community media training organisation

Audio Editing

Pathways Resource Booklet

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Editing Single Files

This seems straight forward. You open a file, edit it and save it in the format you need it to be in. However, in some software applications, you have the choice between what is known as "*non-destructive*" and "*destructive editing*".

Non-Destructive Editing
In a nutshell, non-destructive editing allows you to make modifications to the file without making any changes to your original source, thereby, saving the original source. Even if you choose not to use this method, by understanding how it works you will begin to understand the complexity of digital editing.

In non-destructive editing, your decisions about where to cut and paste are remembered in an editor decision list which sits as another layer above the original file. It's a set of commands which allows you to tell your computer what parts of the file you have decided to play and which parts you want to discard. The original file stays the same.

So now you are starting to understand the way the digital audio editing process works with a combination of audio files and data files which remember you edit commands. While you might need a plug in to be able to make your editing non-destructive" there is an old-fashioned way of avoiding this process. You just simply make a backup of all of your original files before you start the editing and mixing process.

Destructive Editing
Destructive editing means that if you make a change to the file, for example you cut some 2 minutes of audio out, when you save the file you will not be able to bring that 2 minutes back at a later date. Once again making a backup copy of the original will avert any disasters

Common Editing Errors

- **Cutting out breaths!** Something as simple as the breath someone takes before they start talking is important to create a natural sound. While some people like to cut off the breath of at the beginning of the first thing someone says, this doesn't work with breaths in the middle of comments. Instead, use the breaths as markers ie don't cut directly before the first word you want to use, rather you should leave the breath in.

- **Edits are too close together.** When you edit you want it sound natural. If your edits are too close together it will be obvious to most people. Don't forget to leave breaths in!

- **Edits are noticeable because of jump in background sound.** When recording audio, you should always avoid certain background sounds such as cars going by or planes overhead. Music is also a problem. If you can't avoid these sounds, then you need to get as far away as possible from them. When it comes to editing these sounds will cause problems. For example, if a car is approaching in the background as a speaker begins and you edit out some of the words they say as the car passes, the sound of the car will suddenly disappear and the edit will be obvious. Similarly, the song in the background will jump if you edit the speaker talking over it.

- **Not enough space on your drive**. Audio files are much bigger than most normal word processing documents so it is important to ensure you monitor your computers disk space. Using an external hard drive is always a good solution. *But always check there is enough space in the drive or computer you are transferring your files to.*

- **File management** (we said we could not say these two words enough) is probably one of the biggest problems which users experience. Before starting any project make sure you have a file management system in place.

Editing Tips

The following are some basic tips to effectively edit your audio:

Content Editing Vs Cosmetic Editing

While there might be small repetitive phrases and some stumbling and “umm’ing” distract you, it’s important on the first edit to simply concentrate on the narrative and make the important parts of the story stand out.

With digital editing, because it is so easy to cut out a single sound or word, the tendency is to get caught up in the detail while doing the first edit. Try to avoid this as you will lose the flow of the narrative that you are editing. The second and third edit is often referred to as cosmetic editing. It’s here; on the second edit we can cut smaller phrases and unnecessary asides. On the third edit you can cut out the umms and ahs to get your piece down to time.

Editing Plans

An editing plan helps make the editing process faster. Have a complete editing plan written out before you begin. You may change it but it's better to start out with a basic direction in mind. It will save a lot of time in the long run. Your plan is based on the original audio file. **Don’t cut this one up.** keep it and copy the segments that you decide to use and paste them into a new file.

- Listen to the whole file right through to decide which bits to use!
- Make simple notes of what you hear, and note what you want to keep or cut
- Time each section - particularly if your final production needs to be a certain length
- Note on the plan, the start point of the various parts are that you wish to cut out. Listen for any noticeable variations in the background noise
- Consider how the segment will fit into your overall program.
- Work out a rough introduction for the segment that will go in a cue sheet - does this affect how you will edit?

Here is an example of an editing plan:

Editing Plan

Filename : Banana.wav
Title: Interview with The Dusty Bananas Date: 30/5/2009
Speaker/Performer(s): Barney from The Dusty Bananas and Jon Brown
Program: Lunch Wrap Producer: April Turner

Segment Number	First and Last Words	Duration	Counter Time (start) and comments
1.	Starts:// “Welcome to the program, when did you start recording the first album?”// “It was a process that.. Ends: and we just knew that we’d hit the bigtime..”	40 secs	1’12 – cut my first question, brilliant response.
2.	Starts:“here is a song// (Cough) Excuse me //called…” Ends: “..it was called “Peel” from the album Unzip the Yellow”//	0.10 secs	2’02 – cut cough
3.	Starts: “We can’t wait to get to Queensland..” Ends “…it is seriously, the best record we have ever made. Thanks //James..er.//Jon”	58 secs	2’30 – add track in under this section

Editing Plan Template

Sound editor's name:

Title or file name: Date:

Speaker/Performer(s):

Program: Producer:

Segment Number	First and Last Words	Duration	Cumulative Time

This is an example of a good Cue Sheet

Note:

- Layout is easy to read
- Key information in **bold** and CAPITALS
- All details have been filled in
- Includes notes

Item	The House that Jack (could afford) to Build
Producer	Sarah Thomas

Date produced	23.01.2008	Use by Date	30.1.08
File Name	Homecheaphome.wav	Duration	6.47
Item is stored on: Computer			

Introduction

The current housing situation in Australia has been labeled as a “crisis”... these days the old children’s nursery rhyme might read: “this is the country that put up the prices, that decreased the opportunity, to buy the house that Jack built!” Australian houses are the least affordable in the world, and our cities are listed in the world’s top 50 worst housing markets. DR GARY GARNETT (GAR-NET) is an expert in housing and urban design from Francis University. Sarah Thomas asked him what housing affordability really means.

Cue in	“Well, I think that’s a very wide ranging..
Cue out	…which we need to explore”

Back announcement

DR. GARY GARNETT from Francis University, speaking to our Sarah Thomas and sharing his idea that housing affordability really means housing accessibility for Australians.

Notes

Dr Garnett has given us permission to put a link to the study on our website. www.2008housingstudy.ufrancis.com.au

Cue Sheet for Pre-recorded Items- to be used by presenters once your piece is edited.

Item	
Producer	

Date produced		Use by Date	
File Name:			
Item is stored on: CD ☐ Mini disc ☐ Computer ☐ Other ☐ (specify)……			

Introduction

Cue in	
Cue out	

Back announcement

Self-evaluation of Sound Editing

Listen back to your edited files and complete the following:	Yes	No	Comments
Were the opinions or views of interviewees accurately reflected in the final edited piece?			
Were the edits smooth and unobtrusive?			
Was there any abrupt cut-off of sound, or sudden change in volume?			
Were unwanted sounds (noises, ums, ahhs) removed?			
Were there any sections where sounds or pauses shouldn't have been removed?			
Were there sections in the edited pieces that could have been improved by further editing?			

Mixing Tips

Fades and Music Levels

As with analogue mixing, the levels of music are important when mixed with words. With digital editing you can both see and hear the levels. Become familiar with the VU meters, the volume envelopes and the various ways you can control the levels of your audio. Usually each channel you use has its own volume control. You can also vary the volume of an individual file and fade files out.

In order to create really beautiful mixes, play around with the fades – try to make fades longer rather than shorter for a smoother sound. Always listen to your mixes of voice and music on speakers and headphones, it is quite common for beginners to make the music too loud. Be prepared to decrease the amplitude (make the audio or track softer) or increase the amplitude (make the audio or track louder) as needed.

Atmos

Using atmos (recordings of the location sound with no one talking) really can help fix out problems when edits are noticeable because of jumping background sound. ALWAYS when you record some audio, make sure you record some atmos either before you start or when you finish. Make sure everyone is quiet while you are doing this.

Filters

Digital editing allows you to remove unwanted sounds quite easily. These could be sounds caused by air conditioning or the buzz of a computer. While your aim should be to turn these off before recording, if you find yourself with some unwanted sound you can remove it using filters in the software. This usually involves finding a piece of the audio you want to remove and loading it as a sample then using the filter or Denoiser (or Noise Reduction, or Click and Hiss Removal) removing it to varying degrees. You have to be careful not to alter the audio you wish to keep.

For example, if you do find yourself with a recording which has a buzzing air conditioner throughout, using the atmos you recorded you can load the sound of the air conditioner into the filter and then remove it by say, 50%. This will improve the quality enormously.

You can also use Denoisers and other filters to reduce the unwanted noise by:

1. Find a sample of the noise you want to remove or reduce.
2. Load the sample.
3. Reduce the noise within the recording – always being gentle!

Premixing

If you are mixing a long-complicated piece, it is a good idea to break it down into small premixes. Doing this will reduce the number of individual files you are managing in the final mix.

Normalisation
To normalise audio is to change its overall volume by a fixed amount to reach a target level. It is different from compression that changes volume over time in varying amounts. It does not affect dynamics like compression, and ideally does not change the sound in any way other than purely changing its volume. We might use normalization on audio which is recorded too low. By applying the normaliser, we will bring the loudest parts of the audio (the peaks) as close the maximum volume required by your station. This might be somewhere between -3 and 0db.
We don't recommend using normalization as a standard practice on your final piece of audio as you have little control over the adjustments made. Nothing replaces monitoring your levels as you go and manually adjusting each file so levels remain constant.

Muddy sound
An audio recording may sound like it has too much bass. You can use the equaliser, if your editing software has one, or the various filters to decrease the bass and lower the middle range of the sound.

Effects
It is possible to alter the audio you are mixing to include a range of effects including various forms of looping, echo, delay and time and pitch adjustments. While they are fun to play with we recommend not overusing them. The best way to get started with these is to simply play with them.

Matching Audio
This can be a problem when you are matching audio that's been recorded in different places. Sometimes EQ can help to create a similar sounding quality. Another trick is to make sure that you mix the atmosphere/ambience from both recordings. You will be amazed at what a difference it makes.

Clipping
Clipping can occur when a loud signal hits your microphone or soundcard. You will recognise it because it looks like the wave has gone beyond the edge of the screen you are editing on. Your editing software may have a de-clipping tool which basically tries to rewrite the wave imagining what it might sound/look like if it had not been so loud.

Audio File Formats

An audio file format is a special container for storing audio data on a computer system. There are many different file formats for storing audio data, and they are described in the file name by their extension:

FORMAT	EXPLANATION	EXTENSION
WAV	Microsoft wave audio file	.wav
FLAC	An open source lossless compressed audio file	.flac
AAC	An MPEG sound format	.aac
OGG	Ogg Vorbis	.ogg
MP3	MPEG-1 Layer III	.mp3
WMA	Microsoft wave audio file	.wma
AIFF	Audio Interchange File (Mac)	.aiff

There are 3 kinds of formats:
Raw or uncompressed audio formats, such as WAV, AIFF and AU

Lossless compression formats. These use data compression algorithms that allow the exact original data to be reconstructed from the compressed data. Formats include Apple Lossless (ALAC) and lossless Windows Media Audio (WMA)

Lossy compression formats. This method compresses data and then decompressing it retrieves data that may well be different from the original, but is close enough to be useful in some way. Formats include MP3, Vorbis, lossy Windows Media Audio (WMA) and AAC.

The MP3 has become the ubiquitous file format. A team of European engineers invented it and it became an ISO/IEC standard in 1992. Since then, it has become the pre-eminent format because its **codec** (compression – decompression) provides a final output at least one fifteenth the size of the original with little audible quality loss.

NOTE: Although most editing software allows you to use WAV or MP3, it is best to use WAV files if you have the storage space. This will prevent further compression if you render your 'ready for broadcast' audio file as an MP3.

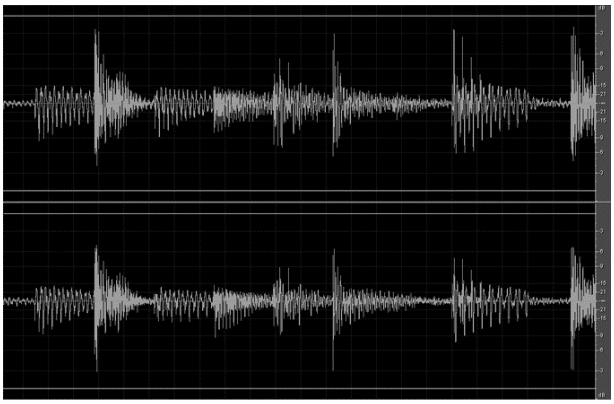
The difference between .mp3 and .wav Files

The WAV file one of the simplest digital audio file formats. WAV files work by taking an audio signal and converting it to binary data. To do this, a device called an analogue to digital converter (AD) takes snapshot ‘slices’ thousands of times per second. For example, CD quality audio records at 44.1kHz, meaning it records at 44,100 slices per second. This makes it capable of recording the entire audible frequency range of 20hz-20khz. Moving up to 48kHz 24-bit stereo will improve both the frequency range and the available dynamic range.

In a nutshell WAV files create an accurate recording of the audio without losing quality. WAV files. They do have drawbacks, however. The main one is the size of the files. This is why most online audio is in MP3 format.

MP3 is a shortened name for MPEG-2 audio layer III. The format was developed by the Moving Picture Experts Group, hence the name.

Unlike WAV files, MP3s are a lossy format. This means that encoding audio to MP3 will reduce its quality, but also reduce its file size. This is achieved in the first place by removing the frequencies of sound which the ear does not hear, it will also compress the remaining data. The results are a much smaller file but with some loss of quality.

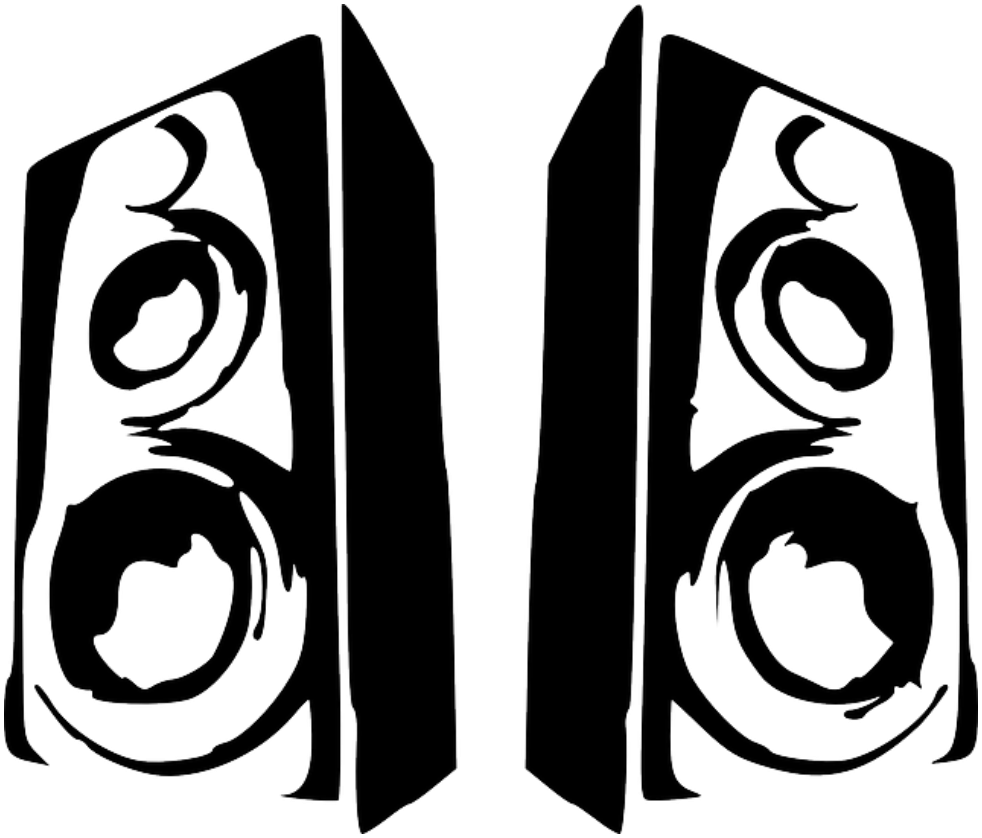


A Word About Sample Rates

The first rule about sample rates is to decide which one you are going to use and stick with it. **All files should be the same sample rate**.

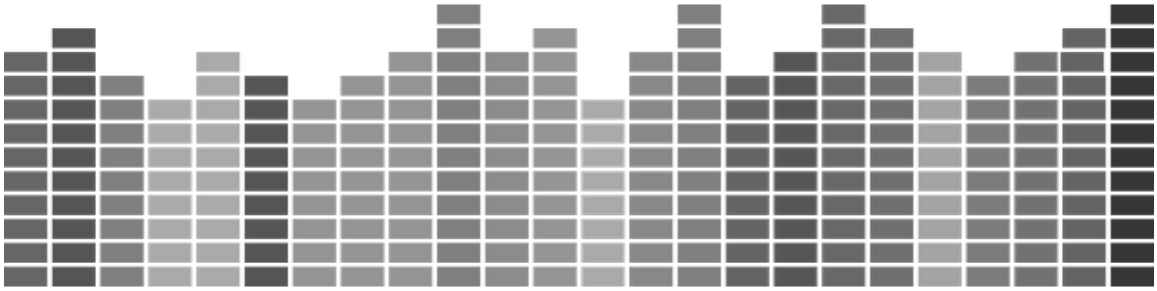
The most common sample rate is 44.1kHz – that was mainly because in the beginning of digital audio we had to burn audio to CD to play it back. Most CD players are designed for 44.1kHz – although these days CD players also playback MP3 files. These days we are more likely to use a computer for playback- so using 44.1kHz is not essential.

As mentioned above, 48 kHz produces a higher quality sound but creates bigger files.



Bit Rates

When you are opening or saving an audio file you will be asked to verify the **bit depth rate** you would like to record in as well as the sample rate. The bit depth rate is what gives an audio recording a representation of the variations of loud and soft etc.



In general, the higher bitrate the ‘smoother’ the sound will be. 8-bit sounds rather grainy and harsh whereas 16-bit sound sounds quite a bit better. 24-bit sound is used by most audio professionals these days not because it sounds so much better than 16-bit sound but because the higher accuracy is useful because *so much is done to the audio in the recording, mixing, and mastering process.*

File Management

We can't say these two words enough. "File management" is so important in the editing and mixing process that if you don't do it well your work could come undone very quickly. There is no right way to manage your files through the editing and mixing process, but it is important to decide how you are going to manage the process before you start. If you don't you will end up with problems such as:

- **Overwritten files** (files generated from a recording program with the same name in the same location...so the new one *replaces and deletes* the old one)

- **Missing files** (where a session or file is moved, preventing audio files from being located the next time the session is opened)

- **Confusion** (which is caused by having files saved with duplicate names or in duplicate locations)

- **Full and slow hard drives** (if you don't pay attention to which drive your sessions end up on)

Just when you finish a long editing and mixing session you can risk losing it all by not taking care with your file management.