



Tutorial 11

Sound Design Methods

An Overview of Sound Design and Planning

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Overview

There are various ways to create sound effects, but the ultimate goal is to produce a sound that fits a certain description or matches a particular event. Usually a sound designer will be given a task as part of a project to create certain sounds needed for the project. Film, TV, radio, games and websites all utilise sound effects to differing degrees. This tutorial will differ slightly in format in that it is less a step by step description of recording methods and more an overview to planning and producing sound effects for a project. These stages are important to understand if you want to undertake any serious project or even just work efficiently.

Concept

Sound design is a creative process, but it does not always involve building sound effects from scratch or rushing out to record every sound required on location. As there are various ways to source sound effects, one important aspect of design is planning the process. Usually a sound designer will be given at least a rough description of the sound material needed. In some cases this might include video clips that need sound added, or a comprehensive description of each sound event; in other cases it might be up to the designer themselves to decide what sounds are needed by reading through a script or design document, or by viewing a webpage, film clip or concept artwork. Once a list of assets has been created it is often up to the designer to determine the importance of each sound that is needed. For example footsteps, while necessary, are not of critical importance to an overall project. It would be unusual to spend as much time creating the sound of people walking compared to creating the sound for the climatic volcano eruption that is the focus of the film, however if the star of the show is a 40 foot TRex then those footsteps need to be distinctive and become a major part of the sound environment. As a result quite some time and effort would be put in to making them sounding right.



Figure 1. Planning stage

Before getting into the studio or going out on location its important to plan out what you need to accomplish and how you are going to achieve you goals.

Planning

By prioritising each sound or group of sounds you can decide how much time should be allocated on the sourcing of each sound. Obviously time and budget issues will also affect the process; this is why planning is important. I refer to the process as “sourcing” because at the design stage this is a good way to think of it. You are planning how and where you are going to obtain sounds from. These can include.

- Foley Recordings
- Location Recordings
- Sound Libraries
- Sound Creation (Editing)
- Sound Creation (Synthesis)
- Outsourced sound creation
- Any combination of the above.

The planning role will often be undertaken by a sound editor or senior sound designer, but often on smaller projects all these roles become the responsibility of one person, so it's worth being aware of the process. Once you know how much time you have to spend on each sound you can determine the best approach to its creation.

Foley

The term Foley comes from its creator Jack Donovan Foley who worked for Universal Studios last century. Because of the limited technology in the earlier years of film production sound for a film was often recorded in one take while viewing the film. Foley used a huge range of objects to simulate the sounds of things by manipulating the objects in front of a microphone. Foley is still used these days in much the same way. A Foley artists experience in understanding what objects can be used to create certain sounds is their greatest talent. A good Foley artist will understand the range of sounds a certain object might make, and how best to manipulate the object to generate different sounds.

Foley differs from location recording in that it is performed in a special studio and that usually the objects being recorded are often not the actual objects they represent. One of the best known examples of Foley is using two coconut shell halves to mimic horse's hooves as it walks.

Figure 3. Jack Donovan Foley
1891-1967

Jack Foley was a sound artist who worked for Universal Pictures. In the 1920s he invented the process of creating sounds that were recorded directly onto the reel as the film was playing. To this day we refer to this method as Foley recording. Many different objects are used to create a variety of sounds and modern Foley studios can look like junkyards because of the interesting collection of items they can have to generate sounds.



Figure 4. Foley Box

The various materials allow for a Foley Artist to simulate walking on different terrain types. These surfaces can be used to create the sounds of footsteps and of objects being dropped, rolled or scraped against the different ground types included.

Foley can be an incredible time saver. If its possible to create the sound of an elephant walking by putting on some heavy shoes wrapped in bandages and plodding around on a floor covered with sand then its probably going to be much quicker and easier to do this than to go out on location and try and find a cooperative elephant. It will also give you much greater control if you need the elephant to perform unusual movements as a Foley artist works directly with the visuals and can respond to actions and movement on the screen. In this manner they can ensure an entire thread of the sound environment is produced relatively quickly. In the case of the elephant it would be much faster to record an artist simulating its movements on the screen straight into a microphone than to individually create each footstep and then add each step into an editor to be placed in a timeline. Also Foley can produce a much more random and natural result which will ultimately aid the project.

A Foley studio will usually resemble a large open room full of junk. This is because Foley artists utilise all sorts of objects and devices to create the sounds they want. A Foley Pit is an area of a studio that contains various surface types like dirt, sand, road, leaves and carpet where a Foley artist can create the sounds of footsteps on the various surfaces needed. Creating a Foley studio will not always be practical, but keeping a box full of "noisy" objects that can be retrieved as needed to create sound effects might be a good addition to a small sound studio. Depending on the project Foley can be an efficient process of creating large amounts of the more common sounds required such as footsteps, body and clothing movement and some of the more clichéd radio sounds like doors, telephones and horses with coconuts on their feet.

With Foley, it is important to set the input levels and do a test run beforehand. Unless you have a technician who is monitoring the levels, you will not be able to track them while recording as you will be tracking the movement of the film, so unless you want to have to record several takes, it is worth working through all the sounds you expect to make and monitor the levels beforehand to ensure you avoid peaking. Then you can proceed with a take confident that it will be a clean recording. Avoid being too close to the microphone with moving objects, especially if you need to move your body and arms a lot. Hitting either the mic or the stand will obviously corrupt the recording. If you have the luxury of owning several microphones then it might be worth setting up a selection to capture angles or different types of microphone captures. You might be able to produce a richer tone with a combination of different mics mixed together. Like all things don't be afraid to experiment. Objects of different materials will affect the microphones in different ways. Hard objects that produce harsh ringing can distort easily while fabrics and other soft materials produce soft sounds that can be difficult to pick up. This is why Foley is easier with an assistant to monitor the levels; otherwise it is necessary to constantly readjust for each new object to get the best balance. Treat each new object as you would a new event when location recording, do not get complacent because you are in a studio and simply apply one input level for all objects.

Location recording

There are several tutorials which discuss location recording; however as part of a larger project it is important to work out if going out on location is really going to provide the sounds you need. Going out and recording a train going by is quick and easy, but recording a unit of artillery firing down range is going to take a lot of coordination and organisation. Under these circumstances sometimes using a sound library is a much better solution to a problem. If there are a series of sounds that need to be recorded on location, try and schedule as many as possible into a day as this will save lots of time both out in the field and in the studio later as sorting through one large batch of sounds can be more efficient than sorting through lots of small ones.



Figure 5. Location Recording

A sound recordist on location can have many issues to deal with. Wind, background noise and unpredictable input levels of sound sources will keep a sound recordist on their toes when they need to capture material for a project.

Sound Libraries

The main issue with sound libraries is that there are some library sounds that have been so overused that everyone knows them. The last thing you want to do is use the camel sound used for a Demon in the computer game Doom, that has also been used for every camel depicted in film (almost). Or the same explosion that appeared in nearly every war film made for over 20 years. But as has already been mentioned, there will be times when recording your own version of certain sounds is just not practical, if it's even possible. In these circumstances, I try as much as possible to use the library sounds as the core to create a new sound. Editing and mixing with other sounds can create a new sound that, while not entirely original, will at least not be replicating a sound that has already been used. Sound libraries are an excellent resource for speed sourcing. You can quickly and easily search through a database and audition the sounds to find what you need. For this reason they are very popular for TV and advertising projects where time is tight.

One of the other issues with sound libraries is that sometimes they can be very expensive. A good professional level sound library with thousands of sounds may cost many thousands of dollars. This is because the amount of time it takes to record and collate a good sound library is considerable. And often when you break it down you are paying less than one dollar for each sound in a library; that is unbelievably good value considering what may have been necessary to record each sound. Of course it does mean the overall cost of the library may be too much for some people to afford. Online sound libraries often sell individual sounds, but usually they will be more expensive per sound as you can choose exactly which sound you want to purchase. Obviously free online sound libraries also exist. With all sound libraries some will be better than others. They often include samples to listen to online before you buy to get an idea of the quality. Make sure that any license agreements that are included with a sound library allow you to use the sounds for the purpose you require. It is not very common but there are limitations as to what you can use a sound from a sound library for. Even free libraries have some limitations.



Figure 6. Sound Effects Libraries

There is a large range of sound libraries available for purchase. Many of the big Hollywood studios have released their own sound libraries which contain excellent quality sound effects.

Sound Creation (Editing)

This is probably the most common method of sound design and the method most people think of first. Creating sounds in this manner can involve editing individual sound samples from various sources mixing and blending various sounds together to create a more complex sound and then editing the final mix to create the sound required. Some sounds can be created through a simple edit of an existing sound others require large complex combinations. It is a good habit to make copies of all the sound material you are using beforehand and work from a folder dedicated to that project. In this way you avoid making permanent changes to any of your library sounds and can always revert back to the original source if anything goes wrong. Also many sound editors generate extra files that contain undo and format information and you don't want these being added to your library folders.

When working in a multi-track editor there are some useful tips to remember.

1. Listen to your sound repeatedly. I often just sit and play a sound over and over and over for several minutes. As I listen, I am trying to isolate if there are any of the base sounds that are too loud, too soft, or just shouldn't be there at all. If you create a sound with lots of layers and you are unsure if you need all the layers, mute a single layer and then listen over and over, un-mute then mute again. If the layer you are muting does not change how the overall sound plays then it's being lost in the mix and you may not need it. You could increase it in volume to see if it's needed. Generally I add one sound at a time. A new sound is added with a high amplitude level, that way I can hear it, and hear how it adds to the mix. I then gradually lower its amplitude little by little so it sits in the mix. (As more and more sounds are added to a mix some sounds can be overwhelmed. Often many sounds in a mix can't be heard and so may as well be removed, but be careful that you listen carefully before you just remove a sound.) Some complex sounds are the sum of their parts, so don't remove anything that might be adding to the final sound.

2. Be careful as you add more and more sounds. The final sound will be a combination of all the existing sound material, but it is also a combination of the amplitude of all the sound material. It is very easy to max out volume levels when combining lots of sounds and this will result in a muddy distorted sound effect if you are not careful. Adding sounds and then reducing the levels allows some room for more sounds to be blended in. As long as the individual sounds are at a good level relative to each other the whole sound can be increased in amplitude once it's mixed together.

3. Listen for abrupt beginnings and ends of the base sounds. Using base sounds with harsh start and stop cuts may create clicks or sudden noticeable changes in the sound. Try and blend sounds in and out. Obviously if there is needs to be a harsh cut as part of the sound then that is appropriate, but think of the base sounds as pieces of a puzzle, make sure they slot together well.

4. Remember that subtlety is as useful as overkill. If all your sounds are bigger than Hollywood then the listener will very quickly get fatigued. Don't fall into the trap of trying to make every single sound a feature sound. Most sounds in a project are background, utility or common type events. These add a good contrast to the few spectacular sounds that can define a project.

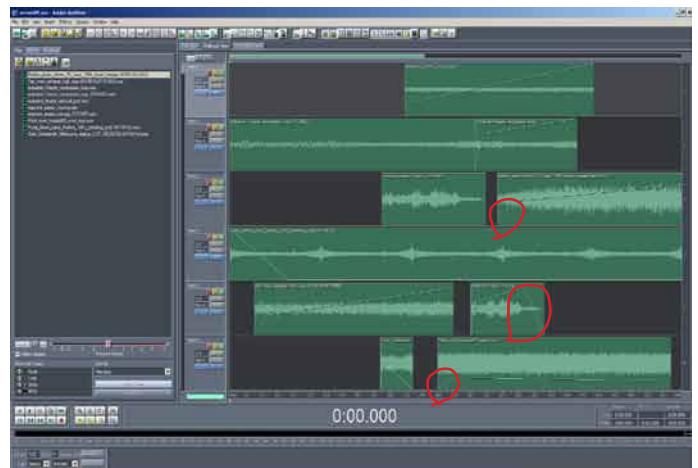


Figure 7. Adobe Audition. Multi Track Sound Editor
A multitrack editor allows the user to mix multiple sounds together to create new complex sounds. Each of the base sounds can be manipulated in the editor and the positional panning and volume level of each sound can be controlled. Note the fade in and fade out points to avoid the abrupt start and finish of the separate sound elements. Be careful to avoid peaking from too many loud sounds combined together.

Sound Creation (Synthesis)

Sounds can also be generated by synthesis as in a musical synthesizer. Sound synthesis consists of tones generated electronically such as a sine wave or square wave which can then be manipulated in various ways. Electronic synthesis is now very advanced and there are both software applications as well as electronic music instruments capable of creating sounds. Synthesis can be used to generate base sounds to use in combination with other sounds to create effects, or at the more advanced levels can create complex effects entirely synthesized. The process of creating synthesized sounds can be complex and requires an understanding of exactly what each stage of the process will achieve. At a more experimental level a synthesizer can be a great tool to work with and discover what can be created, even if the user doesn't fully understand how the sound was achieved. A full understanding of sound synthesis is a topic for a tutorial of its own.



Figure 8. Software Synthesizer

There are a variety of software synthesizers available both to purchase as well as some free to download ones. Some are modelled on real world synths and others are completely original designs.

Figure 9. Working with external groups

Melbourne Symphony Orchestra at ABC Southbank Studios in Melbourne Australia. Sometimes the size of an outsourced project can be quite major. An orchestra requires a large performance space, a team of sound technicians as well as management and support crew. This is not something to be undertaken lightly as this is a very good example of "Time is money" Prior planning for a project of this scale is absolutely critical.

Outsourced Sound Creation

Outsourcing is essentially the process of contracting someone else to complete the work. I have included it here simply for completeness. On a large project needing lots of assets or a project with a short timeline it may be beneficial to contract some of the work out to another designer. This can free up resources to work on more important aspects of a project. It is important when outsourcing to ensure very good lines of communication. A contractor may not be as familiar with a project and as such needs to be carefully briefed if they are to provide satisfactory work. Working with contractors makes planning an essential part of a project as the outsourced designers need to have a clear schedule and deadline to work to.

If you are outsourcing then you are effectively functioning as a manager and it is important to ensure you monitor the work being provided closely. If a contractor is not provided with good information as they need it, it can be very difficult for them to produce good work. Clear and concise feedback should help a contractor produce work appropriate for your project. Outsourcing can include things like an external recording studio, contract location sound recorders, musicians and bands or any service you require outside your own team or studio.

Anything but the smallest of projects can benefit from planning properly before starting work. It is a fairly safe generalization to say that many of the worst problems suffered by many projects occur because of poor planning or poor communication. There are numerous ways to create sounds for projects and being able to fall back on one technique because another has proven impractical can really save a project from disaster.