

I understand that many of you will have access to only basic equipment and have minimal knowledge of sound engineering principles. But keep in mind that the quality of the final product depends almost entirely on the quality and performance of the raw recordings.

There are many factors that can affect this quality. I have listed a few of them to watch out for. Some of you may not be able to adhere to all the points in this document, like the part about the environment but there are some paragraphs that have to be followed by everyone without exception.

These are the “Creating a new session” and “Exporting” paragraphs. If anyone is having a problem in these areas, contact me at [arbitrandomstudio@gmail.com](mailto:arbitrandomstudio@gmail.com) and i can help you through it.

## **Recording Equipment**

**Software:** Audacity is an excellent free software that can do a lot of things while still being accessible to newcomers. Using others like Logic, Garage Band, Cubase, Nuendo, ProTools, etc is fine if you are comfortable with the preferences section of that software, as this knowledge is required to export files correctly. I find that Audacity is simpler in this respect. And if all of you have the same software, it becomes easier for me to help you with problems.

**Environment:** You need a small room that sounds “dead” i.e very little or no natural reverb. Generally, cluttered spaces and walls offer good absorption of reverb compared to bare or smooth walls. Closets may be too small and may even make a voice sound boomy. The wall closest to the singer will be the wall that contributes the most reverb to the mic.

To check the reverb of your room, clap your hands loudly in the different areas of different rooms. The right place to sing would be where the “hang” of the clapping is the shortest. Long flat surfaces on a wall like a mirror, window, etc reflect sound very well should be as far away as possible. Ideally the wall closest to the singer should be behind them. Having something like a bookshelf on that wall with different sized books, which breaks the flatness of the wall, is a good absorber and diffuser. If possible, hanging a carpet or a thick bed sheet behind the singer also works well.

**Microphones:** Broadly speaking, there are two types of microphones; Dynamic and Condenser. A dynamic mic needs a lot of gain, can handle a louder sound source and sounds a bit dull. They are generally good for percussive instruments or very loud instruments like a guitar amp. Condenser mics need to be powered via 48V phantom power and therefore requires less gain and sounds brighter. These are good for vocals and stringed instruments.

The singer should be between 4-16 inches from the mic depending on the loudness of the section being recorded. Any closer and you risk getting a boost in the low end which can't be EQ'ed out. Any further and you will hear more of the room sound. A mic stand is a must as it removes low frequency vibrations. If possible, investing in a pop filter is a good idea.

## **Recording**

**Creating a new session:** Make sure your session has a sample rate of 44.1kHz and a bit depth of 24bits. This has to be set when making a new session. Most softwares don't allow you to change the bit depth after you have started recording.

In Audacity, the sample rate can be changed in the drop down menu at the bottom left corner of the screen (Project Rate). And the bit depth can be chosen in Preferences > Quality > Sampling > Default Sample Format. Choose these settings BEFORE you start recording anything. These settings are crucial for when you're ready to export.

**Setting Gain:** This is a very tricky part and the most important, from a mixing stand point. Gain is the amount of input volume you apply before the signal reaches the computer. This is done only in the analogue domain (audio interface) and any increase of volume in the computer is artificial gain. Ask the singer to do a full practice run through of the song and record it. This run through will tell you a few things, like the locations of the soft and loud sections of vocals and the average level the singer is comfortable singing at.

Simply setting the gain once for the entire length of the song will not work. Record all the soft sections first and then the loud sections separately, having different gain settings for both sections. This is where the level meters on your software become important. Make sure the meters for the vocal track can be seen while recording. In Audacity, the meters of the record armed track is visible at the top of the screen. It has an icon of a mic next to it.

Adjust the gain of the mic and the distance of the singer to the mic so that the meters, on average, stay at around 60% of its length, occasionally peaking at around 85%. Similarly the signal shouldn't fall below 40% for an extended period. Be on the look out for a signal that crosses 90% of the level meter for more than half a second, even if it doesn't clip (when the meters go red). In that case, re-record.

**Headphone Mix:** This is the volume balance of tracks that the singer gets on their headphones. This usually means the payback levels of the supporting tracks while recording if you do not have a dedicated headphone mix. A good balance of supporting tracks can give a singer the freedom to give their best performance. And this mix should be managed according to their performance. If the singer is having trouble with pitch, increase the level of the melodic elements. If the singer is having trouble with staying on time increase the level of rhythmic elements.

The singer should always be able to hear themselves well. But this can be a double edged sword. Many times a singer isn't aware of how much their voice changes in level during a song, which may make finding the right amount of gain difficult.

This sometimes can be solved with the headphone mix. If the singer's loud sections are going too loud, try increasing the level of their voice in the headphones. This will automatically make them aware of how loud they truly are and therefore reduce it on their next take. And vice versa if they're too soft. You don't have to do this while recording. Set it for once for each new section.

Another important factor is the level of the metronome. Make sure that there is no bleed from the headphones into the mic. An easy way to check this is to just hit record without the singer singing after the gain amount has been set. The backing tracks and metronome should be playing on the headphones. If you can hear any of it on the recorded track when you solo it, there is bleed and you need to reduce the overall level of the headphone mix.

### Things to keep in mind WHILE recording

- Record the voice section by section, grouping them by their loudness. For e.g. record all the verses, which tend to be softer, first. Then reduce the gain for the choruses, which tend to be louder, and do them next. Gain plays a big role in the tone of the voice. So make you sure you're satisfied with the sections that were recorded with a particular gain setting before changing it for the next section, as it may be difficult to find the same gain setting again and you will be left with a vocal track whose tone changes within the same section.
- Make sure that the singer hasn't changed their distance from the mic while singing or between takes, as this also affects the tone.
- Quite often there are a few words or notes in a melody that pop out in volume, exceeding 80% of the meter without clipping. This could be because of the pitch or intensity of that word. Your practice run through should indicate where in the song they come. Instead of changing your gain amount just because of one word, have the singer make a note of the locations of these notes and ask them to face away from the mic when singing them. eg. if the line is, "And then I **saw** her standing there..." with "saw" having a greater intensity and volume, the singer should very quickly turn their head to the left or right by a few degrees away from the mic, as they sing "saw".
- After many takes the tone of some singers may change over time. So after you are done with recording be sure to play the song back to make sure the tone of the voice is consistent through the song. Sometimes the tone of the most recent take sounds different from the initial takes at the start of the song. In this case, re-record only the initial takes.
- Make sure you are satisfied with the raw tone of the voice without any EQs or effects as this is what you will have to export.

### Editing

Besides choosing and placing the takes you want, very little editing should be done. After recording everything and finalising your takes, there may be some place where takes overlap. For example, it may happen between the end of a verse and the start of a chorus. In that case, place the chorus sections on a different track. So in this example, you will have two tracks for one vocalist. Verses separately and choruses separately. Also extend the start and end of the clips as much you can, so that the inhales and exhales don't get cut.

## **Exporting**

- You may have made volume adjustments to your tracks for a rough mix. Perhaps there is even some volume automation along a track. Remove all these changes before exporting. The volume fader on each track with recorded audio must be at 0.0dB throughout.
- If you like certain elements from your rough mix, that you would like me to emulate, export a reference file of all tracks together as an mp3.
- If there are any plugins added to a track like reverb, delay, compressor or an EQ, bypass or remove them from the track before exporting.
- When exporting individual tracks, make sure you use the grid and keep a common starting point for all tracks. This ensures that nothing goes out of sync when I place the tracks in my session.
- If you have panned a track left or right, set it back to centre before exporting. (I can re-create it listening to your reference mp3)
- Some softwares (Logic) have a default compressor/limiter on the master bus track and it may be hidden unless you select the master bus track. Remove any compressor/limiter or EQ or effects from this track.
- Make sure that you don't export multiple tracks together or have the click on. This sometimes happens if an unwanted track is accidentally left on solo while exporting. Each exported file must contain only one instrument or vocal. It's fine if there are multiple files of the same instrument or vocal.
- Export your files in the .wav format at 44.1kHz and 24bits. This should be the settings of your session anyway.
- After exporting, play back the wav files in your usual music player and listens for distortion, crackles or noise which may have occurred due to errors while exporting.
- Mention the BPM of the track in your folder name.