety with high or tilted walls

Because the Margay is so narrow front to back, there is a danger of tipping with high walls. Margay has tie-back points on the rear to prevent this.

Use these tie-backs to secure the Margay wall to a structural part of the building. Don't wait until the wall is finished. Do this as you build the wall up.

If the wall is *tilted* forward, tie the Margay all the way up.
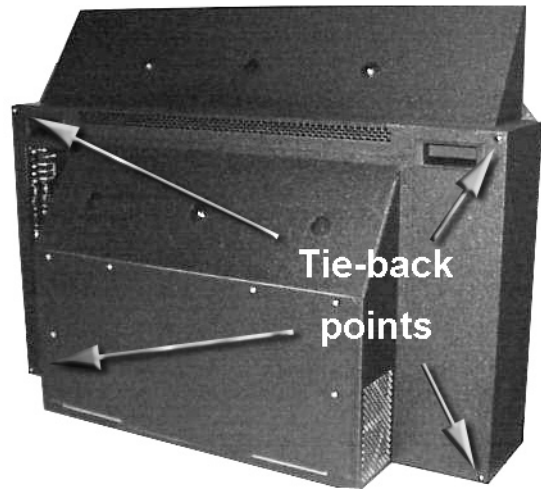
The tie-back points are ¼″x20 threaded holes.

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2.4.2 Building a Banner, Upside Down

It is possible to hang a single row of Margays upside down to make a banner. Be sure the ceiling can hold them.

Clarity does not provide any special brackets to hang a Margay upside down. There are too many variables to consider, so the method to use is best determined on site.

Whatever you use to attach Margays overhead, it must be capable of sustaining five (5) times the weight of a Margay, which is 68 lbs or 30.8 kg. The mounting system must therefore hold 340 lbs or 154 kg for *each* Margay.

You may use the screen supports to cover part of the Margay, but they are not necessary in the upside down configuration.

Inverting the picture and menus

In the Miscellaneous menu (under Advanced Options) check Inverted Installation. This one check mark inverts the picture and the menus. It also reverses the left-right of the optical engine alignment motors so left and right will be correct for you.

MENU > ADVANCED OPTIONS > MISCELLANEOUS

Screens when inverted

The screen supports, which normally hold screens up, will now be above the row of screens. You may wish to devise some way to push the screens up from the bottom to press them against this support to prevent a gap.

It is not necessary, of course, to use the screen support parts in an inverted installation.

Miscellaneous   *clarity* visual systems

- ☑ **Beeper**
- ☐ Curtain Pattern   White
- ☑ Auto Codes
- ☑ Plug and Play (EDID Enable)
- ☐ Inverted Installation

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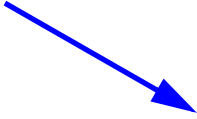
2.5 Connections

Margay has four groups of connectors. All inputs are paired with loop-thru outputs (except RS232 In). The inputs are toward the rear of the Margay.

Analog and digital connectors

Two analog connectors and one digital (DVI) connector have their separate loop-thru outputs. The Analog outputs (buffered) always carry the corresponding analog input picture.

The digital output is different. The digital output carries a digitized version of the *selected* input. If you change the active input in the Picture menu, the digital output changes.
  • See 2.5.1 "Connections, Analog & Digital Sources" on page 22.

Video connectors

Video connections are optional. The Video Input Module (VIM) is not installed at the factory; it is installed in the field by the installer. When installed, the VIM accepts composite, S-video and component video (YPbPr). Each input connector is paired with its separate loop-thru output.
  • See 2.5.2 "Connections, Video Sources" on page 24.

Control connectors

You can control the Margay with a remote control or with serial commands from a computer or other device. Send commands in either the RS232 or RS485 standard.

Normally, you send RS232 commands to one Margay's RS232 In and loop out the RS485 Out to the next cube's RS485 In.

RS485 has better long-distance communication.
  • See 2.5.4 "Connections, Control: RS232 & RS485" on page 28.

Power

AC power (115V or 230V) can be looped thru to neighboring cubes. The limit on loop-thru is
  • 4 Margays when using 115V;
  • 8 Margays when using 230V.
The power supply is auto-ranging.

  • 8 cubes when using 230V.
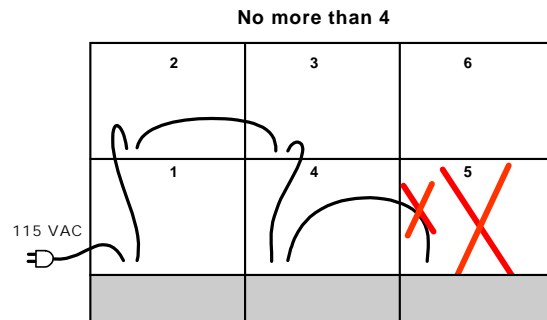
  • See 2.5.3 "Connections, Power" on page 26.
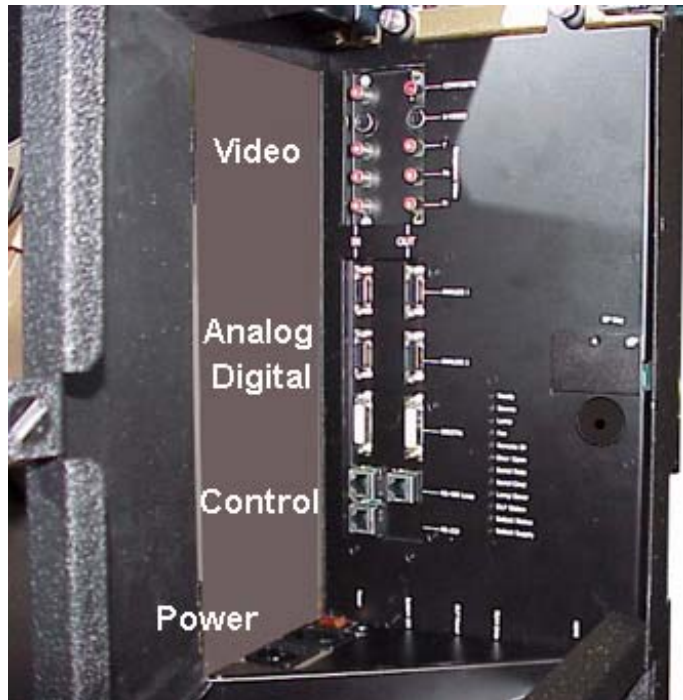
Electronics module as seen from the front. The electronics module door is open.

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2.5.1 Connections, Analog & Digital Sources

The Digital Out connector carries the selected input.

All of the source inputs, the picture inputs, have loop-thru output connectors. These loop-thrus are buffered.

- **Analog 1** and **Analog 2** are 15-pin VGA-type connectors. Margay will accept a wide range of computer resolutions up to 1600×1200 and 1920×1080. Each of these connectors has a dedicated loop-thru output. These connectors are also used for RGB video with separate H&V sync, composite sync, or sync on green; also for YPbPr video at 480p, 720p, or 1080i.

✎ When an Analog input has a source with sync on green or composite sync, the DVI Out may not show the picture properly. If the source is present at power up, it usually works well, but if you disconnect and reconnect the source, the DVI loop-thru stops working for these two types of sync.

- **Digital In** is a standard DVI cable. It has a loop-thru, but this Digital Out connector is *not* dedicated to the Digital In connector. Instead, the Digital Out connector carries the picture of the currently selected input. For instance, if the Analog 1 connector is selected, the picture on the Digital Out connector is a DVI version of that Analog 1 picture.

✎ The DVI does **not** carry the picture from the composite, the S-Video, or the component YPbPr inputs.

Limits of loop-thru

No signal can loop-thru forever. There is always some degradation of the signal along the way. If you want to loop a single source to a number of Margays, try one of the methods shown here. In diagram A the signal loops thru six times at most. In diagram B the signal loops thru four times at most. In each diagram the cubes marked **X** is the farthest from the source.

A
PC
Connecting with a combination of analog and digital loop-thru
SVGA
Analog connections
Digital connections
X

B
PC
Connecting with a distribution amplifier and loop-thru
SVGA
Distribution Amplifier
Digital connections
Digital connections
X
X
X

In **Out**

ANALOG 1

ANALOG 2

DIGITAL

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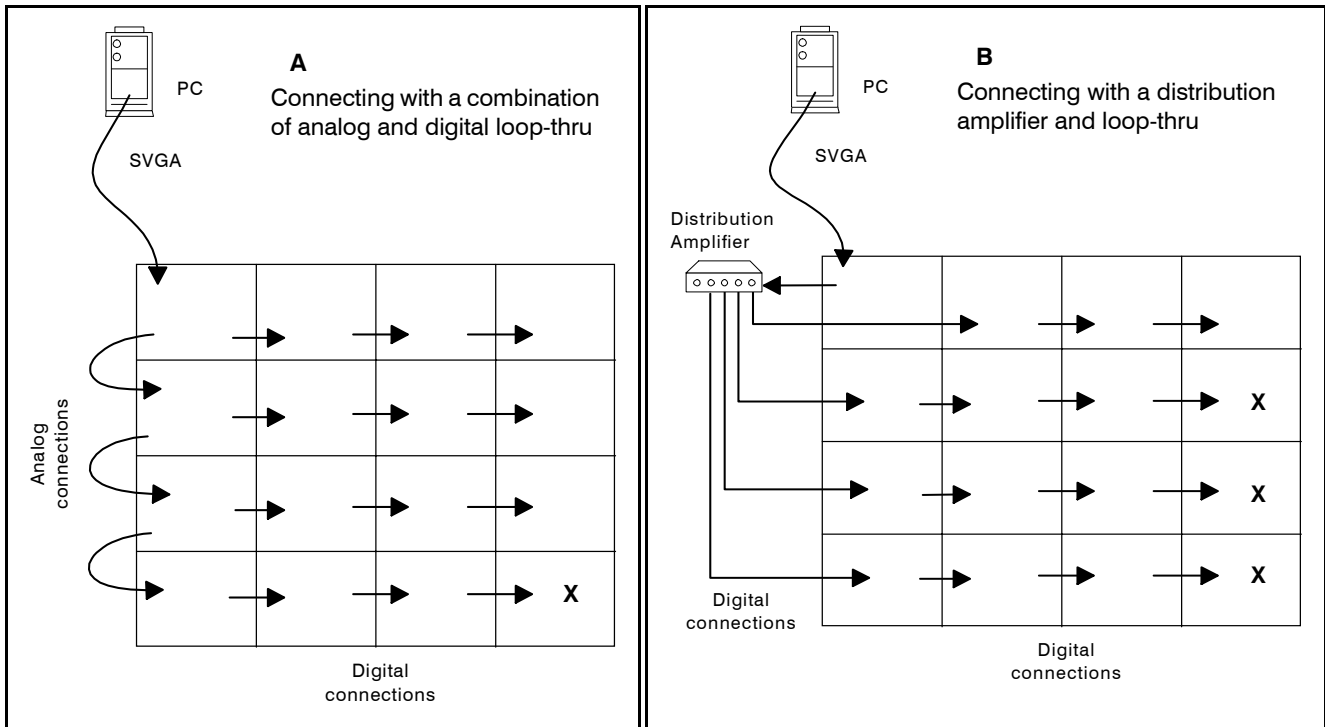
2.5.2 Connections, Video Sources

Video is a option installed in the field.

If you did not install the optional Video Input Module (VIM), skip this section. (2.2 "Installing the VIM (Video Input Module)" on page 10)

Composite video

Connect an NTSC, PAL, or SECAM composite source to COMPOSITE IN. Loop-thru from COMPOSITE OUT.

S-video

Connect an NTSC or PAL S-video source to the 4-pin DIN connector, S-VIDEO IN.

Component video

NTSC or PAL rate interlaced video can be fed into the Y, Pb, and Pr IN connectors and looped out. Be sure the DVD player is not set to progressive scan. Use the Analog 1 or 2 connector for progressively scanned DVD.

✎ When you choose Component Video in the Picture menu, the Colorspace automatically switches to YPbPr. When you choose another picture source, Colorspace switches back to RGB.

Picture	*clarity*
🖼 **Source**	**Component (YPbPr)** ▶
Video Standard	PAL 50Hz/4.43MHz
🄰 Sharpness	Sharpest
Input Levels	▶

Component video YPbPr sources can also be fed into the Analog 1 or Analog 2 inputs. Colorspace must be manually changed to YPbPr in this case.
- Use RGB when the analog source is normal RGB.
- Use YPbPr when the source is component analog.

Picture	*clarity*
🖼 **Source**	**Analog 1** ▶
✴ Colorspace	YPbPr (Component Video)
Sync Type	Composite
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Pixel Frequency	65.02 MHz
⊢⊣ Horizontal Resolution	1280
�_ Vertical Resolution	768
🔶 Frequency	– + 1344
📷 Phase	– + 22.5°
🄰 Sharpness	Sharpest
Input Levels	▶

The Analog inputs have a greater range of modes for component than the YPbPr video inputs. If your YPbPr source does not work in the video inputs, try Analog 1 or 2.

2.5.3 Connections, Power

AC loop-thru means you won't need as many mains sockets.

Bring in AC power next to the electronics module.
The voltage can be 115 (90V – 132V) or 230 (200V –
254V).

Loop the AC power out to the next Margay, if you
wish, but limit this to four (4) connected Margays for
115V operation and eight (8) connected Margays for
230V operation.

⚠ **WARNING**
Do not exceed the recommended number of
Margays linked in series for AC power or the
current draw will be too great.

The AC switch on each Margay controls that cube
only. Turning off the switch in the first cube *does not*
cut the AC power to the remaining cubes.

The switch is lit when it is ON and there is AC
power to the Margay.

✎ The AC input is fused with a 10A fuse. If for some
reason the fuse in any Margay blows, all the cubes
downstream from this one will go off.

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AC power in and out

No more than 4

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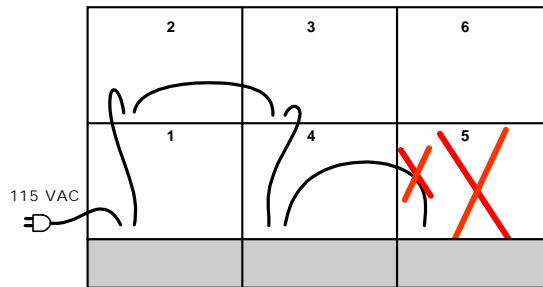
2.5.4 Connections, Control: RS232 & RS485

With serial control, you can control a whole wall, several walls, and any single display in them.

Connect to the computer

Connect the first cube in the wall to the serial out port of a computer or another type of controller, such as a video controller. Connect with computer serial cable, such as Cat-5, using straight-thru cable.
You will probably need to convert the 9-pin serial port to RJ45 with an adapter, which you can buy in most electronic stores.

For very long runs of RS485 cable, it may be necessary to terminate in the last Margay in the string. See 4.4 "Controlling Margay with RS232/RS485" on page 74.

Wiring the adapter

To go from 9-pin D-sub serial connector on the back of the ccomputer to an RJ45 connector, use a standard RJ45-to-9-pin adapter. Wire it internally as shown. The wiring shown for this adapter is correct for *straight-thru* cables. Straight-thru cables are wired 1-to-1, 2-to-2, etc.

Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2
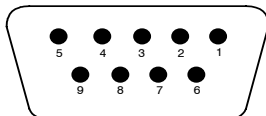
female 9-pin

Connect from the computer or controller to the first Margay. It doesn't matter which cube this is.

Connect this first cube's RS485 Out to the next cube's RS485 In.

✎ Start with RS232 and loop all the rest with RS485.

Information about controlling with RS232 is in 4.4 "Controlling Margay with RS232/RS485" on page 74.

For best results, the RS485 cables should be twisted pair. The pairs are pins 3 & 6 (signal) and pins 1 & 2 (ground). CAT5 cable has the correct twisted pairs.
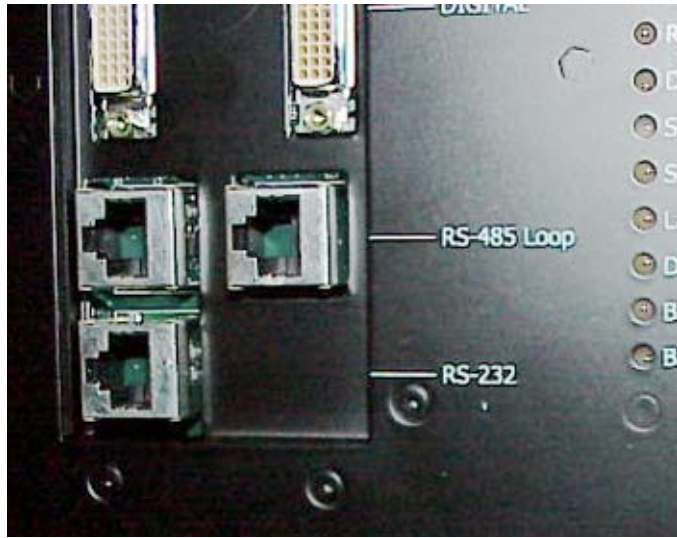
2.6 Installing and Removing Screens

The Margay screens in a wall are quite close together, so the order in which you remove them from a wall is very important.

⚠️ *WARNING*
Do not install or remove any screen until you have read and understand this section. If screens are installed or removed improperly, they may be damaged.

About "no-mullion" screens

One of the best features of Margay is its "zero mullion" screens. The screens are as close together as possible, which means there is very little dead space between them.

The Margay screens "float." When they are installed, they will move up, down, right and left a little. This floating allows them to be position as close to each other as possible. Screens next to each other touch each other.

Floating also means that screens higher in a wall are resting on the lower screens. The screens in the bottom row rest on screen supports, the "skirt" at the bottom that holds all the screens up.

The screens won't fall off if the screen support is removed or if screen in the bottom row is removed. However, they may move down a little.

Avoiding damage to the screens

The close, "zero mullion" screen arrangement comes at a price: You have to be more careful when installing and removing screens than with other Clarity products.

⚠️ *WARNING*
Pulling the screens off incorrectly can damage the screens. See the example on the facing page.

Avoiding gaps between screens

When you install screens in a wall, it is important to put them on in the proper order.

The next two sections describe in detail how to install and remove screens properly.

View from above a row of Margays

When Margays are installed in a row, the screens are very close together.

Top of Margay 1	Top of Margay 2	Top of Margay 3
Screen 1	Screen 2	Screen 3
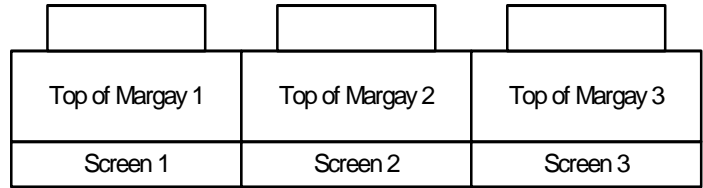
Pulling a screen from the outside of the row causes it to bind with its neighbor.

Top of Margay 1	Top of Margay 2	Top of Margay 3
Screen 1	Screen 2	Screen 3
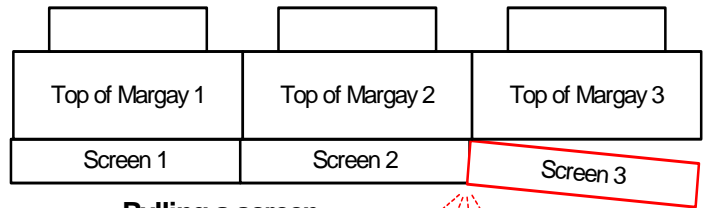
Pulling a screen from the outside edge. DON'T DO THIS!

ouch

The proper way is to make the first pull on the neighboring edge of an outside row.

Top of Margay 1	Top of Margay 2	Top of Margay 3
Screen 1	Screen 2	Screen 3
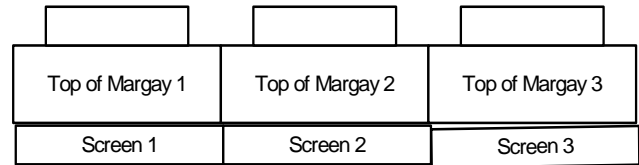
Pull the inside edge of the column first, but just a little.

Then pull the outer edge to release all the spring latches.

Top of Margay 1	Top of Margay 2	Top of Margay 3
Screen 1	Screen 2	Screen 3

Then pull the outer edge.

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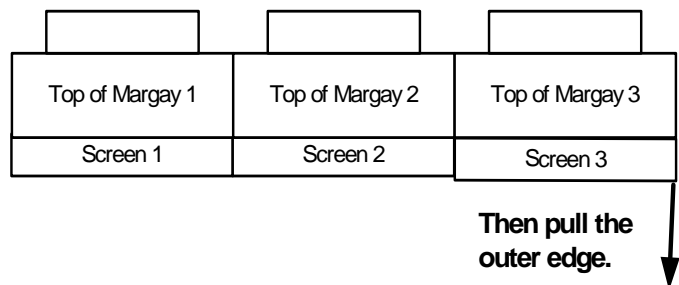
2.6.1 Installing the Screens

Start in the middle of the bottom row and work outward and upward.

First

1. Be sure the wall of Margays is straight and the corners are square. Measure the diagonals of the whole wall. If the diagonals are equal, the wall is a perfect rectangle.

2. The screen supports should be installed on the bottom row of Margays.

Screen supports
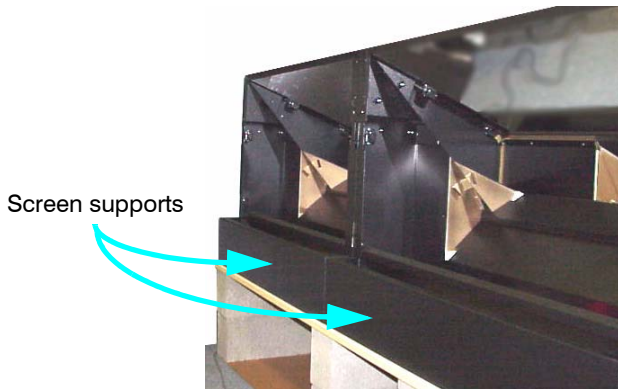
Then

3. Start in the *middle of the bottom row* and install that screen.

   a. Pull the screen rails all the way out on both sides of the Margay chassis.

Extend
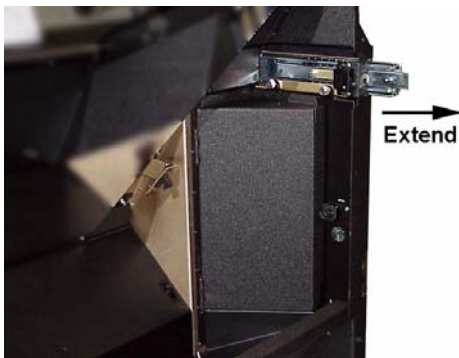
   b. The screen rails have a large pin and the screens have an L-shaped slot.

   c. With one person holding each side of the screen, hang the screen on the rail so the pin goes into the slot.

4. Slide the screen closed, lifting it slightly so the screen won't scrape on the screen support below.

Next

5. Install the screens to the left and right of the center to complete the bottom row.

   a. After you add a screen, press it toward the center.

6. Install the screens above the center screen.

   a. Left each screen and you press it in so it doesn't scrape on the screen below.

   b. Continue until you reach the top.

7. Check the line of this bottom row of screens. If they are not straight, use **shims** on the top of the screen support until the screens are straight.

8. Complete the second row, working outward and pressing the screens inward after they are pressed home.

9. Working upward and outward, finish all the rows.

Final adjustment

Check all the screens for alignment with each other. The lines between screens should form straight lines where they intersect.
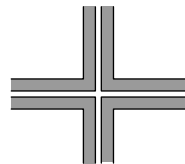
The four corners should meet like this …

… not like this.

8	**5**	**5**	**8**
7	**4**	**4**	**7**
6	**3**	**3**	**6**
2	**1**	**1**	**2**
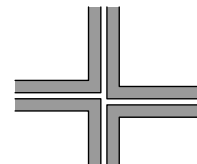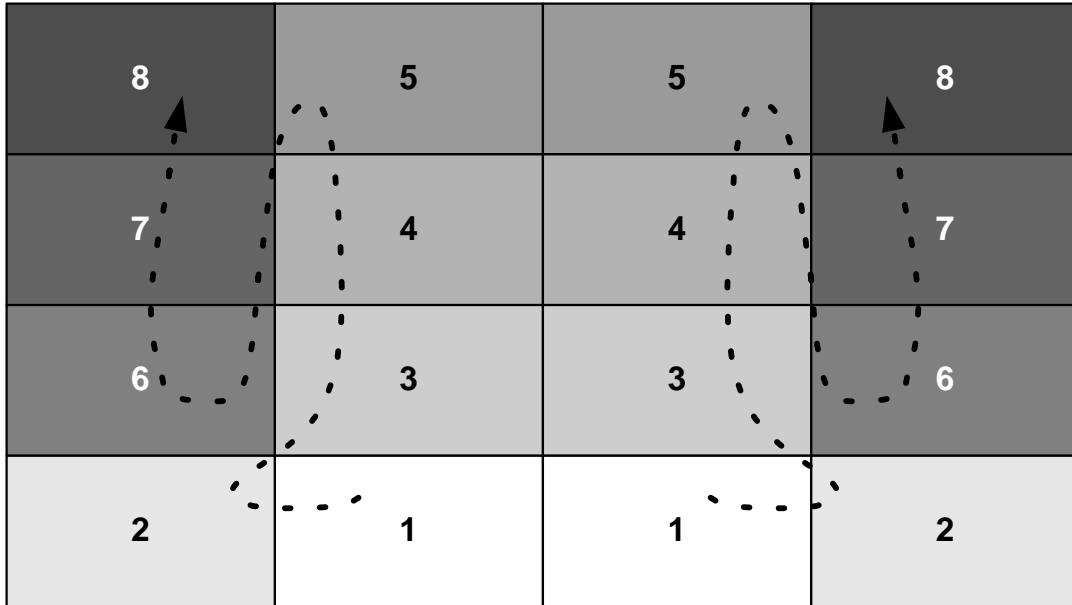
In a wall of Margays, install the screens starting with the center of the bottom row and work out to the ends.

Then install the screens above the middle until you have an inverted **T**.

Finally, install the rest of the rows, complete each row before moving up.

2.6.2 Opening or Removing a Screen

Removing a screen from a *single* Margay standing *alone* is not a problem. Simply grasp the sides of the screen and pull forward sharply. The spring latches will pop loose.

Removing a screen from a Margay in a *wall* is more exacting, because the screens are so close together.

On the opposite page, look at the row of Margays. To remove a screen on the outside column in a wall, *do not* start at the outside edge. This seems the logical place to start, but it will cause the outside screen to crunch against the next screen to the center.

Notice also that if you want to remove a screen in the middle of a wall, you should work from the outside of the wall inward.

Hints

✎ When pulling with the suction cup, always pull at a slightly up angle. This keeps the screen from scraping the screen below.

✎ Place the suction cup puller near the corner of the screen.

✎ Start at the outside and work in.

✎ Never pull the "open" edge first.

Steps to remove a single screen from a Margay wall

1.
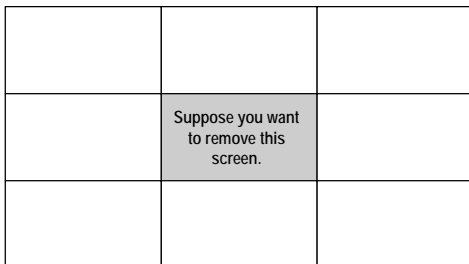
2.
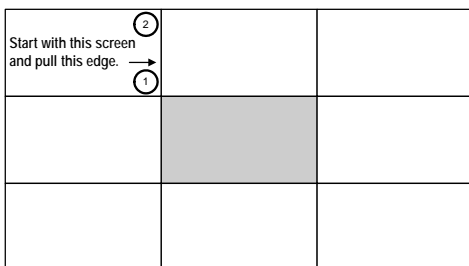
3. Place the suction cup near the corner of the screen and pull slightly up and outward sharply.

You will hear the screen latch click and release. Pulling up a little keeps this screen from rubbing the screen below. Release the latch at top and bottom of one side.

Place suction cup at these points
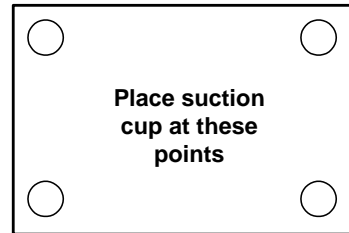
⚠ *CAUTION*
When you pull the edges out, pull out only ½" (2 cm). That is enough to release the spring latches without harming the next screen.

4.

Then pull this edge.

5.

With both edges free, remove this screen completely

6.

Next, pull this edge.

7.

Then this edge.

8.

Now here.

9.

Then this edge.

10.

Finally, pull this edge.
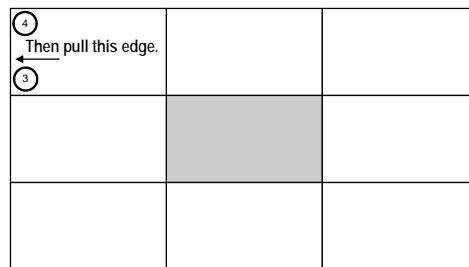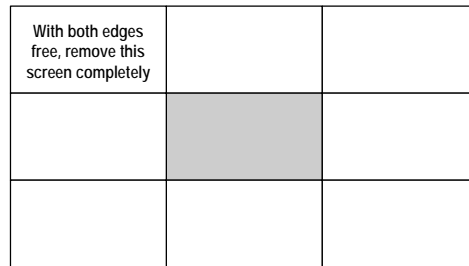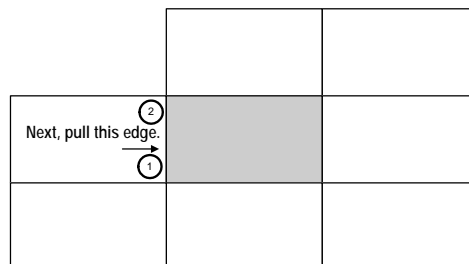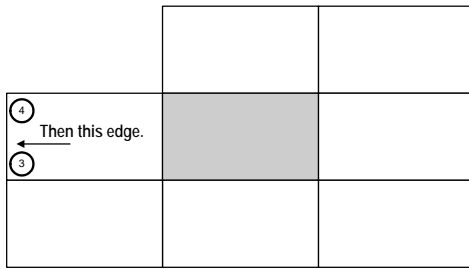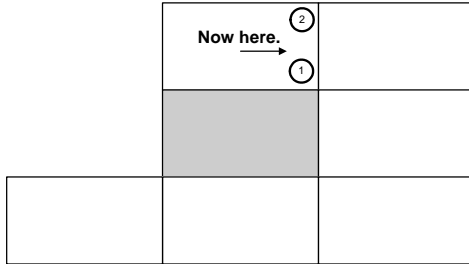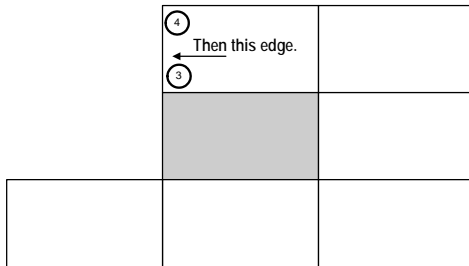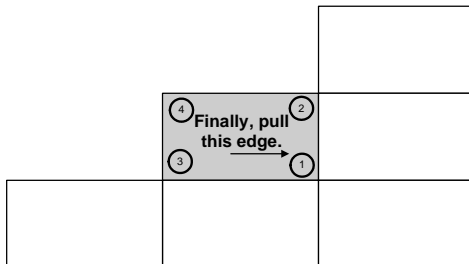
This may seem like a long way to pull a single screen, but this order of operations helps prevent screen damage.

2.6.3 Opening a Screen Temporarily for Work

The Margay screen props open for work from the front.

1. *Carefully* open the screen of the Margay you want to work on. See 2.6.2 "Opening or Removing a Screen" on page 34.
2. Pull the screen all the way out.
3. Use the hook to hold the screen at an angle.
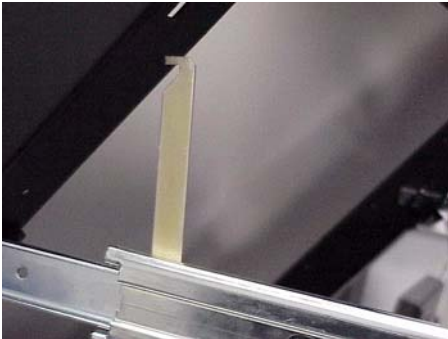
4. Be sure to close the hook along the slider before closing the screen.

3 Aligning and Adjusting

3.1 Adjusting Margay's Engine: Important Step

The optical engine must be adjusted to aim the picture accurately at the screen.

Although the optical engine was perfectly adjusted when the Margay left the factory, vibration along the way may have moved it.

> ⚠ *CAUTION*
> It is important to check this mechanical adjustment of the optical engine before any electronic adjustments are made to the picture.

Aligning the optical engine

1. Open the Engine Alignment menu.
2. In the last item in the menu, choose Grid. This pattern shows all the pixels in the optical engine.
3. Start by positioning the grid pattern to the *center* of the screen.
   a. The Left and Right Side controls move the left and right sides of the grid up and down. These two controls react with one another a little, so moving the right side may affect the left side, too.
   b. Separately the Left and Right Side controls adjust rotation of the grid image. Together they adjust the vertical position.
   c. Use the Horizontal control to move the grid image left and right. Again, this control interacts somewhat with the up and down controls of left and right.
4. When the grid image is centered, use the Image Size control to size the image. Try to lose (hide) one pixel at the edge of the screen.
   a. The other pattern, Alignment Dashes can help you here. This pattern shows the last six pixels at each edge.
   b. To hide one pixel, adjust the size so that you see five dashes at each edge.
   c. There may be a small amount of curvature (barrel or pincushion distortion) at the edges. This is normal. You will have no more than about one pixel of curvature along any edge.
   d. The Image Size control may affect the rotation or position of the image, so go back and forth between the controls to find the best adjustment.

Hiding one pixel at all sides is ideal. Try to make it at least one pixel and no more than three.

What if you CAN'T move the image enough?

In some rare situations, you may not be able to use the Engine Alignment menu to move the image far enough on the screen. If so, you must manually move the optical engine carriage.

1. If you have moved the image using the Engine Alignment menu, move the image back to the "center". You can find the center of the range of alignments by finding each extreme and moving the image to the middle.

✎ By "centering" the alignment engine you will retain fine image adjustment settings. In the following steps, you will do gross adjustments to move the image. You must still do fine tuning of the image alignment using the Engine Alignment menu.

2. Remove the rear panel (6 ¼-turn screws).
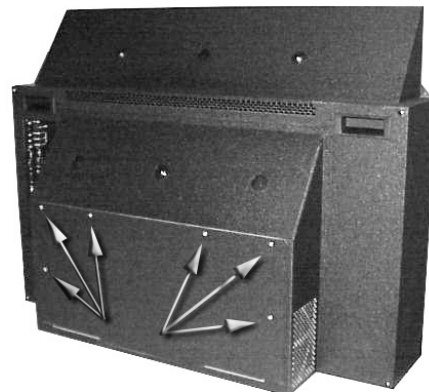
3. The optical engine carriage is exposed. (Cables normally attached to the optical engine have been removed for these pictures.)

4. Loosen the two mounting nuts on the left side of the carriage.

Loosen these two nuts
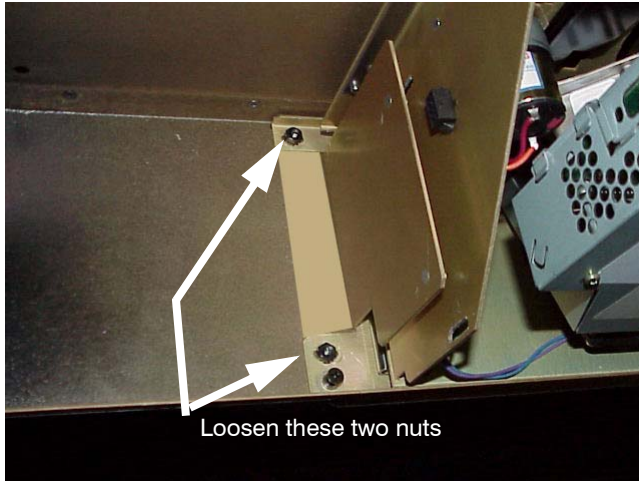
5. Loosen the single mounting nut on the right side of the carriage

Loosen this nut
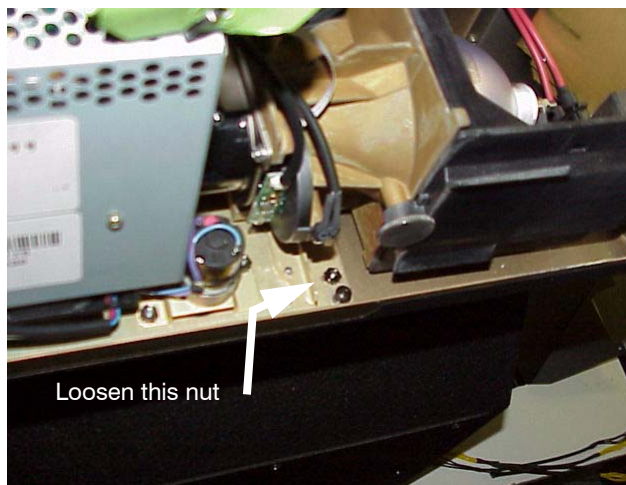
6. To move the screen image to the right, move the carriage to its left (as you face the carriage from the back of the unit).
7. To move the screen image to the left, move the carriage to its right.

8. To move the screen image up or down tighten or loosen the adjustment screws on the both sides of carriage.

Move image up or down by adjusting this screw...

... and this screw
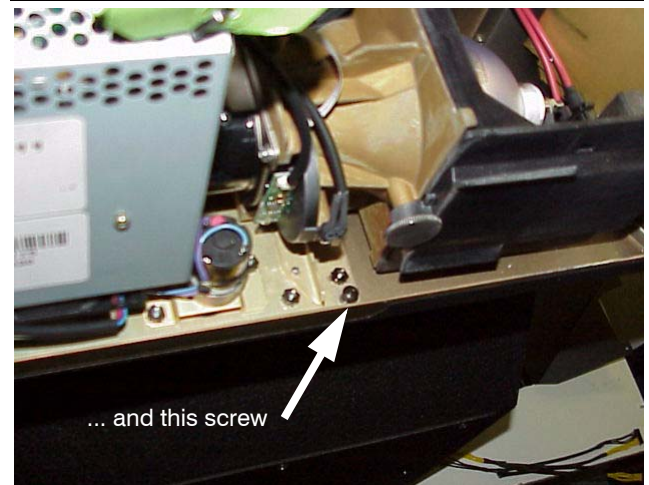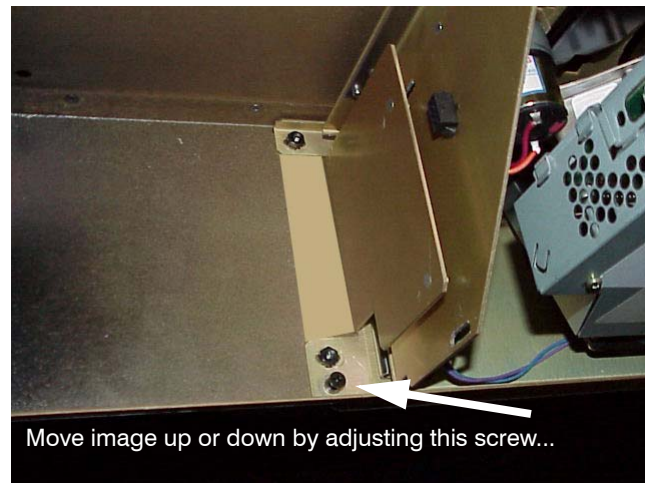
a. To move the screen image down, tighten these screws (turn the screws clockwise).
b. To move the screen image up, loosen the screws (turn the screws counter-clockwise).

✎ These adjustments are for large physical movement. You'll still need to do fine tuning of the picture position using the process described in "Aligning the optical engine" on page 38.

9. After you have moved the image to a more reason-able position, tighten the three mounting nuts you loosened earlier.
10. Now fine-tune the image position as described in "Aligning the optical engine" on page 38.

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Main Menu

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Advanced Options

Color Balance	▶
Miscellaneous Options	▶
Lamp Settings	▶
Serial Port Settings	▶
Auto Setup Options	▶
Engine Alignment	▶
Menu Options	▶

Engine Alignment

Left Side	
Right Side	
Horizontal	
Image Size	
Test Pattern	Grid
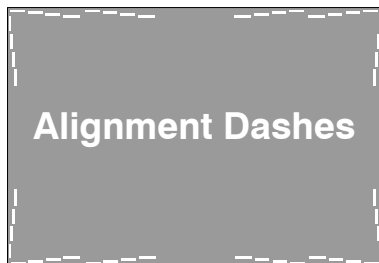
Alignment Dashes

Use the Alignment Dashes pattern to show how many pixels are visible at each edge.
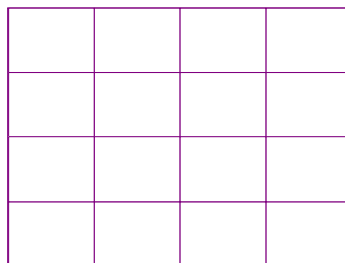
Use the Grid pattern to adjust rotation and to align all patterns in a wall.

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3.2 Adjusting Each Margay To Its Source

The source picture—from computer, video, DVD—is not always perfect in its size or strength; it does not always conform exactly to a standard. Margay has a way to compensate for this.

Computer sources vary quite a bit from computer to computer. They even vary between video outputs on the same video card. Video sources vary more.

To make the Margay respond correctly to these non-standard sources we adjust Input Levels.
- Input Levels for computer sources, analog, see page 44
- Input Levels for computer sources, digital, see page 48
- Input Levels for video sources, page 50

How does Input Level relate to Color Balance

To make all the displays show the same color and brightness across the whole wall, you need to adjust input levels *and* do color balancing.

You can do Input Levels first, or you can do Color Balance first. It doesn't matter. But they must both be done.

✎ Input Levels and Color Balance do not affect each other, but they both affect the final picture.

- Color Balancing the displays, page 52

What does Input Level do?

For analog computer sources adjusting to the computer's picture output means finding what that computer means by black and white.

Black is supposed to be a voltage of zero coming from the computer's video card, but it almost never is. White is supposed to be a voltage of 0.7 volts, but it usually isn't either.

The Input Level adjustment process asks you to provide a picture from the computer that is black, then one that is pure white. With these, you can quickly and automatically make the display "learn" what *this* computer means by black and white.

The result? Good pictures, using all the dynamic range of color coming from the computer.

✎ For Input Levels, you must use black and white coming from the computer you will use for the program. You don't make this adjustment with your work laptop and then switch to another computer for the display's program of pictures.

What does Color Balance do?

Color balancing adjusts all the displays in a wall so they produce the same colors across the entire wall.

Displays differ from one another because of very small differences in the color of the light produced by the lamp and by differences in the dyes used to make the color in a DLP™ optical engine.

In color balancing you use the display's internal test patterns of white, first, then gray. The internal pattern assures that a pure white is used.

Selecting the source
1. Press MENU on the remote.
2. Select PICTURE and press ENTER.
3. Select SOURCE and press the LEFT ARROW key.
4. Choose the source you want and press ENTER.
5. Press MENU again to close all menus.

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Main Menu

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Picture

Source	Analog 1	▶
Colorspace	YPbPr (Component Video)	
Sync Type	Composite	
Vertical Frequency	60 Hz	
Horizontal Frequency	43.38 kHz	
Pixel Frequency	65.02 MHz	
Horizontal Resolution	1280	
Vertical Resolution	768	
Frequency	– ⟨▭⟩ +	1344
Phase	– ⟨▭⟩ +	22.5°
Sharpness	Sharpest	
Input Levels		▶

☑	Analog 1
☐	Analog 2
☐	Digital
☐	Component (YPbPr)
☐	S-Video
☐	Composite

43
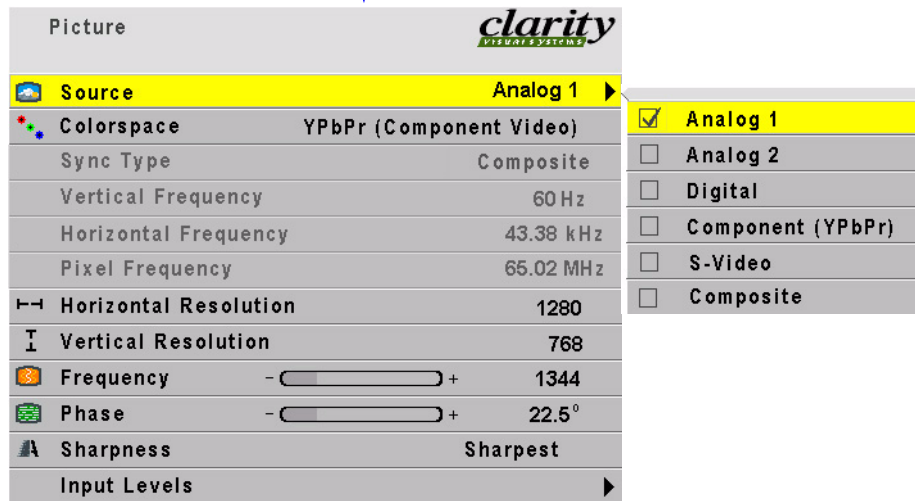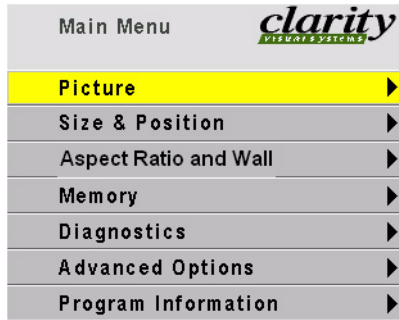
3.2.1 Adjusting to Computers, Analog RGB

The best way to adjust levels is the semi-automatic method.

Adjusting levels semi-automatically

This is quick and easy if you can get a black picture and a white picture from the source computer.

1. Display a black picture from the source. *This must come from the computer source that will be used for the program.* It does no good to use your laptop for this adjustment, then connect to a different computer for the program. Nor can you use the Margay's black test pattern. (Hint: Make a black screen from Windows Paint program.)
2. In the MANUAL LEVELS menu, select Auto Black Level and press ENTER. (There are several paths to the Manual Levels menu as shown in the pictures.)
3. Display a white picture from the source.
4. Select AUTO WHITE LEVEL and press ENTER.

That's all there is to it.

The Margay is now adjusted to the black and white levels of *this* computer using *this* video card. If you change computers or video output cards in the computer, you must do this again.

Adjusting levels completely automatically

Open the AUTO SETUP OPTIONS menu and check DO BLACK/WHITE LEVELS. You can check the other items, too, particularly FREQUENCY and PHASE.

Now press SETUP. Margay looks for the darkest pixel and the brightest pixel in the picture and adjusts itself so that these are the truly the darkest and brightest.

When the Black/White Levels item is checked, the Margay will do this automatic level adjustment whenever a *completely* new source is displayed.

What is a "completely" new source?

Margay remembers all the values in the last 10 pictures. If a new picture comes from a different source, such as from a different computer, and that picture has almost exactly the same resolution, number of active lines, number of blanking lines, etc., the Margay will assume that this is a source it has seen before and use the remembered setup values. This is a different sort of memory from the 40 numbered memories described in "Using the Memories Efficiently" on page 78.

On the other hand, if the new source is sufficiently different, Margay will engage all the checked processes in the Auto Setup Options menu.

When a saved memory is recalled from the Recall menu, Margay does not do any auto setup.

Which is best: Manual, Semi-Auto, or Auto

The manual and semi-automatic methods are more accurate. The automatic method is sometimes not accurate enough for the White Level.

The good news is that you should only have to do the manual or semi-auto method once for each computer source. Save these settings in the Save menu, "How to Save to a Memory" on page 80. Then use Recall to instantly bring it all back.

When to re-adjust levels

You should re-adjust black and white levels whenever:

- the computer is changed;
- the video card in the computer is changed, or you switch the source for *this* cube to a different video card output in the same computer;

you change the electronics module.

Adjusting to computer sources manually

See "Adjusting Input Levels Manually" on page 46.

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Main Menu

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Auto Setup Options

☑	**Retry on lost signal**
☐	Do Black/White Levels
☑	Do Frequency
☑	Do Phase
☑	Do Position

Picture

🖼	Source	Analog 1 ▶
•	Colorspace	RGB
	Sync Type	Separate H&V
	Vertical Frequency	60 Hz
	Horizontal Frequency	43.38 kHz
	Pixel Frequency	65.02 MHz
⊢⊣	Horizontal Resolution	1280
ꞁ	Vertical Resolution	768
🔆	Frequency	− ▭▭ +	1344
	Phase	− ▭▭ +	22.5°
	Sharpness	Sharpest
	Input Levels	▶

Input Levels

🔆	**Auto Black Level (offset)**			
◗	Auto White Level (gain)			
	Center Point	2	1	4
🔆	Black Level (offset) - All	− ▭▭ +		55
	Red	− ▭▭ +		68
	Green	− ▭▭ +		57
	Blue	− ▭▭ +		69
◗	White Level (gain) - All	− ▭▭ +		130
	Red	− ▭▭ +		128
	Green	− ▭▭ +		131
	Blue	− ▭▭ +		130

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3.2.1.1 Adjusting Input Levels Manually

It is rarely necessary to adjust input levels manually. You can skip this section.

Adjusting levels manually

1. Display an all-black picture from the source computer.
2. Press LEVEL on the remote.
3. Select MANUAL BLACK LEVEL and adjust it up and down with the +/– keys to make the three CENTER POINT values go to zero. If they do not all touch zero at the same time, use the individual colors under MANUAL BLACK LEVEL to adjust them.

✎ Do not go beyond the point where the Minimum just goes to zero. The idea is to just touch the zero level.

4. Display an all-white picture from the source computer.
5. Select MANUAL WHITE LEVEL and adjust the levels until the CENTER POINT values just touch 255, adjusting the individual colors as necessary.

✎ It is not a good idea to use the levels to make all the displays in a wall match each other. That should be done with the Color Balance menu. ("Color Balancing a Wall of Margays" on page 52.)

3.2.2 Adjusting to Computer Sources, Digital

Digital sources do not normally need adjustment, but the controls are there if you need them.

These controls are advance level controls and should not be adjusted unless you have been briefed by the factory or are familiar with black level adjustments. They are used to correct the digital blacks that come from video cards that have incorrect levels.

✎ Don't use these controls unless you have been briefed by Clarity or you are familiar with black level adjustments. These controls are usually not necessary.
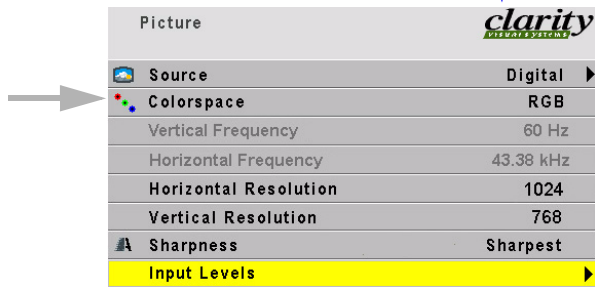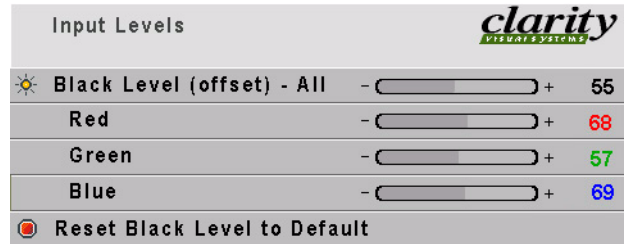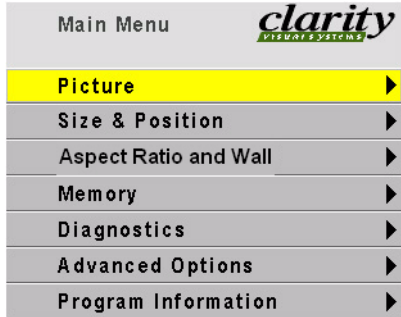
Main Menu

Picture ▶

Size & Position ▶

Aspect Ratio and Wall ▶

Memory ▶

Diagnostics ▶

Advanced Options ▶

Program Information ▶

Picture

Source — Digital ▶

Colorspace — RGB

Vertical Frequency — 60 Hz

Horizontal Frequency — 43.38 kHz

Horizontal Resolution — 1024

Vertical Resolution — 768

Sharpness — Sharpest

Input Levels ▶

Input Levels

Black Level (offset) - All   – ⊂▭▭⊃ +   55

Red   – ⊂▭▭⊃ +   68

Green   – ⊂▭▭⊃ +   57

Blue   – ⊂▭▭⊃ +   69

Reset Black Level to Default

This form of the Input Levels menu appears when the current source is Digital and the **colorspace is RGB**.

This form of the Input Levels menu appears when the current source is Digital and the **colorspace is YPbPr**.

Input Levels

Hue   – ⊂▭▭⊃ +   27

Blue Only

Restore Factory Defaults

Black Level (offset) - All   – ⊂▭▭⊃ +   55

Red   – ⊂▭▭⊃ +   68

Green   – ⊂▭▭⊃ +   57

Blue   – ⊂▭▭⊃ +   69

Reset Black Level to Default

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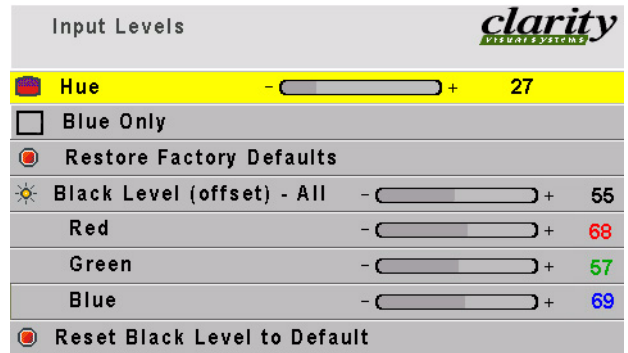
3.2.3 Adjusting to Video Sources

Video adjustments are quite a bit like the controls on a television receiver.

Adjusting the picture

1. Select a video source in the Picture menu. When the VIM option is installed (Video Input Module) Margay has available
   a. one composite video,
   b. one S-Video, and
   c. one component (YPbPr) input.
2. Press LEVEL on the remote.

✎ These controls are also used for analog sources when you chose YPbPr Colorspace.

Now you have two choices.
- Adjust using any picture from the video source.
- Adjust using a standard color bar pattern from the source.

Adjusting with any picture

This procedure must be done *after* you adjust color balance (page 52).

1. Choose pictures that have blacks and whites represented as well as a variety of colors.
2. Adjust Contrast, Brightness, Saturation and Hue on *one* Margay until it looks satisfactory.
3. Adjust all the other Margays in the wall so they have the same values for Contrast, Brightness, Saturation and Hue as the first Margay.

Adjusting with color bars

1. If possible, use a color bar pattern from the video source you will use for the program material. You cannot use the color bar from the Test Patterns menu.
2. In the Picture menu, check Blue Only. You should see only the alternate color bars, all of them blue.
3. Adjust Saturation to make the outer two color bars match. Match them in brightness; they will already match in color.
4. Adjust Hue to make the inner two color bars match.
5. Uncheck Blue Only

✎ When a video source is selected, Auto Setup Options is not available. Adjustments must be made manually.

6. If the color bar pattern has a pluge, you can use it to adjust Brightness.

Pluge
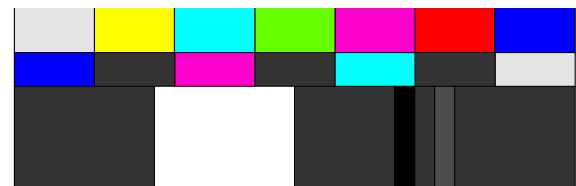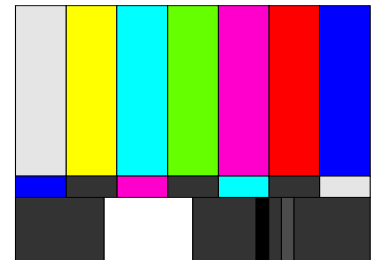
Adjust Brightness so you *cannot* see the different between these two marks,

but you *can* see the difference between these two marks.
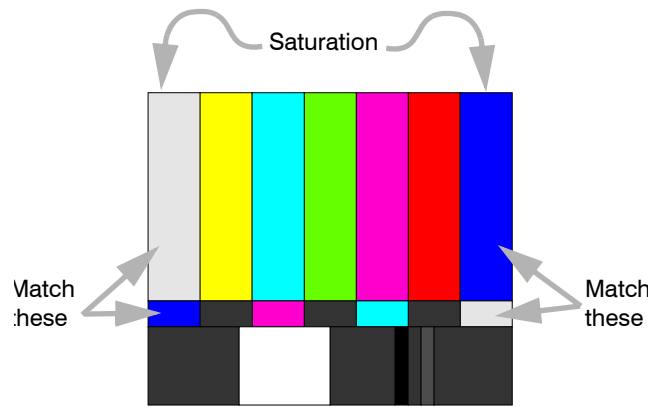
Adjust Saturation so the outside bars
match when Blue Only is checked.
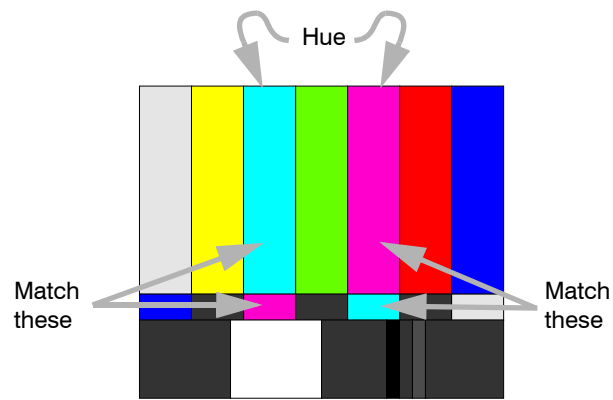
Adjust Hue so the inside bars match
when Blue Only is checked.

3.3 Color Balancing a Wall of Margays

Color Balancing can be done before or after Input Levels.

The object of color balancing is to make the individual units show the same colors. When we see a red car move across a video wall from one display to another, we want it to have the same color for the whole trip, not change from red to maroon to orange.

The displays naturally have slightly different colors from one display to the next, because of slight variations in the lamp and DLP™ engine. This cannot be avoided, but we can compensate for it with color balancing.

Color balancing is subjective. It may seem strange at first, but it gets easier with practice. Fortunately, you don't have to match all the colors; you only have to match whites and grays.

When you make all the displays look the same with White and Gray, all the other colors will look the same. It is not necessary to achieve a perfect white or a perfectly colorless gray. It is only necessary that all the displays look alike when they display white and gray.

⚠ **CAUTION**

Never try to match the colors of the display units with the Black and White Level controls or with the Video Controls. You will not like the results if you do.

Color Balancing

1. Turn on all the units in the wall and let them warm up for at least five minutes. The lamps must be thoroughly warm before you color balance.
2. For each display, press MISC once on the remote.
3. Set **Gamma** at the bottom of the menu to either Video or Film, but be sure this is the same for all cubes.
4. Set **White Boost** to **Off**.
5. Set **Test Pattern** to **White**.

✎ Always use the internal Test Patterns for color balancing, not an external pattern.
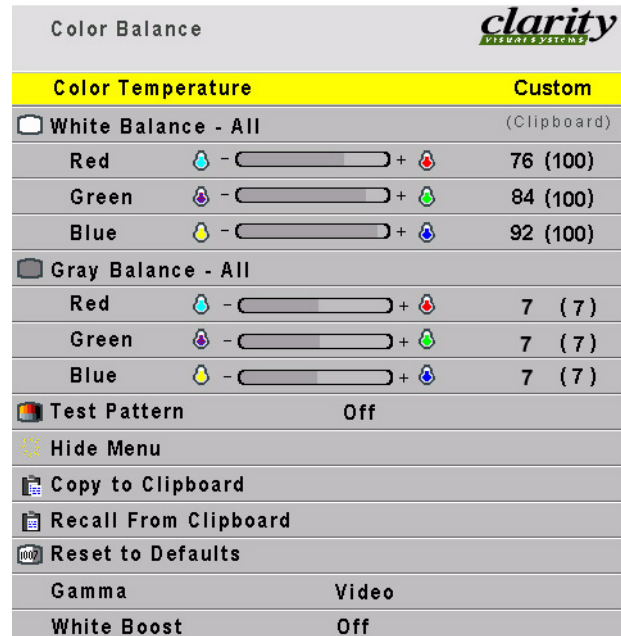
✎ If the wall has never been color balanced, make sure you start with the same color temperature setting on each cube. If you are not interested in achieving a specific color temperature, use the default of 8500K, which is the brightest. If the cube has been color balance before, it will display CUSTOM in its color temperature setting, because the balance values don't match any of the pre-set color temperatures.

6. Look at the Color Balance values on *all* displays. All the White balance values should be 100, and all the Gray balance values should be 7. If any values are not that way, select **Reset to Defaults** and press ENTER. This is where you should *always* start color balancing.
7. Select Hide Menu and press ENTER on each display. This will remove all the menus so you can see the whole screen on all displays. (To re-open the Color Balance menu, press ENTER for that displays.)
8. Look at all the displays together. Stand far enough away from the wall so you are looking almost squarely at all of them. Pay attention to the large central area, not the edges.
9. Find the darkest display. This is the *baseline* display. *Do not* change this one.

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10. Pick a display next to the baseline display, above, below, or to the side. This will be the *variable* display. Turn on the Color Balance menu for this variable display by pressing ENTER. Be close to the display to do this so only this one display has the Color Balance menu showing.

11. Match the brightness of this *variable* display to the *baseline* display.
    • Match brightness first. Move the selector arrow to White Balance – All.
    • With the left key, reduce the brightness until it matches the baseline display.
    • Select the individual colors and adjust the amounts of Red, Green and Blue to achieve the best match in color and brightness to the baseline display.

12. When the first variable unit matches the baseline unit, it becomes another baseline unit. Turn off its Color Balance menu with Hide Menu.

13. Choose another variable unit next to any baseline display, turn on its Color Balance menu, and match its white to any baseline display.

14. When all displays match in white, change Test Pattern to Gray so all the displays show an internal gray pattern.

15. The gray values range from 0 to 15, and they are all now set at 7. Therefore, gray can be adjusted up and down. Choose a display that has a middle brightness and that has very little color in gray. This becomes the first *baseline* display for gray. It *does not* have to be the same as the baseline unit used for White.

16. Proceed as before, matching the grays one display at a time. Always work with adjacent displays.

17. When all displays match in gray, turn off the test pattern on each display.

✎ Copy to Clipboard will save all the current settings to a temporary memory. You can then make more adjustments to see if it gets better or worse. Recall from Clipboard will restore these saved settings. The clipboard is only for testing. These values are not saved when AC power is off.

✎ While color balancing, change the White value by a lot, not just one step. It's difficult to see one step in White. A large change will tell you if you are heading in the right direction.

✎ If you can't decide which way to go or how to get this cube closer to the others, try any change. If it is the wrong change, it will be quickly obvious, and you can go back. Use the clipboard.

Color Balance values are saved for all input sources in the same memory location. Color Balance is the same for all sources.

Changes in the White value moves this end point.

Changes in the White values affect the Gray values.

Changes in the Gray values do **not** affect the White values.

Changes in the Gray value move this mid point.

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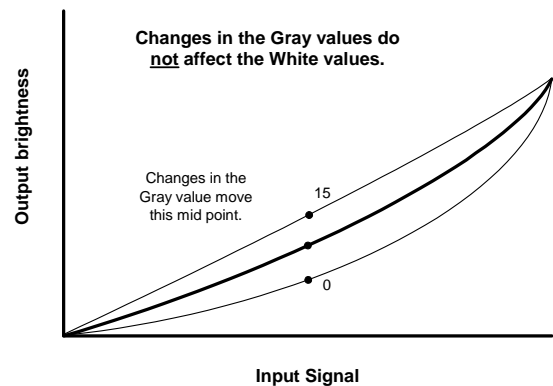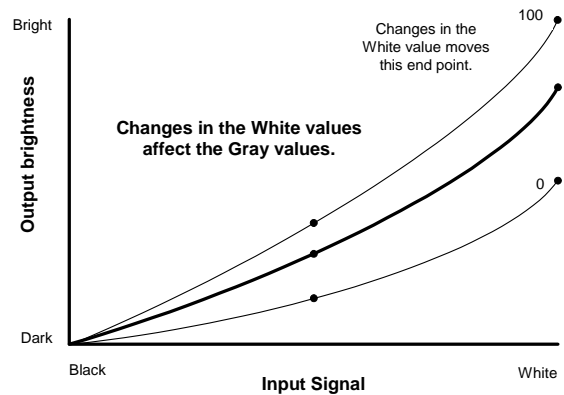
3.4 Spreading One Picture Over a Wall

Whether you use Clarity's Big Picture™ or an external video processor, your goal is to make the picture fit together properly at the edges. When this is done correctly, the viewer does not notice the black lines separating the screens.

If you have *not* checked the optical engine alignment on each Margay, do so now. (See 3.1 "Adjusting Margay's Engine: Important Step" on page 38.)

Using an external processor

The processor divides a single picture into several sections and sends each part on a separate cable. Connect these cables to the proper Margay. You do not need the Big Picture key is this case.

You can still position the picture with the Margay controls, or, with most processors, position and zoom the picture with the processor controls.

Using Clarity's Big Picture™

Each Margay must have a Big Picture key installed ("Installing the Big Picture Key" on page 12).

Loop the same source through all the Margays in a wall ("Connections, Control: RS232 & RS485" on page 28).

For each cube, set the Wall menu for the same wall size.

- **Wall Width** and **Wall Height** are the number of cubes wide and high for the *picture*. This may be different from the physical wall size. You could build a 4x4 wall of Margays and use Wall Mode to put a single picture on the four cubes in the upper left corner, for instance.
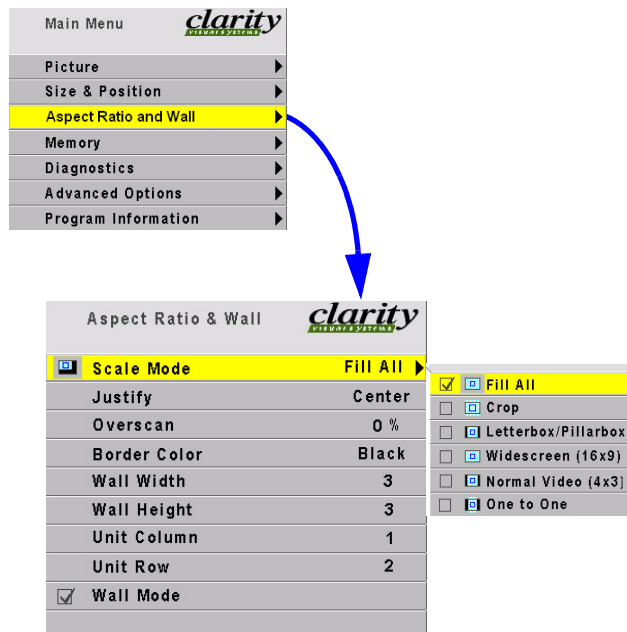
- Unit Column and Unit Row is the position of the Margay in this "wall."
- **Wall Mode**, when checked, turns on the Clarity Big Picture™ feature. When not checked, the cube shows the whole picture.

✎ Each cube in a "wall" gets the whole picture by looping the source from one cube to another, or be feeding them all with a distribution amplifier. The Wall & Aspect Ratio menu tells the cube what portion of the entire picture to display.

Scale Mode, Justify and Border Color...

...are explained in the next section, page 56.

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3.4.1 Scaling and Cropping

Sometimes the picture does not fit the wall. If the source picture is video from a DVD, the aspect ratio is probably 1.77 (16x9), the same as HDTV.

✎ The aspect ratio of a picture is its width divided by its height. $1024 \div 768 = 1.33$

The aspect ratio of a Margay is 1.77 (16x9), the same as HDTV. When the source picture's aspect ratio is *not* the same as the Margay wall, you have to do something to make the picture fit. You have some basic choices:
- Fill the area both ways. This will produce some distortion in the picture. Circles will not be round.
- Put the picture in without distortion and crop off the sides (or top and bottom).
- Put the picture in without distortion and fill the extra space with black or some other solid color.
- Force an aspect ratio, such as 16 x 9 or 4 x 3.

This is a 1.77 picture shown on a 3x3 wall of Margays. The picture fills the wall nicely, and there is no distortion or cropping.

A picture with an aspect ratio of 1.77 is shown on a 3x3 wall of Margays.
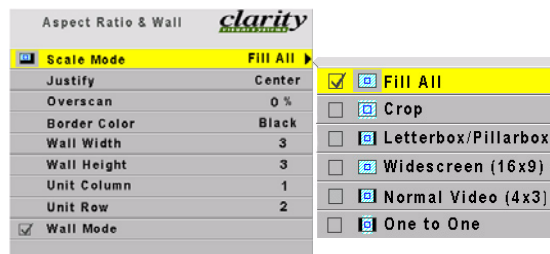
Let's start with a 1.33 (4x3) picture, the aspect ratio of normal TV, and put it on this same wall of Margays. Here is the original picture.

Scale Mode determines how the picture will be made to fit the wall.
- **Fill All** means that the picture will touch the borders of the wall all around, even if this means stretching (and distorting) the picture in one direction. The picture had to be stretched sideways to fill the screens.

- **Letterbox** means expand the picture until the first edges (top-bottom or left-right) touch the border of the wall, then fill in the other sides with a solid color.
- **Crop** means expand the picture until the *second* edges touch the border and let the other edges of the picture fall outside the wall and get cropped. Here the width is filled, there is no distortion, but

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the top is cropped off. This would happen when the Justify is BOTTOM.

- **Widescreen** means force the aspect ratio to 16 x 9 (1.77), the standard for many DVD movies.
- **Normal** forces a 4 x 3 (1.33) aspect ratio, the ratio of standard television.

Justify determines how the picture will be place in the wall.
- If the picture is too wide for the wall and is cropped on the sides, you can choose **Left**, **Center**, or **Right**.
- If the picture is too tall for the wall and is cropped top and bottom, you can choose **Top**, **Middle**, or **Bottom**.
- Similar choices are made if the picture is letter-boxed.

Border Color determines the color of the "extra" space around the picture if it doesn't fill the screen. The choices are:
- Black
- White
- Red
- Green
- Blue
- Dark Red
- Dark Green
- Dark Blue

When the Scale Mode is Fill All, the Border Color line will be grayed out, because there will be no border.

No Big Picture key
If there is no Big Picture key, the whole picture will appear on the screen, and the menu looks like this:

You can't spread one picture over several Margays, but you can make the picture fit one Margay is the ways described above.

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3.4.2 Zoom and Position

Position moves the picture on the screen. This is NOT the same as optical engine alignment. Zoom adjusts the edges of the picture to make it fit with the other pictures in a wall.

Position

Press the MISC button once to open the Picture Position menu. The four arrow keys move the picture on the screen.

The numbers for Horizontal and Vertical Position refer to the number of pixels from sync to the first displayed pixel. These numbers get smaller as the picture moves up and to the left.

Black edge

If you see a black edge on the screen, and you can't move the picture to cover the black, you must adjust the optical engine position. See "Adjusting Margay's Engine: Important Step" on page 38 to do this.

Zoom

Zooming is used mainly to make the edges of a large picture—one that covers many Margay screens—fit each other side-to-side and top to bottom.

Zoom menu entries

- **Image Resolution** is the resolution of the source picture.
- **This Cube** is the number of pixels this unit is using of all the incoming pixels, followed by the size of the wall (from the Wall & Aspect Ratio menu) and the Column and Row of this unit.

Using Zoom and Position

Picture Position is usually used to center the picture on the screen.

✎ If the screen has a black edge on one or two sides, and you try to move the picture to cover the black side, and this does NOT cover it, see "Adjusting Margay's Engine: Important Step" on page 38 for help.

Zoom is primarily used to adjust the edges of the picture when one picture is spread over several cubes. Whether you use Clarity's Big Picture™ or an external video processor to make one picture cover several cubes, the Zoom controls can make the edges fit together.

Picture Position _clarity_
Use arrow keys to move image

Horizontal Position 234
Vertical Position 34

Zoom Top & Left _clarity_
Arrows move top and left

+1
+0 +1
– 2

Image Resolution 1024x768
This Cube 511 x385 2x2 1:2

Zoom Bottom & Right _clarity_
Use arrow keys to move bottom and right of image window

– 2
+1 +0
+1

Image Resolution 1024x768
This Cube 511 x385 2x2 1:2

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3.4.3 Viewport Adjustment

The Viewport menus adjust the image on the DMD™.

What is the DMD?

DMD stands for Digital Micromirror Device. It is Texas Instrument's name for their patented chip that produces the pictures in a DLP™ (Digital Light Processing) system.

The DMD chip is about the size of a postal stamp and contains, in the case of Margay, 1280 by 720 pixels.

What is Viewport?

The Viewport menu adjust the number of pixels actually used on the DMD. You can't increase this number, naturally, but you can reduce it.

- **DMD Resolution** shows the resolution of the DMD chip. This has nothing to do with the resolution of the source picture.
- **Viewport** shows the number of DMD pixels being used.

Main Menu *clarity* VISUALSYSTEMS

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Viewport Top & Left *clarity* VISUALSYSTEMS
Arrows move bottom and right

+ 0

+ 0   − 4

+ 0

DMD resolution   1280 x 720
Viewport   1276 x 720

Size & Position *clarity* VISUALSYSTEMS

Picture Position	▶
Zoom Window Top & Left	▶
Zoom Window Bottom & Right	▶
Viewport Window Top & Left	▶
Viewport Window Bottom & Right	▶
Reset All Windows to Default	

Viewport Bottom & Right *clarity* VISUALSYSTEMS
Arrows move bottom and right

+ 0

+ 0   − 4

+ 0

DMD resolution   1280 x 720
Viewport   1276 x 720

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3.5 Saving Your Work & Recalling a Memory

Some saving is done automatically, but there are big advantages to saving your work manually. There is more information about memories starting on page 78.

How automatic save works

Whatever changes you make with the remote control or RS232 commands, these changes are saved automatically. If you change sources (switch to another input connector) and come back to this source, everything you did before will be "recalled." Things will look like they did before.

Suppose you make adjustments to an SVGA source on Analog 1, then you feed a UXGA source to Analog 1 and make new adjustments. Then you switch to the S-Video 1 connector and do some more setup for it.

Later you switch to the Analog 1 input again, and this time it has the SVGA source from before. The Margay will recognize that it has seen this source before, or at least a source with these characteristics, and will recall the SVGA settings you established before.

This kind of recall includes Input Levels, Position, and Frequency, but it does not include Wall Mode and any Big Picture adjustments you made. Those need to be recalled from memory slots.

Manually saving to memory slots

Margay has 40 numbered memory slots, and this is the best way to save. Recall is fastest from memory slots.

First, set up the Margay the way you want it, including all the adjustments listed in this section. Then press the SAVE button twice. This opens the Save grid.

Navigate to an unchecked slot number, or to a checked slot if you want to overwrite what's already saved. Press ENTER.

This menu shows all the data that will be saved. You can't change anything but the name in this menu. To save immediately, press ENTER. The appearance of this menu is somewhat different for digital and video sources, reflecting what is saved for them.

To change the name of the memory slot

The default name is an abbreviated description of the contents. In this case, the name tells you that the source is connected to Analog 1, which is an XGA picture. This cube is part of a 2x2 wall, and it's the cube lower left corner (column 1, row 2).

If your customer wants or needs a more descriptive name, select the Name line and press ENTER.

Use the left-right arrow keys to navigate along the line. Use the up-down keys to change the character at that point. Press PREV when finished. Then select Save Now and press ENTER again.

If you have RS232 control, there are commands to send a string name to a memory slot, saving time.

How to recall a memory slot

1. Press SAVE once to open the Recall grid.
2. Navigate to the slot you want to recall. You can only land on slot numbers that are not empty (have checks). Press ENTER to open the Recall detail menu. If this slot number has exactly the same settings are currently being used, a (Current) message appears on the top line.
3. The only line you can select is Recall Now. Press ENTER.

✎ The best practice is to recall settings from memory slots. It is faster.

Main Menu — *clarity*

- Picture ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- Advanced Options ▶
- Program Information ▶

Memory — *clarity*

- Recall ▶
- Save ▶
- Delete ▶

Memory — *clarity*

- Recall ▶
- Save ▶
- Delete ▶

Recall — *clarity*

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☑27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

ENTER

Save — *clarity*

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☑27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

ENTER

Recall — *clarity*

Slot to Recall			5
Recall Now			
Name			AN1 1024x768, 2x2,1:2
Source			Analog RGB 1
Colorspace			RGB
Resolution			1024 x 768
Wall			2 x 2 1:2
Scale/ Justify		Widescreen / Center	
Position			328,4
Zoom UL/ LR			+1, +0 / -1, +2
Viewport UL/ LR			+0, +0 / +0,+0
Frequency/Phase			1344 / 0°
Sharpness			Normal
Black Level	52	50	104
White Level	178	131	135

Save — *clarity*

Save to Slot			1
Save Now	(Overwrite)		
Name			AN1 1024x768, 2x2,1:2
Source			Analog RGB 1
Colorspace			RGB
Resolution			1024 x 768
Wall			2 x 2 1:2
Scale/ Justify		Widescreen / Center	
Position			328,4
Zoom UL/ LR			+1, +0 / -1, +2
Viewport UL/ LR			+0, +0 / +0,+0
Frequency/Phase			1344 / 0°
Sharpness			Normal
Black Level	52	50	104
White Level	178	131	135

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3.5.1 Memory: What Is Saved? And Where?

Margay's automatic memories work well, but the best way to save and recall is with the numbered memory slots, because they recall everything.

In the Margay some parameters (values) are associated with the **mode**. The mode is primarily the horizontal and vertical resolution and the vertical frequency of the incoming source picture. It is more than this, but if you think of it this way, you will be close enough.

Some parameters are associated with the **input**. The input in this instance means the input connector: Analog 1, Analog 2, Digital, Composite Video, etc.

Some parameters are global, that is, they are not associated with either the mode or the input connector. They are universal.

Parameter	Specific to the Mode	Input	Global
ASCII Response Term.			x
ASCII Response Type			x
Auto Codes			x
Auto Lamp On			x
Baud Rate			x
Beeper			x
Black Level: R, G, & B	x		
Brightness (video)	x		
Color Balance (all values)			x
Colorspace		x	
Contrast (video)	x		
Curtain Pattern			x
Do Black/White Levels			x
Do Frequency			x
Do Phase			x
Do Position			x
Frequency	x		
Gamma			x
Group ID			x
Hue	x		
Inverted Installation			x
Justify		x	
Lamp Saver			x
Menu H Position			x
Menu Timeout			x

Parameter	Specific to the Mode	Input	Global
Menu V Position			x
Overscan		x	
Phase	x		
Plug and Play (EDID)			x
Position, Horizontal	x		
Position, Vertical	x		
Resolution, Horizontal	x		
Resolution, Vertical	x		
Retry On Lost Signal			x
Saturation	x		
Scale Mode		x	
Sharpness		x	
Terminate RS-485			x
Unit ID			x
Viewport Window Bottom		x	
Viewport Window Left		x	
Viewport Window Right		x	
Viewport Window Top		x	
Wall Height		x	
Wall Mode		x	
Wall Unit Column		x	
Wall Unit Row		x	
Wall Width		x	
White Boost			x
White Level: R, G, & B	x		
Zoom Window Bottom		x	
Zoom Window Left		x	
Zoom Window Right		x	
Zoom Window Top		x	

Memory

The Margay remembers that last 10 modes it received and all the **mode** parameters associated with them.

Switching modes

For instance, suppose you set up the Black and White Levels for a 1024x768 @ 65Hz vertical from a

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computer connected to Analog 1. Then later, using the same input connector but a different computer you set up the Margay for a 1600x1200 @ 60Hz. You re-adjust the Black and White Levels, because they are different.

Still later you plug in the first computer with its 1024x768 @ 65Hz picture. Immediately, the Margay recognizes that it has seen this signal type before, and it recalls the Black and White Levels from its internal memory.

It does not Do Frequency or Phase or anything else, because it recognizes that this input was used before, and the previous settings are probably correct.

Possible issue with Mode specific memory

Suppose that after setting up the 1024x768 and 1600x1200 pictures, you connect a third computer that is 1024x768, but it has a different requirement for Black and White Level. In this case, the Margay would use the *wrong* values for these levels.

To prevent this from happening, use the memory slots as described below.

Switching input connectors

Now suppose you use Analog 2 to bring in a picture that uses the component YPbPr video. You change the Colorspace setting to YPbPr. If you switch back to Analog 1 in the Picture menu, the Margay switches back to the RGB Colorspace, because Colorspace is specific to the input connector.

Possible issue with Input specific memory

What happens if you switch back to Analog 1 and the picture there is YPbPr? The Margay has no way to know this, no way to detect the difference between RGB and YPbPr, so it will use the wrong Colorspace.

To prevent this from happening, use the memory slots as described below.

Global parameters

In none of the examples above does the Margay try to change the Baud Rate or the Color Balance values, because these items are saved globally.

Memory slots

The Margay has memory slots, 40 of them. Each slot memorizes *all* the mode specific and *all* the input specific parameters as well as the input connector used.

When you recall a memory slot, you recall *exactly* the way the Margay was set up when the memory was saved.

- The change is immediate. There is no waiting for the Margay to Do Frequency or Do Phase or any of that.
- The switch includes the correct input connector.
- The memory slots can be named something specific to your application: "COMPUTER XL-61," "MAIN DVD PROGRAM."
- And there are 40 of them, not just 10.

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4 Operating

4.1 Selecting a Source

The "source" is the picture coming into the Margay. It may be from a computer, a video, or a DVD player.

Selecting the source
1. Press MENU on the remote.
2. Select PICTURE and press ENTER.
3. Select SOURCE and press the LEFT ARROW key.
4. Choose the source you want and press ENTER.
5. Press MENU again to close all menus.

Selecting a source means choosing an input connector so you can see the picture coming into that input.

If the source you select is not there, you will see a Source Absent message on the screen. This usually means there is no picture coming into that connector, or the picture is not valid.

> Source...
>   Analog 2
>   Source Absent
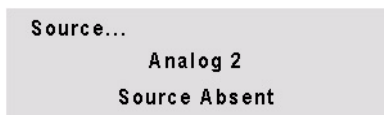
This message means Analog 2 is selected now, but there is no picture coming to that connector.

Main Menu clarity
visual systems

Picture ▶
Size & Position ▶
Aspect Ratio and Wall ▶
Memory ▶
Diagnostics ▶
Advanced Options ▶
Program Information ▶

Picture clarity
visual systems

Source	Analog 1 ▶
Colorspace	YPbPr (Component Video)
Sync Type	Composite
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Pixel Frequency	65.02 MHz
Horizontal Resolution	1280
Vertical Resolution	768
Frequency – ⬜══════ +	1344
Phase – ⬜══════ +	22.5°
Sharpness	Sharpest
Input Levels	▶

☑ **Analog 1**
☐ Analog 2
☐ Digital
☐ Component (YPbPr)
☐ S-Video
☐ Composite

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4.2 Normal Start Up

It is often helpful to know what the sequence of events is when the Margay starts.

Start up sequence

When AC power is turned on, it seems that nothing happens for a few seconds. The electronics module is starting up and initializing itself.

Next, if the optical engine is warm, the fans start. During this time, you cannot turn the lamp on. It shortens lamp life to turn it on when it is hot, so the fans run for a minute or so to be sure it is cool. (There is a temperature sensor on the optical engine. If it is cool enough, the cool-down period is skipped.)

After this cooling down period, you can turn on the lamp. If **Auto Lamp On** is checked in the Miscellaneous menu, the lamp will strike (begin to turn on) at the end of the cooling period.

Lamp Settings	*clarity* visual systems
☐ Auto Lamp On	
☐ Lamp Saver	
Lamp Saver Timeout	1 hr
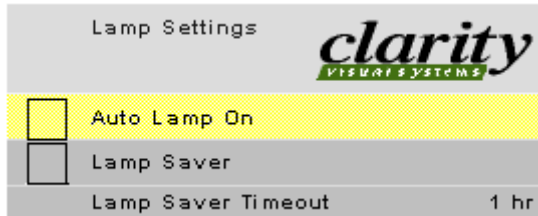
Shut down sequence

When you turn off the lamp, the fan continues to run for 15 seconds to cool it off.

The **lamp** fan runs continuously when the lamp is one, and for 5 minutes after the lamp is turned off. The **intake** fan runs:
- during Lamp On,
- for 15 seconds after AC power is applied, during which time you cannot turn on the lamp,
- and for 15 seconds after Lamp Off.

⚠ *CAUTION*

It is bad practice to turn off the Margay by turning off the AC power. The lamp does not cool properly. This may shorten lamp life.

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4.3 Controlling Margay with Remote

You can control Margay with the remote control or with RS232 commands.

Remote control

The remote control projects a series of IR (infrared) pulses to the Margay for control. Aim the remote control at the screen and press MENU. The main menu should be visible, if the lamp is on.
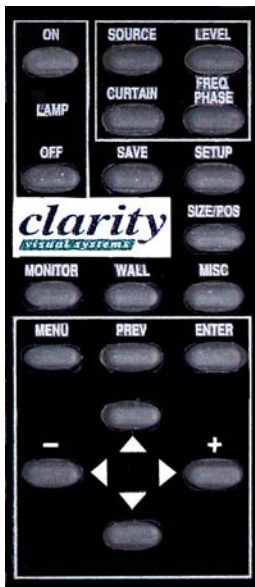
For a complete list of all remote actions, see 7.2 "Remote Control Buttons" on page 116.

Beeper

If Beeper is checked in the Miscellaneous menu, the Margay will make a beep each time a remote button is pressed (and the Margay receives the signal).
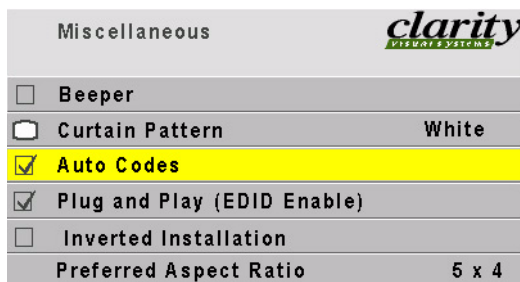
If the Margay cannot perform the requested action, it will beep three times, a triple beep. Triple beep will happen whether Beeper is checked on not.

If the remote doesn't work
- The batteries in the remote are dead or installed wrong.
- The remote was not aimed at the screen.

- Something is blocking the IR receiver in the Margay.
- IR remote action was disabled by an RS232 command.

✎ The remote control has a large spread of its IR radiation. It is difficult from a distance to control only one Margay in a wall. Step closer.

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4.4 Controlling Margay with RS232/RS485

Connect the RS232 In to the computer. Loop thru with RS485.

Remote control with serial commands is a good way to control a wall while it is operating. It's also an easy way to control Margays in a wall during initial setup using one of the Clarity utility programs.

> Open Clarity's website in your internet browser. www.ClarityVisual.com
>
> In the top banner, click on LOGIN. This opens a new window.
>
> Click on the lower, blue LOGIN NOW button for Consultants and Designers.
>
> The User Name is tech.
>
> The Password is help.
>
> Click OK to open the window with all the manuals, utility programs, FRUs and firmware updates.

Utility programs available:
- Cube Control
- Diag
- Serial Talk
- OnOffer
- … and more

Cube IDs

When the cubes are connected in a series loop (2.5.4 "Connections, Control: RS232 & RS485" on page 28), each cube should have a *unique* ID. The ID is set in the Serial Settings menu.

The **Group ID** and the **Unit ID** go together to make the cube's ID. Each of the two parts has a range for characters from 0 to 9 and from A to Z (not case sensitive).

Addressing the cubes

When you send a command, it will have an *address*. There are five forms of the address.
- To address all the cubes in this serial loop, use ** for the address.
- To address a single cube, use the specific ID of that cube, such as A6 or 00 or 1B.
- To address all the cubes with a certain Group ID, use an address like 3* with will address all the cubes with the Group ID of 3, but with any Unit ID. If you have three walls, and all the cubes in one of the walls have Group ID 3, this type of command would address only this wall.

- To address all the cubes with a certain Unit ID, use an address like *0 or *3.
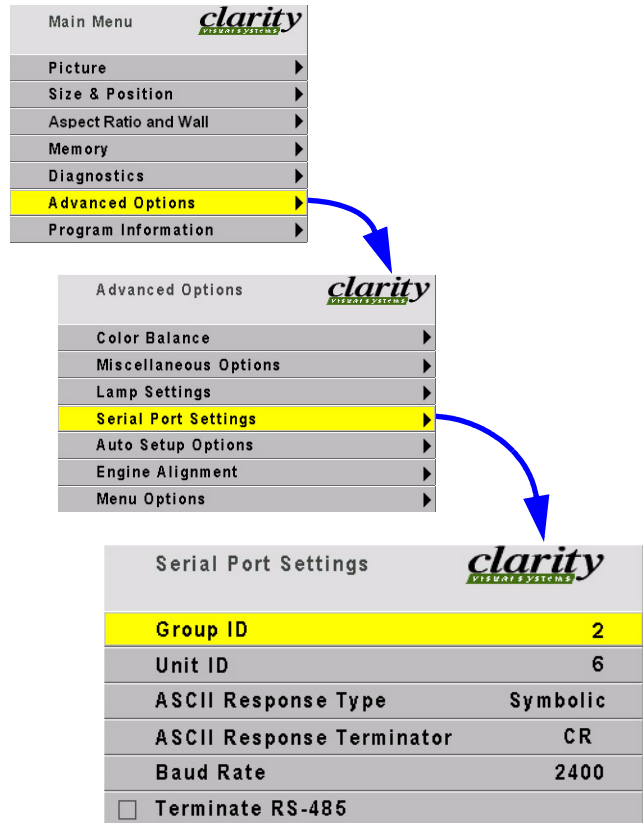
Baud rate

Each cube's baud rate *must* be set to the computer or controller's baud rate. The baud rate is *not* automatically established, as it is in modems.

Terminating the series

If the serial string is very long, you may have to terminate the last cube in the string for good communication. Check the Terminate RS485 box.

In most instances, this is not necessary. Terminating the string unnecessarily can cause its own communication problems. The guide line is: If it works without terminating, leave it alone.

ASCII settings

… are explained in the RS232 manual for Margay, available or the website. Document 077-0007. All the **serial commands** are in this document, too. This and other documents are available from Clarity's website.

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4.5 Asset Tag and Display Status

The Asset Tag feature allows you to identify each Margay by its serial number or in other ways.

To see the current Asset Tag, press MONITOR.

The Asset Tag is initially blank. You can write in any short text message using RS232 commands. See the Margay RS232 Guide, available from Clarity's website.

> Open Clarity's website in your internet browser. www.ClarityVisual.com
> In the top banner, click on LOGIN. This opens a new window.
> Click on the lower, blue LOGIN NOW button for Consultants and Designers.
> The User Name is tech.
> The Password is help.
> Click OK to open the window with all the manuals, utility programs, FRUs and firmware updates.

Display Status menu information
- Margay—the name of this product
- 573-2300—the part number for the firmware in Margays
- Rev—the revision number of the firmware currently operating in this Margay
- Optical Engine SN—the serial number read from the optical engine in this Margay
- Asset Tag—a text line you enter (see above)
    Clarity recommends you enter the serial number of this Margay here, unless your facility has a special method of identifying property.
- PS Fan and Eng Fans—If these fans are not on, the lamp will not be on, and you wouldn't be able to see this menu at all.
- Lamp—same for this item.

- Interlock—If the interlock is Open, the lamp will not light (unless the interlocks have been bypassed to service the display).
- Mode ID—the number of the mode (type of signal) currently set
- HPer—the horizontal period in nanoseconds (ns) of this signal (picture)
- VLines—the number of vertical lines in the picture
    This number will be larger than the vertical resolution, because it includes vertical blanking lines that are not visible.
- Last Fault—the last event that caused that forced the lamp off, followed by the number of hours and minutes since that happened, measured in System Hours, not clock time

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5 Troubleshooting

5.1 Troubleshooting Tips

Margay has several troubleshooting aids.

On Screen codes

The On Screen code is a series of red and amber lights that can flash on the screen to tell you what is wrong. These flashing lights are particularly helpful when the lamp won't light.

Inside LEDs

The LEDs on the electronics module give you information about the state of the Margay.

General troubleshooting

Exchange parts from one display to another. This is a very effective way to find a problem. If the problem follows the part to the new unit, that part was at fault.

If the problem stays in the first unit, you haven't found the problem yet, but you have learned something: The part you move was not the problem. Put it back in the original unit and try something else.

Lamp won't light

Check to make sure the lamp is actually *not* lit. If the lamp is lit, you can usually see light if you look carefully. Light may come through spaces between parts

Many things can make the screen black, even though the lamp is lit.

- The Curtain may be on. If the curtain is black and it is on, the screen will be black.
- There is no source picture. With no valid picture coming in, the display will be black.
- There is something blocking the light to the screen. Is the lens cap on?
- There are parts missing in the optical path. If someone was working on the display, maybe he or she forgot to put something back in.

If the lamp is not lit:

- No AC coming in? Check the main AC switch on the display. It should be lit.
- No ballast power? Some displays have a green LED near the main AC switch that lights when the 350 volt part of the power supply is working. It should be lit. Other displays may have an LED on the electronics module to show when this high voltage power is available.

⚠ *WARNING*

Always turn off the AC power and remove the power cord before working inside the display and before removing a lamp.

- If you have AC and ballast or 350V power, try swapping the lamp into a display where the lamp is good.

Display A

Display B

Lamp A doesn't work here.

Move Lamp A here.

Move good Lamp B out temporarily.
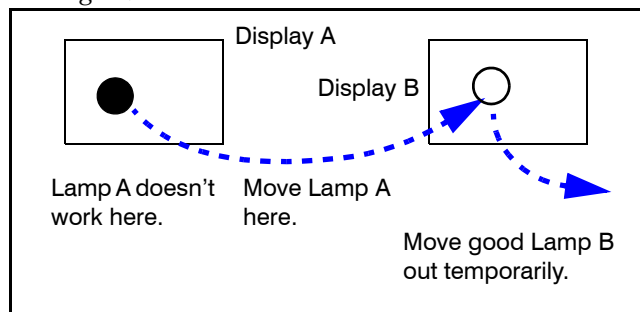
  a. If Lamp A works in Display B, put it back in Display A. Lamp A is OK.

  b. If Lamp A does not work in Display B, the problem is Lamp A. Put a new lamp in Display A.

- If the lamp is OK, try swapping the ballast in the same way. The lamp ballast provides power to the lamp. It is an electronic part, and all electronic parts are eventually subject to failure.
- Fan failed. Most fans are sensed. That means the electronics module knows whether they are running or not. If they don't run when they should, the electronics module turns off the lamp and prevents it from striking (turning on) again.

Swapping other parts

You can swap electronics modules or fans in the same way to see if one is bad.

When you swap electronics modules, try to put them back in their original locations. Otherwise you may have to do setup procedures again, such as Input Level adjustment and Color Balance, because these values are stored in the electronics module.

When you swap fans, always exchange fans of the same size.

Why not use a new part out of the box?

It may seem like a good idea to take a new part out of the box and substitute it for a suspected part in the

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display. However, there is a very tiny chance that the part in the box doesn't work.

If you test a part by putting in a known good part, you get better information.

5.2 Reading the On Screen Code

Red and amber lights flashing on the screen can tell you what is wrong.

Turning on the On Screen code

   With the remote control, press MONITOR. You should see the red or amber lights flashing on the screen. This also opens the Display Status menu, but of course, you won't see it if the lamp is off.

   If there is a bright picture, it may be difficult to see these lights. They are soft, out of focus lights. Move around to see them.

   Or, press CURTAIN to make the screen black so they will be easier to see.

   If you see a steady, unblinking, amber light, it means the lamp is on and there are no alarm conditions. If the screen is black at this time, there are other reasons for it being black:
- The curtain is on and black.
- The source itself is a black picture.
- There is no source, which turns the screen black.
- There is some foreign object blocking the light path.

Automatic On Screen code display

   If Auto Codes is checked in the Miscellaneous menu, the code will start showing whenever there is a fault event that forces the lamp off.

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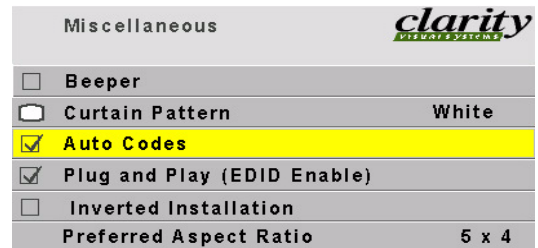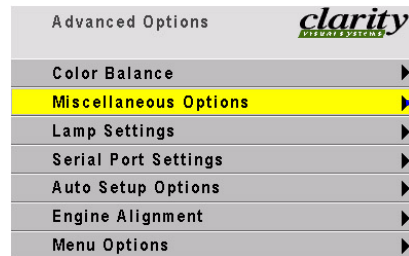
Margay On-Screen Codes

	Condition	Priority	Each block represents 0.2 seconds	
Starts with Red Lamp is off	Door open	1	R _ R _ R	See Footnote 1
	Power Supply Fan failed	2	R _ Amber Amber	
	DLP™ Fan failed	3	R _ Amber Amber _ R	
	350V failed	4	R _ R _ Amber Amber	
	Optical Engine failed	5	R _ R _ Amber Amber _ R	
	Lamp failed	6	R _ R	
	Lamp off (wait, auto off) [2]	7	R _ R _ Amber Amber _ Amber Amber	
	Wait (lamp off, cooling)	8	R _ R _ R _ R	
Starts with Amber.	Lamp off (lamp saver) [3]	9	Amber Amber _ Amber Amber _ R	
	Lamp off (ready to turn on)	10	Amber Amber _ Amber Amber	
	Lamp striking (starting)	11	Amber Amber _ Amber Amber _ Amber Amber	
	Lamp on, no alarms	12	Amber on continuously	

R = Red   To show the code, press MONITOR button once.

[1] With Priority 1-6, to turn lamp on, cycle AC power off, then on. If Auto Codes in the Miscellaneous menu is checked, events with Priority 1-5 starts the On-Screen Code automatically, .

[2] Lamp Saver turned lamp off; lamp are cooling and will turn on at end of cooling period.

[3] A Lamp On command from the remote or from RS232 commands will turn lamp on.

5.3 Reading the LEDs

The LEDs on the electronics module can give you more detailed information about the Margay's state.

To see LEDs

The LEDs are on the electronics module. From the rear, you can see them easily, that is, if there aren't too many cables in the way.
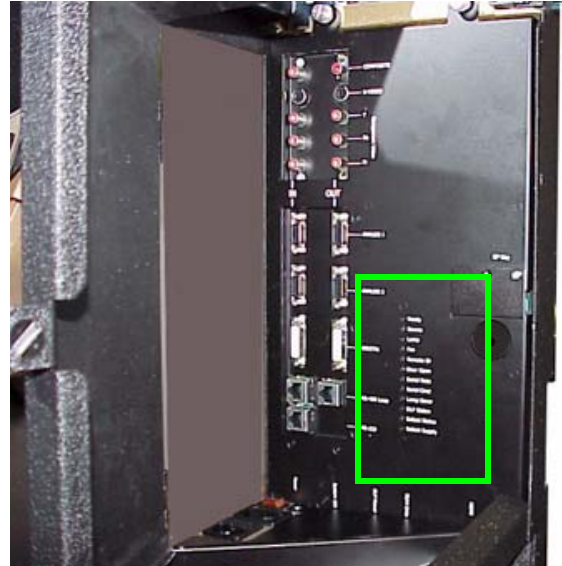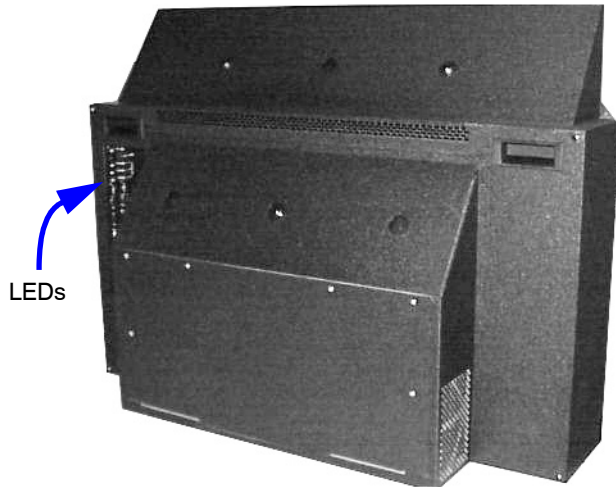
LEDs

From the front, open the screen. Then open the electronics module door to the right.

Electronics module

Light shield

LEDs in Margay

LED Name	Off	Green	Amber	Red
		When the LED is…		
Ready	Lamp is on (or no power)			
Source	Source absent	Valid source present		Source absent or not valid
Lamp	Lamp off	Lamp on	Lamp striking	Lamp failed
Fan	Fan off	Fan is running	Fan failed recently, but is now running	Fan failed Lamp disabled
Remote IR	Not receiving IR now	Receiving IR radiation		
Door Open (refers to rear panel and electronics module door)	No power to electronics	Door closed & rear panel closed Lamp enabled	Either door was open, now closed Must cycle AC power to reset and enable lamp	Either door open Lamp disabled
Serial Data	No command received	Received any command		
Serial Cmd	No command received	Received command "meant for me"		
Lamp Saver	Lamp Saver not active or lamp is off	Lamp Saver active Source present Lamp on	Active Lamp is cooling Source present Lamp will come on when cooled	Active Source absent Lamp off
Optical Engine Status		Optical engine OK		Optical engine fault or communication failure
Ballast Status [1]	Lamp off	Lamp on		Ballast fault or communication failure
Ballast Supply [2]	High voltage (HV) off	HV on and ready	HV on but not ready	Had to wait more than 10 seconds for ready state

1. At this writing, Ballast Status LED is not implemented, so it is always off.
2. At this writing, Ballast Supply LED will show Red state only briefly.

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6 Maintenance for Margay

6.1 Changing a Lamp

You can change the lamp from the front or the rear.

When should I change the lamp?

Change the lamp when it fails. Lamp life is the *median* life of a large sample of lamps. Median means *middle*. It is *not* what most people think of as *average*.

Suppose the specification for lamp life is 5000 hours. If you had a large group of these lamps, more than 100, and you turned them all on at the same time, after 5000 hours *at least half* of them would still be on.

Suppose 50 of these lamps had failed after only 1 hours of use. Then suppose the rest of the lamps failed after 5001 hours. The *average* life of these lamps would be 2501 hours.

But the *median* life specification is still valid, because at least half of them lasted 5000 hours. This is the way all lamp manufacturers specify lamp life— as the median, not the average.

Taking a different case, suppose the first 50 lamps failed at 1 hour and the rest of them lasted 10,000 hours. The specification is still valid, because *at least half* of the lamps were still working after 5000 hours.

You can't tell from the lamp life specification how long any one lamp will live.

Margay lamp life

The median lamp life for the Margay lamp is 6000 hours. If you routinely change the lamp at 6000 hours, you may be throwing away thousands of hours of useful life. And you may be replacing it with a lamp that is destined to last less than 1000 hours.

How to change the lamp from the front

1. Open the screen. (See 2.6.2 "Opening or Removing a Screen" on page 34.)
2. Open the door covering the electronics module (on the right).
3. Turn off the AC power switch and remove the power cord

4. Loosen the screw on the light shield.
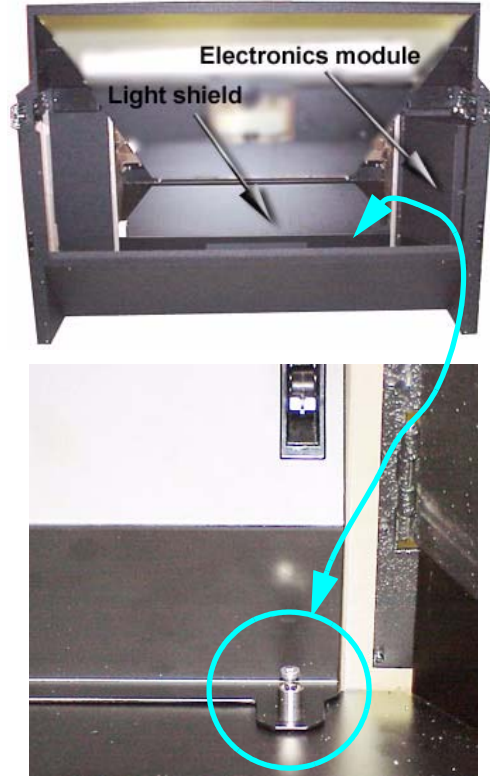
5. Lift the cover and latch it.

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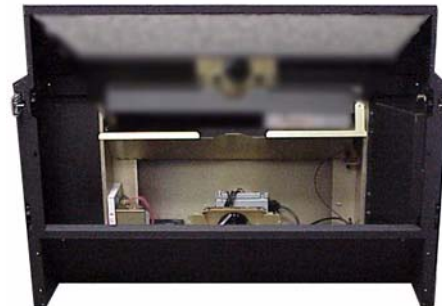
6. Loosen the lamp screw to the right rear of the lamp.
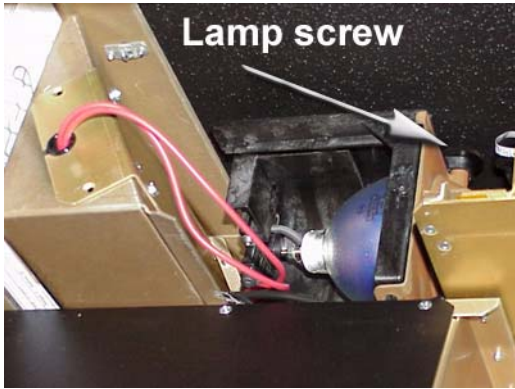
7. When the screw is loose, move the lamp to the rear about 3/8" (10 mm), then to the left, and lift it out, still connected.
8. Disconnect the lamp cable.

Removing the lamp from the rear
1. Turn off the AC power switch and remove the power cord
2. Remove the rear panel (6 ¼-turn screws).
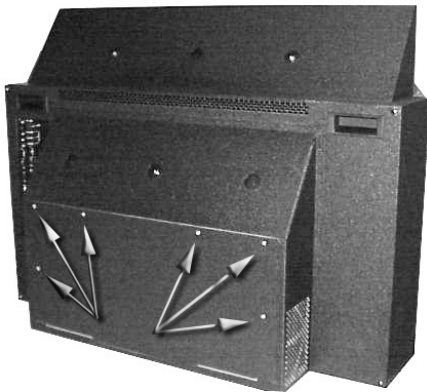
3. Loosen the lamp screw.
4. Pull the lamp toward you and to the right.
5. Disconnect the lamp cable.

Replacing the lamp
1. First, plug in the lamp cable. Be sure it is fully seated.

⚠ **WARNING**

If the lamp cable is not fully seated on the lamp plug, the lamp will not operate properly. Overheating may occur.

2. Then mount the lamp in its place. Note the two pins opposite the lamp screw. These fit into holes in the optical engine.
3. Close the system following the removal steps in reverse.

Resetting lamp hours
It is a good idea to reset the lamp hours to zero when you install a new lamp. (See "Diagnostics: Hours" on page 107.) This is not absolutely necessary; it is just a way for you to keep track of lamp use.


How to maintain lamp life
There are some actions that can *shorten* lamp life:
- Turning off AC power when the lamp is on. (Turn off the lamp with the remote and let it cool until the fans stop; then turn off AC.)
- Turning a lamp on and off rapidly. (The lamp should be allowed to heat up fully before turning it off, at least three minutes.)

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6.2 Changing the Air Filter

Clean, cool air is essential for proper Margay operation.

When should I change the air filter?

When it gets dirty, change it.

Unfortunately, there is no absolute rule about when to change an air filter. For some installations the environment has clean, dust-free air, such as a corporate lobby. The air filter may be good for a year or more.

In other environments—airports, subway terminals—the air full of dust and dirt all the time. The air filter might have to be changed every month.

Of course, it also depends on how many hours per day or per week the lamp is on.

How to determine a changing schedule.

Remove and inspect the air filter after three months of operation. Make a note of the air filter's condition. Then check it again after six months of operation.

These two inspections will give you some idea of how often the filter needs changing. If it doesn't need changing after six months, inspect again in a year. As long as the environment doesn't change, you can build an appropriate schedule in this way.

If new construction occurs in the vicinity of the Clarity displays, watch out. New construction usually means **DUST**.

Removing the air filter from the front

1. From the front, open the screen. (See 2.6.2 "Opening or Removing a Screen" on page 34.)
2. Open the electronics module door. Turn off the AC power switch and remove the power cord.
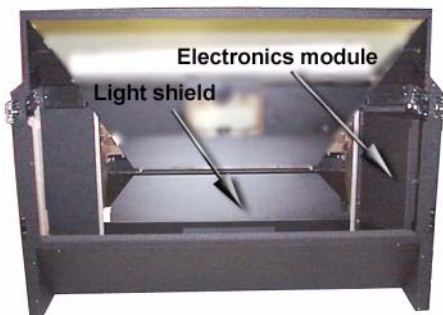
3. Loosen the light shield screw. Lift and latch the light shield in its up position.
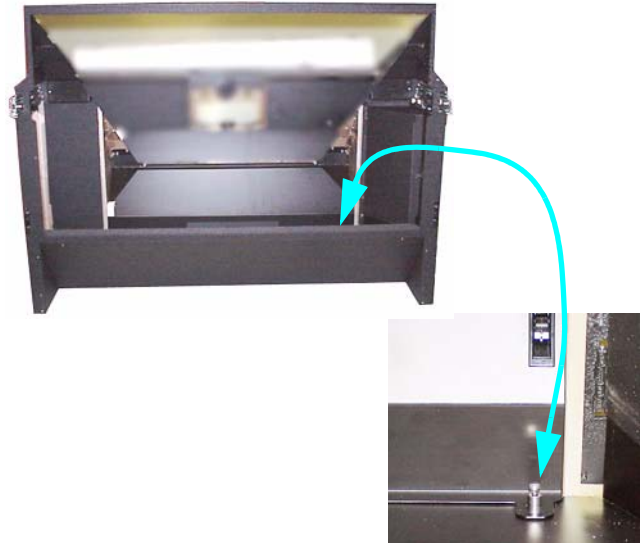
4. Lift out the air filter, tilting it forward as you lift.
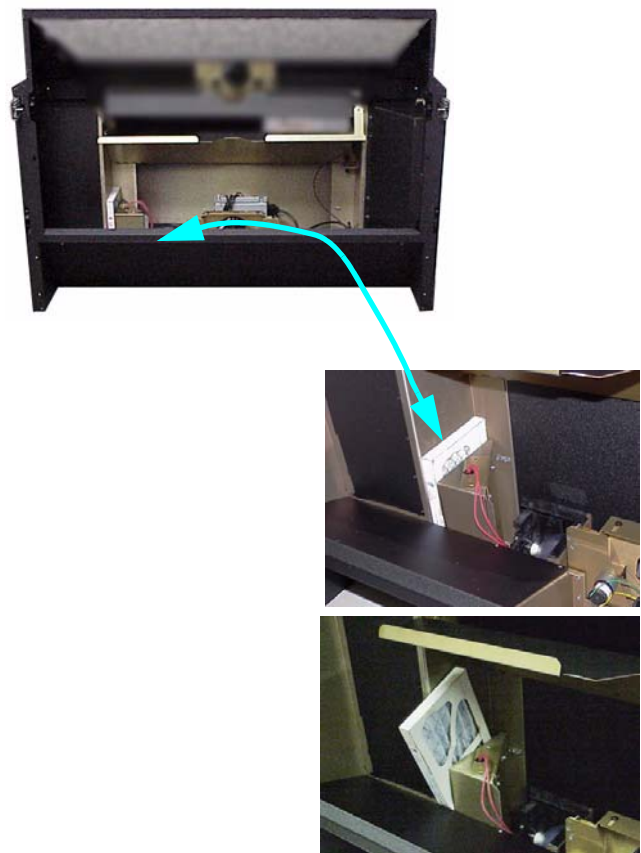
Removing the air filter from the rear

1. Turn off the AC power switch and remove the power cord
2. Remove the rear panel (6 ¼-turn screws).
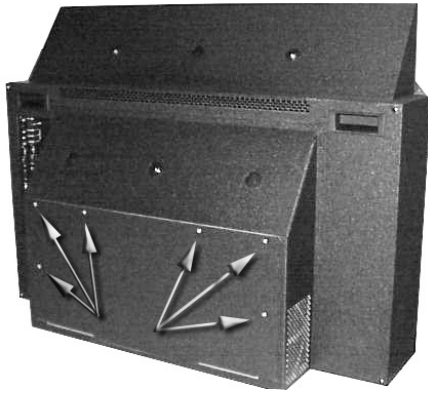
3. Push open the electronics module door.
4. Reach around through this door and loosen the light shield screw.
5. Push the light shield up until it latches out of the way.
6. Lift the air filter up and forward, away from you.

6.3 Cleaning the Screen and Mirrors

Dirt is everywhere, and unless the displays you service are in a super-clean room, from time to time you will have to clean the screens, mirrors and lens of Clarity Visual displays.

- What cleaning product should I use?
- How should I use them?
- How often should I use them?

Cleaning products and how to use them

For mirrors and screens, a foam spray cleaner seems to work well. It's is sold under different names in different parts of the world. It is available from many janitor supply companies or building maintenance supply companies. Ask for
- **Claire** #50 glass cleaner, or
- **Sprayway** #50 glass cleaner

It is probably sold under a local name, but it all comes from one company. If you ask for either of the two names above (it is sold under both), you will get this cleaner under the local name.

This cleaner is good on glass (screens, lenses, mirrors) and acrylic (screens).

Spray it on the mirror, but *not on the screen*. For screens, spray it on the cloth, not the screen.

⚠ *WARNING*

DO NOT spray liquid of any kind on the screen. It can drip down the screen and wick up between the layers. When liquid gets between the screen layers, it is impossible to remove, and the screen is ruined!

Wipe the mirror or screen gently with a lint-free cloth or lint-free paper (see Cloth below). Turn the cloth over to the dry side and continue wiping to take up the haze.
- **Glass Wax**™ is another good cleaner for mirrors and glass screens, but it does not work well on acrylic screens. It is a liquid in a can. You spread it on, let it dry, then wipe it off.
- **Windex**™ works well, too. Just don't spray it on the screen. (See Warning above.)

Cloth to use

White cotton cloth is better for cleaning than colored cloth. The dyes in some colored cloth tend to make it less absorbent.

Paper towels tend to leave lint. A better paper towel for cleaning is Scott® **Shop Towels**. These blue, lint free, paper towels are generally available at auto parts stores, home fix-it stores, and hardware stores.

Cheesecloth is another good choice. This open-weave cotton material is light and absorbent.

Removing dry dust

Often the cleaning problem is just dust, not fingerprints or other oily dirt. If it's just dust, wiping with a dry cheesecloth or a dry Shop Towel will usually do the job.

Or use one of the cleaning products designed specifically for picking up dust.
- Pledge **Grab-It**™, from Johnson
- **Swiffer**™, from Proctor and Gamble

These are synthetic wipes that have a static charge that holds onto dust. They do a very good job of picking up dust and leaving no lint behind. However, they will not wipe away grease or oil, such as fingerprints, and they can't be used with liquid cleaners.

Cleaning lenses

Clean lenses as you would the glass mirrors. However, because the lens is small, it is easier to spray the cleaner, if you use one, on the cloth, not the lens itself.

Where is the dirt?

When you see dirt in the picture, you can sometimes tell where it is by its focus. Use a white test pattern to see the dirt most easily.

Small specs of dirt or dust that are in **very sharp** focus are on the screen itself.

If the dirt is in **soft focus**, it is probably a smudge on the large mirror.

Dirt on the output lens cannot be seen in the picture. However, that does not mean you should not clean this lens. Dirt here will reduce the brightness of the picture, but it won't show up as specs in the picture.

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7 Reference Section

7.1 Menu Trees
Picture

The Picture menu has different items depending on the current source type. You cannot adjust Frequency in Digital pictures, so that item is not in the Picture menu when the selected source is Digital. You cannot adjust Horizontal Frequency in Analog, because that is determined by the source, so it is grayed out.

In the Source line, the left-right keys choose the source. Other items can be adjusted if they are not grayed out.

The **Freq/Phase** button opens the **Picture menu** directly.

In most menus, this area describes what the selected (highlighted) function will do or what it is used for.

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Picture: Source Select

Main Menu	clarity VISUAL SYSTEMS
Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶
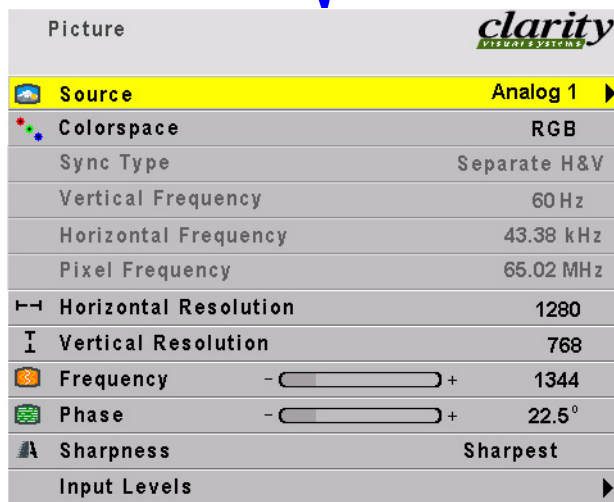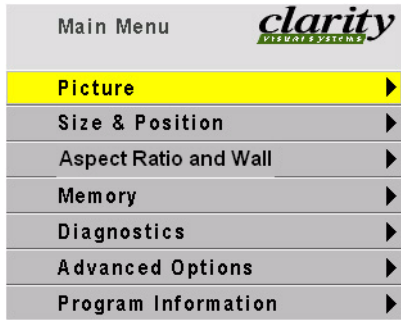
Press the LEFT ARROW to open the Source choice menu.

Picture	clarity VISUAL SYSTEMS
🖼 **Source**	**Analog 1** ▶
✴ Colorspace	RGB
Sync Type	Separate H&V
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Pixel Frequency	65.02 MHz
⊢⊣ Horizontal Resolution	1280
ⲓ Vertical Resolution	768
🔆 Frequency − (▭) +	1344
📠 Phase − (▭) +	22.5°
🎚 Sharpness	Sharpest
Input Levels	▶

☑	Analog 1
☐	Analog 2
☐	Digital
☐	Component (YPbPr)
☐	S-Video
☐	Composite
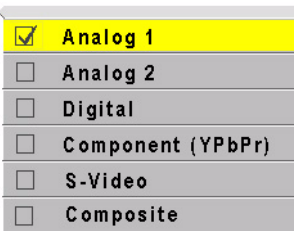
To select a source manually,
 highlight Source,
 press LEFT ARROW key,
 select the source you want,
 press ENTER.

☑	Analog 1
☑	Analog 2
☑	Digital
☑	Component (YPbPr)
☑	S-Video
☑	Composite

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Input Levels: Analog Sources

Main Menu	*clarity* VISUAL SYSTEMS
Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶
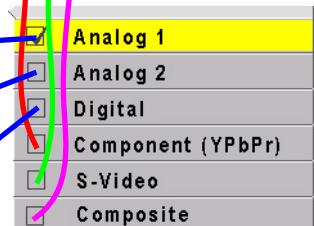
For digital, see "Input Levels: Digital Sources" on page 95.

For video, see "Input Levels: Video Sources" on page 96.

Picture	*clarity* VISUAL SYSTEMS
🖼 Source	Analog 1 ▶
✳ Colorspace	RGB
Sync Type	Separate H&V
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Pixel Frequency	65.02 MHz
⊢⊣ Horizontal Resolution	1280
⊥ Vertical Resolution	768
🔶 Frequency − ⬛ +	1344
▦ Phase − ⬛ +	22.5°
▣ Sharpness	Sharpest
Input Levels	▶

Press LEVEL to open the Manual Levels menu directly.

Input Levels	*clarity* VISUAL SYSTEMS
☀ **Auto Black Level (offset)**	
◑ Auto White Level (gain)	
Center Point	2 1 4
☀ Black Level (offset) - All − ⬛ +	55
Red − ⬛ +	68
Green − ⬛ +	57
Blue − ⬛ +	69
◑ White Level (gain) - All − ⬛ +	130
Red − ⬛ +	128
Green − ⬛ +	131
Blue − ⬛ +	130

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Input Levels: Digital Sources

Main Menu *clarity*
Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

For analog, see "Input Levels: Analog Sources" on page 94.

For video, see "Input Levels: Video Sources" on page 96.
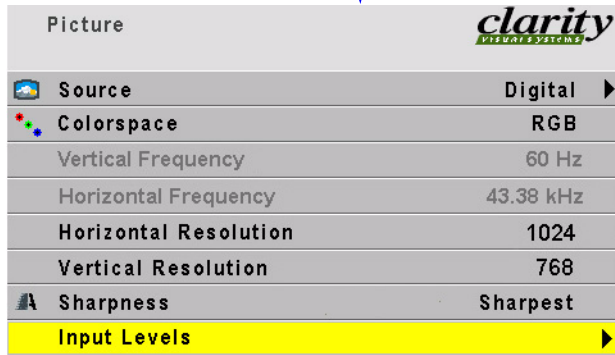
Picture *clarity*
🖼 Source	Digital ▶
✳ Colorspace	RGB
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Horizontal Resolution	1024
Vertical Resolution	768
◢ Sharpness	Sharpest
Input Levels	▶

Press LEVEL to open the Manual Levels menu directly.

Input Levels *clarity*
🟫 Hue	– ▭▭▭ +	27
☐ Blue Only		
⦿ Restore Factory Defaults		
☀ Black Level (offset) - All	– ▭▭ +	55
Red	– ▭▭ +	68
Green	– ▭▭ +	57
Blue	– ▭▭ +	69
⦿ Reset Black Level to Default		

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Input Levels: Video Sources

Main Menu | clarity

- **Picture** ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- Advanced Options ▶
- Program Information ▶
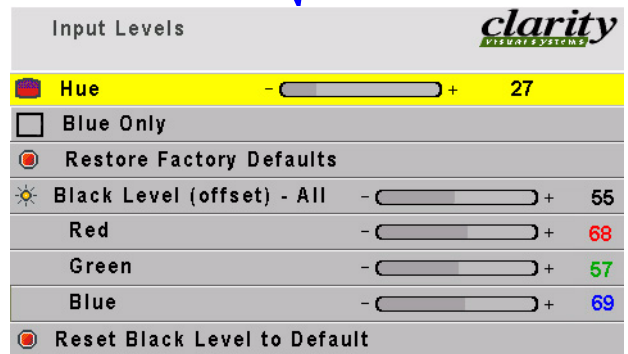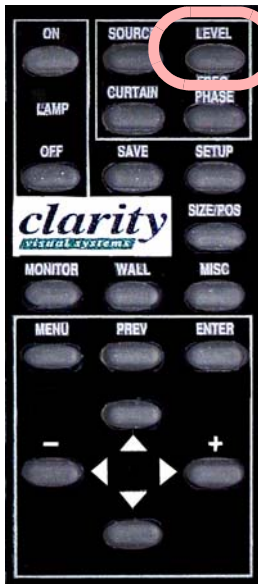
For analog, see "Input Levels: Analog Sources" on page 94.

For digital, see "Input Levels: Digital Sources" on page 95.

Picture | clarity

- Source   S-Video ▶
- Video Standard   PAL 50Hz/4.43MHz
- Sharpness   Sharpest
- **Input Levels** ▶

Input Levels | clarity

☀	**Brightness**	– ▭ +	148
◑	Contrast	– ▭ +	127
▦	Saturation	– ▭ +	125
▦	Hue	– ▭ +	133
☐	Blue Only		

Press LEVEL to open the Manual Levels menu directly.

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Size & Position

Main Menu

- Picture ▶
- **Size & Position** ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- Advanced Options ▶
- Program Information ▶

Size & Position

- **Picture Position** ▶
- Zoom Window Top & Left ▶
- Zoom Window Bottom & Right ▶
- Viewport Window Top & Left ▶
- Viewport Window Bottom & Right ▶
- Reset All Windows to Default

Picture Position
Use arrow keys to move image
⬌

Horizontal Position	234
Vertical Position	34

Size & Position

- Picture Position ▶
- **Zoom Window Top & Left** ▶
- Zoom Window Bottom & Right ▶
- Viewport Window Top & Left ▶
- Viewport Window Bottom & Right ▶
- Reset All Windows to Default

Zoom Top & Left
Arrows move top and left

+1

+0   +1

−2

Image Resolution   1024x768

This Cube   511x385   2x2 1:2

Size & Position

- Picture Position ▶
- Zoom Window Top & Left ▶
- **Zoom Window Bottom & Right** ▶
- Viewport Window Top & Left ▶
- Viewport Window Bottom & Right ▶
- Reset All Windows to Default

Zoom Window is in two parts. Each part lets you control two sides of the picture using the arrow keys. Zoom is very limited if the **Margay** does not have the Big Picture key.

Reset All Windows to Default makes all Zoom values zero. If Big Picture is being used and Wall Mode is on, the Zoom values go to the Big Picture defaults.

Zoom Bottom & Right
Use arrow keys to move bottom and right of image window

−2

+1   +0

+1

Image Resolution   1024x768

This Cube   511x385   2x2 1:2

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Size & Position

Main Menu

- Picture ▶
- **Size & Position** ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- Advanced Options ▶
- Program Information ▶

Size & Position

- Picture Position ▶
- Zoom Window Top & Left ▶
- Zoom Window Bottom & Right ▶
- **Viewport Window Top & Left** ▶
- Viewport Window Bottom & Right ▶
- Reset All Windows to Default

Viewport Top & Left
Arrows move bottom and right

```
        + 0
+ 0          − 4
        + 0
```

DMD resolution   1280 x 720
Viewport   1276 x 720

Size & Position

- Picture Position ▶
- Zoom Window Top & Left ▶
- Zoom Window Bottom & Right ▶
- Viewport Window Top & Left ▶
- **Viewport Window Bottom & Right** ▶
- Reset All Windows to Default

Viewport shrinks the picture. In the example menu, the right side was pulled in 4 pixels. At the bottom of the menu, Viewport indicates that only 1276 of the DIDs 1280 pixels are being used. This feature is most useful when each cube in a wall is fed a separate picture from a video processor. In such a case, you can't zoom the picture smaller, but you can shrink the picture with Viewport.

Reset All Windows to Default makes all Zoom and Viewport values zero. If Big Picture is being used and Wall Mode is on, the Zoom values got to the Big Picture defaults.

Viewport Bottom & Right
Arrows move bottom and right

```
        + 0
+ 0          − 4
        + 0
```

DMD resolution   1280 x 720
Viewport   1276 x 720

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Aspect Ratio & Wall

Main Menu	*clarity*
Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Aspect Ratio & Wall	*clarity*
🔲 Scale Mode	Fill All ▶
Justify	Center
Overscan	0 %
Border Color	Black
Wall Width	3
Wall Height	3
Unit Column	1
Unit Row	2
☑ Wall Mode	

☑	🔲	Fill All
☐	🔲	Crop
☐	🔲	Letterbox/Pillarbox
☐	🔲	Widescreen (16x9)
☐	🔲	Normal Video (4x3)
☐	🔲	One to One

Press the LEFT ARROW to open the Scale Mode choice menu.

Wall Width and Height determine the dimensions of the Big Picture wall, which is not necessarily the same as the physical wall (it could be smaller). The upper limit is 32 cubes in each dimension. However, this does not mean you can safely stack Margays 32 cubes high!

Unit Column and **Row** designate where this cube is in the defined wall, which is not necessarily the same position as in the physical wall. The Column can never be larger than the Width, and the Row can never be larger than the Height.

When **Wall Mode** is checked (on), each cube shows only its segment of the whole picture. When Wall Mode is unchecked (off), the cube shows the entire picture.

When the aspect ratio of the source picture and the aspect ratio of the cube (or the whole wall when in Wall Mode) do not match, **Scale Mode** and **Justify** are used to fit the picture onto the cube (or wall).

Scale Mode is Fill All, Crop, Letterbox/Pillarbox, Widescreen, Normal Video or One to One.

Fill All stretches the picture as necessary on one axis to fill the screen. All of the picture is shown.

Crop fills the screen by zooming until the second edges touch the screen edges and crops the rest. Some of the picture will be cut off.

Letterbox/**Pillarbox** fills the screen by zooming until the first edges touch the screen edges (sides or top-bottom) and leaves the rest of the screen filled with the Curtain color. All of the picture is shown.
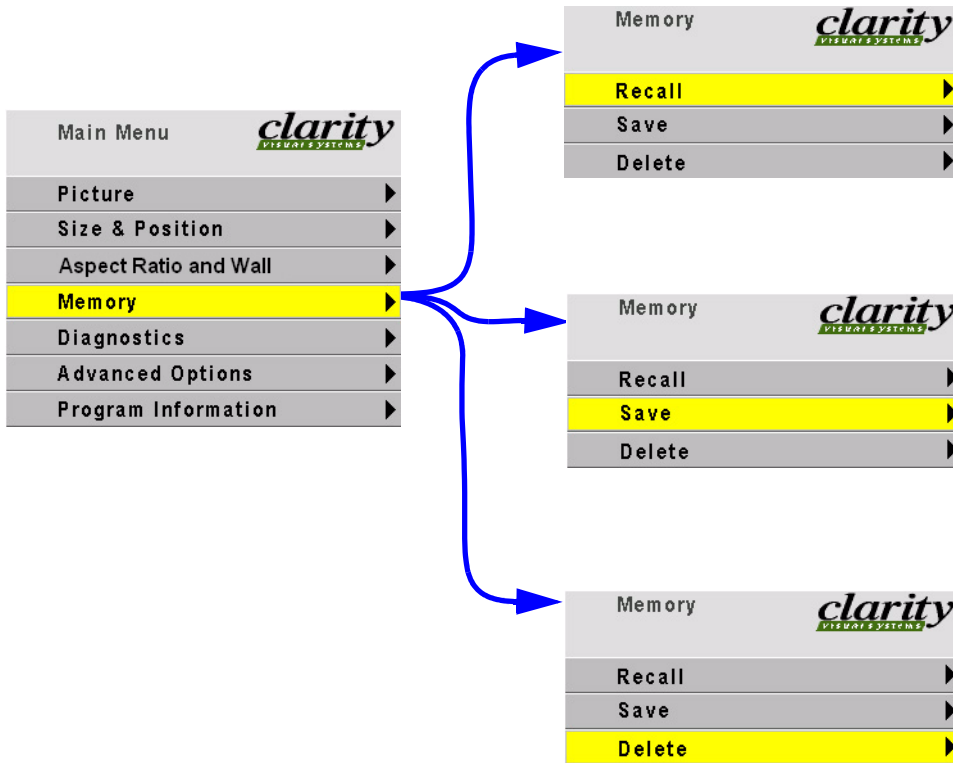
Widescreen (16x9) forces a 1.77 aspect ratio to display compressed DVDs correctly. All of the picture is shown.

Normal Video (4x3) may be the best choice for standard video sources, such as PAL and NTSC.

One to One puts the original picture up pixel for pixel. Its shape and size will depend entirely on the source. VGA sources will be small.

Justify moves the picture to the top, middle or bottom, or to the left, center or right. This has no function when the Scale Mode is Fill All.
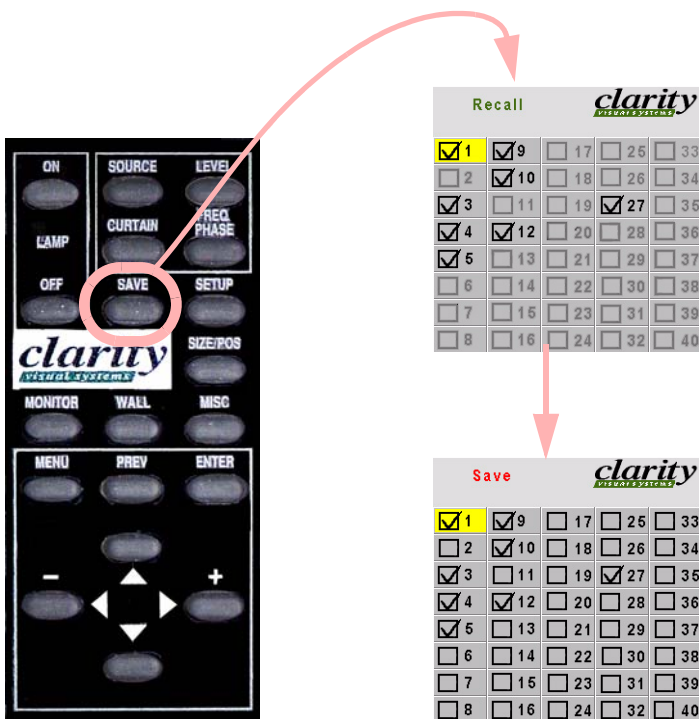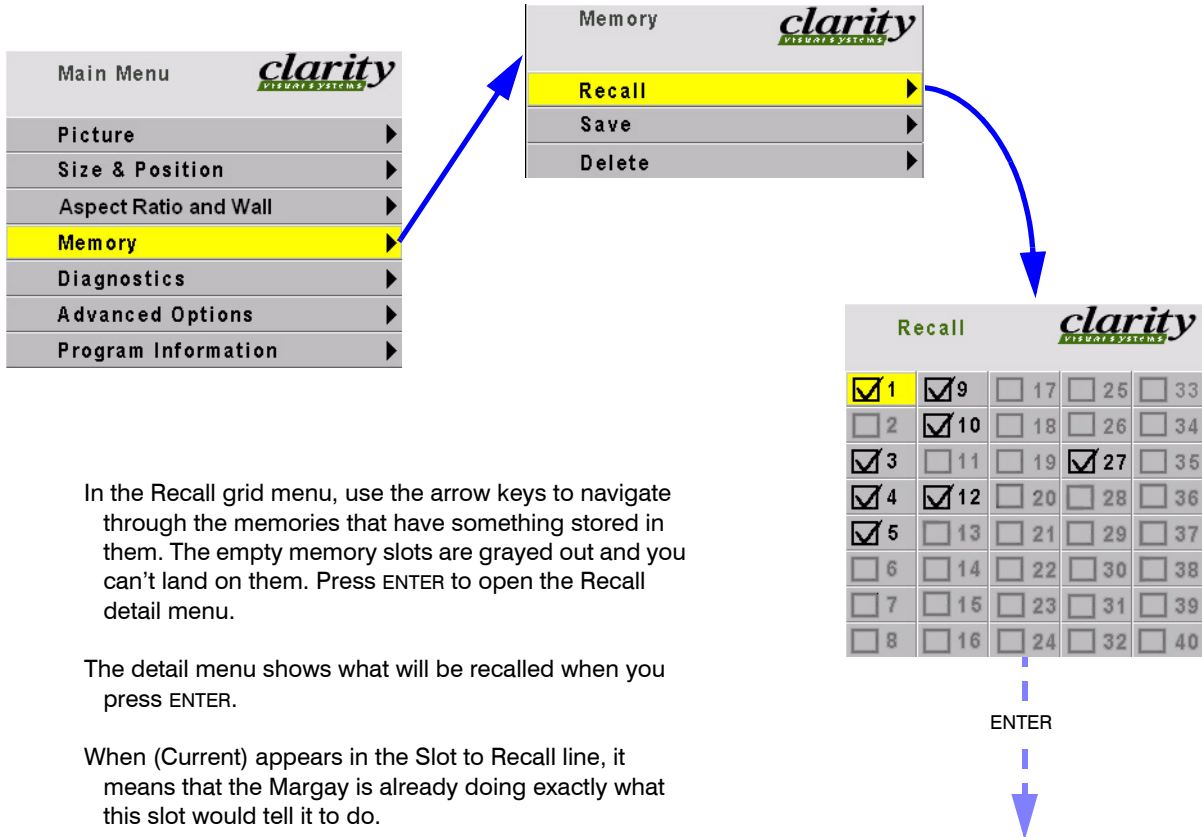
Memory

Main Menu

- Picture
- Size & Position
- Aspect Ratio and Wall
- **Memory**
- Diagnostics
- Advanced Options
- Program Information

Memory

- **Recall**
- Save
- Delete

See "Memory: Recall" on page 101.

Memory

- Recall
- **Save**
- Delete

See "Memory: Save" on page 102.

Memory

- Recall
- Save
- **Delete**

The Delete menu looks like the Recall menu.
It is not necessary to delete a memory slot before saving something new.

Recall

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☐27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

Save

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☑27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

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Memory: Recall

In the Recall grid menu, use the arrow keys to navigate through the memories that have something stored in them. The empty memory slots are grayed out and you can't land on them. Press ENTER to open the Recall detail menu.

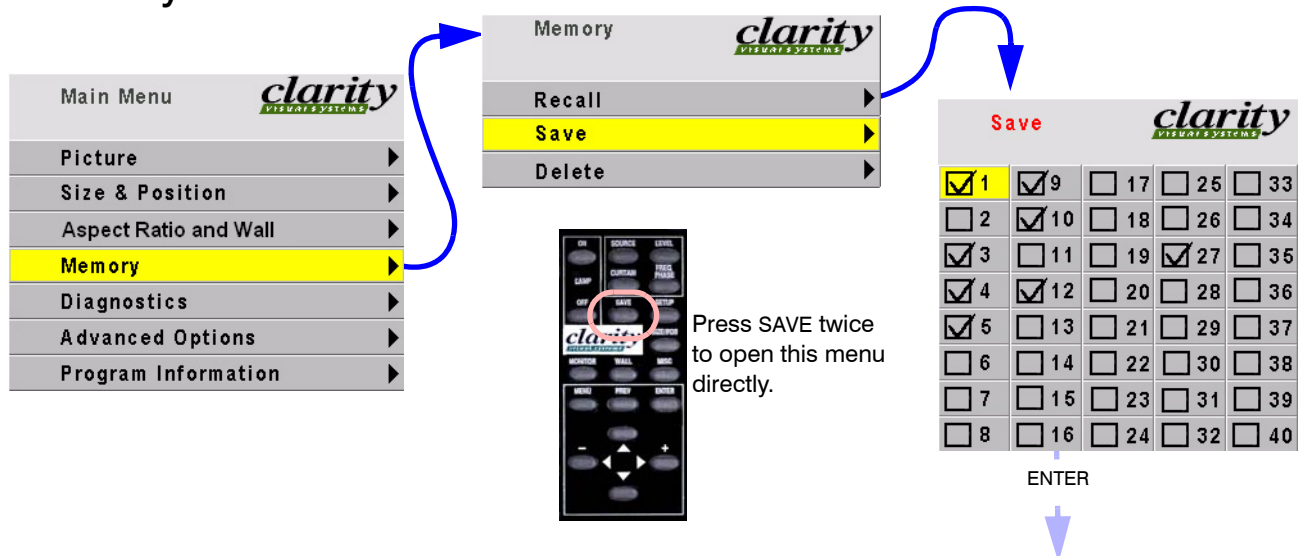The detail menu shows what will be recalled when you press ENTER.

When (Current) appears in the Slot to Recall line, it means that the Margay is already doing exactly what this slot would tell it to do.

Press SAVE once to open the Recall grid directly.

Memory: Save

Press SAVE twice to open this menu directly.

ENTER

In the Save grid, use the arrow keys to cycle through the available memories. As you navigate through all 40 memories, Save Now will show (Overwrite), as shown here, if the slot already has something in it.

For each empty memory, the Name of the memory is the default name for this slot. You can change this name as described below. Many lines are grayed out because you can't change anything here except the name of the memory. The lines in this menu are different for saving different modes: video or digital.

(Overwrite) appears if the Save to Slot number currently has something saved in it.

To save, highlight Save Now and press ENTER.

A (Current) notice will appear in Save to Slot to indicate that the save was successful and that the slot now contains exactly what the *Margay* is doing now.

To change the **Name** of a memory slot, highlight Name and press ENTER. A bar appears below the name which indicates character position. Use the $+/-$ arrows to move the yellow highlight in this bar. Use the up-down arrows to change the character at that position. There are 24 character spaces available.

The default name is an abbreviation of the memory contents: connector used, resolution, wall configuration and wall position (if wall mode is on).

Save	
Save to Slot	1
Save Now	(Overwrite)
Name	AN1 1024x768, 2x2,1:2
Source	Analog RGB 1
Colorspace	RGB
Resolution	1024 x 768
Wall	2 x 2 1:2
Scale/ Justify	Widescreen / Center
Position	328,4
Zoom UL/ LR	+1, +0 / -1, +2
Viewport UL/ LR	+0, +0 / +0,+0
Frequency/Phase	1344 / 0°
Sharpness	Normal
Black Level	52 50 104
White Level	178 131 135

Save	
Save to Slot	2
Save Now	
Name	AN1 1024x768 2x2 1:2
Source	Analog RGB 1
Resolution	1024 x 768
Colorspace	RGB
Resolution	1024 x 768
Wall	2 x 2 1:2
Scale/ Justify	Widescreen / Center
Position	328,4
Zoom UL/ LR	+1, +0 / -1, +2
Viewport UL/ LR	+0, +0 / +0,+0
Frequency/Phase	1344 / 0°
Sharpness	Normal
Black Level	52 50 104

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Diagnostics: Display Status

Main Menu — clarity VISUAL SYSTEMS
- Picture ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- **Diagnostics** ▶
- Advanced Options ▶
- Program Information ▶

Diagnostics — clarity VISUAL SYSTEMS
- **Display Status** ▶
- RS232 Port Status ▶
- RS485 Port Status ▶
- Test Patterns ▶
- Setup Summary ▶
- Hours ▶

The Optical Engine SN is read from the optical engine.

The Aspect Tag is a text line you can enter using the appropriate RS232 string command.
(Find the Margay RS232 Guide on the Clarity Visual Systems website.)

Display Status — clarity VISUAL SYSTEMS

Margay
573-2300   Rev 1.1
Optical Engine SN: 41036423610132
        Asset Tag: M0441006

PS Fan   On   Eng Fans   On
Lamp   On
Interlock   Ok

Mode ID: 55   HPer: 2096   VLines: 795
Last Fault: Interlock open   00375:45

Diagnostics: RS232 & RS485 Status

Serial Port Status RS-232
Press <enter> to clear

Commands Received	24
Replies Sent	3
Last Packet Type	Operation
Last Packet Address	This cube
Bytes Received	231
Bytes Sent	25
UART Framing Errors	0
Group 0 Unit 0 19200 Baud	

Most Recent

0,   0,   0,   0,   0,   0,   0,   0,   0,   0

Main Menu

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Diagnostics

Display Status	▶
RS232 Port Status	▶
RS485 Port Status	▶
Test Patterns	▶
Setup Summary	▶
Hours	▶

Serial Port Status RS-485
Press <enter> to clear

Commands Received	24
Replies Sent	3
Last Packet Type	Operation
Last Packet Address	This cube
Bytes Received	231
Bytes Sent	25
UART Framing Errors	0
UART Overflow Errors	0
Group 0 Unit 0 19200 Baud	

Most Recent

0,   0,   0,   0,   0,   0,   0,   0,   0,   0

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Diagnostics: Test Patterns

Main Menu — *clarity* VISUAL SYSTEMS

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Diagnostics — *clarity* VISUAL SYSTEMS

Display Status	▶
RS232 Port Status	▶
RS485 Port Status	▶
Test Patterns	▶
Setup Summary	▶
Hours	▶

Test Patterns — *clarity* VISUAL SYSTEMS

None		Custom Color ▶
White	Gray Scale	Grid
Red	Red Scale	Alignment Dashes
Green	Green Scale	4x4 Checkerboard
Blue	Blue Scale	Uniformity
Black	Colors	Focus
Gray	Color Bars	Logo

Custom Test Pattern Color — *clarity* VISUAL SYSTEMS

Red	– ▭ +	157
Green	– ▭ +	0
Blue	– ▭ +	255
All	– ▭ +	

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Diagnostics: Setup Summary

Main Menu — *clarity* VISUAL SYSTEMS

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Diagnostics — *clarity* VISUAL SYSTEMS

Display Status	▶
RS232 Port Status	▶
RS485 Port Status	▶
Test Patterns	▶
Setup Summary	▶
Hours	▶

Setup Summary — *clarity* VISUAL SYSTEMS

Source	Analog 1
Colorspace	RGB
Resolution	1024 x 768
Wall	3x3 2:1
Scale/Justify	Fill All / Center
Position/ Overscan	328 31 / 0%
Zoom UL/ LR	+0, +0 / +0, +0
Viewport UL/LR	+0, +0 / +0, +0
Frequency/Phase	1664 / 315.0°
Black Level	10 45 28
White Level	105 129 138
Sharpness	Sharpest
White Balance	85 100 94
Gray Balance	6 8 11
Slot -12-	Group 0 Unit 0

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Diagnostics: Hours

Main Menu

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Diagnostics

Display Status	▶
RS232 Port Status	▶
RS485 Port Status	▶
Test Patterns	▶
Setup Summary	▶
Hours	▶

System Time is the number of hours the electronics module has received power.

Running Time is the total number of hours any lamp has been on.

Lamp is the total number of hours *this* lamp has been on, that is, if someone reset lamp hours when the lamp was changed.

Reset Lamp Hours, when your press ENTER, will reset the Lamp hours, but neither of the other times.

Hours

System Time	02543:23
Running Time	01988:24
Lamp	01867:34
Reset Lamp hours	

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Advanced Options: Color Balance

Main Menu *clarity* VISUAL SYSTEMS

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Advanced Options *clarity* VISUAL SYSTEMS

Color Balance	▶
Miscellaneous Options	▶
Lamp Settings	▶
Serial Port Settings	▶
Auto Setup Options	▶
Engine Alignment	▶
Menu Options	▶
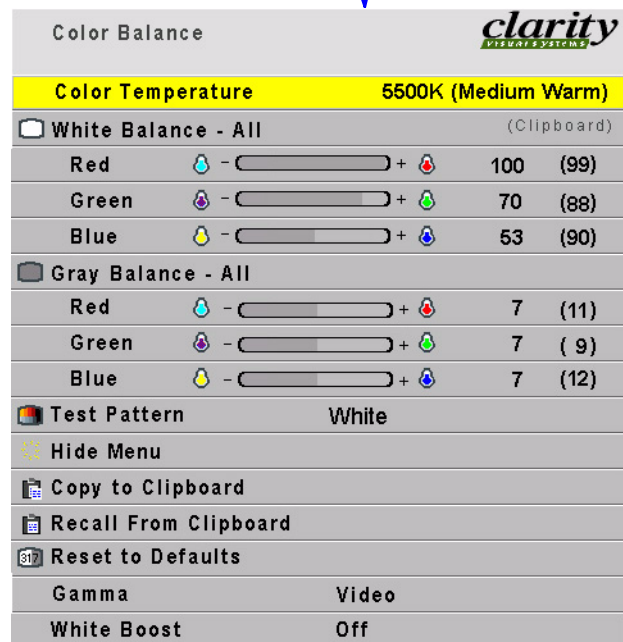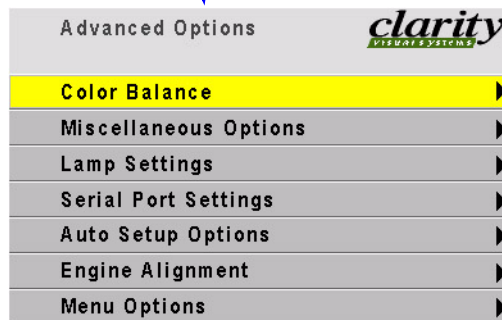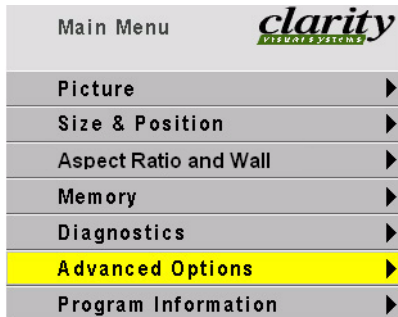
For a complete description of color balancing, see "Color Balancing a Wall of Margays" on page 52.

Color Temperature sets the color temperature to one of four fixed values (3200K, 5500K, 6500K, 8500K) or to **Custom**. The fixed temperatures have preset values for all the White and Gray settings and are used primarily in single Margay installations.

Custom is the one for color balancing a wall of Margays.

Gamma changes the colors slightly for Film or Video display. Use Film for deeper reds. Use Video for optimal brightness.

White Boost can increase the brightness of the brightest parts of the picture. Settings are Off, Medium, High. Using this control may alter slightly some of the brighter colors. If used, it should be used on all cubes.

✎ It will be more difficult to color balance a wall if White Boost is used.

Color Balance *clarity* VISUAL SYSTEMS

Color Temperature	**5500K (Medium Warm)**		
▢ White Balance - All			(Clipboard)
Red	– ⬛⬛⬛⬛⬛ +	100	(99)
Green	– ⬛⬛⬛⬛ +	70	(88)
Blue	– ⬛⬛ +	53	(90)
▢ Gray Balance - All			
Red	– ⬛⬛ +	7	(11)
Green	– ⬛⬛⬛ +	7	(9)
Blue	– ⬛⬛ +	7	(12)
🔲 Test Pattern	White		
Hide Menu			
Copy to Clipboard			
Recall From Clipboard			
Reset to Defaults			
Gamma	Video		
White Boost	Off		

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Advanced Options: Miscellaneous Options
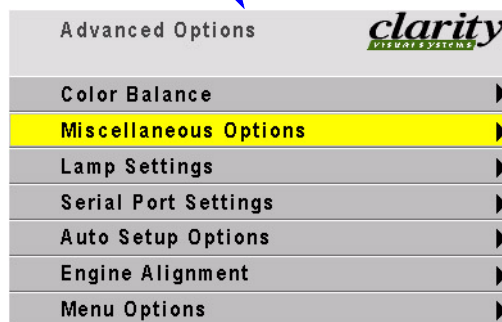
Beeper makes the Margay make a chirping sound each time a remote button is pressed (and received by the Margay). The display *always* triple-beeps when a button is pressed that tells the Margay to do something it can't do, such as turn on the lamps when they are already on.
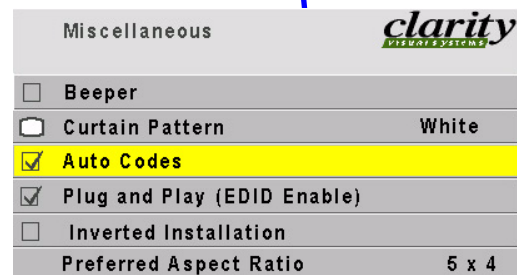
Curtain Pattern choose what the screen will show when the Curtain button is pressed.

Auto Codes causes the Margay to start flashing the On Screen Codes whenever an event causes the lamps to go out, such as opening the rear panel.

Plug and Play enables the Extended Display Identification Data (EDID) that is used by many computers to determine the capabilities of the monitor. This is a complicated standard, and not all video card drivers and operating systems act the same. If you are having trouble getting your video card to output a picture when attached to our display, you can try disabling Plug and Play and rebooting the computer, to see if it acts any better. Normally Plug and Play should be enabled.

Inverted Installation inverts the menus, the picture, and makes the left-right sense of the image alignment motors switch.

Preferred Aspect Ratio tells the Margay which aspect ratio to use when the incoming signal may have several choices. For instance, 1024x768 and 1366x768 have similar signal timings, and the Margay might choose the wrong one. If you application sometimes has 1024x768 but never 1366x768, set this control for 4x3.

Advanced Options: Lamp Settings

Main Menu

- Picture ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- Advanced Options ▶
- Program Information ▶

Advanced Options

- Color Balance ▶
- Miscellaneous Options ▶
- Lamp Settings ▶
- Serial Port Settings ▶
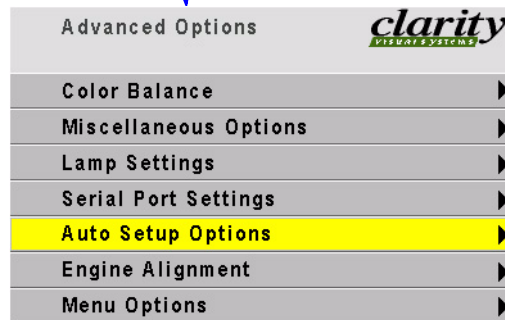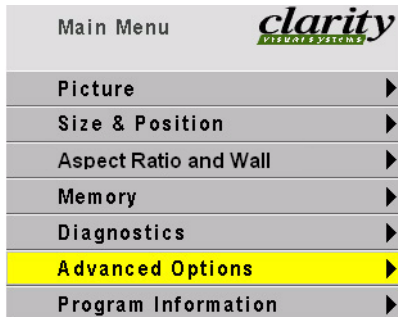- Auto Setup Options ▶
- Engine Alignment ▶
- Menu Options ▶

Lamp Settings

- Auto Lamp On
- Lamp Saver
- Lamp Saver Timeout   1 hr
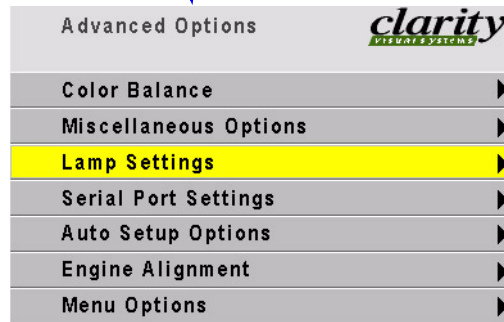
Auto Lamp On makes the lamp turn soon after AC power is applied. The Margay must always go through its initialization and sometimes wait for the lamp to cool.

Lamp Saver causes the lamp to turn off if there is no source for the specified period of time. When a valid source is re-acquired, the lamp will turn on again. When the lamp turns off, it must cool down. If the source is acquired during this cool-down period, the lamp will turn on after the cooldown period. The Lamp Saver Timeout value ranges from 5 minutes to 24 hours.

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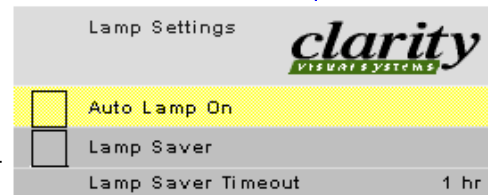
Advanced Options: Serial Port Settings
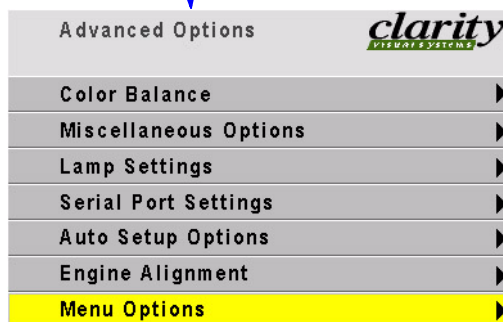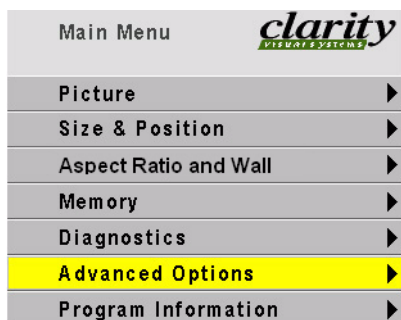
Main Menu *clarity*

- Picture ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- **Advanced Options** ▶
- Program Information ▶

Advanced Options *clarity*

- Color Balance ▶
- Miscellaneous Options ▶
- Lamp Settings ▶
- **Serial Port Settings** ▶
- Auto Setup Options ▶
- Engine Alignment ▶
- Menu Options ▶

Serial Port Settings *clarity*

Group ID	2
Unit ID	6
ASCII Response Type	Symbolic
ASCII Response Terminator	CR
Baud Rate	2400
☐ Terminate RS-485	

Group ID and **Unit ID** combine to make the two-character ID for the display. These must be different for each display is a serial RS232 / RS485 control string. The range of each is 0-9 and A-Z.

ASCII Response Type and **ASCII Response Terminator** are explained in the Margay RS232 Guide, available from Clarity's website.

Terminate: In most instances, this is not necessary. Terminating the string unnecessarily can cause its own communication problems. The guide line is: If it works without terminating, leave it alone. It should only be used on the last display in the string, if at all.

Advanced Options: Auto Setup Options

Main Menu — clarity
- Picture ▶
- Size & Position ▶
- Aspect Ratio and Wall ▶
- Memory ▶
- Diagnostics ▶
- **Advanced Options** ▶
- Program Information ▶

Advanced Options — clarity
- Color Balance ▶
- Miscellaneous Options ▶
- Lamp Settings ▶
- Serial Port Settings ▶
- **Auto Setup Options** ▶
- Engine Alignment ▶
- Menu Options ▶

The checked events occur when
- the input changes, say from XGA to UXGA
- a new source is selected
- you press the SOURCE button.

Retry on lost signal, when checked, means the Margay will look for a valid picture on the other connectors whenever sync on the current connector is lost. Margay will stop on the next connector that has a picture (sync).

Do Black/White Levels automatically adjusts the lightest and darkest pixels to be white and black. This fully automatic method is prone to errors in the white level. Semi-automatic level adjustment is better.

Auto Setup Options — clarity
- ☑ Retry on lost signal
- ☐ Do Black/White Levels
- ☑ Do Frequency
- ☑ Do Phase
- ☑ Do Position
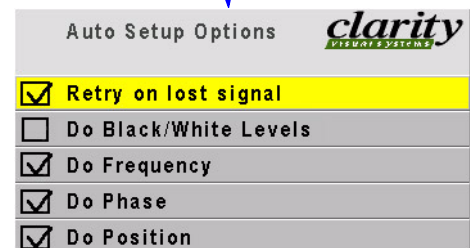
Do Frequency and **Do Phase** automatically adjust the electronics module to the frequency and phase of the selected picture.

Do Position puts the upper left pixel of the picture in the upper left corner of the LCD.

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Advanced Options: Engine Alignment

Main Menu — *clarity* VISUAL SYSTEMS

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Advanced Options — *clarity* VISUAL SYSTEMS

Color Balance	▶
Miscellaneous Options	▶
Lamp Settings	▶
Serial Port Settings	▶
Auto Setup Options	▶
Engine Alignment	▶
Menu Options	▶

See "Adjusting Margay's Engine: Important Step" on page 38 for a complete explanation of these controls.

Engine Alignment — *clarity* VISUAL SYSTEMS

Left Side	
Right Side	
Horizontal	
Image Size	
Test Pattern	Grid

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Advanced Options: Menu Options

H and **V Position** move the location of the menus on the screen.

Menu Timeout sets how long menus will remain on the screen before disappearing on their own. The choices are 5, 15, and 60 seconds, and Never Time Out, which keeps the menu on indefinitely.
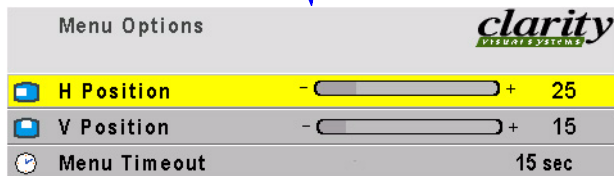
Program Information
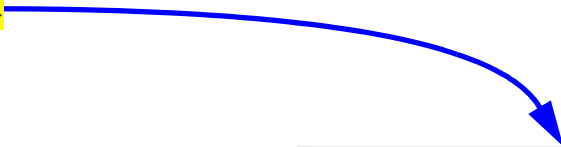
The middle section shows the native resolution of the Margay and the Revision number of the firmware.

7.2 Remote Control Buttons

The function of each remote control button are shown on the next several pages.

Turns the lamps on and off.

Input Levels *clarity*

☀ **Auto Black Level (offset)**			
◑ **Auto White Level (gain)**			
Center Point	2	1	4
☀ Black Level (offset) - All	– ⬤—————+		55
Red	– ⬤—————+		68
Green	– ⬤—————+		57
Blue	– ⬤—————+		69
◑ White Level (gain) - All	– ⬤—————+		130
Red	– ⬤—————+		128
Green	– ⬤—————+		131
Blue	– ⬤—————+		130

Picture Position *clarity*
Use arrow keys to move image

⬍

Horizontal Position   234
Vertical Position   34

Main Menu *clarity*

Picture	▶
Size & Position	▶
Aspect Ratio and Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Zoom Top & Left *clarity*
Arrows move top and left

+1

+0   +1

– 2

Image Resolution   1024x768
This Cube   512x384   2x2 1:2

Zoom Bottom & Right *clarity*
Use arrow keys to move bottom and right of image window

– 2

+1   +0

+1

Image Resolution   1024x768
This Cube   512x384   2x2 1:2

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Starts scanning the input connectors for the next available source.

Recall

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☑27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

Save

☑1	☑9	☐17	☐25	☐33
☐2	☑10	☐18	☐26	☐34
☑3	☐11	☐19	☑27	☐35
☑4	☑12	☐20	☐28	☐36
☑5	☐13	☐21	☐29	☐37
☐6	☐14	☐22	☐30	☐38
☐7	☐15	☐23	☐31	☐39
☐8	☐16	☐24	☐32	☐40

Color Balance

Color Temperature	5500K (Medium Warm)
White Balance - All	(Clipboard)
Red	100 (99)
Green	70 (98)
Blue	53 (90)
Gray Balance - All	
Red	7 (11)
Green	7 (9)
Blue	7 (12)
Test Pattern	White
Hide Menu	
Copy to Clipboard	
Recall From Clipboard	
Reset to Defaults	
Gamma	Video
White Boost	Off

Display Status

Margay
573-2300   Rev 1.1
Optical Engine SN: 41036423610132
Asset Tag: M0441006

PS Fan	On	Eng Fans	On
Lamp	On		
Interlock	Ok		

Mode ID: 55   HPer: 2096   VLines: 795
Last Fault: Interlock open   00375:45

Miscellaneous

☑ Beeper	
☐ Curtain Pattern	White
☑ Auto Codes	
☑ Plug and Play (EDID Enable)	
☐ Inverted Installation	

Lamp Settings

☑ Auto Lamp On	
☑ Lamp Saver	
Lamp Saver Timeout	0 hr
Lamp Saver Timeout	15 min

Serial Port Status RS-232
Press <enter> to clear

Commands Received	24
Replies Sent	3
Last Packet Type	Operation
Last Packet Address	This cube
Bytes Received	231
Bytes Sent	25
UART Framing Errors	0
Group 0 Unit 0 19200 Baud	

Most Recent
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

Serial Port Status RS-485
Press <enter> to clear

Commands Received	24
Replies Sent	3
Last Packet Type	Operation
Last Packet Address	This cube
Bytes Received	231
Bytes Sent	25
UART Framing Errors	0
UART Overflow Errors	0
Group 0 Unit 0 19200 Baud	

Most Recent
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

Serial Port Settings

Group ID	2
Unit ID	6
ASCII Response Type	Symbolic
ASCII Response Terminator	CR
Baud Rate	2400
☐ Terminate RS-485	

Test Patterns

None		
White	Gray Scale	Grid
Red	Red Scale	Alignment Dashes
Green	Green Scale	4x4 Checkerboard
Blue	Blue Scale	Uniformity
Black	Colors	Focus
Gray	Color Bars	Logo

Auto Setup Options

☑ Retry on lost signal	
☐ Do Black/White Levels	
☑ Do Frequency	
☑ Do Phase	
☑ Do Position	

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Turns the curtain on and off. Curtain pattern is selected in the Miscellaneous menu.

Displays this message

See "Spreading One Picture Over a Wall" on page 54

Adjusting the Image

and starts the process of adjusting the image; performs those steps checked in the Auto Setup Options menu

Wall & Aspect Ratio	*clarity*
Wall Width	2
Wall Height	2
Unit Column	1
Unit Row	2
☑ Wall Mode	
▣ Scale Mode	Letterbox
Justify	Top
Border Color	Dark Red

Changes the value of the high-lighted item. In some menus, like PIcture Position. these buttons control left-right movement. The + button moves you to the next menu, when there is an arrow in the current highlighted item.

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Opens the Picture menu

Picture *clarity* visual systems

🖼 Source	Analog 1 ▶
✦ Colorspace	RGB
Sync Type	Separate H&V
Vertical Frequency	60 Hz
Horizontal Frequency	43.38 kHz
Pixel Frequency	65.02 MHz
↦ Horizontal Resolution	1280
⊥ Vertical Resolution	768
⬛ Frequency	− [━━━━━] + 1344
⬛ Phase	− [━━━━━] + 22.5°
⬛ Sharpness	Sharpest
Input Levels	▶

Selects the previous
menu.

Selects the highlighted item. If there
is an arrow in the item, this button
goes to that menu.

Moves through the items in a
menu. In some menus, such as
Picture Position, these button con-
trol up-down movement.

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7.3 Drawings

All dimensions are in inches.

Screen slides out on
rails for full front service

Screen Brace
(bottom row only, remove for stacking)

ELECTRONICS I/O

EXHAUST VENTS

HANDLES

REAR SERVICE DOOR

INTAKE VENTS

120

43.592

24.509

50.005

32.496

2X .500

.511

4X 1/4-20
TIE BACK NUTS

.525

121

7.244

11.835

3.590

17.666
TO SCREW HEADS

17.556

35°

.103

24.503

7.974

13.569

8.235

AUXILLARY EXHAUST VENTS

122
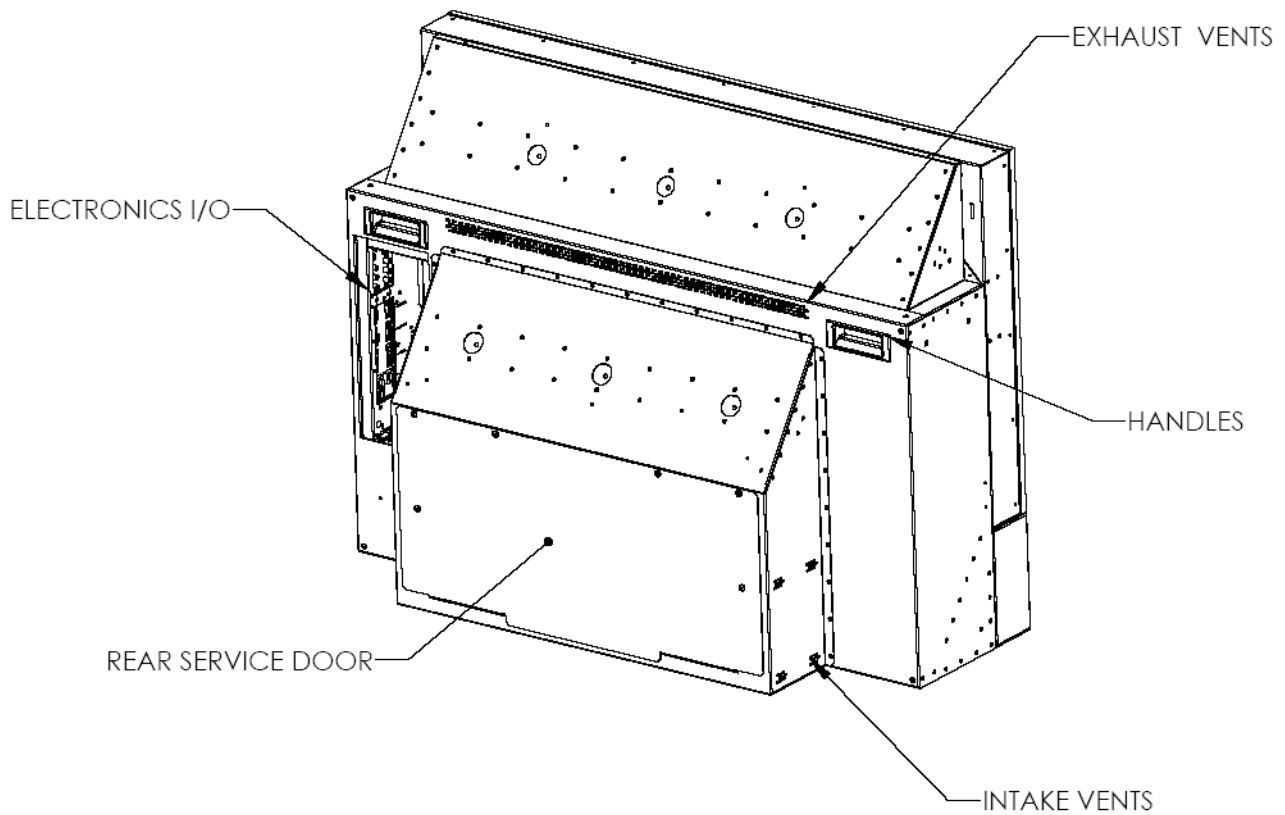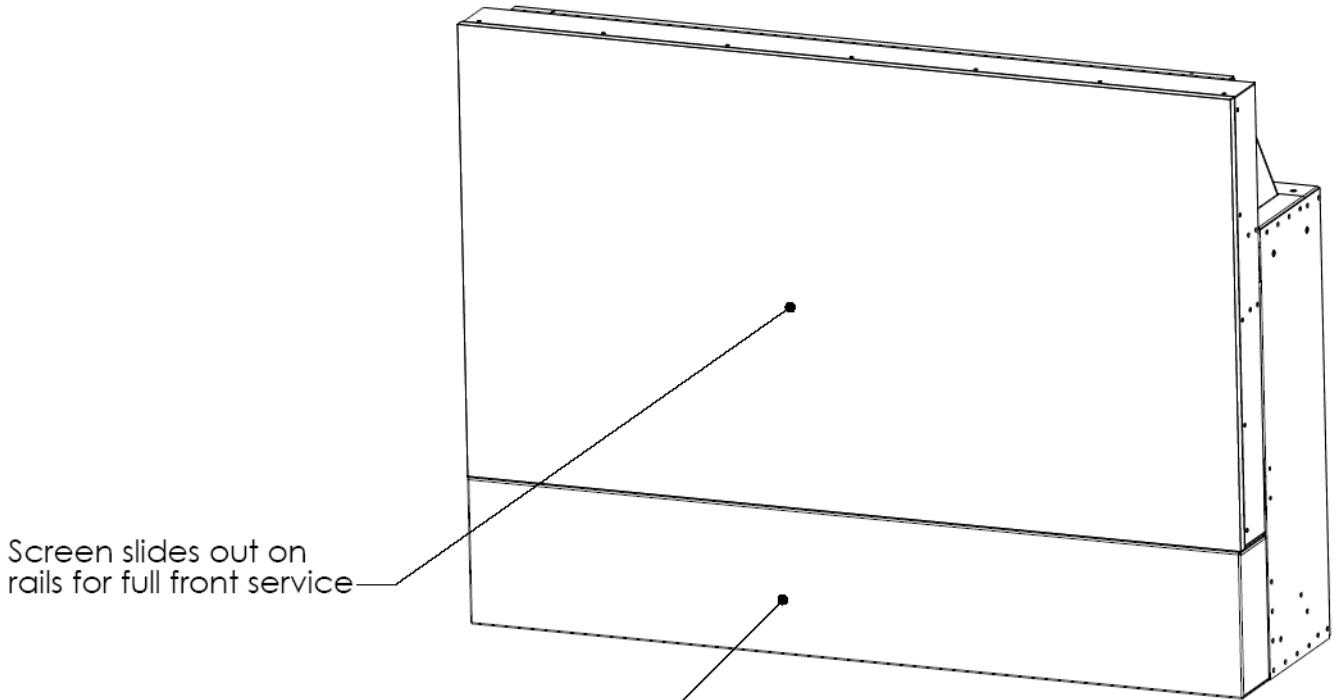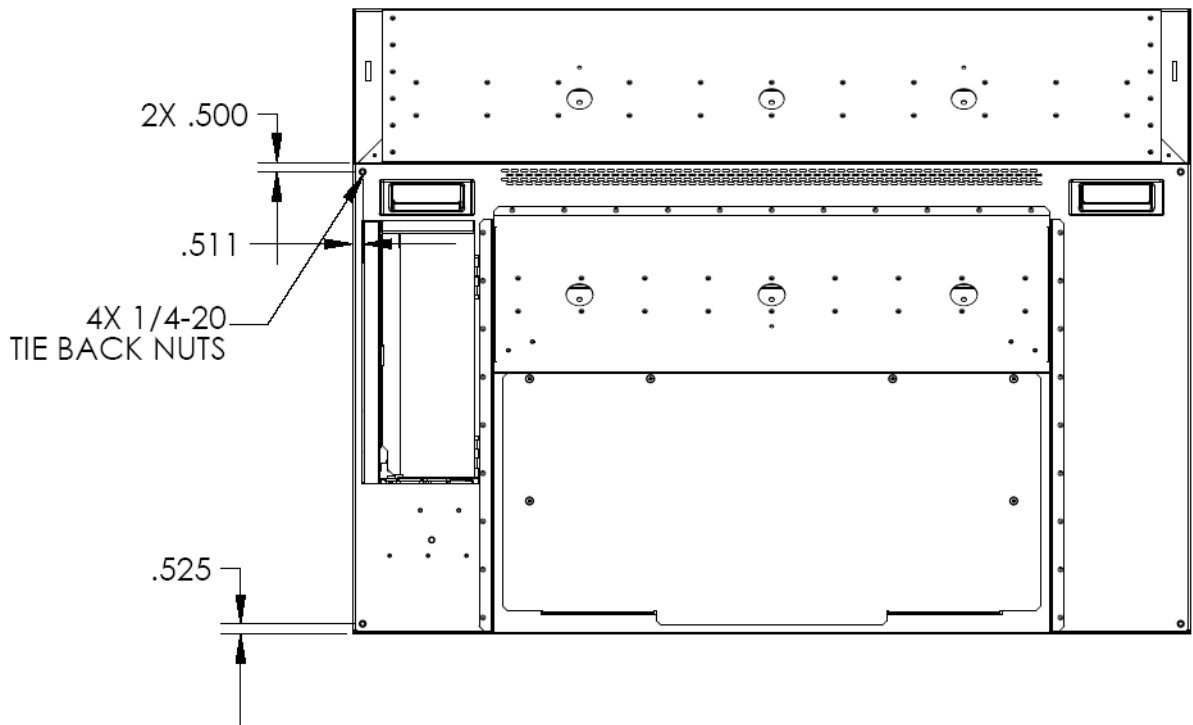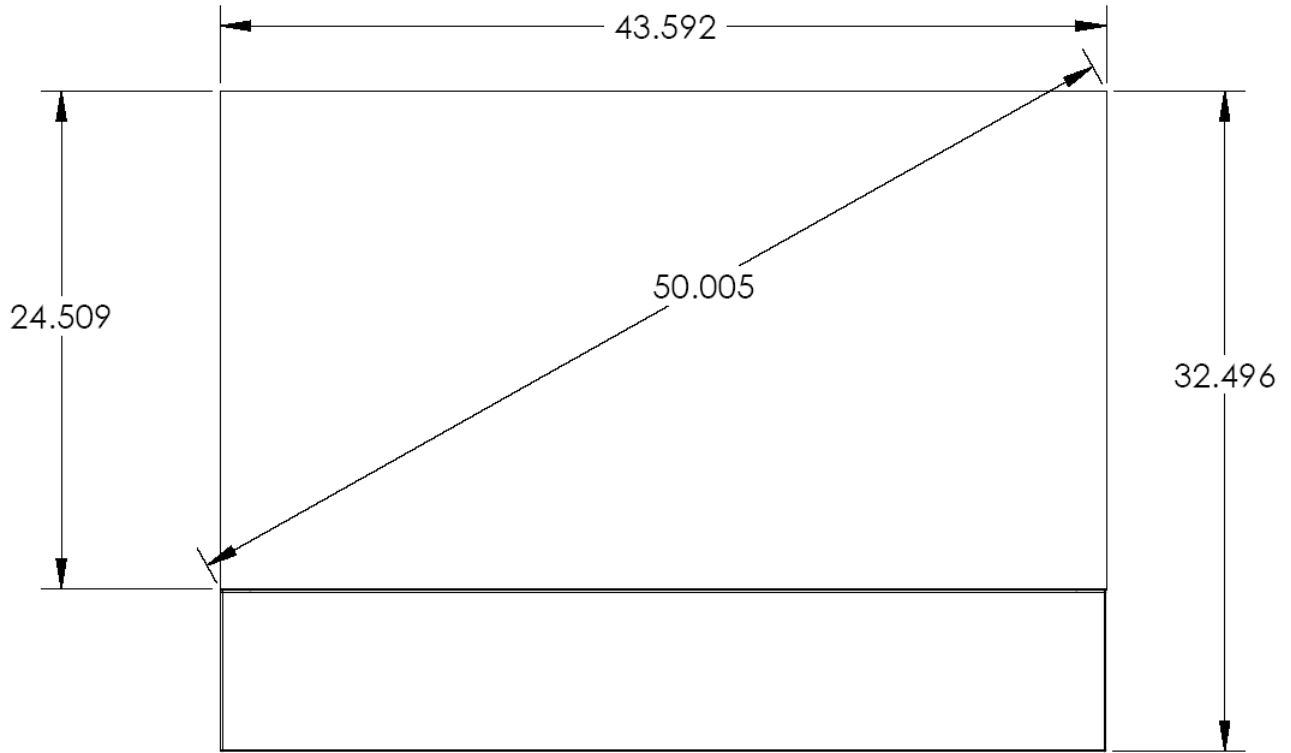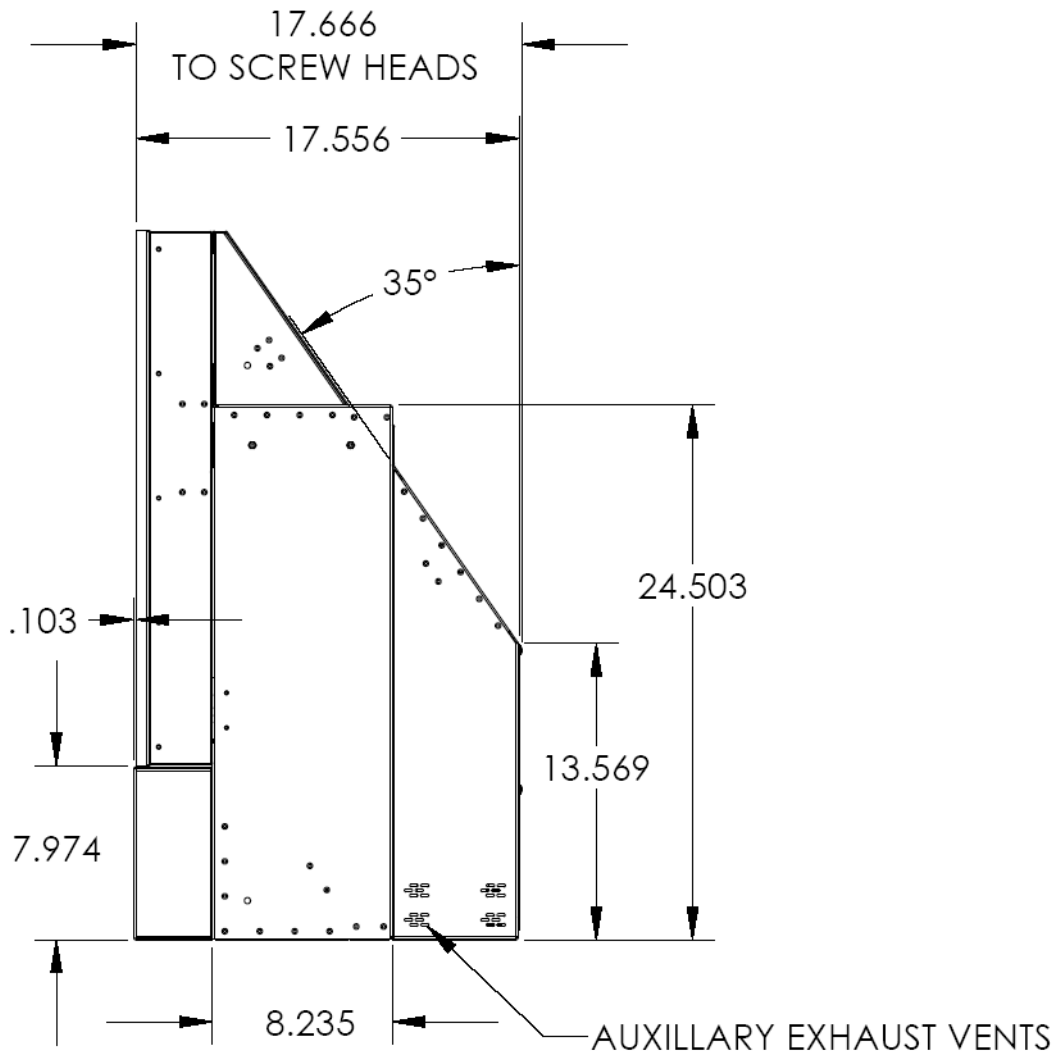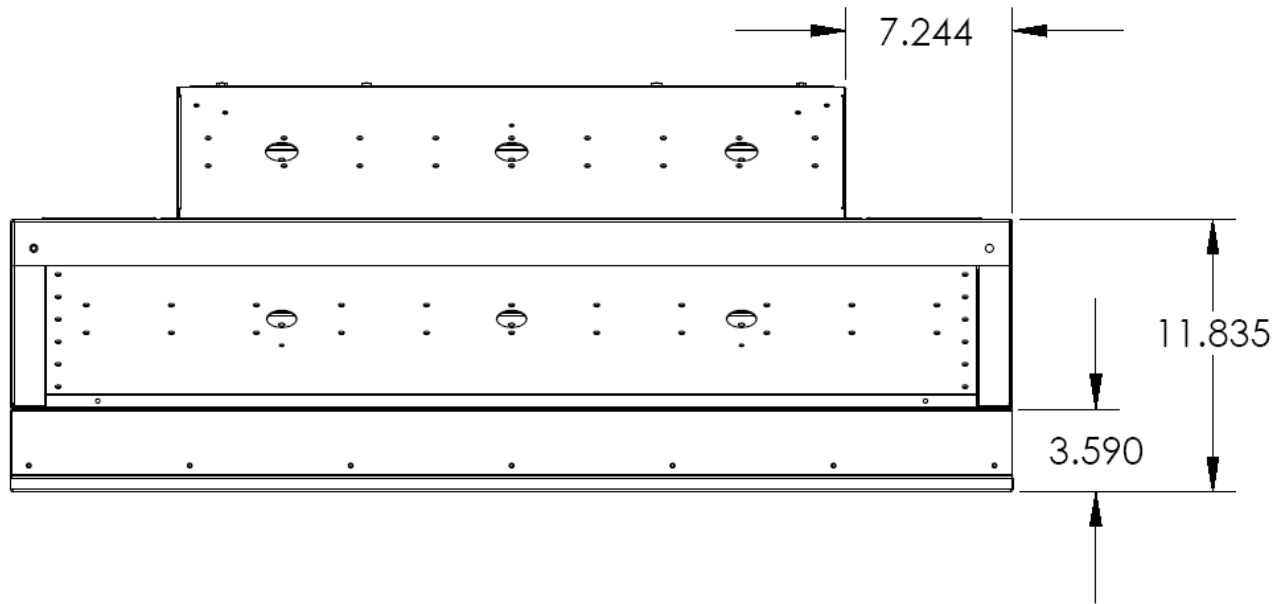
7.4 Connector Diagrams
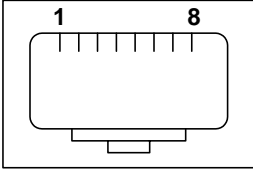
These are connector diagrams with pin designations. All connectors on these pages are shown looking at them from the outside, not from the solder side. These diagrams look at the outside of the connector, as the cable sees it, not the wiring side.

RS232 adapter
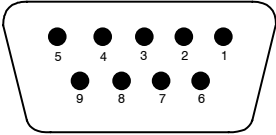
The wiring shown for this adapter is correct for *straight-thru* network cables.

Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2

RJ45 looking into the socket.

This little 9-pin to RJ45 adapter is available unwired from many computer or electronic stores. Get one with a female 9-pin connector.

The cable **must** be wired straight-thru. You can tell if a cable is wired straight-thru by looking at its two ends side-by-side.

1. Hold the cable ends next to each other, both ends pointing away from you. Have the clips on both connectors pointing down so you can't see them.
2. If the color of the wires on the two connectors is the same, left to right, the cable is straight-thru. The order of the colors doesn't matter, as long as they are both the same.

DB15 standard VGA connector

Pin 5		Pin 1
Pin 10		Pin 6
Pin 15		Pin 11
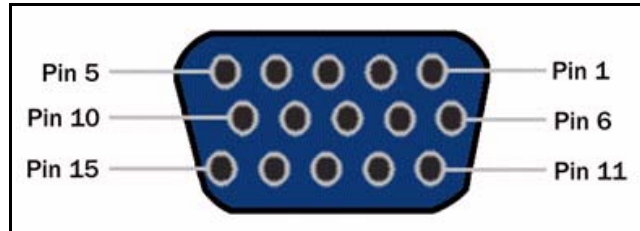
Pin	Signal
1	Analog Red Out
2	Analog Green Out
3	Analog Blue Out
4	Not connected
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V (DDC)
10	Ground
11	Not connected
12	SDA (DDC)
13	TTL Horizontal Sync
14	TTL Vertical Sync
15	SCL (DDC)

S-Video connector

Pin	Signal
1	Ground (luminance)
2	Ground (chrominance)
3	Luminance 1 V including sync 75 ohms
4	Chrominance 0.3 V burst 75 ohms

DVI-I connector
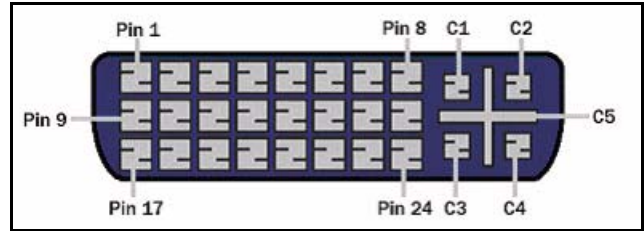
Pin	Signal	Pin	Signal
1	TMDS data 2-	13	TMDS data 3+
2	TMDS data 2+	14	+5 V power
3	TMDS data 2/4 shield	15	Ground (for +5V, Hsync, Vsync)
4	TMDS data 4−	16	Hot plug detection
5	TMDS data 4+	17	TMDS data 0−
6	DDC clock	18	TMDS data 0+
7	DDC data	19	TMDS data 0/5 shield
8	Analog vertical sync	20	TMDS data 5−
9	TMDS data 1−	21	TMDS data 5+
10	TMDS data 1+	22	TMDS clock shield
11	TMDS data 1/3 shield	23	TMDS clock +
12	TMDS data 3−	24	TMDS clock−
C1	Analog Red	C3	Analog Blue
C2	Analog Green	C4	Analog H sync
C5	Analog ground		

7.5 Glossary of Terms

Term	Meaning
aspect ratio	The ratio of the width to the height of a picture, often expressed as 4-by-3, 4:3, 4u×3, or 1.33:1 (the aspect ratio of standard television pictures). 16-by-9 (1.77:1) is the aspect ratio for high-definition TV.

Clarity Display	Aspect Ratio
Lion X, UX, XP, UXP, XL, UXL Panther UX, UXP Puma X, XP, UXP Tigress S, X Wildcat S, SE	1.33
Lion SX, SXP	1.25
Bobcat 1, 2	1.66
Bay Cat, Margay, Bengal	1.77

Term	Meaning
ballast	The electronics part (module) that powers the lamp, providing high voltage to start the lamp and a lower voltage for operation.
Bay Cat	The name for a Clarity direct-view LCD display, similar to a Clarity Bobcat, but with a larger screen (46") and higher resolution (1920x1080). Model number SN-4610-1080
Bobcat	The name for any Clarity model beginning SN-4025 or SN-4035. A 40" direct view LCD display of 1280 × 768 pixels.
composite sync	Sync signals that combine the horizontal and vertical syncs onto one signal line, separate from the video. RGBS uses this type.
composite video	A video distribution system in which all the video information, is sent on one wire. Sometimes called C-Video.
cube	One display without regard to others that may be in a wall with it. *See also* unit; display.

Term	Meaning
C-Video	Composite video; a video distribution system in which all the video information, is sent on one wire.
DA	Distribution amplifier; a device that takes in one input and gives out many of the same type. DAs are available for video, computer and digital signals.
display	One display unit without regard to others that may be in a wall with it.
DLP™	Digital Light Processing, Texas Instruments' trademarked name for their optical system using a DMD™ and a color wheel. Other manufacturers also use TI's DMD chips.
DMD™	Digital Micromirror Device, Texas Instruments' trademarked name and patented device for reflecting individual pixels of light toward a screen.
DVI	Digital Video Interface, a standard for distributing computer pictures in digital form.
electronics module	The electronic part that controls almost everything about the display. It converts incoming pictures to a form the LCD can use to display pictures and provides control through the remote control and RS232 connections to other functions, such as turning lamps on and monitoring fans.
Fast key	One of the buttons on the remote control that takes you directly to a menu or chain of menus.
H & V sync	Horizontal and vertical sync on two separate lines. The VGA family uses this type.
key	a push button on the remote control
lamp life	A lamp life of 5,000 hours means that for a *large* group of lamps, after 5,000 hours of use, *at least* half of them will still be operation.
LED	Light Emitting Diode: a small, low power lamp used as an indicator, often red or green, but can be other colors.

Term	Meaning
Lion	The name for any Clarity model beginning WN-6720.
Margay	Model WN-5040-720, a DLP™ optical engine with one lamp and a resolution of 1280 × 720
module	A stand-alone electronic assembly. Clarity displays are designed to be serviced at the module level, not the component level. That is, the technician changes the whole electronics module rather than changing a small part in it.
mullion	The metal edge surrounding the screen material that holds the screen in place.
native resolution	The resolution of the LCD or DMD itself. This is the highest resolution the display can show, but in some products the display will accept higher resolutions an
NTSC	The television system used in North America, Japan and parts of South America. It stands for National Television Systems Committee, the group that originally approved it. See also PAL and SECAM.
PAL	The television system used in most of the world. It stands for Phase Alternation Line. See also NTSC and SECAM.
Panther	The name for any Clarity model beginning WN-67**4**0 or WN-67**3**0.
power supply	The device that converts the mains AC voltage to other voltages that the rest of the display can use.
Puma	The name for any Clarity model beginning with WN-5020 or WN-5010.
remote	The remote control.
RGB	Red, green, blue; three parts of a video signal sent on separate wires. *See also* YPbPr.
RGBHV	RGB plus sync, where H and V sync are on separate wires.
RGBS	RGB plus sync, where composite sync is on a separate wire.

Term	Meaning
SECAM	The television system used primarily in France, Russia and the former Soviet Bloc countries. Sequential Color and Memory. See also NTSC and PAL.
slot	A memory location; the numbered location in memory
SOG	Sync on green, usually for RGB sources
source	A source of pictures, such as a computer, a VCR, a DVD player or the loop-thru from another Clarity cube.
stack	A group of displays physically bolted together forming a wall.
strike	lighting a lamp or trying to light a lamp
SVGA	Super VGA, a standard for distributing analog computer pictures with a resolution of 800 pixels by 600 pixels.
S-Video	A video distribution system in which the luminance (brightness) and chrominance (color) are sent on separate wires. Short for Super Video.
SXGA	Super extended VGA, a standard for distributing analog computer pictures with a resolution of 1280 pixels by 1024 pixels.
sync on green	The sync part of the signal is combined with the green channel in RGB video. Also called SOG.
Tigress	The name for any Clarity model beginning with WN-5230. The original Tigress, no longer produced, has been replaced by the Tigress S and Tigress X, whose model numbers start with WN-5230**A**.
unit	One complete display. *See also* cube; display.
UXGA	Ultra-extended VGA, a standard for distributing analog computer pictures with a resolution of 1600 pixels by 1200 pixels.
VGA	Video Graphics Adapter, a standard for distributing analog computer pictures with a resolution of 640 pixels by 480 pixels.

Term	Meaning
video	In this manual, video means NTSC, PAL or SECAM pictures.
video input module	See VIM
VIM	Video Input Module: an optional board which plugs into the electronics module that allows S-Video and composite video inputs.
wall	A group of displays physically bolted together. (Not possible with Panthers.)
Wildcat	The name for any Clarity model beginning WN-4030.
WXGA	Wide XGA, a standard for distributing analog computer pictures with a resolution of 1280 pixels by 768 pixels.
XGA	eXtended VGA, a standard for distributing analog computer pictures with a resolution of 1024 pixels by 768 pixels.
Y	One of the components of "component" video. *See also* component video *and* colorspace.
YPbPr	Designators for the three conductors in component video. Y = luminace signal Pb = B-Y (blue − luminance) signal Pr = R-Y (red − luminance) signal

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7.6 Specifications for Margay

Mechanical				
Specification	**Maximum**	**Minimum**	**Typical**	**Notes**
Outside dimensions				
Width			43.6"	1107.4 mm
Height			32.5"	825.5 mm
Depth			17.5"	444.5 mm
Weight			68 lbs	30.8 kg
Shipping weight			~85-90 lbs	~38-41 kg
Stacking				
Horizontal				unlimited
Vertical	4			>10 with support
Orientation	15°			Tilt on any axis; inverted tilt, same
Chassis color			Black	
Ventilation, rear clearance required		0"		0 mm Large walls must maintain adequate air exchange.
Screen size (front face)				
Diagonal	50"			1270 mm
Width	43.5"			1105 mm
Height	24.5"			622 mm
Mullion	<1 mm			<0.04"
Serviceable from …				front or rear, completely
Controls				RS232, RS485, remote IR control
WallNet™ ready?				Yes

Electrical and Heat				
Specification	**Maximum**	**Minimum**	**Typical**	**Notes**
Video input amplitude				
Separate analog	1.4 V p-p	0.35 V p-p	0.7 V p-p	75 ohm termination
Composite analog	5.0 V p-p		0.3 V p-p	75 ohm termination
TTL H and V sync	5.0 V	2.5 V	3.5 V	TTL at 330 ohm termination
In / Out connectors				
Analog Source1 in and loop out Analog Source 2 in and loop out				15-pin D-sub female
Standards accepted				
DVI				Digital Source, DVI transmission std, in and loop out DVI out carries any selected input
Optional video module (VIM)				
Composite video				RCA connectors, in and loop out
S-video				4-pin DIN connectors, in and loop out
Component YPbPr				3 RCA connectors, in and loop out

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Electrical and Heat

Specification	Maximum	Minimum	Typical	Notes
Video standards for VIM				NTSC PAL SECAM HD 480p to 1080i Component YPbPr
RS232 in RS485 in and loop out				RJ45 connectors
Frequency				
Dot clock			165 MHz	
Horizontal frequency	120 Hz	56 Hz		
Vertical frequency	91.1 kHz	31.47 kHz		
Sync lock				Will not lose sync lock with signal inputs within stated frequency range
Maximum input DC offset	±2V			
AC requirements				
Line voltage				
115 V range	132V	90V		45–65 Hz auto-ranging, power factor corrected
230 V range	254V	200V		
Line current				
115 V	2.0A		1.5A	
230 V	1.2A		1.0A	
Heat, BTUs per hour			550 BTU	
Power consumption			160W	

Optical

Specification	Maximum	Minimum	Typical	Notes
Viewable screen size				
Diagonal			50"	1321 mm
Width			32.5"	826 mm
Height			17.5"	445 mm
Image position	+½ pixel	−½ pixel	0 pixel	
Rotation	− ½ pixel	+½ pixel	0 pixel	After calibration on site
Pincushion/Barrel	−2.5 pixel	+2.5 pixel	1.5 pixel	
Keystoning	−½ pixel	+½ pixel	0 pixel	
Focus/Aberration				No objectionable defocusing or chromatic aberration at 1.5 screen diagonals by a 20/20 vision viewer
Screen				
High Contrast Acrylic				
Gain			1.5	
Brightness, ANSI white			70 fL	white boost off
			95 fL	white boost on
Viewing angle				

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Optical

Specification		Maximum	Minimum	Typical	Notes
	Horizontal			±45°	at ⅕ gain
	Vertical			±45°	at ⅕ gain
Resolution					
	Horizontal				1280 pixels
	Vertical				720 pixels
Pixel pitch					29.4 pixels/inch (29.4 dpi) 11.57 pixels/cm (0.86mm dot pitch)
Contrast ratio				1500:1	dark room
Viewing angle					
	Horizontal half-gain			±45°	
	Vertical half-gain			±45°	
	Vertical				
Lamp life				6000 hours	Median life: at least 50% still operational after 6000 hours
Stuck pixels		2			2 stuck dark; 0 stuck bright
Screen lamination		1/16"			<1.6 mm delamination at edges

Environmental

Specification	Maximum	Minimum	Typical	Notes
Temperature operating	40° C	0° C	40–0° C	All performance specifications are maintained within this temperature range
non-operating	70° C	−20° C		
Altitude (barometric pressure)	10,000 ft			254 m, above sea level, or equivalent barometric pressure
Humidity	80% R.H.	20% R.H.		40° C non-condensing

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7.7 Regulatory Certifications

Declaration of Conformity

Manufacturer's Name: **Clarity Visual Systems**
Manufacturer's Address: **27350 SW 95th Avenue, Suite 3038**
                               Wilsonville, OR 97070-7708

declares that the products
    Model Numbers: **WN-5040-720 (DLP™ projector)**
    Product Options: **All**

conforms to the following EU Directives and the standards stated:

  Safety: **UL60950 - Safety of IT Equipment**

  Electromagnetic Compatibility Directive 89/336/EEC and amendments

    EN 55022/CISPR 22 – Radiate and Conducted Emissions from IT Equipment
    EN 50082-1/EN61000-4 – Generic Immunity Standard
        Including: EN61000-4-2 Electrostatic Discharge
                              EN61000-4-3 Radiated Susceptibility
                              EN61000-4-4 Electrical Fast Transient Burst
                              EN61000-4-5 Surge
                              EN61000-4-6 Conducted Susceptibility
                              EN610004-11 Voltage Dips & Interrupts

FCC Regulations
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an 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 receiving antenna.
- Increase separation between equipment and receiver.
- Connect equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician.

Note: Any changes or modifications to the display not expressly approved by Clarity Visual could void the user's authority to operate this equipment. Use of a shielded interface cable is required to comply with the Class A limits of Part 15 of FCC rules.

Other Certifications
    UL, CUL, FCC/CISPR 22/85, CE

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Having trouble?

Most questions are probably answered somewhere in this manual. Check the Index.

    If the problem you have is completely baffling, call your Clarity reseller—the company that sold the Clarity display to you.
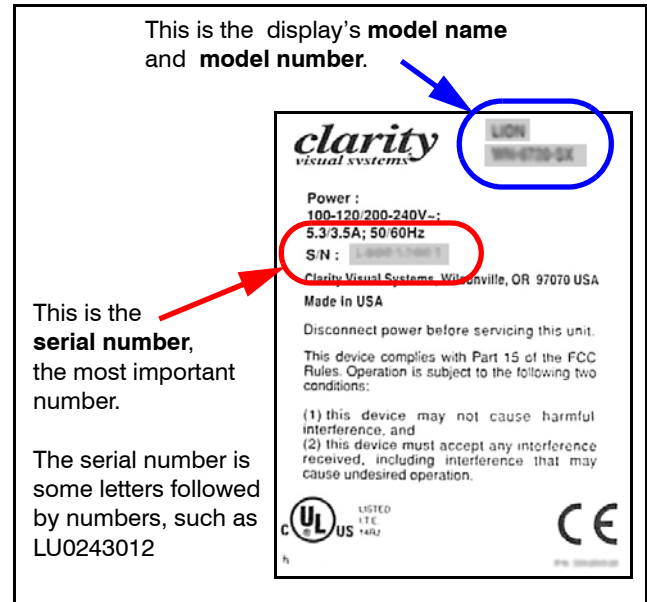
My Clarity Reseller is:

If you can't contact your reseller for some reason, Clarity's contact information is on the back cover of this manual.

But first!

Get the **serial number** of the unit you have. The serial number is found on a label in these places:

Clarity Display	Serial Number Label Location	
	from rear	**from front**
Bobcat	on the back panel	not available
Lion	on the back panel of the lower section	on the left wall of the Center Bay
Panther	on the back panel	not available
Puma	on the back panel	on the left wall
Wildcat	on the back panel	on the left wall
Margay	on back of electronics door	behind electronics door
Bay Cat	on the back panel	not available
Bengal	on right above electronics	on left behind screen, above electronics

This is the display's **model name** and **model number**.

This is the **serial number**, the most important number.

The serial number is some letters followed by numbers, such as LU0243012

Describe the problem

Try to describe the problem in the most precise language you can. Remember, the person you are talking to or writing to can't see what you see. Try to use helpful language.

Un-helpful language:
- It looks funny.
- The picture doesn't look right.
- The image is bad.
- It isn't working.

Helpful language:
- I see horizontal streaks coming from the right side of high contrast edges.
- I see a solid green background has vertical bands in it.
- Whenever I try to "_____", I get a message on the screen that says "_____".
- The lamp will not turn on. When I changed it with another lamp, it still did not turn on.
- There is a black line on the left side, and I can't move the picture over there with the Position control.
- I see flashing red and amber lights on the screen. (Note the sequence of the colored lights. It's important.)

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