

From a Blue Screen to the Silver Screen

Fly high above a city, swing from web to web, or travel deep beneath the oceans' waves; blue screens can create any background imaginable. Through the blue screen imaging process, multiple scenes can come together to create one image. Blue screens, first invented in the 1930s, require a meticulous set-up and rigid technological procedure. Originally compositioned optically, blue screens have developed with the emergence of computers. Carrying out the blue screen imaging process requires several key components.

The Process

The process of blue screen imaging itself contains several rather basic steps that achieve an effect that remains plausible only with this technique. Without this technique, filming a star destroyer hovering over a doomed planet becomes impossible. To make a blue screen composite, first, the camera operator films a foreground and a separate background scene. A technician then takes the desired amount of the foreground scene and transforms the image into a silhouette. While the cameraman films the background scene a second time, the silhouette covers where the foreground scene would hypothetically take place. In the last filming of the scene, the foreground fills in the silhouette in the final composite image (as seen in Figures 1-4).

This process used to be carried out by several people visually cutting the pieces of film and overlapping the separate pieces of foreground film and background film. For example, a technician would be presented with a foreground scene of a girl jumping rope and a background scene of a ledge overlooking a precarious ravine. The technician would cut the picture of the girl out, make a hole in the background scene where the editor wants the girl to appear and then glues the actual image into the hole. With the progression of computer technology, several softwares have been invented that automatically replace the background color in the foreground scene with the scene specifically shot for the background. Using computers also reduces the production and editing times for extensive compositions.



(From left to right) Figure 1- The foreground is shot in front of a blue screen. Figure 2- The background image is filmed in a separate location (or computer generated). Figure 3- A 'hole' is cut in the background image where the foreground image will be inserted. Figure 4- The blue screen is replaced by the background scene and the foreground scene 'fills in' the hole.

Set-up

Set-up and positioning remain vital to the success of a blue screen composition. For whatever color used (green and blue as the most commonly chosen), lighting plays a crucial role. Without proper, consistent lighting throughout the screen, the image warps and unrealistic shadows appear. One of the solutions to the problem of lighting includes using a variety of fabrics with the appropriate color made specifically for blue screen imaging. For example, a Velcro fabric softens the light and distributes it across the entirety of the area in a less harsh manner than paint.

Color

The color of the screen, or 'matte', must have a certain level of saturation. Common household paints do not have the necessary level of saturation so some companies produce paint specifically for blue screening. Some paints even include fluorescent flecks that catch and reflect the color optimally in Ultraviolet light. When the director chooses which color to use in the blue screen process, the colors of the objects in the foreground must be taken into perspective. When the technician uses a software, if an object in the foreground contains blue then it is best to use green as the 'matte' color and vice versa.

Cost and Dependability

Blue screen gets selected because directors get picky. Optimal filming cannot take place in the rain, for example, so if a director wanted to shoot a sunny summer's day in Washington, the supervisor would have to

suspend the crew indefinitely until their desired conditions turned up. Unlike the real world, blue screen can create the optimal conditions without the time delay or the added costs of waiting for said conditions. Another advantage of blue screen happens to be the endless possibilities it creates. Not only can blue screen create any scene on this earth, but any scene anyone can imagine. From outer space to the deepest depths of the ocean, blue screen can create any image, no matter how practical or possible it would be to film in reality.

Blue Screen Hole

If the incorrect color is chosen, the color of the foreground image gets replaced by the background image in a phenomenon called a 'blue screen hole.' A blue screen hole makes one or more components of the foreground look invisible or non-existent. Smoking the set can cause blue screen holes, too. An easy way to avoid a hole and also achieve the 'smoky' effect is to add the effect to the composite image in an extra layer of film. Shiny objects, if not coated with a dull spray, also create holes.

Detail Loss

Detail loss follows the blue screen hole on the list of mistakes made when amateurs use blue screen imaging. For example, detail loss can be caused by a tint in the color of the blue screen. The computer does not adjust to tints and shadows in the screen and therefore does not realize that the entire screen needs replacement and only replaces sections of the screen that fit the color parameters. This makes big spots of blue where the background was supposed to be. Makers of cameras sometimes include a 'sharpening tool' feature that automatically adjusts the lines of the subject to appear crisp. The tool does not work with blue screen imaging because of the way it works. The tool erases blurs around the edge of the subject and replaces them with a premade outline based on the setting of the foreground scene. If the cameraman uses this tool while filming a foreground scene in a lighted condition, the outlines will fit that condition. But if the technician substitutes the lighted condition for a dark background, the outlines warp the image and make the subject appear to glow. Lens filters can cause a similar effect as a tinted screen by filtering out saturation and certain shades of color. The filter then, in turn, makes the screen appear tinted in the footage. Colored lights and dimmers also tint the screen and should be avoided when working with this technique.

Blue Spill

Blue spill comes next on the list of easily solved problems associated with blue screen. This phenomenon makes the foreground image's outlines appear the same color as the screen due to reflection of the high saturation colors. To avoid this minor setback, a director simply lights the foreground separately from the screen. Blue spill occurs most frequently with foreground images light in color or with a smooth or shiny texture.

Other Applications

Blue screen imaging travels far beyond the realm of movie-making. The same technique can be used in photography and television by substituting the movie camera. Some news station studios create the appearance of an elaborate, expensive news room when in reality only blue screens exist where the amazing windows and designer conference tables appear to be.

Conclusion

Blue screen imaging has been useful since its development in the 1930s. The process has been made easier with the invention of software, the downfalls prove easy to prevent and fix and there continue to be numerous applications for the technique. As long as the requirements to a successful composite image are met, any amateur filmmaker can expect a realistic, simplistic, cost efficient and dependable product from the blue screen imaging technique.

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Image References

Figures 1-4

Brain, Marshall. "How Blue Screens Work." *HowStuffWorks*. N.p., n.d. Web. 3 Nov. 2009. <<http://entertainment.howstuffworks.com/blue-screen2.htm>>.