Radiance Tech Tip 5
Using Test Patterns

Introduction

The Lumagen Radiance video processor features high accuracy, internally generated, test patterns that can be used for testing and calibration.

The test patterns can be generated at the same horizontal and vertical resolution as the current output mode or they can also be generated at a user specified, output mode, 2D/3D type, CMS and Style. The test patterns can be used for calibrating displays, calibrating 3D glasses, and troubleshooting.

The test patterns are arranged in thirteen pattern groups. To display the test pattern menu, press "MENU, Other, Test Pattern".

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Geometry	**Contrast**	**Lines**	**Gray1**	**Gray2**	**Color1**
Crosshatch	Contrast 1	Horizontal	Ramp	Large Window	Colorbars 100
Overscan	Contrast 2	Vertical		Small Window	Colorbars 75
Overscan 2.35	Black Ramp			Solid Window	
Aspect Squares	Low Clip			Medium APL	
	White Ramp			Small APL	
	High Clip				
	Targets				
	Check				
	Inverted Check				
	Video Black				
	Video White				

Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	Group 13
Red	**Green**	**Blue**	**Yellow**	**Cyan**	**Magenta**	**UserColor**
Large Window	Large Window	Large Window	Large Window	Large Window	Large Window	Large Window
Small Window	Small Window	Small Window	Small Window	Small Window	Small Window	Small Window
Solid Window	Solid Window	Solid Window	Solid Window	Solid Window	Solid Window	Solid Window
						Size
						Size APL

Controlling the test patterns

<>	Select the pattern group.
∧∨	Adjust IRE on some patterns.
"1"	Step backward through the patterns within a group.
"2"	Hide/display the menu.
"4"	Step forward through the patterns within a group.
"CLR"	Completely exit the test patterns.
"Ok"	Leave the test pattern up and display the menu.
"PRV"	Toggle between video input and test pattern.
"ALT"	Exit the menu.

Test pattern operation

Location   To display the test pattern menu, press "MENU, Other, Test Pattern".

A/R Indicator   Indicator for test patterns shows whether it's an Adjustable pattern or a Reference pattern. A small black "A" or "R" is shown in the lower right corner of the test pattern label.

```
Geometry:Crosshatch(REF)
Pattern 1 of 3  IRE:  100
Press Help for commands        R
```
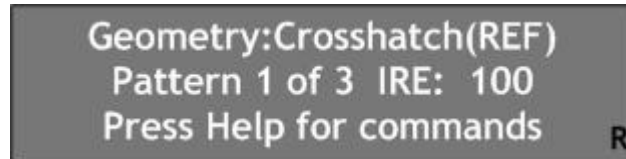
This same "A" or "R" is displayed for 6 seconds, in the upper right corner of the test pattern, when you use the RS-232 command interface to display a test pattern. The indicator is designed to have a negligible affect on the average picture level of the test pattern.

Menu timeout   The test pattern timeout setting controls the length of time the test patterns are displayed. In the "Normal" setting the test patterns are displayed for 3 minutes. In the "Slow" setting the test patterns are displayed for 30 minutes. Press "MENU, Other, Menu control, Timeouts, Test pattern timeout, [Normal, Slow], OK".

Test Pattern Menu

Reference   Uses the current output mode. These patterns are only affected by the Output PC/Video level settings and can be used to calibrate the controls on your display.

Adjustable   Uses the current output mode. These patterns are affected by all the Output Color Management settings and can be used to calibrate the controls on your Radiance.

Warm up   Displays a warm up pattern of 20IRE to 50IRE. Use the up and down arrow buttons to change the IRE level. This pattern is safe for long-term use on a CRT or plasma display and can be used to warm up a display for calibration.

Ref w/Mode   Uses the specified Test Mode. These patterns are only affected by the Output PC/Video level settings and can be used to calibrate the controls on your display.

Adj w/Mode   Uses the specified Test Mode. These patterns are affected by all the Output Color Management settings and can be used to calibrate the controls on your Radiance.

Test Mode   User specified test mode that can be used to display test patterns in a user defined output mode, 2D/3D type, CMS and Style.

Test Pattern Example

The Radiance allows you to view the adjustable test pattern or an external video input while making adjustments to the Radiance input and output controls. This can be very useful when you are doing a video calibration.

1. Enable the "Service mode" menu by pressing "Menu, Other, Menu control, Menu Mode, Ok, Service mode, Ok".
2. Display the adjustable test pattern by pressing "Menu, Other, Test Pattern, Adjustable, Ok".
3. Press the right arrow button three times to display the "Gray1: Ramp" pattern.
4. Press "Ok" to leave the test pattern displayed and return to the menu.
5. Use the arrow buttons to navigate the menu to "Menu, Output, CMS's, [*CMS], Gamma Factor, Ok".
6. Use the up and down arrow buttons to adjust the gamma factor of the output and notice the affect on the display.
7. Press "PREV" to display the input video.
8. Use the up and down arrow buttons to adjust the gamma factor of the output and notice the affect on the display.
9. Press "PREV" again to return to the test pattern display.
10. Press "ALT" to return to the test pattern command menu.
11. Press the left/right arrow button to choose a different test pattern group.
12. Press "CLR" to clear the test pattern.
13. Cycle the power on the Radiance to reload the last saved configuration.

How to use the Contrast1 and Contrast2 patterns

It is important to note that many displays will have different black levels depending on the average picture level (APL) of the image. The Radiance "Contrast 1" pattern with a –4% and a +4% vertical bar on the sides is a high APL image. It is better to use the low APL Radiance "Contrast 2" pattern, which has -4% to 4% vertical bars in 1% steps in the center, and the "Black Ramp" pattern to insure that dark scenes have a correct black level setting.

Note:
Setting black slightly too dark is better than setting black slightly too bright. If black is too bright the image will look "softer" than it should.

1. Set the black-level (brightness) and white-level (contrast) using the controls on the display. If the display controls are too coarse, or lack the proper range, you can use the Radiance output–configuration black-level and white-level to adjust the black, or white, output level (MENU> Output> Styles> [style]> HDMI Format> Type).
2. When black is properly calibrated, a -4% bar cannot be differentiated from a 0% black background, and a +4% bar can be barely seen against a 0% black background. In fact, in a well-designed display/projector, when properly calibrated, even a -1% bar cannot be differentiated from a 0% black background, and +1% bar can, while viewing the "Black Ramp" contrast test pattern from the Radiance.

Note:
Use the Radiance 'Reference' test patterns for setting the display controls.

Constant 50% APL test pattern

The Gray Window test patterns, "Gray: Small 50 APL" and "Gray: Medium 50 APL" have a constant 50% APL (Average Picture Level). The central measurement window can be adjusted from 0 to 100 IRE, in steps of 5 IRE. At the same time, a boarder that is of equal area to the central window varies the opposite way from 100 to 0 IRE, in steps of 5 IRE. The background is 50 IRE. The three elements of the test pattern, add up to a constant APL of 50%.

1. Display the test patterns by pressing "Menu, Other, Test Pattern, Ref/Adj, Ok".
2. Press the right or left arrow buttons to display the "Gray" test pattern.
3. Press "1" or "4" to display the "Gray: SmlAPL" or "Gray: MedAPL" pattern.
4. Press the up and down arrow buttons to adjust the central measurement window, from 0 to 100 IRE.
5. Press "2" to turn the menu display on and off.

Variable Size and APL test pattern

The User Color Window test patterns, "UserColor:Size" and "UserColor:SizeAPL" allow you to set the size and APL (Average Picture Level) of the test pattern. The size of the central measurement window can be adjusted form 0.00 to 99.5%, in steps of 0.1%. The test pattern can be adjusted from 0 to 100% APL, in steps of 1%.

Note:
Radiance test pattern window size for small=1.56%, medium=11.1% and large=100%.
Some video generators use window patterns that are 10.85%.
THX and Lightspace use window patterns that are 6.5%.

1. Display the test patterns by pressing "Menu, Other, Test Pattern, Ref/Adj, Ok".
2. Press the right or left arrow buttons to display the "UserColor" test pattern.
3. Press"1" or "4" to display the "UserColor:Size" or "UserColor:SizeAPL" pattern.
4. These patterns use the RGB levels that are set in the first three patterns in the group.
5. Press the up or down arrow button to highlight the "Size" setting and use the numeric keypad on the remote to enter three numbers for the window size.
6. For the variable APL pattern, use the numeric keypad on the remote to enter two numbers for the APL (Average Picture Level).
7. Press "2" to turn the menu display on and off.

Note:
For the variable APL pattern. As you vary the size of the window the background level is adjusted to give the desired APL. If it can't meet the requested APL, a greater-than or less-than sign is displayed next to APL to indicate this (.ie setting RGB=240,240,240, the custom size to 90.0% and the APL to 30% would give the greater-than sign next to APL).

Test Pattern Directory

Note: The following drawings are illustrations and may vary from the actual test patterns.

Group 1

Geometry: Crosshatch
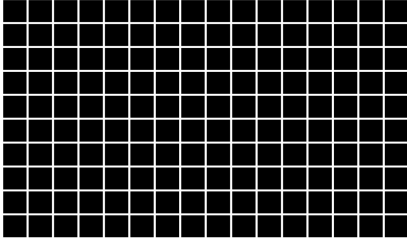
Geometry: Overscan

Geometry: Overscan 2.35
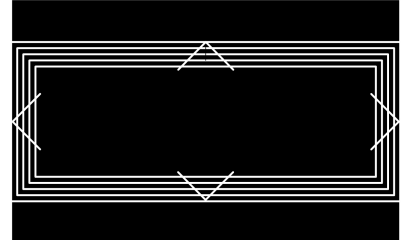
Geometry: Aspect Squares
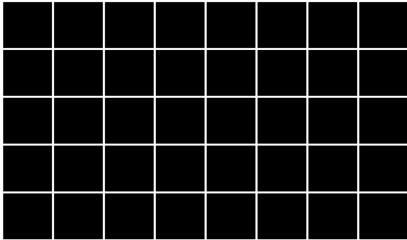
Group 2

Contrast: Contrast 1

Contrast: Contrast 2
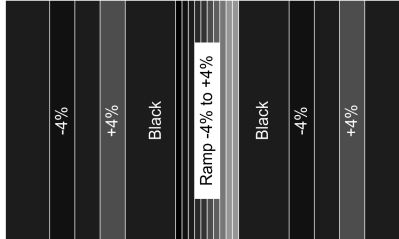
Contrast: Black Ramp
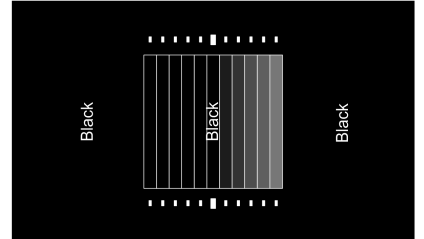
Contrast: Low Clip
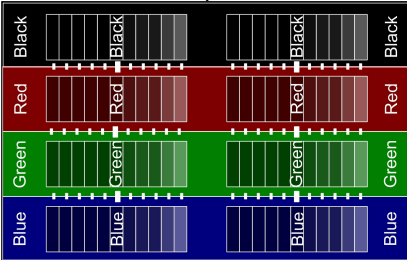
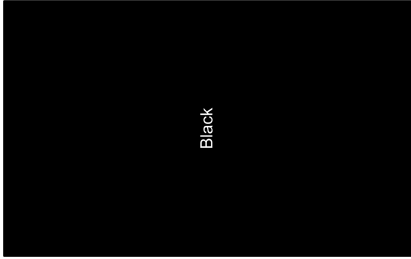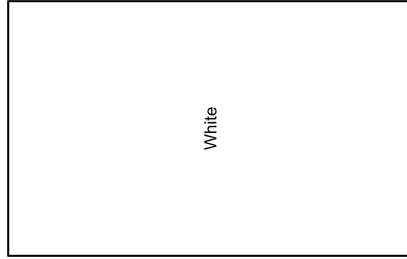Contrast: White Ramp
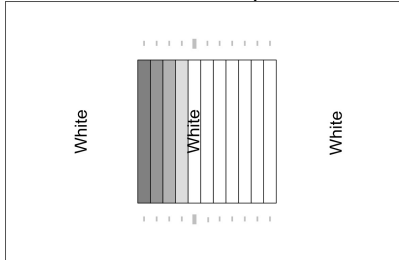
Contrast: High Clip
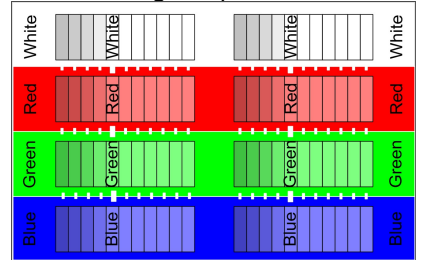
Contrast: Targets
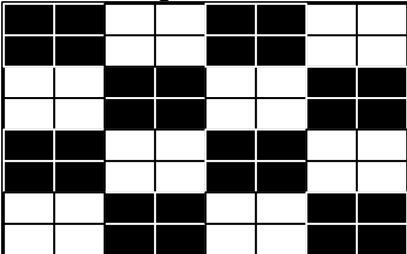
Contrast: Check
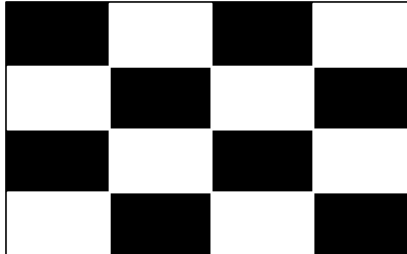
Contrast: Inv Check
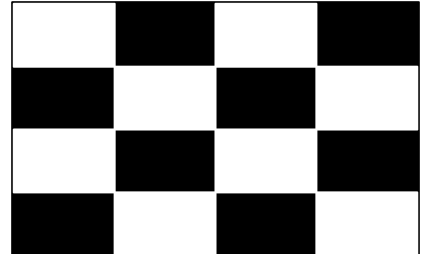
Contrast: Video Black

Black

Contrast: Video White

White

Group 3

Lines: Horizontal (1 pixel)
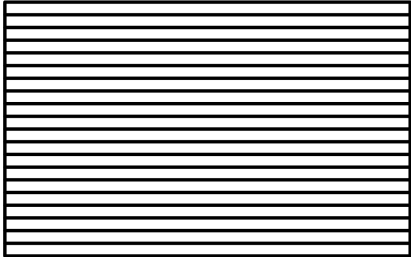
Lines: Vertical (1 pixel)

Group 4

Gray1: Ramp

Black White

White Black
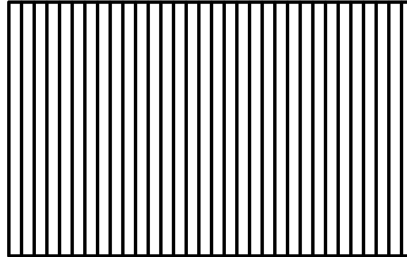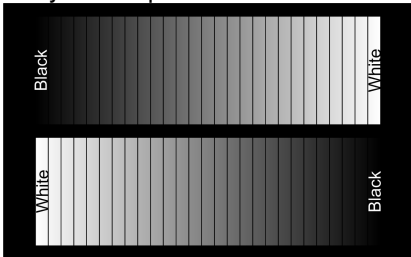
Group 5

Gray: Large window
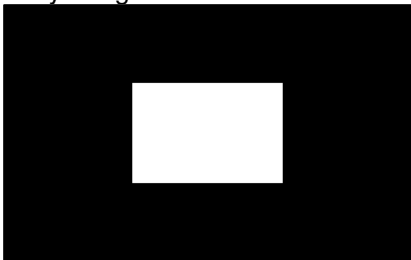
Gray: Small window
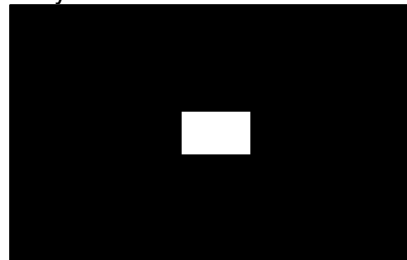
Gray: Solid window
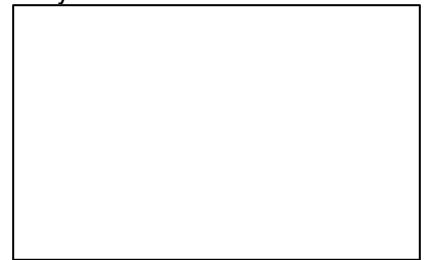
Gray: Medium 50% APL
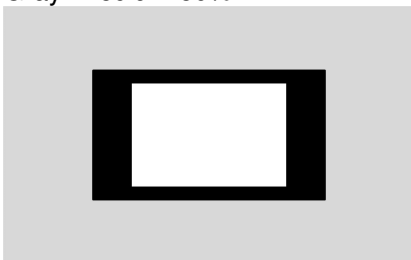
Gray: Small 50% APL
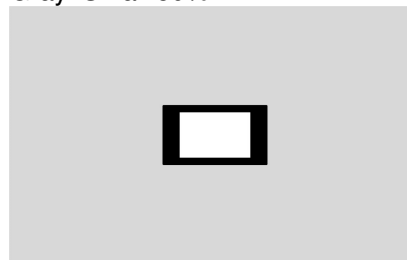
Group 6

Color1: Colorbars 100

White	Yellow	Cyan	Green	Magenta	Red	Blue

+4% -4%   +4% -4%

Color1: Colorbars 75

White	Yellow	Cyan	Green	Magenta	Red	Blue

+4% -4%   +4% -4%
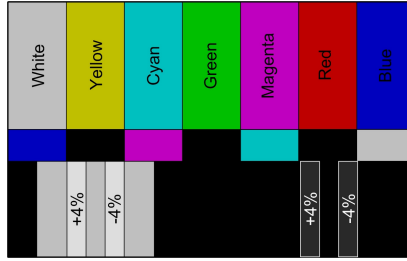
Group 7
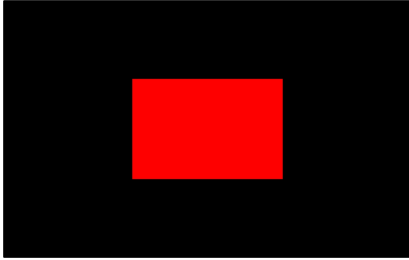
Red: Large Window

Red: Small Window
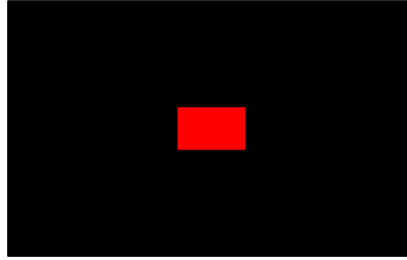
Red: Solid Window
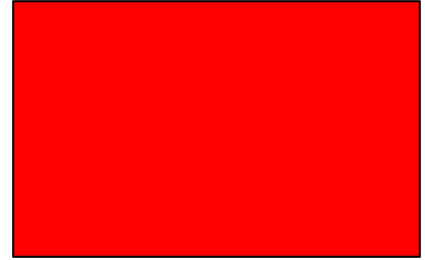
Group 8

Green: Large Window
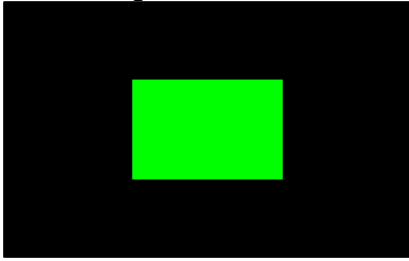
Green: Small Window
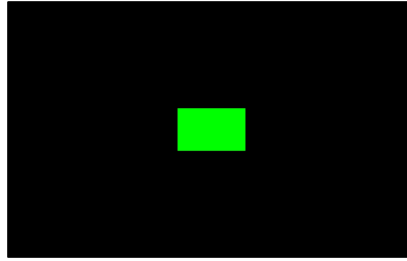
Green: Solid Window
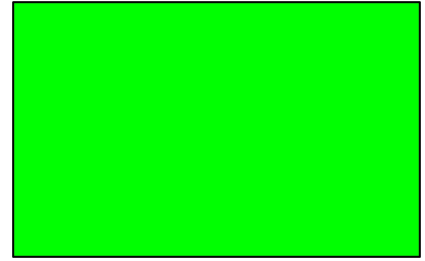
Group 9

Blue: Large Window
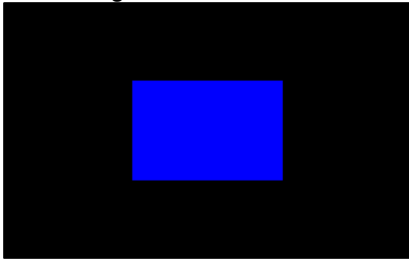
Blue: Small Window
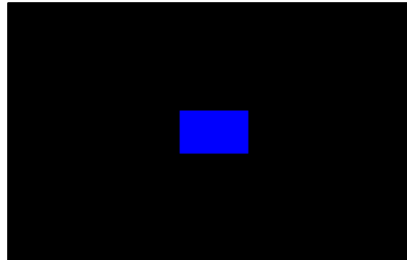
Blue: Solid Window
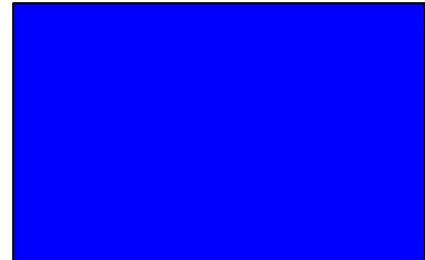
Group 10

Yellow: Large Window
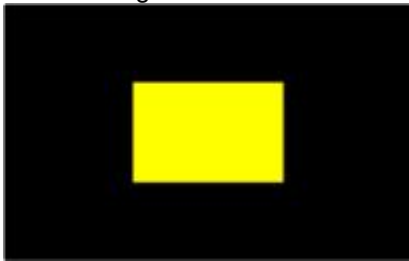
Yellow: Small Window
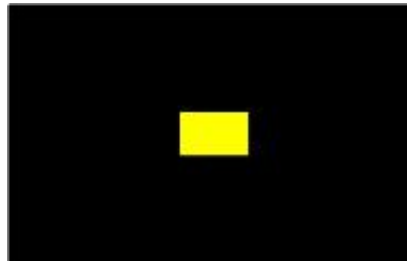
Yellow: Solid Window
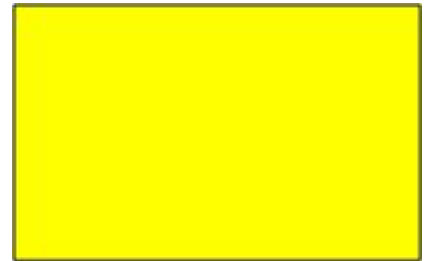
Group 11

Cyan: Large Window
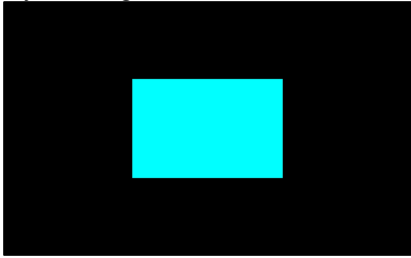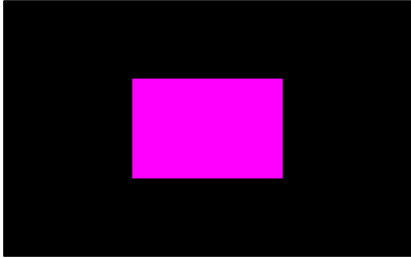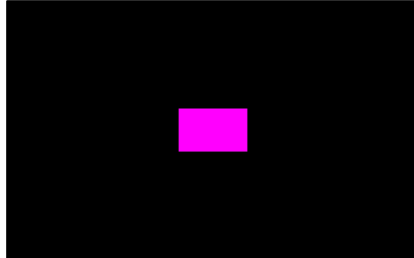
Cyan: Small Window
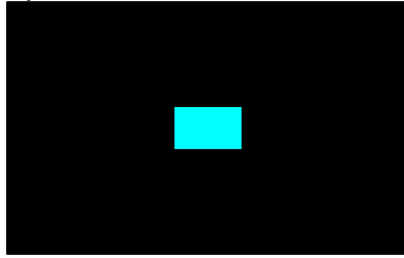
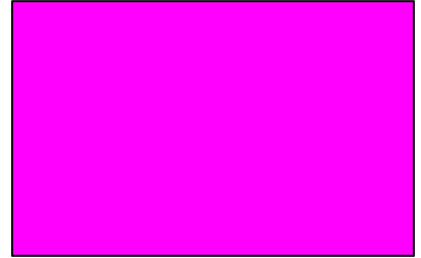Cyan: Solid Window
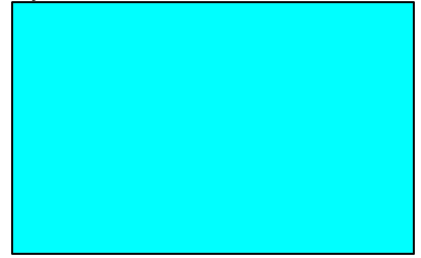
Group 12
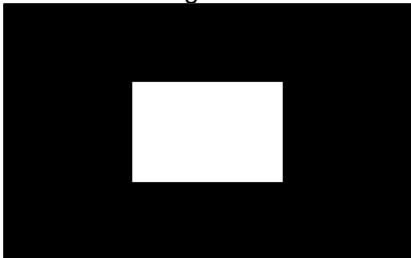
Magenta: Large Window

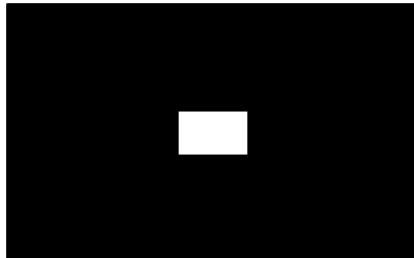Magenta: Small Window

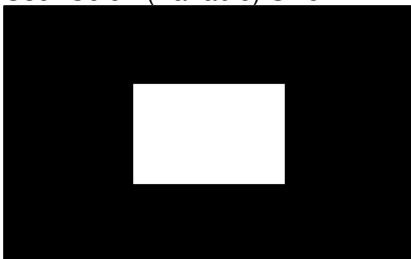Magenta: Solid Window

Group 13

User Color: Large Window

User Color: Small Window

User Color: Solid Window

User Color: (Variable) Size

User Color: (Variable) Size/APL