Panther
PN-6730-UX
PN-6740-UX

User's Guide

clarity
visual systems

PN-6730-UX
PN-6740-UX

Panther Series
67" Display Unit

User's Guide

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1 About the Panther

1.1 Questions About the Panther

In this manual, the various Panther models are referred to generally as Panther or PN-6730-UX.

Questions and Answers about the Panther

Question	Answer
What is a Panther?	Panther is the name for model number PN-6730-UX or PN-6740-UX, the 67” Clarity display designed specifically for stand-alone operation.
How much does a Panther weigh?	A fully assembled Lion weighs 300 lbs. (136 kg)
What is the operating temperature range?	0° to 35°C (32° to 95° F). The ambient air temperature, that is, the temperature of the incoming air, should not be in this range.
What kinds of inputs does the Panther accept?	Computer: UXGA, 1600 × 1200; SXGA, 1280 × 1024; XGA, 1024 × 768; SVGA, 800 × 600; VGA, 640 × 480. Video: NTSC, PAL, SECAM in either composite or S-Video. Digital Computer: DVI at the Computer resolutions noted above.
What options are available for the Panther?	There are two models: PN-6730-UX, which does not have audio, and PN-6740-UX, which has audio. Beyond that, there are no options.
How much power does a Panther use?	It depends on how many lamps you are using. For 4 lamps, about 690 W. See ‘Specifications’ on page 144 for a complete list
How many lamps does it use?	The Panther has four lamps, but you can use two, three or four. (It will continue to operate even if only one lamp works.)
What is the aspect ratio of the screen, Width:Height?	4:3, or 1.33, the same as standard television or computer screens.
Can servicing be performed from the front?	No. All servicing is performed from the rear.
How much space do I have to leave behind the Panther for ventilation?	At least 8 inches (20 cm) for air flow.

1.2 Your Personal Safety Is Important

The PN-6730-UX is heavy. It sometimes contains very high voltages. It produces UV (ultra-violet) radiation, and in some parts, it is very hot. If your physical health and safety mean nothing to you, you may skip this section and take your chances. More sensible people will take two minutes to read this section at least once.

The fully assembled display weighs about 247 lbs (113 kg), which is why you assemble it by parts as you build the wall.

The individual pieces are not light, either:

- lower section, 98 lbs, 45 kg.
- top section, 101 lbs, 46 kg.
- screen, 48 lbs, 22 kg.

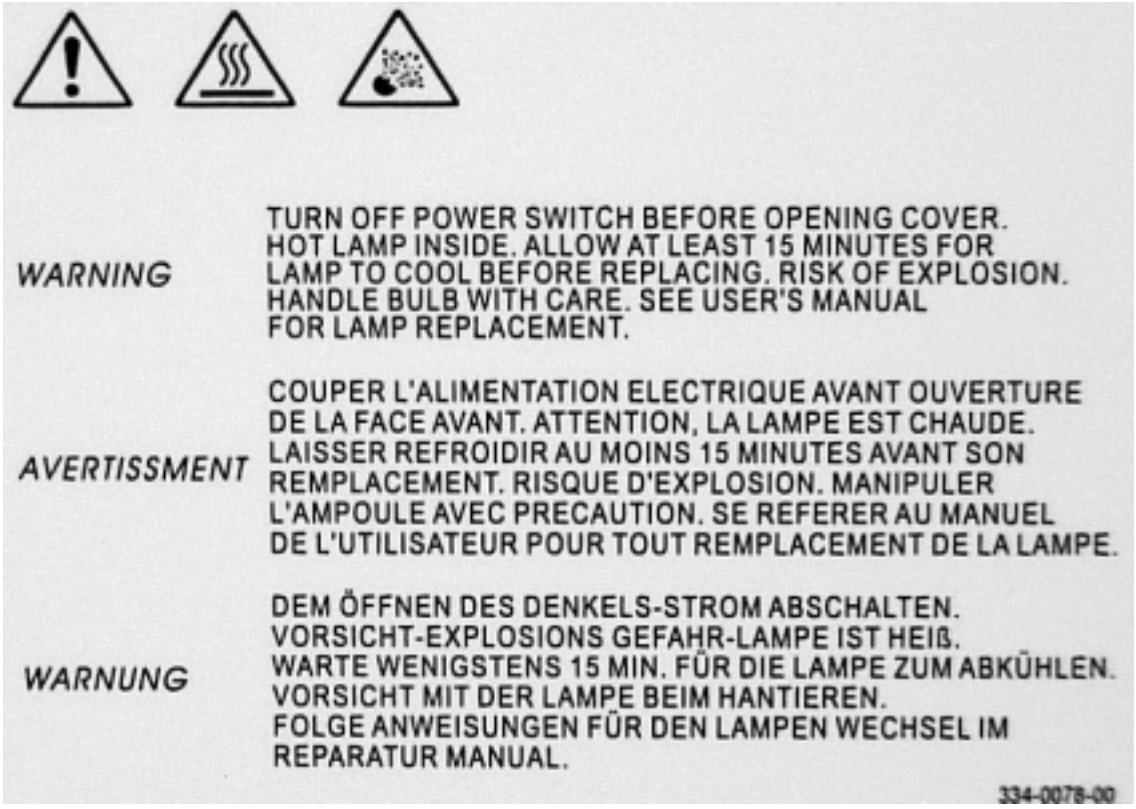
These pieces are large and awkward to handle. Never lift or move pieces alone. Always have at least two people.

When assembling a wall, you will need more than two people to handle and control the sections.

- The lamps need very high voltages to ignite, around **20,000 volts**.
- The lamps produce lots of light and **UV radiation** (ultra-violet) as well. UV light can damage your retinas. After the light leaves the lamps and passes through the LCD, there is no more UV.
- The **screen** is heavy (about 50 lbs) and made of glass. Breakable glass. Treat it with care. Always handle the screen with two people. When it is not on the display, keep it in a safe place, where it will not be hit, and no one will lean against it.
- There is no electrical interlock on the screen. Opening the screen does *not* turn off the high voltage to the lamps. The Lamp Bay door has an intrusion switch; opening this door shuts off the lamps.

✎ The plug on the power cord serves as the disconnect for this product.

✎ Der Netzstecker dient bei diesem Produkt als Trenneinrichtung vom Stromversorgungsnetz.




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.
334-0100-00

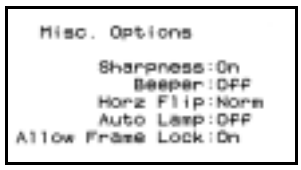

WARNING
High intensity light.
Do not look into the projection lens while unit is on.
WARNING
Possible UV Exposure
Use protective eye wear while operating with screen removed.

1.3 Changes in Panther

These are the changes in Panther for Rev C firmware. To learn about upgrading firmware, see 'Upgrading Firmware' on page 122.

Frame Lock

LCD displays, like the Panther, have a specific fixed frequency of data from the electronics module to the LCD. Video has a different frequency. In Panther the electronics module collects incoming video frames in a buffer at the video rate and sends frames of pixels to the LCD. Because these two rates are the the same, there are times when a frame of video may be dropped to keep pace with the output. This can cause a jerkiness in video of moving objects. This may occur twice a minute or more frequently.



The Panther can prevent this by locking two frame rates together, if they are close. Setting "**Allow Frame Lock**" On in the **Misc Options** menu allows this locking to occur This is the default.

Frame Lock mode is not turned on if there are menus open or if there is no input. If you see a picture when menus are open, but it disappears when menus disappear, turn off Allow Frame Lock.

Lamp Control

The lamps turn on and off almost immediately when you change the **Lamp Count**. Be careful not to change this count up and down too fast. Do not reduce the count (turn lamps off) then increase it (turn them back on) again immediately. Wait at least 15 seconds.

There is additional logic to detect a false "350V missing" notification. This would turn lamps off. Now if the Panther electronics senses that 350V is missing, it looks to see if any lamps are on. If any are, then 350V must be present, and lamps are not forced off.

Video mode detection

Composite or S-Video sources are now detected for NTSC, PAL and SECAM. This works for Auto Detect as well as for Find Mode. The Curtain is *not* put up during this detection.

Video colors wrong

Sometimes with AC power on the colors of composite or S-Video would be completely wrong. This is now corrected.

Zoom

A **Custom Zoom** selection was added to the Pan/Zoom menu. This allows zooming the edges inidivdually.

Color Balance

The Color Temperature menu now has a **Custom Color Balance** control that allows finer adjustment of the overall colors of the picture.

Auto Detect

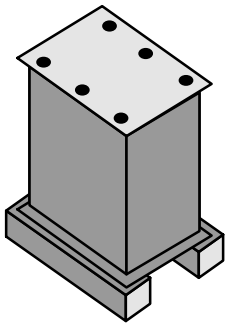
The auto detection cycle would operate continuously when given an unsupported mode. It now picks the closest matching mode no matter how far it is from the ideal. The **Source Select menu** shows both the actual values (frequencies) detected and the expected values for that mode. When these differ by more than 10%, the value is red.

2 Installing the Panther

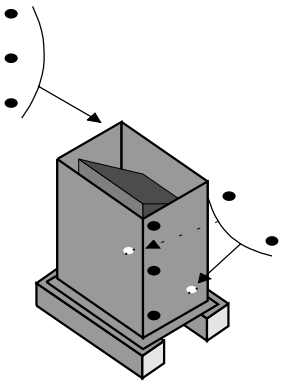
2.1 Unpacking the Panther

The Panther in the shipping container is fully assembled. These are the same instructions that were on the outside of the container.

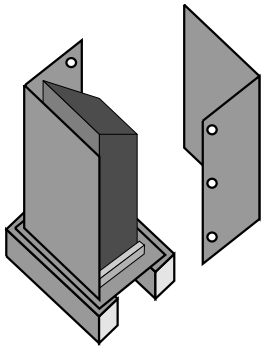
Tools: 9/16″ socket wrench.
At least two persons.



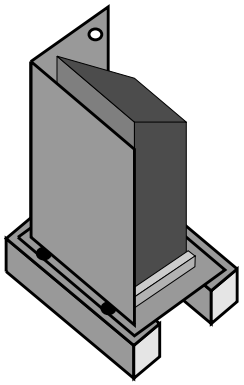
1. Unbolt and remove top.



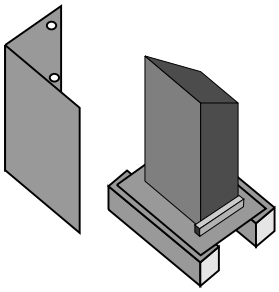
2. Remove all #2 bolts: 3 places on one vertical end; 3 places on opposite vertical end; 2 places



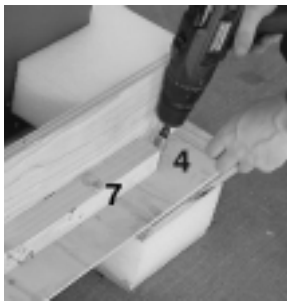
3. Remove L-shaped side panel.

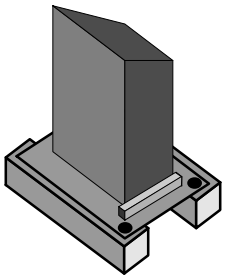


4. Remove #3 bolts, 2 at bottom edge.

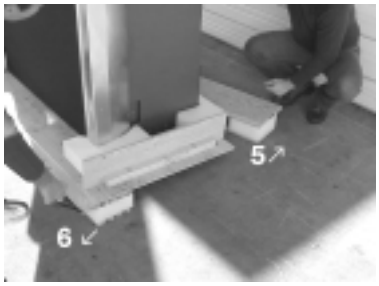


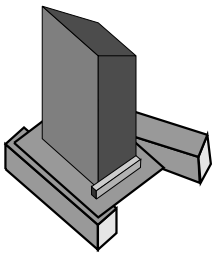
5. Remove remaining side panel.

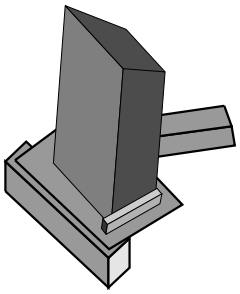


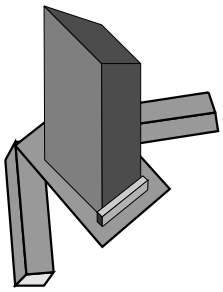


6. Remove #4 bolts, 2 places at one end. Do NOT remove #7 bolts.

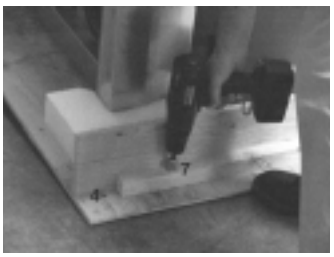


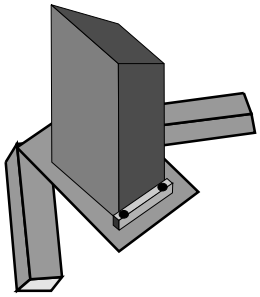




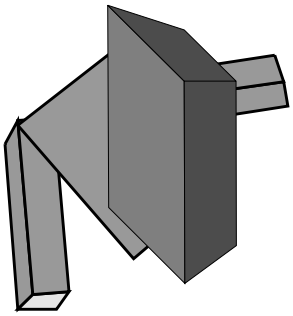


7. One person hold rear of display. One person push up on end of Panther display. Pull #5 strap first.
8. Then pull #6 strap. One end of packing case is

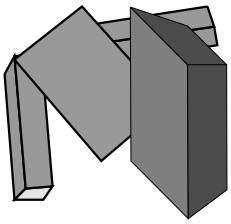




9. Hold display to prevent it from rolling, and remove #7 bolts, 2 places.



10. Roll Panther display *slowly* down the ramp.



11. Panther out of packing crate. Disassemble crate further for storage.

2.2 Quick Start for Panther

These quick start steps are explained fully in succeeding sections. If you have trouble, turn to the more detailed description.

1. Roll the Panther into place, leaving enough space behind it to work.

2. Remove the rear cover. (Panther seen from rear with cover closed.)

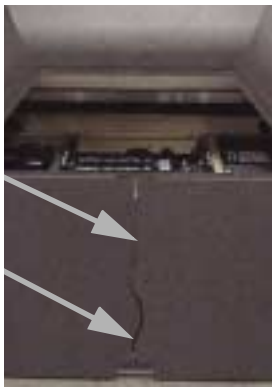
3. Plug in the power cord. (Panther with rear cover off.)

4. Connect a laptop (or any other computer) to the VGA connector on the left side of the Panther.

5. If you are using **sound** from the laptop, connect the sound output from the computer to the Laptop connector on the Panther's audio input panel at the rear right.

6. Plug in the power cord to an AC socket. Turn on the AC Master switch.

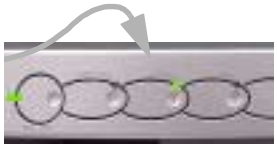
7. For neatness, dress the cords on the rear panel through the slot and out the bottom cutout.



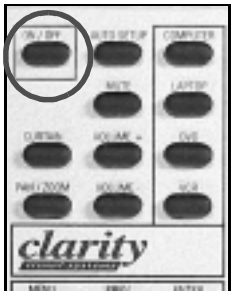
8. Close the rear panel and roll the Panther into place.

✎ The AC Master power switch should stay on. Turn the lamps on and off from the front panel or the remote.

9. Wait about 30 seconds for the system to start. When the Lamp LED turns amber, press the Lamp On switch on the front panel.



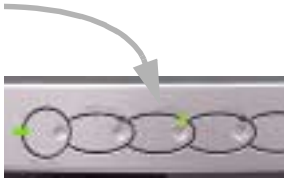
Or aim the remote control at the screen and press Lamp On/Off.



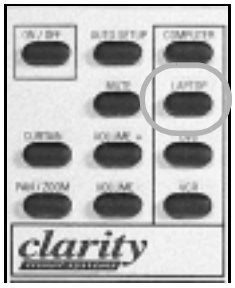
✎ If you hear a rapid, triple beep, the system is not ready for a Lamp On command. Wait a few more seconds and try again.

When the Lamps start to turn on, the Lamp LED (next to the Lamp On switch on the front panel) turns green.

10. Press the Laptop button on the front panel.

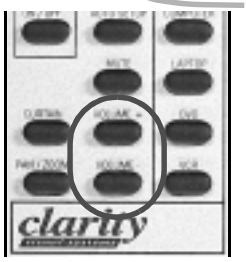


Or on the remote. The Laptop LED on the front panel will be green if the source picture is valid, amber if it is not valid or missing.



11. Control the volume of sound with the two buttons beneath the front panel,

or the Volume buttons on the remote.



2.3 Connecting Power

Each display may draw up to 6 amps (3 amps at 230 V). The AC Master switch on the power supply module is a circuit breaker, which will trip to the off position in the event of an overload. The power supply is auto-ranging.

Remove the back cover. Use a flat screwdriver or a coin to turn the four very large screws one-quarter turn.

Connect a power cable to the power supply and to an AC source. The power supply is auto-ranging, so it works with any source from 100 to 240 VAC, 50 to 60 Hz.

The AC Master switch on the power supply is a circuit breaker. It lights when the switch is ON, *and* AC power is available to it.

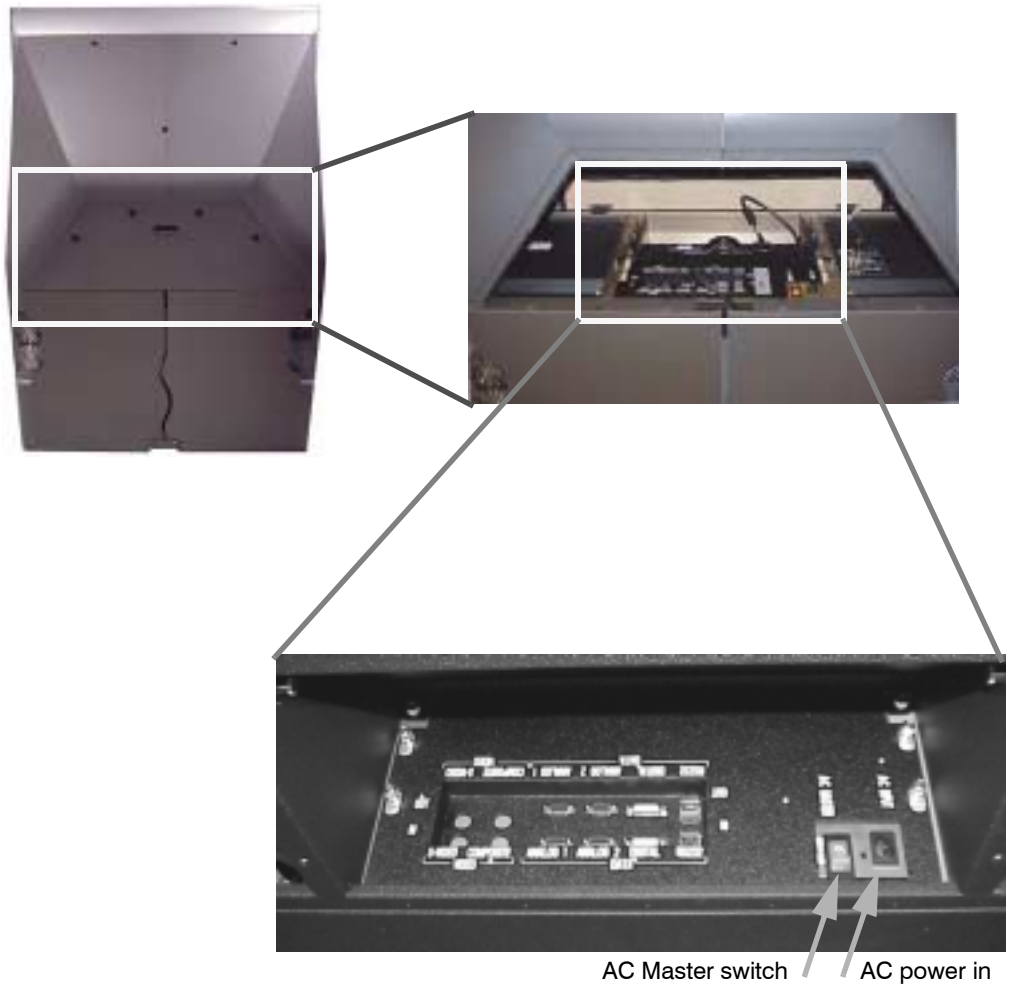
The AC Master is not lit if it is OFF, *or* there is no AC power available.

If there is an overload, the circuit breaker switch will move to the OFF position. Reset the breaker by switching it to the ON position. **However**, a circuit breaker that trips is a sign of trouble. Find the trouble first, or call a qualified service person who can find the trouble.

About UPS supplies

Some installations use a UPS—Uninterruptible Power Supply. These will work on the Lion *if* the output of the UPS is a sine wave.

Many UPS systems have square wave or stepped wave outputs. These types will *not* work with Lion. The Lion 350-volt power supply for the lamps requires a sine wave input.


AC Master switch
AC power in

2.4 Connecting Picture Sources

The three basic types of inputs are 1) analog computer (UXGA down to VGA), 2) digital computer and 3) video (NTSC, PAL and SECAM, optional). Each of these inputs has a separate loop-thru output. With the DVI the selected input is always available as a digital signal on the Digital Out connector.

The Panther has these connectors for picture sources**.**

:

Picture Source Connectors

Picture comes in on	Picture is selected with	Remote	Picture goes out from
Analog 1	Computer button		Analog 1 and Digital
Analog 2[1]	Laptop button		Analog 2 and Digital
S-Video	DVD button		Composite Video and Digital
Composite	VCR button		S-Video and Digital
Digital	(Source Select menu)		Digital

1. The Analog 2 Input is initially connected to the Laptop connector on the side of the Panther.

(Digital Video Interface) is a standard for digitally connecting computers to their monitors or for interconnecting digital displays.

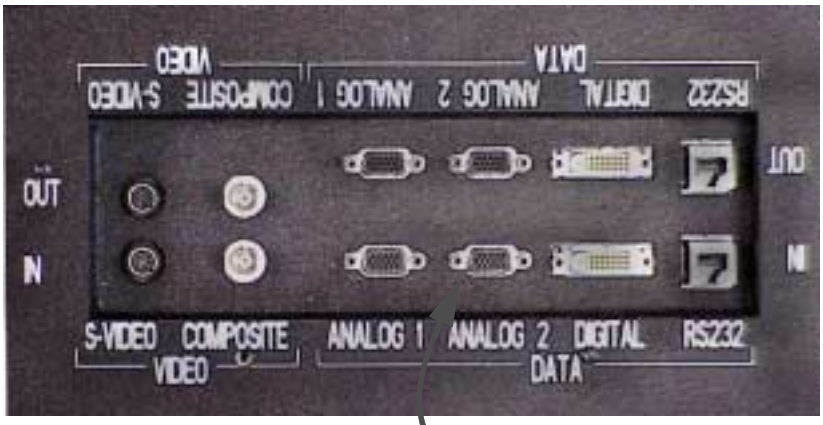
The Panther converts any of its inputs to the DVI standard and makes this available at the Digital Out connector. This means you can bring in any picture source—UXGA, SXGA, SVGA, NTSC, RGBS—to the first display and connect the rest of the displays in the loop with DVI. The **advantages** of DVI are:

- DVI is less subject to picture degradation than analog methods of loop-thru. (However, even with DVI, loop-thru is not infinite.)
- DVI inputs require much less setup and adjustment. You adjust the picture in the first Panther only, the one with the analog input. Setup time is reduced.

What's in a name?

The inputs "Computer" and "Laptop" are identical. You can use the Computer Analog 1 input with a laptop computer. And you can plug a tower computer into the Laptop Analog 2 input.

In the same way, the S-Video connector can be used from a DVD, laser disk, VHS VCR or any other video source. And the Composite input will accept any kind of composite video picture, regardless of the type of player connected to it. The Composite and S-Video inputs will accept and display NTSC, PAL or SECAM.



Video inputs and outputs as seen from the rear of the Panther.

The Analog 2 In connector is initially connected to the Laptop connector on the side of the Panther.

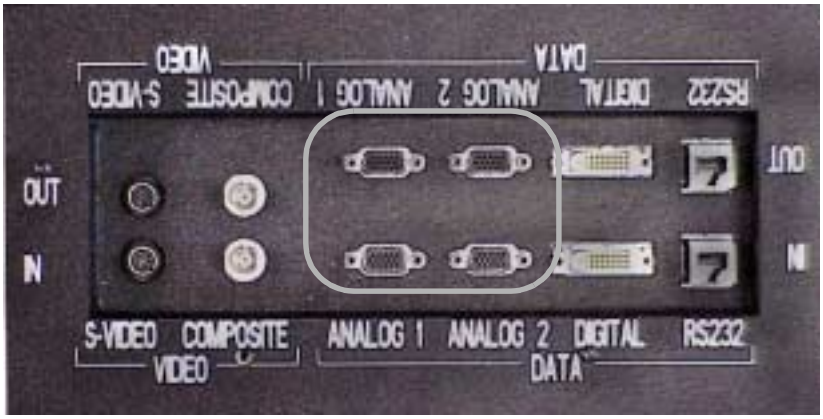
2.4.1 Using Analog Computer Sources

These inputs include everything from 1600 × 1200 down to 640 × 480. Analog 1 and Analog 2 are the analog computer input connectors. They have separate outputs.

The two Analog inputs are identical, and each can be separately configured to accept any of the computer resolutions within range. Each Analog input has a separate, buffered output for loop-thru.

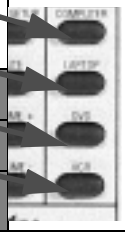
The Analog 2 Input is initially connected to the Laptop connector on the side of the Panther.

The range of supported computer resolutions, including refresh (vertical) rate, is listed in the table on the facing page.



The electronics module as seen from the rear of the display.

Picture Source Connectors

Picture comes in	Selected with	Remote	Picture goes out
Analog 1	Computer button		Analog 1 and Digital
Analog 2	Laptop button		Analog 2 and Digital
S-Video	DVD button		Composite Video and Digital
Composite	VCR button		S-Video and Digital
Digital	(Source Select menu)		Digital

Formats Supported in the Analog 1, Analog 2 and Digital Connectors

Resolution	Name	Refresh rate (Hz)	H Freq (kHz)	Pixel Freq (MHz)	Pixels per line
640 × 480	VGA	60	31.5	25.175	800
		72	37.9	31.5	832
		75	37.5	31.5	840
		85	43.3	36	832
800 × 600	SVGA	56	35.1	36	1024
		60	37.9	40	1056
		72	48.1	50	1040
		75	46.9	49.5	1040
		85	53.7	56.25	1048
1024 × 768	XGA	60	48.4	65	1344
		70	56.5	75	1328
		75	60.2	78.75	1312
		80	64	85.5	1376
		85	68.77	94.5	1376
1280 × 1024	SXGA	60	64	108	1688
		60 (a)	63.5	109.9	1730
		70	77.4	130.6	1726
		75	80	135	1688
		85	91.1	157.5	1728
1600 × 1200	UXGA	60	75	162	2160
640 × 480	MAC	67	34.97	31.33	859
832 × 624		75	49.72	57.28	1152
1280 × 720p	HDTV	60	45	74.25	1650
1920 × 1080i		30	33.75	74.25	2200
720 × 400	VESA	70	31.47	28.32	936
720 × 400		85	37.9	35.5	936
1024 × 1024i	1024 × 1024i	60	63.3	89.12	1323

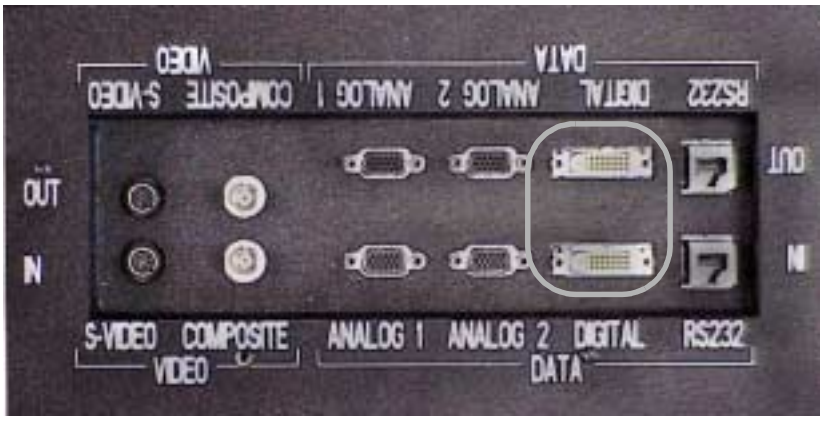
2.4.2 Using Digital Computer Sources

DVI (Digital Video Interface) connects computers to picture display devices with digital signals. This reduces picture degradation.

The Digital loop-thru is different from all the others. The Digital Output does *not* always carry the same picture as the Digital Input.

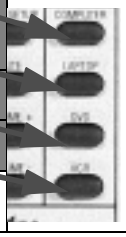
The picture on the Digital Output is always the picture on the *selected input*.

✎ Digital pictures may also have video characteristics when a video picture is looped out of the Digital Out connector and video is the selected source.



The electronics module as seen from the rear of the display.

Picture Source Connectors

Picture comes in	Selected with	Remote	Picture goes out
Analog 1	Computer button		Analog 1 and Digital
Analog 2	Laptop button		Analog 2 and Digital
S-Video	DVD button		Composite Video and Digital
Composite	VCR button		S-Video and Digital
Digital	(Source Select menu)		Digital

Formats Supported in the Analog 1, Analog 2 and Digital Connectors

Resolution	Name	Refresh rate (Hz)	H Freq (kHz)	Pixel Freq (MHz)	Pixels per line
640 × 480	VGA	60	31.5	25.175	800
		72	37.9	31.5	832
		75	37.5	31.5	840
		85	43.3	36	832
800 × 600	SVGA	56	35.1	36	1024
		60	37.9	40	1056
		72	48.1	50	1040
		75	46.9	49.5	1040
		85	53.7	56.25	1048
1024 × 768	XGA	60	48.4	65	1344
		70	56.5	75	1328
		75	60.2	78.75	1312
		80	64	85.5	1376
		85	68.77	94.5	1376
1280 × 1024	SXGA	60	64	108	1688
		60 (a)	63.5	109.9	1730
		70	77.4	130.6	1726
		75	80	135	1688
		85	91.1	157.5	1728
1600 × 1200	UXGA	60	75	162	2160
640 × 480	MAC	67	34.97	31.33	859
832 × 624		75	49.72	57.28	1152
1280 × 720p	HDTV	60	45	74.25	1650
1920 × 1080i		30	33.75	74.25	2200
720 × 400	VESA	70	31.47	28.32	936
720 × 400		85	37.9	35.5	936
1024 × 1024i	1024 × 1024i	60	63.3	89.12	1323

2.4.3 Using RGBS Sources

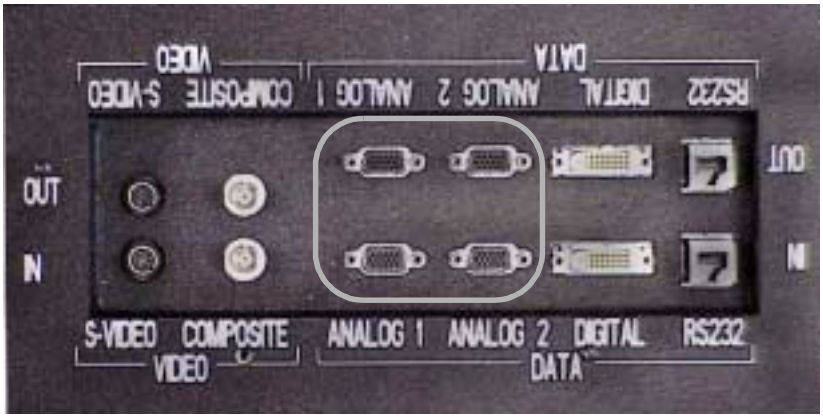
RGBS sources can have composite sync or sync on green. These sources connect to the Analog 1 or Analog 2 connector, but they are handled differently in the Panther.

RGB (or RGBS) signals can have

- composite sync,
- separate H & V sync,
- sync on green,

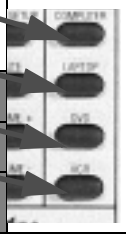
RGB pictures go into the Analog 1 and Analog 2 inputs. If the RGB comes to the first display on three or four BNC connectors, you will need to provide an adapter to 15-pin.

RGB inputs can be in computer-like format, in which case, the range of acceptable resolutions is the same as for the Analog inputs as shown in the table.



The electronics module as seen from the rear of the display.

Picture Source Connectors

Picture comes in	Selected with	Remote	Picture goes out
Analog 1	Computer button		Analog 1 and Digital
Analog 2	Laptop button		Analog 2 and Digital
S-Video	DVD button		Composite Video and Digital
Composite	VCR button		S-Video and Digital
Digital	(Source Select menu)		Digital

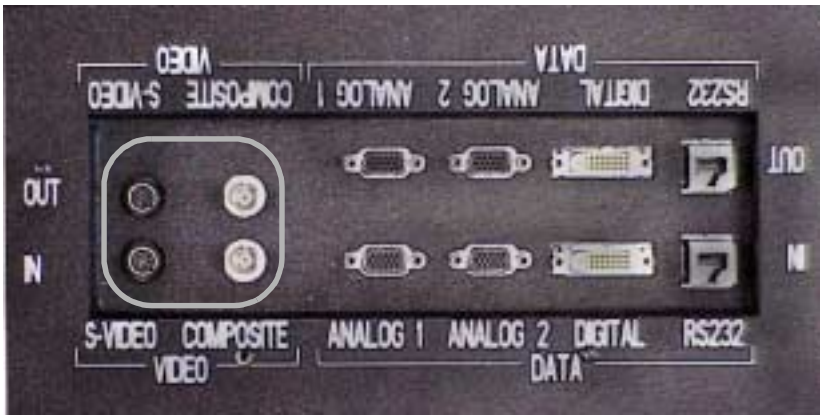
Formats Supported in the Analog 1, Analog 2 and Digital Connectors

Resolution	Name	Refresh rate (Hz)	H Freq (kHz)	Pixel Freq (MHz)	Pixels per line
640 × 480	VGA	60	31.5	25.175	800
		72	37.9	31.5	832
		75	37.5	31.5	840
		85	43.3	36	832
800 × 600	SVGA	56	35.1	36	1024
		60	37.9	40	1056
		72	48.1	50	1040
		75	46.9	49.5	1040
		85	53.7	56.25	1048
1024 × 768	XGA	60	48.4	65	1344
		70	56.5	75	1328
		75	60.2	78.75	1312
		80	64	85.5	1376
		85	68.77	94.5	1376
1280 × 1024	SXGA	60	64	108	1688
		60 (a)	63.5	109.9	1730
		70	77.4	130.6	1726
		75	80	135	1688
		85	91.1	157.5	1728
1600 × 1200	UXGA	60	75	162	2160
640 × 480	MAC	67	34.97	31.33	859
832 × 624		75	49.72	57.28	1152
1280 × 720p	HDTV	60	45	74.25	1650
1920 × 1080i		30	33.75	74.25	2200
720 × 400	VESA	70	31.47	28.32	936
720 × 400		85	37.9	35.5	936
1024 × 1024i	1024 × 1024i	60	63.3	89.12	1323

2.4.4 Using Composite and S-Video Sources

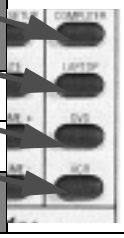
Video sources are either Composite or S-Video. Each connector has a separate output. Both C-Video (Composite) and S-Video accept NTSC, PAL, and SECAM pictures.

If you use S-Video loop-thru from the S-Video Out connector, use high quality S-Video cables. Some cables, particularly the ones that come free with VCRs, are low quality. Looping through a series string of these will quickly degrade the picture. The usual effect is loss of chroma (color).



The electronics module as seen from the rear of the display.

Picture Source Connectors

Picture comes in	Selected with	Remote	Picture goes out
Analog 1	Computer button		Analog 1 and Digital
Analog 2	Laptop button		Analog 2 and Digital
S-Video	DVD button		Composite Video and Digital
Composite	VCR button		S-Video and Digital
Digital	(Source Select menu)		Digital

Video Formats Supported in Composite and S-Video Connectors

Name	Active lines	Vertical rate	Horizontal rate
NTSC	525	60 Hz (59.94)	15.734 kHz
PAL	625	50 Hz	15.25 kHz
SECAM	625	50 Hz	15.25 kHz

2.5 Connecting Audio

Audio follows video. When you select a video source, you select the corresponding audio source.

For Panther model PN-6740-UX, which has the audio feature, each picture input is associated with an audio input. Select a picture source also selects the audio source, as shown opposite.

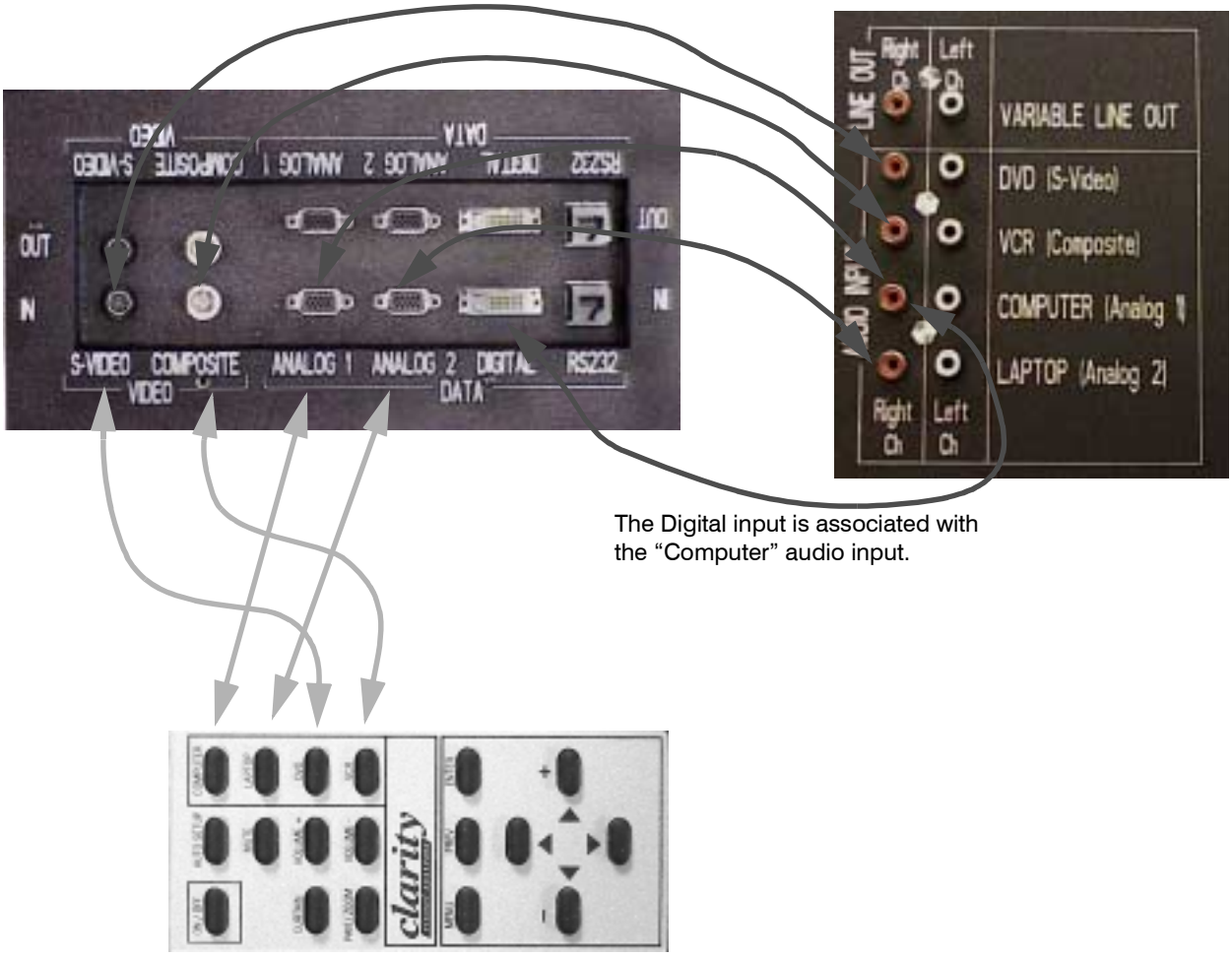
The Digital picture input is associated with the Computer (Analog 1) audio input.

Variable Line Out

The Line Out connectors are line level. You must have an external amplifier to drive external speakers.

The Line Out level is *variable*, that is, the volume control affects both the internal speakers and the level from the Variable Line Out connectors.

Each video input is associated with an audio input.



The Digital input is associated with the “Computer” audio input.

2.6 Connecting RS232 Control Cables

Many installations control the displays with RS232 commands from a computer or processor. If your installation does not, skip this section.

RS232 control has one big advantage: you can control one or more Panthers from a computer at a considerable distance.

✎ If your installation will *not* use RS232 control, skip this section.

RS232 connections are made with cables like those used for computer networks. These cables have eight (8) conductors and have RJ-45 connectors on each end.

✎ It is important that the cable have 'straight through' connections. To know if your cable is correct, hold the two connectors side by side with the ends pointing in the same direction. Look at the side of the connectors that do not have the locking tab. If the colors of the wires inside the connector are the same left to right for both connectors, this is the correct cable. If the colors are mirror reflections of each other, it is the wrong type.

You need an **adapter** to go from the computer's 9-pin serial output connector to an RJ-45 connector. Adapters of this type are readily available at computer and electronic supply stores. You will only need one adapter; all the rest of the connections will be RJ-45 to RJ-45.

The adapter is not pre-wired. You will make three connections inside the adapter, as described on the facing page and in 'Connector Diagrams' on page 138.

Connecting RS232 cables

1. Connect the adapter to the serial output connector of the controlling computer. (This computer does not have to be the same one as the computer used as a picture source.) The serial output is sometimes called the Comm Port, and sometimes there are two.

✎ If the serial output is a 25-pin connector, use a 25-to-9-pin adapter, then the 9-pin to RJ-45 adapter.

2. Connect a cable from the RJ-45 adapter to the nearest cube's RS232 In connector.
3. Connect this first cube's RS232 Out connector to the next cube's RS232 In connector.
4. Continue in this way until all cubes are connected.

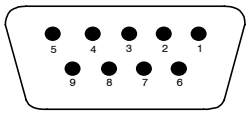
✎ The order in which you connect the cubes is *not* important. You can connect them in any order that is convenient and keeps the cable lengths to a minimum.

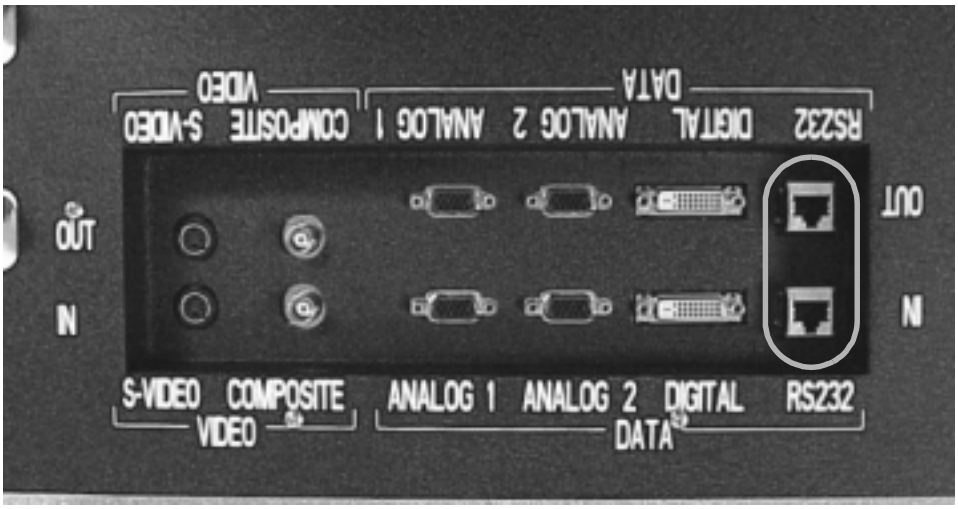
Wiring the adapter

To change the RJ45 connectors to 9-pin D-sub connectors, use a standard RJ45-to-9-pin adapter and connect 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



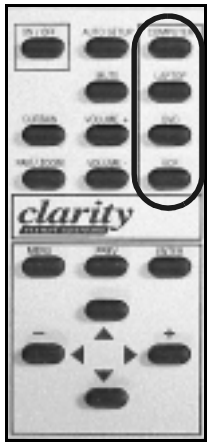


Connector panel, seen from rear.

3 Adjusting the Picture

3.1 Quick Selection and Adjustment

These instructions will get you a good looking picture 95% of the time. Details on how to adjust for a good picture the other 5% of the time are given in the rest of this chapter.



1. Select the source by either
   - pressing one of the source buttons on the remote, or
   - pressing one of the front panel buttons.
2. When you select Laptop or Computer, you should adjust for Black Level and White Level for best picture. ('Adjustments for Computer and Laptop' on page 42)
3. When you use DVD or VCR, you can adjust color and brightness in the Video Controls menu. ('Adjustments for DVD and VCR' on page 46)

Lots of laptops

Sometimes several people will bring their laptops, plug into the side Laptop connector and run their PowerPoint® slide shows. If the color and brightness of these shows differ or are not satisfactory, the fault is probably in the Black Level and White Level settings. See 'Adjustments for Computer and Laptop' on page 42 for more on this.

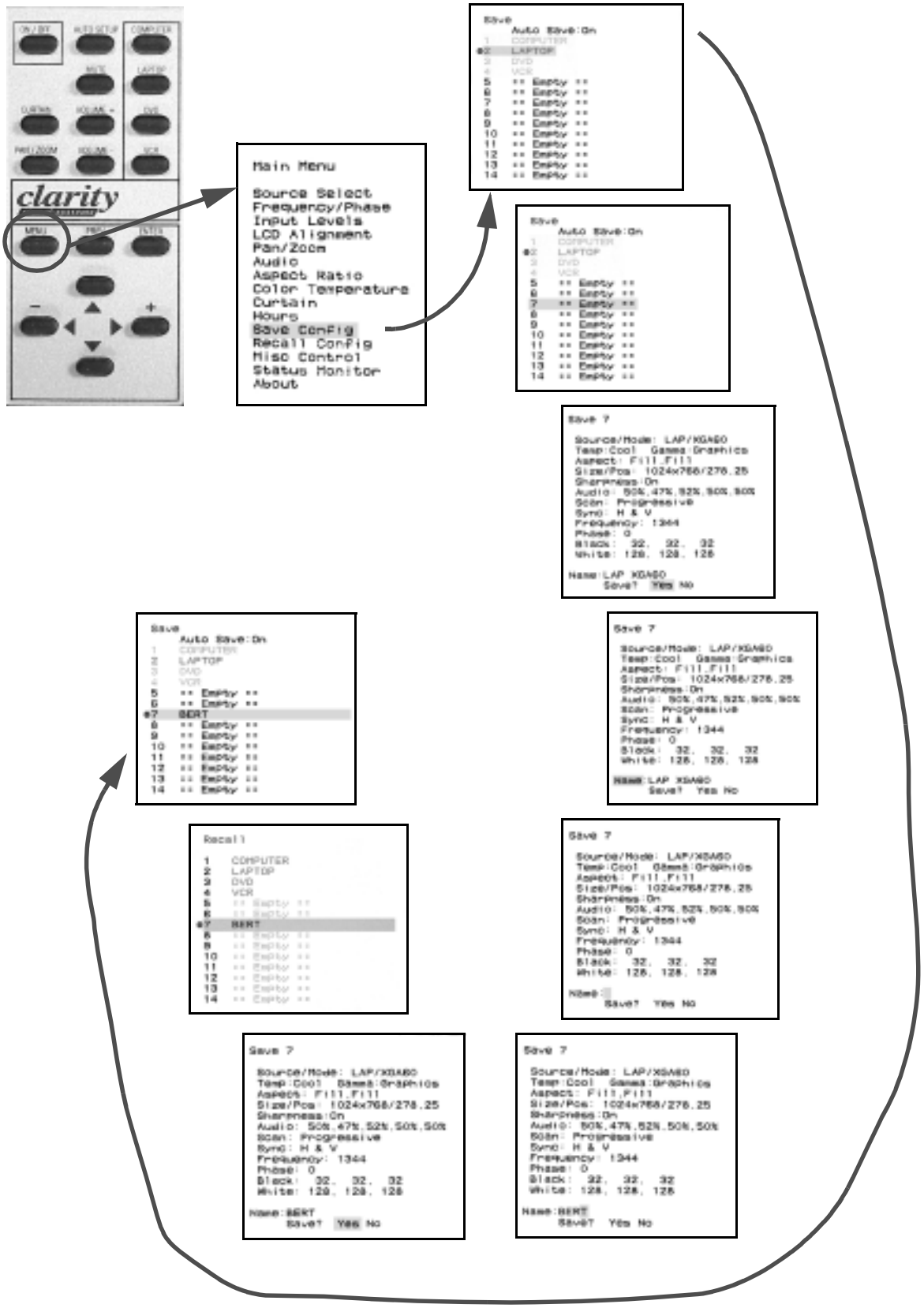
All laptops have different voltage levels for black and white, and that can cause problems. However, Panther has a solution: using separate memories for each laptop.

Set it up this way:

1. Connect a laptop to the Laptop connector on the side and select Laptop with the remote.
2. Press Auto Setup on the remote.
3. Display a black picture from the laptop. You can make a black picture quickly with Windows Paint program.
4. On the remote, press MENU > Input Levels > ENTER > Auto Black Adjust > ENTER.
5. Display a white picture from the laptop, again, making one with Paint.
6. Select Auto White Adjust (down arrow) in the Analog Level menu and press ENTER. The Panther is now adjusted for *this* laptop.
7. If necessary, press PAN/ZOOM and adjust position and size. Try the Default Find first.
   - Press ENTER enough times to highlight Default. Press left or right arrow to activate Find.
   - If necessary, press ENTER to select Pan and use the arrows to make minor adjustments.
8. Save this in a numbered memory:
   - Press MENU > Save > ENTER.
   - Select a numbered memory, 5–14, and press ENTER.
   - Press the up arrow to highlight Name. If there is already a name here, press ENTER to erase it.
   - Use the up-down arrows to cycle through the alphabet, numbers and punctuation to write your name. Use the right-left arrows to move along the line.
   - When finished, press ENTER to leave the Name section. Highlight Yes and press ENTER.
   - Press PREV to leave the Save menu.
9. Repeat steps 1 through 8 for each different laptop.
10. When you plug your laptop into the Panther again, recall the settings:
    - Press MENU on the remote.
    - Select Recall and press ENTER.
    - Select your named memory and press ENTER two times.
    - Press PREV to clear the menu.

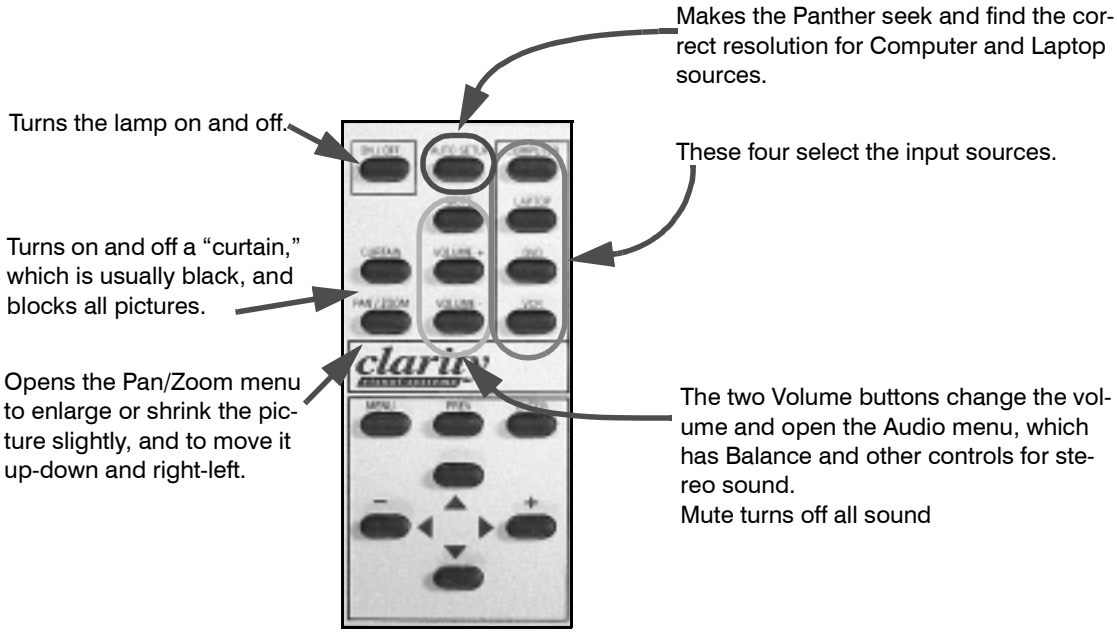
Lots of DVD players

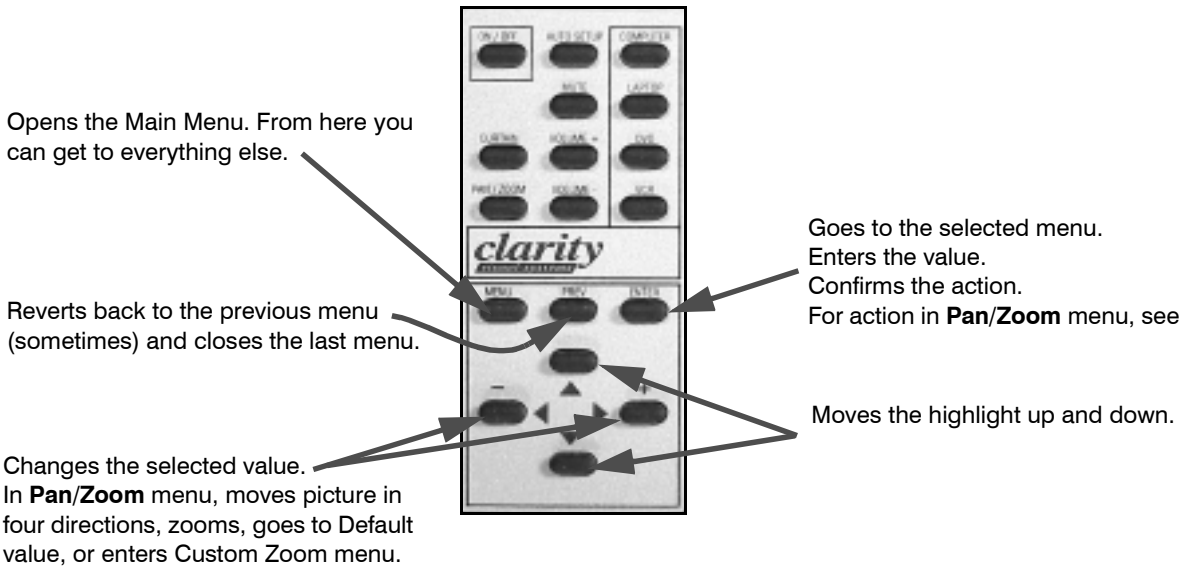
You can use the laptop trick above to save for many different DVDs or VCRs, too.


clarity
MENU
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Save
Auto Save:On
1 COMPUTER
2 LAPTOP
3 DVD
4 VCR
5 ** Empty **
6 ** Empty **
7 ** Empty **
8 ** Empty **
9 ** Empty **
10 ** Empty **
11 ** Empty **
12 ** Empty **
13 ** Empty **
14 ** Empty **
Save 7
Source/Mode: LAP/XGA60
Temp:Cool Game:Graphics
Aspect: Fill,Fill
Size/Pos: 1024x768/276,25
Sharpness:On
Audio: 50%,47%,52%,50%,50%
Scan: Progressive
Sync: H & V
Frequency: 1344
Phase: 0
Black: 32, 32, 32
White: 128, 128, 128
Name:LAP XGA60
Save? Yes No
Recall
Name:BERT

3.2 A Tour of the Remote Control

Typically, most of the initial setup is done with the remote control. More detailed information about each of these functions is found throughout this manual.

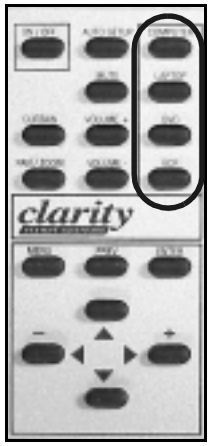



Opens the Main Menu. From here you can get to everything else.
Reverts back to the previous menu (sometimes) and closes the last menu.
Changes the selected value.
In **Pan**/**Zoom** menu, moves picture in four directions, zooms, goes to Default value, or enters Custom Zoom menu.
Goes to the selected menu.
Enters the value.
Confirms the action.
For action in **Pan**/**Zoom** menu, see
Moves the highlight up and down.
clarity

3.3 Selecting the Source

The "Source" is the computer or laptop or DVD or VCR that the picture (and sound) comes from. Select the source from the front panel buttons, or use the remote control.

The remote control has four buttons that select a source directly. The table below shows which connect is selected with which button:



Remote button	Connector
Computer	Analog 1
Laptop	Analog 2*
DVD	S-Video
VCR	Composite

* This is also the connector on the left side of the Panther.

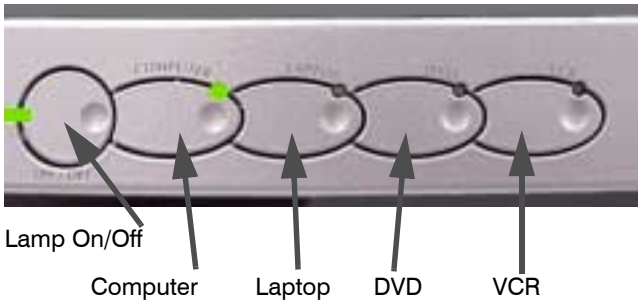
Select a source with the remote

Press the correct button. This immediately switches the Panther to the that source and recalls the associated memory. For the Computer and Laptop buttons,

- …if the picture is the same resolution as is stored in that memory, the picture is displayed almost immediately.
- …if the picture has a different resolution than was stored in the memory, the Mode Detect cycle starts.

Selecting a source from the front panel

Press one of the four front panel buttons.



A green LED means the source is valid; a red one means the source is invalid or absent.

The Lamp On/Off button has an LED that is green when lamps are on, amber when they are off and there is AC power. With Lamps Off, you cannot change the source.

The Mode Detect cycle

The "mode" is the resolution of the source picture, but it is more than that. Mode also means the vertical frequency, the number of blank lines at the bottom of the picture (which you don't see), and the number of blank pixels at the end of each line (which you also don't see).

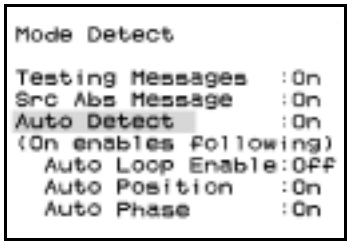
During the Mode Detect cycle, the Panther looks at the incoming picture and determines how to set itself to display the picture properly. This takes several seconds, and during this time the curtain is on. During this time the curtain is a solid color on the screen, usually black.

At the end of the Mode Detect cycle, the curtain turns off, the Panther shows the picture, and the new mode is stored in the associated memory.

Mode Detect for video

When you select DVD or VCR, the Panther recalls the correct memory and detects whether the source is NTSC, PAL, or SECAM. Unlike computer sources, the curtain is *not* put up during video mode detection.

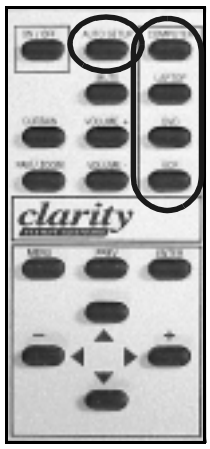
When Mode Detect happens

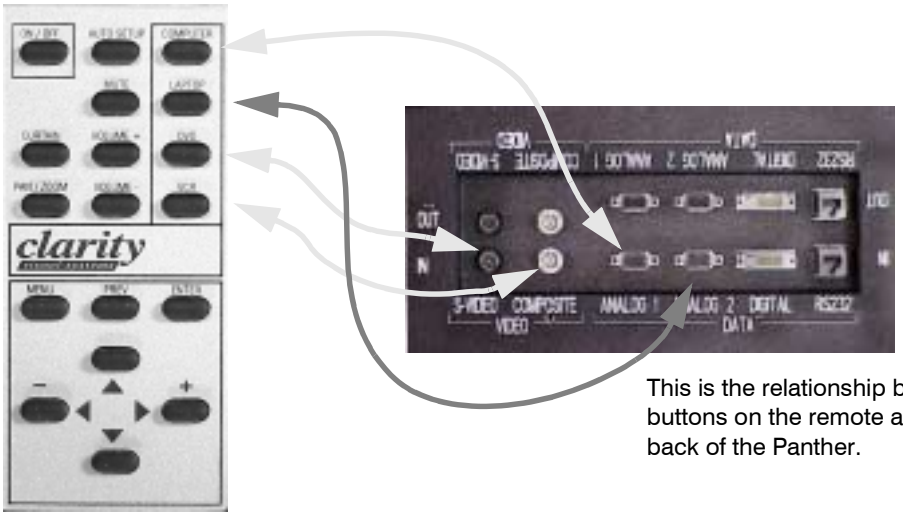


When Auto Detect is on in the Mode Detect menu, the Mode Detect process will start whenever:

- if someone unplugs one laptop, running at 1024 × 768 and someone else plugs in a laptop at 800 × 600;
- someone unplugs an NTSC VCR and plugs in a PAL VCR;
- you switch the input from Laptop to Computer;

Whether Auto Detect is on or off, you can force Mode Detect by pressing Auto Setup in the remote.





This is the relationship between the source select buttons on the remote and the connectors in the back of the Panther.

3.3.1 Audio Follows Picture Sources

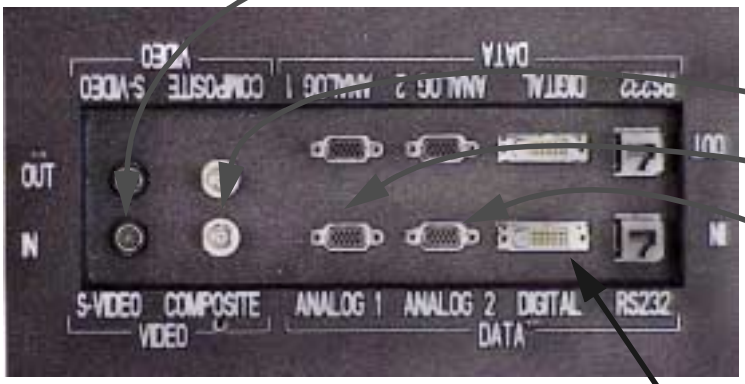
The audio inputs follow the picture connector inputs. The names of the connectors are different.

The audio connectors provide stereo inputs for each of the four video inputs. Choosing Laptop from the remote chooses the audio and video together.

These (optional) connectors are in the right-hand section at the rear of the Panther.

The **Variable Line Out** connectors provide a way to feed the audio to an external amplifier and speakers. It is labeled "Variable" because the Panther's volume control does affect this output level.

If you use the Digital connector for a picture source, connect its audio to the Computer (Analog 1) connectors. When you choose Digital in the Source Select menu, the Computer audio connect is also selected.



Picture connectors seen from the rear.

Audio connectors seen from the rear.

Digital connector uses Computer (Analog 1) audio in.

3.4 Adjusting For a Good Picture

If you want your pictures to look their best, take a little time to make the correct adjustments.

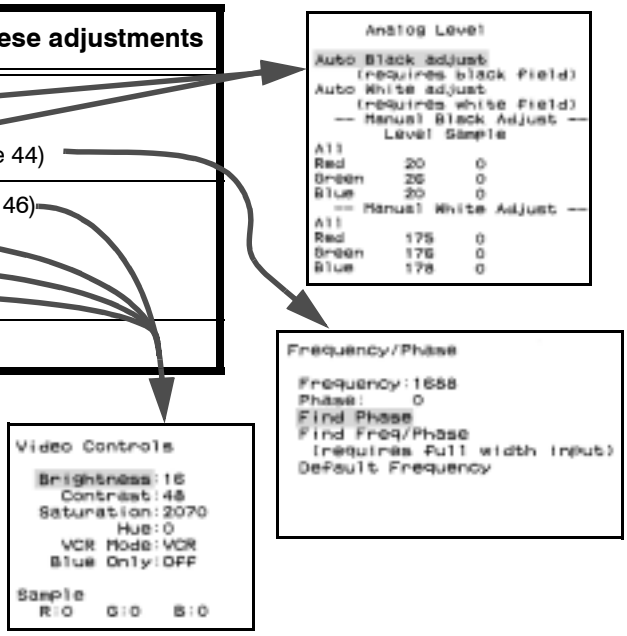
Every picture source is different. Two laptops of identical brand and type and showing the same picture will produce slightly different pictures on a Panther. The pictures may vary in color or brightness. One may look washed out, the other may have no detail in the darker areas.

Fortunately, Panther has an excellent way to over come these differences. And it only takes a few minutes.

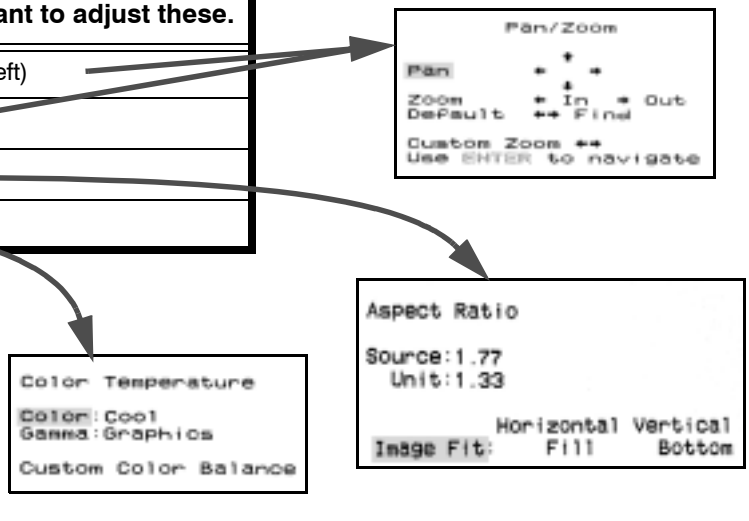
Most of these adjustments quick and easy. You only have to open a menu and push a button and the Panther does all the rest.

The table on the opposite page shows which adjustments you need to make for each type of input. Don't try to make adjustments from this page. All the details are given later.

If you use this input connector,	you should make these adjustments
Analog 1 (Computer) Analog 2 (Laptop)	Black Level (page 42) White Level (page 42) Frequency/Phase (page 44)
S-Video (DVD) Composite (VCR)	Brightness (all on page 46) Contrast Hue Saturation
Digital	none



For all inputs, you may want to adjust these.
Position (Pan up-down, right-left)
Zoom in or out
Aspect ratio
Color Temp



3.4.1 Adjustments for Computer and Laptop

These adjustments tell the display what the computer uses for black and white. The adjustments are semi-automatic. Do NOT use these adjustments to adjust color. (This section does not apply to composite or S-Video pictures.)

The display has to know what the computer means by black and white. All computer sources have a slightly different definition of black and white, and the adjustments described here tell the display what your computer means.

There are two ways to do this.

- Use **Auto Black Adjust** and **Auto White Adjust** to find the levels based on an all-white or an all-black picture.
- Manually adjust the levels.

For computer pictures, Auto is easier and faster. For RGB pictures, you must adjust manually.

✎ For these adjustments, you *must* use a picture that comes from the actual computer used for the program material. It does not work to set these levels with one computer and then connect a different computer as the source of the program material.

Auto Black Adjust

1. Show a black picture from the computer that will be used for program material.

✎ The sample point for Black Adjust and White Adjust is near the center of the screen.

2. Press MENU on the remote.
3. Highlight Input Level and press ENTER to open the Analog Level menu.
4. Select Auto White Adjust and press ENTER.

The system will quickly adjust the computer's black level. The process takes about one second. If the picture is not close enough to black, a message appears. This prevents adjusting the black level when the picture is white, but it does not prevent other mistakes.

Auto White Adjust

You *must* do Black Adjust first.

1. Show a white picture from the computer that will be used for program material. If the Analog Level menu is still visible, skip to Step 4.
2. Press MENU on the remote.
3. Highlight Input Level and press ENTER to open the Analog Level menu.
4. Select White Adjust and press ENTER.

This takes about three seconds. The system will quickly adjust the computer's white level, and a 'Working…' message appears. If the sample point is obviously not white, an 'out of range' message appears.

Where to get black and white pictures

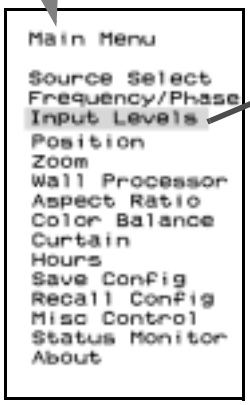
You can download Diag from Clarity Visual's website: www.ClarityVisual.com. It has perfect black and white pictures. Or you can make them with Windows Paint. Or make a solid color desktop. If the center portion of the screen is black (or white), the auto adjust will work.

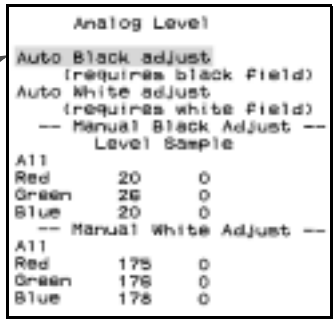
Manually adjusting levels

You *must* use this method for RGB or RGBS picture sources, but you can use it for any Analog 1 or 2 source.

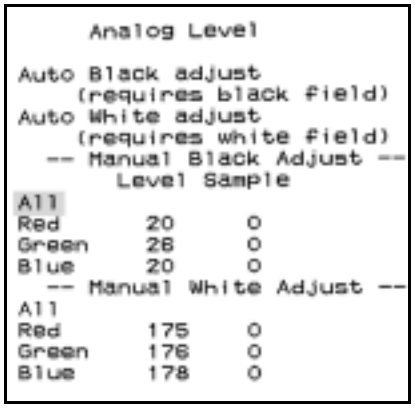
1. Display an all-black picture from the RGB source.
2. Highlight each of the three numbers under Black and use the left-right arrow keys to reduce the **Sample** numbers until they reach zero. Go up and down until you are sure the number just touches the zero point and doesn't go beyond it.
3. Black *must* be done first. Display an all-white picture from the RGB source.
4. Highlight each of the three numbers under White and use the left-right arrow keys to increase or decrease the **Sample** numbers until they reach 255. Go up and down until you are sure the number just touches the 255 point and doesn't go beyond it.

✎ The numbers under Level are not important to you during these adjustments.

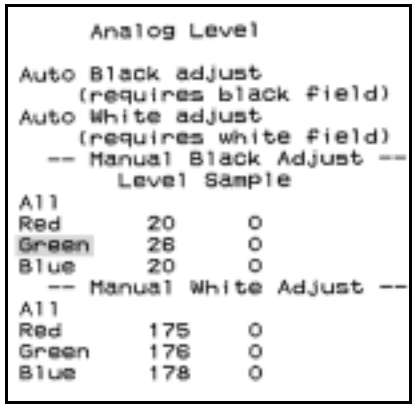




Adjusting the black and white levels using the Auto Level.



With the highlight on All as shown here, the + and – arrow keys change all three Black Levels together.



With the highlight on Green as shown here, the + and – arrow keys change only the Green Level of Black Adjust.

Manually adjusting black and white levels.

3.4.2 More About Computer and Laptop

For the very best picture, and for the correct size, computer sources should be adjusted for Frequency and Phase. These are automatic or manual.

The phase of computer pictures varies slightly from one computer to another, and the frequency is sometimes incorrect. Adjusting for this is quick and easy.

1. Press MENU on the remote.
2. Highlight Frequency/Phase and press ENTER.
3. Highlight Find Phase and press ENTER.
   —or—highlight Find Freq/Phase and press ENTER.

It is usually enough to Find Phase, which is faster, because the frequency is often correct.

There are three possible results:

- If everything works, the "Working …" label disappears.
- If the Selected Source was not Computer or Laptop, the error message appears.
- If the picture does not have enough fine detail in it, you see the "Unable …" message in the Frequency/Phase menu. Display a page of black and white text on the computer and try again.

✎ For these adjustments, you must use a picture that comes from the actual computer used for the program material. It does not work to set these levels with one computer and then connect a different computer as the source of the program material.

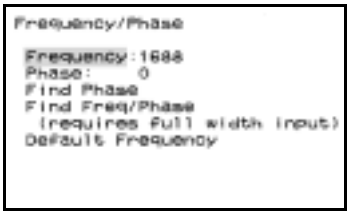
✎ Adjusting the Frequency also changes the width of the picture. However, do not use this control for width adjustment. Use Pan/Zoom.

✎ The numbers for Frequency and Phase do not have any meaning. They are there just to let you know which way and how far you are changing things.

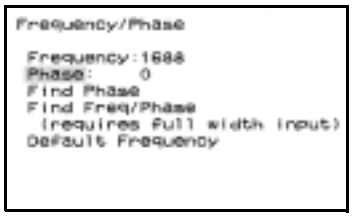
Adjusting Frequency and Phase manually

This requires a "checkerboard" pattern from the source computer. The Windows™ shutdown screen is ideal for this.

1. Make the desktop of your Windows computer a plain white background—no pictures, no wallpaper.
2. Click Start > Shutdown, but *do not shut down.*
3. Now the pixels are alternately black and white in the plain background.
4. On the Panther's remote, press MENU, select Frequency/Phase, and press ENTER again.
5. Select Frequency in the Frequency Phase menu.



6. Adjust with the left and right arrow keys until you see no vertical bands in the background.
7. Select Phase and adjust with the left-right keys until there is no noise in the picture. There should be at least one large range of Phase numbers in which there is no noise. Adjust to the middle of this range.



Main Menu

Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About

Frequency/Phase

Frequency:1688
Phase: 0
Find Phase
Find Freq/Phase
(requires full width input)
Default Frequency

Select Find Phase or Find Freq/Phase and press ENTER.

If automatic Find works …

Frequency/Phase

Frequency:1688
Phase: 0
Find Phase
Find Freq/Phase
(requires full width input)
Default Frequency

If auto won't work with this picture …

Frequency/Phase

Frequency:1688
Phase: 0
Find Phase
Find Freq/Phase
(requires full width input)
Default Frequency
Unable to auto
find phase
with this image

If the currently selected source is NOT Computer or Laptop, this message appears.

Frequency/Phase

These controls apply only to computer sources.

Press enter to continue

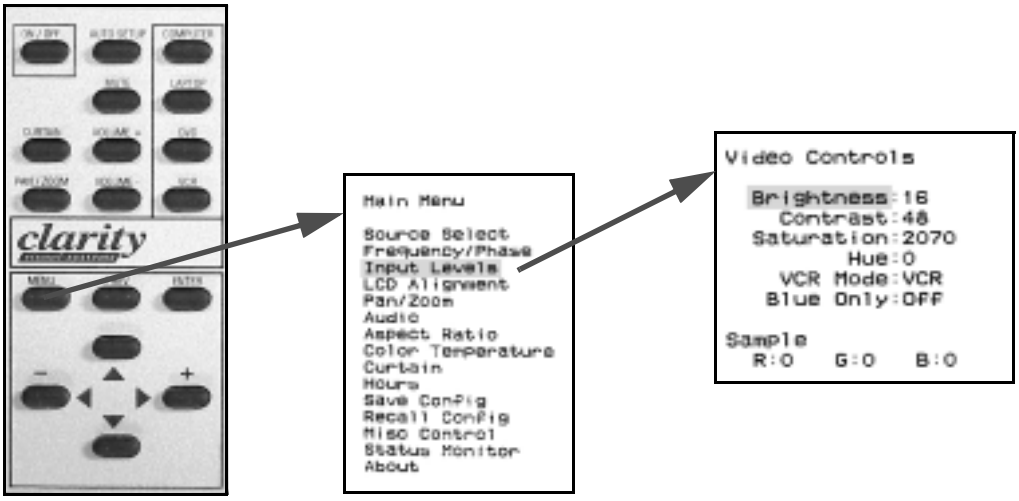
3.4.3 Adjustments for DVD and VCR

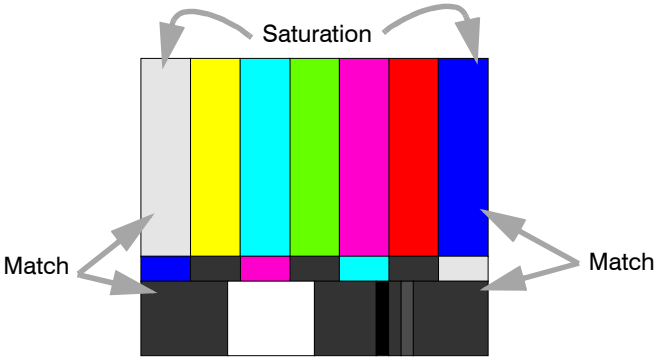
Video sources can be composite or S-Video. The composite (or C-Video) input and the S-Video input have their own loop-thrus. (This section does NOT apply to computer sources.)

Adjusting the picture

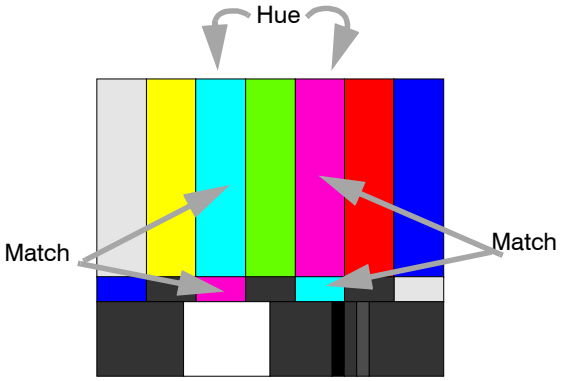
1. Press either DVD or VCR on the remote.
2. Press MENU, select Input Levels, and press ENTER. This opens the Video Controls menu. (If the selected source is not C-Video or S-Video, the LEVEL button will not open the Video Controls menu.)
3. Display an all-black picture *from the video source*. This should come from the actual source that will be used for program material, not from a test signal generator. (For DVD players, frame 50882 on Reference Recordings, 'A Video Standard' test disk has this picture.)
4. Select **Brightness** and adjust it with the +/– keys. Make the R, G, and B values as close to 001 as possible and keep the Brightness number as high as possible.
   - If the initial Sample values are greater than 001, reduce the Brightness until the first Sample value reaches 001.
   - If the initial Sample values are 001, increase the Brightness until all Sample values are 002 or greater. Stop increasing Brightness when the last Sample value goes from 001 to 002.
   - If Brightness is decreased while the Sample values are at 001, the color range for the displayed image will decrease.
5. Display an all-white image *from the video source*. Frame 50823 on Reference Recordings, 'A Video Standard' test disk has this picture.
6. Set the Sample values for R, G, and B as close to 254 as possible while keeping the Contrast number as low as possible.
   - If the initial Sample values are less than 254, increase the Contrast until the first Sample value reaches 254.
   - If the initial Sample values are 254, decrease the **Contrast** until all Sample values are 253 or less. Stop adjusting when the last Sample value goes from 254 to 253.
   - If the Contrast is increased while the Sample values are at 254, the color range for the image will decrease.
7. Display a color bar pattern *from the video source*. Frame 17177 is SMPTE Color Bars. Or use any 75% saturation color bar signal.
8. Select **Blue Only** on the Video Controls menu and press ENTER. This will display only shades of blue.
9. Adjust **Saturation** up or down until the two outside blue bars (which were white and blue) are the same.
10. Adjust **Hue** up or down until the two inside blue bars (which were cyan and magenta) are the same.
11. Set **VCR Mode** On, if the source is a video player without time-base correction (most home VCRs are this type).
12. Exit the menus with the PREV button.

Find Mode, the automatic mode detection process (page 60) does not function for C-Video and S-Video sources. Nor do any of the subparts of Auto Detect.





Adjust Saturation so the outside bars match when Blue Only is checked.



Adjust Hue so inside bars match when Blue Only is checked.

3.4.4 Setup for Digital Sources

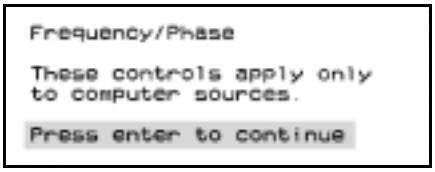
Digital sources don't need to be adjusted, so this will be very quick.

Adjusting to digital sources

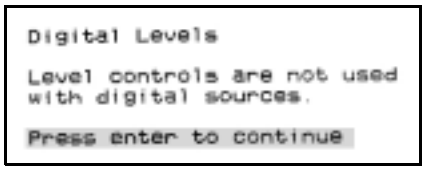
1. Press MENU, select Source Select, and press ENTER.
2. Press the left or right arrow key on the remote to select Digital, and press ENTER.
3. If. Auto Detect is on, the Panther will start seeking the mode. If it is not on, select Find Mode and press ENTER.

Level and Freq/Phase adjustments to not apply to digital pictures, so these two will not function even if they are on in the Mode Detect menu. Auto Position will run, if it is on.

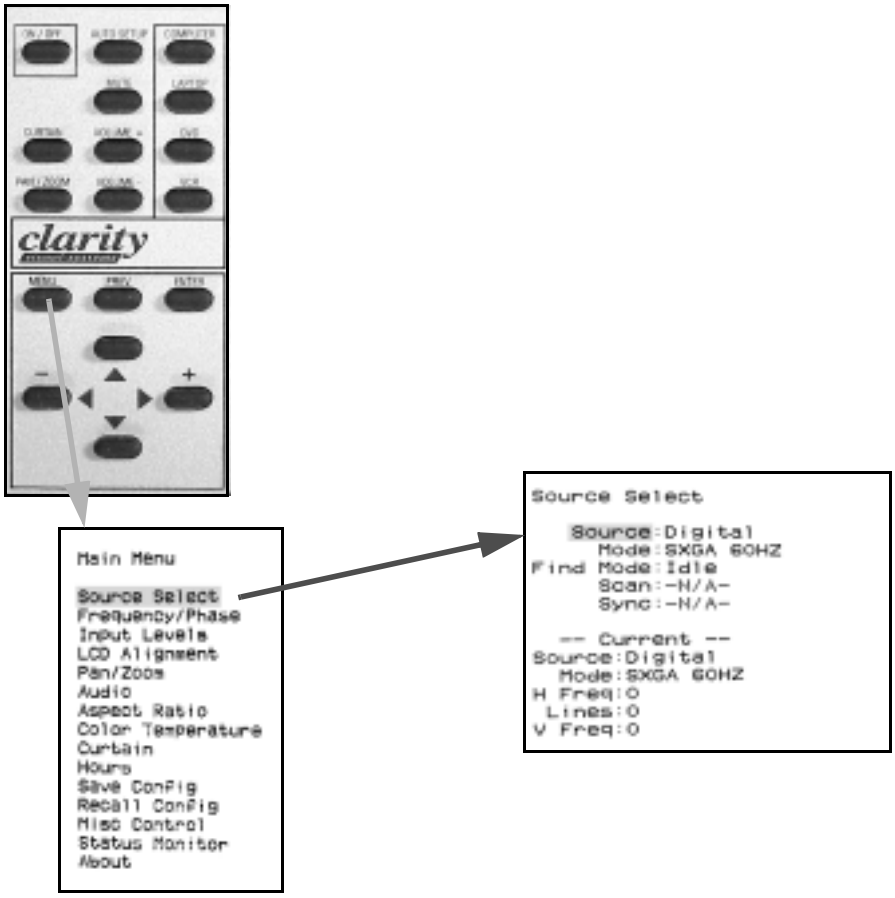
If you try to enter the Frequency/Phase menu when Digital is the current source, you get:



Black and White Level do not apply to digital pictures either. If you try to open the Input Level menu when Digital is the current source, you get:



✎ When Digital is the selected picture source, the audio for Computer (Analog 1) is also selected. There is no separate audio input associated with the Digital input.


clarity
MENU
PREV
ENTER
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Source Select
Source:Digital
Mode:SXGA 60HZ
Find Mode:Idle
Scan:-N/A-
Sync:-N/A-
-- Current --
Source:Digital
Mode:SXGA 60HZ
H Freq:0
Lines:0
V Freq:0

3.4.5 Color Temperature

The three settings change the 'warmth' of the picture. These choices apply globally over all the sources.

Incandescent lights have a 'warm' feeling, while most fluorescent tubes feel 'cool,' because they have a different color temperature. You can change the color temperature of the Panther's picture:

1. Press MENU on the remote.
2. Select Color Temperature and press ENTER.
3. With Color highlighted, use the right-left arrow keys to select the color temperature you wish.
   - Warm
   - Normal
   - Cool (the default setting)
4. Highlight Gamma and select:
   - Graphics (usually best for computer pictures)
   - Video (best for video pictures)

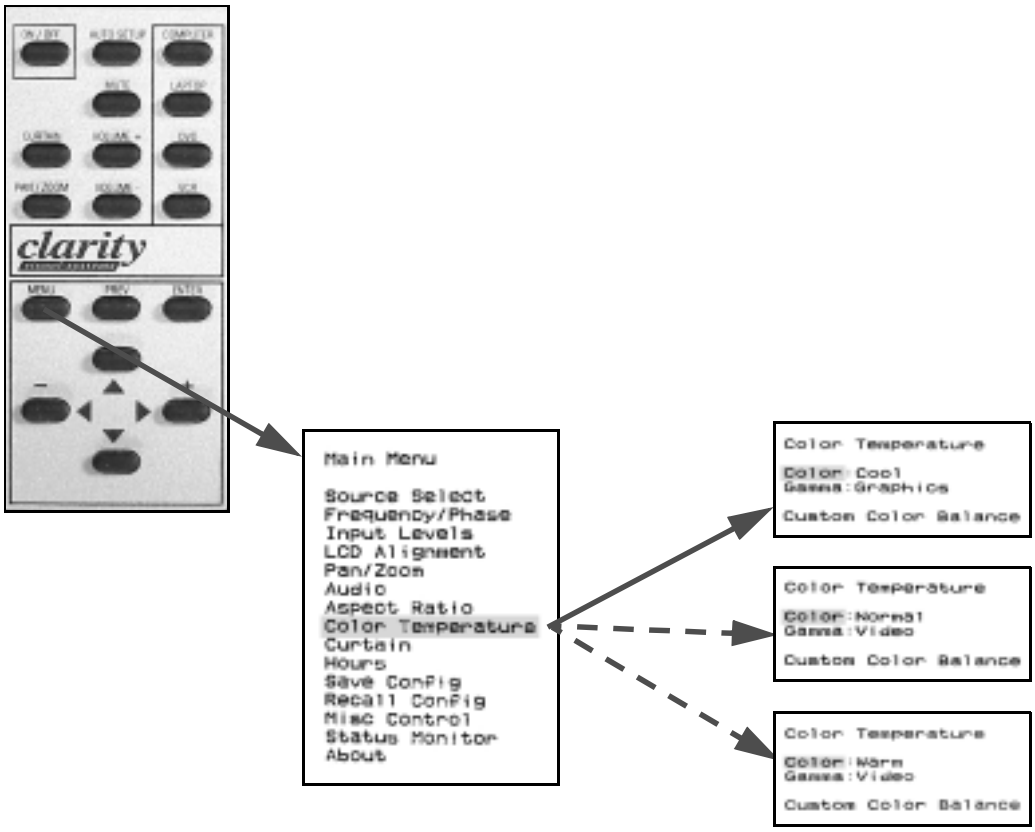
You will see the change immediately.

Note that the Color Temperature setting applies to all five inputs, including Digital. If you change the Color Temperature for the Computer input, it changes the setting for Laptop, DVD and VCR, too.

CAUTION

For Computer and Laptop inputs, DO NOT use the Black Level and White Level controls to adjust color. The results will not be good.

For DVD and VCR inputs, you can use the Video Controls to adjust Brightness, Contrast, Hue (tint) and Saturation (called 'color' or 'picture' in TV controls). These are saved separately for each memory. (See 'Adjustments for DVD and VCR' on page 46.)


clarity
MENU
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Color Temperature
Color: Cool
Gamma: Graphics
Custom Color Balance
Color Temperature
Color: Normal
Gamma: Video
Custom Color Balance
Color Temperature
Color: Warm
Gamma: Video
Custom Color Balance

3.5 Making the Picture Fit the Screen

Aspect ratio is the width of a picture divided by its height. When the aspect ratio of the source picture differs from the aspect ratio of the Lion screen, something must be done to make the picture fit the screen.

The aspect ratio of the screen Panther is 4:3 or 1.33, which is the aspect ratio of 1600 × 1200 UXGA pictures. This is fine for most picture sources.

Aspect Ratio is ratio of the width to the height of the screen, expressed as two whole numbers (4:3, 16:9) or a decimal number (1.33, 1.77).

$$\frac{1600}{1200} = 1.33$$

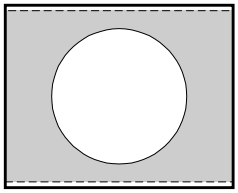
When aspect ratios are not the same

When the aspect ratio of the source picture is not the same as the aspect ratio of the Panther, the picture will not fit the screen. You have several choices:

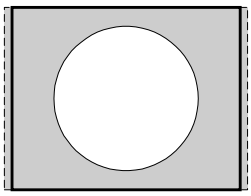
If the source aspect ratio is greater than 1.33

When the source picture's ratio is greater than the cube or wall (for instance, source 1.77, cube 1.33) you have choices such as these:

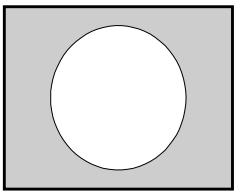
1. Fill the screen for width without distortion and leave space at the top and bottom. The system expands the picture horizontally until it fits the screen: no distortion.



2. Fill the screen for height without distortion and let the sides be cropped off. The system expands the picture vertically until if fits the screen: no distortion.



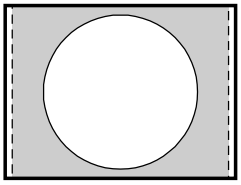
3. Fill the screen for width and stretch it to fit vertically. The system expands the picture horizontally until it fits the screen, then stretches it to fill the screen vertically: some distortion results.



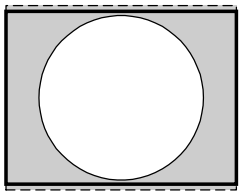
If the source aspect ratio is smaller than 1.33

When the source picture's ratio is less than the cube or wall (for instance, source 1.25, cube 1.33) you have choices such as these:

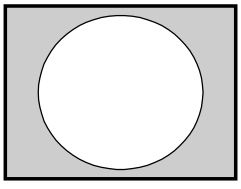
1. Fill the screen for height and leave space at the sides.



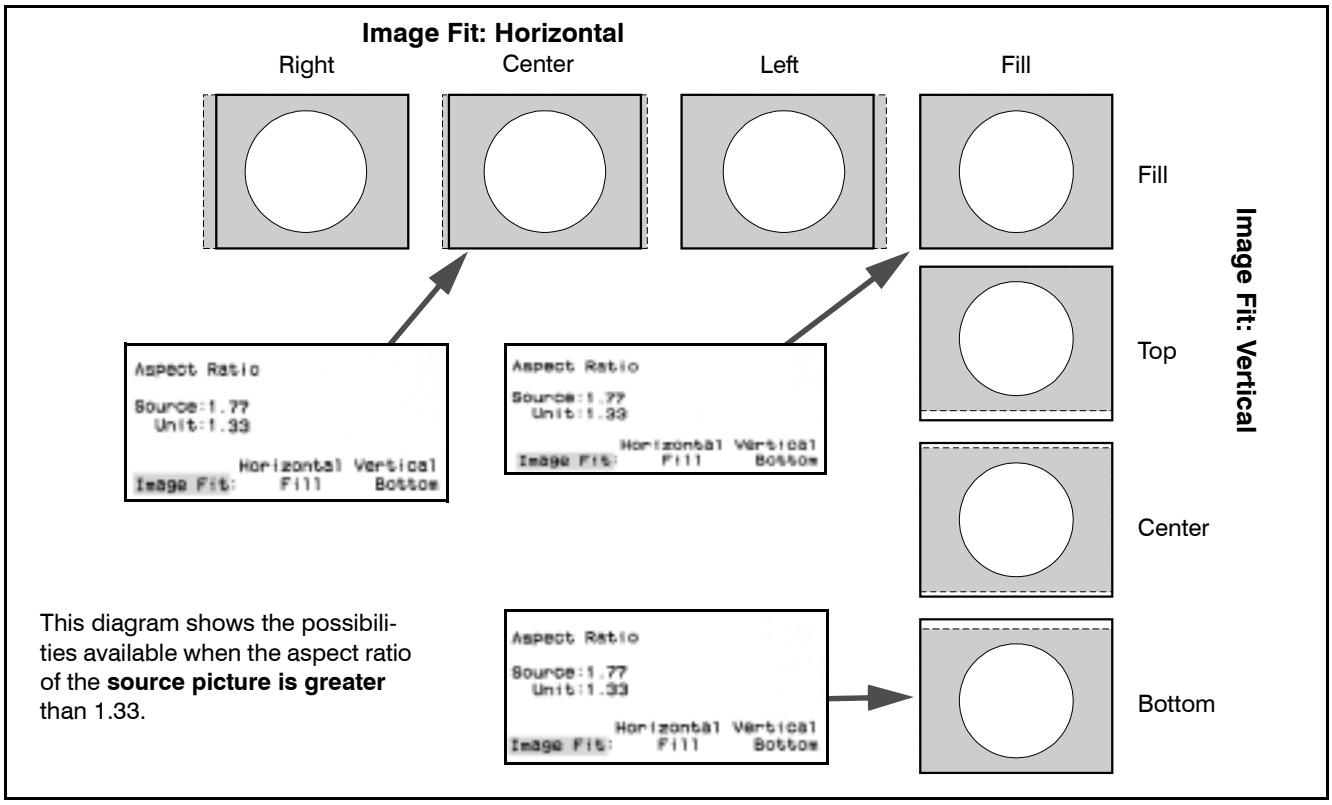
2. Fill the screen for width and let the top and bottom be cut off.



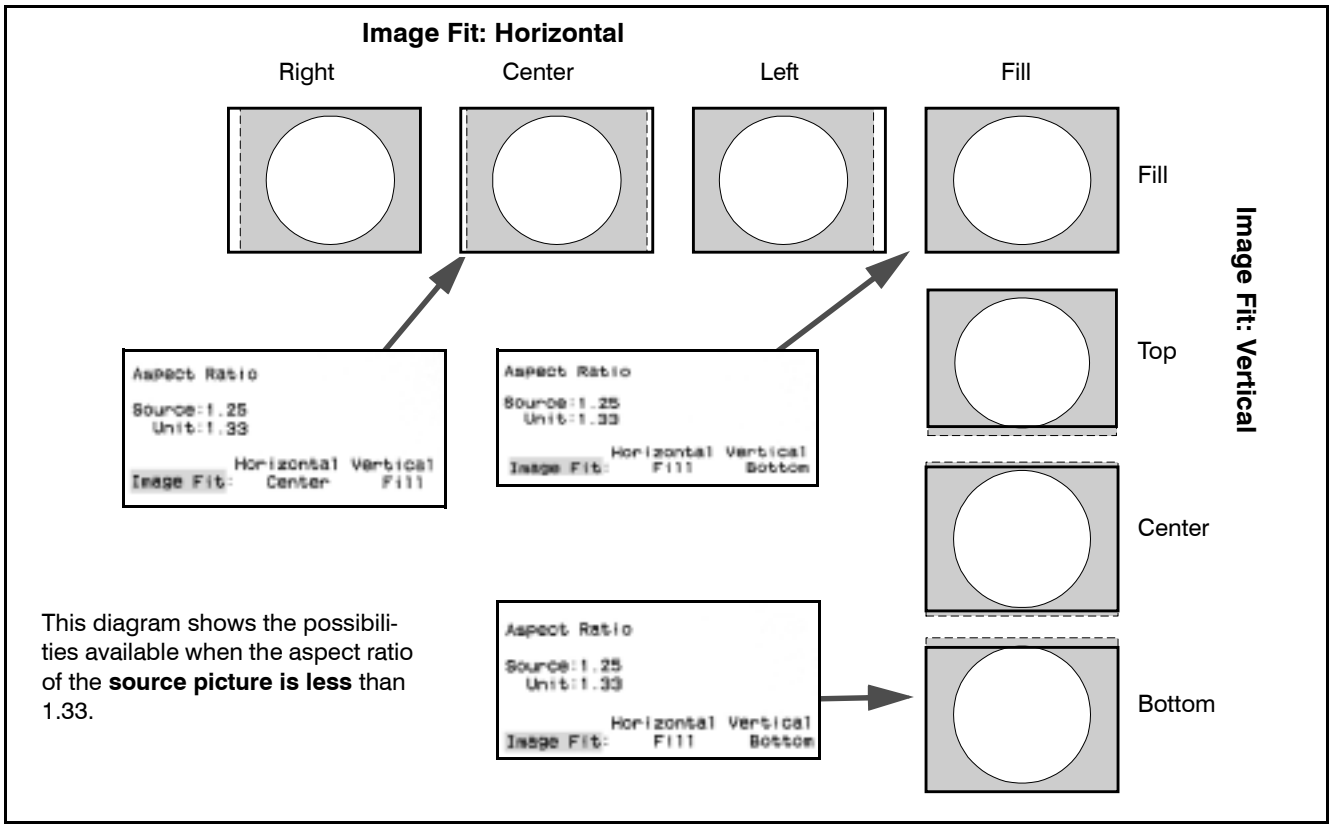
3. Fill the screen for height and stretch it horizontally to fit. This produces some distortion.



In the Aspect Ratio menu, described in the next section, you choose how you want to display the picture. The background color, which shows in strips at the top and bottom in example 1, is taken from the User Curtain color. (You will learn how to set this color in 'Curtain and Its Colors' on page 82.)



This diagram shows the possibilities available when the aspect ratio of the **source picture is greater** than 1.33.

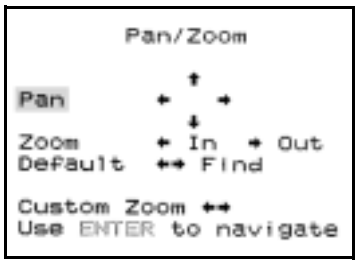


This diagram shows the possibilities available when the aspect ratio of the **source picture is less** than 1.33.

3.5.1 Pan and Zoom

*Pan moves the picture on the screen. Zoom makes the picture larger or smaller. In this menu, the up-down keys **do not** move the highlight selector in the menu.*

Navigating in the Pan/Zoom menu



In the Pan/Zoom menu, you move around and control things differently. You choose

- Pan,
- Zoom,
- Default,
- Custom Zoom,

by pressing the ENTER button. The highlight selector only moves down.

You use the arrow keys to

- move the picture when the highlight is on Pan,
- zoom larger and smaller when on Zoom,
- find the standard pan/zoom values when on Default (sort of like a reset),
- open the full-control zoom menu when on Custom Zoom.

Pan: Press ENTER to move the highlight selector to Pan. Use the 4 arrow keys to move the image electronically on the screen.

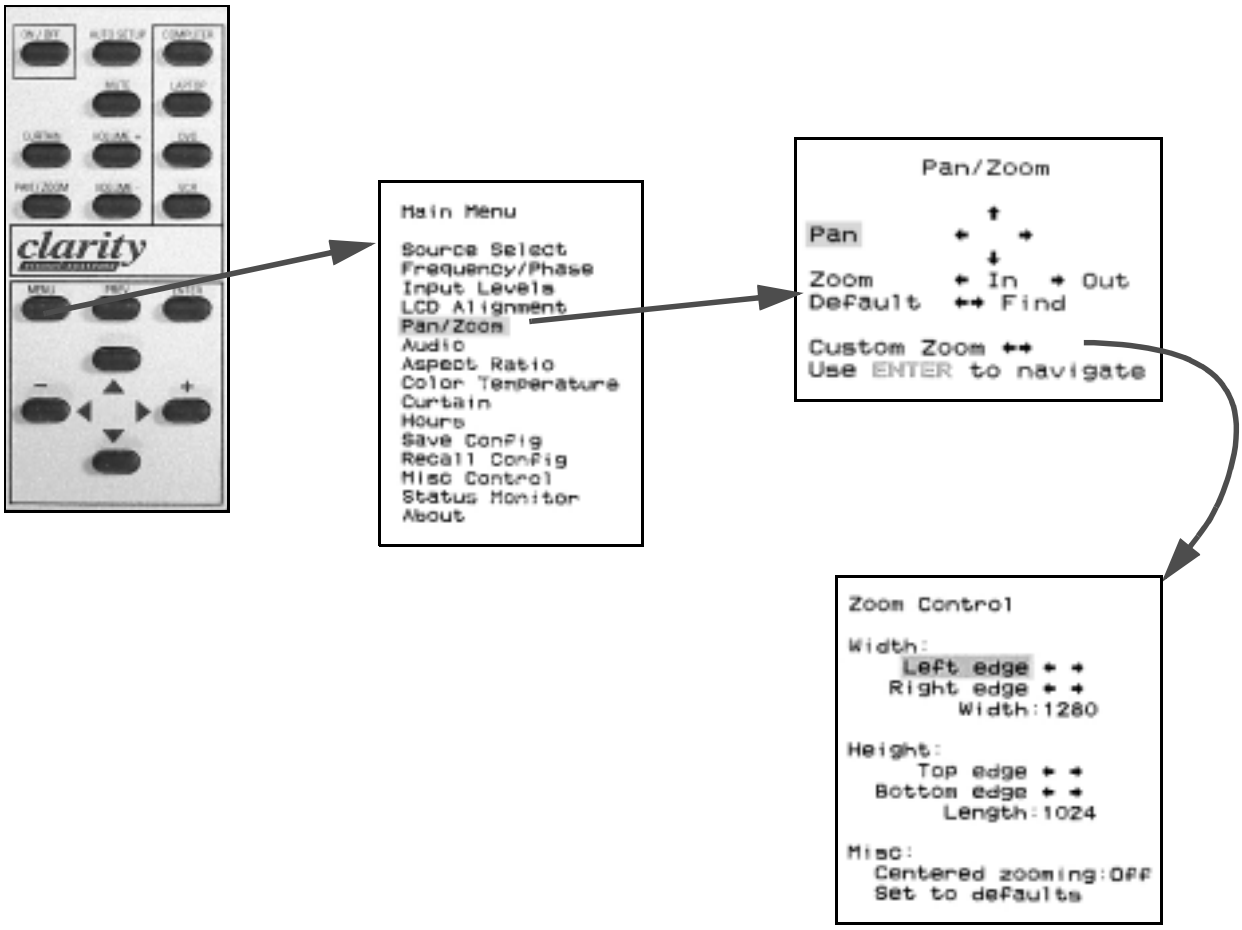
Zoom: Press ENTER to move the highlight selector to Zoom. Use the left-right arrow keys to zoom the picture larger and smaller. Zoom occurs from the center in all four directions.

Default: Press ENTER to move the highlight selector to default and press the left arrow key. This restores the default size (zoom) of the picture and moves the upper left corner of the picture to the upper left corner of the screen.

Custom Zoom: If you want to zoom on only one side, and not all four sides at once, press ENTER to move to Custom Zoom, then press left or right. This opens the Zoom Control menu. The numbers is this menu indicate the number of original pixels that are displayed. This means that as you zoom in, the picture getting larger, the numbers get smaller.

Black edge in picture

If you see a black edge in the picture, try to use the Pan control to move the picture over it. If you *cannot* move the picture to cover the black area, the LCD needs adjusting. See 'Adjusting the LCD Position' on page 56.


clarity
MENU
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Pan/Zoom
Pan
Zoom ← In → Out
Default ↔ Find
Custom Zoom ↔
Use ENTER to navigate
Zoom Control
Width:
Left edge ← →
Right edge ← →
Width:1280
Height:
Top edge ← →
Bottom edge ← →
Length:1024
Misc:
Centered zooming:OFF
Set to defaults

3.5.2 Adjusting the LCD Position

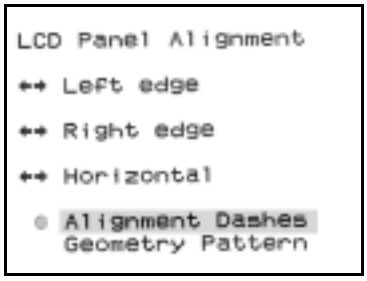
***If the** LCD **is not properly aligned to the screen, a sharp, black edge may show on one or more sides.** These adjustments were correct when the Panther left the factory, but vibration during shipping may cause an unwanted change.*

Adjusting the LCD is a two-part process:

- moving the LCD to make it align with the screen squarely, and
- adjusting the size of the image so it fills the screen.

LCD Alignment

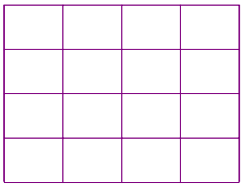
1. Press MENU on the remote.
2. Highlight LCD Alignment and press ENTER.



You may choose either Alignment Dashes or Geometry Pattern and press ENTER.

- Alignment Dashes has groups of six dashes around the edges representing the outside six pixels.This pattern makes it easy to count hidden pixels.

- Geometry Pattern shows a 4×4 grid. The outside frame is 3 pixels wide. This pattern is useful for rotating and shifting the LCD.



The patterns are drawn slowly, and during this time the remote won't do anything. When the pattern is complete, a red dot appears next to the pattern name.

LCD position

Highlight Left or Right edge or Horizontal and use the left-right buttons to change the position. The buttons drive motors that turn completely, so the left or right button may move the pattern in either direction. Press and hold for continuous motion.

Adjust the pattern to **hide about 3 pixels at each edge**.

Size

Size in adjusted by rotating the objective lens. The objective lens is the lens that points up at the mirror. You can see this lens from the rear of the display.

- Turn the lens **in** (clockwise) to make the image larger so it fills more of the screen.
- Turn the lens **out** (anti-clockwise) so it does not spill past the edges of the screen too far.

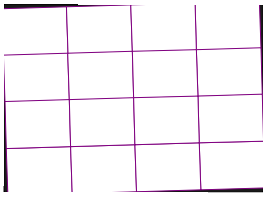
✎ Turning the lens adjusts LCD image size, not focus. There is no focus control in the Panther.

Objective lens adjusts image size.

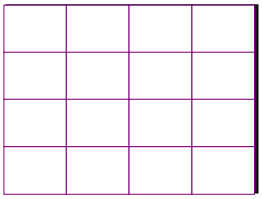
Difference between LCD alignment and the Pan/Zoom controls

If the LCD is not properly aligned, no amount of Pan and Zoom can fix it.

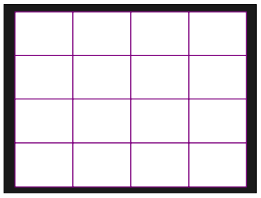
- The LCD Alignment menu physically moves the LCD into proper position so the LCD's image is squarely on the screen.
- Rotating the objective lens assures that all the LCD's image (all the pixels except those on the very edges) fill the screen.
- The Pan controls move the *electronic* picture around on the LCD.
- The Zoom controls expand (or contract) the *electronic* picture so that less of it (or more of it) is on the LCD.



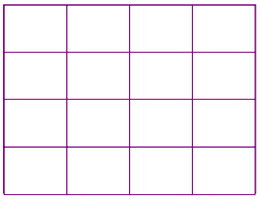
LCD rotated, left side down. Move left edge up or right edge down.



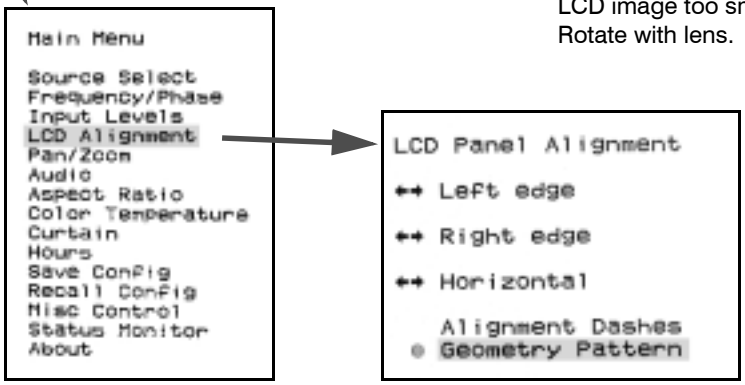
LCD shifted sideways to the left.



LCD image too small. Rotate with lens.



LCD squarely aligned and the correct size.



3.6 Lamp Control, On or Off?

Panther tries to maintain the correct number of lamps lit only if Lamp Control is On.

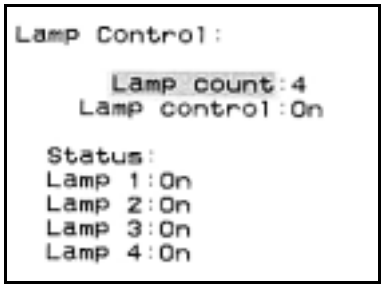
Lamp Control

Lamp Control may be off when the display is shipped. If you want the system to automatically turn on a lamp if one should fail, Lamp Control must be on. See the table opposite to learn about the effect of Lamp Control on and off.

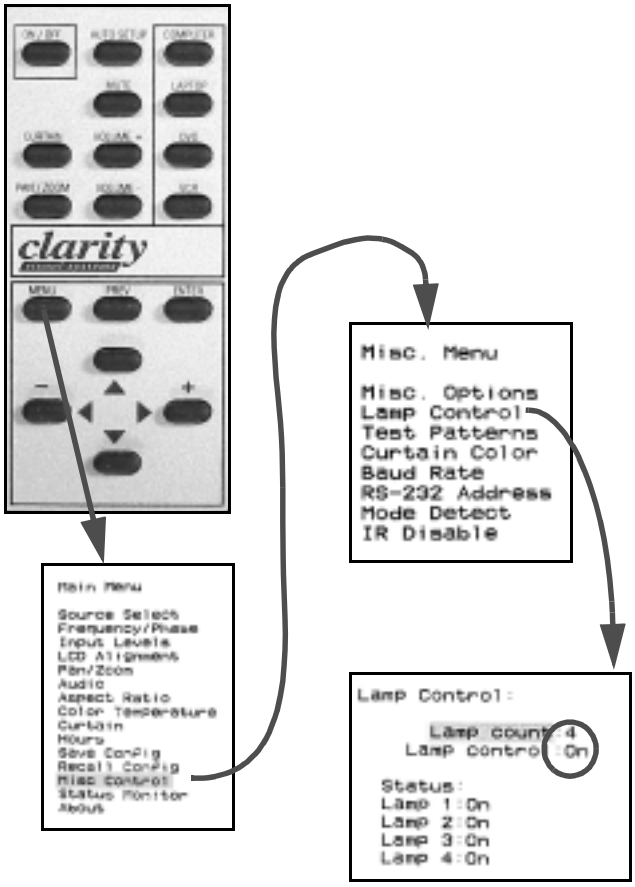
In short, if Lamp Control is On, the system tries at all times to maintain the correct number of lamps. If Lamp Control is off, the system does not try to compensate for failed lamps.

Lamp Control may already be on in the displays you have. It is best to check it now. To turn on Lamp Control:

1. Connect AC power and turn on the AC Master switch.
2. After the fans stop, aim the remote at the screen and press LAMP ON. The lamps will start to turn on.
3. After about a minute, when the lamps have warmed up, press MISC two times. You should now see the Lamp Control menu.



   - If the second line in this menu says Lamp Control: **On**, stop here.
   - If the second line says Lamp Control: **Off**, go to the next step.
4. Press the down arrow on the remote to highlight Lamp Control.
5. Press ENTER to change Lamp Control to On.
6. Press PREV to close the menus.



CAUTION

Do not change the Lamp Count number up and down and up and down rapidly. It takes about 30 seconds for the lamps to respond to changes in the Lamp Count number. If you run the count up and down, the system may get out of step with reality.

Effect of Lamp Control

When …	… and Lamp Control is OFF,	… and Lamp Control is ON,
… a lamp fails to light on the first try …	the system will **not** try that lamp two more times and will **not** turn on another lamp in its place.	the system will try that lamp two more times. If it doesn't light on the third try and if the Lamp Count is 2 or 3, the system will try to light another lamp.
… a lamp goes out and the Lamp Count is 2 or 3 …	the system will **not** try another lamp.	the system will try to turn on another lamp.

3.7 What Mode Detect Does

In the Mode Detect menu, you decide which of several actions are automatic or manual, and what types of messages will appear on the screen.

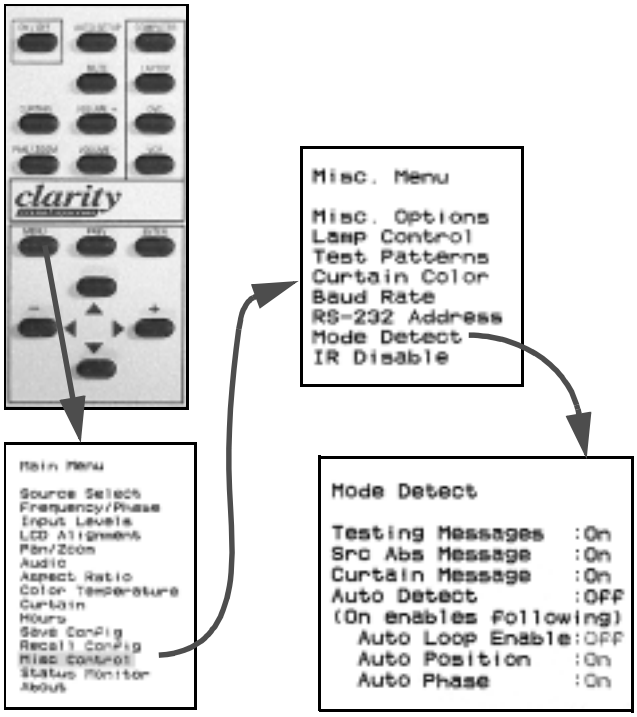
The Panther must know what type of source picture it is displaying: SXGA, UXGA, and others for computer sources; NTSC, PAL, SECAM for video sources. This is the **mode**, the type of source picture the Panther will use. If the mode does not match the actual source picture, the image will be very distorted or may not display at all.

To **choose the mode automatically**

- Press **Auto Setup** on the remote.
- In the Source Select menu, select **Find Mode** and press ENTER.
- Set **Auto Detect on** in the Mode Detect menu. Whenever the resolution changes, Find Mode starts and settles on the new one.

To **choose the mode manually**, select **Mode** in the Source Select menu and press +/– until the right mode appears.

To open the **Mode Detect menu**, press MENU > Misc Control > Mode Detect.



Auto Detect On

When the source mode changes, for instance from UXGA to XGA, the Mode Detect process starts. If the Panther is successful in finding the mode, then

- if Auto Phase is On, phase is automatically set;
- if Auto Position in on, the pixel in the upper left corner of the picture is put in the upper left corner of the LCD.

If **Auto Loop Enable** is On, and the Panther cannot find the mode on the first try, it will keep testing and testing until it is successful.

Auto Detect Off

The items below Auto Detect are grayed out when Auto Detect is off. If the mode changes, the Panther does not look for a new mode. However, when you press AUTO SETUP or select and start Find Mode, Auto Detect goes through the mode search process *once*.

If Freq/Phase or Position are On, these automatic systems will occur, even though they are grayed out in the Mode Detect menu. However, AUTO SETUP and Find Mode make it happen only once, even if Auto Loop Enable is On.

Messages

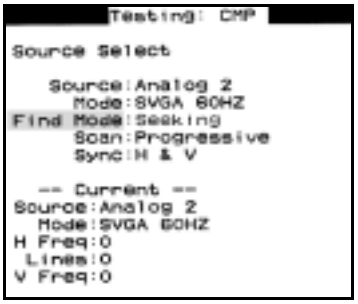
If **Testing Messages** is on, a message appears letting you know what is happening during Auto Detect:

- Testing H/V (separate H & V sync)
- Testing CMP (composite sync)
- Testing SOG (sync on green).

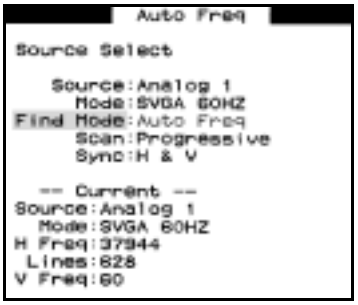
If **Src Abs Message** is on, a sign saying, 'Source Absent' appears on the screen whenever there is no source on the selected connector. This message turns off after 30 seconds.

When **Curtain Message** is on, a Curtain sign appears whenever you turn on the User Curtain. This message covers up either of the other messages.

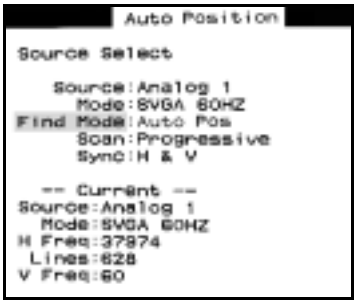
Lack of a valid source will also turn on the source absent Curtain. The default color is black, but you can change this in the Curtain menu. (See 'Curtain and Its Colors' on page 82.)



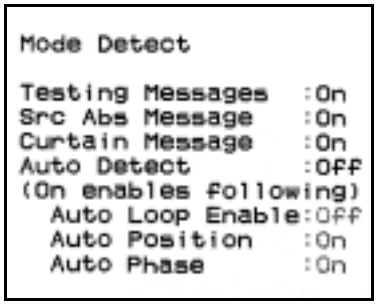
Whether Find Mode is started automatically or manually, it starts seeking the mode (Analog and Digital sources only).



If Auto Freq/Phase is on, the Panther starts to find the correct frequency and phase.



If Auto Position is on, the Panther puts the upper left corner of the picture in the upper left corner of the screen. This is very fast, and you may not see Auto Pos in the menu.



Mode Detect menu showing its default (factory) settings. When Auto Detect is Off, the two lower Autos are grayed out, but you can still change them.

3.8 How to Save Your Work

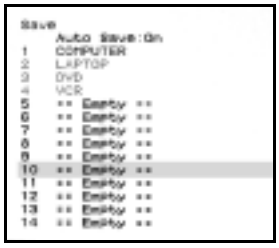
Save Config stores information in one of 14 memories. The first four memories are dedicated to the four main inputs. Saving can also happen automatically.

If Auto Save is On, the adjustments you make to the four standard inputs are **saved automatically**, each time you change to a new source. When you select a new source—Computer, Laptop, DVD or VCR—the memory for the new source is recalled. If this is all you need, press PREV and quit reading.

There are 10 other memories that you can use, and recall manually. This is how to use them:

To save the current configuration of the display in a new memory:

1. Press MENU.
2. Highlight Save Config and press ENTER.
3. Check that **Auto Save** is On in the second line.
4. Arrow up or down to the number you want to save in. If the memory is not currently used, it will say '== Empty ==′. Otherwise it will show what is currently saved there.



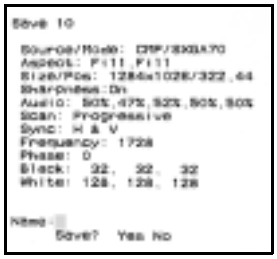
5. Press ENTER. This opens the Save detail menu for that one memory number, shown at the top.

6. If the memory …
   - was empty, the highlight is on Save Yes. Press ENTER. Or go to Step 7 for custom naming.
   - already had something in it, the highlight is on Overwrite No. Press left or right and then press ENTER. Or go to Step 7 for custom naming.

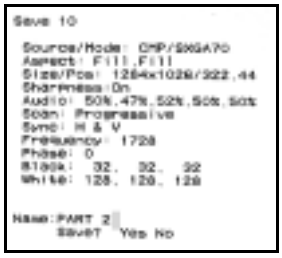
Custom naming the memories

The default label for a memory is a very abbreviated list of its contents. You may want to change the label to something more appropriate to your application. After Step 5 above, do the following:

7. Press the up arrow. This puts the highlight just after Name.
8. To erase the current name, press ENTER. Then use the up-down arrows to cycle through the available letters, numbers and punctuation. Use the left-right arrows to navigate along the line.



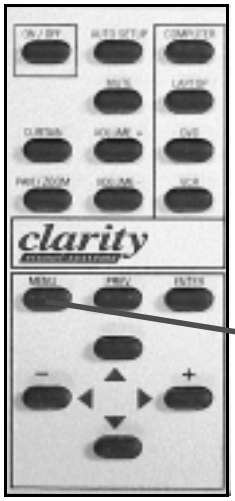
9. When the name is complete, press ENTER. This puts the highlight on Yes.
10. Press ENTER again to save the settings in this numbered memory with the label you wrote.



You do not have to erase the whole label before writing a new one. You can edit the current label. There is no delete key or backspace key. To delete characters, find the space character in the cycle.

To erase a memory:

1. Press MENU.
2. Highlight Save Config and press ENTER.
3. Select the memory you want to erase.
4. Press the **left arrow** key.
5. The detail of what you are about to erase is shown. Highlight Yes and press ENTER to erase this memory.
6. The focus goes back to the main Save menu, and the number you just erased is marked ==Empty==.




```
Main Menu

Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
```

```
Save
      Auto Save:On
1     COMPUTER
2     LAPTOP
3     DVD
4     VCR
5     == Empty ==
6     == Empty ==
7     == Empty ==
8     == Empty ==
9     == Empty ==
10    == Empty ==
11    == Empty ==
12    == Empty ==
13    == Empty ==
14    == Empty ==
```

Press ENTER

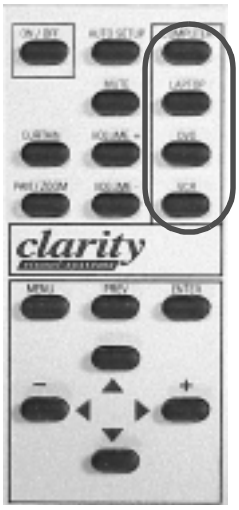
```
Save 1

 Source/Mode: CMP/SXGA60
 Aspect: Fill,Fill
 Size/Pos: 1280x1024/342,33
 Sharpness:On
 Audio: 52%,47%,52%,50%,50%
 Scan: Progressive
 Sync: H & V
 Frequency: 1688
 Phase: 0
 Black:  32,  32,  32
 White: 128, 128, 128

Name:COMPUTER
Overwrite?  Yes No
```

3.9 Recalling What You Saved

Recalling a numbered memory immediately sets all the values to what you previously saved.

The four standard source select buttons automatically recall their memories as well as switch to that connector. If Auto Save is On in the Save menu, it is not necessary to Save or Recall.

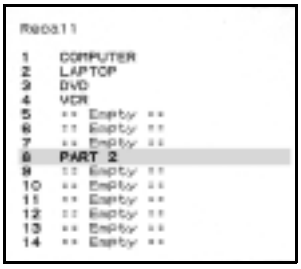
When one of these four is the source, every change you make in the settings—position, black level, frequency—is saved in the associated memory and automatically recalled when you select that source again.



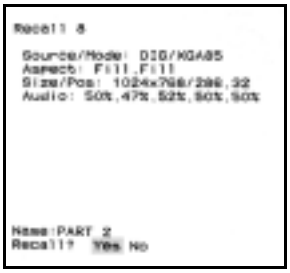
✎ If Auto Save in the Save menu is *not* on, this automatic saving does not happen.

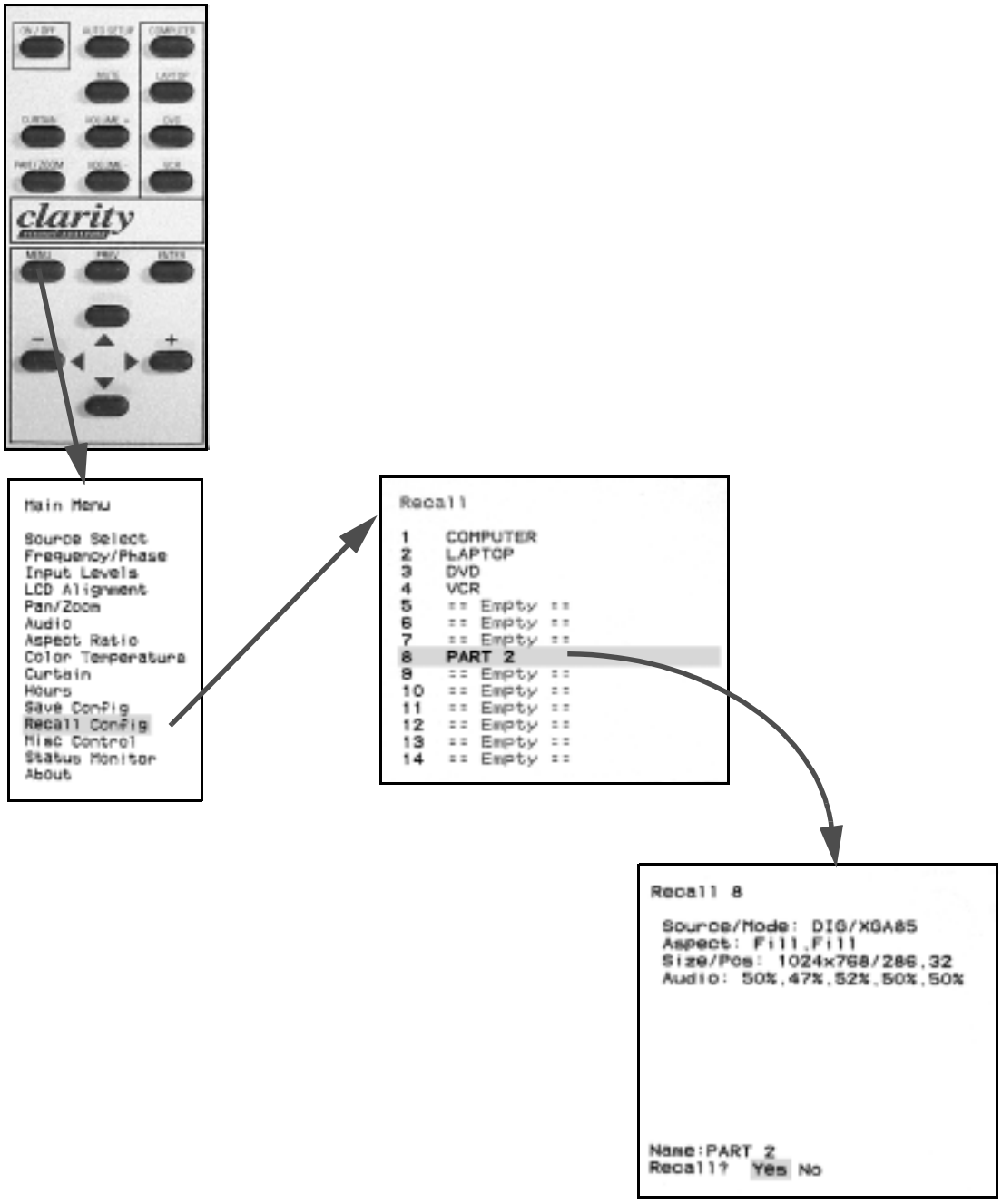
To recall other memories

1. Press MENU.
2. Highlight Recall Config and press ENTER.
3. Arrow up or down to the memory you want to recall. You cannot recall ==Empty== memories.



4. Press ENTER. This opens the Recall detail menu with the highlight on Yes. Press ENTER again.




clarity
MENU
PREV
ENTER
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Recall
1 COMPUTER
2 LAPTOP
3 DVD
4 VCR
5 == Empty ==
6 == Empty ==
7 == Empty ==
8 PART 2
9 == Empty ==
10 == Empty ==
11 == Empty ==
12 == Empty ==
13 == Empty ==
14 == Empty ==
Recall 8
Source/Mode: DIG/XGA85
Aspect: Fill,Fill
Size/Pos: 1024x768/286,32
Audio: 50%,47%,52%,50%,50%
Name:PART 2
Recall? Yes No

4 Operating the Panther

4.1 Reading the On-Screen Diagnostic Code

When the lamp won't light, this is the fastest way to learn why. To see them, press the up-down-up on the remote when there are no menus on the screen.

The On-Screen Diagnostic Code lets you trouble-shoot, even when the lamp won't ignite. This code is a brief series of lights of two colors that appear on the screen. These lights blink in a simple code, shown on the facing page.

To start the On-Screen Diagnostic Code

Press PREV twice to be sure there are no menus on the screen. Then press up–down–up arrow keys.

You will immediately see the LEDs on the screen. The tables show the patterns of the codes and what they mean. If the lamps are on, you will also see the Cube Status menu.

To stop the On-Screen Diagnostic Code, ENTER or the left or right arrow key. The Status menu goes away.

✎ Whenever you open the Cube Status menu (MENU > Cube Status > ENTER) you will see the On-Screen Diagnostic Code. This will usually be a steady amber light.

The code is built so you can read it even if you are color blind. One color always stays on three times as long as the other, so you can read the code by the sequence of colors or by the time sequence.

On-Screen Diagnostic Code

	Condition	Priority	Each block represents 0.1 seconds
These start with Red & **turn off the lamps**.	Interlock, thermal cutoff open	1	R ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Interlock, Lamp Bay door open	2	R ▯ R ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Sensor overtemp, lamps off[1]	3	R ▯ Amber ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Power supply fan stopped	4	R ▯ Amber ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Either Exhaust fan stopped	5	R ▯ Amber ▯ Amber ▯ ▯ ▯ ▯ ▯ ▯ ▯
	350V missing	6	R ▯ R ▯ Amber ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Lockout[2]	7	R ▯ R ▯ R ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
These start with Amber & **do not** turn off lamps.	Sensor overtemp, lamps not off[3]	8	Amber ▯ R ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Lamp failure, any lamp	9	Amber ▯ R ▯ Amber ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Sensor approached limit	10	Amber ▯ R ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Standby state[4]	11	Amber ▯ Amber ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
	Lamps on and no alarms	12	Amber on continuously

R = Red

[1] Sensor over limit and Temp Monitor is On.

[2] Conditions 1, 2, 4, 5, or 6 will cause Lockout. After fixing the problem, you may see Condition 7, Lockout. You must cycle AC power off, then on to reset the Lockout condition.

[3] Sensor over limit and Temp Monitor is Off.

[4] Unit is waiting for a Lamp On command.

What the On-Screen Diagnostic Codes Mean

Condition	Meaning
1. Interlock, thermal cutoff open	The thermal cutoff switch is open, preventing the lamps from lighting. This indicates a serious overtemp condition.
2. Interlock, Lamp Bay door open	The Lamp Bay cover is lifted. Close it and recycle the AC power.
3. Sensor overtemp, lamps off[1]	One of the temperature sensors measured a temperature over its limit (Trip point) *and* the Temperature Sensor control is On.
4. Power supply fan stopped	The power supply fan has failed.
5. Either Exhaust fan stopped	Either exhaust fan has failed.
6. 350V missing	The 350V from the power supply to the lamp ballasts is not there, so the lamps cannot light.
7. Lockout[2]	The system is in the UL Lockout state. Cycle AC power off, then on to reset this.
8. Sensor overtemp, lamps not off[3]	One of the temperature sensors measured a temperature over its limit (Trip point) *and* the Temperature Sensor control is Off. This will not turn off the lamps.
9. Lamp failure, any lamp	At least one of the lamps failed, but not all of them.
10. Sensor approached limit	One of the temperature sensors came within 10 °C of its Trip point.
11. Standby state[4]	The display is in Standby. It is waiting for an On command to turn on the lamps.
12. Lamps on and no alarms	Everything is normal.

[1] Sensor over limit and Temp Monitor is On.

[2] Conditions 1, 2, 4, 5, or 6 will cause Lockout. After fixing the problem, you may see Condition 7, Lockout. You must cycle AC power off, then on to reset the Lockout condition.

[3] Sensor over limit and Temp Monitor is Off.

[4] Unit is waiting for a Lamp On command.

4.2 Controlling the Lamps

You can operate the display with 2, 3, or 4 lamps. If you don't need them all, the others will be there as spares. The system can automatically switch over to a good lamp whenever one fails to ignite. Do not change the Lamp Count rapidly.

The Panther has four lamps, as you know. How many are used depends on the settings in the Lamp Control menu.

To open the **Lamp Control menu** …

1. Press MENU.
2. Select Misc Control and press ENTER.
3. Select Lamp Control and press ENTER.

Lamp Count is the number of lamps wanted, not the number of lamps operating. Set this number with the left-right (– +) buttons to 4, 3, or 2 lamps. Or only one lamp. The Panther will then turn lamps on or off to reach this number of operating lamps.

✎ Do not change the Lamp Count rapidly. It takes about 30 seconds for the system to change the lamp configuration. Changing the lamp count rapidly, before the system has time to respond, can cause the system to get out of step with reality. Do not use this control as a toy.

Lamp Control turns the lamp control on and off. You would only use this in troubleshooting.

- When lamp control is **On**, everything works as it is described in this section.
- When lamp control is **Off**, changing the Lamp Count doesn't do anything. Also, if a lamp goes out, the system will not try to light another one.

Lamp 1 (2, 3, 4) shows the state of each lamp. Each lamp has a state indication.

- **On**: The system needed this lamp and it is on.
- **Off**: The System Did Not Try To Strike This Lamp During The Most Recent On Sequence.
- **Striking**: The system is currently trying to light this lamp. If the lamp is good, this process will take only a few seconds. If the lamp is not good, this could take more than a minute.
- **Failed**: The system tried this lamp, but it would not light.
- **Shutdown**: The system is about to turn this lamp off.

If a lamp fails to light on the first try, and Lamp Control is on, the system waits 30 seconds and tries to ignite that lamp again. It tries three times, so it might take several minutes to get all the lamps lit.

Continual monitoring of lamps

When Lamp Control is on, the system monitors the state of the lamps once per second. If any lamp goes out, it tries to ignite the next spare good lamp.

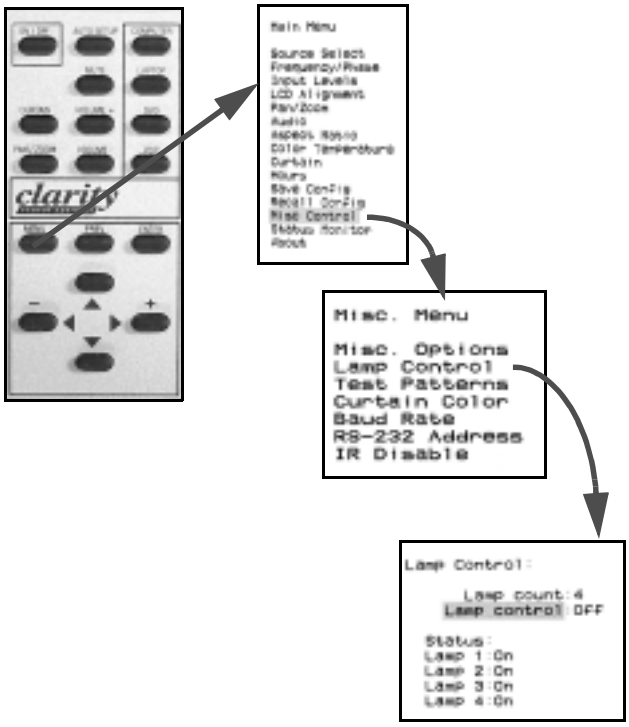
Failed lamps

When the system tries a lamp three times and it does not light, it marks that lamp Failed in the Lamp Control menu and does not try it again.

If AC power is turned off, then on again, the state of all lamps is reset. Whenever you change lamps, you open the Lamp Bay door. This opens the Lamp Bay intrusion switch and prevents the lamps from lighting until the switch is closed *and* AC power is cycled.

Auto Lamp On

In the Misc Options menu set Auto Lamp to On. The lamps will come on soon after the AC power is applied, without waiting for a command.

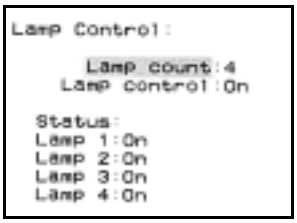


Lamp Ignition Sequence Example*

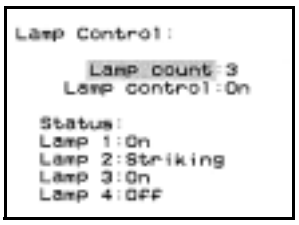
Seconds	Action	Result
00	Lamp ON command	Lamp ignition sequence starts
01	Lamp 1 ignition start	
02	Lamp 2 ignition start	
03	Lamp 3 ignition start	
07	Lamp 1 lit?	Yes
08	Lamp 2 lit?	No. Inquire every one second. If Yes is received, stop ignition sequence.
09	Lamp 3 lit?	Yes
32	Lamp 2 ignition retry	Second try
38	Lamp 2 lit?	No. Inquire every one second. If Yes is received, stop ignition sequence.
62	Lamp 2 ignition retry	Third try
92	Lamp 2 lit?	No; mark as failed; go to next lamp
93	Lamp 4 ignition start	
99	Lamp 4 lit?	Yes

* In this example, Lamp Count is 3, but Lamp 2 will not ignite. Times are approximate.

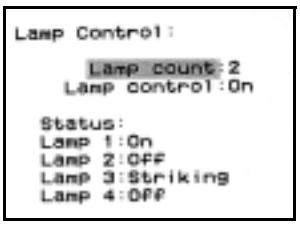
Lamp Bay seen from rear.
Arrow points toward screen.



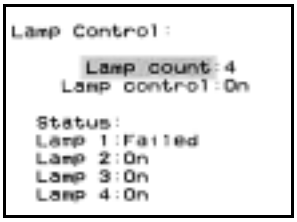
Four lamps requested, and they all turned on.



Three lamps requested. The system is still trying to strike Lamp 2. If this lamp fails, it will try Lamp 4.



With 2 lamps requested, the system uses 1 and 3. If one of these fails, the system tries Lamp 3, then Lamp 4.



The system wanted 4 lamps, but only three work.

4.3 Controlling Audio

The volume is controlled from front panel buttons or the remote control. Either way, the Audio Controls menu opens on the screen.

Audio control from front panel

Beneath the Lamp On/Off button on the front panel there are two volume control buttons.

- Left button is volume down.
- Right button is volume up.

Pressing either button opens the Audio Controls menu on the screen. To control any of the other audio items in this menu, you must use the remote control.

Audio control with remote control

Press either of the Volume buttons on the remote. This raises (or lowers) the volume one step and opens the audio menu.

With the audio menu open, use the up-down arrow keys to select an item and the left-right keys to change the value.

To open the audio menu without changing the volume, press MENU, select Audio, and press ENTER.

Volume raises and lowers the sound level of the internal speakers *and* the external speakers (if you have them connected).

Mute turns off (or on) the sound for internal and external speakers.

Loudness boosts the bass and treble.

Int Spkrs turns off (or on) the internal speakers but leaves the external speakers untouched.

Tone

Treble adjusts the relative volume of the highs.

Bass adjusts the relative volume of the lows.

Balance

Internal adjusts the left-right balance for the internal speakers only.

Line Out adjusts the left-right balance for the external speakers only.

About Line Out

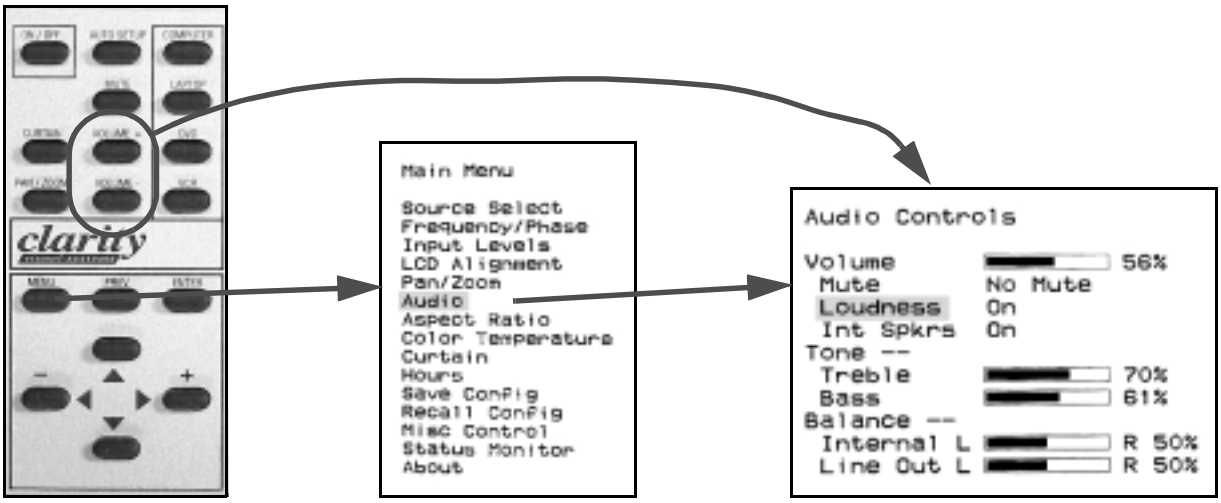
The Line Out connectors are called Variable Line Out because the Volume controls both the internal speakers and external speakers.

Why does the value jump so far?

When you adjust Volume or the other controls, the step size is determined by the audio control chip. These step sizes are not the same for the four controls, so some controls move along faster than others.

The table below shows how many steps there are for each control.

Control	Number of steps
Volume	51
Treble	17
Bass	21
Balance	52



Volume buttons are beneath the panel.

4.4 Reading the Inside LEDs

These LEDs on the electronics module can tell you a lot about the system: Are the fans are running? Are any interlocks are open? Which lamp has failed? But you have to open the rear panel to see them.

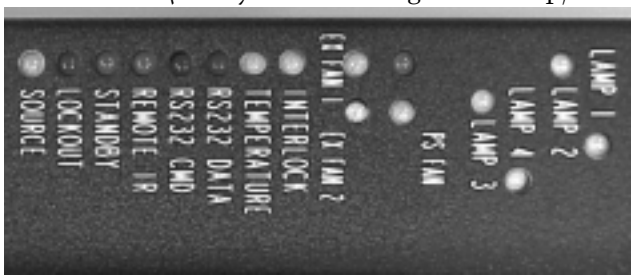
The Diagnostic LEDs are on the electronics module. To see the Diagnostic LEDs, open the screen and raise the cover of the center bay. Near the front (screen side) of the electronics module you will see the LEDs.

To see these LEDs, look from the rear of the Panther.

1. Open the rear panel of the Panther.
2. Observe the LEDs.

Lamp LEDs are arranged in the same pattern as the lamps themselves.

- Off: The lamp is off. Lamp ballast power is not applied, and the lamp is not on.
- Green: The lamp is on. Lamp ballast power has been applied, and the lamp is lit (has not failed).
- Amber: The lamp is not yet on. Lamp ballast power is applied, but the lamp is not lit. If Lamp Control is off, this lamp may have failed.
- Red: The system tried to turn on the lamp, but lamp would not light. Lamp ballast power is not applied, and the lamp did not light the last time it tried to light. The system will not try this lamp again until AC power has been cycled off, then on (after you have changed the lamp).



Fan LEDs indicate the fan's state. To turn on any lamps, the Power Supply Fan and both the Exhaust Fans must be working.

- Green: This fan is running.
- Red: This fan failed, and it caused the lamps to go out. Lamps cannot be lit.

Standby is green when the lamps are ready to light and the display is waiting for an ON command. It is off when the lamps are on.

Interlock: There are two interlocks. One is a switch which opens when the Lamp Bay door opens, and the other is a thermal cutoff switch (not associated with the temperature sensors). If either of these opens, this LED turns red and the lamps will not light. The Interlock LED will turn green when the Lamp Bay door is closed again or the thermal cutoff switch is reset. See Lockout below.

Lockout is red whenever the Interlock LED turns red. As long as it is red, you cannot light the lamps. The only way to turn off the Lockout LED is to cycle the AC power off, then on again. When AC power comes back, the Lockout LED will be off *provided the condition that caused the lockout has been corrected*. These events cause a Lockout condition:

- Lamp Bay door opens
- Intake fan stops when it should be on
- Both exhaust fans stop when they should be on
- Thermal cutoff switch opens
- Overtemp condition occurs, if Temperature Monitoring is on
- All lamps fail

Lockout is green for about 15 seconds after AC power is applied and again immediately after you turn off all lamps. Lamps cannot be turned on during this period.

Temperature: There are four temperature sensors; lamps, LCD, electronics module board, and Air Intake Bay. If any of these exceed a preset limit, this LED turns red. If it approaches close to the limit but does not exceed it, you are warned by an amber LED.

RS232 Data: Stays on green for one second every time an RS232 command is received, whether or not the command was addressed to this cube.

RS232 CMD: Stays on green for one second every time an RS232 command is received that was *addressed to this cube*, whether it is a global com-

mand addressed to all cubes, a specific command: for this cube only, or a command meant for a group that includes this cube.

Remote IR: This LED flickers whenever IR radiation is detected. This LED flickers very briefly, so it is sometimes hard to see.

Power supply LED

Near the AC Master switch there is an LED labeled 'BALLAST POWER.' It indicates that the 370-volt supply for the lamp ballasts is working.

LED Indicators on the Electronics Module

LED	Off	Green	Red	Amber
Lamps	Lamp is off.	Lamp is on.	Lamp has failed and will not be tried again.	Striking, but not lit yet. If Lamp Control is off, and the lamp has failed, the LED will remain amber.
Fans	Fan is off and is supposed to be off.	Fan is running.	Fan has failed; all lamps shut off.	Fan has failed, but lamps do not shut off.
Interlock	No AC power	Normal; interlocks closed	Lamp Bay cover open or thermal cutoff open	
Temperature	No AC power	Normal	Temperature exceeded limit	Temperature approaching limit
RS232 Data		On green for one second when any RS232 data is received		
RS232 CMD		On green for one second when data for this cube is received		
Remote IR		Flickers whenever IR is detected from any source, including Remote		
Standby	Normal (lamps on)	Ready for Lamp ON command		
Lockout	Normal (Standby or lamps on)	Lamps can't be lit during this time; wait for Lockout state to end.	An interlock or other failure event occurred. You must cycle power to reset this Lockout.	
Source	No AC power	Normal; valid source detected	Source not valid or no source	Testing for sync type

4.5 Reading the Status Menus

The Status Monitor menu chain shows lots of information about the current state of the cube.

To see the Status Monitor menus …

1. Press MENU.
2. Select Status Monitor and press ENTER.
3. Select the menu you want to see and press ENTER.

None of these menus have any control, so there is no highlight in any of them.

Cube Status

- Current state of each lamp.
- Lamp Control is on or off (can be changed in the Lamp Control menu, page 70).
- Current state of each fan.
- Whether fan monitoring is on or off. (Service Guide)
- State of the Thermal Interlock.
- Current state of the Lamp Bay door switch (OK means the switch is closed).
- Whether 350 V power is available to the lamp ballasts.
- Whether the interlocks are being monitored to shut off the lamps (normally on).

Setup Summary

This is the same information shown in the Save and Recall detail menus with the addition of the Color Bal, which is saved globally and not in each memory. These number will be different for the three Color Temperature choices. See "Color Temperature" on page 50 and 'How to Save Your Work' on page 62.

Serial Status

- Current setting in the Baud Rate menu (page 88).
- Current RS232 address settings (page 88).
- Number of messages Received and Transmitted for each of the four ports. Port 1 is RS232 In and Out. Port 2 is the Load Date and Trace connectors.
- Bottom four rows show Parity errors (not used), Overrun (of UART capacity), Breaks in reception or transmission, and Framing errors on the two ports. Port 1 is used for ordinary control of the cube. Port 2 is for loading new firmware and monitoring the cube's status.

✎ Pressing ENTER in this menu resets the counts to zero.

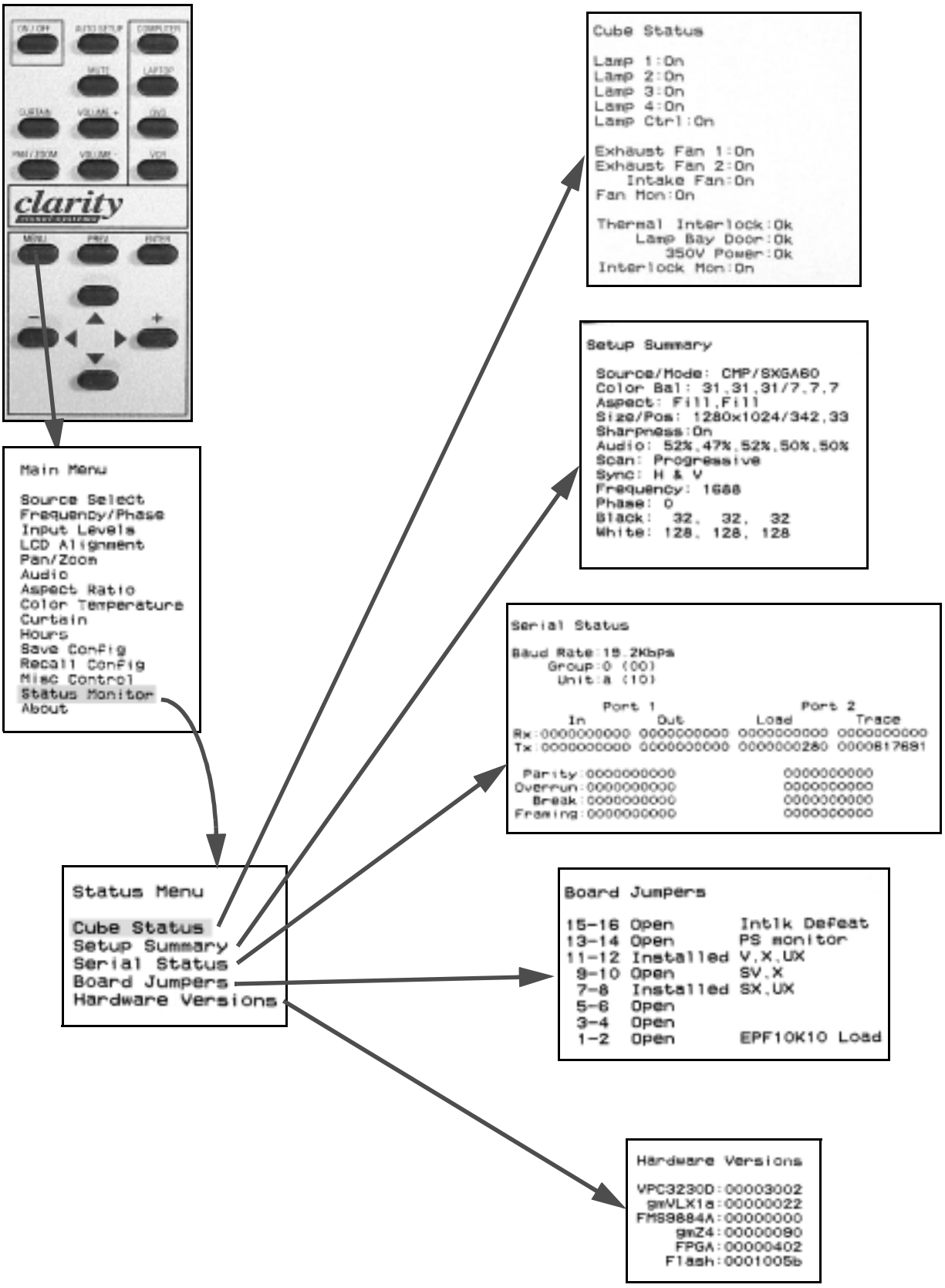
Board Jumpers

These jumpers are on the electronics module board. Some are used to bypassed interlocks for testing purposes. (Don't do it; safety is involved.) The state of each jumper is indicated by the open-installed notice. None of these jumpers are for user control. They are here for information only.

The 7–8 and 11–12 jumpers indicate that this display uses a UXGA LCD. Do not move these jumpers. You cannot change the resolution of the picture with these jumpers.

Hardware Versions

This is for service information only. It shows the version of the main chips in the electronics module.


clarity
MENU
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Status Menu
Cube Status
Setup Summary
Serial Status
Board Jumpers
Hardware Versions
Cube Status
Lamp 1:On
Lamp 2:On
Lamp 3:On
Lamp 4:On
Lamp Ctrl:On
Exhaust Fan 1:On
Exhaust Fan 2:On
Intake Fan:On
Fan Mon:On
Thermal Interlock:Ok
Lamp Bay Door:Ok
350V Power:Ok
Interlock Mon:On
Setup Summary
Source/Mode: CMP/SXGA60
Color Bal: 31,31,31/7,7,7
Aspect: Fill,Fill
Size/Pos: 1280x1024/342,33
Sharpness:On
Audio: 52%,47%,52%,50%,50%
Scan: Progressive
Sync: H & V
Frequency: 1688
Phase: 0
Black: 32, 32, 32
White: 128, 128, 128
Serial Status
Baud Rate:19.2Kbps
Group:0 (00)
Unit:a (10)
Port 1
Port 2
In
Out
Load
Trace
Rx:0000000000 0000000000 0000000000 0000000000
Tx:0000000000 0000000000 0000000280 0000817891
Parity:0000000000 0000000000
Overrun:0000000000 0000000000
Break:0000000000 0000000000
Framing:0000000000 0000000000
Board Jumpers
15-16 Open Intlk Defeat
13-14 Open PS monitor
11-12 Installed V,X,UX
9-10 Open SV,X
7-8 Installed SX,UX
5-6 Open
3-4 Open
1-2 Open EPF10K10 Load
Hardware Versions
VPC3230D:00003002
gmVLX1a:00000022
FMS9884A:00000000
gmZ4:00000090
FPGA:00000402
Flash:0001005b

4.6 The Hours Menu

The Lamp Hours menu helps you keep track of lamp life.

To open the Hours menu:

1. Press MENU on the remote.
2. Highlight Hours and press ENTER.

The Hours menu shows the time in hours and minutes for three groups:

- **System Hours** shows how long the electronics module has received power. This is essentially the number hours the AC power has been on. You cannot reset this. (If the electronics module is replaced, it will start with System Hours near zero.)
- **Runtime Hours** shows how long any lamps have been on, essentially showing how long the optical parts in the light tower and the optical engine have been used. You cannot reset this.
- **Lamp Hours** *should* show how long the lamp has been used. You *can* reset these times.

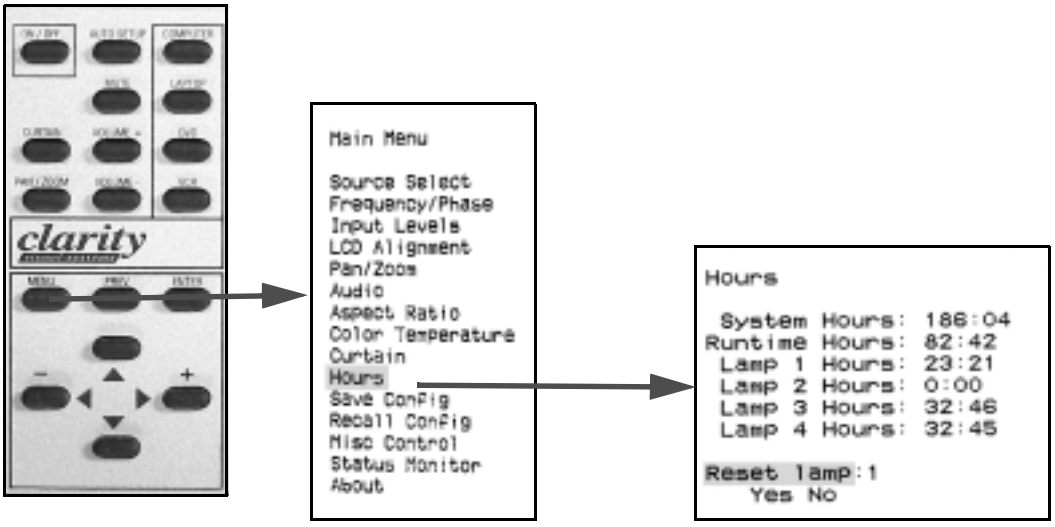
Lamp Hours will only be accurate if you take care to reset the hours when the lamp is changed, and *not* reset hours otherwise.

✎ Lamps are not warranted to last for any particular number of hours. A lamp life of 6,000 hours means that half the lamps in a large sample will last at least that long. It does not guaranty that any individual lamp will last that long.

Resetting Lamp Hours

1. Open the Hours menu. 'Reset lamp' is highlighted.
2. Press ENTER to move the highlight to No.
3. Press the – (left) arrow key to highlight Yes.
4. Press ENTER.

✎ There is no 'undo' for Lamp Hours.


clarity
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Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Hours
System Hours: 186:04
Runtime Hours: 82:42
Lamp 1 Hours: 23:21
Lamp 2 Hours: 0:00
Lamp 3 Hours: 32:46
Lamp 4 Hours: 32:45
Reset lamp:1
Yes No

4.7 Setting Some Conditions

Here are the settings you can change to suit your application.

Press MENU, select Misc Options and press ENTER to open the **Misc. Menu** menu. To change any item, highlight it and press ENTER.

Sharpness: The default conditions is on for analog sources, and that's the best. It is grayed out for digital video sources where it would have no effect. When Sharpness is off, the picture goes through a low pass filter.

Beeper: When this is on, the system beeps every time a button is pressed, and beeps continually when a button is held down. When Off, the system only beeps for three conditions:

- Lamp On command from the remote
- Lamp Off command from the remote
- (See also **Triple beep** on this page.)

Horz Flip reverses the image left and right when you press ENTER. It is usually set to Norm, but you can change it to Flip if you need to.

Auto Lamp, when on starts to strike the lamps very soon after AC power is acquired, without waiting for a Lamp On command. In most applications for Panther, it is best to leave it off. If AC power is lost, the lamps are ignited soon after it power is restored. If Auto Lamp is Off, the system waits for a command from the remote or from RS232 before igniting the lamps.

Lamp Control is discussed in 'Controlling the Lamps' on page 70. It should normally be left on.

Test Patterns are discussed in 'Test Patterns' on page 84.

Curtain Color is described in 'Curtain and Its Colors' on page 82.

Baud Rate in kilobytes per second, is the data rate that the RS232 Input and Output ports use. This does not matter if you are not using RS232 control. The correct rate, matching the computer's rate, must be set in each display manually with this menu. The RS232 port *does not* automatically detect the incoming rate, as modems often do. See 'Controlling the Displays with RS232' on page 88 for more information.

✎ The rate set in this menu does not effect the baud rates for the Trace and Load Data connectors. These are always 115.2 Kbps.

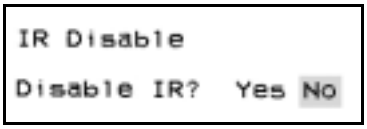
Address Select sets the RS232 address of this display cube. This does not matter if you are not using RS232 control. This is the only place where you can set the RS232 address. If you do not use RS232 control, this address does not matter. If you do use RS232, see 'Controlling the Displays with RS232' on page 88 and 'Sending RS232 Commands' on page 90 for a complete description of the system and its protocol.

Mode Detect

See a complete discussion in 'What Mode Detect Does' on page 60.

IR Disable

Press MISC seven times to open the IR Disable menu. If you select Yes and press ENTER, the menu



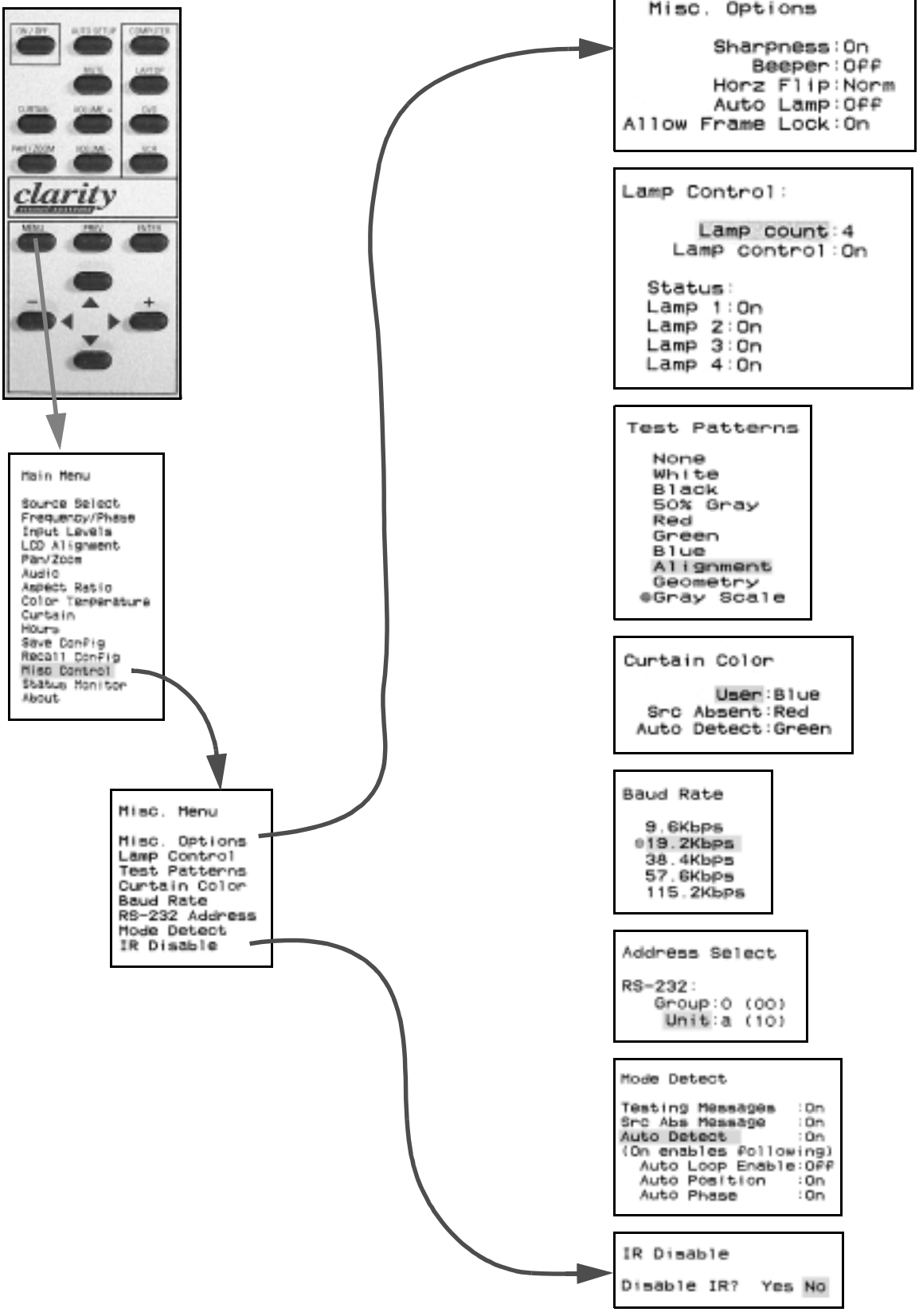
disappears and almost all remote control buttons are disabled. This is useful to prevent accidental changes to the settings. The Lamp Off button will still turn off the lamps in this condition, and when they are turned back on, IR is not disabled.

To enable IR control again without having to turn off and on the lamps, press ENTER. The IR Disable menu opens with the highlight on No. Press ENTER again, and all remote buttons operate normally.

Triple beep

The Panther will triple beep if you try to give it a command from the remote control that it cannot do. For instance, pressing MENU with the lamps off will produce a triple beep. Some of the triple-beep signals will happen even when the Beeper is off.

✎ To make a selection in a menu that has a red dot move the highlight to your choice and press ENTER.


clarity
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ENTER
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Misc. Menu
Misc. Options
Lamp Control
Test Patterns
Curtain Color
Baud Rate
RS-232 Address
Mode Detect
IR Disable
Misc. Options
Sharpness:On
Beeper:Off
Horz Flip:Norm
Auto Lamp:Off
Allow Frame Lock:On
Lamp Control:
Lamp count:4
Lamp control:On
Status:
Lamp 1:On
Lamp 2:On
Lamp 3:On
Lamp 4:On
Test Patterns
None
White
Black
50% Gray
Red
Green
Blue
Alignment
Geometry
•Gray Scale
Curtain Color
User:Blue
Src Absent:Red
Auto Detect:Green
Baud Rate
9.6Kbps
•19.2Kbps
38.4Kbps
57.6Kbps
115.2Kbps
Address Select
RS-232:
Group:0 (00)
Unit:a (10)
Mode Detect
Testing Messages :On
Src Abs Message :On
Auto Detect :On
(On enables following)
Auto Loop Enable:Off
Auto Position :On
Auto Phase :On
IR Disable
Disable IR? Yes No

4.8 Curtain and Its Colors

Curtain, when on, blocks the source picture and displays instead a solid color on the screen. There are three conditions under which this might occur.

Curtain is a control that covers (blocks) the incoming picture with either black or a selected color. Curtain is active (on) under these conditions:

- **User**: when you manually turn Curtain on with the Curtain button or through the main menu;
- **Src Absent**: when there is no picture from the selected source (Source Absent), or when this picture is invalid (which is also considered to be Source Absent);
- **Auto Detect**: while the system is trying to acquire the incoming picture, searching for its type of sync.

In each of these situations, the Panther covers the screen with black or with a color you choose: red, green, blue, black or white.

The User color is also used as the background for Aspect Ratio. When the Image Fit is *not* set to fill-fill, part of the screen may be filled with the User color.

To set Curtain colors

1. Press MENU.
2. Highlight Curtain and press ENTER.
3. Highlight Curtain Colors and press ENTER.
4. Select the condition and press ENTER.
5. Select the color.
6. Press PREV to return to back up and select another condition, or press PREV several times to back out of the all menus.

For most applications, the screen should be black under each of these conditions, and this is the default setting. However, you may set them differently so you will know what the Panther was doing.

To turn the Curtain on or off

- Press CURTAIN on the remote to toggle the curtain on or off.

—or—

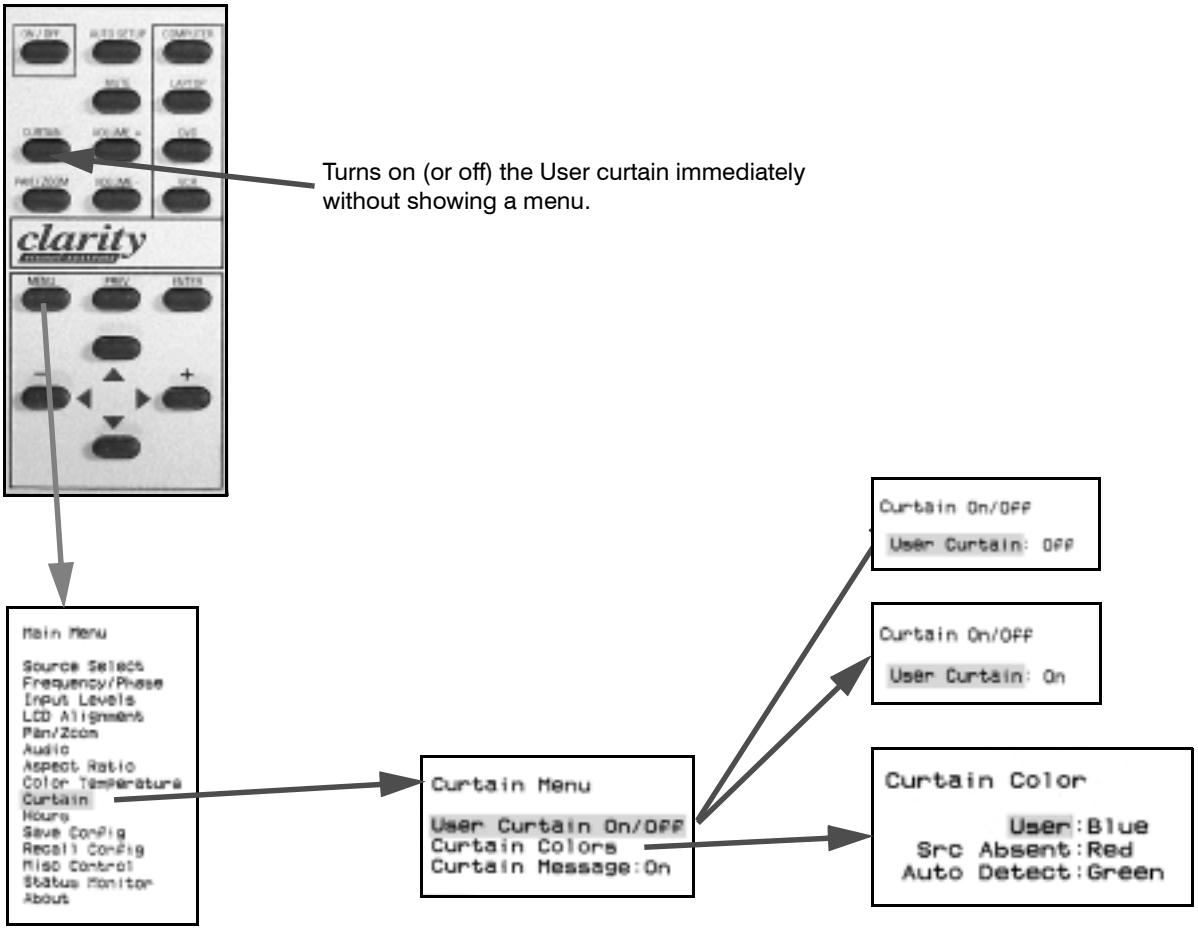
- Press MENU, select Curtain, press ENTER, select User Curtain On/Off, press ENTER, press ENTER again to toggle the curtain on or off.

Curtain Message

When Curtain Message is On, a notice appears on the screen whenever the User Curtain is on.

Test Patterns

Test patterns constitute a fourth type of curtain. When you turn on a test pattern, the incoming video is blocked, just as it is with the three types of curtain described above. The Test Pattern overrides all curtain types. That is, when you turn on a test pattern, you see the test pattern, not the curtain color.


Turns on (or off) the User curtain immediately without showing a menu.
clarity
MENU
PREV
ENTER
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Curtain Menu
User Curtain On/OFF
Curtain Colors
Curtain Message:On
Curtain On/OFF
User Curtain: OFF
Curtain On/OFF
User Curtain: On
Curtain Color
User:Blue
Src Absent:Red
Auto Detect:Green

4.9 Test Patterns

The Test Patterns available in the menus are internal patterns. They cannot be used for Black and White Level adjustments or Frequency and Phase.

Test patterns are internally generated. When you turn on a test pattern, the selected source picture is blocked. To show the picture again, you have to turn the test pattern off.

To display a test pattern

1. Press MENU on the remote
2. Select MISC and press ENTER.
3. Select Test Patterns and press ENTER.
4. To change patterns, move the highlight up or down with the arrow keys, then press ENTER.
   - The pattern does not appear until you press ENTER.
   - The red dot shows which pattern is on.
   - While a test pattern is on, you can press PREV to turn off the menu and the pattern will remain.

To turn off a test pattern

1. Press MENU.
2. Select MISC and press ENTER.
3. Select Test Patterns and press ENTER.
4. Use the up or down arrow to move the highlight to **None**.
5. Press ENTER. This turns off the test patterns and displays the selected source picture on the screen. (If the source picture is not visible when the Test Pattern menu says None, one of the curtains is on.)

Using Test Patterns

None means no test pattern is used and the source picture is displayed.

White is used for color balancing. You can turn on White from the Color Balance menu. White can also be used to look for pixels that are stuck off.

Black is used to look for pixels that are stuck on.

50% Gray is also used for color balancing, and you can turn it on from the Color Balance menu.

Red, Green, and Blue can be used to look for stuck pixels.

Alignment is used to adjust the position and size of the LCD's image. This pattern has a series of short dashes all around the edge of the picture. The dashes indicate the outside six pixels on each edge.

Geometry is used to adjust the position and size of the LCD's image. When you highlight Geometry and press ENTER, the screen may start with random pixels. Then a 4×4 grid is painted from the top down. The lines in the interior are one pixel wide, and the outside edges are three pixels wide.

Gray Scale can show if there are any bit missing in the data from the electronics module to the LCD. The pattern should progress from dark to light with no vertical bands of a lighter or darker shade interrupting the pattern.

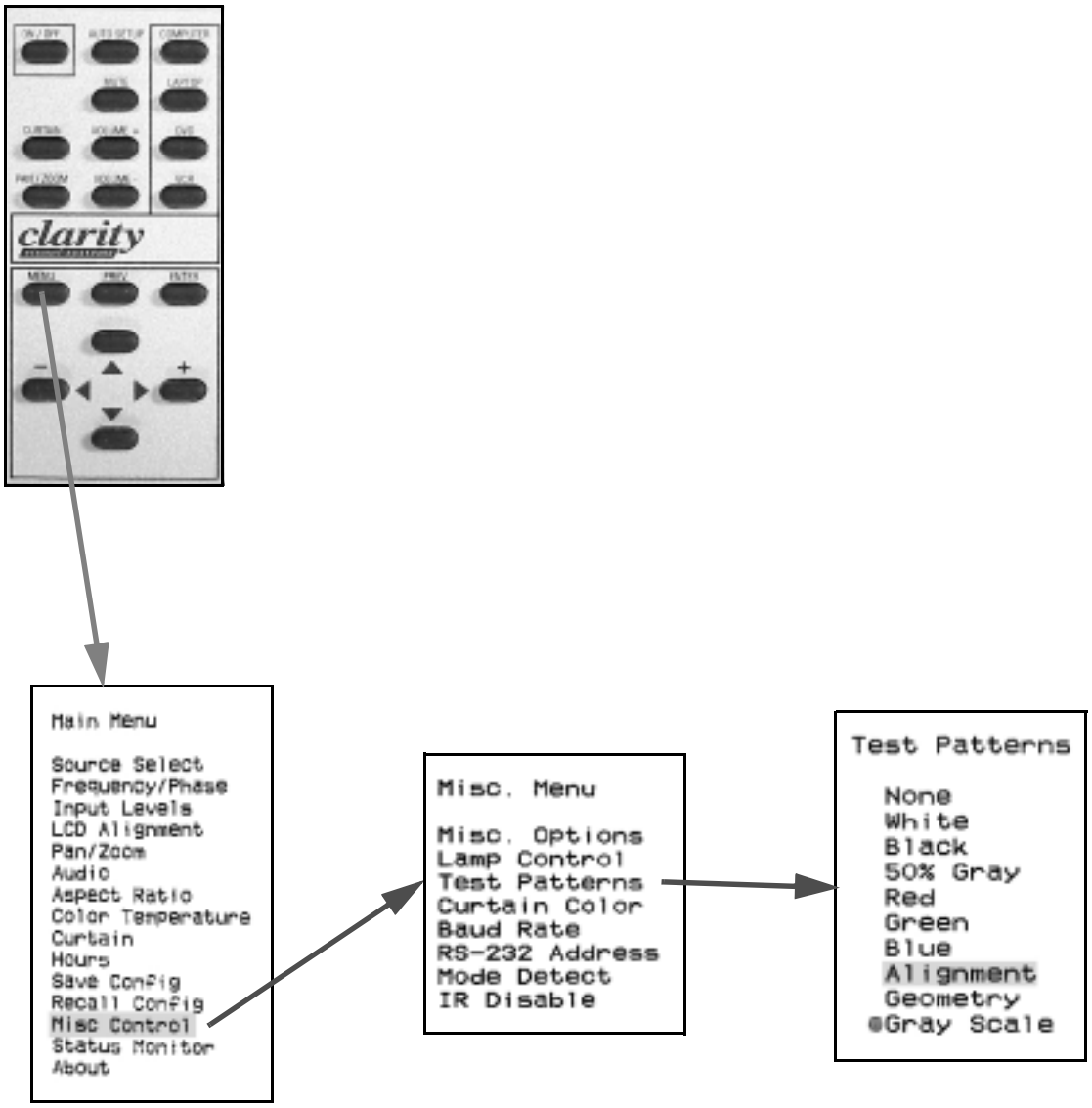
About Alignment and Geometry patterns

The Alignment and Geometry test patterns, which are the same as Alignment Dashes and Geometry Pattern in the LCD Alignment menu, take several seconds to display. They must be drawn eight pixels at a time.

In the Alignment pattern you may see only three dashes on the left side of the screen, no matter how where the LCD is horizontally. If this happens, highlight Alignment in the Test Patterns menu and press the + or – a few times to make all six dashes appear.

If the left side border in the Geometry Pattern is only two pixels wide, highlight Geometry Pattern and press the + or – buttons to fix it.

✎ Be sure to set Test Patterns to None when you are finished with them. Otherwise, no source pictures can be displayed.


clarity
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Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Misc. Menu
Misc. Options
Lamp Control
Test Patterns
Curtain Color
Baud Rate
RS-232 Address
Mode Detect
IR Disable
Test Patterns
None
White
Black
50% Gray
Red
Green
Blue
Alignment
Geometry
Gray Scale

5 Controlling with RS232 Commands

5.1 Controlling the Displays with RS232

Panthers can be controlled individually or in groups with RS232 commands. Each display must have a unique address. Each cube and the computer used for command must have the same baud rate setting. Baud rate is not automatic, as it is in modems. If your installation does not control the display with RS232 commands, skip this entire chapter.

To control lots of displays with RS232 commands, each display must have a unique RS232 address. The cube's address consists of two hexadecimal numbers:

- first digit: Group
- second digit: Unit

These two digits together make one address. There are 256 unique possible addresses.

To set the baud rate

1. Press MENU.
2. Select Misc Control and press ENTER.
3. Select Baud Rate and press ENTER. This opens the Baud Rate menu.
4. Highlight the baud rate that the computer uses at its Comm Port and press ENTER.

✎ The baud rate of the computer and the display must be the same. The display does not automatically detect the baud rate, as most modems do.

To set the address of a cube

1. Press PREV to go back to the Misc. Menu. (Or press MENU > Misc Control ENTER > RS232 Address ENTER. This opens the Address Select menu.
2. Highlight Group, and use the left/right arrow keys to change the Group Address. Range: 0–15, which is 0–f in hexadecimal notation.
3. Highlight Unit and choose Unit Address for this cube.

✎ The addresses are shown in both hex (0–9, a–f) and decimal (00–15). When sending commands to cubes with RS232, you always use the hex form of the address.

4. Press PREV the menus.

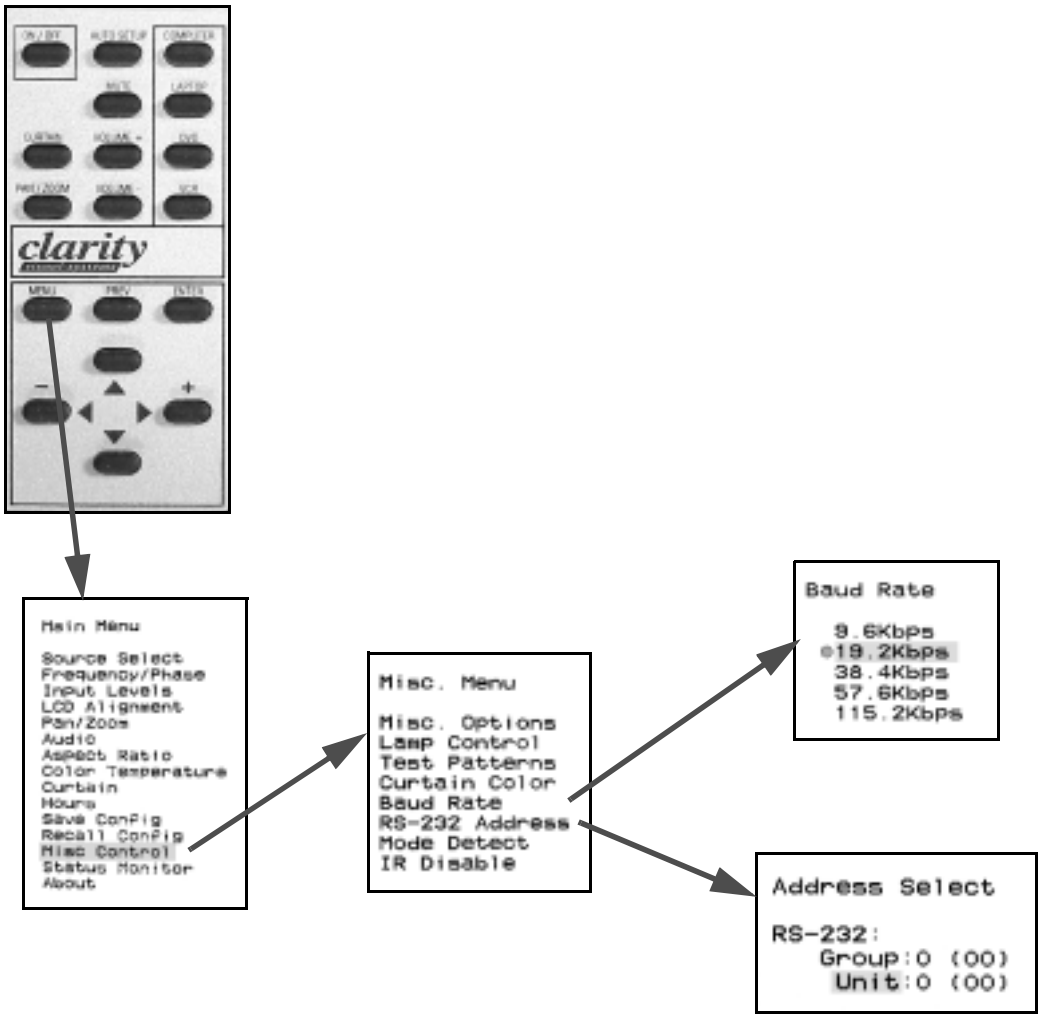
What address to use

You may address the cubes with any addressing scheme you choose, but here are some things to keep in mind:

- You can send a single command to all the cubes that have the same first digit. Example: You might have two video walls, one with 0 as the first number in the address, and one with 1 as the first number. This is called **group addressing**.
- You can send a single command to all the cubes that have the same last digit. Example: You can address all the cubes that have 3 as the second digit. This is called **unit addressing**.
- You can send a single command to all the cubes in all the walls. This is called **global addressing**.
- You can send a command to one cube alone. This is called **single addressing**.

How you construct commands to address cubes in these different ways is explained in the next section, 'Sending RS232 Commands' on page 90.

One thing you cannot do is change a cube's address with RS232 commands. You can't send an RS232 command to cube 17 and tell it to have address 18. You can only change addresses with the remote control.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Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
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Recall ConFig
Misc Control
Status Monitor
About
Misc. Menu
Misc. Options
Lamp Control
Test Patterns
Curtain Color
Baud Rate
RS-232 Address
Mode Detect
IR Disable
Baud Rate
9.6Kbps
19.2Kbps
38.4Kbps
57.6Kbps
115.2Kbps
Address Select
RS-232:
Group:0 (00)
Unit:0 (00)

5.2 Sending RS232 Commands

RS232 commands must have the specific form described here. The baud rate of the computer must match the rate of the display.

Every command must start and end with special characters.

- **Start** character: hex 02, which sometimes it prints as the ☺ character.
- **End** character: hex 03, which sometimes prints as the ♥ character.

Between the start and end of an RS232 command, there are two parts:

- **Address**: 2 bytes, 00 through FF, hex numbers, which equal 0 to 255 decimal.
- **Command**: 3 bytes, text and binary numbers, listed in 'RS232 Command List' on page 94.

Four types of addresses

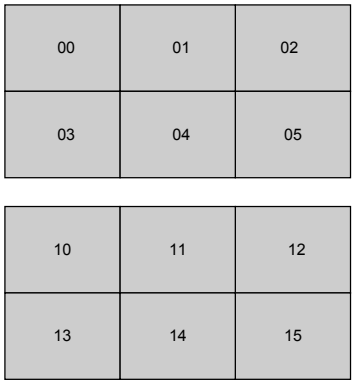
The rest of this section does not apply to most Panther installations, because most Panthers are single units, and you can safely leave the RS232 address at 00.

The address of each cube is set in the Address Select menu. Each cube in a system *must* have a different address.

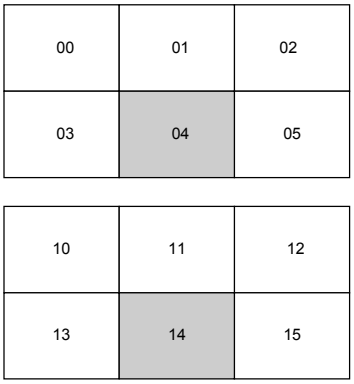
Normally, all cubes in a system are looped together for RS232 control, so several separate video walls may be joined in a single, long, RS232 loop. In such an arrangement, cubes can be addressed singly, in small groups, or they can all be addressed together.

In the following illustrations, all 12 cubes are strung together in one RS232 loop, so they can all 'hear' the same commands.

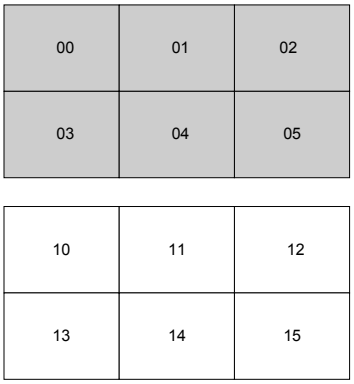
When the command uses a **global address**, all the cubes obey the command, regardless of their addresses. In the command ☺**PON♥, all cubes in both video walls turn on their lamps. A '*' is a wild-card and means 'any.' (PON is the command to turn on the lamps.)



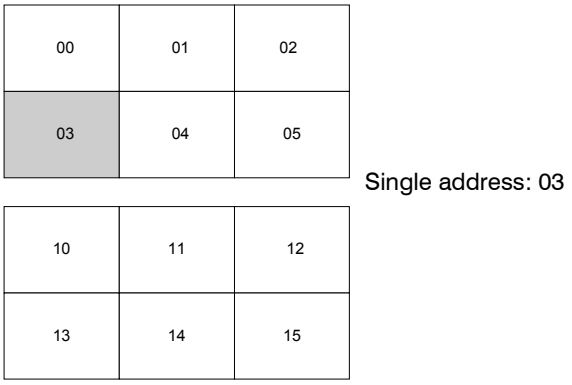
In **unit address**, all cubes with the same *last* digit obey the command. The first digit is a wildcard. In the command ☺*4PON♥, all cubes with an address ending in 4 turn on their lamps.



In **group address**, all cubes with the same *first* digit obey the command. In the command ☺0*PON♥, all the cubes with an address starting in 0 turn on their lamps.



In **single address**, only one cube responds to the command. Here, the command is ☺03PON♥. Only cube 03 turns on its lamps.



In single address, and *only in single address*, the cube responds to the computer, acknowledging the command.

Acknowledging commands

A cube acknowledges a command *only* if the command is addressed to it individually—no '*' in the address. The acknowledgment can take several forms:

- ACK means 'I heard the command and I will attempt to execute it.' It will try to turn on the lamps, for instance, but it may not be successful. Maybe there are no lamps in the cube to turn on.
- NAK means 'I heard the command, but I can't do it.' The cube can't turn on the lamps during the Lockout Period.
- UNK means 'This command is unknown to me.' POJ doesn't mean anything to the cube.
- ERR means 'This command has an error in it.' This often means the binary number in the command is out of range.
- If the command asks for a value, such as BR$, meaning 'What is your White Color Balance adjustment level for Red?' the cube will also respond with a value, either a binary number or an ascii character, as appropriate.

How to send commands

Each serial communications system has its own way of sending hex values. In AnyComm, a Shareware program available on Clarity's website, the dollar sign indicates that a hex value follows. So,

$02$30$34$$57$58$03$03

which means:

- $02 – the start character
- $30$34 – the cube with address 04
- $57$58$03 – the hex values for the characters WX and the hex value of 3 to set this cube's wall width to 3 cubes wide. (All RS232 commands use upper case letters, never lower case.)
- $03 – the end character

Other communications systems use different ways to indicate hex values.

- \x (backslash x)
- 0x (zero x)

Check with the instructions for the system you are using.

Table of ASCII Hex Values

Dec	Hex	Char		Dec	Hex	Char		Dec	Hex	Char		Dec	Hex	Char
0	00			32	20	Space		64	40	**@**		96	60	`
1	01			33	21	!		65	41	**A**		97	61	a
2	02	start		34	22	"		66	42	**B**		98	62	b
3	03	end		35	23	#		67	43	**C**		99	63	c
4	04			36	24	$		68	44	**D**		100	64	d
5	05			37	25	%		69	45	**E**		101	65	e
6	06			38	26	&		70	46	**F**		102	66	f
7	07			39	27	'		71	47	**G**		103	67	g
8	8			40	28	(		72	48	**H**		104	68	h
9	9			41	29	)		73	49	**I**		105	69	i
10	0A			42	2A	*		74	4A	**J**		106	6A	j
11	0B			43	2B	+		75	4B	**K**		107	6B	k
12	0C			44	2C	,		76	4C	**L**		108	6C	l
13	0D			45	2D	-		77	4D	**M**		109	6D	m
14	0E			46	2E	.		78	4E	**N**		110	6E	n
15	0F			47	2F	/		79	4F	**O**		111	6F	o
16	10			48	30	0		80	50	**P**		112	70	p
17	11			49	31	1		81	51	**Q**		113	71	q
18	12			50	32	2		82	52	**R**		114	72	r
19	13			51	33	3		83	53	**S**		115	73	s
20	14			52	34	4		84	54	**T**		116	74	t
21	15			53	35	5		85	55	**U**		117	75	u
22	16			54	36	6		86	56	**V**		118	76	v
23	17			55	37	7		87	57	**W**		119	77	w
24	18			56	38	8		88	58	**X**		120	78	x
25	19			57	39	9		89	59	**Y**		121	79	y
26	1A			58	3A	:		90	5A	**Z**		122	7A	z
27	1B			59	3B	;		91	5B	[		123	7B	{
28	1C			60	3C	<		92	5C	\		124	7C	|
29	1D			61	3D	=		93	5D	]		125	7D	}
30	1E			62	3E	>		94	5E	^		126	7E	~
31	1F			63	3F	?		95	5F	_		127	7F	DEL

5.3 RS232 Command List

This is a complete list of the RS232 commands that you can use. Some commands must be used in pairs to accomplish the change required. Two indexes of RS232 commands follow this section: 'Index of RS232 Commands' on page 102 and 'Index of RS232 Codes' on page 104. For ascii values, see 'Table of ASCII Hex Values' on page 92

Increment and **Decr**ement: For toggle commands, such as Lamp On / Lamp Off, Incr turns it on, Decr turns it off. For adjustable quantities, such as H-Position, Incr increases the value one step, Decr decreases it one step.

Get is an inquiry that must *always* be addressed to a single cube. (Cubes do not respond when they are addressed in groups.) The answer is returned as a binary (hex) number or as text, as noted.

***** the ascii character which asks an ascii character in the response

$ the ascii character which asks for binary (hex) data in the response

Set is followed by a value in binary (hex) or ascii text, as noted. Set commands can be addressed to individual cubes or to groups.

@ substitute an ascii character for this symbol in the command line

substitute a binary (hex) value for this symbol in the command line

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
System Controls						
1	Lamp On / Off	PON	POF	PO*		State of system (responses to PO*) PON = Run POU = UL lockout; cycle power POX = Timed lockout; wait POF = Standby PO1 = Ignition PO2 = Waiting for power PO3 = Restrike PO? = Unknown
2	Frequency Adjust	FRU	FRD	FR$	FW#	# = –128 to 127
3	Phase Adjust	PHU	PHD	PR$	PW#	# = 0–31
4	V-Position Up / Down	VPU	VPD			To Get/Set V-Position, Get/Set Zoom Top Edge. For H-Position, Zoom Left Edge.
5	H-Position Left / Right	HPL	HPR			
6	H-Image Control Normal / Flip	HF0	HF1	HF*		0 = normal, 1 = flip
7	Curtain on/off	CON	COF	CO*		CON = on, COF = off
8	Curtain Color			CC$	CC#	1 = red 2 = green 3 = blue 4 = black 5 = white
9	Sharpness	SON	SOF	SO*		SON = on, SOF = off
10	Buzzer	BON	BOF	BO*		BON = on, BOF = off
11	IR Remote Enable / Disable	ION	IOF	IO*		ION = on, IOF = off
12	Lamp Control			LO*	LO@	0 = off, 1 = on

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
13	Lamp Count (Set lamp count to number of lamps desired.) Lamp Mask (Get 'mask' of which lamps are supposed to be on. See also, Lamp Status, for actual state of each lamp.)			LC$	LC#	Set # = binary (hex) 1–4 Get $ is a bit mask showing which lamps are enabled, not how many. Does not determine which lamps are actually on. (See Lamp Status command) F in hex = 1111 binary, all lamps 7 in hex = 0111 binary, lamps 1, 2, 3 5 in hex = 0101 binary, lamps 1 & 3 Etc.
14	Lamp Status			LA@		Send LA@, where @ is lamp number, 1–4 Responses are: LAN = lamp on LAF = lamp off LAK = lamp striking LAS = lamp shutting down LAD = lamp failed
15	Read Lamp Hours			L@$ (see Comments)		Requires two commands to get value: L1$ = Get Lamp 1 high byte L2$ = Get Lamp 1 low byte L3$ = Get Lamp 2 high byte L4$ = Get Lamp 2 low byte L5$ = Get Lamp 3 high byte L6$ = Get Lamp 3 low byte L7$ = Get Lamp 4 high byte L8$ = Get Lamp 4 low byte
16	Lamp Hours Reset	LR@				Reset Lamp Hours to zero @ = Lamp number, or S = all lamps
17	Read System Hours (low byte)			TL$		
18	Read System Hours (high byte)			TH$		
19	Read Runtime Hours (low byte)			RL$		
20	Read Runtime Hours (high byte)			RH$		

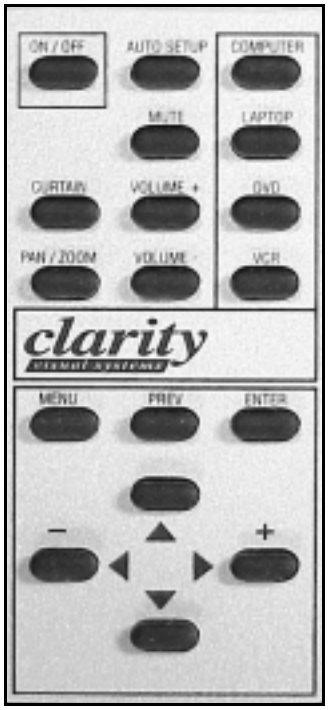
Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
Source and Save / Recall						
21	Select Input			IN*	IN1 IN2 IN3 IN4 IN5 IN6	1 = Analog 1 2 = Analog 2 3 = Digital 4 = (not used) 5 = C-Video 6 = S-Video Enter Set values as text
22	Select Mode for Analog 1, Analog 2 and Digital			IM$	IM#	0 = VGA 60Hz 1 = VGA 72Hz 2 = VGA 75Hz 3 = VGA 85Hz 4 = SVGA 56 Hz 5 = SVGA 60Hz 6 = SVGA 72Hz 7 = SVGA 75Hz 8 = SVGA 85Hz 9 = XGA 60Hz 10 = XGA 70Hz 11 = XGA 75Hz 12 = XGA 80Hz 13 = XGA 85Hz 14 = SXGA 60Hz 15 = SXGA 75Hz 16 = SXGA 85Hz 17 = UXGA 60Hz 22 = Mac 640 × 480 67Hz 23 = Mac 832 × 624 75Hz 24 = VESA 720 × 400 70Hz 25 = VESA 720 × 400 85Hz 26 = HDTV 1080i, 60Hz 27 = HDTV 720p, 60Hz 28 = 1024 × 1024
23	Select Mode for Composite and S-Video			IM$	IM#	29 = NTSC 30 = PAL 31 = SECAM
24	Save in numbered memory				SA#	Memory numbers 1 through 14
25	Recall numbered memory				RC#	
26	Save global settings				SAA	Saves all settings not assigned to memory numbers.
27	Auto Save	SV0	SVW1	SV*		0 = off, 1 = on
28	H in V sync	HV1	HV0	HV*		0 = off: no H in V sync; prevents system from sensing 'no H in V sync' as a fault 1 = Normal: H is in V sync

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
Input Level						
29	Auto-adjust White Input Level	AWL				
30	Input White Level Adjust ALL	LAU	LAD		IA#	# = 0–255
31	Input White Level Adjust Red	LRU	LRD	LR$	IR#	
32	Input White Level Adjust Green	LGU	LGD	LG$	IG#	
33	Input White Level Adjust Blue	LBU	LBD	LB$	IB#	
34	Auto-adjust Black Input Level	ABL				
35	Input Black Offset Adjust ALL	OAU	OAD		QA#	# = 0–255
36	Input Black Offset Adjust Red	ORU	ORD	OR$	QR#	
37	Input Black Offset Adjust Green	OGU	OGD	OD$	QG#	
38	Input Black Offset Adjust Blue	OBU	OBD	OB$	QB#	
39	Input Level Data Red			DR$		Read red sample in FPGA
40	Input Level Data Green			DG$		Read green sample in FPGA
41	Input Level Data Blue			DB$		Read green sample in FPGA
Move Sample Point						
42	X coordinate			BX$	AX#	# = 0–255
43	Y coordinate			BY$	AY#	# = 0–255
44	Sample point disable/enable	DR0	DR1			DR0 disables sample point; uses last sample values. DR1 enables new data from the sample point.
Color Balance						
45	Color Temperature			CT*	CT@	C = Cool N = Normal W = Warm ? = custom color balance setting (only in response to CT*)
46	Red Color Balance Adjust (white)	BRU	BRD	BR$	CR#	# = 0–31
47	Green Color Balance Adjust (white)	BGU	BGD	BG$	CG#	
48	Blue Color Balance Adjust (white)	BBU	BBD	BB$	CB#	
49	Red Color Balance Adjust (gray)	GRU	GRD	GR$	RR#	# = 0–15
50	Green Color Balance Adjust (gray)	GGU	GGD	GG$	RG#	
51	Blue Color Balance Adjust (gray)	GBU	GBD	GB$	RB#	
52	Gamma Control	GON	GOF	GO*		1 = on, 0 = off
Auto Detect						
53	Auto Detect	AT0	AT1	AT*		0 = Auto Detect off 1 = Auto Detect on 2 = Actuate Auto Detect one time
54	Source Absent Message	AS0	AS1	AS*		0 = Source Absent messages off 1 = Source Absent messages on
55	Curtain Message	CM0	CM1	CM*		0 = off, 1 = on
56	Auto Message	AM0	AM1	AM*		0 = Auto Detect messages off 1 = Auto Detect messages on

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
57	Auto Frequency/Phase			AF*	AF@	0 = turn off Auto Freq/Phase 1= Auto Freq/Phase on (works only if Auto Detect is on) 2 = Activate Auto Freq/Phase one time
58	Auto Position			AP*	AP@	0 = Auto Position off 1 = Auto Position on (works only if Auto Detect is on) 2 = Activate Auto Position one time
59	Enable / Disable Auto Re-strike	LF1	LF0	LF*		LF1 = auto re-strike active LF0 = auto re-strike inactive
Test Signals						
60	Test Signal Disable (pass video)	TSD				TSD removes test signal, displays video.
61	Test Signal - White Field	WHT				
62	Test Signal - Black Field	BLK				
63	Test Signal - 50% Gray Field	GRY				
64	Test Signal - Red Field	RED				
65	Test Signal - Green Field	GRN				
66	Test Signal - Blue Field	BLU				
67	Test Signal - Alignment	GE1				
68	Test Signal - Geometry	GE2				
69	Test Signal - Gray Scale	GE3				
70	Test Signal - inquiry			TS$		0 = none, 1 = black, 2 = 50% gray, 3 = white, 4 = red, 5 = green, 6 = blue, 7 = alignment, 8 = geometry
71	Test Signal - Data Red				TR#	Set test signal red level 0–255
72	Test Signal - Data Green				TG#	Set test signal green level 0–255
73	Test Signal - Data Blue				TB#	Set test signal blue level 0–255
Temperature, Fans, Motors,						
74	Temperature Sensors			T@$ (see Comments)		@ = Temperature Sensor 1–4 Response is binary °C temp of sensor *
75	Fan Status			FS*		Get Fan status (1 bit for each fan) 0 = Power Supply Fan 1 = Exhaust Fan 1 2 = Exhaust Fan 2
76	LCD Motor, motorRight Edge	M1F	M1B			The directions F / B (Forward / Back) indicate the direction of motor movement, but not the direction of image movement.
77	LCD Motor, Horizontal	M2F	M2B			
78	LCD Motor, Left Edge	M3F	M3B			
Aspect Ratio						
79	Aspect Ratio Horizontal			AC$	AC#	0 = fill 1 = left 2 = center 3 = right

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
80	Aspect Ratio Vertical			AD$	AD#	0 = fill 1 = top 2 = middle 3 = bottom
Zoom Control						
81	Zoom All Edges	ZAI	ZAO			Zoom all edges: I (letter) = In, O = Out
82	Zoom, Left Edge	ZLU	ZLD			After all 8 settings have been sent, send XGO (letter O) to 'make it so.' If the high byte is zero, it does not need to be sent.
83	Get/Set Left Edge (high byte)			Z0$	X0#	
84	Get/Set Left Edge (low byte)			Z1$	X1#	
85	Zoom, Right Edge	ZRU	ZRD			
86	Get/Set Right Edge (high Byte)			Z2$	X2#	
87	Get/Set Right Edge (low byte)			Z3$	X3#	
88	Zoom, Top Edge	ZTU	ZTD			
89	Get/Set Top Edge (high byte)			Z4$	X4#	
90	Get/Set Top Edge (low byte)			Z5$	X5#	
91	Zoom, Bottom Edge	ZBU	ZBD			
92	Get/Set Bottom (high byte)			Z6$	X6#	
93	Get/Set Bottom Edge (low byte)			Z7$	X7#	
Video Decoder						
94	Brightness	D1U	D1D			–128 to 127; –16 is default
95	Get/Set Brightness			F2$	E2#	
96	Contrast	D2U	D2D			0 to 63; 48 is default
97	Get/Set Contrast			F4$	E4#	
98	Saturation	D3U	D3D			0 to 4095; 2070 is default. Send high byte first. Display is updated when the low byte is sent.
99	Get/Set Saturation (high byte)			F5$	E5#	
100	Get/Set Saturation (low byte)			F6$	E6#	
101	Hue	D4U	D4D			–512 to 512; 0 is default. Send high byte first. Display is updated when the low byte is sent.
102	Get/Set Hue (high byte)			F7$	E7#	
103	Get/Set Hue (low byte)			F8$	E8#	
Audio Controls						
104	Volume	VAU	VAD	VA$	SV#	# = 0 – 100 VAU and VAD adjust volume by one unit of audio resolution. Volume has 51 steps, so there will be no difference between commands when the data differs by one.
105	Mute	VM1	VM0	VM*		0 = Mute off, 1 = Mute on
106	Loudness	VL1	VL0	VL*		0 = Loudness off, 1 = Loudness on
107	Treble	TAU	TAD	TA$	ST#	See comments for volume. Treble has 17 steps.
108	Bass	BAU	BAD	BA$	SB#	See comments for volume. Bass has 21 steps.

Row	Function	RS232 Commands		RS232 Data		Comments
		Incr	Decr	Get	Set	
109	Balance, internal	BIU	BID	BI$	SI#	See comments for volume. Balance has 52 steps. 0-50 is balance toward left side.
110	Balance, external	BEU	BED	BE$	SE#	See comments for volume. Balance has 52 steps. 0-50 is balance toward left side.
111	Internal Speaker	VI0	VI1	VI*		0 = disable, 1 = enable
System Monitor						
112	Ping			PNG		Verifies that a cube is at an address.
113	Product ID			P00		Gets the product ID (hex) In the About menu, the project number is 573-xxyy-zz. The xx value is returned as a hex number.
114	Version ID			VER		Get software version ID (hex) 0x01 = Rev A 0x02 = Rev B 0x03 = Rev C, etc.
115	Lamp Out Counter			S1$	S1C	Get/Clear lamp out count (number of lamp out "events", such as power brown-outs.
116	Re-strike Attempts			S2$	S2C	Get/Clear re-strike count
Responses from display, if it is individually addressed						
117	Received Valid Command	ACK				Command successfully executed
118	Received Invalid Command	NAK				Command error on execution
119	Unknown Command	UNK				Unknown command
120	Parameter Error	ERR				Parameter outside range



R00	R01	R02
R10	R11	R12
R20	R21	R22
R30	R31	R32
R40	R41	R42
R50	R51	R52
R60	R61	R62
R70	R71	R72
R80	R81	R82

The RS232 codes here produce the effect of pushing the corresponding buttons on the remote control. For instance, sending the code ☺05R20♥ will toggle the Curtain on or off for the display with address 05, because that has the same effect as pressing the CURTAIN button on the remote control.

There is no difference to the electronics module between sending the R61 command and actually pressing the up arrow on the remote.

When an 'R' command opens a menu, the highlight bar will be where it was the last time the menu was closed, and you probably won't know where that is.

Some of the 'R' buttons do not exist on the physical remote control and have no function.

Index of RS232 Commands

The numbers in this index are the row numbers in the RS232 Command List table on page 94.

Index of RS232 Codes

The numbers in this index are the row number in the RS232 Command List table on page 94. Only the first two letters of most codes are given, because all versions of that code appear in the same row.

6 Troubleshooting

6.1 Solving Power and Startup Problems

When you see nothing but black on the screen, it is probably a startup problem. If the image is there, but it is not right, it is an image problem, covered in the next section.

Things to check if you have no image:

- Is the AC Master switch lit?
- Is the unit plugged in?
- Is there power in the AC mains?
- Press the up-down-up on the arrow keys of the remote control. This will display the Cube Status menu, if the lamps are on. It also starts the On-Screen Diagnostic Code, which should appear whether the lamps are on or not. These two bright LEDs blink in a pattern to tell you why the lamps are not lit. See 'On-Screen Status Codes and LEDs' on page 136 to interpret the code.
- If the lamps are lit and you can see menus, but you don't see the video image, check Curtain. In the main menu, select Curtain and press ENTER. Highlight Curtain On/Off and press ENTER. If Curtain is on, press ENTER to turn it off.
- Check Test Pattern. Maybe the black test pattern is on.

✎ There are no user serviceable parts in either the electronics module or the power supply.

This is the normal startup sequence:

1. AC power is applied. Either the main circuit breaker switch is turned on, or AC is reacquired after a power loss.
2. Several LEDs on the electronics module turn on and off as the Panther gets started. This initialization phase is about 15 seconds.
3. After initialization, the Standby LED turns on, and all the fans stop. However, if Auto Lamp On is enabled, this step is skipped, the fans stay on, and lamp ignition starts right away.
4. Lamp Ignition: The system receives an On command from the remote or RS232 or Auto Lamp On.
5. All fans run. The system attempts to ignite each lamp in turn with a one second delay between each lamp start. It always starts with Lamp 1 and lights them in numerical order.

✎ If the Lamp Bay door is open, and its interlock switch is open, no lamps will ignite. If lamps are already on when the door opens, they all go off. When the Lamp Bay door is opened, the Lockout LED goes red. To relight lamps, you must close the Lamp Bay door and cycle AC power.

✎ If *both* exhaust fans fail to turn, *or* the power supply fan fails to turn, the lamps will not ignite and will be automatically turned off if they are on. If only one exhaust fan fails, the system runs normally. The long, squirrel cage fan that blows on the LCD has no sensor and does not affect lamp operation.

6. All requested lamps are on.
7. When the system receives an Off command, all lamps turn off immediately. All lamp LEDs go out.
8. All fans stop, and the Standby LED turns on.

Lamp strike sequence

The lamps always ignite, or try to ignite, in this order: 1, 2, 3, 4.

When you set the Lamp Count for 3 lamps, Lamps 1, 2 and 3 will try to light. If one of these will not ignite in three tries, the Panther will try Lamp 4.

You cannot choose which specific lamps to light. The firing sequence is always 1, 2, 3, 4.

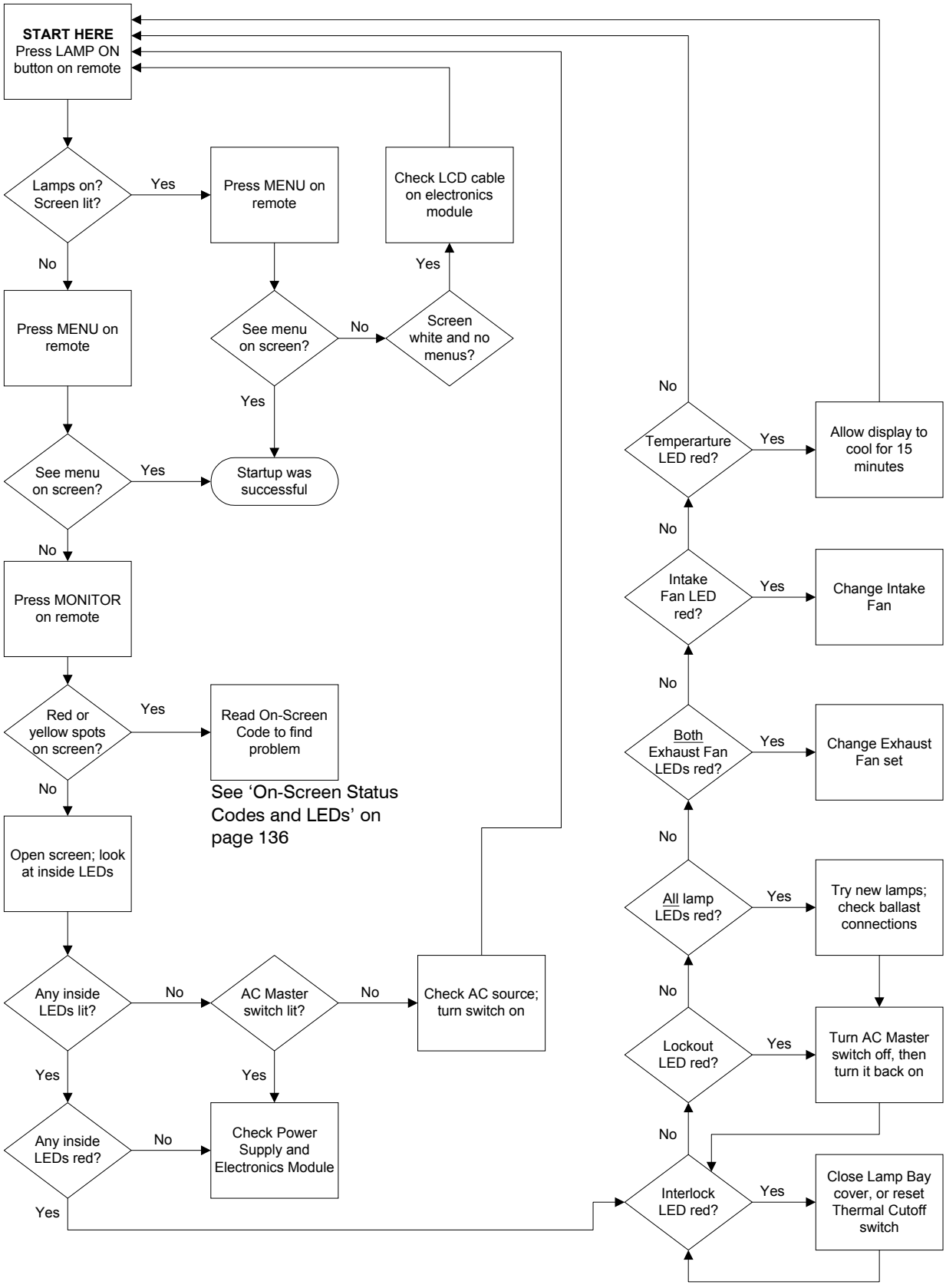
If the Lamp Count is set at 2, Lamps 1 and 3 will try to light. (This produces a better balance of light than if 1 and 2 were used.) If either of these fails to light, Lamp 2 is tried. At this point, if the system does not detect two working lamps, it tries Lamp 4.

After the lamps are lit, the system continually monitors the state of the lamps. If any lamp fails, that lamp is marked as failed, and Panther tries the next lamp in order, if there is one.

About UPS supplies

Some installations use a UPS—Uninterruptible Power Supply. These will work on the Lion *if* the output of the UPS is a sine wave.

Many UPS systems have square wave or stepped wave outputs. These types will not work with Lion. The Lion 350-volt power supply requires a sine wave input.


START HERE
Press LAMP ON button on remote
Lamps on? Screen lit?
Yes
Press MENU on remote
Check LCD cable on electronics module
No
Press MENU on remote
See menu on screen?
No
Screen white and no menus?
Yes
Yes
See menu on screen?
Yes
Startup was successful
No
Press MONITOR on remote
Red or yellow spots on screen?
Yes
Read On-Screen Code to find problem
See 'On-Screen Status Codes and LEDs' on page 136
No
Open screen; look at inside LEDs
Any inside LEDs lit?
No
AC Master switch lit?
No
Check AC source; turn switch on
Yes
Yes
Any inside LEDs red?
No
Check Power Supply and Electronics Module
Yes
No
Temperarture LED red?
Yes
Allow display to cool for 15 minutes
No
Intake Fan LED red?
Yes
Change Intake Fan
No
Both Exhaust Fan LEDs red?
Yes
Change Exhaust Fan set
No
All lamp LEDs red?
Yes
Try new lamps; check ballast connections
No
Lockout LED red?
Yes
Turn AC Master switch off, then turn it back on
No
Interlock LED red?
Yes
Close Lamp Bay cover, or reset Thermal Cutoff switch

6.2 Solving Image Problems

If you can see the image, but it is not right, this is the place to start. Image problems include skewed, rotated and keystoned pictures, pictures that are the wrong size, and pictures that are torn or noisy. If you can't see an image, turn back one page.

What to do about image problems

What is wrong?	What to do to fix it.
The image is **reversed** left and right.	On the remote control, press MENU. Select Misc Control and press ENTER. Select Misc. Options and press ENTER. Select Horz Flip and press ENTER.
The **white** areas are 'blooming,' too white.	Go to 'Adjustments for DVD and VCR' on page 46.
The **black** is too black. The areas in the dark parts of the image all one shade, all black.	Go to 'Adjustments for DVD and VCR' on page 46.
The images are **noisy**. There are horizontal streaks in the picture, especially at the edges of high contrast.	Go to 'Adjustments for Computer and Laptop' on page 42.
There are **vertical bands**, light and dark, in the image.	Go to 'Adjustments for Computer and Laptop' on page 42.
There is a **dark line of no video** on the top, bottom, left or right side.	Go to. Check the Aspect Ratio setting, as described in 'Pan and Zoom' on page 54 and 'Adjusting the LCD Position' on page 56.
The image is **too large** or **too small**.	This may be due to improper lens adjustment. Check this at 'Adjusting the LCD Position' on page 56. If you are using Clarity's Big Picture™, it may be a zoom problem. See 'Pan and Zoom' on page 54.
The screen is one solid color: black, red, green, blue, or white.	Check Test Patterns to see that they are Off. See '' on page 85. Check Curtain in the Main menu; When the Curtain is On, it can have any of these colors. See 'Curtain and Its Colors' on page 82.
The image is **not bright enough**.	How many lamps are you using? Look at the Lamp Control menu. Are any lamps 'Failed'? See 'Controlling the Lamps' on page 70.
The screen flashes to red (or green or blue or white) when I change the source.	Check Curtain in the Main menu; When the Curtain is On, it can have any of these colors. See 'Curtain and Its Colors' on page 82.
Using **HDTV 1080i mode**, the picture jumps around and looks incorrect.	See

6.3 Aligning the LCD

Aligning the LCD image to the screen must be done first. If you don't check this first, later adjustments may be a waste of time.

Rule No. 1: If it doesn't need adjusting, don't adjust it.
Rule No. 2: Always follow Rule No. 1.

The adjustments in this section align the LCD image to the screen, giving the image the right position and size. Use the **Geometry Pattern**, described below, to do general alignment. Use the **Alignment Dashes** to hide an exact number of pixels.

Does the LCD have to be moved?

1. Turn on the power.
2. After one minute, aim the remote control at the screen and press LAMP ON. When the lamps are lit, press MENU.
3. Press the down arrow key to highlight LCD Alignment and press ENTER.
4. Highlight Geometry Pattern, press ENTER and wait.
5. In a few moments you will see a grid pattern slowly appear on the screen, a white grid enclosing 16 black boxes. The outside lines are three pixels wide and the interior lines are one pixel wide.

✎ If the left side border is only two pixels wide, no matter how far you move the LCD horizontally, highlight Geometry Pattern and press the + or – buttons to fix it.

6. There are six dashes in each group, representing the outside six pixel rows and columns of the LCD. You won't see them all because some will be hidden behind the mullion. (If you have *not* read and on, do so *now*.
7. To adjust the LCD:
   - Highlight Left Edge, Right Edge or Horizontal in the menu.
   - Press + or – momentarily to move that part of the LCD pattern one small amount.
   - Press and *hold* + or – to move that part continuously.

✎ You may see only three dashes on the left side of the screen, no matter how far you move the LCD horizontally. If this happens, highlight Alignment Dashes again and press the + or – a few times to make all six dashes appear. Then move the highlight up to the three motor controls and continue.

8. There is also a Geometry Pattern, which has three pixels on the outside border and one pixels boxes.
9. Adjust the LCD to hide the number of pixels shown in the table.
10. To exit the menu, press PREV and the pattern will disappear.

How LCD Alignment works

Three motors move the LCD. The edge motors move the LCD up and down and the horizontal motor moves it sideways. Each time you push a right or left key once, the motor moves a small amount and stops. If you hold the button, the motor runs continuously.

The motors move the LCD with eccentric cams, which means they have a cyclic effect. If you hold the button for one motor long enough, the image will come back to where it started. There is some horizontal movement when you move one side vertically, and there may be a little vertical movement when you move horizontally.

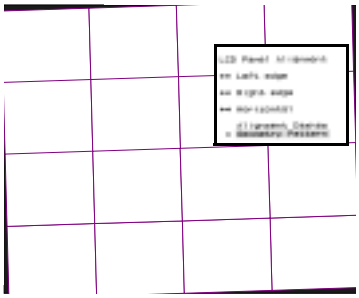
When you go too far in one direction and want to go back, there is a little slack. It takes several 'kicks' in the opposite direction to make the LCD move.

If you see black all around the picture, check to see that the screen brackets are in place and that the screen is completely closed against them. There must be a screen bracket in each corner, even if this display is standing alone.

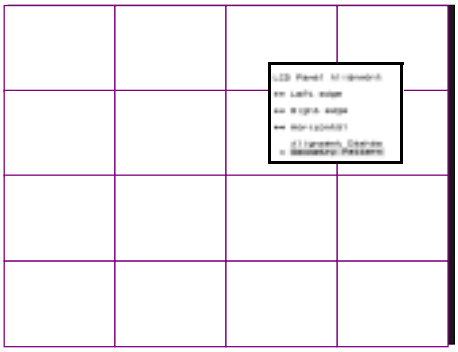
Use the objective lens to change image size. Open the screen (or reach through the rear) and rotate the lens in the Center Bay. Rotating the lens adjusts image size, not focus. (There is no control for focus.) Adjust the image size so that you lose at least two pixel on all four edges.

✎ Check the LCD position on each display. Check it each time the displays are moved into a new position. Shipping sometimes 'adjusts' the LCD position. It's best to check again every time the wall is constructed.

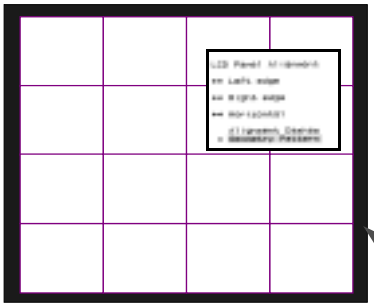
✎ If you use RS232 commands to adjust the LCD, the remote control will not work while the pattern is on.



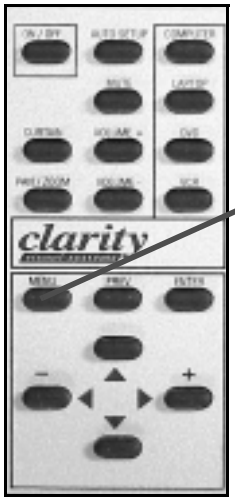
If the picture is rotated, use the Left or Right Edge controls.

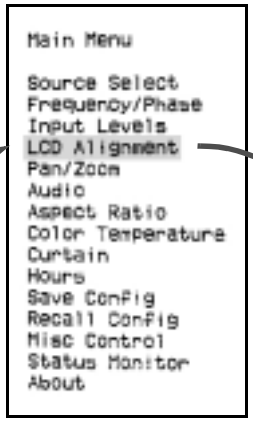


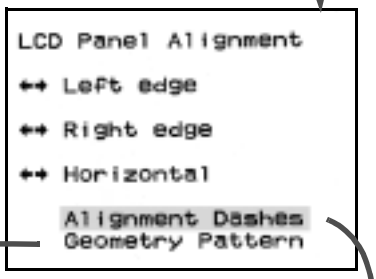
If the picture is moved left or right, use the Horizontal control. This is the Geometry Pattern.

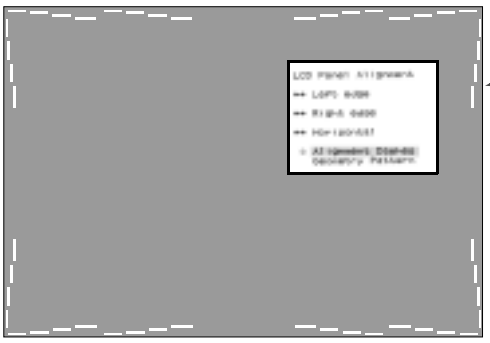


If the picture is too small, rotate the lens clockwise.









6.4 Getting Technical Support

Before you call or email, get the serial number of the displays you are having trouble with. Have you searched the Index of this manual?

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

If the problem you have is completely baffling, call, email or fax.

But first!

Get the **serial number** of the unit you have. The serial number is found

- inside on the right (as seen from the front) wall of the display behind the screen.
- on the back outside of the display.

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

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 from the right side of high contrast edges.
- A solid green background has vertical bands in it.
- Whenever I try to "_____", I get a message on the screen that says "_____".
- The lamp did not come on. When I swapped it with another lamp,it still did not come on.
- There is a black line on the left side, and I can't move the picture over there with the Position control.

Clarity Visual Customer Service

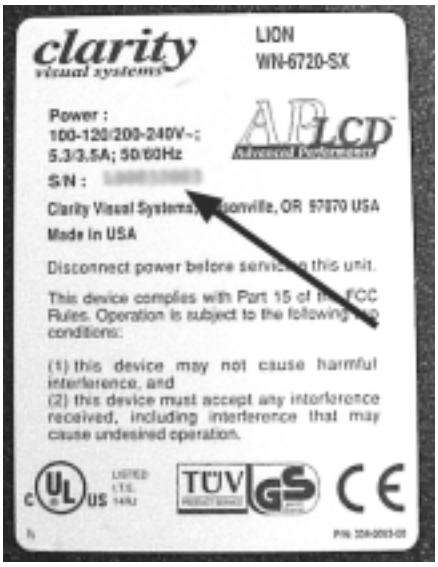
+1 503 570 4634 voice,
M-F, 0700-1700, U.S. Pacific time
service@clarityvisual.com

+1 503 570 4657 fax

Clarity Visual Systems
Attn: Customer Service
9025 SW Hillman Court, Suite 3122
Wilsonville, OR, USA
97070–7708

Remember, have the serial number ready.

Arrow points to the serial number.



Serial number sticker, showing location of the serial number.

7 Routine Maintenance

7.1 Changing Lamps

Always turn off the power and wait for the lamps to cool. If the wall is tilted, change the lamps from the rear. Reset the lamp hour meter after changing a lamp.

To remove lamps

1. Determine which lamp(s) to change.
   - Press MENU on the remote.
   - Select Status Monitor and press ENTER.
   - Select Cube Status and press ENTER.
   - Look for the lamp that is out. Remember this number.

—or—

   - Remove the rear panel.
   - Look at the Diagnostic LEDs to determine which lamp is out. One will be red or amber.

—or—

   - Press MENU.
   - Select Misc Control and press ENTER.
   - Select Misc. Options and press ENTER.
   - Look for the lamp that is "Failed."

2. Remove the rear panel.
3. Turn off the AC Master switch and disconnect power cord.

WARNING
Turn off the power and allow the lamps to cool for 15 minutes before changing lamps.

4. Open the Lamp Bay cover.
   - Remove the screw that holds the Lamp Bay door closed.
   - Pull inward on the two spring-loaded pins at the rear end of the Lamp Bay cover and lift up.
   - Pull in on the other two pins and remove the cover.
5. Loosen completely the two captive screws on the failed lamp.
6. Lift the lamp straight up with the wire handle.

✎ It is a requirement to cycle power off and then on whenever the Lamp Bay door is opened. None of the lamps will light unless you do this.

To install lamps

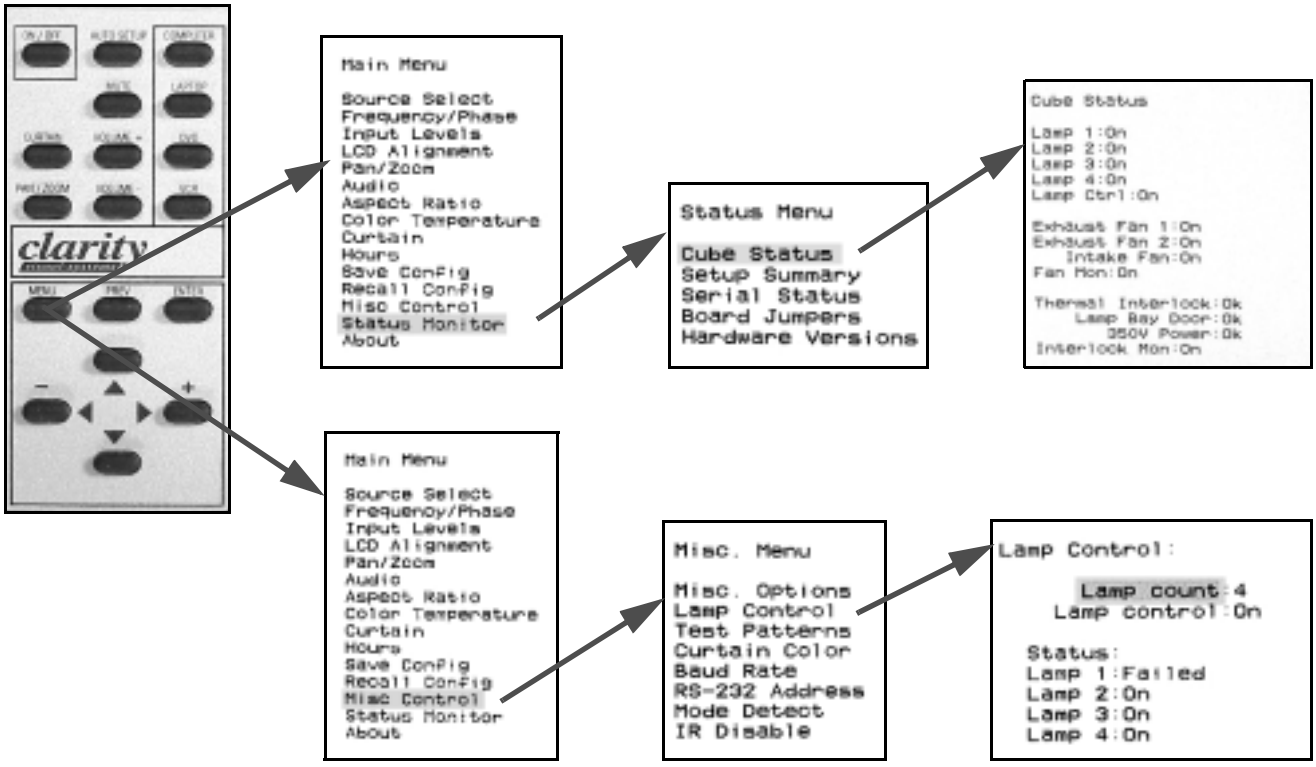
If you have just removed a lamp and everything is still open skip to Step 3.

1. Turn off the AC Master switch and disconnect power cord.
2. Remove the rear panel.
   - Remove the screw that holds the Lamp Bay door closed.
   - Pull inward on the two spring-loaded pins at the rear end of the Lamp Bay cover and lift up.
   - Pull in on the other two pins and remove the cover.
3. Insert the lamp in the empty place. The lamp should face toward the center. They will only fit one way.
4. Tighten the two lamp screws. Finger tight is enough.
5. Close the Lamp Bay cover and replace the screw.

CAUTION
The spring-loaded pins must be visible on the top of the cover as you close it.

6. Reconnect the power cord and turn on the main power switch.
7. Close the rear panel.
8. Turn on the lamps and select MENU > Hours. Reset the lamp hours for the lamp(s) you changed. (This step is not absolutely necessary. It's for your records.)

Lamp Bay from rear.



Remember: You must cycle the AC power after you change lamps. Turn it off, then on again.

7.2 Changing the Air Filter

The air filter should be changed at about 8000 lamp hours, more often if the system is used in dusty, dirty or greasy environments.

To change the filter

1. Remove the rear panel.
2. Turn off the AC Master switch and remove the power cord.
3. Open the Air Intake Bay door by pulling in on two spring-loaded pins.
4. Loosen the screw that holds the filter at one corner and remove the filter.
5. Install the new filter with the *wire side facing inside*.
6. Close the Air Intake Bay door and be sure the pins go in their proper holes.

CAUTION

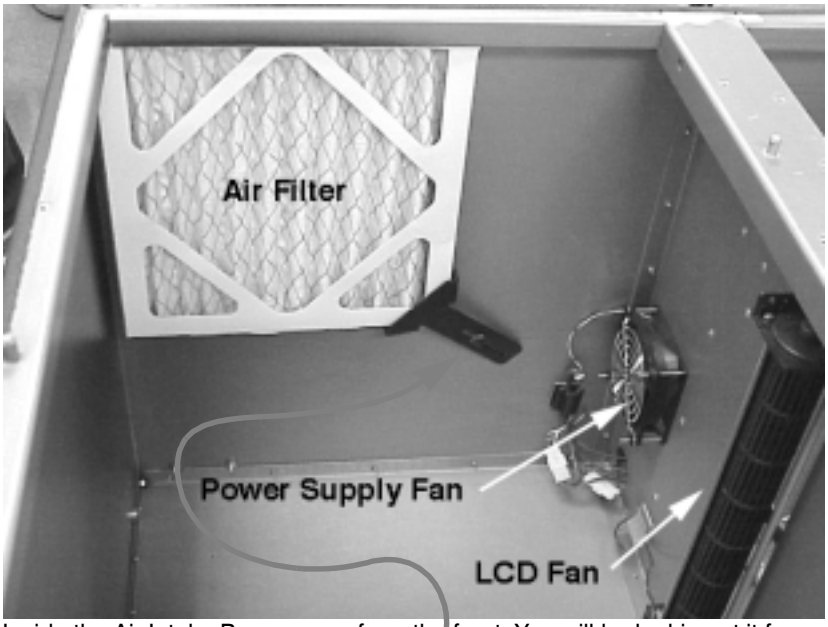
The spring-loaded pins must be visible on the top of the cover as you close it.

7. Close the rear panel.
8. At the Center Bay, reconnect the power cord and turn on the main power switch.

To clean the air filter

If the air filter is not too dirty, use a vacuum cleaner to suck the dirt out. However, it is recommended to change the air filter when vacuuming no longer produces a clean air filter.

Air Intake Bay is below Audio Input panel. Pull in two spring-loaded pins at rear and lift cover.



Inside the Air Intake Bay as seen from the front. You will be looking at it from the rear. Screw holding air filter bracket.

7.3 Cleaning the Screen, Mirror

The screen is glass and fingerprints show up on it. Most of these may not show in the picture, but a clean screen is better.

✎ The outer layer of the screen is glass. Don't lean on it. Don't let it get scratched. Protect it.

⚠ ***WARNING***

Spray the cleaner on the cloth. **Never spray anything on the screen**. Do not let any liquid drip down the screen. It will wick up between the screen layers. When liquid gets between the screens, it is *impossible* to remove. The screen may be permanently ruined.

Why is the screen ruined?

The screen is made of several layers. The outer layer is glass, but there are inner layers of acrylic that are Fresnel lenses. If liquid runs down the screen, collects at the bottom and wicks up between these layers, it is impossible to get it out.

Cleaners to use

Claire #50 Glass Cleaner is good glass cleaner. It is a foaming spray in a pressurized can. It is sold under many different names by local companies that sell janitor and building maintenance supplies.

In some parts of the world this same cleaner is known as **Sprayway #50 Glass Cleaner**. Ask at a janitor supply company for either of these cleaners. Hundreds of supply companies sell this product under their own brand name.

Glass Wax™ does a good job of cleaning the screen. It is a thick, pink liquid. Put some on a clean, damp cloth and or a clean, damp sponge and spread it thinly on the screen. Let it dry. Wipe up the powder with a clean, dry cloth.

Cleaners NOT to use

- Do not use any cleaner that has an abrasive material, such as sink and porcelain cleaners, or cleaning compounds that contain pumice. These damage the anti-reflective coating.
- Do not use a
- A 'clean' cloth that has been used to wipe something else, such as a table. There could be microscopic particles of grit in the cloth, and these will scratch the screen.
- Do not use a sponge that has been used to clean other things. It is very difficult to get grit out of a sponge, once it is in there. Buy a new sponge, and keep it for this purpose only.

Using soapy water

You can use plain soapy water to clean the screen. Use a mild liquid soap, very dilute. Wring out or squeeze out *most* of the water. (Read the Cautions on this page.) Wipe carefully with the damp cloth. Dry with a second cloth.

✎ White cloth is actually a better for wiping than colored cloth. The dyes in cloth tend to make it less absorbent.

Same cleaner for mirrors, lens

You may use the same cleaner for the large mirror and the lens. However, in most instances, the mirror and lens only have dust. It is best to blow this away using clean air. Clean, compressed air is available in pressurized cans from stores that sell cameras.

Camera stores also sell lens cleaning solutions, and this is good for the lens, mirror, or screen.

7.4 Upgrading Firmware

From time to time Clarity may change the Panther firmware to add features or correct minor problems.

Firmware upgrades must be done. Read *all* these instructions before you start.

The electronics module has a dedicated serial port for downloading new firmware. This port supports Xmodem transfers (only) of binary files at **115.2 kbps** (only). The display continues to operate while the new firmware is loaded, but the new firmware does not take effect until the AC power is cycled.

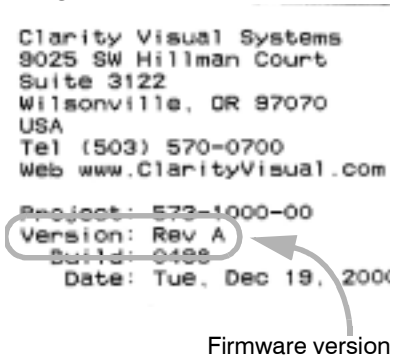
You may use any serial communications software that supports **Xmodem**. Tera Term works well (shareware on www.ClarityVisual.com, Reseller area, Utility Software section).

Download the new firmware from www.ClarityVisual.com, Reseller area. The zipped file will contain

- cube.bin (the main application program)
- lut.bin (a lookup table)
- fpga.bin (field programmable gate array data)

Check the current firmware version

Look at the About menu (MENU > About) to see if you need to upgrade.

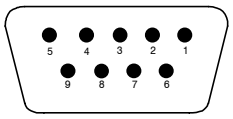


Connect the PC to the electronics module

Use a female 9-pin to RJ-45 adapter, available at electronics and computer stores and wire it as shown.

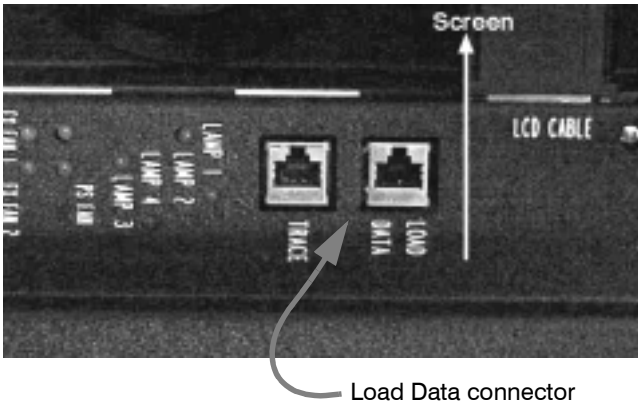
Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2



Connect a straight-thru cable with RJ-45 connectors at each end (computer network cable) from the adapter to the electronics module's Load Data connector.

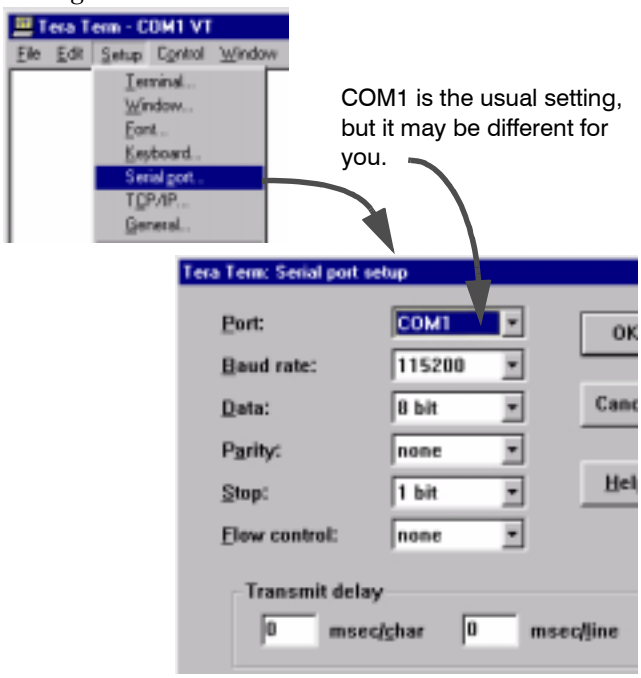
✎ Do NOT use the RS232 connectors on the electronics module for firmware upload. It won't work.



Set up the communications software

Turn on AC power to the display. It is not necessary to turn on the lamps. Start the communications

software (Tera Term) on your computer and use these settings:



Start the download

With the cursor in the serial communications software, press Enter (↵). You should see a **Cbug:** prompt appear in the software window. *If you do not see this prompt*, stop here and check the settings above.

At the **Cbug:** prompt, type **download app**↵.

WARNING

Typing **download app**↵ erases several blocks of code in memory. **Do not turn off the power** until the new firmware is successfully loaded.

You should see text like this:

CBug: download app
Sector: 0x40000
Sector: 0x50000
Sector: 0x60000
Sector: 0x70000
Downloading app: 0x40000
C

At this point you see a **C** prompt, and slowly more **C**s will appear. Start the transfer before the 5th C prompt appears, which is a time-out. Begin transferring the **cube.bin** file using **xmodem**. If you are using Tera Term, you would do this:

1. Click File > Transfer > XMODEM > Send
2. In the dialog box, Browse to find the directory with **cube.bin**.
3. Double-click cube.bin.

✎ If you extracted the .bin files from a self-extracting zipped file, cube.bin will be in C:\Clarity\Up\573-1000.

A dialog box will appear showing the progress of the transfer in percent. At the end of downloading this box disappears, and the **Cbug:** prompt appears again.

WARNING

If the dialog box does not disappear and the transfer stalls before it is complete, **DO NOT** turn off the cube's AC power. Instead, press Cancel in the dialog box, type 'download app' again and start over.

Possible problems

- The most common problem is a download stall—the download process stops before it is complete. The dialog box does not disappear and the Cbug: prompt does not reappear.
- If the download is performed with a very slow PC, it is possible that the electronics module will overrun the PC. If the PC can't keep up, the download stalls.
- If you select the wrong file to transfer (the wrong.bin file) the file may overrun the space available and stall the transfer.

If *not* successful…

If AC power to the cube is lost during firmware download, the cube will not work. Do this:

1. With the computer connected and the Tera Term program active, turn on AC power to the cube.
2. As soon as text appears in the Tera Term window, press Escape several times. This will give you a new CBug prompt. Begin again with download app at the top of this page.

If successful…

If the download was successful, turn off the AC power and turn it back on again. The changes in firmware only take effect after a new power-up. You may download new firmware while the display is on; this will not interrupt the program. However, the new firmware will not be used until AC power is cycled.

Other downloads

It is usually not necessary to load the 'fpga' or the 'lut' files, but there is no harm in doing so. However, if this is a cube, read the caution below:

CAUTION

You must load cube.bin first. When this is

successfully loaded, cycle AC power off, then on again, so the system is running on the new firmware. Then load lut.bin and fpga.bin.

To load the **fpga** file:\

1. At the **Cbug:** prompt, type **download fpga**↵.
2. When the **C** prompt appears, begin the xmodem transfer of the **fpga.bin** file.

To download the **lut** (lookup table):

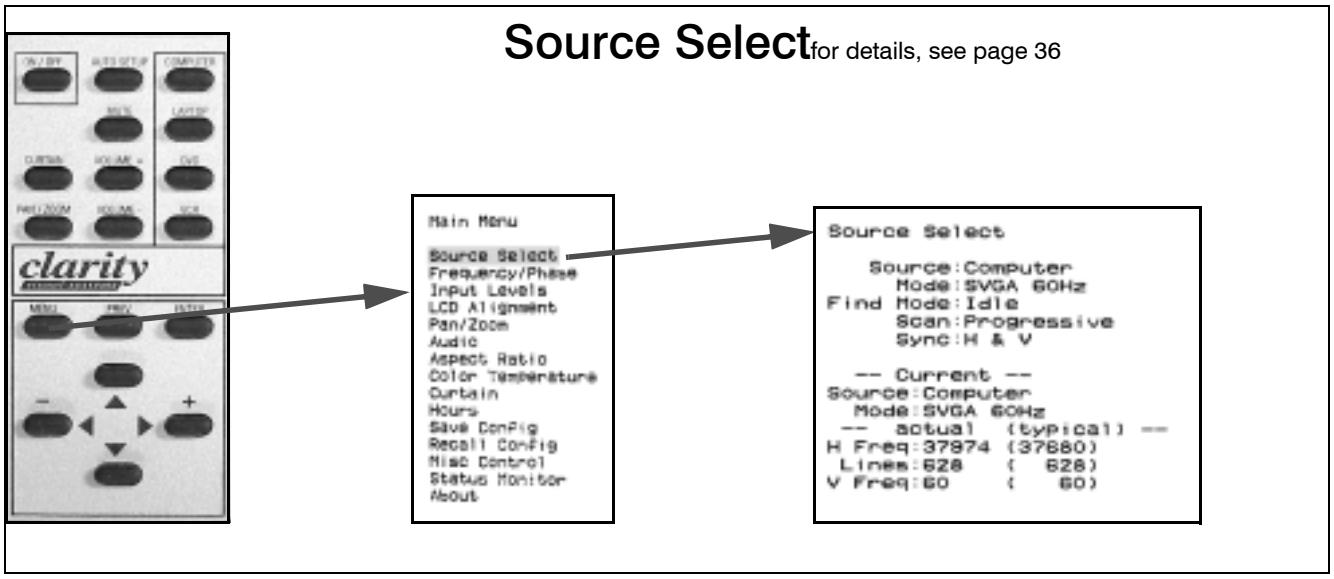
1. At the **Cbug:** prompt, type **download lut**↵.
2. When the **C** prompt appears, begin the xmodem transfer of the **lut.bin** file.

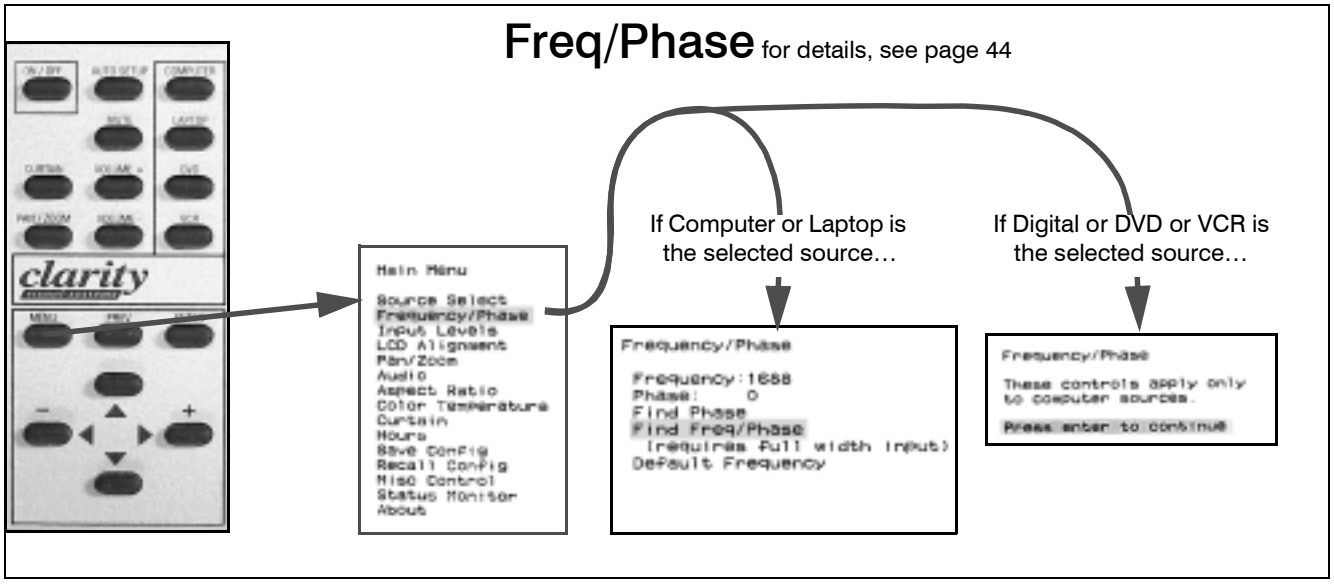
Watching the data

You can see the data come into the electronics module by looking at the Serial Status menu. Press MONITOR three times to see this menu.

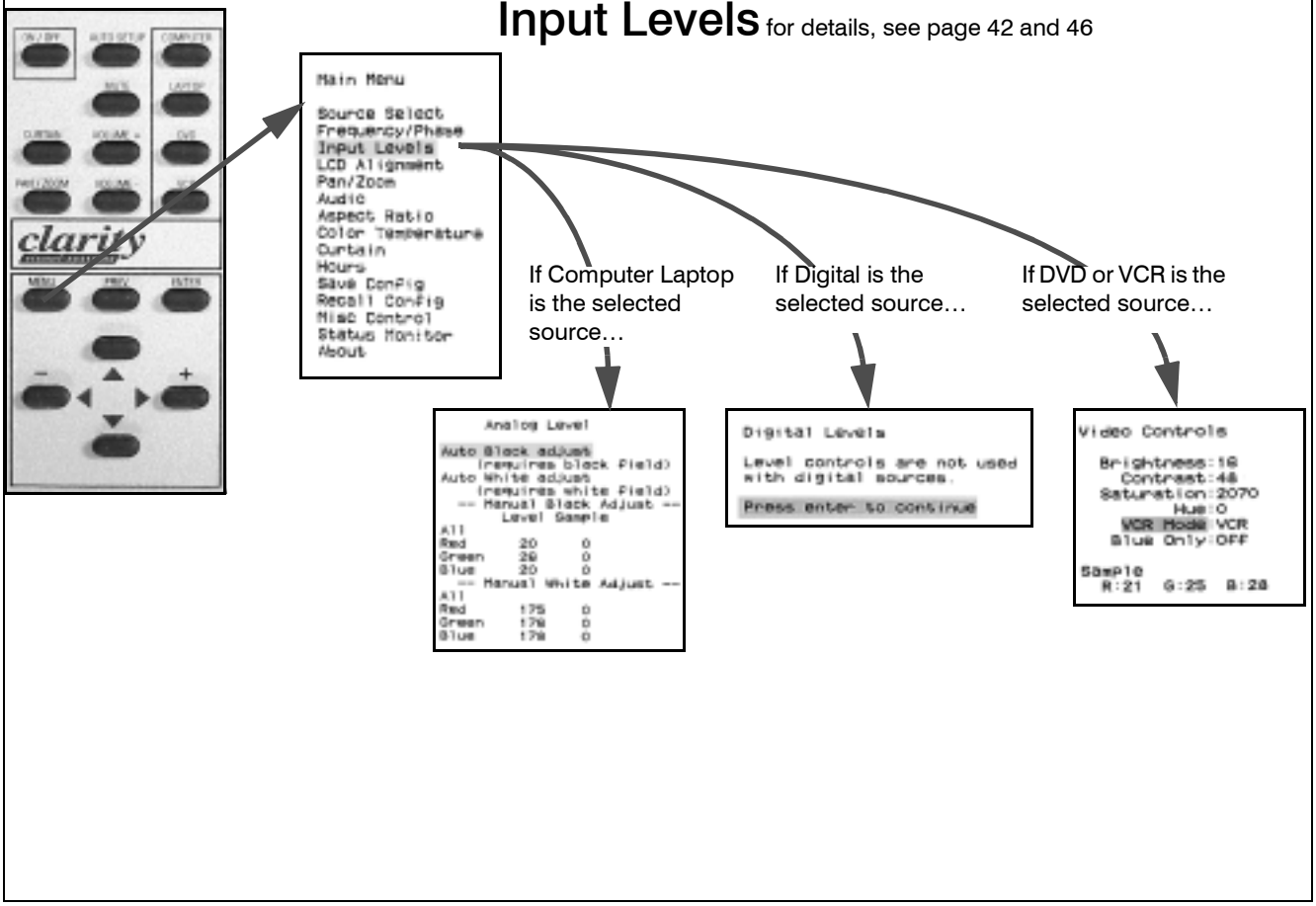
8 Reference Section

8.1 Menu Structures

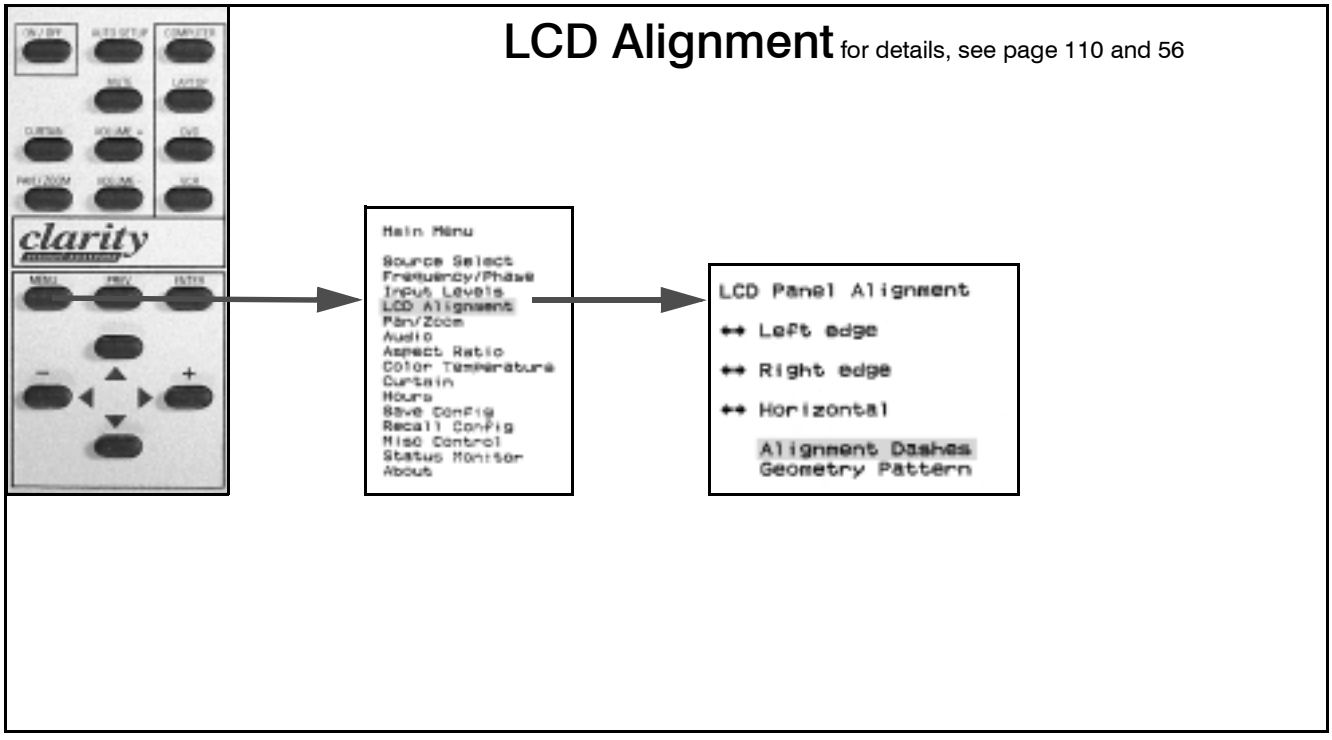




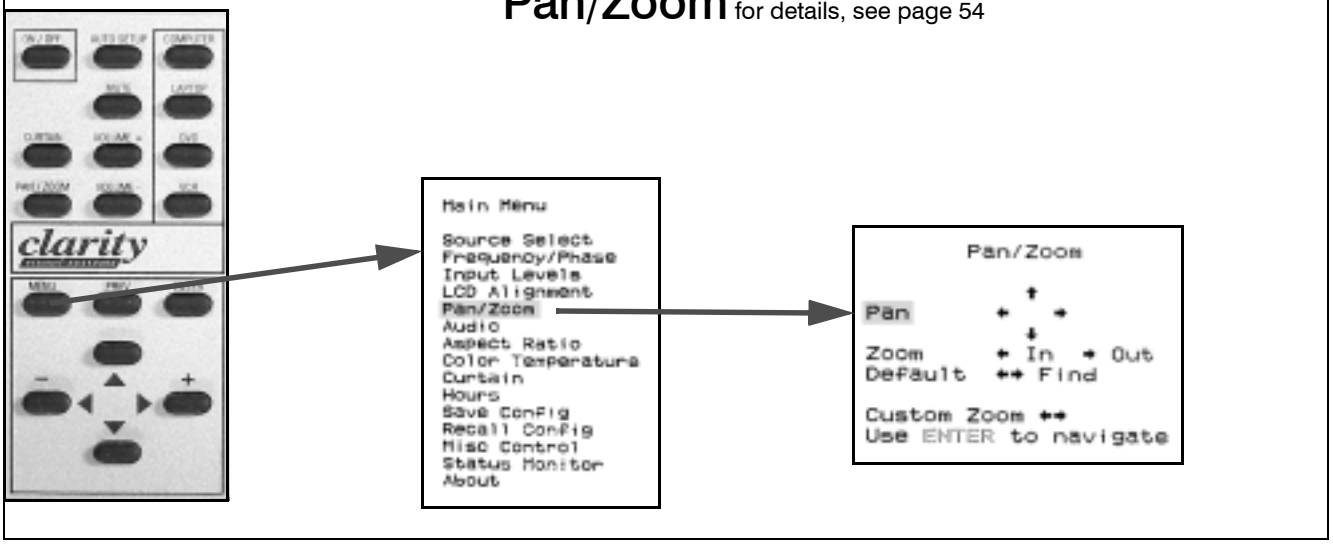
Input Levels for details, see page 42 and 46



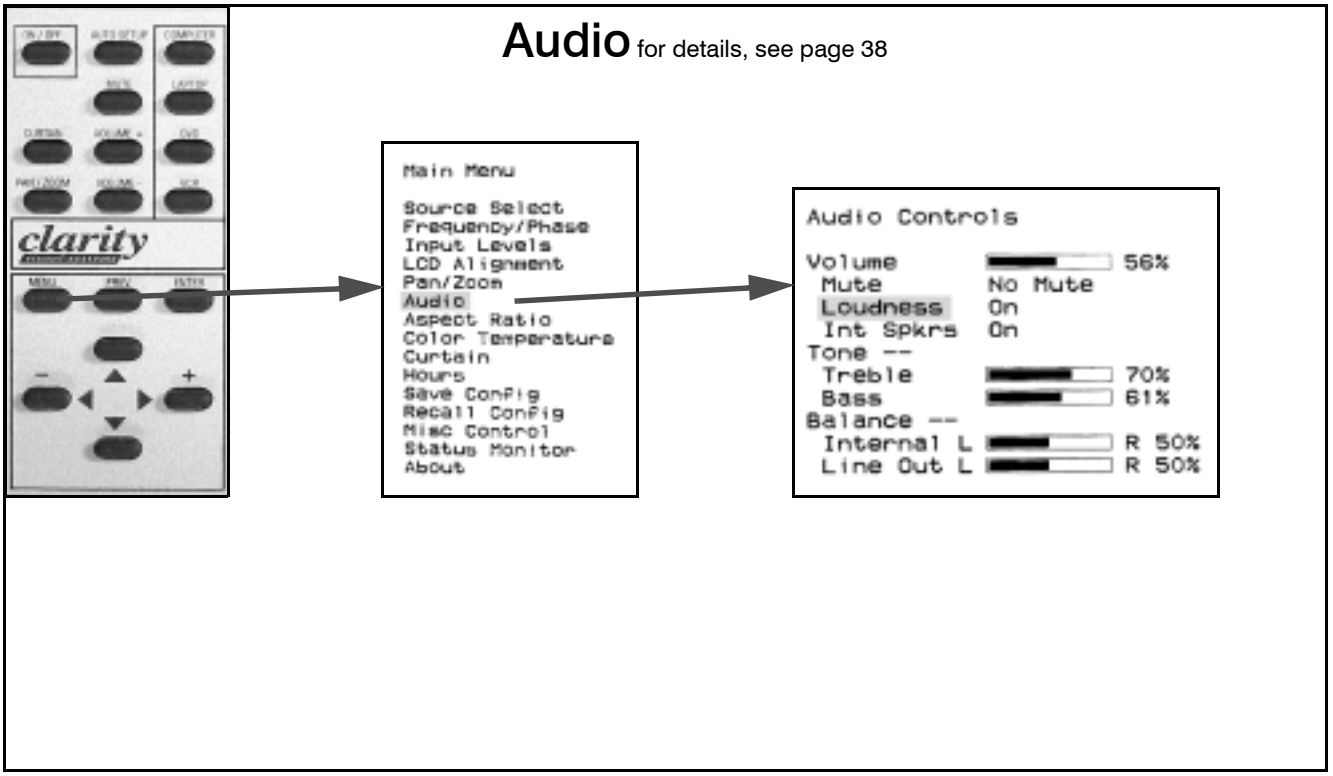
LCD Alignment for details, see page 110 and 56



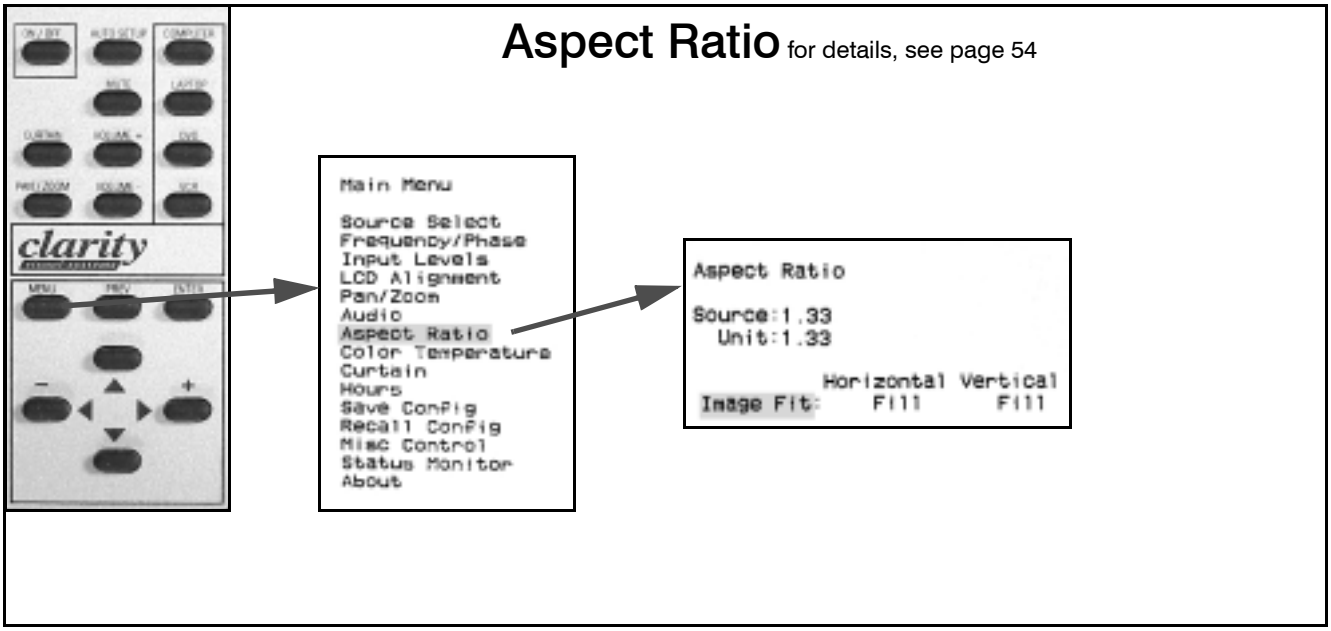
Pan/Zoom for details, see page 54



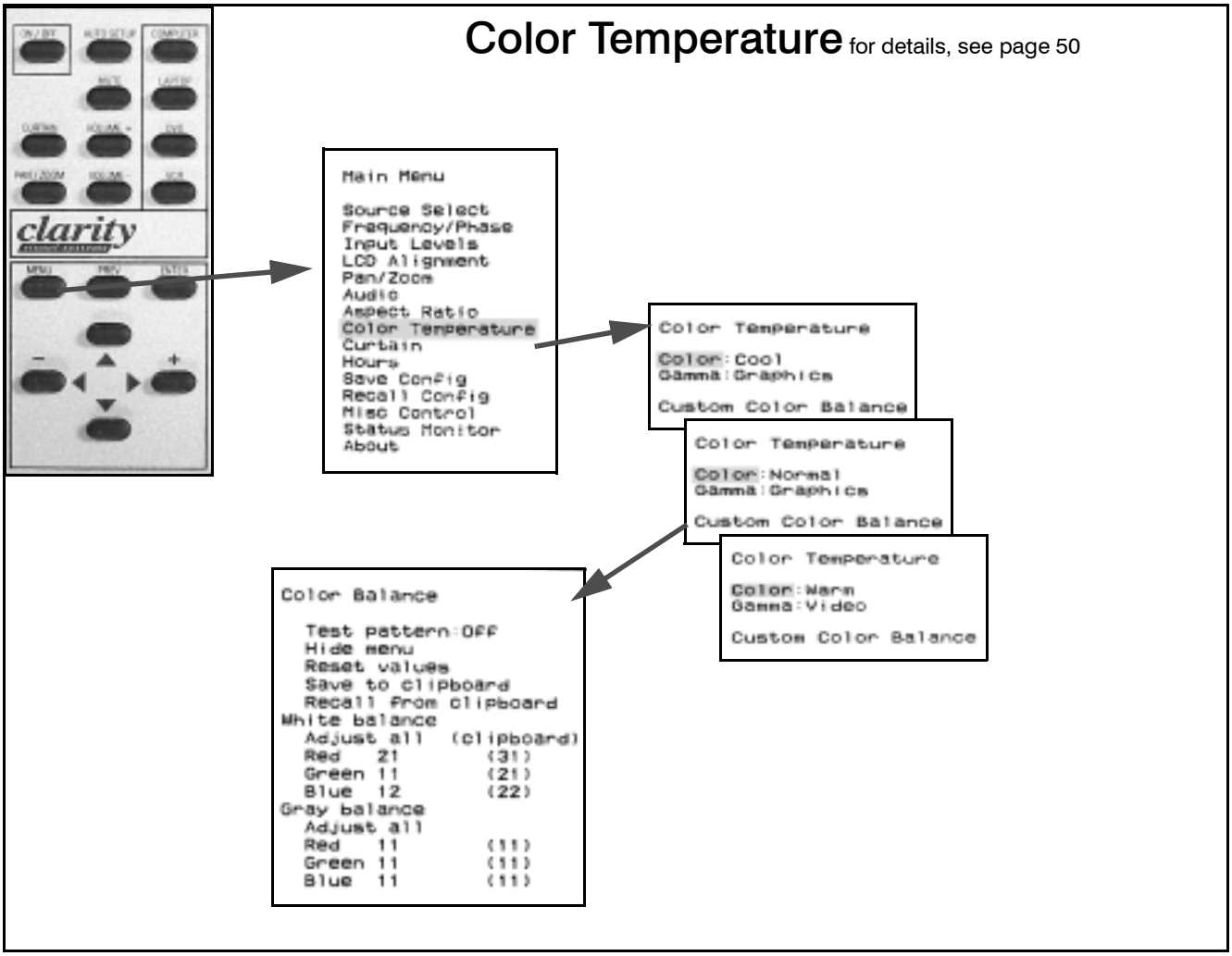
Audio for details, see page 38

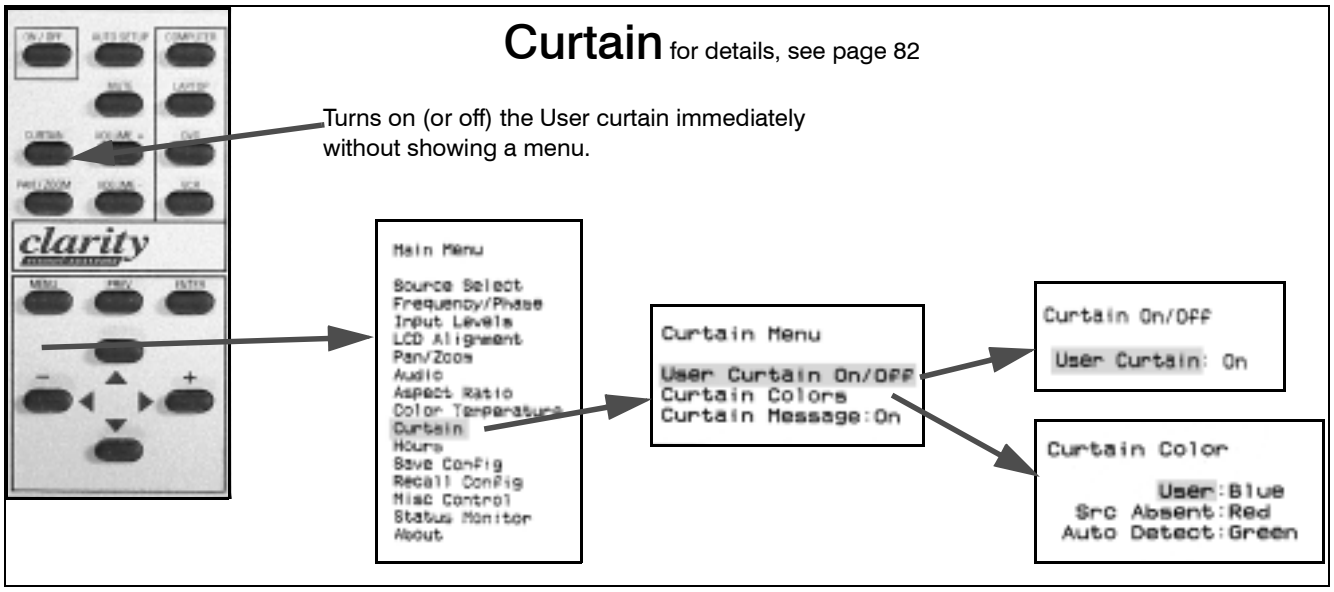


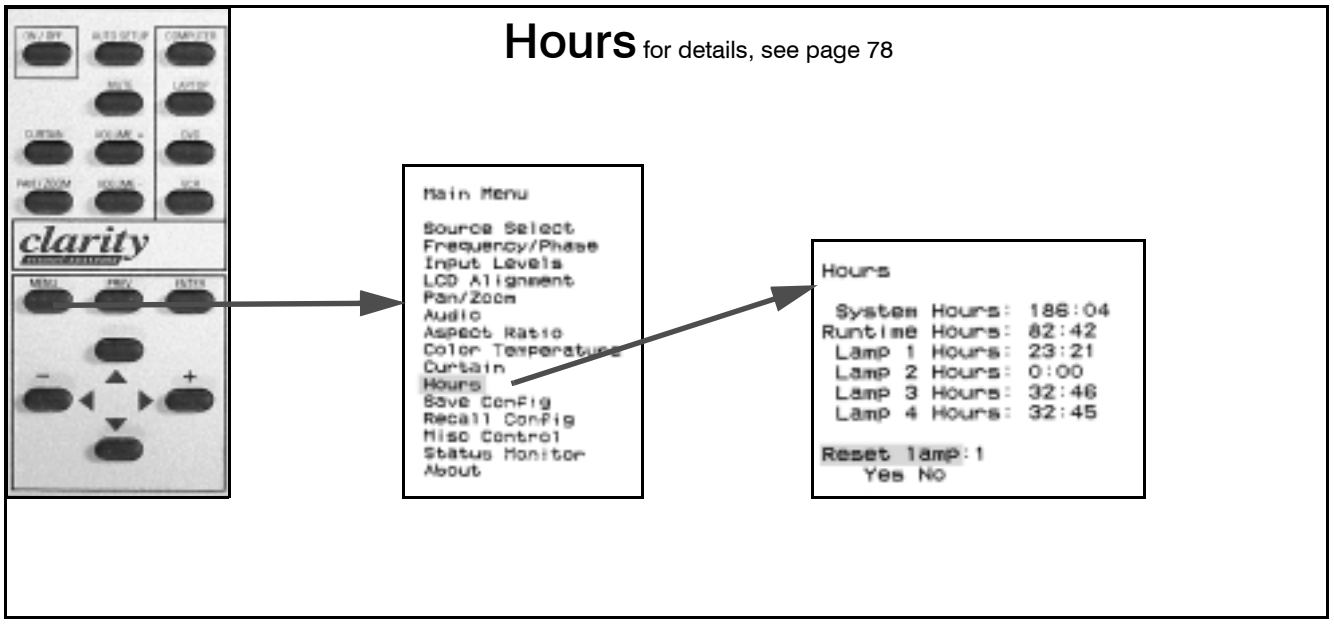
Aspect Ratio for details, see page 54

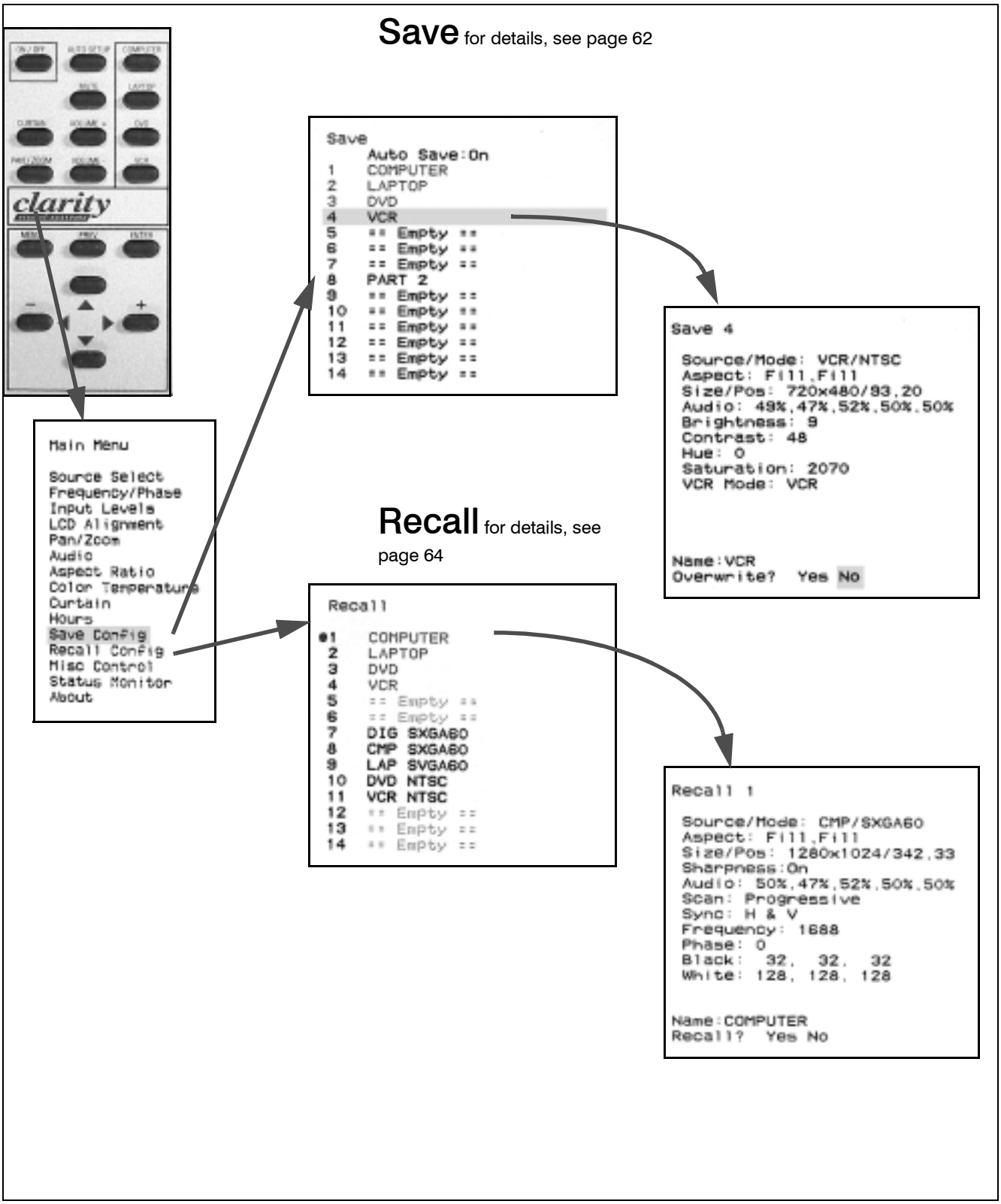


Color Temperature for details, see page 50




Curtain for details, see page 82
Turns on (or off) the User curtain immediately without showing a menu.
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Curtain Menu
User Curtain On/OFF
Curtain Colors
Curtain Message:On
Curtain On/OFF
User Curtain: On
Curtain Color
User:Blue
Src Absent:Red
Auto Detect:Green


Hours for details, see page 78
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Hours
System Hours: 186:04
Runtime Hours: 82:42
Lamp 1 Hours: 23:21
Lamp 2 Hours: 0:00
Lamp 3 Hours: 32:46
Lamp 4 Hours: 32:45
Reset lamp:1
Yes No


Save for details, see page 62
clarity
Main Menu
Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
Save
Auto Save:On
1 COMPUTER
2 LAPTOP
3 DVD
4 VCR
5 == Empty ==
6 == Empty ==
7 == Empty ==
8 PART 2
9 == Empty ==
10 == Empty ==
11 == Empty ==
12 == Empty ==
13 == Empty ==
14 == Empty ==
Save 4
Source/Mode: VCR/NTSC
Aspect: Fill,Fill
Size/Pos: 720x480/93,20
Audio: 49%,47%,52%,50%,50%
Brightness: 9
Contrast: 48
Hue: 0
Saturation: 2070
VCR Mode: VCR
Name:VCR
Overwrite? Yes No
Recall for details, see page 64
Recall
●1 COMPUTER
2 LAPTOP
3 DVD
4 VCR
5 == Empty ==
6 == Empty ==
7 DIG SXGA60
8 CMP SXGA60
9 LAP SVGA60
10 DVD NTSC
11 VCR NTSC
12 == Empty ==
13 == Empty ==
14 == Empty ==
Recall 1
Source/Mode: CMP/SXGA60
Aspect: Fill,Fill
Size/Pos: 1280x1024/342,33
Sharpness:On
Audio: 50%,47%,52%,50%,50%
Scan: Progressive
Sync: H & V
Frequency: 1688
Phase: 0
Black: 32, 32, 32
White: 128, 128, 128
Name:COMPUTER
Recall? Yes No

Misc Control for details, see page 80


```
Main Menu

Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
```

```
Misc. Menu

Misc. Options
Lamp Control
Test Patterns
Curtain Color
Baud Rate
RS-232 Address
Mode Detect
IR Disable
```

```
Misc. Options

      Sharpness:On
         Beeper:OFF
      Horz Flip:Norm
      Auto Lamp:OFF
Allow Frame Lock:On
```

```
Lamp Control:

      Lamp count:4
   Lamp control:On

  Status:
  Lamp 1:On
  Lamp 2:On
  Lamp 3:On
  Lamp 4:On
```

```
Test Patterns

 ●None
  White
  Black
  50% Gray
  Red
  Green
  Blue
  Alignment
  Geometry
```

```
Curtain Color

        User:Blue
  Src Absent:Red
 Auto Detect:Green
```

```
Baud Rate

  9.6Kbps
 ●19.2Kbps
  38.4Kbps
  57.6Kbps
  115.2Kbps
```

```
Address Select

RS-232:
   Group:0 (00)
    Unit:0 (00)
```

```
Mode Detect

Testing Messages   :On
Src Abs Message    :On
Curtain Message    :On
Auto Detect        :OFF
(On enables following)
  Auto Loop Enable:OFF
  Auto Position    :On
  Auto Phase       :On
```

```
IR Disable

Disable IR?  Yes No
```

Status Monitor for details, see page 76


```
Main Menu

Source Select
Frequency/Phase
Input Levels
LCD Alignment
Pan/Zoom
Audio
Aspect Ratio
Color Temperature
Curtain
Hours
Save Config
Recall Config
Misc Control
Status Monitor
About
```

```
Status Menu

Cube Status
Setup Summary
Serial Status
Board Jumpers
Hardware Versions
```

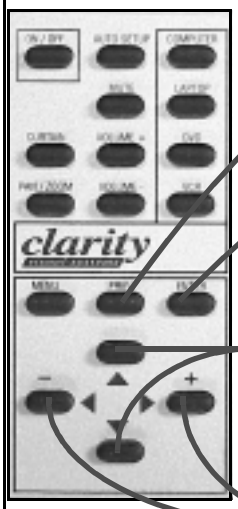
```
Cube Status

Lamp 1:On
Lamp 2:On
Lamp 3:On
Lamp 4:On
Lamp Ctrl:On

Exhaust Fan 1:On
Exhaust Fan 2:On
   Intake Fan:On
Fan Mon:On

Thermal Interlock:Ok
    Lamp Bay Door:Ok
       350V Power:Ok
Interlock Mon:On
```

```
Setup Summary

 Source/Mode: AN1/SVGA60
 Color Bal: 31,31,31/7,7,7
 Wall: 4x4 4:1  Wall OFF
 Aspect: Fill,Fill
 Size/Pos: 800x600/191,19
 Sharpness: On
 Scan: Progressive
 Sync: H & V
 Frequency: 1056
 Phase: 28
 Black:  20,  20,  23
 White: 176, 170, 170
```

```
Serial Status

Baud Rate:19.2Kbps
    Group:0 (00)
     Unit:A (10)

          Port 1                Port 2
      In        Out         Load        Trace
Rx:0000000000 0000000000 0000000000 0000000000
Tx:0000000000 0000000000 0000000280 0000617691

 Parity:0000000000           0000000000
Overrun:0000000000           0000000000
  Break:0000000000           0000000000
Framing:0000000000           0000000000
```

```
Board Jumpers

15-16 Open       Intlk DeFeat
13-14 Open       PS mOnitor
11-12 Installed V,X,UX
 9-10 Open       SV,X
 7-8  Installed SX,UX
 5-6  Open
 3-4  Open
 1-2  Open       EPF10K10 Load
```

```
Hardware Versions

VPC3230D:00003002
 gmVLX1a:00000022
FMS9884A:00000000
     gmZ4:00000090
     FPGA:00000402
    Flash:0001005b
```



Prev Closes the last menu that was opened.

Enter Enters the current data, or goes to selected menu
In the Pan/Zoom menu, Enter moves the cursor from Pan to Zoom to Default and back to Pan

Moves cursor (highlight) up and down.

Special: up-down-up turns on the On-Screen Status Code, whether lamps are on or off.

Adjusts values. Right (+) moves to next menu when there is one. In the Pan/Zoom, the left-right keys are defined in the menu.

8.2 On-Screen Status Codes and LEDs

Press up-down-up arrow keys to see the On-Screen Status Code. If the lamps are on, this also turns on the Cube Status menu.

On-Screen Diagnostic Code

	Condition	Priority	Each block represents 0.1 seconds
These start with Red & **turn off the lamps**.	Interlock, thermal cutoff open	1	R R
	Interlock, Lamp Bay door open	2	R R R
	Sensor overtemp, lamps off[1]	3	R Amber R
	Power supply fan stopped	4	R Amber
	Either Exhaust fan stopped	5	R Amber Amber
	350V missing	6	R R Amber
	Lockout[2]	7	R R R R
These start with Amber & **do not** turn off lamps.	Sensor overtemp, lamps not off[3]	8	Amber R R
	Lamp failure, any lamp	9	Amber R Amber
	Sensor approached limit	10	Amber R
	Standby state[4]	11	Amber Amber
	Lamps on and no alarms	12	Amber on continuously

R = Red

[1] Sensor over limit and Temp Monitor is On.

[2] Conditions 1, 2, 4, 5, or 6 will cause Lockout. After fixing the problem, you may see Condition 7, Lockout. You must cycle AC power off, then on to reset the Lockout condition.

[3] Sensor over limit and Temp Monitor is Off.

[4] Unit is waiting for a Lamp On command.

LEDs on Panther Front Panel

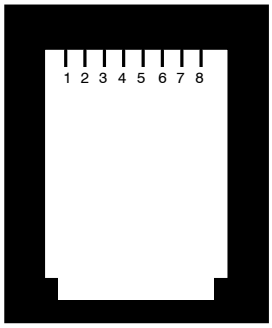
LED	Color	Meaning
Lamp On/Off	Red	Panther is in Lockout. Cannot start lamps yet.
	Amber	Panther is in Standby. Ready to turn on lamps.
	Off	No AC power.
Computer Laptop DVD VCR	Red	Source is absent or not valid.
	Amber	Good source is present.

LED Indicators on the Electronics Module

LED	Off	Green	Red	Amber
Lamps	Off	On	Failed	Striking, but not lit yet. If Lamp Control is off, and the lamp has failed, the LED will remain amber.
Fans		Running	Failed; all lamps shut off	Failed, lamps not shut off
Interlock		Normal; interlocks closed	Lamp Bay cover open or thermal cutoff open.	
Temperature		Normal	Temperature exceeded limit	Temperature approaching limit
RS232 Data		On green for one second when any RS232 data is received		
RS232 CMD		On green for one second when data for this cube is received		
Remote IR		Flickers whenever IR is detected from any source, including Remote		
Standby	Normal (lamps on)	Ready for Lamp ON command		
Lockout	Normal (Standby or lamps on)	Lamps can't be lit during this time; wait.	An interlock or other failure event occurred. You must cycle power to reset this Lockout.	
Source		Normal; valid source detected	Source not valid or no source	Testing for sync type

8.3 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 In (Out is same)
RJ45 connector viewed from the outside, looking into it as the cable does.

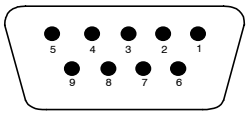
1. No connection
2. No connection
3. Transmit Data (TXD)
4. Ground (earth)
5. Ground (earth)
6. Receive Data (RXD)
7. No Connection
8. No connection

Wiring the adapter

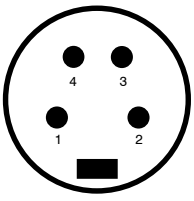
To change the RJ45 connectors to 9-pin D-sub connectors, use a standard RJ45-to-9-pin adapter and connect it internally as shown. The wiring shown for this adapter is correct for *straight-thru* cables.

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

RJ45	9-pin
6	3
5	5
3	2

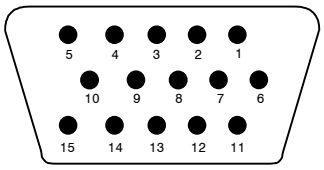


✎ You can tell if a cable is wired straight-thru by looking at its two ends side-by-side. Hold the cable ends next to each other, both ends pointing away from you. Have the clips on both connectors pointing down so you can't see them. If the color coding on the two connectors is the same, left to right, the cable is straight-thru. The order of the colors doesn't matter, as long as they are both the same.



S-Video In and Out
(female connector)

1. Ground
2. Ground
3. Y (Luma)
4. C (Chroma)



Analog In and
Out, 1 and 2
(female connector)

1. Red Video
2. Green Video
3. Blue Video
4. No connection
5. No connection
6. Ground
7. Ground
8. Ground
9. No connection
10. Ground
11. No connection
12. No connection
13. Horizontal sync/Composite sync
14. Vertical sync
15. No Connection

8.4 Glossary of Terms

Lots of words and acronyms (abbreviations) are used in this manual. Here is what some of them mean. Check the Index, too, page 149.

Term	Meaning
aspect ratio	The ratio of the width to the height of a picture, often expressed as 4-by-3, 4:3, 4×3, 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. The aspect ratio of a single Panther is 5:4.
ballast	The device that drives the lamp; it provides high voltage to start the lamp and lower voltage later.
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 complete Panther
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 complete Panther
DVI	Digital Video Interface, a standard for distributing computer pictures in digital form.
electronics module	The device that controls almost everything about the display. It converts incoming pictures to a form that the LCD can use and provides control through the remote control and RS232 connections.
Fast key	One of the buttons on the remote control that takes you directly to a menu or chain of menus.
Fresnel lens	A lens that has been flattened.

Term	Meaning
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
keystone	An image that is wider at the top or bottom, or taller on the left or right.
LCD	Liquid Crystal Display: the imaging device used in the Panther. It works something like a digital watch, but in three colors and with greater detail.
LED	Light Emitting Diode: a small, low power lamp that glows; used as an indicator.
mode	The type of source: for computer sources, mode is the resolution and other factors, such as the vertical refresh rate. For video source, mode is NTSC, PAL or SECAM.
Panther	Model PN-6730-UX with 1600 × 1200 resolution, or Model PN-6740-UX which is the same but with audio.
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.
PAL	The television system used in most of the world outside of North America and Japan. It stands for Phase Alternation Line.
power supply	The device that converts the mains AC voltage to other voltages that the rest of the display can use.
remote	The remote control.
RGB	Red, green, blue; three parts of a video signal sent on separate wires.
RGBS	RGB plus sync, with the sync on a separate wires.

Term	Meaning
SECAM	The television system used in France, Russia and the former Soviet Bloc countries. Sequential Color and Memory.
SOG	Sync on green
source	A source of pictures, such as a computer, a VCR, a DVD player.
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.
unit	One complete Panther
UXGA	Ultra-extended VGA, a standard for distributing analog computer pictures with a resolution of 1600 pixels by 1200 pixels.
VGA	Video Graphics Adapter, an early standard for distributing analog computer pictures with a resolution of 640 pixels by 480 pixels.
video	In this manual, video means NTSC, PAL or SECAM pictures.
VIM	Video Input Module
wall	A group of displays physically bolted together. A real, physical wall, as in a building
XGA	Extended VGA, a standard for distributing analog computer pictures with a resolution of 1024 pixels by 768 pixels.
mode detect	Finding the resolution and other information about a source

8.5 Regulatory Information

Declaration of Conformity

Manufacturer's Name: **Clarity Visual Systems**
Manufacturer's Address: **9025 SW Hillman Court, Suite 3122**
Wilsonville, Oregon 97070-7708

declares that the products
Model Numbers: **WN-6730-UX (LCD projector)**
Product Options: **All**

conforms to the following EU Directives and the standards stated:

Safety: **UL 1950 - Safety of IT Equipment**
EN 60950 - 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
	ENV50204	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

8.6 Specifications

Mechanical

Specification	Maximum	Minimum	Typical	Notes
Outside dimensions				
Width	56.2”			1427 mm
Height	77.5”			1969 mm
Depth	26.5”			673 mm
Weight	275 lbs			125 kg
Shipping weight	~350 lbs			~159 kg (147L x 109W x 135H cm) (58”L x 43”W x 53”H)
Chassis color			Silver	
Ventilation requirement		8", 200 mm		Clearance at rear
Screen size				Aspect ratio 4:3
Diagonal	66.5”			1689 mm
Width	53.3”			1354 mm
Height	40.2”			1021 mm

Electrical and Heat

Specification	Maximum	Minimum	Typical	Notes
Video input amplitude				
Separate RGB analog	1.4 V p-p	0.35 V p-p	0.7 V p-p	75 ohm termination
Composite analog sync	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
Input connectors				
15-pin D-sub female				Analog 1, Analog 2, In and Out
DVI				Digital In and Out; DVI std, no DDC
BNC				Composite video
4-pin DIN)				S-Video In and Out
RJ45				RS232 In and Out
Frequency, see table, page 147				
Total pixels, lines, see table, page 147				
AC requirements				
Line voltage 115 V range	120 V	100 V		45–65 Hz auto-ranging, power factor corrected
230 V range	240 V	200 V		
Line current				
115 V, 4 lamps	6 A		5.5 A	
115 V, 3 lamps	5 A		4.2 A	
115 V, 2 lamps	4 A		3.0 A	
230 V, 4 lamps	3.2 A		2.7 A	
230 V, 3 lamps	2.7 A		2.1 A	
230 V, 2 lamps	2.2 A		1.5 A	
Power				

Electrical and Heat

Specification	Maximum	Minimum	Typical	Notes
4 lamps	690 W		633 W	
3 lamps	575 W		483 W	
2 lamps	460 W		345 W	
Heat in BTUs per hour				
4 lamps	2373		2167	
3 lamps	1964		1615	
2 lamps	1571		1178	

Optical

Specification	Maximum	Minimum	Typical	Notes
Image position	+1 pixel	–1 pixel	0 pixel	
Rotation	– ½ pixel	+½ pixel	0 pixel	
Pincushion/Barrel	–1 pixel	+1 pixel	0 pixel	
Keystoning	–1 pixel	+1 pixel	0 pixel	
Focus/Aberration				No objectionable defocusing or chromatic aberration at distance of 1.5 screen diagonals by a 20/20 vision viewer
Screen, Wide-View				
Gain			1.0±10%	Two-part screen composed of a front black glass screen and a back Fresnel lens
Viewing cone, 1/2 gain	80°, ±40°			1/5 gain, 135°, ±63.5°
Brightness, 4 lramps			~52 cd/m^2	
Brightness, 3 lamps			~39 cd/m^2	
Brightness, 2 lamps			~26 cd/m^2	
Quality View Metric (QVM)[1]			1,400	with four lamps
QVM at 50° viewing angle			300	
Brightness uniformity			> 80%	ANSI 13-point standard
Contrast ratio			>1,500	Dark room
Resolution, see table, page 147				
Lamp life, hours 100W UHP lamp			8,000	Median according to UHP specification (50% still operational after specified median lamp life)

1. Clarity's Quality Viewing Metric (QVM) is a comprehensive measure of image quality. It combines the effects of brightness, contrast and ambient light to yield a more meaningful measurement for evaluating perceived image quality. See www.ClarityVisual.com for more information on QVM and image quality.

Environmental

Specification		Maximum	Minimum	Typical	Notes
Temperature	operating	35° C, 95° F	0° C, 32° F		All performance specifications are maintained within this temperature range
	non-operating	60° C, 140° F	–10° C, 14° F		

Environmental

Specification	Maximum	Minimum	Typical	Notes
Altitude (barometric pressure)	10,000 ft			Above sea level, or equivalent barometric pressure
Humidity	80% R.H.	20% R.H.		40° C non-condensing

Formats Supported in the Analog 1, Analog 2 and Digital Connectors

Resolution	Name	Refresh rate (Hz)	H Freq (kHz)	Pixel Freq (MHz)	Pixels per line
640 × 480	VGA	60	31.5	25.175	800
		72	37.9	31.5	832
		75	37.5	31.5	840
		85	43.3	36	832
800 × 600	SVGA	56	35.1	36	1024
		60	37.9	40	1056
		72	48.1	50	1040
		75	46.9	49.5	1040
		85	53.7	56.25	1048
1024 × 768	XGA	60	48.4	65	1344
		70	56.5	75	1328
		75	60.2	78.75	1312
		80	64	85.5	1376
		85	68.77	94.5	1376
1280 × 1024	SXGA	60	64	108	1688
		60 (a)	63.5	109.9	1730
		70	77.4	130.6	1726
		75	80	135	1688
		85	91.1	157.5	1728
1600 × 1200	UXGA	60	75	162	2160
640 × 480	MAC	67	34.97	31.33	859
832 × 624		75	49.72	57.28	1152
1280 × 720p	HDTV	60	45	74.25	1650
1920 × 1080i		30	33.75	74.25	2200
720 × 400	VESA	70	31.47	28.32	936
720 × 400		85	37.9	35.5	936
1024 × 1024i	1024 × 1024i	60	63.3	89.12	1323

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