



Why have your display professionally calibrated by an ISF certified technician?

Isn't my new TV already showing a great picture?

The truth is, all displays, whether professional grade studio monitors or consumer sets, require calibration to perform to full potential. Your set can only be optimized for best picture in your home viewing room environment.

What is wrong with this Picture?

Here is a beautiful outdoor family scene, in a quality that you might see when viewed on one of today's high-end HDTV video displays. Does the display accurately reproduce what your eyes would see if you were standing just up the hill from this family's camping site? Does the display provide an honest sense of being there?



Actually, there are a number of controls incorrectly set on this video display. For example, the black level is set too high, making the rich black areas of the picture muddy gray.

What happens?

Movie cinematographers go to painstaking levels to be sure what is captured on film and transferred to electronic video is an exact reproduction of the scene's light and

colour content. Colour balance (temperature), colour saturation levels, and light levels are all closely monitored. How else could you get the sense of being there when you watch that movie at your local movie theatre?

When program material is cut to a DVD or broadcast, the process is both electronically and visually monitored by engineers using displays that are calibrated to industry standards. Film to electronic video transfers and display calibration procedures are all conducted according to industry standards established by the Society of Motion Picture and Television Engineers (SMPTE). Similar Broadcast standards, such as NTSC and ATSC, assure proper broadcast video. These standards have been perfected over the last 60 years and are meticulously adhered to.

If the video content on the signal coming into the display contains painstakingly accurate scene information, then the last step is simply reproducing it on the display screen. In reality, execution and standards don't align. If you have walked into a TV showroom, you likely noticed that each display has a slightly different looking picture. In theory, if each was calibrated like a broadcast studio monitor using SMPTE procedures, they would look nearly identical. More importantly, each display would be accurately reproducing the video scenes. Goal accomplished, right?

Not so fast.

Video display manufacturers have discovered that displays sell better when the brightness is turned up, picture transitions emphasized and, grey scale is shifted blue. Furthermore, they have introduced non-standard picture corrections or enhancements such as sharpness control, edge enhancement, and colour enhancement or "red push". These features, combined with automatic colour adjustment and room light sensing correction, further degrades the true picture reproduction. It should then be no surprise why the grass and sports jerseys don't look the right colour, faces look sun burnt, and colour is washed out. The next time you visit a show room, take a look at the differences from set to set. It will become clear to you that a factory calibration has nothing to do with producing an accurate picture or its best picture.

Factory Calibration

Even if the manufacturer calibrated to known standards, it would NOT guarantee accurate reproduction.

The manufacturer doesn't calibrate the display at the factory for the best possible picture in your home because every viewing room will have different ambient lighting conditions. They want the display to look as appealing as possible (brightest) next to competing displays on a dealer's showroom floor. Since a showroom floor often has a high ambient light level, the manufacturer usually sets the brightness, contrast, and service controls for the highest "apparent" light output.

Is it up to the manufacturer to get it right?

Even if the manufacturer calibrated to the known standards, which would increase the price, it would not guarantee accurate reproduction. Electronic display components such as CRTs and plasma panels age at varying rates. Light engine driven displays

require an initial burn in period. This causes light level, colour, colour balance and, video peaking variations upon installation during burn-in and through the life of the display. Again, unique room lighting conditions or changes also cause variation.

The installer who delivered the display said he adjusted it for best performance.

Most installation technicians make adjustments until it “looks right” in their eyes. This is **NOT** professional calibration, as this ad hoc technique does not adhere to any specifications or standard procedures. While some improvement *may* be made, this methodology does not provide a standard performance level or consistency between installations and technicians to insure good quality display performance. In fact, manufacturers recognize that your system can look its best and lasts its longest only when it is professionally calibrated after a short initial aging period.

What can be done?

Hire the services of a professional calibrator trained and certified by the Image Science Foundation.

What is the Image Science Foundation (ISF)?

ISF is the premiere display standards organization and is exclusively focused on the end product—what the viewer sees! They consult with manufacturers and trained dealers like Experience Home Theatre, generate media communications promoting picture quality in magazines, and license manufacturers of sophisticated test instrumentation.

ISF Professional Calibration

Consumer Electronic Manufacturers continue to improve display technologies. The good news is that most displays come equipped with a full set of user controls and service menu adjustment capabilities that can be accessed and optimized by an ISF trained technician. A certified ISF technician has the sophisticated test and measurement equipment required to perform a professional calibration.

What is important for good pictures?

- Match display input, source and format for optimum results
- Match display to the room (ambient lighting, size and viewing distance).
- Display the whole picture
- Display the right picture
- Maximize display's useful life
- Consumes less power
- Accurately display the image as filmed by calibrating to industry standards
 - Maximize true image contrast (dynamic range)
 - Calibrate for life-like, full and accurate colours
 - Reproduce accurate colour balance at all picture light levels
 - Optimize for accurate detail and minimize artifacts

Why do you have to match source and input setup?

- Can your display's manufacturer anticipate differences in sources?
- Will you be mixing media?
- Performance variations between source, format and input combinations.
- Matching aspect ratios

Why do you have to match a display to room environments?

- The ambient light conditions in your home viewing room will differ from lighting conditions of another room. The room is the most important factor in setting black level and contrast (effecting contrast ratio). For this reason, the manufacturing facility cannot produce the correct setting for you.
- It is important to sit at the correct viewing distance to maximize your viewing experience. Source, resolution and screen size must be considered.

What do we mean by “get the whole picture?”

- Clipping white levels eliminate active picture elements.
- Low black levels eliminate active picture information.
- Excessive over-scan settings mean you overlook important picture details the director intended you to see.

What do we mean by “getting the right picture?”

- Improper black levels add information that artists do not intend to be seen (artifacts).
- “Sharpness”, “Detail”, and “Enhancement” controls do not have any correct application in the reproduction of accurate images, which is the function of your display. If the enhancement did not exist on the production end, why should it be introduced on your display (artifact)?
- Correct picture geometry and displayed aspect ratio.

Maximize the monitor's useful life.

- Calibration can extend the useful life of some monitors.
- All phosphorous-based devices like CRT and Plasma have a half life.
- They look better longer when properly calibrated.
- Calibrated monitors consume 10% to 30% less power.

Accurately display the image as it was intended to be.

Remember how different all those TV's looked at the store, when they were all receiving the same program? The difference wasn't so much the quality of the various models as it was the non-standard adjustment of each display. A good example is colour temperature; NTSC and HDTV systems both specify a display color temperature of D6500 Kelvin. Typical color temperatures out of the box range from 8000 Kelvin to over 16,000

Kelvin (occasionally we have even seen color temperatures out of the measurement range of even very sophisticated test instruments)!

The gray scale or colour balance calibration is the foundation for your displays colour reproduction and accuracy and must be set to the D65 industry standard.

What do we need to calibrate?

- Analyze and optimized source and input setup.
- Brightness or black level
- Contrast or white level
- Colour decoder
- Sharpness (eliminate false enhancement)
- Gray Scale (colour balance) to the D65 Standard
- Colour Gamut (where adjustment available)
- Focus (projection technology)
- Geometry, centering, sizing
- Convergence (CRT)



Yes, an ISF calibration can transform the picture into the same beautiful life-like pictures and scenes the artists intended. Furthermore, a precision calibration can make a modest display look like a system that costs thousands of dollars more.

ISF Video display calibration is recommended by: Home Theatre Magazine, Audio Video Interiors, Widescreen Review, Stereophile's Guide to Home Theatre, and Sound & Visionmagazines for the best picture a display can make!

At Experience Home Theatre, we are trained and certified by the Image Science Foundation (ISF) in the art and science of optimizing video displays for the highest possible image quality.