

- **Chroma Key**
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# CHROMA KEY COMPOSITING



## ***Introduction***

- Chroma key compositing, or Chroma keying, is a technique for mixing two images or frames together in which a color from one image is removed, revealing another image behind it..
- This technique is also referred to as color keying, color-separation overlay.





## ***History***

- In early filmmaking, a complex and time consuming process known as 'travelling matte'.
  - Travelling Matte - A process that was used to superimpose backdrops with actors performing against a blank wall.
  - In the 1930's, the blue screen method was developed at RKO Radio pictures to make more effective films.
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# Travelling Matte



## ***Process***

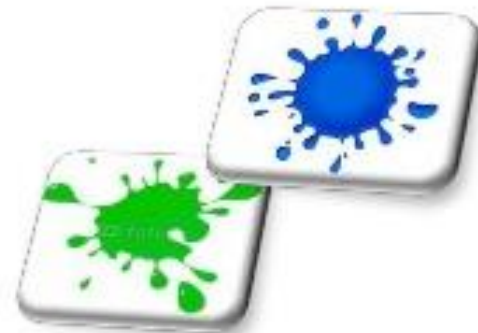
- The portions of the video which match the preselected color are replaced by the alternate background video. This process is commonly known as "keying", "keying out" or simply a "key".



## ***Backdrop***

- Green Backdrop
- Blue Backdrop

These backdrops are usually used because these colors are considered to be the furthest away from skin tone.





## ***Processing a Green Backdrop***

- Green is currently used as a backdrop more than any other color because image sensors in digital video cameras are most sensitive to green, due to the Bayer pattern allocating more pixels to the green channel, mimicking the human eye's increased sensitivity to green light.
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## ***Green Screen Technique***



## ***Processing a Blue backdrop***

- Blue was preferred as a backdrop before digital keying became commonplace because of the existence of high contrast film that was sensitive only to the blue color.



# ***Blue Screen Technique***



## ***Main elements***

- Space
- The Screen
- Lighting
- The Camera
- Post Production



## ***Clothing***

- A Chroma key subject must avoid wearing clothes which are similar in color to the Chroma key color(s) unless intentional



- Sensors are placed on the areas where the image must be modified or replaced with some other image keeping the image position constant.



## ***Programming***



- Different quality and speed-optimized techniques are used for implementing color keying in software
- *a function  $f(r, g, b) \rightarrow a$  is applied to every pixel in the image*
- *$a \leq 0$  means the pixel is the green screen,  $a \geq 1$  means the pixel is in the foreground object. Values between 0 and 1 indicate a pixel that is partially covered by the foreground object*
- An example of such an algorithm is the use of active contour

## ***Applications***

- It is commonly used for Weather forecast broadcasts, wherein the presenter appears to be standing in front of a large map, but in the studio it is actually a large blue or green background.





- It is used also used in the entertainment industry for special effects in movies and video games.



## ***Key Benefits***

- The consumption of time is reduced to a maximum extent.
- Chroma keying reduces the complexity in film making.
- The production cost is minimized compared to the cost of making used in Travelling Matte technique.



## ***Drawbacks***

- Difficulties emerge with blue or green screen when a costume in an effects shot must be of the same color. For example, Spider-Man and the Green Goblin.
- Underexposing or overexposing a colored backdrop can lead to poor saturation level



# Special effects

**Special effects**, Artificial visual or mechanical effects introduced into a [movie](#) or television show. The earliest special effects were created through special camera lenses or through tricks such as projecting a moving background behind the actors.

Greater flexibility came with the development of the optical printer, which made it possible to combine separate pieces of film and replace part of an image, thus allowing for effects such as characters flying through the air. Special effects have also been created mechanically on the set through the use of devices such as wires, explosives, and puppets and by building miniature models to simulate epic scenes such as battles.

The growing use of [computer animation](#) and computer-generated imagery has produced increasingly elaborate and realistic visual effects. Though each movie studio formerly had its own special-effects department, effects are now created by private companies such as [George Lucas](#)'s Industrial Light and Magic, formed to provide the revolutionary effects seen in *Star Wars* (1977) and later movies.

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The special effects (commonly abbreviated as SFX) are all realized “on set”, that is they happen in reality, in a physical and tangible way, to create a condition that would not occur naturally or spontaneously.

When you throw a match into a can of gasoline and record the resulting explosion, or when you build a fake arm and attach it to the actor and then be able to detach it with the corresponding burst of blood, it is producing a special effect.

The same goes for false gunshot wounds, blank projectiles, stage knives and so on.

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Visual effects (or VFX), on the other hand, are added at a later time, thanks to the power of a computer.

When you create a digital model of a spaceship and fly it against the backdrop of a scene painted with matte painting, or thanks to chromakey you create the illusion that the actor is crashing from an airplane, those are visual effects. Recently, thanks to the introduction and dissemination of very powerful animation and compositing software and also relatively affordable prices, the VFXs are simpler and cheaper than SFX: this is the reason why more and more explosions, splashes of blood or the glare of the shots are today made through visual effects.

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In other words, the special effects are applied on the set during production, while the visual effects take place in post-production.

This does not mean that the visual effects supervisor is not involved in the production (or vice versa the special effects supervisor in the post), but rather that the creative decisions taken by the respective teams usually belong to their specific phases of film making, obviously in collaboration and based on the director's directions.

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## **Types of special and visual effects**

Special effects can be divided into two categories: optical and mechanical.

The former are obtained by manipulating the camera and the lights to make the appearance of the scene different from what would appear to the naked eye.

To do this you can work on camera lenses, lighting types or camera movements that give a particular look to the shot.

The mechanical effects are used instead when you want to create an object or a situation from nothing: for example by creating special weather conditions such as wind, fog or snow from scratch, or using explosives or scale models.

The visual effects, as we said, have instead become a fundamental element of modern cinema, to such an extent that today rarely comes a film that is completely devoid of it. We talk about green screens, computer-generated images (or CGI), 3D rendering or animations of various kinds.



## **Special effects vs visual effects: which ones are the best?**

So, is there still a place for special effects in today's world?

According to many, the answer is yes, and for one simple reason: emotion.

When an actor lives a real explosion or runs through a real forest in flames, while the smoke reaches his face, his acting is more real, because it is real.

These methods will always succeed in transmitting more realistic emotions.

On the other hand, visual effects have succeeded in transporting audiences into worlds that could never have been achieved with SFX alone: flying through the stars at the speed of light, diving into the depths of an ocean, or experiencing the epic battles in Middle Earth.

Without the use of computers, modern films would lose not only in style but also in entertainment. So which of the two methods is the best?

Neither, or rather, both. Instead of contrasting them, today's directors have to combine them, to make the most of both worlds: creating a real effect on the set and then improving it further with the computer.

Only in this way can special and visual effects be exploited to their full potential and thus achieve the most convincing result.

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# What is Visual Effect (VFX)?





- ▶ Visual effects are the process by which imagery is created outside the context of a live action shot in filmmaking.
- ▶ VFX are made in post-production, using the power of a computer.
- ▶ If you create a computer model of a spaceship and fly it across the background of a scene, that's VFX.

- ▶ If you green screen an actor to make it look like he's falling from a plane, that is done using VFX.
- ▶ These days, VFX is cheaper than SFX so often explosions, spurting blood and muzzle-flashes are done as VFX.

# What is a Special Effect (SFX)?









- ▶ Special effects are illusions or visual tricks used in the film, television, movies, video game and simulator industries to simulate the imaginary events in a virtual world.
- ▶ SFX are done 'in camera,' that is to say they really, physically happen.
- ▶ If you drop a match in a petrol can and record the explosion, that's SFX.

- ▶ If you build a prosthetic arm, then attach it to an actor then have it ripped off and blood spurt out, that's is SFX.
- ▶ So are firing blanks, gunshot wounds, stabbing people etc.

# Demonstration

The demonstration format, a kind of “show and tell,” has been a part of television since its very early days. It includes productions ranging from a food channel production that “shows and tells” how to cook, to segments on late-night television where the host shows album covers, funny pictures, funny headlines, and so on.

Much of the production in corporate videos is created using demonstration formats. Googling “how to” gets over a billion hits. All how-to productions, which are show-and-tell in nature, are very direct in what they’re trying to accomplish. They tell a story with a beginning, a middle, and an end. They’re video cookbooks, and they say, “Here are the ingredients. These are the steps needed to ...”

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# Live Cast

Live Cast is a term that describes the process of broadcasting real-time, live video footage or video feed to an audience accessing the video stream over the Internet.

The most common seen media example of the live transmission is a news program or a news broadcasting.

A livecast takes advantage of the large audience that can be reached on these social media platforms.

Livecasts also allow individuals to interact in real time with the host, are often sponsored which supports the content producer with monetization, and sometimes have cool giveaways.

The term was coined by Stephen Bienko of 42 Growth Strategies.

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# Switcher

A video switcher is a hardware device used to switch or choose between different audio or video sources.

Although the main functionality is for selecting between the sources of audio or video, they are at times used in mixing video and adding footage or special effects on a secondary source. Video switchers are mostly used in film and video production environments like production trucks and television studios.

A video switcher is also known as a production switcher, video mixer or vision mixer.

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The way it works is the video switcher selects between multiple incoming video signals from various sources (camera, PowerPoint feed, etc.) and directs one of those signals to a single output that could be a streaming device, video recorder, display device (i.e. a monitor or screen) or all the above.

Video switchers can create different visual effects, ranging from simple mixes and transitions like dissolve to elaborate special effects. The device can also be used to perform keying operations and help in producing color signals. During a shoot, a technical director is typically the one that controls the switcher, analyzing the various incoming camera angles, and selecting the best view to output.

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# Footage

In filmmaking and video production, **footage** is raw, unedited material as originally filmed by a movie camera or recorded by a (often special) video camera, which typically must be edited to create a motion picture, video clip, television show or similar completed work.

Footage may also refer to sequences used in film and video editing, such as special effects and archive material (for special cases of this, see stock footage and B roll).

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## **Difference Between A-Roll and B-Roll**

Most simply put, A-Roll is all the main footage you might shoot on any type of film or video project. The term is connected with the idea of having (at least) a two camera setup and having an A-Camera for your main footage. A-Roll shot with the A-Camera is also usually meant to designate both the most important footage, as well as the best shot and produced.

Meanwhile, B-Roll denotes any footage shot by a B-Camera and is usually considered to be supplemental footage to that of the A-Cam's A-Roll. B-Roll can either be shot at the same time as the A-Roll for an alternative angle or coverage, or could also be footage shot at a different time and place. And while not always the case, B-Roll is thought of to be lesser footage shot on a lesser camera and of lesser importance.

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# TV Series & Serial

TV Series are those shows that have a common baseline but each episode is self-contained and can be watched independently. e.g. Friends, HIMYM, etc.

A serial is a show with sequential story where the story of one episode affects the other and moves in linear progression. e.g. 13 reasons why, Vampire's diaries, etc.

A series contains the same characters throughout, but each episode is a different story. So, you can start watch series from any episode (Martial Law, NYPD Blue, Friends, Colombo);

but, if you want to watch a serial, you should start from the first episode, because each episode is a continuation of previous one.

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**Series.** A TV show broken into groups of episodes. Each group is usually broadcast at a regular (often weekly) interval or released simultaneously on streaming services. Each group is released with a significant gap between each. In the USA each group of episodes is called a *season*, in the UK each group is what is called a *series*.

**Serial.** When the story arc of any episodic content spans multiple episodes (of television, but can also be applied to magazine stories or comics for example).

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# What are TV Serials?

TV serials are television programs which involve a long narrative which slowly unfolds over the course of an entire show, from the pilot episode to the finale.

They are designed to be watched in order, with viewers turning in each week to get the next installment of the story.

The serial has very old roots, with many famous novels such as *Great Expectations* originally appearing in a serialized format, and TV serials are quite varied and diverse, including comedies, dramas, science fiction, and other genres.

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The primary thing which differentiates a TV serial from an ordinary television show is the existence of plot arcs. Many serials have a plot arc which extends over the entire show, along with a number of smaller arcs which are played out over the course of a season or a block of episodes.

To keep track, viewers of TV serials must watch the episodes in order, and they will quickly lose track of what is going on if they miss or scramble episodes. In some cases, the show may be a miniseries, with a finite end date, and in other instances, the show may have no specific date planned for the finale.

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