

# Apple TV can now automatically calibrate color. But does it actually work?

Called color balance, the feature uses an iPhone camera to improve color accuracy on your TV. We test it out.

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Apple TV screen calibration using an iPhone.

Color accuracy is an important ingredient in a good TV picture, but how are you supposed to know what's "accurate"? You could mess around with picture settings yourself, or pay an expert to use sophisticated gear to calibrate the TV. Now there's a new option for owners of the Apple TV streaming box who also happen to have a newer iPhone. It's similar to some of the adjustments I make as a TV reviewer for CNET, but requires no expertise and takes about 30 seconds of your time.

Called color balance, the feature is found in Apple TV's settings menu. We have a whole article on how to use it yourself, but here's the basics.

- You need an iPhone X or newer with Face ID running iOS 14.5 or later
- You also need an Apple TV or Apple TV 4K running TVOS 14.5 or later
- To use the feature, go to **Settings** app on your Apple TV, then **Video & Audio**
- Scroll down to the bottom of the screen, where you'll find a **Color Balance** option in the Calibration section. Select it.
- Hold your iPhone up to the screen. A color swatch will appear and the phone will measure it and adjust the output of the Apple TV to balance color.

## How to use Apple TV's new color balance calibration

So does it work? Yes, but with some caveats. I tested the feature on three different TVs, one high-end, one midrange and one budget, and measured two different picture modes on each one to see how Apple TV's color balance affected image quality.

The results were good, but depended in large part on what picture mode I was using. The Apple TV's color balance was most effective on relatively inaccurate picture modes, but with accurate ones it had little or no visible impact. It's also limited by that fact that color balance only works on the Apple TV itself -- if you want better color on another device, like your game console or cable box, just use an accurate picture mode to begin with.

## What is color balance?

Color balance refers to the accuracy of different colors on the TV. It starts with color temperature, aka white balance, which is literally the color of white and gray. White can tend more toward blue ("cooler") or red ("warmer"), but there's a standard white point used, known as D65, that's used by Hollywood studios and other content creators to

color correct TV shows and movies. Ideally your TV matches that white point. When I calibrate a TV for a review, I use its built-in white balance controls as well as white and gray test patterns to come as close as possible to D65.

White forms the basis of all colors you see on a TV, so an accurate white point is crucial. If it's too blue or red skin tones look off, snow and clouds look harsh or unnatural and everyday objects can seem artificial. A cooler, bluer white point is often the default in TVs because it makes the image seem brighter and more attractive, especially in a line of TVs at the store. That's why TVs often default to a Vivid or Dynamic picture mode, which in my measurements is often extremely blue. Conversely the most accurate, balanced color is generally found in the Movie, Cinema or Calibrated picture modes.



## How well does Apple TV color balance work?

By measuring patches of white and color with an iPhone, and using the information to adjust the output of the Apple TV, the new color balance feature is designed to take the guesswork out of getting balanced color in a similar way to my meters and software.

To test the feature I chose a high-end LG G1 OLED TV from 2021, a mid-range Vizio M-Series from 2020 and a budget Insignia Roku TV from 2015. TV

quality varies so much there's no way to cover it fully for this test, but I figured these three models are a decent cross-section. If anything they likely skew too much toward the budget side of things -- I'm guessing many people who spend \$180 on an Apple TV 4K are using it with relatively nice TVs.

I chose two picture modes for each TV, one relatively inaccurate and one accurate. Because the Apple TV 4K defaults to HDR output I measured the LG and Vizio in HDR, while I fed the Insignia SDR. Here's the results, in average degrees Kelvin (a measure of color temperature, where 6500K equates to D65), of each mode before and after using Apple TV color balance.

### APPLE TV COLOR BALANCE RESULTS

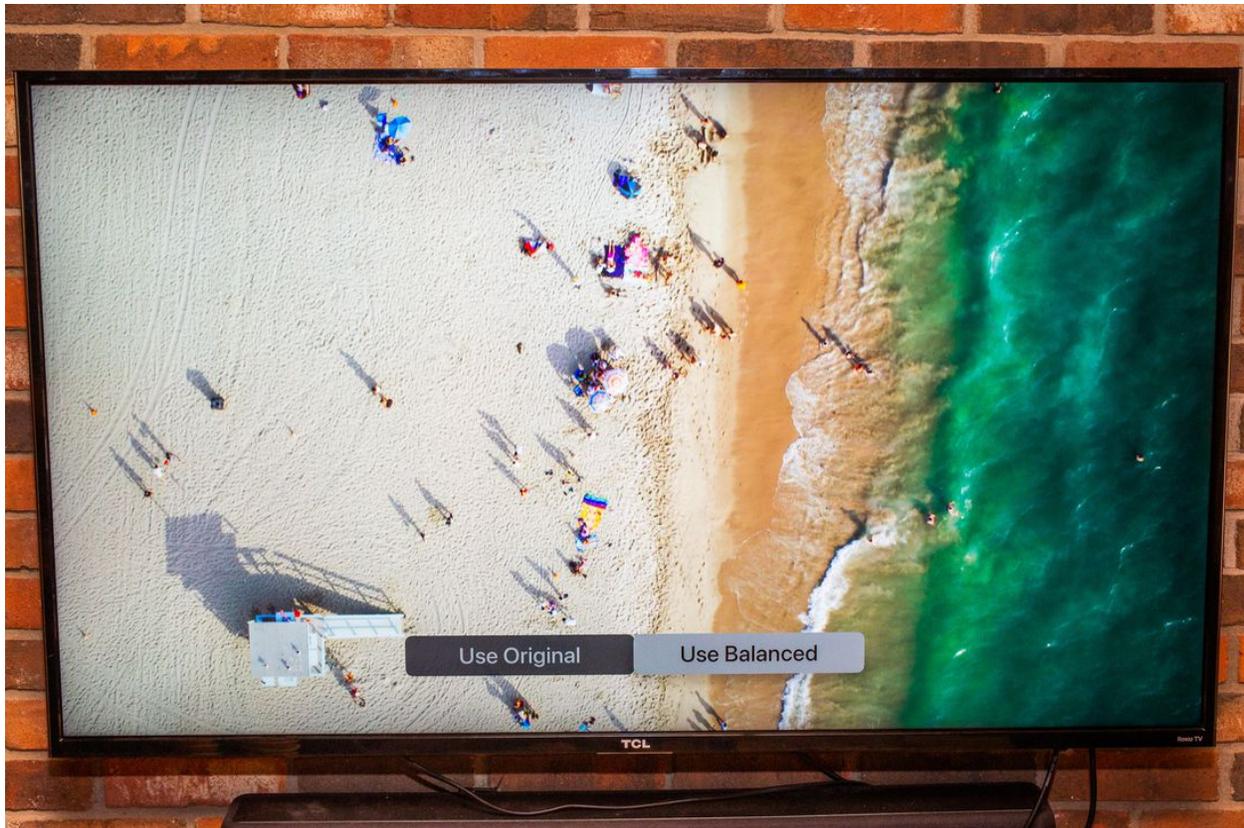
TV	Inaccurate mode	Before (target = 6500K)	After (target = 6500K)	Change	Improved?
LG OLED65G1	Standard HDR	9872	7492	2380	Yes
Vizio M65Q7-H1	Bright	8298	6251	2047	Yes
Insignia NS-50DR710 NA17	Normal	9628	7516	2112	Yes
TV	Accurate mode	Before (target = 6500K)	After (target = 6500K)	Change	Improved?
LG OLED65G1	Cinema HDR	6399	N/A	N/A	N/A
Vizio M65Q7-H1	Cal Dark	5752	5681	-71	No
Insignia NS-50DR710 NA17	Movie	5473	6905	1432	Yes

On all three TVs the Apple TV color balance improved the bluish, inaccurate mode significantly,

by more than 2000K, but the results varied. The Vizio came closest to the 6500K target, but the other two were still more than 1000K off.

In the accurate modes the Apple TV's color balance didn't make as big a difference. The LG's Cinema mode was so accurate already that Apple TV reported it didn't need to be calibrated (hence the "N/A"). The Vizio actually got slightly worse afterward, while the Insignia did improve. In both the Vizio and Insignia's case, however, it was tough for me to see a difference when I switched back and forth between Apple's Use Original and Use Balanced beach scene.

Using that scene even the large, 2000K-ish differences might seem subtle to you. Apple chose sand for a reason: it shows mid-gray and white colors well, and there's enough color there to get a sense of how grayscale affects the green of the ocean and the bright umbrellas for example.



Video nerds may be interested to know that even though the Apple TV puts up red, green and blue color swatches in addition to white ones during the measurement process, I didn't measure any major differences in primary and secondary colors before and after. I also didn't measure a major impact on light output or gamma.

During the course of testing I encountered a few quirks as well. The system would frequently fail mid-measurement, and I would have to start again. Often it would be difficult to engage: I had to move the phone around a lot within the measurement box to

