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# SOUND SENSE

Fred Pfof and Bob Meacham explain what sound is and how to manipulate it

*A fascinating pair of articles from the very lively newsletter of an active and successful club ...  
 Viewfinders Digital Video Club of Cupertino, CA*

## Start with a piano keyboard...



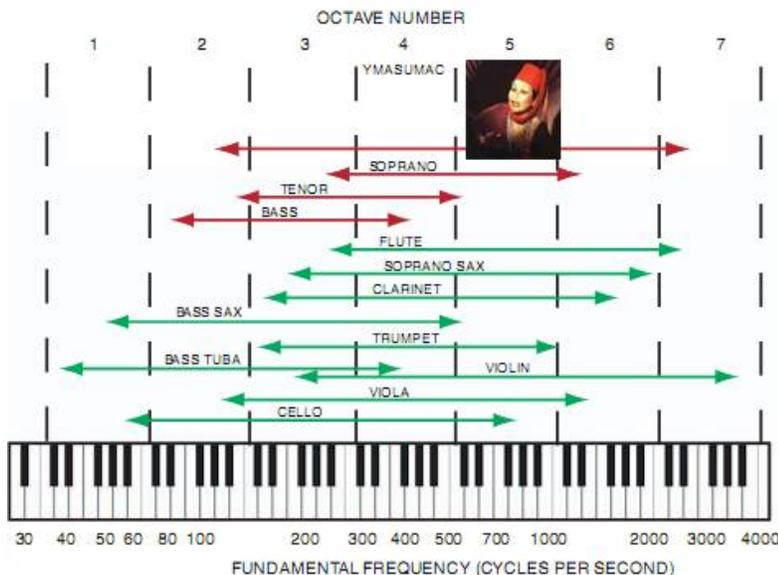
*Physics of Sound by Fred Pfof*

Pitch represents the perceived frequency of sound.

Frequency is measured in cycles per second (Hz) A piano is designed to produce a fundamental frequency range from approximately 25.5 Hz to 4186 Hz. This is a much greater range than the human voice or most musical instruments (see diagram below) and therefore pressing an individual key produces a frequency/pitch comparison to most other sounds we hear.



Frequency can be determined by physical measurement but it may differ from pitch (what we hear) because of harmonic or other overtones in the sound. The human ear may have difficulties in distinguishing frequency differences caused by environmental circumstances. Pitch is the approximate highness or lowness of sound tone heard by the ear.



The voice, which is produced by vibrations of the vocal cords which then resonate through the throat, mouth and nasal cavities is only capable of a limited range of sound, although a trained vocalist will strive to extend it. Most musical instruments can produce a significantly larger frequency range but are generally smaller than that of the piano.

To achieve the greater range, the piano was designed with about 230 strings to cover its 88 keys. All keys do not have the same number of strings. Generally the 10 lowest pitches have one string each, the next 18 pitches have two strings each and the remaining 60 pitches at the high end of the keyboard have three strings each. The reason for multiple strings to a piano key is to provide the ear a more pleasing sound than a single string can

produce.

## ...then the computer



### *Audio Editing by Bob Meacham*

#### **What part does audio play in videos?**

Since we are no longer making “Silent Movies”, the audio of your productions plays an equal part to the visual in producing a good video. You can tell your story or show the event visually, but paying attention to the soundtrack will not only enhance your work but also control and influence your viewer’s impressions of both the video and the subject on the screen. Try a simple test; watch any movie or program and pay close attention to the audio, both to the main track (vocals, dialogue, or voice over inflections) as

well as supportive tracks of music and sound effects. Then try watching the same video with the sound turned off to understand the influence that audio has on the entire presentation.

We are no longer just folks shooting video, we are videographers. And that includes paying as much attention to the audio as the video. Our audience has become more advanced, and so must we.

#### **Why audio is important to video**

Surveys have shown people will sit through poor quality video longer than poor quality audio. With poor video you can shut your eyes to get away from it. But poor quality audio bombards one's ears without relief. As a videographer, even with simple videos, we need to learn to manage (shoot, capture and edit) audio as equally as we do our video.

Audio can help to set the mood, create a feeling, enhance a video with additional sounds, and compliment the images we see on screen. Audio editing is no more involved than video editing, it just requires a few simple tools. Some of which are probably built into your video editing software but some may require an audio dedicated application.

#### **What can you do with audio editing?**

There are many things you can do to affect the audio in your videos. Most, if done properly, will add greatly to the entire movie. Here are a few of the basic things you can do with sound:

##### **Add voice over**

Using either yours or another person’s voice after the fact you can compliment the video by describing the story to the viewer behind the onscreen action. Try to explain the movie by describing those parts of the story the video omits and avoid describing that which they see onscreen. Some audio editing software allows you to “enhance” the quality of a person’s voice with frequency shaping (through the use of Equalizers and Filters) and additions (a slight amount of Reverb or Echo) to make it even better.

##### **Add music tracks and modify them**

Background music can enhance the feel of a video so choose a style that fits, and the effect you wish to convey. But also pay close attention to the sound level in comparison to the captured track.

##### **Add additional sound effects**

You can “fill out” a video by adding sounds that were not captured in the initial shoot. Think of nature sounds like birds or dogs, and transitional sound effects where your video switches from one scene to the next, and also complimentary sound effects to enhance the onscreen action such as booms and explosions for 4th of July fireworks.

##### **Copy sounds from one clip to another**

Sometimes when you shoot a series of video shots the audio might change between locations. In a shot of a lake scene you may have some nice Loon calls but another shot of the foliage might not have much audio. By copying and pasting the

Loon sounds into the second clip your audience still feels they are at the same location. It helps connect the two clips in time and place. The same can be done by copying a good audio track onto another kind of sound that you want the viewer to hear. It can also help in covering a clip that had poor audio that detracts from the scene.

### Clean up poor quality audio

A whole lot is written about the use of audio editing in cleaning up bad audio. For example, if you need to use the audio from a clip of Uncle Ted singing but has unwanted background noise, there are things you can do to try to improve it.

Cleaning up this kind of poor quality audio is probably the greatest challenge for a budding audio editor. In most cases it will require obtaining and learning a dedicated audio editing program. You will need to get deeper into the program capabilities and learn about the various tools that are available in the software. You will need to look at the audio as a waveform or in a spectrum format to find and remove the offending audio pieces. It is not a daunting task, it just takes some trial and effort on your part to find what works.

#### What audio tools are available?

As I mentioned before, a great deal of this is available in your video editing program because the creators realized the importance of audio in video. Look there first and begin by using these tools. If you find you need more than what is available, then look at dedicated audio editing tools.

A few suggestions might be:

**Audacity** – a cross platform and free software that is simple to use but powerful.

**Adobe Audition** (\$350) or **Soundbooth** (\$200) – a PC based audio program that has huge capabilities. It has the ability to not only work with pre-recorded audio but can be used to capture and create new music pieces up to 999 tracks each..

**Apple Final Cut Pro, Final Cut Express and iMovie** – Apple has an audio program called **Garage Band** but it is more about music creation and less about editing video audio. Apple does build in a lot of audio editing tools into its higher level video programs.

There are plenty of other programs available to the video editor. To find one that compliments your video software, look first at the same video editing company for one that may be interactive with your video program.

#### Web sites with more information

After you have started learning to use your audio editing tool there are tons of helpful web sites and blogs available for most applications. Do search out and use ones that are at the same level of skill you are at. Some folks on the net get way too detailed and involved.

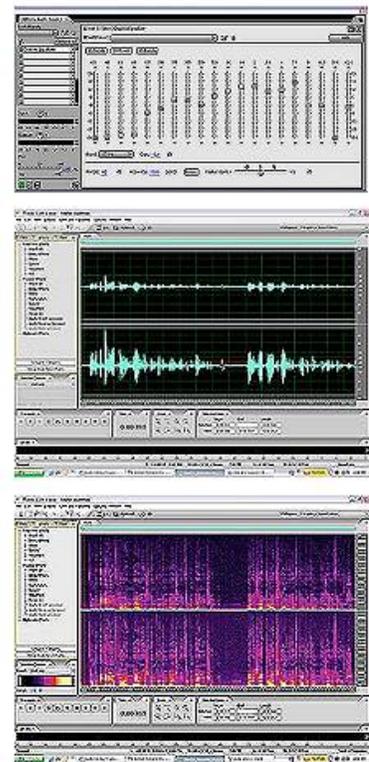
#### Web sites with stock sounds

Also, if you are looking for sounds to add to your videos there are sites, both free and pay, that have a great array of sound effects you can download.

### Audio is important to your video

Remember, when your audience starts watching your video they are looking for something to keep them interested. Poor quality audio is the fastest way to lose them. You can have the greatest piece of video but a poor sound track will ruin it. Get with the new world, audio is all around us so plan on editing your audio on the same par as your video.

*Audio editing application screen shots.*



*Top to bottom: Graphic Equalizer, stereo audio track in waveform, the same audio in a spectral form.*



We are very grateful to Fred, Bob and the editor of Viewfinders newsletter, Brian Lucas, for permission to reproduce this article. Viewfinders Digital Video Club of Cupertino meets monthly in the Cupertino Room, Quinlan Center. 10185 N. Stelling Road, Cupertino, California. Guest admission is free. Membership costs \$30 for individuals, \$35 for families and \$5 for full-time students. Visit their website at [www.viewfindersclub.org](http://www.viewfindersclub.org)

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