

Calibration Report

Client: The Owner

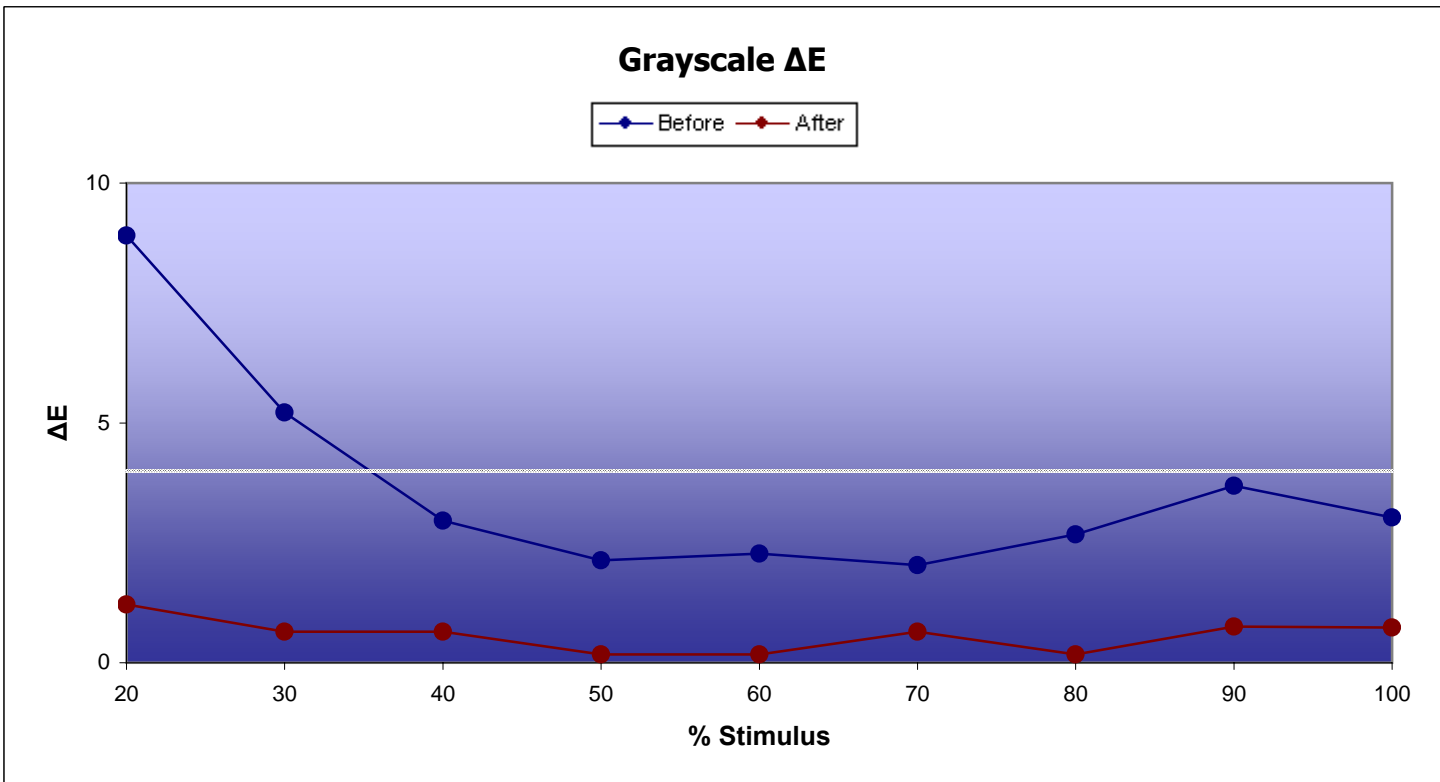
Display: The Display

Gray Scale Performance

This chart displays the color of white across the entire grayscale in raw xy data and Delta-E. White is defined as x0.3127, y0.329. Delta E (dE or ΔE) is a measurement of deviation from a color standard. The smaller the number, the less the deviation from the standard. ΔE for white should not rise above 4. This also shows Correlated Color Temperature (CCT), which is a less precise measurement of the color of white. The target is 6505. Higher than 6505 is too blue. Lower is too red.

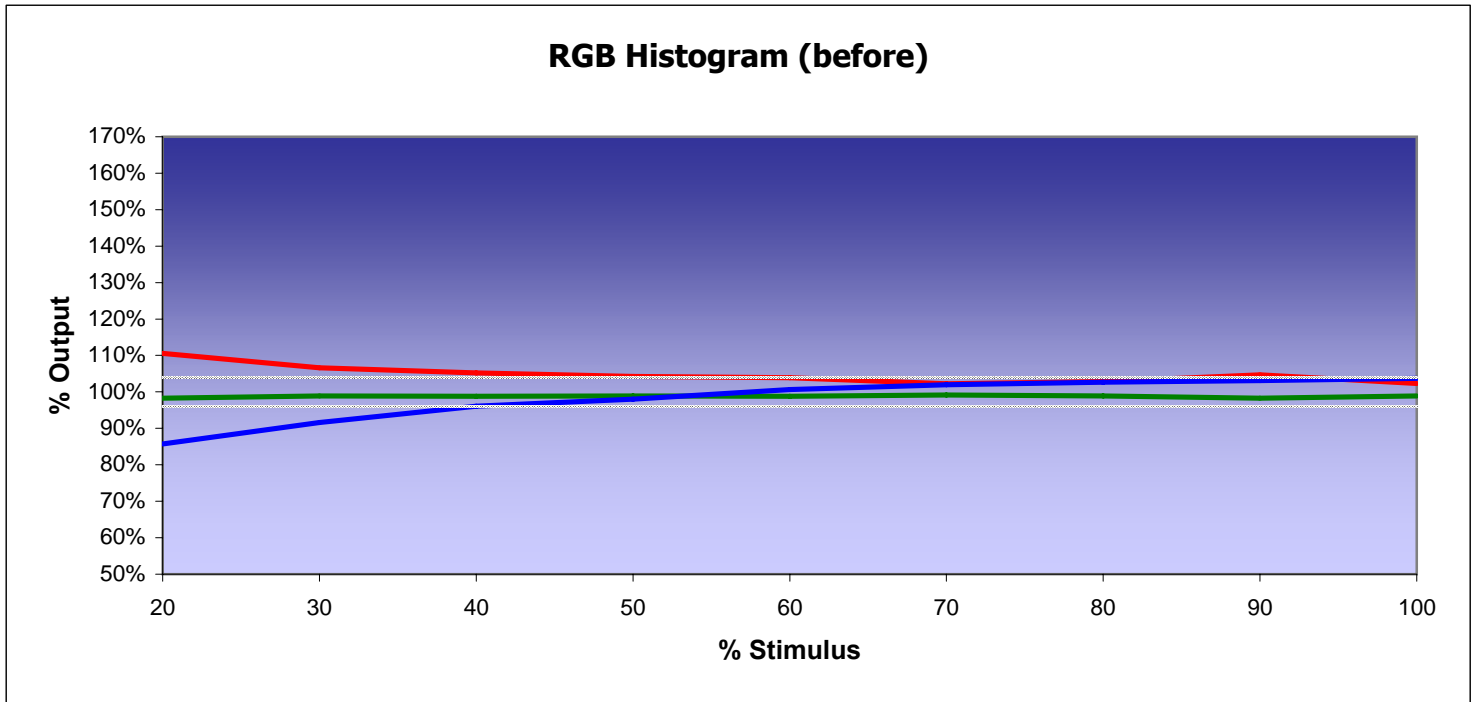
Color Difference Model: CIE94

Before Calibration					After Calibration				
% Stim	x	y	ΔE	CCT	% Stim	x	y	ΔE	CCT
20	0.330	0.343	8.9	5,608	20	0.314	0.328	1.2	6,441
30	0.323	0.337	5.2	5,939	30	0.314	0.330	0.6	6,428
40	0.319	0.332	3.0	6,155	40	0.314	0.330	0.6	6,428
50	0.317	0.330	2.1	6,269	50	0.313	0.329	0.2	6,489
60	0.315	0.327	2.3	6,394	60	0.313	0.329	0.2	6,489
70	0.313	0.326	2.0	6,511	70	0.314	0.330	0.6	6,428
80	0.313	0.325	2.7	6,518	80	0.313	0.329	0.2	6,489
90	0.314	0.324	3.7	6,470	90	0.313	0.328	0.8	6,496
100	0.312	0.324	3.0	6,583	100	0.314	0.329	0.7	6,435
	Ave.		3.7	78 + 897 -		Ave.		0.6	0 + 77 -

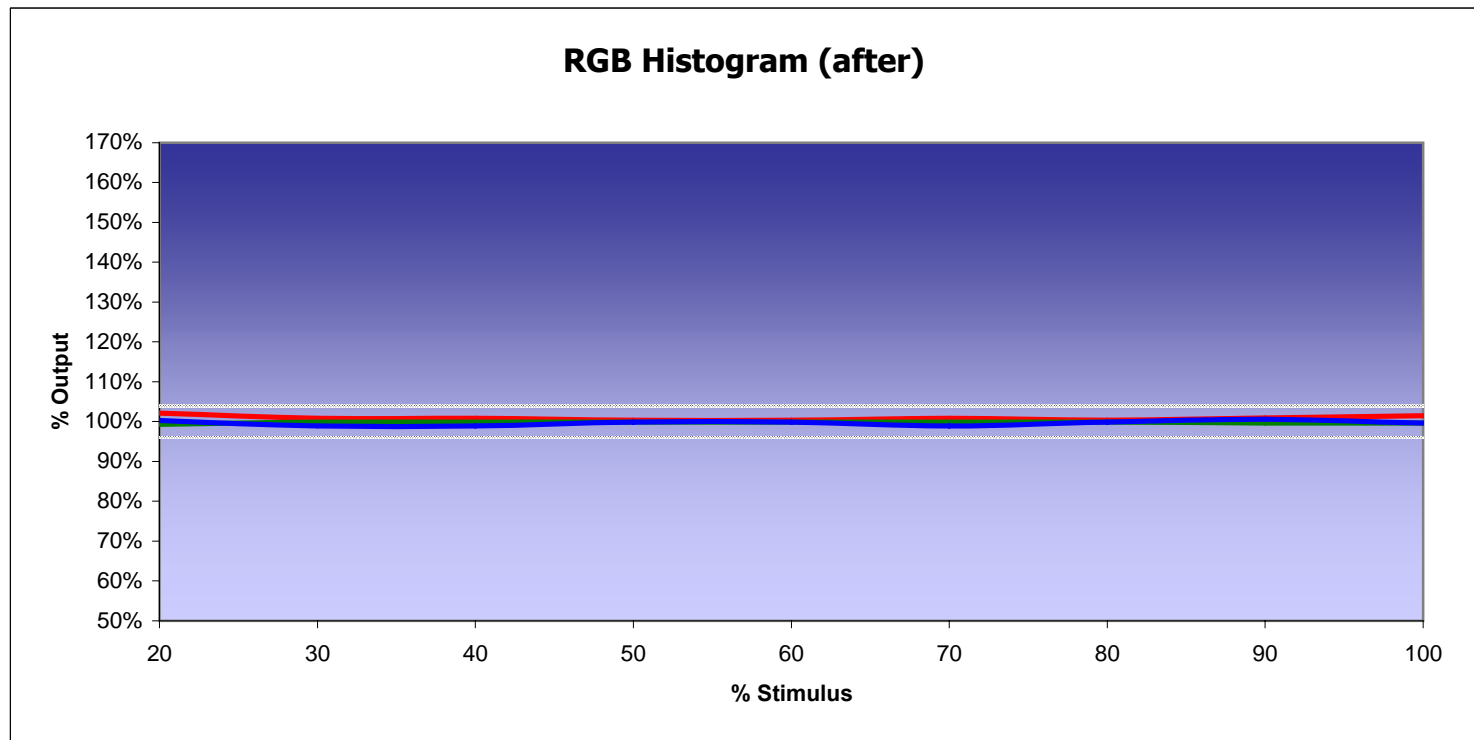


RGB Histogram Chart

This chart also displays gray scale performance, but breaks out the contributions of red, green, and blue. Ideally, all three colors should be within +/- 4% from 100% across the entire range.



	20	30	40	50	60	70	80	90	100	Ave.
R	110.5%	106.6%	105.3%	104.3%	103.9%	102.2%	102.9%	104.6%	102.3%	104.7%
G	98.3%	98.9%	98.8%	98.9%	98.8%	99.1%	98.9%	98.3%	98.9%	98.8%
B	85.7%	91.6%	96.1%	98.0%	100.7%	102.0%	102.7%	103.1%	103.7%	98.2%



	20	30	40	50	60	70	80	90	100	Ave.
R	102.1%	100.9%	100.9%	100.3%	100.3%	100.9%	100.3%	101.0%	101.5%	100.9%
G	99.3%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.7%	99.6%	99.8%
B	100.3%	98.9%	98.9%	99.9%	99.9%	98.9%	99.9%	100.6%	99.6%	99.7%

Chromaticity Performance

Select Color Space: Rec. 709

The raw data below shows the display's ability to accurately reproduce color as defined by the selected color difference model in ΔE units. CIELUV or CIELAB should be 4 or less. CIE94 should be 1.5 or less.

Rec. 709 Reference (HD)

	x	y	Y
R	0.6400	0.3300	0.2126
G	0.3000	0.6000	0.7152
B	0.1500	0.0600	0.0722
Y	0.4193	0.5053	0.9278
C	0.2246	0.3287	0.7874
M	0.3209	0.1542	0.2848
W	0.3127	0.3290	1.0000

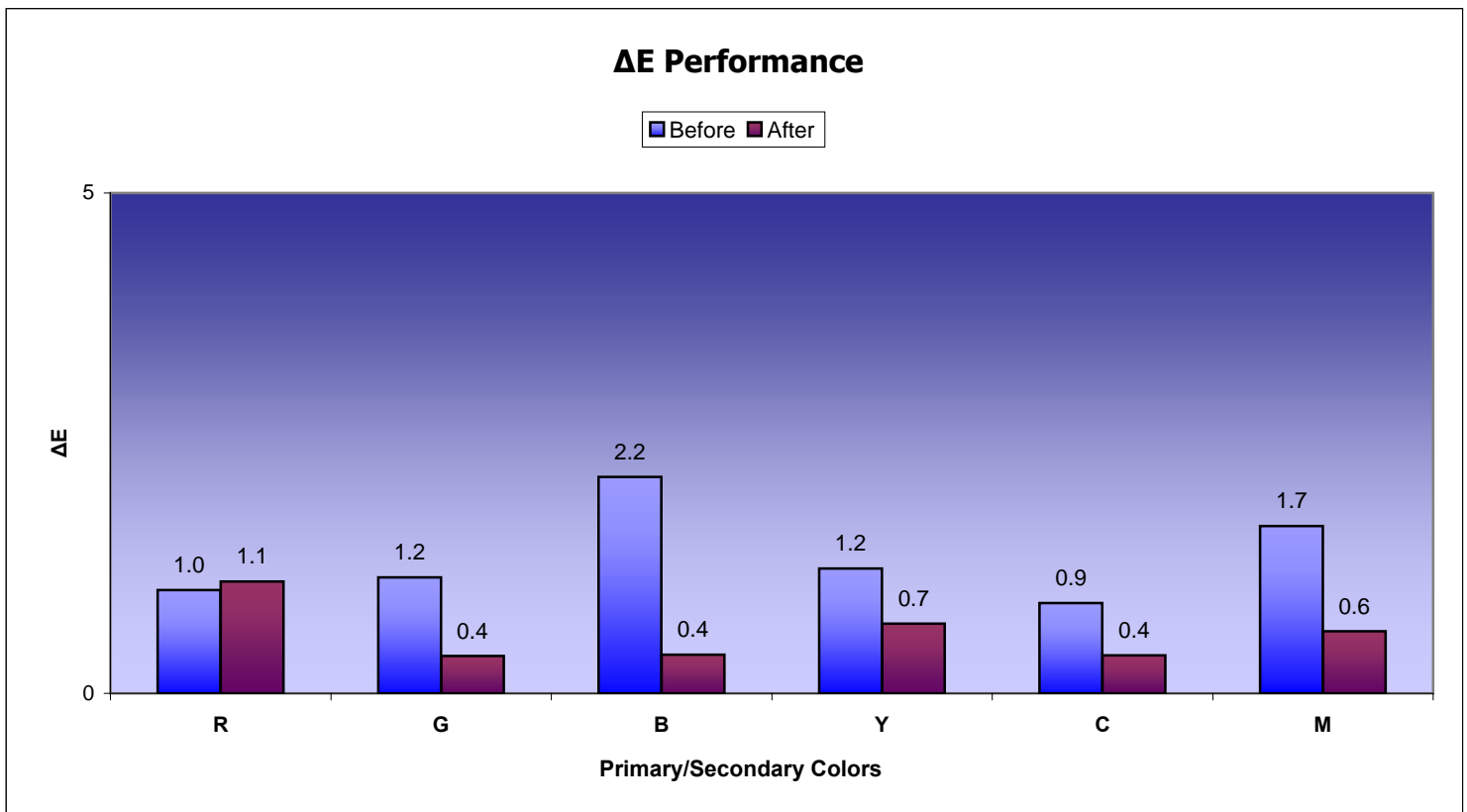
Before Calibration

	x	y	Y	ΔE
R	0.644	0.325	0.215	1.0
G	0.304	0.597	0.736	1.2
B	0.148	0.065	0.079	2.2
Y	0.424	0.501	0.922	1.2
C	0.226	0.326	0.789	0.9
M	0.324	0.156	0.303	1.7
				1.4 Ave.

After Calibration

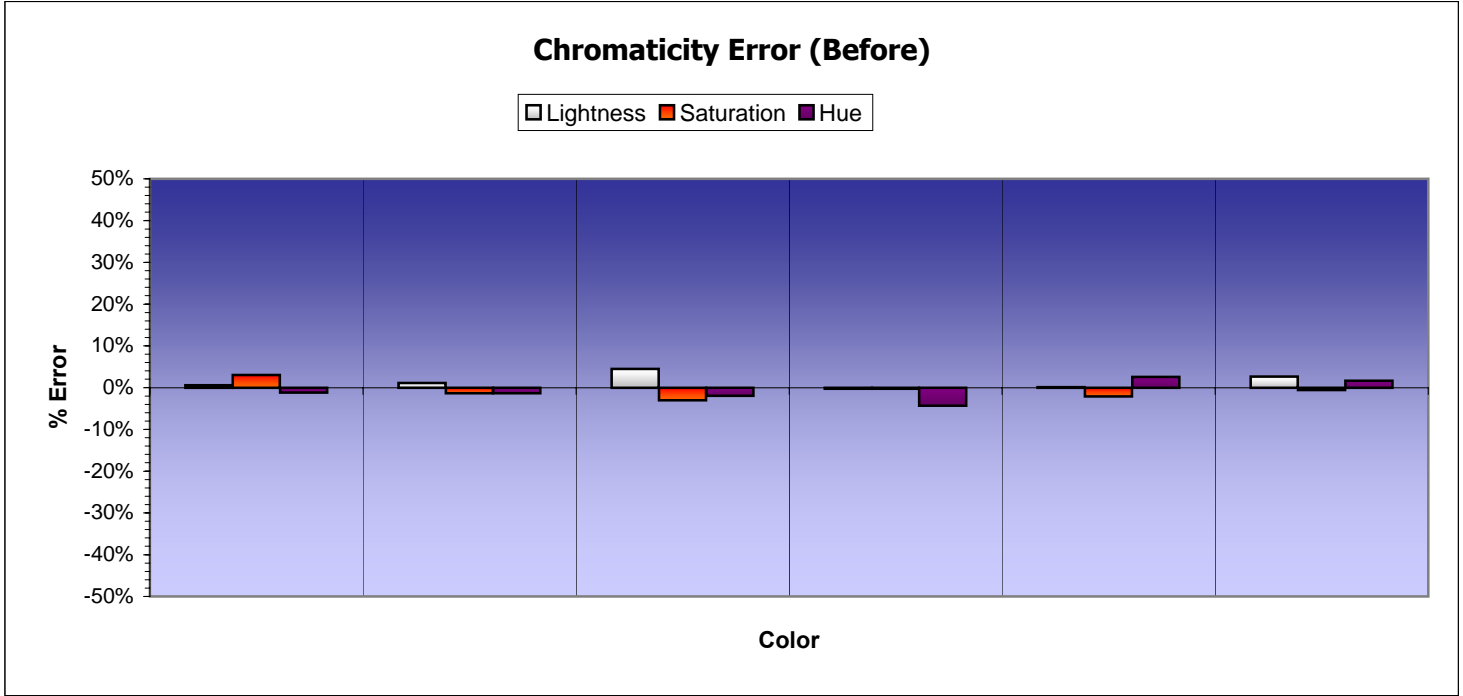
	x	y	Y	ΔE
R	0.638	0.327	0.215	1.1
G	0.302	0.599	0.719	0.4
B	0.148	0.060	0.072	0.4
Y	0.422	0.503	0.931	0.7
C	0.225	0.330	0.791	0.4
M	0.324	0.156	0.290	0.6
				0.6 Ave.

Color Difference Model: CIE94

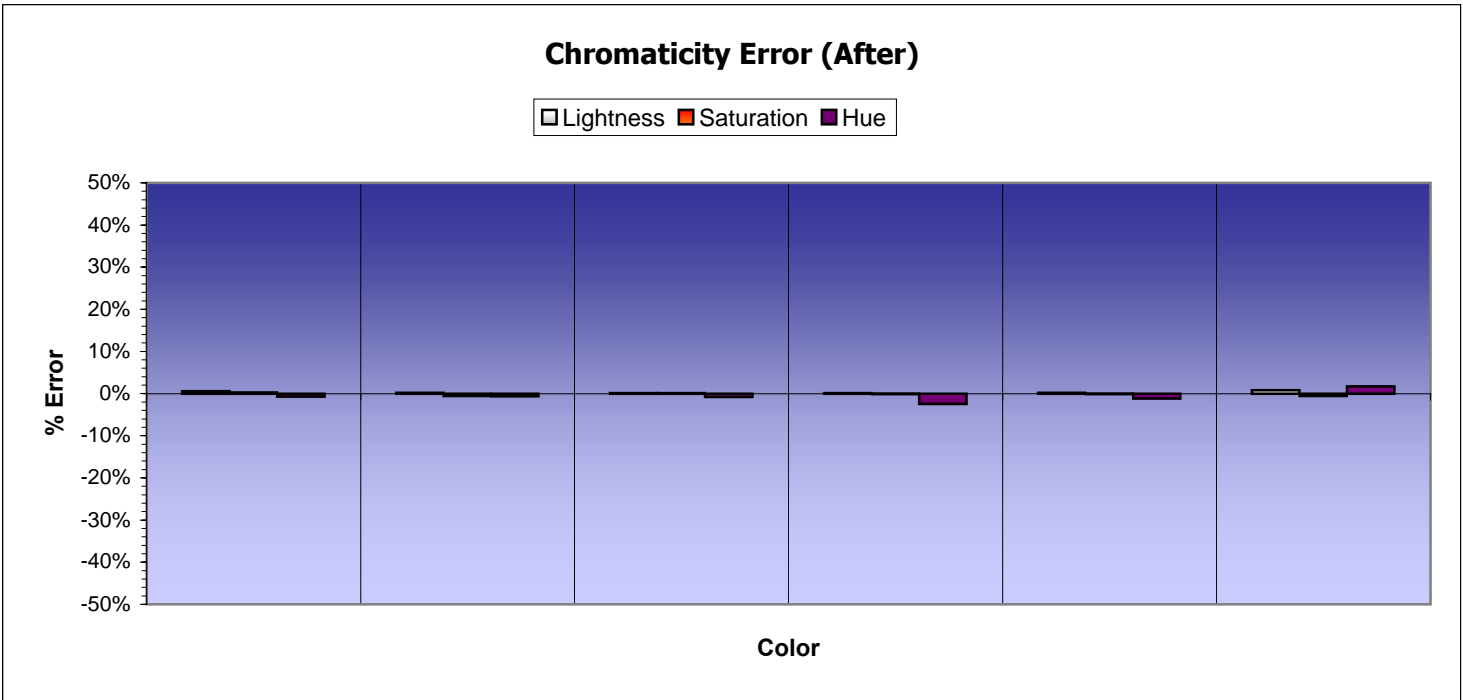


Lightness, Saturation, and Hue Error

These charts display the before/after chromaticity errors of the primary/secondary colors in terms of the three visible components of color: Lightness, Saturation, and Hue (LSH). Ideally, all primary and secondary colors should have no more than 2% error in any component.



Lightness	0.5%	1.1%	4.5%	-0.2%	0.1%	2.7%
Saturation	3.0%	-1.3%	-3.1%	-0.3%	-2.1%	-0.5%
Hue	-1.2%	-1.3%	-2.0%	-4.4%	2.6%	1.7%
	R	G	B	Y	C	M



Lightness	0.6%	0.2%	0.1%	0.1%	0.2%	0.8%
Saturation	0.3%	-0.5%	0.1%	-0.1%	-0.1%	-0.5%
Hue	-0.7%	-0.7%	-0.8%	-2.4%	-1.2%	1.7%
	R	G	B	Y	C	M

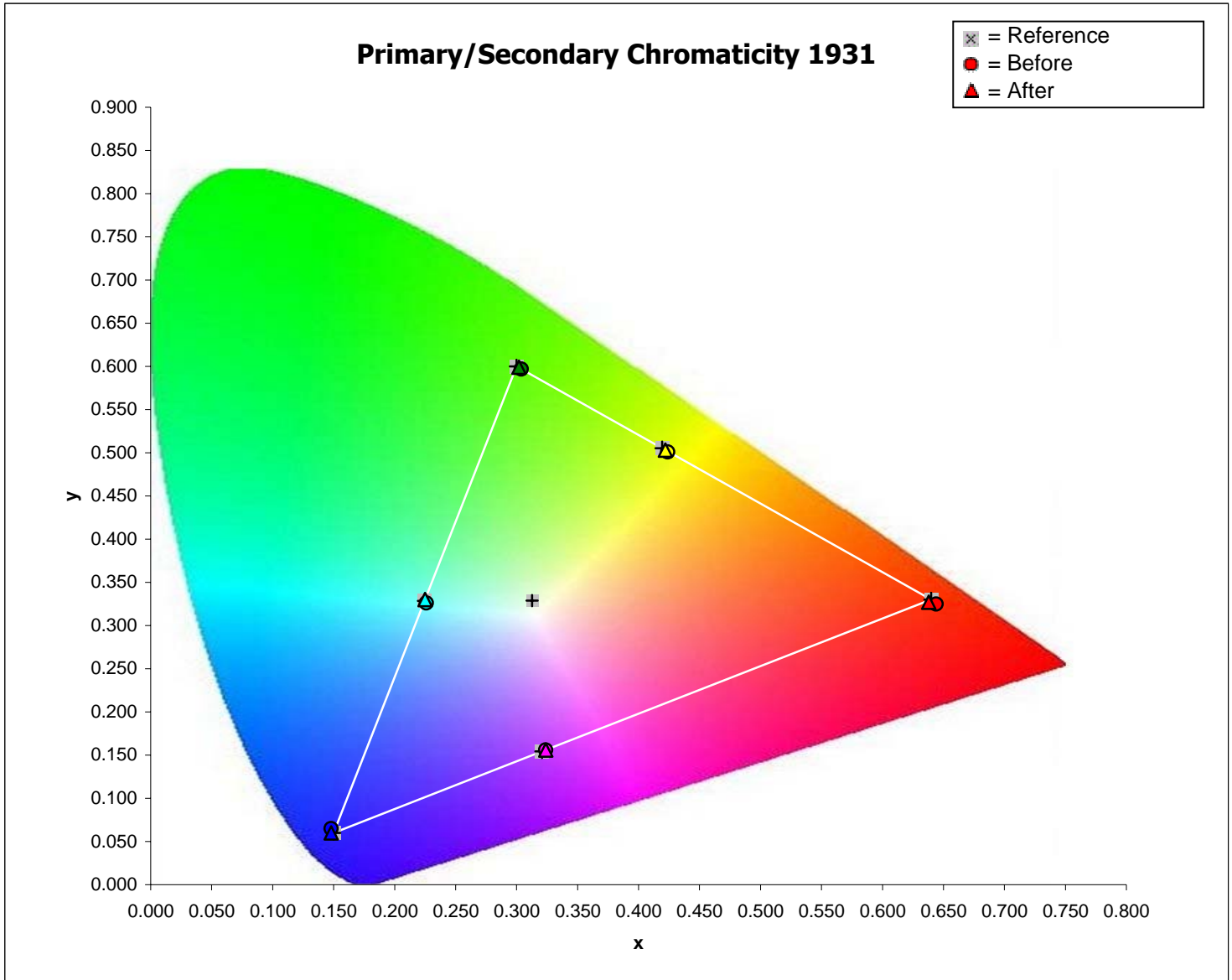
CIE Charts

Color Space: Rec. 709 Reference (HD)

These charts graphically map the accuracy of the display's color saturation and hue relative to the chosen standard

The closer the "After" symbols are to the reference points, the more accurate the color. There are 2 chromaticity charts, one showing before/after performance based on the 1931 xy system and another based on the 1976 u'v' system,

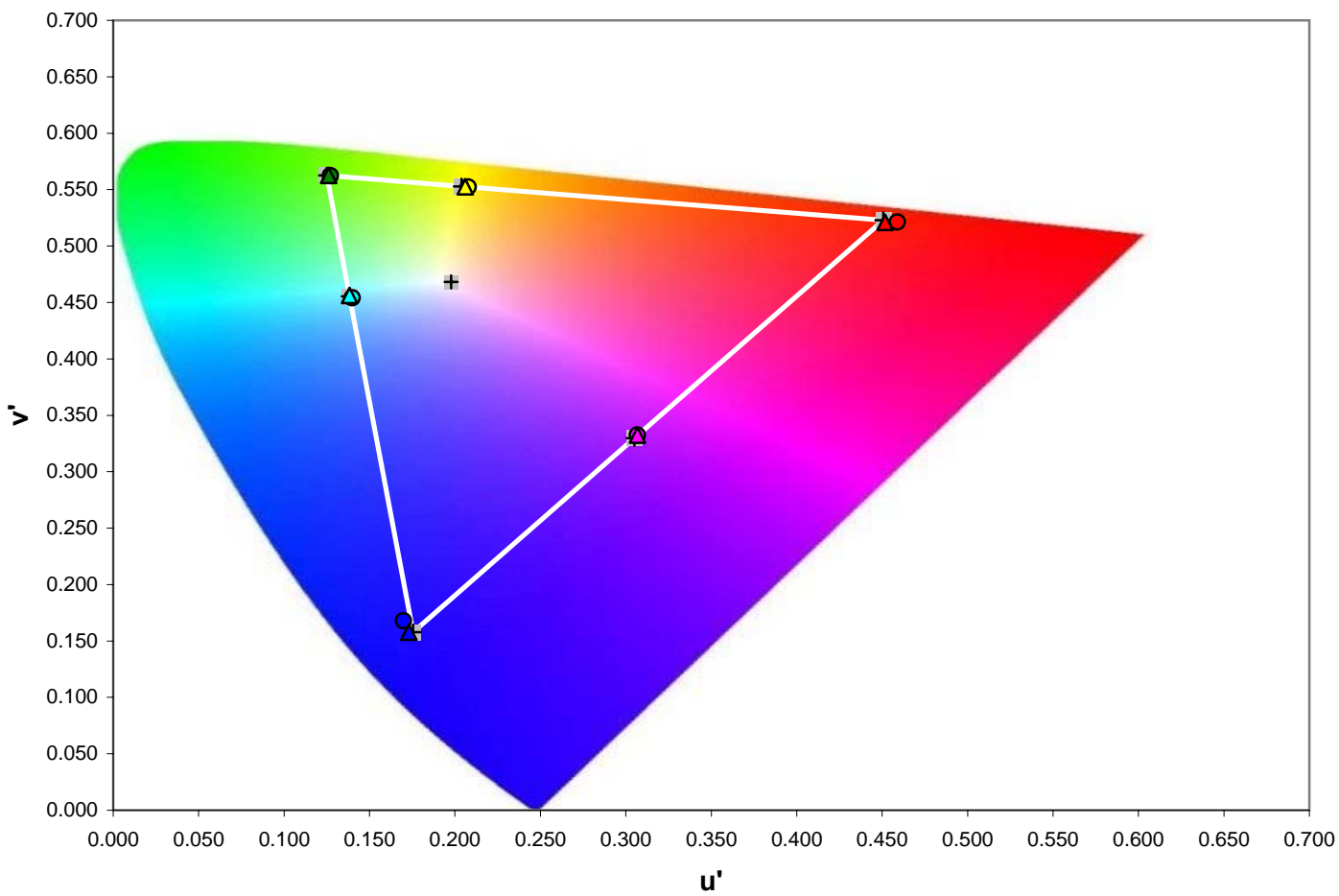
which is less well known, but more perceptually uniform.



The CIE (Commission Internationale de L'Eclairage or "International Commission on Illumination") establishes standards for color performance, uses these charts as a way of visually representing saturation and hue. The third component of color (brightness or lightness) is not represented on these charts, so they provide incomplete, but useful information.

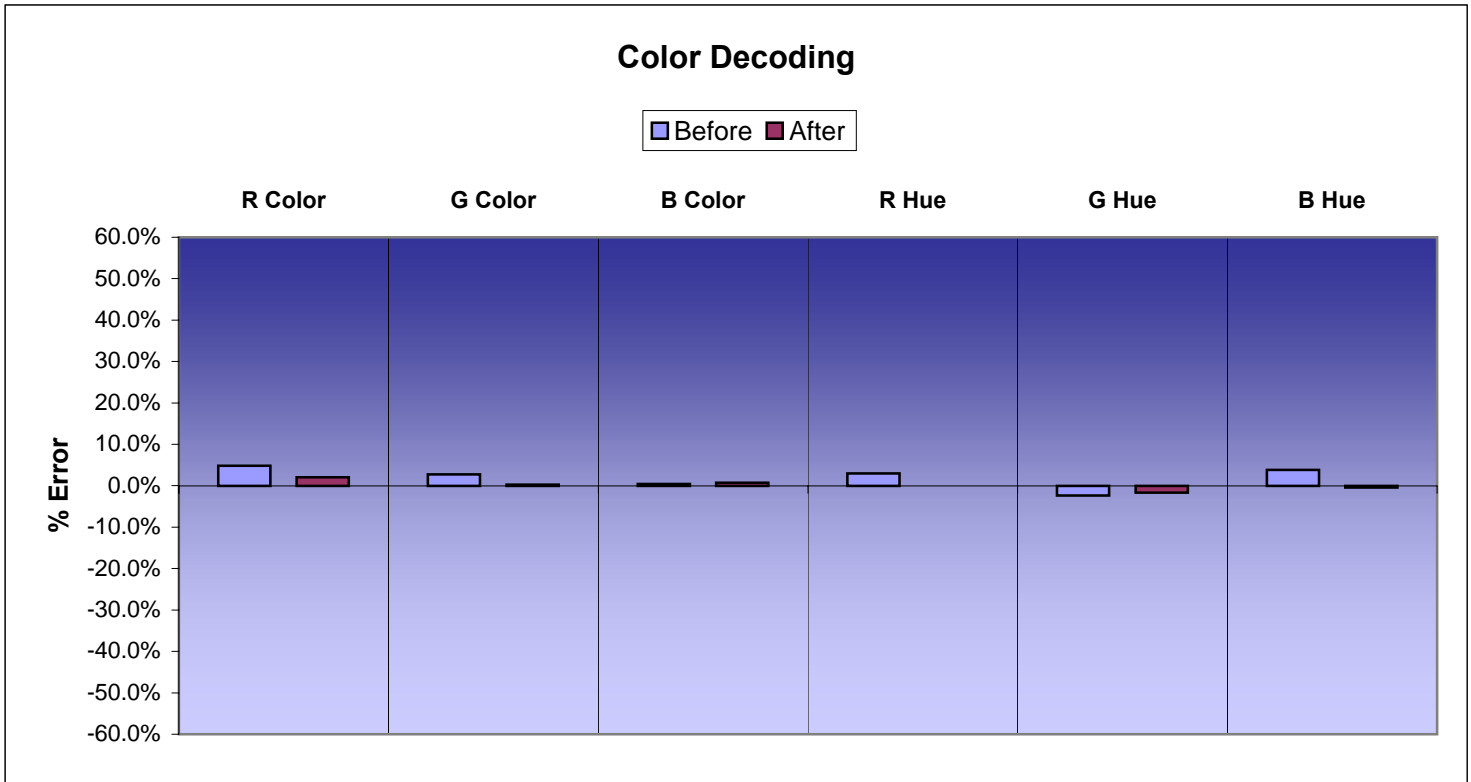
Primary/Secondary Chromaticities 1976

- ⊗ = Reference
- = Before
- ▲ = After



Color Decoding

The display's color decoder affects its ability to reproduce the proper brightness of the primary colors and the proper hues of the secondary colors.



	R Color	G Color	B Color	R Hue	G Hue	B Hue	Ave. Error
Before	4.8%	2.8%	0.4%	3.0%	-2.4%	3.8%	2.9%
After	2.0%	0.3%	0.7%	0.0%	-1.6%	-0.4%	0.9%

Gamma

Gamma describes the rate at which output increases with increasing signal input. This is not a one-to-one relationship. If gamma is too high, the image will darken and shadow detail will suffer. If it is too low, contrast and depth suffer.

Input	Output Before	Output After
10%	6.346	4.707
20%	30.11	21.24
30%	71.85	57.04
40%	129.30	108.10
50%	203.64	173.66
60%	286.03	251.95
70%	386.08	362.03
80%	498.13	478.08
90%	618.47	619.80
100%	748.41	775.05

Input	Gamma Before	Gamma After
10%	2.07	2.22
20%	2.00	2.23
30%	1.95	2.17
40%	1.92	2.15
50%	1.88	2.16
60%	1.88	2.20
70%	1.86	2.13
80%	1.82	2.17
90%	1.81	2.12
Ave.	1.91	2.17

Peak Output (fL)	
Before	After
218.5	226.2

Black (fL)	
Before	After
0.006	0.008

Contrast	
Before	After
37420	29810

