

# Compositional Mixing

An exploration into sonic ownership in contemporary music production.

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## Abstract

This thesis examines a presumption wherein mixing within contemporary practices exists as a process with compositional implications, a term coined as *compositional mixing*. This presupposition is examined through two lines of inquiry: 1) *Are mixing and composition existing interdependently in contemporary music production?* and 2) *What implications do mixing ideologies have on contemporary music production?* To answer these questions, an extensive literature review, eight interviews, and five detailed compositional mixing examples were conducted. The accumulation of the results concluded that: 1) There is evidence that supports interdependency between composition and mixing in contemporary music production within specific parameters. 2) Mixing-related practices can be observed as having a supplementary role on a creationary level within contemporary music production.

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“A film should have a beginning, middle, and end, but not necessarily in that order.”  
(Godard, 1966)

# 1. Introduction

To start, a general statement: music is sound. In its perception, music is mainly auditory (except for the physical sensation caused by very low bass). With perhaps the exception of some more artistically inclined generative methods, those who create music are doing so in most circumstances exclusively through their interaction with sound. When attempting to describe in writing what sounds are musical, there are restrictions. When listening replaces reading, however, even children with no musical training can often quickly identify the basic emotional themes in music. However, this is not an investigation into listeners (children or otherwise). This is an investigation into creators and their craft in modern times. Specifically, where music and sound meet and the evolution of this interaction. This investigation draws its inspiration from the cross-contamination of laptop-era producers' technological, artistic, aesthetic, and procedural realms, afforded by recent technologies, driven by music creation.

At the time of this writing, I am in the fifth and final year of my education at the University of Agder (UiA). I have been lucky enough to engage with (and hopefully improve) my craft through various artistic and audio technician-related conquests throughout this time. Based on my experiences thus far, thinking in sonic terms when working on musical ideas is unavoidable and would be counterproductive for me to approach music creation otherwise. I have come to understand that I am not alone in this practice and have made one of the aims of this thesis to expose this assumption. It is my inclination that modern music producers are expected to be interdisciplinary actors who, if they wish to produce their music in a vacuum (not uncommon in electronic music), require an array of skills honed over time and seemingly executed interchangeably. For me, it is not always clear what separates an artistic practice from a technical one. Is this because of some creative brilliance that I possess? An ego-driven need to control every single sound of my project? The answer to this question is a firm *no* on both counts. For me (and others mentioned later), this is because sonic and musical tasks exist interdependently.

As will be outlined in the following pages, this investigation is centralized around the process of mixing music, a process widely recognized as an artform (Moylan, 2014, 3). Although in its simplest forms, mixing can be as simple as adjusting the volume balance between two sound sources, like so many other things, it can (when done well) realize emotional potential. However, this thesis will not delve extensively into elaborating on the mixing process in its academically

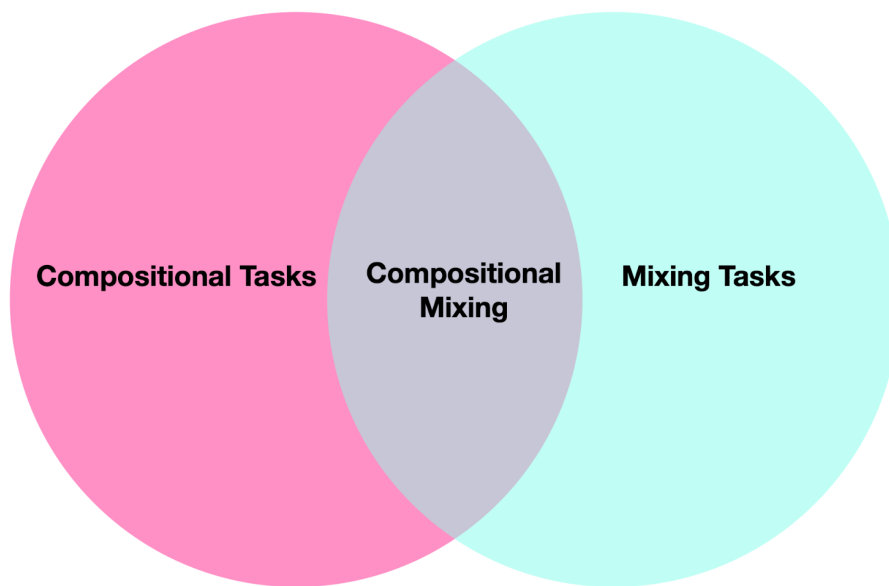
recognized post-production capacity. Instead, this study will show how mixing can exist as a tool with compositional implications.

It is common for laptop-era producers (referred to simply as producers) to at least have a basic understanding of audio principles, techniques, and equipment. Coupled with ‘in-the-box’<sup>1</sup> workflows that provide an “integrated environment... that offers a greater level of dynamism and the ultimate flexibility” (Justin Paterson, cited in Hodgson & Hepworth-Sawyer, 2017, 79), it serves the user through easy access to extensive functionality. There are undoubtedly many who, for whatever reason, are perfectly willing to allow an external party to manage this aspect of the production (this is far from uncommon). However, as shown later, one would be hard-pressed to find digital audio workstation (hereto simply referred to as DAW) oriented producers who consciously shun mixing-related activities entirely. In light of this interdisciplinary evolution of the producer role, this study will focus on observing mixing outside of its theoretically ascribed framework in a capacity that is compositional/generative in practice, a process coined by this thesis as *compositional mixing*.

One of the challenges associated with describing a new thing lies in the rigidity of surrounding terminology. Although much is written on mixing and composition, relatively little is written regarding the relationship between the two. Additionally, composition itself as a definition does not exist without extensive gray zones and particularly in the era of electronic music (Roads, 2015, ix). Therefore, where academic supports waiver, the surrounding methodology will attempt to offer support. The following pages will take the shape of published testimonials, structured interviews, and various practical examples. However, in this introductory stage of the thesis, we may perhaps more easily understand what this thesis directs its attention to using a simple Venn diagram (fig. 1 below) in which it becomes much clearer how compositional mixing is what arises at the intersection between mixing and composition.

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<sup>1</sup> In-the-box refers to processes that are exclusively done in the digital domain.



**Figure 1:** A Venn diagram illustrating how compositional mixing can exist within the context of production in a simplified manner.

To be clear, it is not the intention of this thesis to denounce the long-established validity of mixing as a process. Mixing and mixing engineers will undoubtedly serve record production for untold years outside of the methods described here. Instead, this thesis simply serves to elaborate on how activities that heavily resemble mixing can be observed within music creation by music creators. Should the following claims be shown to hold evidence of this being the case, I hope these concepts may be acknowledged in production and research circles when mixing alone proves to be a less than adequate description.

### **1.1 Mixing vs. Compositional Mixing & Sound Design**

For coherency, the terms *mixing* and *compositional mixing* will express two separate concepts (both defined later in the document). This has been done to avoid uncertainty when expressing compositional mixings rather than a niche interpretation in lack of a more precise definition. Additionally, the term *sound design* will mostly be circumvented for reasons related to prospective confusion surrounding its meaning. “Sound design is a really broad term, it doesn't have a specific definition” (Perkins, 2020). In his linked in (previously lynda.com) course on audio in filmmaking, Perkins points out in a single sentence the issues being expressed: Sound design is more of an umbrella term for a collection of sonic practices rather than a precise definition. For this reason, *sound design* will be avoided as a descriptor where possible.

## 1.2 Research Questions

The lines of inquiry in this study are twofold:

1. *Are mixing and composition existing interdependently in contemporary music production?*
2. *What implications do mixing ideologies have on contemporary music production?*

The astute reader may ask at this point: what connects these two questions? The simple answer is: If mixing has a place in the compositional space, there is likely an ideology behind this. However, should the nature of this interdependence not be witnessed, the second question can aid in showing why this is not the case.

As alluded to in figure 1 (above), the nature of the *interdependence* aspect of the first question is based on the premise that compositional tasks can be shown to be reliant on mixing tasks to achieve their results. Regarding the second question, what is implied by “ideologies” relates to the apparent abolishment of long-established modes of practice where mixing is concerned contemporarily. As will become clear later, these values see the mixing practice in a more post-production-oriented capacity.

## 1.3 Theoretical Framework

The following will detail the theory used in this paper presented in a thematic format as it relates to the different topics discussed.

### 1.3.1 Mixing, DAW & Studio Related Theory

Understanding what constitutes mixing has been paramount to understanding the nature of compositional mixing on an artistic and technical level. Additionally, the many particularities and implications of DAWs and studio mentalities have also been added as these topics are closely associated with mixing practice and by association, compositional mixing.

In his book *'Dawn of the DAW: The Studio as Musical Instrument'* (Bell, 2018), Bell has aided this investigation on multiple fronts through his observations on the implications associated with DAW specific workflows, ITB (in the box) mixing methodology in addition to elaborating on the many intricacies where the user is concerned.

In their book *'Modern Recording Techniques (Ninth Edition)'* (Huber & Runstein, 2017), Huber & Runstein offer insights surrounding DAWs, CPUs (central processing units), and DSP (digital signal processors). These insights have served in establishing an understanding of how modern computing relates to music production and audio processing through a more technical lens.

In *'Mixing audio: concepts, practices, and tools'* (Izhaki, 2018), Izhaki describes mixing as it exists as a practice in intricate detail. In this thesis, Izhaki's insights support a concise definition for mixing, elaboration on the contemporary mix-as-you-go format prevalent in DAW workflows, and elaborating on ITB (in the box) mixing practices.

In *'The Digital Musician'* (Hugill, 2008), Hugill offers valuable insights into the analog domain, precisely where mixing is concerned. In this thesis, this has been particularly useful in elaborating on where traditional methods differ from modern DAW workflows.

In his book *'Rock Formation: Music, Technology, and Mass Communication'* (Jones, 1992), Jones offers a single insight regarding the relationship between mixing and technology, which holds particular relevance within the scope of this investigation.

In *'Mixing Music.'* (Hodgson & Hepworth-Sawyer, 2017) several valuable insights into how mixing relates to production in its contemporary format. Additionally, insights into how mixing is learned has proved useful when describing the many proclivities of the modern user. Interviews from this text are also used here to elaborate on the interdependent nature of mixing as it relates to electric music production practices specifically.

In *'Mixing and Mastering in the Box: The Guide to Making Great Mixes and Final Masters on Your Computer.'* (Savage, 2014) Savage serves the section by elaborating on how one mode of work can be exchanged for another in a DAW framework.

### **1.3.2 Compositional & Production Related Theory**

Understanding what constitutes composition within the context outlined has been an equally important aim of this thesis. As will become evident later, composition and production exist interchangeably where DAW workflows are concerned. For this reason, they will be outlined together here.

In his book *'Cultural Production in and Beyond the Recording Studio'* (Watson, 2015), Watson delves into the many particularities associated with the modern music producer from cultural



and historical standpoints. Watson's observations manifest themselves in this paper primarily from his investigations into roles in addition to elaborations on the self-learning practices engaged with by aspiring producers in modern times.

In their book *'The Bloomsbury Handbook of Music Production'* (Zagorski-Thomas & Bourbon, 2019), relevant insights are offered concerning both conventional and electronic approaches to music production as they exist currently. These insights are centralized around the roles associated with laptop-era producers. Additionally, the construction of compositional norms in modern production concerning process is also explored.

In *'Composing Electronic Music: A New Aesthetic.'* (Roads, 2015) Roads offers substance to this thesis on multiple fronts, most notably regarding how electronic music differs from traditional composing. Roads' insights into how sonic narratives and casualties exist in electronic music production have been precious when exposing how compositional mixing operates in practice. Additionally, several connections to mixing practice are also explored as they exist within the compositional framework of electronic music.

In his book *'The Creative Electronic Music Producer.'* (Brett, 2021) Brett elaborates on the implication of working in the micro-levels of detail allowed for by DAWs and how this seemingly inconsequential function has profoundly served modern music-making practices.

In his publication *'The Producer as Composer: Shaping the Sounds of Popular Music.'* (Moorefield, 2010) Moorefield serves this thesis by observing how modern technology has resulted in a tradeoff between composers and producers in modern times.

In the book *'The Cambridge Companion to Recorded Music'* (Clarke, Leech-Wilkinson, Rink, Cook, Eds, 2009), contributor Blake continues illuminating sentiments regarding the difficulties associated with ascribing a precise definition to the term 'music producer'. In this thesis, this has helped ascribe a more appropriate role during the 'Laptop-Era Music Producer' section.

In *'Understanding and Crafting the Mix: The Art of Recording (3rd ed.)'* (Moylan, 2014), Moyland exposes the many intricacies associated with the mixing and production process. Moylan's insights have aided this investigation by elaborating several relevant theories, including

substantive and ornamental functions. Additionally, Moylan's elaboration on the producer role within its contemporary format has been particularly relevant.

In his book 'Home Recording For Musicians For Dummies.' (Strong, 2014), Strong outlines the spectrum of capabilities available to amateur recording enthusiasts who wish to record at home. His insights offer value to the subject matter by elaborating on the dwindling value of commercial studios in light of what is achievable from one's home with modern tools.

### **1.3.3 Other Sources**

In his publication. '*Experiencing Musical Composition In The DAW: The Software Interface As Mediator Of The Musical Idea.*' (Marrington, 2011) Marrington explores the visual experience of DAWs and how they relate to music-making. These insights are used to demonstrate how the visual representation of the DAW correlates to user functionality when working musically.

In his book '*A year with swollen appendices*' (Eno, 1996), which is essentially a memoir, Eno's pre-DAW-era remarks serve this thesis by elaborating on technology's enabling role in modern production.

## **2. Methodological Approaches**

### **2.1 Literature Review**

Naturally, a literary review of mixing practices in modern times is highly relevant to this project's aims. In addition to this, various sources regarding DAWs and their implications in contemporary production have also supported this investigation. Additionally, various aesthetically-leaning insights when describing compositional frames of reference. Finally, various bodies of work associated with general music production have been equally essential in validating the fundamental lines of inquiry where practice and user experience are concerned.

### **2.2 Tutorial Testimonials**

This study utilizes testimonials from two highly esteemed mixing engineers acquired through 'show all' style tutorials available to subscribing members. These insights outline situations from real-world examples where mixing/compositional practices fall outside what is available from literature alone.

### **2.3 Structured Interviews**

Asking interview subjects open-ended questions is advantageous because it can extract relevant insights from concrete questions regarding mixing ideology within production/composition. In this study, all participants (eight in total) were selected primarily for reasons related to their respective musical achievements as producers/artists. In addition to this, participants were also selected to represent a diverse spectrum of musical backgrounds. This way, if a given question elicits the same/similar responses, more credibility can be associated with the workflow in modern music production rather than with a single genre, musical style, or discipline. The questions asked are as follows:

*Q1: Can you summarize your musical existence and your self-imposed roles within that existence?*

*Q2: Are you mixing your own music?*

*Q3: Do you prefer to mix your own music, or is it out of necessity?*

*Q4: Do you agree that there are creative advantages to mixing your own music?*

*Q5: Are mixing and production/composition happening simultaneously? If so, then to what extent?*

*Q6: Do you view mixing as a separate process in your productions? If not, then why?*

*Q7: Would you describe mixing as a compositional tool?*

*Q8: Have you ever experienced musical ideas evolving from mixing-related activities? If so, do you have one or more examples?*

The questions above serve to uncover a variety of insights; however, collectively, they serve the research questions by uncovering to what extent composition and mixing manifest in the collective psyche of the interviewees. Firstly, Q1 allows the participants to introduce themselves and establish context for their participation. Q2 & Q3 operate in conjunction to quickly establish their mixing role (if any) and gain insight into their opinion on this role (if evident). The ‘*necessity*’ aspect of Q3 (financial or otherwise) has been intentionally left open to interpretation, thus providing the participants the opportunity to elaborate on what ‘*necessity*’ means to them within this context. Q4 speaks to the ideological leanings of the participants directly, asking outright if mixing as they understand it, exists as a creative contributor in their respective workflows. This question also provides the participants the opportunity to reveal where the *creative* aspects of the mixing may exist within their individual processes as defined by them. As will be outlined later, this question provides an opportunity to establish compositional context. Q5 and Q6 serve to understand where in the participants' respective workflow mixing exists and thus their insights (positive or negative) surrounding this. Concerning Q5 specifically, this question has been added to reveal to what extent the contemporary (mix-as-you-go) mixing approach is utilized. Finally, Q7 and Q8 exist to uncover how the participants react to the notion of mixing having compositional connotations while exposing what form this may take.

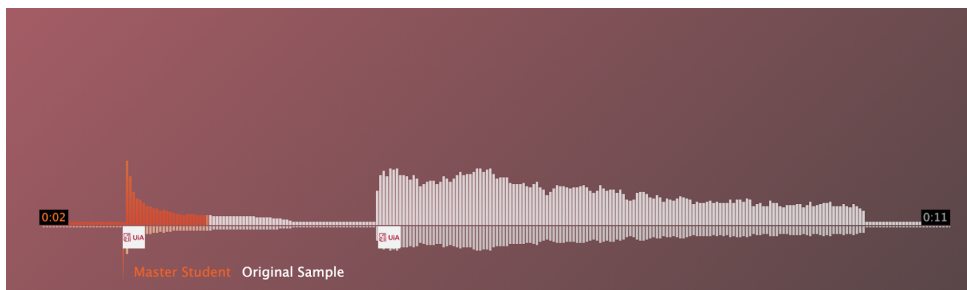
For clarity's sake, it should be stated that all participants have given written consent and have been fully informed of the purpose of their contribution, as well as their ability to withdraw their contribution at any time before the final thesis submission. All data has been managed in accordance with and approved by, the NSD. All original responses can be accessed through the appendix section (Appendix A).

### **2.3.1 Interview Summaries**

As this section has a rather substantial page count (20 total pages), the sum of the insights gathered has been summarized at the end of each round of responses for coherence.

## 2.4 Practical Examples

Practical examples are used in this thesis that detail individual cases of compositional intent. The examples are often presented in “start-to-finish” format and are aided through detailed descriptions and session screenshots before being presented in audio format. In this way, confusion surrounding outcome and intent can be mitigated. Concerning the audio examples specifically, links to a dedicated (private) SoundCloud profile have been added throughout the example section (fig. 2) to aid the reader better when grasping the technical, sonic, and musical implications this section attempts to convey. Each section is followed by a summary detailing how the mixing-related activity shown constitutes a compositional narrative or, in some other way, speaks to compositional mixing in practice.



**Figure 2:** A screenshot of one of the sound cloud examples accessed through the links detailed in the example portion of the thesis.

### **3. Mixing: Definitions and Manifestations**

Understanding mixing in rudimentary terms assists in expressing its role outside its academically established parameters. Therefore, this section will establish a consensus for mixing before exploring relevant historical insights related to the craft. Exploring these topics will help establish the common frameworks from which investigations into the artistic and compositionally inclined aspects can be opened for scrutiny.

Before continuing, it is first essential to separate mixing into three states: traditional, contemporary, and compositional. With the latter being discussed in depth later, the first two (traditional & contemporary) will impart an understanding of the particularities associated with the linear, segregated, technically inclined mixing occupation (mixing engineer) and how modern practices have challenged this process in contemporary times.

#### **3.1 What is Mixing?**

“The act of mixing takes a collection of audio clips on a set of tracks and blends them into a finished composition.” (Roads, 2015, 369). Exploring an introductory level description, Roads expresses mixing as the blending of sounds with the aim of achieving a result (presumably through a technological medium). Interestingly, Roads also implies that the composition itself exists in a state of incompleteness without this act. Exploring Izhakis's additional viewpoint of mixing as: “...a sonic presentation of emotions, creative ideas, performance, and musicianship.” (Izhaki, 2018, 8) serves to present mixing in its aesthetic capacity without the means. With these two depictions in mind, mixing in a basic format can be considered a duality: 1) A process administered to achieve a goal (a final mix). 2) The presentation of an artistic act (a sonic performance). Moyland echoes this sentiment by stating: “It is often helpful to consider the mix process in two stages: one artistic composing (crafting) the mix, and one technical, performing (executing) the mix. While the two often happen almost simultaneously, they require different skills and thought processes. It is a duality of function that changes many people, as the creative flow is diverted by the technical, with great complexity in both realms.” (Moylan, 2014, 416).

#### **3.2 Defining Traditional Mixing**

Hugill writes: “Traditionally, there are three main phases in the production of recorded music: recording, overdubbing and mix down. The mixer is central to all three. In the recording phase,

the input signals are normally directed into an input strip on the mixer, or its digital equivalent. The gain of each input strip is set to a corresponding level and the result is assigned to an output on the mixer. This output is then routed to a recording device such as tape or hard disk. Overdubbing, as the name implies, is a stage at which new material and tracks may be added, or corrections made to existing tracks. Many recording sessions build up layers in this way, overdubbing repeatedly to arrive at a finished result. Once again, there are different ways of achieving the same results when using digital technologies. In the mix down stage, the recorded material becomes the input, while levels, EQ, panning and effects are adjusted to achieve the desired result: the final mix.” (Hugill, 2008, 53) As Hugill observes, in traditional recorded music workflows, the mixing desk is at the heart of a series of complex operations. In order to achieve its results, the work is constrained by a series of predictable events worked towards linearly. In this setup, engaging in mixing-related tasks early on would be inherently counterproductive by design.

Traditionally, mixing is synonymous with the mixing engineer role: “Traditionally, the mix engineer would work with a number of relatively fixed performances, optimizing these spatially, spectrally and dynamically.” (Justin Patterson cited by Hodgson & Hepworth-Sawyer, 2017, 79). As elaborated by Paterson, the role of the mixing engineer primarily existed within this format to extract sonic intelligibility on the source material rather than act as a creative contributor.

In conclusion, traditional mixing refers to how mixing is engaged within the confines of a mixing console by an agent (a mixing engineer). This is not to suggest that mixing in this traditional format needs a console to be classified as being traditional, but it is put forth here that it is bound by the mentalities born from the era that saw its inception as a process.

### **3.3 Defining Contemporary Mixing (as you go)**

“...today’s DAWs, on which most sequenced music is produced, make it easy to mix as you go. The mix is an integral part of the project file, unlike a console mix that is stored separately from the multitrack.” (Izhaki, 2017, 31)

Izhaki elaborates the removal of the console is a significant catalyst when attempting to define mixing outside of its traditional attributions. Most notably, the more integral nature of mixing (mix as you go) allowed for in sequenced (DAW) environment (discussed in depth later). Therefore, in the contemporary format, mixing can be described (at least in part) as an operation working in

tandem with other creative tasks rather than within the confines of a linear chain of events. Although this mixing method is not specifically recognized as being conventional per se, it is readily apparent that it does not fit the traditional definition. Therefore, in light of this rather significant difference in practice, the mix-as-you-go method will serve to function as the contemporary counterpart throughout the remainder of this thesis.

### 3.4 Traditional Mixing Ideologies in Contemporary Music

Speaking on his work mixing for Hozier, Grammy award-winning producer/mixer Andrew Scheps reflected: “Some songs I get basically a folder full of WAV files (and I) start from scratch. Some sessions I get are rough mixes, little bit of processing but all the balance is there, maybe a little bit of automation<sup>2</sup>. This session was set up like it could have been the final mix session [...] tons of routing, tons of processing, lots of decisions being made, automation already there in place so this was how do I take a very complicated session and then fit that into my template.” (Scheps, 2022)<sup>3</sup>. This sentiment from Scheps serves to indicate two key insights: 1.) It is not uncommon for professional producers to engage in extensive mixing-related activities prior to a dedicated mixing stage. 2.) The mixer can expect to elaborate on an already established sonic narrative (as was the case for Hozier's session). Scheps goes on to elaborate on the extent of the second point when discussing the vocal reverb processing by stating: “I'm not using my reverbs from my template at all, they've spent so much time crafting individual reverbs for individual instruments and vocals [...] Why would I add overall reverbs unless I have to? [...] I didn't have to do that for the vocals because they'd already build the spaces we're gonna have.” (Scheps, 2022).

As indicated by multi-Grammy award-winning mixer Michael Brauer on one of the pitfalls mixing engineers face when working with modern productions: “You didn't just match and improve it by the 5 or 10 percent that it needed– you went 50 or 60 percent and you went straight away from what they were already happy with [...] **The job today is to match it and improve it.**” (Brower, 2021). As stated by Brower in his mixing tutorial, the job tasked to modern mixing engineers is less about re-inventing and more about maximizing the sonic potential of an existing mix.

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<sup>2</sup>A process that dictates parameters for automatic adjustments during playback on the timeline.

<sup>3</sup> <https://www.puremix.net/video/inside-the-mix-hozier-with-andrew-scheps.html> Part 1 10:17-10:58



In summary, it is clear from these testimonies that traditional mixing ideologies have had to adapt to fit new parameters as a direct consequence of mixing work being an integrated part of the production prior to a discrete mixing stage.

### **3.5 Mixing & Technology**

As pointed out by Jones: “*Mixing is the point in the recording process most affected by technology.*” (Jones, 1992, 173). However, should one dig into this sentiment a little deeper it becomes apparent that without technology, mixing could not exist. Perhaps the closest non-technological equivalent to mixing was orchestral conductors whose musicians, even then, relied on the technological aid of musical notation to execute their roles successfully. Therefore, should the nature and scope of the technology change, it stands to reason that the processes governed by technology are susceptible to change in turn.

## 4. DAWs & DSP

To tell the story of compositional mixing, one must first investigate the emergence and mass implementation of DAWs, their workflows, and their dominance within contemporary music production practices. This section will therefore serve to expose the intricacies of DAWs and how their existence allows for compositional mixing to manifest by virtue of their capabilities.

The emergence of the DAW has had an enormous influence on all aspects of contemporary music creation. Practices and processes unthinkable in the tape based era of music production (non-linear editing<sup>4</sup>, pitch correction, audio warping, etc.) have now become commonplace for anyone working in DAWs. Bell elaborates on the scope of DAWs by stating: “Most DAWs include a robust suite of instruments, the capabilities to “score” and record them, and the tools to mix and process the results. By the same token, the teams of specialists required to operate an analog studio are rapidly being supplanted by producers working alone, in pairs, or in small groups. With the roles and processes of recording artists changing so dramatically, it follows that the design metaphors of their tools are changing in tandem.” (Bell et al., 2015). With this in mind, this chapter will detail some of the most compelling catalysts for this shift by examining some key events that have culminated in today's norms before focusing on how this relates to the user.

### 4.1 The Price of Computation

*“As new technologies and programming techniques continue to turn out new hardware and software systems at a disarming pace, many of the long-held production limitations have vanished as increased track counts, processing power and affordability have changed the way we see the art of production itself. In recent years, no single term implies these changes more than the “DAW”.” (Huber & Runstein, 2017, 219)*

Three points are conveyed here by Huber & Runstein regarding the DAW that hold relevance here. Firstly, the abolishment of production limitations (mixing included). Secondly (correspondingly), the expansion of processing power with the third being affordability. Roads echoes these sentiments by stating: “For decades, the number of tracks that could be mixed was limited by tape technology. The tape era peaked in 1991, when a digital 48-track tape

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<sup>4</sup> Non linear editing or NLE refers to a form of editing that allows the user to perform editing on a linear timeline (a song) without being beholden to the project's linear format. E.g working on any audio or midi clip in the session at any time. Linear editing refers to analogue workflows which are bound by a linear framework.

recorder cost over \$250,000 and a large mixing console to match it cost nearly the same. Simultaneously, a revolutionary change took place as inexpensive software-based recording and mixing programs reached musicians with personal computers.” (Roads, 2015, p. 376). Therefore, in addition to technological innovation, affordability has also spelled opportunity for a much larger user demographic than would have been the case previously.

## **4.2 CPU, RAM, DSP**

Whereas analog processing configurations are limited by the amount of hardware that can be delegated to performing single tasks, it is the nature of computer-based music creation that digital signal processing (DSP) ultimately serves as the governing factor where capability is concerned (Huber & Runstein, 2018, p. 406). It is also the case that the amount of DSP available will have a direct link to the computer's capabilities, with the two main factors being the CPU (central processing unit) and the amount of RAM (random access memory). As can be expected, more powerful computers will inevitably have a more impressive CPU and more RAM. In short, the computer's processing capabilities directly correlate to the music-making experience where DAWs are concerned.

## **4.3 ITB Mixing**

“Audio sequencers let us mix inside-the-box. That is, they provide everything that is needed to complete a mix without external hardware (with the obvious exception of speakers)” (Izhaki, 2018, p. 149) As observed by Izhaki, audio sequencers (DAWs) allow for extensive in the box (ITB) mixing where all audio processing occurs within the confines of the DAWs project file. Izhaki follows the statement by indicating that only a shortlist of hardware components is required to fully realize an ITB workflow (computer, audio interface & playback system). For most contemporary electronic musicians, ITB workflows are the rule rather than the exception (Bell, 2018, 136). Although ITB mixing will be explored in more detail later, it is essential to note that this form of mixing is integral to compositional mixing as it merges the generative and sonic activities in a way that would be counterproductive outside of this format.

## **4.4 Plugins**

Plugins are an invaluable tool in modern production, offering controls that often far exceed hardware processors in functionality, convenience (perhaps the most notable being perfect recall), and cost, making them highly desirable tools in DAW workflows. “By and large, effects plug-ins operate in a native processing environment... This means that the computer's main

CPU processor carries the processing load for both the DAW and the plug-in DSP functions.” (Huber & Runstein, 2018, p. 406). As indicated by Huber & Runstein, the host computer carries the processing workload for both the plugin and DAW (except for some dedicated DSP processing units). In recent years, plugins have vastly outstripped hardware units in popularity (fig. 3) becoming the exception rather than the rule for laptop producers (Bell, 2018, 29). This has culminated in plugins being the new normal for processing with ITB workflows being ever more commonplace for music makers and mixers alike (Hepworth-Sawyer et al., 2019, 224). Perhaps as important as the environment they exist in (DAWs), plugins are deeply intertwined into the narrative of both mixing and music creation (Hepworth-Sawyer et al., 2019, 224) and by extension, compositional mixing also.



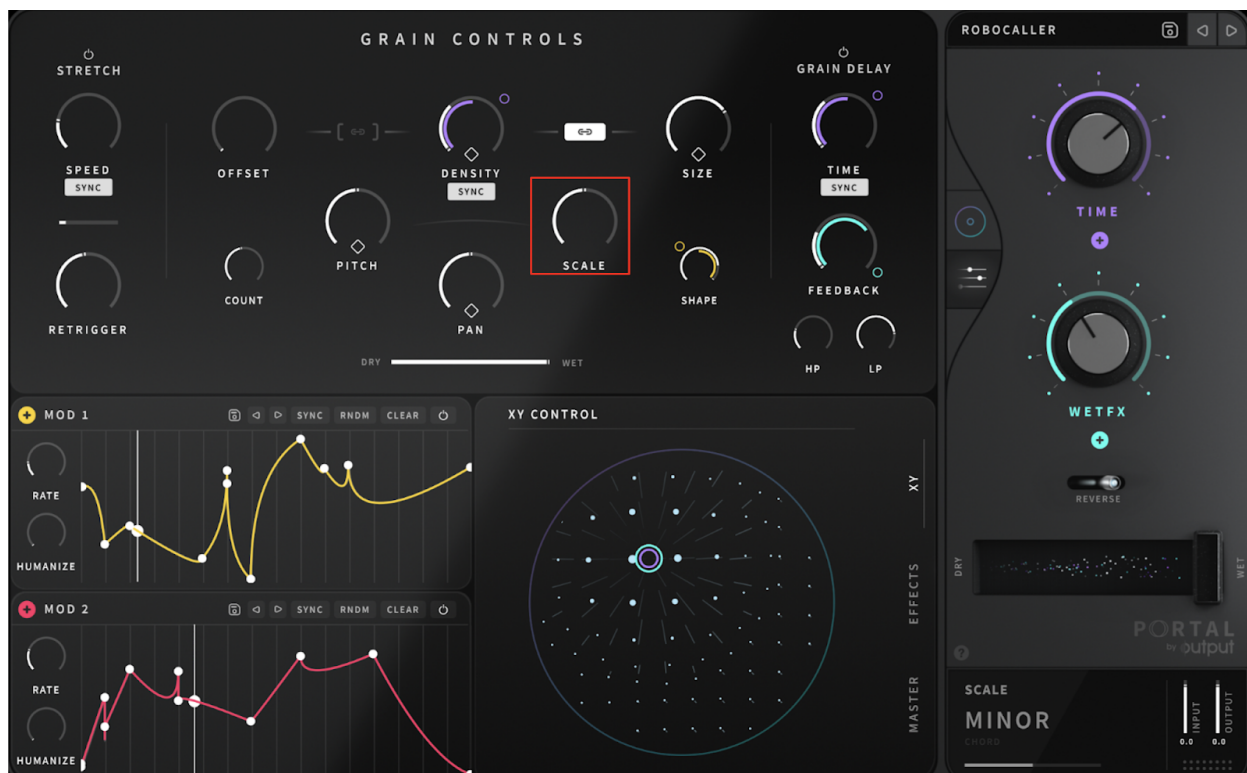
**Figure 3:** The author adjusting a Tubtech PC1E hardware equalizer (EQ) unit.

#### **4.4.1 Plugin Examples**

The following will offer examples of audio effect plugins that are impossible to recreate in the analog domain and have musicality seemingly built into their functionality.

### PORTAL (Output)

“With PORTAL, granular synthesis takes your sounds to another dimension. Easily alter any audio input – VSTs<sup>5</sup>, drums, vocals, live guitar, you name it – in a new and musical way.” (Output, 2022). Relying primarily on granular synthesis<sup>6</sup> to achieve its effects, Portal (fig. 4) goes beyond being simply a ‘special effect’ by incorporating musical controls such as scale selection. By virtue of this, this plugin offers generative qualities which can be engaged with and utilized in compositional situations in addition to being an effect.



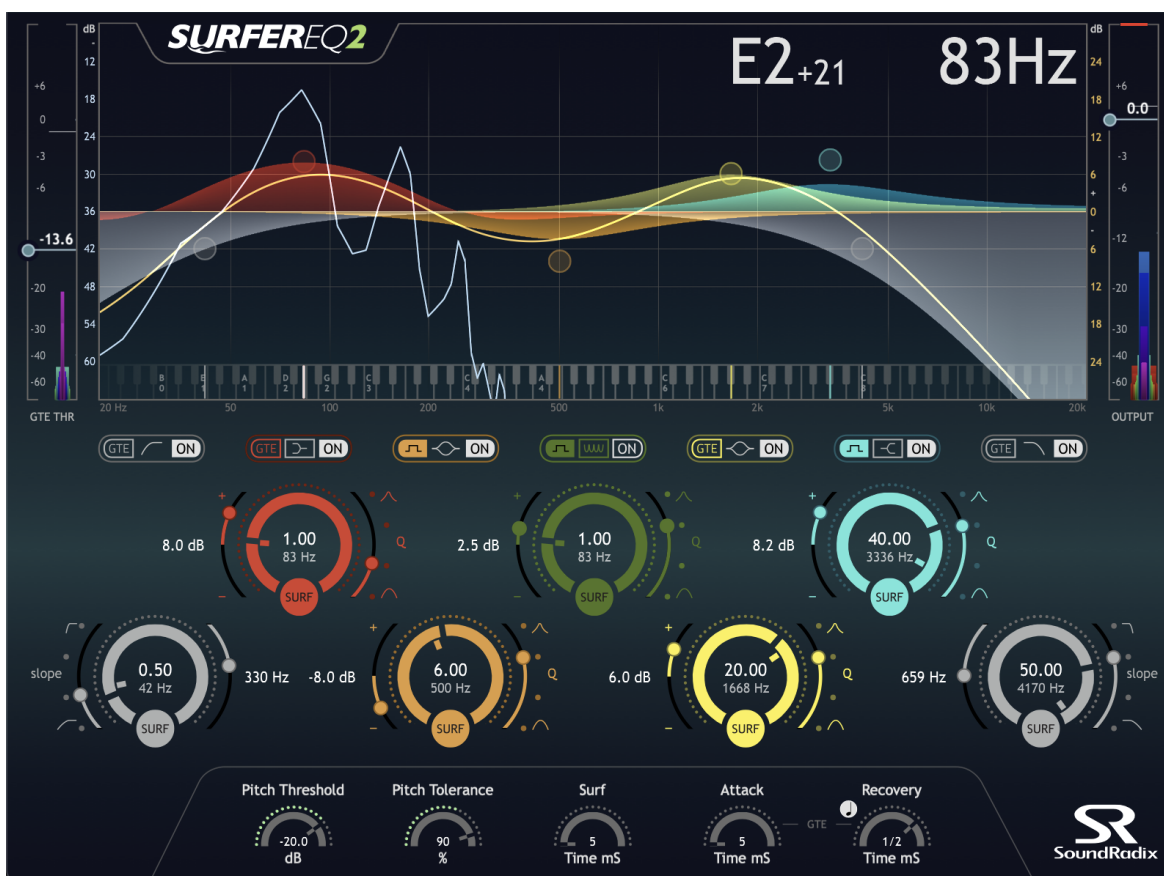
**Figure 4:** A screenshot of outputs Portal plugin offering musical control via scale selection (outlined in red).

<sup>5</sup> VST refers to ‘Virtual Studio Instrument’.

<sup>6</sup> Granular synthesis functions by segregation the incoming audio into small snippets or ‘grains’ that can be manipulated in various ways. It should be noted that this type of synthesis is specific to the digital realm of audio.

### SurferEQ2 (Sound Radix)

“SURFEREQ tracks the pitch of a monophonic instrument or a vocal source and can adapt its bands' frequencies relative to the music in real-time, maintaining the natural harmonic balance of the sound source and making it possible to shape the source's timbre relative to the notes being played.” (Sound Radix, 2021). As indicated by Sound Radix, this EQ<sup>7</sup> stands apart from conventional equalizers by virtue of its ability to track musical pitch (as shown in figure 5). In practice, this results in a more concise control over a signals timbre on monophonic<sup>8</sup> sources. However, should be more experimentally inclined, the implications of this EQ could serve a variety of compositional outcomes.



**Figure 5:** A screenshot of the Sound Radix Surfer EQ2 identifying the fundamental frequency of a bass guitar performance with all adjacent (SURF enabled) EQ bands moving relative to the pitch tracking identified by the fundamental band. At the bottom, the settings used for pitch identification and tracking behavior are also shown.

<sup>7</sup> An EQ or 'equalizer' is a device that manipulates individual frequency ranges in amplitude through the use of various filters. An extremely prevalent and powerful mixing tool.

<sup>8</sup> A source that is monophonic refers to a signal that is performed as single notes (bass and vocals are an example of this) as opposed to chords.



### Nectar 3 Plus (iZotope)

iZotope's Nectar 3 Plus markets itself as: “12 vocal-focused processing modules offer the treatment you need for any type of vocal. Get DSP for harmonies, doubling, saturation, and much more...” (iZotope, 2022). This all-in-one solution for vocals is not a new concept per se; however, it stands out in its ability to generate reasonably realistic sounding harmonies with relative ease and, in doing so, introduce a compositional component to an otherwise mix-oriented tool. Figure 6 serves to illustrate this functionality in practice.



**Figure 6:** A screenshot of iZotopes Nectar 3 plugin with the harmony module engaged alongside other typical vocal mixing processors such as Equalisation (EQ), compression, and reverb. In this example, multiple harmonies coincide with a predefined musical key allowing the desired intervals to be placed within the stereo spectrum.

### 4.5 (Non) Linear Workflows

DAW workflows allow the user to control their creative process with significantly more flexibility than has previously been the case in comparison to a more traditional analog workflow. As pointed out by Savage, the traditionally ascribed linear approach to music production (section 3.2) does not apply to modern, DAW driven production in the same way: “...because all of these functions are housed together in the DAW and are easily accessible, and because all of the

mixing functions (including advanced ones) may be housed in the DAW in the same file, it is very easy to transition from one mode of work to another.” (Savage, 2014, 5)

Circling back to Izhaki's previous statement: "...today's DAWs, on which most sequenced music is produced, make it easy to mix as you go." (Izhaki, 2017, 31), it becomes clear that working in this way is not only possible but may also presumably be seen as preferable. Speaking of his work on The Weeknd's album "Beauty Behind The Madness," producer Carlos 'Illangelo' Montagnese expresses the following: "My process is difficult to talk about, because I do everything at once [...] Writing, producing, mixing is all one fluid process for me. There's no separation between any of the things that I do." (Montagnese, 2015)

Speaking about DAW workflows, Bell elaborates: "In the digital era... performance, recording, and composition have largely collapsed into a single act...The "writing" that occurs in this type of informal context often takes the form of exploratory and improvisatory recording and sequencing, a process bearing little resemblance to pencil-and-paper composition." (Bell et al., 2015). In summary, it can be stated categorically that within the context of DAW-driven music production, the workflow's linearity (or lack thereof) exists largely as one that is **user-definable**.

#### **4.6 Visual Response (GUI) & Workflow**

Although the DAW is a tool within tools for sound production, it is also essential to establish that visual feedback is also a factor. The GUI (Graphical User Interface) refers to what the user interacts with and is directly associated with functionality.

"Music production-oriented DAW platforms like Garageband, Cubase, Logic and Sonar, while possessing traditional notation facilities, tend to represent musical information on the screen in a way which produces a different kind of visual response. At the macro level the composer deals with rectangular blocks of varying sizes, implying a visual environment more akin to the canvas of an artist rather than a composer. This propensity towards the visual is exaggerated by the ability which all DAW packages possess to allow the user to add colour to these objects, as well as the numerous tools for cutting, moving, muting, deleting and re-assembling of these shapes into limitless configurations within the screen space." (Marrington, 2011, para 16)

As observed by Marrington, the visual environment of the musical tasks has migrated to screens. This undoubtedly serves the user in the creation process. Using Ableton as an



example, it appears that there is little in the way of visual separation between compositional and sonic processors. An example of this can be seen in figure 7 (below), where a compositional element (synthesizer) is side by side with a stock delay unit. Although these processes are strictly speaking separate processes, the visual aesthetic shows distinctly similar color schemes and layouts.



**Figure 7:** A screenshot of Ableton's Operator ( synthesizer) and Spectral Time (delay) plugins offers extensive visual feedback where functionality is concerned. Additionally, both plugins share similar visual aesthetics.

In conclusion, although it would fall outside the scope of this investigation to delve into all the visual manifestations invented by developers for music creation software, it is important to stress the link between visual graphical interface and functionality as the visual aesthetic (along with the added functions) of the modern DAW has undoubtedly contributed to workflows being engaged differently.

#### 4.7 Micro-Management

“DAW software facilitates our working with levels of musical detail, allowing us to manipulate its minutiae. There are many tools for achieving this precision, but none more fundamental than a DAW’s standard zoom function that magnifies an audio’s waveform so that its micro-level of detail becomes macro” (Brett, 2021, 108)

As observed by Brett, DAWs offer observance of minute instances of time (and control as a consequence) with ease that drastically surpasses the functionality offered in the analog realm. Although Brett is referring to audio editing, this functionality is equally relevant within the context of mixing because DAWs allow for effect processing to share the same level of detail when automated (fig. 8).

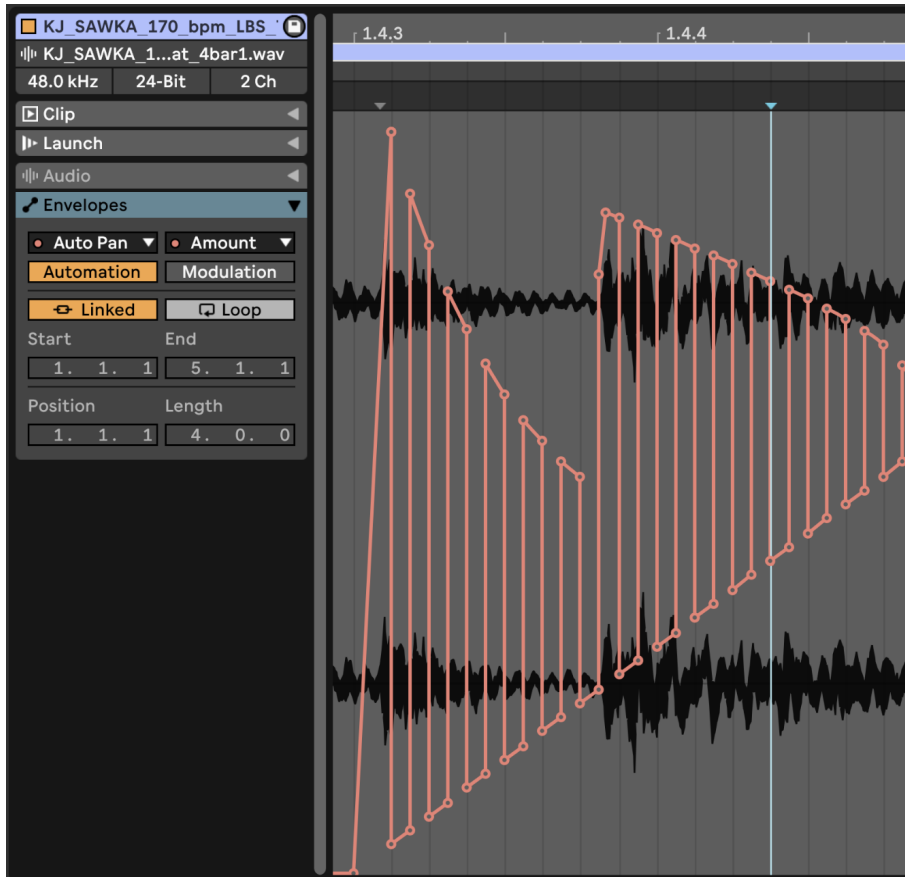


Figure 8: A zoomed-in audio file showing extremely detailed plugin automation.

## 5. The Laptop-era Music Producer

*“It’s not surprising that far from removing ‘sacred cow auteurs’, modern technology has simply shifted the metaphor from exceptional accomplishment on paper by ‘composers’ to exceptional accomplishment on hard disk by ‘producers’” (Moorefield, 2010, 111)*

This section will continue the technical discussions expressed in the previous chapter through the lens of the user. Various elaborations into roles will be explored in addition to elaborating on how the processes surrounding composition and mixing can be shown to exist in modern production. Before expanding into the subject matter further, it is first essential to establish what is meant by a producer within the context of this thesis. Although it may be largely axiomatic for those who engage with production to identify as ‘music producers’ or ‘electronic music producers’, the definition from a theoretical and historical standpoint lacks a clear definition. Blake elaborates on the issue here by stating: “The term ‘record producer’ is the greyest of grey areas. ‘Producers’ have had to deploy a startlingly wide range of skills.” (Blake, 2009, 36). Therefore, to avoid any potential confusion, a producer within the context of this section will refer to an individual who 1) uses computer-based technologies as a vessel for music creation and refinement. 2) embodies significant creative influence over their music-making process.

### 5.1 The Fall of Apprenticeship and Commercial Studios

Before delving into the many particularities associated with modern producers, it is first relevant to allude to the downfall of the commercial studio. Shelvock writes: “With the demise of large commercial studios, opportunities for traditional apprenticeship training into recording engineering and production roles have become extremely limited.” (Matt Shelvock cited by Hepworth-Sawyer et al., 2019, 174). Regarding the digital DAW-driven takeover, Shelvock’s observation here (admittedly intended to represent the more engineering enthused demographic) holds relevance when considering where music production has migrated to in the lack of these spaces. Although the full spectrum of these potential implications falls outside the scope of this thesis, it can be assumed that the demise of traditional apprenticeship (and consequently commercial studios) has given way to (and perhaps has been exacerbated by) many of the engineering tasks associated with music production in studios (such as recording and mixing) being added to the shoulders of solo practitioners (producers) operating in a DAW framework, a sentiment echoed by Strong:

“Not long ago, you needed to go to a commercial recording studio and spend thousands of dollars if you wanted to make a decent-sounding recording. Now you can set up a first-class recording studio in your garage or spare bedroom and create CDs that can sound as good as those coming out of top-notch studios (that is, if you know how to use the gear).” (Strong, 2014, 1)

## **5.2 On Self Learning**

“Through self-learning and the use of DAWs, so-called “bedroom producers” have been able to develop skills and use recording and sound manipulation techniques that in the past had been the preserve of audio workers working in professional studios.” (Watson, 2014, 146)

When attempting to understand the state of the modern producer, it is highly relevant first to establish how the craft is learned in modern times. As indicated by Watson, teaching oneself through the engagement of a task has been an invaluable process for those wishing to learn. In recent years, many bedroom producer types that have experienced notoriety in popular music culture have gained their skills through self-learning practices. The nature of the learning is relevant as it is at the discretion of the one engaging in the practice to define what is or is not relevant. Although perhaps not a unique example, this makes electronic music different from other musical practices where a more rigid educational system has a long-established feature of the learning process, as is the case for classical music. This holds relevance as producers today are learning the intricacies of mixing due to their engagement with production.

“If you’re putting things into a sequencer then you are learning about mixing and production by default, as opposed to, say, writing a song and singing it on your guitar. It has enabled the genre to blossom creatively because it was all being figured out as it went along. It was new and so there weren’t any traditional generic templates before it became commercially successful, that is. The means of production using computers can be relatively cheap compared to traditional recording studios, but the integrity and quality of the musical ideas is always the thing that will shine through.” (Phil France cited by Hodgson & Hepworth-Sawyer, 2017, 163-164)

Self-learning is not strictly reserved for engineering, as indicated by France. The sequencer (DAW) framework is an ongoing educational entity for those who pursue it, and relevant skill sets (such as mixing) are so connected to music-making in this format that one is hard-pressed not to learn by doing.

It has been stated that humans are living in the age of unprecedented access to information; where this subject matter is concerned here, this equates to easy access to information regarding all aspects of music production. While in the pre-internet era, where books ruled supreme, in the “free” domain (Youtube, Gearspace, Reddit, etc.), there exists an endless collection of discussions, tutorials, project walkthroughs (some admittedly poorly informed and pedagogically questionable) that exist for those who wish to explore these topics. Additionally, for those willing to pay, there are show-all high-quality tutorials spanning every aspect of the production process (Mix with the masters, Puremix, Masterclass, Music Production Live, Groove 3 etc.). It is without a doubt that access to this information has been of value to those who have willingly pursued it.

In summary, self-learning is at the heart of the curious modern producer. In the age of endless online resources, it is more convenient and less expensive than ever for one to learn their craft remotely.

### **5.3 A Merging of Roles**

As elaborated by Zagorski-Thomas, Burgess, the role of the producer has seen a significant shift in recent decades. The previously essential and well-established roles required to steer recorded music into completion have, over time, dissolved into producers exemplifying many if not all of the roles (and, in doing so, adding further confusion to the producer term). Watson elaborates further: “Whereas in a professional studio, music production has always been a collective project between recording artists, musicians, producers, and recording engineers, in small digital home studios, their multiple roles are performed by a single person... That a single person could perform all of these roles would have been unthinkable without the enabling power of technology...” (Watson, 2014, 36). As stated by Watson, the professional studio concept owes its existence to a collaboration of competencies. In the small digital home studios (bedroom studios), technology has allowed for the competence of many to exist in a self-sufficient capacity. Eno supports Watsons sentiment here by elaborating on his observation of this trend in his pre-DAW-era memoir: “The technologies we now use have tended to make creative jobs do-able by many different people: new technologies have the tendency to replace skills with judgement - it's not what you can do that counts, but what you choose to do, and this invites everyone to start crossing boundaries.” (Eno, 1996, 394). However, regardless of the capabilities, the production process is still a composite of several different processes that need to be understood by the user during production. Recording, editing, programming, composition,

mixing (etc.) are all born from long-established processes that have largely existed as separate processes. However, should one be inclined to work efficiently, having at the very least a rudimentary understanding of these processes are crucial to utilizing the potential of said technology. In light of this, it can be put forth that: to be a solo music-making entity (a producer) where the goal is to produce one's own music, mastery of several roles is required.

#### **5.4 Merging Methodology and Aesthetics**

“The merging of the production processes of songwriting, preproduction, recording, and mixing [...] has, by now, long been the norm for many genres. Electronic dance music and hip-hop songs are rarely if ever written on an acoustic guitar or piano and then arranged, rehearsed, and recorded. They typically begin and end in the box (or various boxes) via an interactive process of development.” (Zagorski-Thomas, Burgess, 2019, 109)

As pointed out by Burgess, modern practices have dictated a substantial shift in production methodology. It is now beyond speculation that technology serves as the overarching catalyst for these shifts. With regard to the subject matter here, this is highly illuminating as it speaks to how much someone in a production position is expected to grasp and subsequently influence the songwriting process. It is with this in mind that suggesting an overlap between the processes of composition and mixing not only appears to (at least in practice) hold validity by virtue of the sophistication of the tools but may also be commonplace in modern music-making as a result of modern music-making methodology.

“The aesthetic approach to recording production creates a conceptual context of the artistic aspect of recording. The intangible aspect of the art can then be appreciated within this context. The recordist must clearly define the aesthetic position of the recording, in order to successfully control and shape it.” (Moylan, 2014, 316)

As pointed out by Moyland, the artistic aspects of engineering are heavily interwoven into the production process. As outlined in the previous section (section 5.3), in modern production it has become practically unavoidable for laptop-era producers to engage in their craft without engaging in practices and principles that are heavily rooted in audio engineering. Moyland further elaborates on this: “A new creative artist has evolved. This person uses the tools of recording technology as sound recourse for the creation (or recreation) of an artistic product. This person may be a performer or composer in the traditional sense, or this person may be one

of the new musicians: a producer, or sound engineer, or any of the host of other related job titles.” (Moylan, 2014, 37). As expressed by Moylan, the tools available to what he describes as “new musicians” exist as tools for creation suggesting an underlying understanding of the principles of audio engineering. This amalgamation puts musicianship (composition) and technical practice (engineering) in the same arena simultaneously.

In summary, it stands to reason that while the surrounding methods associated with music production have merged, so have the aesthetic intricacies associated with the previously individual processes. In practice, this culminates in a producer who possesses the possibility to exact sonic ownership over their product. A method of creation that by traditional modes of operation would be substantially more challenging, time-consuming, and expensive to achieve.

## 6. Compositional Mixing

When speaking musically, the term *composition* is often used to describe a task carried out by a composer, often in conjunction with classical music and when working with film/tv. However, composition is described as: “The act or process of composing. Specifically: Arrangement into specific proportion or relation and especially into artistic form” (Merriam-Webster, .n.d). As pointed out earlier by Moorefield, the producer title has replaced the composer title (Moorefield, 2010, 111), a sentiment echoed across related literature. In light of this, the designated definition will be, for the purposes of this document, used to summarize (at least in part) mixing in this way also. It is important before continuing to elaborate on what compositional is referring to within the context of this phrase; although often associated with the generation of music, compositional mixing will refer to how mixing can be used as a compositional tool or even a tool for the generation of new musical ideas. Therefore, this section will explore to what extent compositional mixing as a concept can hold theoretical validity and explore other surrounding concepts that can serve to establish a definition before finally attempting to ascribe a definition to it.

### 6.1 Overlapping

As acknowledged by Paterson: “While mixing per se has always been a profoundly creative act, mixing ITB has amplified this potential and expanded it to overlap with other major aspects of the creative process: composition, arrangement, pre-production, editing, production, and mastering. The DAW has presented the integrated environment that allows these aspects to be incorporated (at least in part) into the mixing stage, or indeed for the mix to start to coalesce before its technical inception.” (Justin Paterson, cited in Hodgson & Hepworth-Sawyer, 2017, 78). Although this sentiment acknowledges mixing within a compositional framework, it fails to divulge the nature of this relationship. However, Roads offers the following: “As a sonic process emerges out of nothing, it may spawn additional musical events. These events, be they individual particles or agglomerations, interact with existing events, setting up a chain of implied casualties. Two sounds can converge or coincide at a point of attraction or scatter at a point of repulsion, leading to a number of consequences[...].” (Roads, 2015, p. 328). Again, although Roads is not speaking specifically about mixing per se, his sentiment does offer a stance that echoes Paterson’s claims. In light of these claims, support has been given to the notion that composition and mixing are closely associated with the same process, at the same time.



## **6.2 Substantive & Ornamental Functions**

Moylan argues that: “Any element can function in one of two general ways: substantive or ornamental. They can contribute to the substance of the musical idea, or they can provide an enhancement to its character.” (Moylan, 2014, 319). When trying to elaborate on the nature of compositional mixing, Moylan's segregation between these two states holds value when mapping the aesthetic territory occupied by compositional mixing. As alluded to previously, this is because, compositionally, mixing is proposed to interact with both the substantive and ornamental. Although exactly how these two aspects relate to one another in practice will be demonstrated in detail later in the example section (Section 8), it can be argued that the compositional mixing is an interaction between the substantive and the ornamental with ornamental functions being repurposed for substantive effect.

## **6.3 Sonic Causality & Narrative**

“In electronic music especially, musical narrative often revolves around processes of sonic transformation.” (Roads, 2015, p. 324)

“One way teleology can emerge in a musical narrative is by the design of chains of causal relationships.” (Roads, 2015, p. 327)

As elaborated in Road's sentiments above, causality and narrative are indicative of sonic processes. With regard to compositional mixing, these sentiments hold weight when describing a mode of composition that is expressed through sonic processes. Roads elaborates further by stating: “A sonic narrative consists of a chain of events, these chains can create an illusion of cause and effect, as if a subsequent event was the plausible or even inevitable consequence of an antecedent event.” (Roads, 2015, p. 327). Although this sentiment has been written from the perspective of the listener, Zagorski-Thomas & Burgess allude to this being the case from a creationary standpoint also: “Rather than writing a song that can be arranged into a track, the production objective is to compose a track from which traditional elements of a song may emerge but whose elements are birthed out of the track's sonic components.” (Zagorski-Thomas, Burgess, 2019, 109). Although examining all the possible narratives at play within music production practices (be it subjective or otherwise) would fall outside of the scope of this thesis, when speaking of compositional mixing, the concept of sonic causality & narrative undoubtedly holds relevance.

### 6.3.1 Jon Hopkins

Regarding how sonic narratives can be observed in practice, Jon Hopkins elaborates on how the processing of one element can spark a chain of events that coalesce into a new musical avenue. “There’s always something that you can fiddle with, and that will trigger another idea, and before you know it you sampled what you’ve just done, like the tail of a reverb accidentally you’ll just hear it and straight away resample it and then you’ve got a whole new sound to play with. It’s sort of *exponentially interesting*, and hopefully that’s coming out in the tracks.” (Heaton, 2016)

### 6.4 Attempting to Defining Compositional Mixing

Building on this thesis’s ascribed definition for mixing definition: “The conveyance of something artistic through technical means.” Roads elaborates further on mixing as it exists specifically concerning electronic music, stating: “The process of mixing many channels into a smaller number of channels is specific to the practice of electronic music. The composer plays the role—formerly delegated to a conductor of artfully blending diverse sound sources.” (Roads, 2015, 363). This insight from Roads holds importance here as it speaks to electronic music specifically. What becomes important to grasp from this statement is the connection to something compositional being a part of the process inherently.

In light of the initial interviews and example sections and by virtue of this thesis’s attempt to unveil compositional mixing as a practice showing a semblance of validity, a preliminary definition of compositional mixing can be suggested at this point as being something approximating: *The process of enacting musicality (composing) through the medium of mixing tools, concepts, and practices.*

It should be noted that this definition is not without room for interpretation. Specifically concerning what constitutes “*enacting musicality*.” The wording here has been chosen in favor of other more specific terminology, such as “A mode of composition that is expressed through sonic processes.” as this terminology indicates compositional mixing as an origin source which would be misleading in light of compositional mixing existing by sonic casualties. This is to say; this process is inherently bound by a cause and effect relationship offered from working off of external sources.

## **7. The Interviews**

In early 2022, eight subjects were asked to participate in one-on-one style interviews surrounding their thoughts on mixing within the context of their productions. Although the initial plan was to conduct oral interviews exclusively, except for three of the participants (Hoff, Røshol & Steenersen), all the interviewees submitted their responses in written format as a matter of preference. The original sound files have not been presented in appendices or footnotes here for reasons relating to intellectual property. However, the full unedited versions of the written interviews are added as an appendix to this thesis.

The reasoning behind this more structured methodology taking precedence over an unstructured interview format has been done for two main reasons: 1) To better compare different mixing ideologies within the context of production. 2) to gain insight into what remains unelaborated through the existing theory. With these goals in mind, it has been reasoned that utilizing eight voices to elaborate on a specific line of inquiry at a time would serve the aims of this thesis in a relevant way. Additionally, all participants are identified in this interview. This has been done for two reasons: 1) To elaborate on what qualifies them for this interview is supported by their identification. 2) The responses given could, in certain circumstances, be inherently identifying. Before proceeding with the lines of inquiry, the reader may benefit from revisiting the reasoning behind the lines of inquiry outlined previously (2.3).

### **7.1 The Participants**

The following text will introduce the interviewees, their merits, and music backgrounds and a short statement explaining what factors contributed to making them desirable candidates for this investigation:

Kristine Hoff is a self-described producer/artist/vocalist known professionally as MAUD. She is (at the time of this writing) a second-year master's student at the University of Agder (UiA) and an independent artist who has gained some notoriety for her dark-pop production style (Unrecorded Music Blog, 2021). Hoff serves as a good candidate for insights in this thesis by her role as an electronic music artist who produces herself.

Tom Van de Ven is a techno producer and educator based in Amsterdam, known professionally as VNTM. Van de Ven has performed in electronic music venues such as Tomorrowland,

Awakenings, Egg Club London, and many others, alongside many acclaimed techno acts (Charlotte de Witter, Adam Beyer, Mind Against) (VNTM, 2022). Van de Ven serves this thesis because he is an electronic music artist who produces and mixes his music.

Trond Gètaz is a self-described producer, multi-instrumentalist, sound designer, composer, and a mixing engineer professionally known as Getaz from Stavanger, Norway. In 2020 Gètaz released an album in the hip-hop genre titled “Time Machine”<sup>9</sup>. Gètaz serves as a good candidate for this thesis by virtue of his role as an electronic music producer who mixes the music he produces.

Henrik Alsmark (referred to as Alsmark) is a self-described producer, sound designer, mixing engineer, and studio technician based in Kristiansand, Norway. At the time of this writing, Alsmark is a second-year master's student at the University of Agder (UiA). Alsmark is known professionally for two projects (Man Muni and Alsmark) that both exist in the realm of experimental pop. Alsmark serves this investigation by being an electronic music artist who produces and mixes his music.

John Martin Steenersen is a music producer, artist, and vocalist professionally known as Kill Ginger based in Kristiansand, Norway. Steenersens style falls comfortably within a modern pop context with strong urban influences (NPS Music, 2021). Steenersen serves this thesis by his role as an artist who produces and mixes his music.

Kristian Moen Vik is a commercial pop producer based in Oslo, Norway known professionally as Flatmate (Nordic Music Partners, 2022). Vik serves this thesis by virtue of his producer credits on numerous large label releases including a Spellemann (Norwegian Grammy equivalent) nomination for his work with Norwegian artist Bernoft (Spellemann, 2022).

Even Sarucco is a music producer/artist based in Kristiansand, Norway known professionally as EvenS. Sarucco’s work with the EvenS project can be described as largely instrumental and ambient in nature with roots in early UK dubstep. Saruccos music is often “down-tempo”, incorporating soundscapes that are captivating and transcendent in experience. Sarucco’s music has amassed several million plays on Spotify (Spotify, 2022), often appearing in

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<sup>9</sup> Time Machine: <https://open.spotify.com/artist/1SOVMIX8x1S2EJJcFpXBRm>

“Chillstep” and “Future drum and bass” playlists. Sarucco serves this thesis by his role as a producer/artist who mixes his music.

Andreas W Røshol is a vocalist/topliner/artist/producer based in Kristiansand, known professionally as AWR. In addition to this, Røshol is a Ph.D. research fellow at the University of Agder (UiA) with a research focus on the realms of creativity and technology in contemporary popular music (UiA, 2020). Røshol serves this study by virtue of his producer status in addition to his relevant academic insights on the issues presented.

## 7.2 The Questions & Responses

**NOTE: THE SPOKEN WORD INTERVIEWS CONDUCTED BY HOFF, RØSHOL & STEENERSEN HAVE BEEN SUBJECTED TO GRAMMAR CHANGES FOR THE SAKE OF THE READER.**

### 7.2.1 Q1: Can you summarize your musical existence and your self-imposed roles within that existence?

**MAUD:** Yeah, so I'm an artist, producer, instrumentalist, singer, programmer and I mix my own music. I started out quite early to sing and play piano as a kid and went to cultural school in my hometown Bodø. I grew up with a lot of jazz in my home because my dad was a jazz musician. I started a music program at high school with rhythmical piano, then moved on to classical piano. It wasn't until after high school that I started to write and record my own music in GarageBand but my production skills weren't that good at the time. I had a couple of different bands, but I always felt that I wanted the soundscape to be more electronic. So that's why I ended up studying electronic music eventually. At UiA (University of Agder).

**VNTM:** I'm a music producer, mix engineer, live performer and also a teacher in music production. I'm basically doing everything in those areas on my own, every once in a while I resort to a master engineer if I can't get something to sound the way I want. But besides that it's all solo work.

**Getaz:** I am more of a creator rather than a performer. As far as self-imposed roles, I am a composer, multi-instrumentalist, sound designer, producer, and a mixing engineer. These roles have developed naturally over the course of all the years I have been making music. I look at instruments as tools, the same as plugins. I want something specific out of every instrument I

“perform” in a studio-setting. Usually, my vision is strong from the get-go. I know what feeling I want to capture, musically, rhythmically, and sonically.

**Alsmark:** I began my musical career after I discovered a fun way to create music, using softwares on the computer. The amount of things that I felt was imaginable to create made me very intrigued about becoming a producer.

After I got my first software (FL Studio), I think I spent most of my time in the beginning just experimenting with the program. I had no current plan to read any user manuals or watch any tutorial videos, I was just fixed on seeing what this thing was capable of doing.

After a good number of years in the fields of curious experimentation, I began to understand some of the logic behind the properties of sound and how the software can be used to not only create arrangements through composing, but also to mold the sound and mix the music using sound design tools.

I think what I do now in a musical existence is a culmination of how I started learning music production and also learning from the people I look up to. I see myself now as a producer, sound-designer, mixing engineer and studio technician, though my biggest strength lies within the realm of production.

**Kill Ginger:** I define myself as a music producer... generally electronic music. Now I make mostly Hip-Hop (and) trap. Singing, producing electronically mostly.

**Flatmate:** I'm a producer and songwriter, sometimes mixer, working with artists and writers full time out of my own studio in downtown Oslo.

**EvenS:** I can only summarize my musical existence as an artist who somehow ended up learning different tools for creating music. My curiosity towards electronic music started at the age of 15 and with the help of the internet I quickly found out about different programs (DAW'S) and later on gathered basic understanding on how to use these programs. Expressing myself as an artist through electronic music became my first choice. The programs I learned forced me to learn different aspects of music production (composing/mixing/sound-design etc..) and led me to a career within songwriting and production.

**AWR:** I had WaveLab<sup>10</sup> on my computer and I had fruity loops on my computer and I had sort of two ways of making music. The first one was basically you know, doing bad types of acapella stuff on WaveLab, recording multiple voices just making music, using the voice just for fun, you know? A lot of strange, strange songs. FL Studio was just programming beats without any form of vocals and at one point, they started merging. In high school I started merging the beats, dragging the beats into WaveLab, recording vocals in Wavelab because, you know, I didn't know any better. But that's always been sort of two... a form of dichotomy between the act of top lining and the act of tracking or making beats or instrumentals. During the latter years, these two types of things have sort of started to emerge as one form of activity but it took quite a long time and it's really dependent on the ways I'm approaching my mood and my motivation. Sometimes I'll just take on my tracking hat and sometimes I'll take on my top lining hat I guess so for me there's sort of two main forms and roles of music making and obviously both of them contain a lot of different sub roles underneath them.

In summary, when answering Q1 above, the candidates consist of multiple backgrounds and engage in different styles/genres in addition to having a wide range of self-imposed roles spanning songwriting, composing, programming, performing, singing, mixing & audio engineering. However, it should be noted that the common denominator of the group lies in them identifying as music producers.

### 7.2.2 Q2: Are you mixing your own music?

**MAUD:** Yes.

**VNTM:** Yes, been doing this since the start.

**Getaz:** Yes, I mix my own music.

**Alsmark:** I do. I tend to not even look at mixing as a part of my process. This happens because it is a crucial part of how I sound design. To elaborate on this: I know that I mix, I just don't think

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<sup>10</sup> WaveLab is DAW primarily used for mastering applications produced by Steinberg. WaveLab is equipped with basic capabilities for recording and processing.

to myself “oh now I am going to do the mixing”. It's more like a part of the process when I create a layer in my musical arrangements.

So say that I want to make a floating drone that is going to be of a high frequency and work as a blanket for the synths. There is three parts of this idea:

1. The concept: it's a drone, that will feel like it's “floating”.
2. It will occupy a high frequency area, I think about this in the context of my current mix and I want to place it somewhere that I feel that it belongs.
3. I want it to be a blanket, as in I want it to hug the synths and enhance the dynamics of the synths.

How do I solve these three parts? This is a rough idea of how I think when solving this.

1. I would start by constructing the sound by either designing it in synths using software and FX plugins. Or I would find a sample and re-sample it using FX and rendering tools.
2. I will use “MIX” plugins to shape the sound, usually just using a generic EQ and compression. (Ofc this also happens during the first part in the initial constructing of the sound)
3. To create a blanket around the synths, I will try to take inspiration from the synths that I want to enhance. And I will use some FX and techniques that are similar to what was used when creating these. Mixing tools will also come in handy when trying to make this sound fit into the arrangement.

So to conclude this tiny “research” of my own process, I can safely say that I don't really differentiate between sound design and mix, they work together. At least for me.

**Kill Ginger:** I'm mixing first. I'm not mixing the end product... I like to mix while I produce. I would like to say that 90 percent of it, at least for me, 90 percent of the mix happens along the way while I produce.

**Flatmate:** Usually not. If I work with a major label or act I send off stems<sup>11</sup> for mixing, but occasionally I mix projects with lower budgets.

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<sup>11</sup> ‘Stems’ Refers to the individual tracks of the session being exported in audio format. This is typically done when handing over a session's content for mixing elsewhere.



**EvenS:** Yes. The mixing process of my own music is very much intertwined with other aspects of music production. To make an element of the mix sound "good", it needs to be heard in context of the other elements (and composition/arrangement). I either balance/mix a track or group to fit the rest, or change the sound to find something more fitting. The choices I make are all based on my musical references which change over time. I'll often listen to different sounds, trying out what I believe fits the rest of the mix based on stereo-imaging/frequencies/textures etc...

**AWR:** Yeah, if I'm doing the tracker roll I'm basically mixing it yes. If I'm doing top lining I might do a vocal mix, it depends on how seasoned the other producer tracker dude/girl is. If she or he is very talented, she would or he would not utilize my vocal mixing yeah.

In summary, when answering Q2 above, the bulk of these insights point to all th participants engaging in the mixing of their music to varying degrees. In the case of MAUD, VNTM, Getaz and AWR, the responses were exclusively affirmative in this regard. However it is worth pointing out that Alsmark, EvenS, Flatmate and Kill Gingers responses to this question varied comparatively. In the case of Alsmark and EvenS, mixing appears to have a role that is integral to their compositions. In the case of Flatmate, as he points out, the mixing role is one that he will engage in should the need arise but as a matter of preference, will hand off the mix to a third party. In the case of Kill Ginger, he also indicated a preference to outsource his mixing (the last 10%) to a third party (a point he elaborates on later in Q4).

### **7.2.3 Q3: Do you prefer to mix your own music or is it out of necessity?**

**MAUD:** Maybe both. Because I have mixed with other mixing engineers before and I find it difficult to articulate or transfer the vision that was made in the rough mix and kind of transfer it into someone else's hands. So I prefer mixing on my own, I've been encouraged to maybe make someone else do the last touches, more technical wise like EQ stuff. But when you've come to a certain level on the mix yourself, it's like, not that...

**Interviewer:** *It's counterproductive, perhaps?*

**Maud:** Yeah. It would just drag out the process in a way.

**VNTM:** I think it's a very very big part of the sound of my music, and I'm constantly searching for ways to improve this, by buying new gear but also taking classes from the best out there.

**Getaz:** I prefer mixing my own music. It's another step in the creative process to be able to capture the sonical landscape I have envisioned.

**Alsmark:** Yes, I prefer to do it myself. At least during the process of creating the first finished products. If by some means I wanted to incorporate a third party to do a mix of my project, it would be because that person's sound, dynamic or feel to my music. In a hypothetical world where an artist I look up to wanted to do a mix of my song, I would love to see what kind of finished product that would lead to. But in most cases, yes I do it myself.

**Kill Ginger:** It's like, because I'm really tired of what I have produced, you know? So it's just like 'Get it away' and someone can fix it for me. Because I've heard it so many times that I don't know what's right.

**Flatmate:** I prefer to send it off to a seasoned professional for two main reasons: one being that I'm busy making creative decisions in my productions as I work and haven't focused solely on the art of mixing. The other reason being I get blind on my own mix after a while of working, it's difficult to see what I can do to improve the product. Having the ability to send off my project to someone who can listen to it with a new angle is invaluable.

**EvenS:** Both. I prefer to mix my own music because I know what I get. It's also cheaper. I appreciate feedback and criticism on my mixes from others, whether that comes from an artist or audio-engineer.

**AWR:** It's really hard. I've been asking this question a lot! It depends on how you define *necessity*, if it's a necessity it's not economic necessity. It's more of a control necessity and I take some pleasure in it to be honest, this type of nitpicky detailing this feeling of the song isn't quite there and you realize 'okay, if I just give all the instruments a bump in three or five K<sup>12</sup> and give the old vocals a bit of high end and suddenly it seems like another song. These types of experiences are quite interesting. In an ideal world, I would probably not mix my own music. I

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<sup>12</sup> "K" refers to kilohertz, a measurement of audio frequency.

know it's better if someone else does it but in this type of individualistic society we live in, people generally don't care about things equally as I do and I'm probably the same the other way around. Or I am. I'm not perfect. So, yeah. I guess, if you really want, you can use, obviously, pay a high end mixer to do it and it will be better but I would really have to pay quite high I feel, it's not the same as mastering I guess.

In summary, when answering Q3 above, this question generated a rather diverse spectrum of opinions, with the majority being mainly in favor of mixing as a matter of preference (VNTM, Getaz, Alsmark, EvenS & MAUD), one who relayed mixed feelings (AWR), and two who were in opposition to this preference (Flatmate & Kill Ginger). In the case of VNTM, Getaz, Alsmark, EvenS & MAUD, the general consensus was related to exacting ownership over their result both sonically and creatively. However, it should be noted that MAUD's reasoning was additionally rooted in the creative conveyance being an issue in past experiences with mixers. In the case of AWR, although it appears as though he is mainly in favor of mixing himself, he offers some potential reasoning behind those who find their mixing stage preferable by voicing the necessity aspect being based detrimentally on control. AWR alludes to mixing one's music in isolation to be less than optimal, which is echoed in part by both Flatmate and Kill Ginger. In the case of Kill Ginger & Flatmate, their reasoning for seeking external mixing appears to be rooted in a loss of sonic objectivity. Flatmate elaborates on this further by describing this as "invaluable" where his work was concerned.

#### **7.2.4 Q4: Do you agree that there are creative advantages to mixing your own music?**

**MAUD:** Yes.

**VNTM:** Yes 100%, with the right abilities it will allow producers and in this case me to experiment and try new ideas in sound. When I've found something that works on a creative level, I can always get it to work in the mixing stage as well, so I don't need anyone else to do that for me and possibly change the identity of the track. It's all up to me and I enjoy that.

**Getaz:** Definitely. Like I mentioned, mixing has a massive impact on how a musical piece gets interpreted. This, together with each choice of the production, are equally important. The touch

of the instruments, or how one would tweak a synth to attack soft or hard, breathy or more harsh.

Like a musician wanting to perform his or her own guitar on a song using the respective pedalboard or amplifier of choice to capture a certain sound, or like a vocalist wanting to track his or her own vocals using head-voice or chest-voice according to what they want to capture in the microphone. I want to mix my own production, using my DAW as my own instrument to produce exactly what I want according to the original vision.

**Alsmark:** Yes I agree that when you mix your own music you have a strategic upper hand, because you have more control over all of the elements of the music design. That is if you haven't already rendered every music track. I'm speaking in the sense that you have the ability to tweak everything at your own leisure. But I also disagree with my own statement, because some might say that when you render all the music to individual sound files, you get a chance to revive the song. A blank slate so to speak. Now when it comes to speaking about mixing in this sense, I always tend to look at it as a singular process that happens at the end of creating the music. But I think that when you choose to put that ideology to the side, and instead mix your music on the go during the creation of the music, you have such a large advantage, because you get to make the music sounding nice as it is being created, giving you an upper hand as a listener to your own music.

**Kill Ginger:** Yeah absolutely. When I send my mixes away for example, I have explained that I want 'this on that'. Because often the mixing engineer wants it clean. But I also think that some of my choices are very important for my sound as well. It matters a little bit but yeah, not that much. It's like mostly levels when I submit it and maybe just some EQ and stuff I think but yeah, it doesn't matter.

**Flatmate:** Yes and no. I think the advantage is that you have full control over everything that happens. It's the mix, for better or worse. On the other hand you do have the ability to revise a mix you receive and also to say no if the mixer doesn't satisfy the idea you had in mind. I think the creative advantage is minimal if any, depending on how tied you are to the Sonics in your work.

**EvenS:** From my own experience I've noticed creative advantages when mixing. Whether you're shaping a certain sound or balancing other elements of the mix to fit in a certain sound,

you are experiencing changes in both the tracks themselves and the mix as a whole. This process can lead to a lot of inspiration.

**AWR:** Obviously, but there's disadvantages as well. Yes.

In summary, when answering Q4 above, all of the interviewees answered this question favorably, however, there was some difference in opinion concerning what shape the creative advantages take with AWR & Flatmate voicing drawbacks. Those who responded affirmatively (MAUD, VNTM, Getaz, Kill Ginger & EvenS) elaborated on differing aspects. In the case of EvenS, Alsmark & Getaz, a clear link between their interpretations of what is meant by 'creative advantages' can be observed. It should be noted that all of these participants who offered examples of their prospective creative advantages gave examples that were linked to the production process rather than a discrete mixing stage (as was the case with VNTM & Kill Ginger). Interestingly, Alsmark alone spoke directly to the ideological connotations implied in this line of inquiry by exposing a compelling argument for the mixing producer, stating, "...I think that when you choose to put that ideology to the side and instead mix your music on the go during the creation of the music, you have such a large advantage... as a listener to your own music."

#### **7.2.5 Q5: Are mixing and production/composition happening simultaneously? If so then to what extent?**

**MAUD:** Yeah, it's happening simultaneously... I use a template that has all my preferred plugins, a lot of sends and buses with like, reverbs, and delays and delay distortion... So whenever I open a project, it's like already affected by those plugins you know?

**Interviewer:** *Whatever you do kind of gets that flavor?*

**MAUD:** Yeah.

**VNTM:** I try to stick to creation in the first 2 hours of a track, just to make sure I get all the ideas out of my head. Once I have a certain outline of the track I can start filling in the blanks and mix it properly. But no sound will ever be included without a bit of eq or post processing, that's

always key step number 1 to make stuff at least fit somewhat. If it then works already fine it's just about fine tuning to make it 100% work.

**Getaz:** Mixing and production/composition happens simultaneously because I want the product to sound as close to the vision as soon and as coherent as possible. This keeps the inspiration grounded, and it lets new ideas flow more easily and adds to the sonical landscape of what the artist and I are trying to portray. To answer "to what extent", I would say: Just enough. Enough to continue with the flow of ideas and not get too caught up or meticulous on one certain element. This has to do with time efficiency during studio sessions.

**Alsmark:** As I have stated a couple times already in some of the other answers, this is a phenomenon that is always re-occurring during my processes of creating music. It is such a vital ingredient to my musical identity, that I don't think I even know what I would do if I wasn't mixing on the go. To me it has become a very important part of what inspires me to keep working on the music, it just feels very nice every time I finish working on a project and I can export a mp3/wave file demo that will already sound good. Even after just working on a new song for the first hours it will already be good enough as a demo. Also see question 2 for a direct example.

**Kill Ginger:** Yeah, in my work, I mix while producing I think, or, of course I do, but what should I say like it's a part of the process, it's just small, the sounds I use are maybe probably already pretty fine. So I'm just taking out a low end or boosting some highs or something. I am while producing, but it's like a part of the creative process so it's nothing I think about so much about.

**Flatmate:** For me, yes, they happen at the same time. When writing a song in the studio I choose sounds and samples that work well together and I add effects and automations as the song comes to life. I think partly because of a lack of time, I can't really stem out a session<sup>13</sup> when I'm done to then mix it from scratch, and also because in a session setting the artist/collaborators expect what is happening real time to sound good. As do I, to me a good mix is inspiring to work with, so it's now just a natural part of the process. Though I don't go into the itty bitty details in a production session (clicks, pops, experimenting with panning etc.), I leave that for the finalizing of the record.

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<sup>13</sup> 'Stemming out a session' is referring to bouncing or exporting the individual files of a session.

**EvenS:** As I wrote in the 2nd question, the mixing and production process is happening simultaneously. The mixing of different elements while producing feels essential to me because I often "hear" the mix in my head based on certain sounds I work with. The relationship between the elements gives me a better clue on how I approach the production/composition process later on.

**AWR:** I look at mixing in two stages. So you have the first stage where there's just one process of making which is a combined effort of arranging, composing, mixing, sound design, probably more at the same time. And then you at some point you enter this type of stage which is 'okay, maybe this music is worth releasing to the world, maybe I could put my name on it.' Even though you might change your mind, you start thinking 'okay, maybe I should try to nurture the last itty bitty details out of it.' And then I would guess, another phase of mixing begins but then again, you you're not starting from scratch. The production sounds quite okay. Often you would work with different iterations, trying to change different elements, checking if the song sounds like something you want to present to the world if the lead vocal two dB<sup>14</sup> up. If the bass guitar should be in mono below 120 hertz, if the chorus is on the synth, is a bit too much... Trying to present a listening experience where the distribution sort of makes sense. So two stages, I think that's the way forward, it seems to me that the professional mixers are basically working in a second stage. So they're not forwarded, like, projects where you have to do like dB leveling from scratch. There's quite a lot of information already there and It's about just getting the last final elements. Yeah.

In summary, when answering Q5 above, when asked directly to what extent mixing tasks are happening simultaneously, the consensus was unanimously affirmative. One valuable insight gathered from this line of inquiry exists in the reinforcement of mixing existing in separate domains (contemporary & traditional) as discussed in section 3.4. AWR describes this separation into two discrete stages; a creationary stage where mixing, composition, arranging, etc. exist as a multifaceted act, followed by a discrete (traditional) mixing stage (a sentiment also echoed by VNTM here as well as in earlier responses by Flatmate & Kill Ginger). With regard to the reasoning behind mixing during production, however, there are some similarities and variations worth exploring further. Firstly, the most shared consensus in favor of mixing during production/composition appears to be rooted in inspiration. Getaz, EvenS, Alsmark &

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<sup>14</sup> dB refers to a decibel. A unit for measuring loudness and volume.

Flatmate all attribute inspiration as being rooted both as a reason as well as a benefit when mixing in this way. Additionally, Flatmate and Getaz also added time management as a contributing factor when working collaboratively (as primarily the case for both), with Flatmate elaborating on how the sonic expectations of artists further invoked this practice. In summary, it appears that inspiration and efficiency are, if not direct counterparts, at least linked as practical counterparts in the minds of the participants. What remains unanimous across all the participants appears to speak to music-making preference as allowed for by the capabilities of the technology.

#### **7.2.6 Q6: Do you view mixing as a separate process in your productions? If not then why?**

**MAUD:** ...what I did with my new EP or next release was that I had everything going on simultaneously to a certain extent (the composition) and then I went into a more technical mixing stage. So I managed to kind of separate those processes so that I can still do creative early changes in the mixing process, but I kind of tried not to, so I kind of limited myself a little bit... also to be able to finish.

**VNTM:** It's blended, but I try to do the creation in 1 day to make sure I keep tapping into the same feelings/vibes, and mixing I can do at different moments afterwards even if I'm not super inspired.

**Getaz:** I'm answering both questions (*Questions 6 & 7*).

The only type of dedicated mixing process I do is coming back to the elements that sound "just enough" and make them exactly how I had envisioned them. This often makes me realize that I have to add a new layer of synth to make it sound how I want, for example. In this step, I might experiment by making the new layer a different voicing as well as a different sonical texture. I am now going back to being a composer and a sound designer again. Mixing and production goes hand in hand.

**Alsmark:** I don't think of it like this, because I rarely find myself actually just mixing. I don't own any physical mixing equipment like a studio desk or outboard hardware, so I don't really have the advantage to do any physical mixing using my production setup. I think that is why I don't do it. I just like to incorporate it into the flow of production and sound-design.



**Kill Ginger:** It's both like I said, I mix while producing but I also give it away at the end. So I think if I were to mix the song myself, I would bounce out stems and just focus on mixing at the end. So in that way, it's kind of a separate process but also I do it in the creative process as well.

**Flatmate:** I mix mostly as I go, but at the end of the project when the recording of vocals and production is set I go in and make final mixing decisions as well as clean up mistakes etc.

**EvenS:** Mostly no, however before I export the pre master's i try to work more "clinical" with eq'ing (cut or shelve whatever frequencies i feel a track don't need), and also double checking sidechain compression, reverbs with high/low-cut as well as tiny changes in balancing (volume and panning).

**AWR:** I presented my previous answer, it might seem like, 'Okay, I'm sort of deciding this is the song, I'm going to try to make this, finish this and then I start mixing it and one of the problems is that if you go too heavily into that mindset, then you might realize that if you listened back to the third session, that something was there, that's not there now and even regardless of how long you're mixing on it, you're not going to come to the third session, because there was something there. And it was another vocal performance, there was another form of arrangement, or the tempo was different... Even though it's easy to say, sort of a two stage mixing approach, it's problematic to assume that you're going to solve everything on a second stage. Often for me, it's sort of you know, it's just a process of diminishing returns<sup>15</sup>. And often you do not know, when you were sort of over the top in our production, you just, you know, when you started going back into the log and listening back to how the song sounded a year ago or six months ago or three weeks ago and when have some manner of fresh ears you realize, 'okay, the song was actually better half year ago.' and it really doesn't depend on how much you're just mixing it now, because you're never going to come to the stage that it is at that point. That is at that point. What I've done is: go back half a year, open that project, just do some small changes, and then you're in. You never know, before we sort of go over the top of the production. I think of every song process sort of like: just go a bit further so that you know that you've gone far enough. Then you can go back, and I'm not sure if that's sort of the business

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<sup>15</sup> The law of diminishing returns within this context expresses the principle whereby the same amount of effort will yield a smaller result over time before eventually becoming detrimental on a creative level.

way of doing it but I think most people do that in terms of creative processes. That's the only way of getting sort of a product above 80%.

In summary, when answering Q6 above, there consensus constitutes some variation in opinion. Regarding those who alluded to a sense of separation (MAUD, VNTM, Flatmate, EvenS, and AWR), the overarching consensus is conveyed as a largely technical one rather than a process with profound creative implications. In the case of Alsmark & Getaz however, their consensus is dismissive of the mixing stage meriting any apparent segregation from the artistic work, instead, voicing this as being a non-starter in their particular workflows.

### 7.2.7 Q7: Would you describe mixing as a compositional tool?

**MAUD:** Yeah.

**VNTM:** Yes, arranging in a classical way by moving elements from left to right, placing them in the room you have is very much a creative thing as well. It's very much interweaved with each other.

**Getaz:** *Refer to question 7 (above).*

**Alsmark:** I think so, yes. Because mixing literally lets you compose the frequencies and how they react to the music. To me, the ability to change the frequency area that a sound will occupy, or the dynamic of the music is a compositional tool. I like to look at my music as a third dimensional space, where I am using frequencies, panning and phase to construct a third dimensional painting of sound.

**Kill Ginger:** That was a hard question! But yeah I would say so.

**Flatmate:** I wouldn't describe it as a compositional tool when talking about commercial pop music or other genres that receive airtime on radio. Though in certain genres or songs where the information is all about the sonic atmosphere it might be a compositional tool, like when effects builds up suspense and takes it away again.

**EvenS:** Yes. If you focus on placement of a certain instrument in the mix, that might open up for more possibilities other places in the mix. Maybe I'll add some noise in the high frequencies because I want the mix to sound warmer, and suddenly I'll do some gated effects on that noise and then I have the starting point for a whole new percussive element.

**AWR:** Obviously it depends on how you define *composition*. It's no problem to say that it's a compositional tool, obviously, because it's a way of enhancing or distributing the composition. The question I'm thinking about is, what's the difference between mixing and composition? Which is a bit more difficult.

In summary, when answering Q7 above, as previously alluded to in section 2.3, this question has served to uncover how the participants react to the notion of mixing having compositional connotations. In this section, all but one of the participants (Flatmate) answered in agreement to mixing existing as a compositional tool for them. Although Flatmate discounted the compositional tool notion within the context of his particular genre (pop), he did not entirely discount the compositional merits of mixing concerning other styles than his. For those with examples (EvenS & Getaz), their elaborations express compositional mixing (as outlined in section 6.4) remarkably closely. Getaz elaborates on how mixing and composing are linked to the point of being indecipherable in his practice, while EvenS exposed how mixing-related activities can birth new musical elements.

#### **7.2.8 Q8: Have you ever experienced musical ideas evolving from mixing-related activities? If so, do you have one or more examples?**

**MAUD:** I think for me, vocal production is very important. And I think a lot of ideas can come through (from) mixing my vocals in a specific way. And also changing how my voice is processed can also create new ideas.

**VNTM:** Especially trying out new ways of distortion open up a whole range of creative ideas, eq'ing I don't really find inspiring anymore. But yeah, trying new effects to reach a certain sound can open up new possibilities too, sometimes I'm looking for a certain distortion and I find something that doesn't fit the current project but might very well be useful somewhere else.

**Getaz:** Yes, this often is the case. I recently worked on this experimental electronic pop song titled Bittersweet where the original idea was that the chords and mood were obviously going to portray a bittersweet feeling. When producing the chorus I played around with some synths and tweaked a sound that felt bittersweet, it had a lush high end and a gritty low end. This sparked an idea to go even further with the concept of the bittersweet mood by changing the choruses sound significantly from a calm and mellow mood to a loud and gritty sound, enhancing the “bitter” in the chorus and keeping the “sweet” in the verse.

**Alsmark:** I think that many times when I have been using mixing tools during sound design, they have been the reason that the sound has become an idea in the first place. This being something simple like, using a low cut filter<sup>16</sup> or just absolutely exploding the sound using compressors. I also like using resonances in the eq to create harmonies and overtones in the sounds, or to remove certain harmonies.

**Kill Ginger:** Yeah, so like, while I'm recording vocals, I have a chain I use. And that's a chain that makes the vocal kind of mixed, you know? Like it fits in with the beat and stuff already. So in that kind of way, I'm kind of mixing while producing, you know? Because the work (vocals) already fits in with what I'm working on. And then, of course, I use reverbs, delays, and stuff to hear what it's going to sound like.

***Interviewer:** And then I assume you work off of those decisions?*

**Kill Ginger:** Yeah, of course.

**Flatmate:** I have several examples of using effect plugins that drastically change a sound to spark ideas that take the production somewhere else. Like an RC-20<sup>17</sup>, if you choose one of the more colored presets and load it on a violin for example you might get a very interesting sonic experience that can alter the direction of your production.

**EvenS:** Also yes, I feel the example I gave in my answer above is good as long as we define sound/instrument-placement as a part of the mixing process.

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<sup>16</sup> A low-cut filter is a type of filter that removes bass frequencies.

<sup>17</sup> RC-20 (Retro Color) is a multi effect plugin that offers several parameters associated with lo-fi recordings (both digital and analogue). [https://www.xlnaudio.com/products/addictive\\_fx/effect/rc-20\\_retro\\_color](https://www.xlnaudio.com/products/addictive_fx/effect/rc-20_retro_color)

**AWR:** So one example would be, to me there is this stage where the distribution of elements are more aligned. For example, if you're opening a project and the bass is really high, and I'm trying to improvise vocal ideas on it, and then there's just no ideas flowing... Obviously, that can have to do with how it's programmed but it's also, you know, taking the bass down a bit in energy and DB level and suddenly it's easier to introduce vocals into the compositional design since it's distributed in the manner that invites towards these types of vocal improvisations, sort of the same if you have a bus<sup>18</sup> with synths and stuff and you just low pass it and suddenly there's room for new ideas. If you're working on the stem level you can quite easily change the overall aesthetics of the song by just some form of filtering, which introduces compositional ideas and suddenly you're placing the song in a different aesthetical landscape.

In summary, when answering Q8 above, in this line of responses, it is readily evident that all the interviewees had examples to offer. Vocals processing was the most prominent example being expressed by MAUD, Kill Ginger, and AWR. In the case of AWR however, the interaction with the composition as a result of mixing was additionally offered as a catalyst for new vocal ideas that may have not taken place otherwise. Getaz offers a particularly insightful example where the songs namesake “bittersweet” has induced work on a sonic level.

## **7.2 Concluding Comments**

Speaking to the collection of responses arranged above, it is evident that there are recurring themes and several points of consensus. Regarding the placement of mixing within the workflow, it can be observed that mixing is intimately linked to the process. Furthermore, the nature of the mixing itself can largely be shown to exist in two discrete stages with an initial stage being creative followed by a more corrective ‘balancing’ stage, a sentiment supported by the literature. Regarding how mixing exists within the narrative of composition, it has been shown that all have managed to produce examples of this. However, there are dissonances concerning what this entails for the participants on a personal level.

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<sup>18</sup> A bus refers to a channel that contains the combined output of several sound sources.

## 8. Examples of Compositional Mixing

The following will offer scenarios where mixing within the production process can be shown in real-world examples that embody compositional intent, or in some other way merit the compositional process. The following examples have been discovered through my engagement in composition, while others have been theorized with relative ease. The DAW used for all the examples is Ableton Live 11.

As previously mentioned, this section makes heavy use of screenshots and audible examples. Regarding the audio examples, links have been added that redirect the reader to a private SoundCloud profile. The links themselves are underlined in blue and accompanied by a playback symbol for easy identification (fig. 9). Additionally, the links HTML will also be added as footnotes.



### [Example of SoundCloud link layout.](#)

**Figure 9:** The playback symbol (left) is used to indicate links (outlined in blue) that lead to audio examples via SoundCloud.

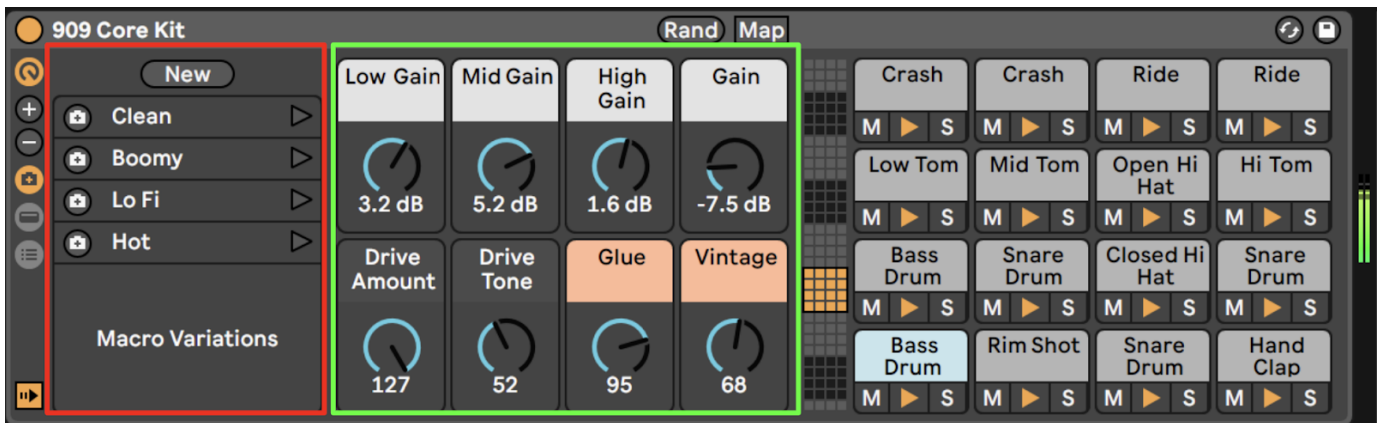
**NOTE:** It is recommended that the reader uses headphones or studio monitors rather than playing back from laptop speakers or smartphones for the optimum listening experience.

### 8.1 Ableton's Macros (Drum Rack Preset)

To instantiate a drum rack preset in Ableton often incorporates processing capabilities. Parameters for manipulation can include control over any mappable parameter<sup>19</sup> of practically any available device. This results in the sonic aspects being coupled with the instrument.

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<sup>19</sup> Not all parameters in ableton are mappable functions.



**Figure 10:** Ableton's drum rack loaded with the stock 909 Core Kit preset showing the various snapshots (outlined in red), macro section (outlined in green) and the individual drum samples (right). It is notable that these controls constitute more than half of the instruments screen real estate.

Figure 10 (above) shows a drum rack loaded from the 909 Core Kit preset (a stock Ableton instrument) containing the individual samples from a Roland TR-909 drum machine<sup>20</sup>. On the left (outlined in red) there are snapshots of macro control variations for quickly administering predefined macro positions (outlined in green). As is evident, extensive under-the-hood controls have been mapped<sup>21</sup> for easy manipulation of the instruments sonic characteristics on the users behalf. In this instance, controls for equalization (low gain, mid gain & high gain), overall volume (gain), saturation (drive amount & drive tone), compression (glue) and sample rate degradation (vintage) have been mapped for the convenience of the user when quickly auditioning sonic processing. Figure 11 (below) shows the (under the hood) masterbus section of the plugin showing what controls of the respective plugins are being controlled by the macros (indicated by green dots).

<sup>20</sup> The Roland TR-909 is widely regarded as a “classic” among drum machines. The TR-909 is favored heavily in the house and techno genres to this day.

<sup>21</sup> “Mapping” refers to device parameters within the drum rack having the ability to be controlled by or “mapped” the macros. In this scenario, controlling effects this way serves to save screen real estate as by default the processes governed by the macros are out of sight.

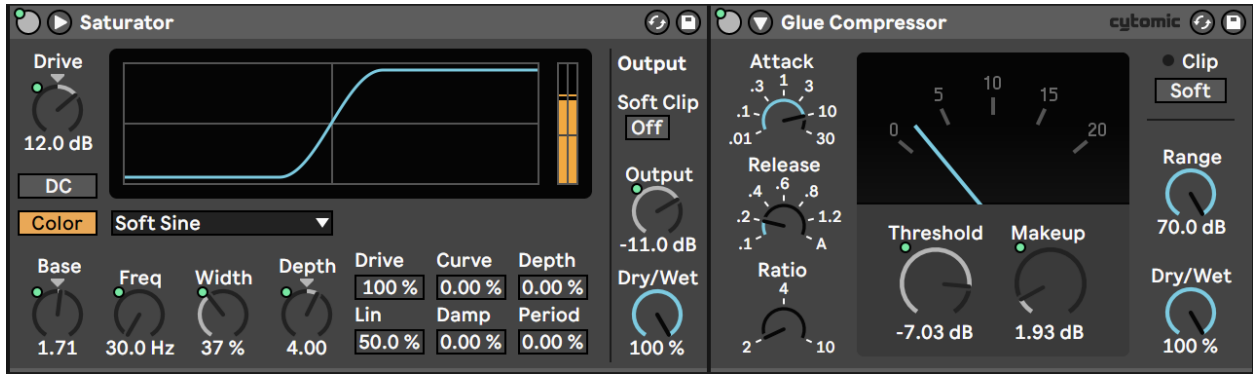


Figure 11: The mix bus section of the drum rack shows various parameters that have been mapped to control the saturator and glue compressor plugins. This results in easy access to sonic decisions while in the compositional headspace.

Coupled with the ease of use of the eight macros and the plugin layout, the drum rack plugin in Ableton at the very least is sonically suggestive in nature offering the user the ability to work with drum programming and sonic representation in tandem.

### 8.1.1 Audio Examples:

The examples for this section (link below) serve to demonstrate the various states (snapshots) available to the user right out of the box (by default). The macro settings for the individual tracks can also be observed within SoundCloud thumbnails on the right-hand side of the screen.



[Link to a SoundCloud playlist containing all examples for Section 8.1](https://soundcloud.com/user-970923641-105136395/sets/81-abletons-macros-drum-rack-preset/s-IUUV37cxom6?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)<sup>22</sup>

### 8.1.2 Summary

Although this does not directly point to compositional mixing in practice, it does point to what the manufacturers have deemed as convenient sonic controls when producing. This holds relevance as it offers little in the way of separation between the musical and sonic aspects.

<sup>22</sup>[https://soundcloud.com/user-970923641-105136395/sets/81-abletons-macros-drum-rack-preset/s-IUUV37cxom6?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/sets/81-abletons-macros-drum-rack-preset/s-IUUV37cxom6?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

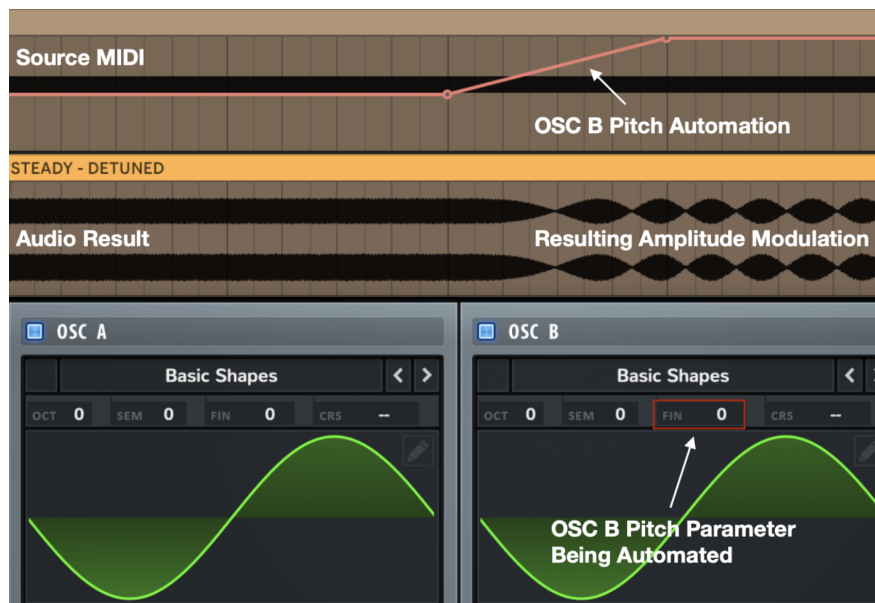


## 8.2 Reece Bass:

“While it may seem complicated, the Reece bass is actually quite simple. In fact, it’s little more than two or more detuned saw waves that engage in phase cancellation with one another.” (Toolroom Academy, n.d.)

When stacking more than one oscillator, any pitch inconsistencies between 2 or more oscillators with similar waveforms playing the same note will result in cancellations as a result of phase incoherence<sup>23</sup>. In the case of the Reece bass, the signature “detuned” sound is the goal and is achieved by stacking multiple detuned oscillators. In so doing, this often exhibits these cancellations in a way that can reduce the sustained quality (often desirable) of the bass unless a preemptive sonic strategy is in place. All audio examples have been affixed to the end of this example section (8.2.6).

As seen in figure 12 (below), an exaggerated example of how adjusting the pitch of one of the oscillators significantly impacts the sustainability of the bass tone. In figure 13 (next page) a Reece bass and its settings can be shown to impart (be it more complex) phase cancellations by virtue of its 16 total voices being detuned<sup>24</sup>.



**Figure 12:** Unwanted artifacts in a sub bass as a result of detuning one of the two oscillators.

<sup>23</sup> Phase refers to the relationship two or more signals have in relation to one another with regard to polarity.

<sup>24</sup> “Voices” refers to the number of simultaneous oscillators being performed simultaneously. The “detune” function serves to give each of these oscillators slightly different values in pitch.

To achieve the best of both worlds, the following goal is set: To have a Reece bass that dominates the low frequency content in a sustained and controlled fashion. To achieve this, segregating the fundamental frequency from the detuned portion of the signal will likely achieve the desired effect. The following steps will serve to demonstrate how mixing techniques can effectively achieve this compositional aim.



**Figure 13:** Filtered Saw wave with 16 detuned oscillators illustrating more complex cancellations. A low pass filter has also been added in this example to drastically reduce high frequency content, a staple in this kind of bass sound.

## 8.2.1 Duplicating Serum

In Ableton, this is easily achievable by duplicating Serum<sup>25</sup> in an instrument rack<sup>26</sup>. In practice, there are now two identical instances of the synthesizer that can be played at the same time with the output of the midi channel being the combined output for both instances of Serum. In figure 14 (below) the duplicated channels have been named “SUB” and “WIDE” for coherence.

<sup>25</sup> Xfer records Serum is a software synthesizer that has gained widespread popularity in recent years. <https://xferrecords.com/products/serum/>

<sup>26</sup> Ableton's instrument rack function allows for multiple virtual instruments to exist in the same midi channel, controlled by the same midi data.

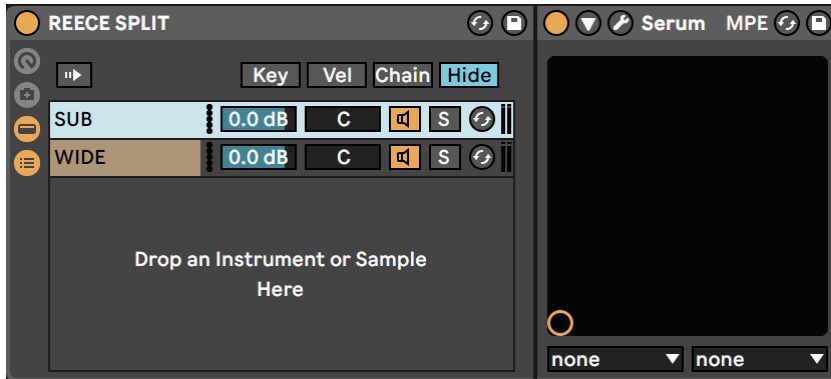


Figure 14: An instrument rack in Ableton Live with two separate performable instances of serum on the same MIDI channel.

### 8.2.2 Adjusting the “SUB” Instrument

As the goal is for the low-frequency content to be unencumbered by phase cancellations, this instrument is going to be changed from a saw to a sine wave (fig. 15 below). This is because a saw wave with no harmonics becomes a sine waveform as demonstrated in (fig.16 below). In this way, the rich harmonic content responsible for detuned characteristics of the bass can be processed separately.

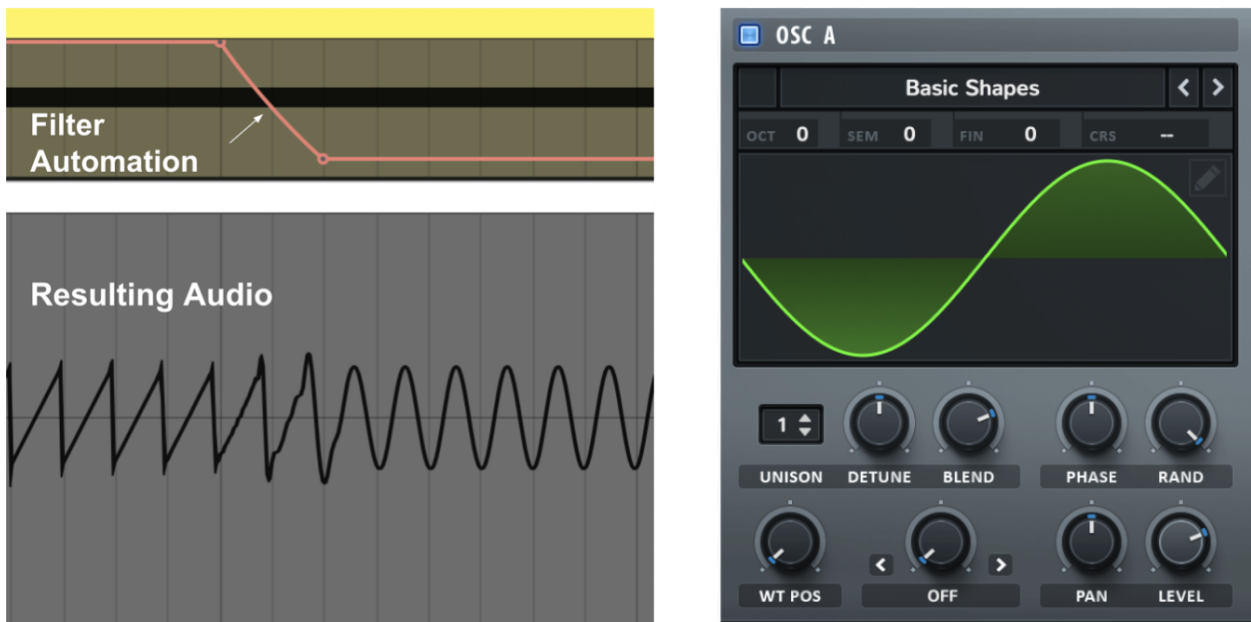


Figure 15 (Left): A saw wave being low pass filtered aggressively to expose the fundamental sine frequency.

Figure 16 (Right): The sine wave oscillator settings used for the “SUB” portion of the instrument.

### 8.2.3 Filtering The “WIDE” Instrument

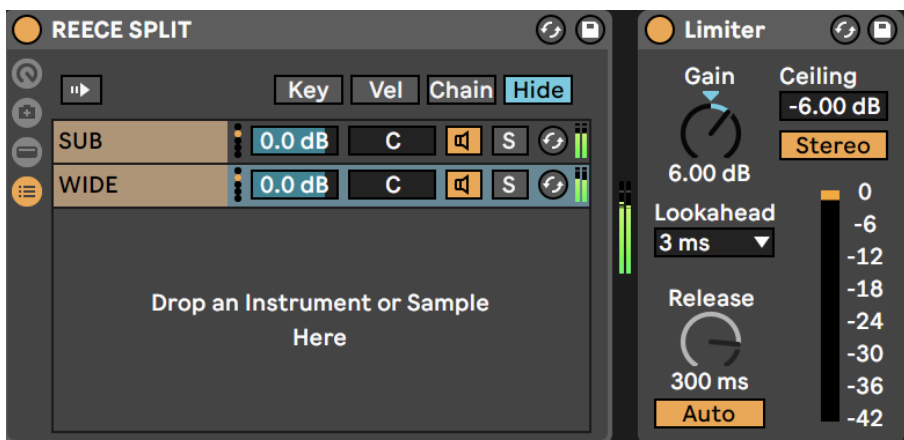
With the fundamental section established, the next stage is to remove the fundamental frequency from the detuned “WIDE” source. In figure 17 the fundamental frequency is being removed with an equalizer utilizing both a high pass<sup>27</sup> and a band reject<sup>28</sup> filter. The result is a near total rejection of the fundamental frequency.



**Figure 17:** The “WIDE” section playing the original detuned saw with an equalizer removing the fundamental frequency.

### 8.2.4 Limiting

In order to create a concise and sustained tone, a limiter<sup>29</sup> is additionally implemented at the end of the instrument channels (affecting both instances) (fig. 18). The result can be seen in figure 19 (below) illustrating the before and after with the newly processes signal exhibiting substantially reduced phase inconsistencies.



**Figure 18:** Ableton's limiter plugin placed at the end of the instrument rack.

<sup>27</sup> A high-pass filter serves to allow high frequency content to pass while attenuating low frequency content.

<sup>28</sup> A band reject filter serves to attenuate a specific frequency or range of frequencies while leaving content on either side of this frequency range unaffected.

<sup>29</sup> A limiter is a device that restricts a signal's dynamic range through the use of a predefined ceiling or threshold.

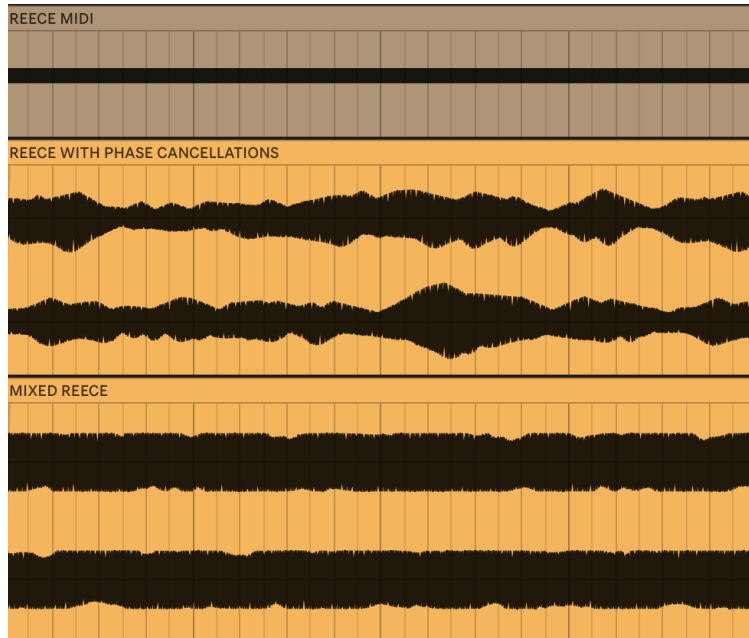


Figure 19: The before and after visualized in the waveforms.

### 8.2.5 Sampling

Now that a single note has been utilized (in this case D1), playing other notes will result in the now rejected fundamental frequency falling outside the scope of the initial processing and re-introducing the issue. To subvert this, the result is recorded as an audio file so as to be performed in a sampler instrument. This will result in the tonal and phase relationships being maintained regardless of the note being played (fig. 20). Finally, the sample is being looped via the ‘sustain mode’ parameter in order to play any individual note indefinitely. Should one fail to engage this function, the sampler would simply playback the audio until the end of the sample which would eventually result in silence.



Figure 20: The resulting audio in Ableton’s sampler instrument with the sustain mode set to loop the material indefinitely when triggered.

## 8.2.6 Audio Examples



[Link to a SoundCloud playlist containing the before and after result along with a demonstration of the earlier example given at the start.](#)<sup>30</sup>

## 8.2.7 Summary

This example illustrates audio engineer practices to solve a musical problem (lack of sustain as a result of phase incoherence) before being reintroduced into the composition. If this composition was handed off to an external mixer as a stem (printed audio) and the sustainability of the bass had persisted in this issue, little can be done to solve this as the nature of phase cancellations has already resulted in a lack of a constant fundamental frequency. In conclusion, it can be stated in this particular result, mixing was the catalyst for a compositionally motivated outcome.

## 8.3 Source Swapping in ‘Sample’ Music

One of the allowances offered by DAW workflows is to inject new material into a track or group with processing already established. Where a more traditional style workflow would perhaps dictate a track's processing in response to source material (in effect being ‘tailored’ to that source), limiting oneself in this manner could prove unopportunitistic if the processing has compositional merit. The following examples will detail this within the context of a drill style track<sup>31</sup>. As alluded to previously in section 6.2, this example serves to embody Moylan's elaborations regarding the substantive and ornamental functions in practice. Specifically, this example serves to show how the ornamental functionality (the processing) exemplifies a substantive role when source swapping in this way.



Figure 21: The plugin chain used for both examples in zoomed out format.

<sup>30</sup>[https://soundcloud.com/user-970923641-105136395/sets/82-reece-bass/s-YUBRaCrLrY5?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/sets/82-reece-bass/s-YUBRaCrLrY5?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

<sup>31</sup> The drill genre has been chosen for its reliance on samples or ‘melody’ tracks where the sampled element often plays a significant role in the overarching musical narrative of the song.

In the following examples, two discrete and intentionally different sound sources (linked below) have been used. It should be noted that initially, the cello sample (8.3.1) was the catalyst for the processing. The plugin chain shown in figure 21 (above) shows that this example is not a subtle thing with processings affecting frequency, harmonic, amplitude as well as introducing tempo synced delay<sup>32</sup>. Starting with the EQ, the intention here was to dull some of the harmonic content while boosting the fundamental frequency in effect 'darkening' the sound somewhat. Next, Ableton's Redux has been utilized to filter out high end information through the process of downsampling<sup>33</sup> for a more lo-fi sound. After, two separate instances of Ableton's auto pan have been added to introduce volume modulation<sup>34</sup>. It can be observed that both effects are high in effect amount (Amount %), making these effects very noticeable. Additionally, the waveform and rate controls serve to dictate the nature of the volume modulation with the first instance being synced to 8<sup>th</sup> note divisions utilizing i saw tooth curve while the second instance is synced to a division of 3/16<sup>th</sup> sine wave modulation resulting in a 'random yet rhythmical' feel. Finally, a tempo synced delay plugin has been added as a repeater at a 16<sup>th</sup> note beat division.

### 8.3.1 Audio Example 1



[SoundCloud to the original cello sample used pre-effects.](#)<sup>35</sup>

### 8.3.2 Audio Example 2



[SoundCloud like to the original chord sample used pre-effects.](#)<sup>36</sup>

### 8.3.3 Audio Example 3



[SoundCloud link containing the original samples followed by the processed results within the context of a drill style track.](#)<sup>37</sup>

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<sup>32</sup> Tempo syncing within the context of delay means that the repeats are linked to the beat divisions imposed by the project's tempo (BPM). In figure 21 the beat divisions are measured in 16<sup>th</sup> note increments between 1 (a sixteenth note delay) and 16 (1 bar in a 4/4 time signature).

<sup>33</sup> Downsampling is the process of reducing a digital signal's sample rate. In this example, this results in frequencies below the sample rate being rendered inaudible. This effect was a sonic artifact of older samplers and results in a lo-fi aesthetic.

<sup>34</sup> When the 'phase' section of the auto pan plugin is set at low values (0-40%) the effect results in a tremolo-like effect.

<sup>35</sup>[https://soundcloud.com/user-970923641-105136395/original-chello-sample/s-K7EtZlrpSfQ?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/original-chello-sample/s-K7EtZlrpSfQ?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

<sup>36</sup>[https://soundcloud.com/user-970923641-105136395/original-chord-sample/s-Wwxm3I7uvvg?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/original-chord-sample/s-Wwxm3I7uvvg?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

<sup>37</sup>[https://soundcloud.com/user-970923641-105136395/sets/84-automating-automation-dynamic-envelope-follower-triggering/s-NO25wf81tEi?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/sets/84-automating-automation-dynamic-envelope-follower-triggering/s-NO25wf81tEi?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)



### 8.3.4 Summary

In these examples, it is readily apparent that the original source material has been sonically influenced to a great degree by the outlined processing. In these examples, the sum of these effects are what made the initial sound (the cello) appealing to the creator (myself) before another sample was introduced. It can be argued that in this example, the ornamental function typically associated with effects such as these, have taken on a role that is no longer entirely ornamental in practice.

### 8.4 Automating Automation (Dynamic Envelope Follower Triggering)



Figure 22: Boss AW-2 auto wah guitar pedal.<sup>38</sup>

An envelope follower<sup>39</sup> can be used to affect device parameters elsewhere. It is the case that there exists a software version of this process as a stock function in Ableton (Suite Addition). One example of this is known to guitarists as auto-wah (fig. 22 above). Auto-wah represents a device which gets its effect from the input of the guitar dictating the filter cutoff frequency of a filter (typically lowpass or band pass). The harder one plays, the greater the effect and vice versa (depending on settings). In the digital domain (Ableton Live), much the same will happen with the added bonus of a great deal more flexibility as it can be administered to any

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<sup>38</sup> Picture acquired from: <https://reverb.com/p/boss-aw-2-auto-wah>

<sup>39</sup> Envelope followers typically reconstruct 'follows' an audio signals input to produce an envelope which corresponds to the audio signal's amplitude. The envelope follower is always continually processing its input and tracking its changes.



automatable parameter. Simply stated, an audio signal of any description can be used to dictate another device's parameters (provided they are automatable parameters) anywhere in the session.

In the following example, the aim is for one event (a clap track) to dictate when a spatial effect (reverb delay combo) is going to happen on another track (a chord track) to better accentuate the clap as a musical event. This will in effect *automate* a process that could have been automated manually. It is at this point astute observers might ask: “Then why not just automate this effect?” and the short answer is because the compositional component of this technique is based on the behavior of the source that is dictating the result (the clap track). This being said, automation could absolutely serve this *aim in this particular example*. However, this example was not chosen for its compositionally groundbreaking implications. In actual fact, this example has been rendered intentionally simplistic to outline this rather complex process's implications within a compositional framework (further elaboration at the end of this example). A link containing all the examples in this section can be accessed in section 8.4.5.

### 8.4.1 Sidechain Listen and Envelope Follower



**Figure 23:** An illustration of the sidechain listen function accepting a signal from an external source (the clap track), which is being interpreted by the envelope follower. The red arrows have been added to indicate both the source track and the resulting envelope curve.

Firstly, on the track that is going to receive the effect (the chord track), a parallel chain is created using (in this instance) Ableton's audio effects rack. As seen in figure 23 (above), the “THRU” section is letting the source audio pass unaffected. On the muted “FOLLOWER” channel, however, the compressor plugin is being exploited for its *listen* function. As seen in the sidechain section (outlined in red), the compressor is ‘listening’ to the selected signal (in this

case the clap track)<sup>40</sup>. After, the envelope follower plugin is placed after the compressor to react to this result.

### 8.4.2 Mapping The Envelope Follower

The next step is to *map* the resulting signal generated by the envelope follower to the “DELAY THROW” macro (elaborated on in next step). In this case, a full scale spike is created resulting in no effect when there is no signal to a full range boost when the source is detected (fig. 24).

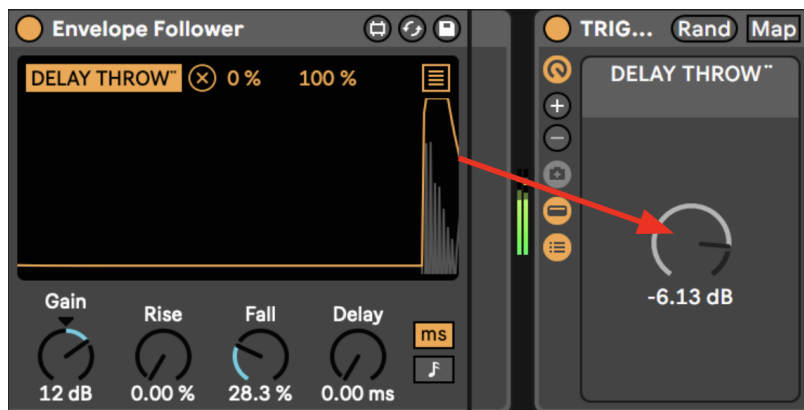


Figure 24: The envelope follower is “mapped” to correspond to the delay throw amount.

### 8.4.3 Elaborating On The Audio Effect Rack

As can be seen in figure 25 (below), prior to the previous step an audio effect rack was instantiated with a chain that is unaffected called DRY SIGNAL and an additional chain (DLY) for the plugin causing the effect when the clap signal is present. As witnessed, a utility plugin was mapped prior to the effect (spaced out plugin) to feed level into the effect only when the envelope follower dictates it.

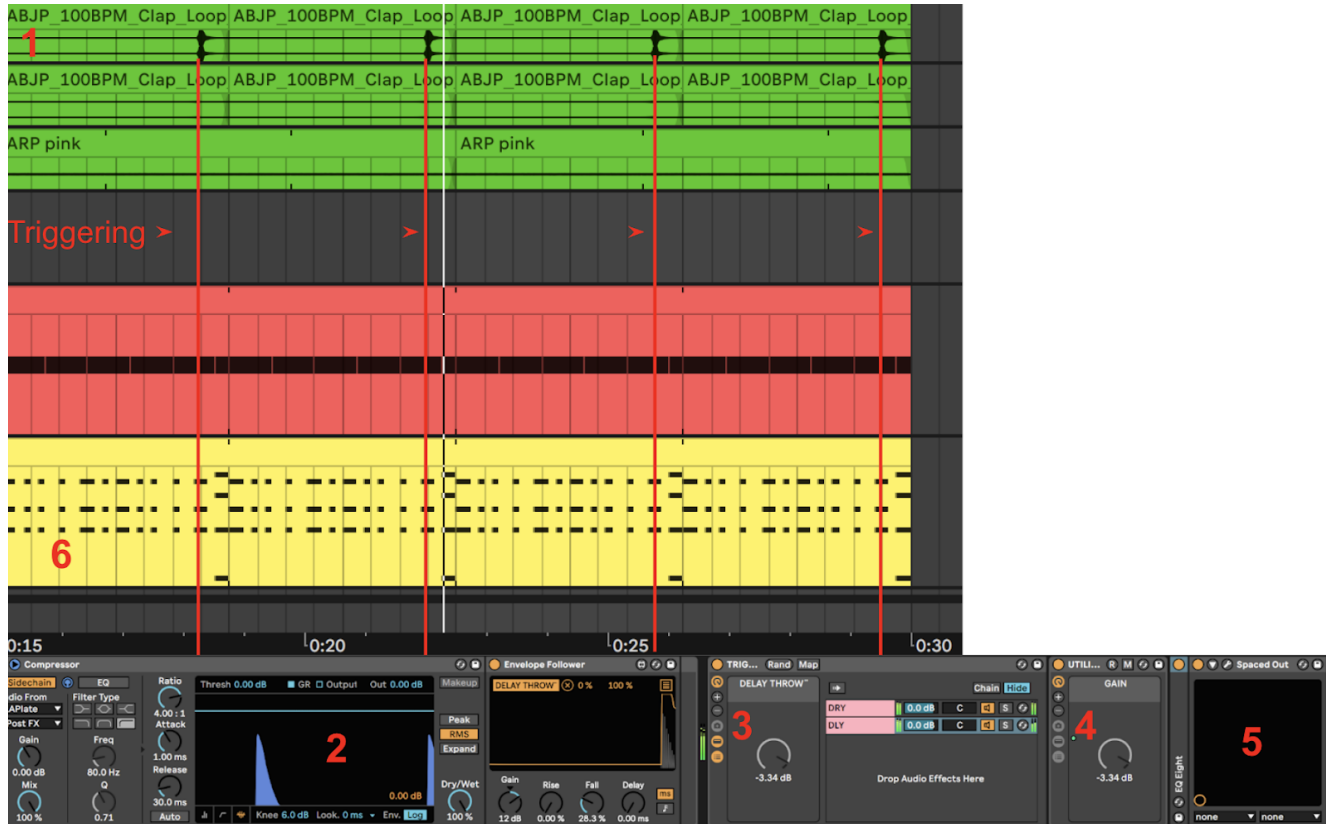


Figure 25: A more comprehensive overview over what the envelope follower is controlling.

<sup>40</sup> The sidechain listen function is typically useful when one wishes to hear the signal that is triggering the gain reduction on the compression.

### 8.4.4 Overview

As illustrated in Figure 26 (below). The clap track (1) will output to the compressor on the chord track (2) which engages the envelope follower (3) resulting in the DELAY THROW (also 3) and GAIN (4) to add level to the plugin to achieve the result.



**Figure 26:** An illustration of the session and relevant processing chain with red lines to indicate where the effect is taking place in the timeline. 1) Clap source track. 2) Muted compressor chain capturing audio for the envelope generator. 3) “DELAY THROW” macro controlling being controlled by the envelope follower. 4) “GAIN” macro being controlled by the “DELAY THROW” macro. 5) Baby audios “Spaced Out” Reverb/Delay plugin. 6) Chord track being affected by the snare.

### 8.4.5 Audio Example (Final Result)

In the example, the envelope follower triggering happens a total of 7 times. Each instance of triggering is readout as they happen within SoundCloud (fig. 27 below).

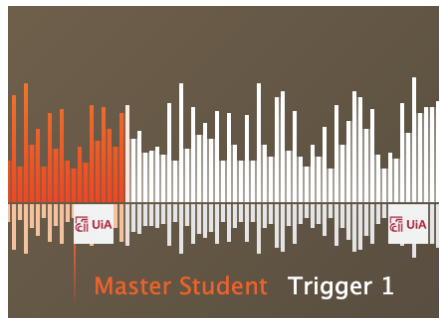


Figure 27: A visual aid elaborating on when the effect is taking place during playback within SoundCloud.



[A link to the final result.](#)<sup>41</sup>

### 8.4.6 Summary

As previously mentioned, in this example, identical hits achieve predictable results every time as would automation. However, the compositional component of this setup lies in the behavior of the clap track. If the clap effect played back at different levels every time (an easily randomizable effect), this new variable would induce a spectrum of results that would vary from clap to clap. In this newly outlined method, a self-imposed performative characteristic has been added, which may inevitably affect the composition's outcome and process as one would be inclined to work around these decisions in this workflow. Additionally, any effects that manipulated the clap tracks dynamic characteristics (compression, limiting, gating, delay repeats, etc.) would add additional variables and further accentuate how the interaction with the envelope follower behaves. In short, this rather simple example has been chosen to set the stage for what compositionally motivated mixing activities can look like in practice.

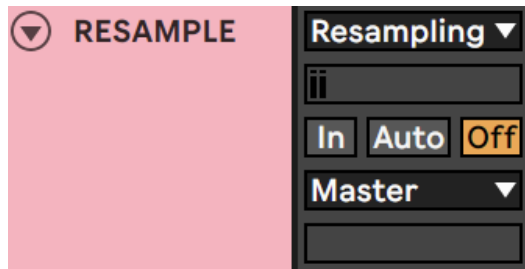
## 8.5 From Snare Drum to Tonal Instrument (Resampling)

Resampling is the act of re-recording the output of an existing track into an audio file. In Ableton, this feature is built into the DAWs functionality allowing for whatever signal is going to the master bus (main output) to be captured in audio format (fig. 28 below). The reasons for doing this could be as benign as wishing to free up CPU in sessions with extensive processing.

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<sup>41</sup>[https://soundcloud.com/user-970923641-105136395/84-automating-automation-dynamic-envelope-follower-triggering/s-tFoudulky90?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/84-automating-automation-dynamic-envelope-follower-triggering/s-tFoudulky90?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

In this example, however, this function is utilized to rework a sound that has already received processing.



**Figure 28:** An Ableton audio track with resampling set as the input.

In the following examples, the aim has been to demonstrate how a seemingly unassuming percussive sample (snare) can be manipulated into a tonal instrument that can be performed as a midi instrument (via Ableton's sampler). However, it is perhaps prudent to explain why one would choose to engage in practice rather than simply using any number of purpose-built instruments (sampled or synthesized). In order to answer this question thoroughly, it is important to understand the artistically inclined motivations. Speaking from a personal standpoint, the answer as I see it is three-fold. Firstly, there is a challenge (and a joy) associated with making music out of seemingly un-musical sounds. This results in exploring sonic avenues and means of processing that one might not have attempted otherwise. Secondly, the results are often riddled with unpredictability which in turn makes for a more engaging user experience. The third and perhaps biggest reason is rooted in a personal compulsion to produce a result that is sonically novel and difficult to reproduce should others be inclined to attempt to do so. With this in mind, the following will detail this process from inception to the final result.

### 8.5.1 Choosing a Sound

First, a snare sample (linked below) was chosen that contained some rather prominent overtones. Although not strictly essential for the technique, the snare in this instance had what might be described as a tonality that was inherently musical. In short, the sound was chosen as it possessed aesthetic intrigue from which further manipulation was an equally intriguing prospect.

 [Link to original unprocessed snare sample.](#)<sup>42</sup>

### 8.5.2 Auto Filtering & Transient Response

The second stage involved using Ableton's auto filter<sup>43</sup>. The auto filter serves to open the signal's high frequency content briefly while allowing the lower register of the signal to remain untouched. This has been done to control the amount of high end information as well as for the sake of the sounds transient<sup>44</sup> response. It is important to note that this stage has been done preemptively with the final result in mind rather than later to have more concise control over the harmonic generation later.

### 8.5.3 Synthesizing a New Fundamental With Filtering

Next two nearly identical EQs are doing aggressive amounts of low end cut off immediately before booting the desired overtone at 659 hz (E4) twice over (fig. 29 below). This serves to exaggerate the prominence of the overtone substantially while at the same time, significantly reducing any frequency information below the newly synthesized fundamental frequency.

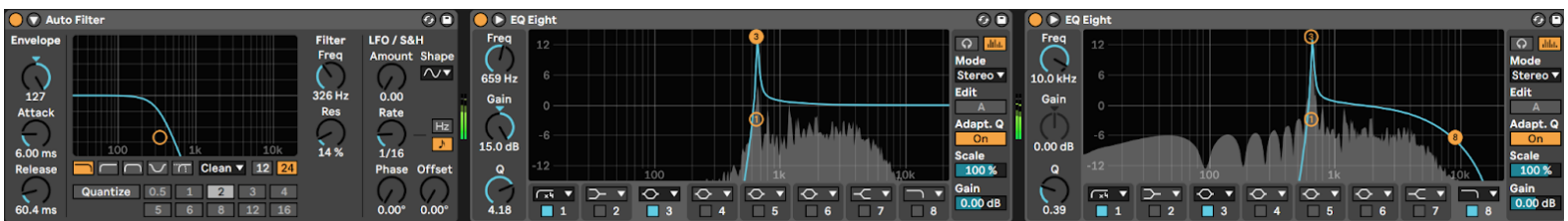


Figure 29: A screenshot of the plugins used consisting of an auto filter followed by 2 nearly identical EQs.

<sup>42</sup>[https://soundcloud.com/user-970923641-105136395/snare-sample-original/s-bWX51Hwo6FV?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/snare-sample-original/s-bWX51Hwo6FV?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

<sup>43</sup>Ableton's auto filter is a device that can exacerbate a filter's cutoff frequency (in this case a low pass filter) in a way that follows the signals (in this case the snare) dynamic characteristics. The amount of this frequency shift can be regulated in amount and time characteristics through the controls for *envelope* and *attack/release* respectively.

<sup>44</sup> The transient of a signal refers to the signal's initial loudest point.

### 8.5.4 Generating New Overtones With Saturation

After filtering, a saturator<sup>45</sup> is added (fig. 30 below) to add overtones to the newly synthesized fundamental frequency. This in effect serves to further reinforce the new fundamental by adding a harmonic series<sup>46</sup> resulting in a synthetically generated timbre.

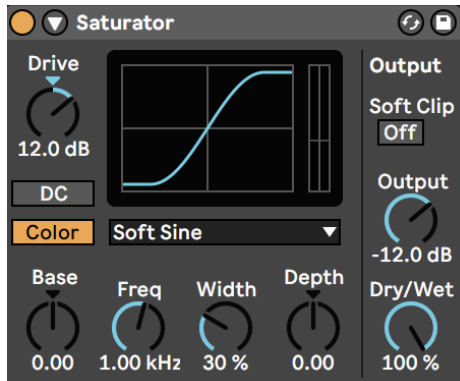


Figure 30: The setting used on the saturator plugin.

### 8.5.5 Generating Space & Length

Once a harmonic relationship is established, delay and reverb effects were used to not only give the new sound a spectral signature, but also to add length to the sound (fig. 31 below). As the initial snare sound is rather brief, the resulting sustain added by the reverb and delay also serve to allow for extended note length when working in the sampling domain later.

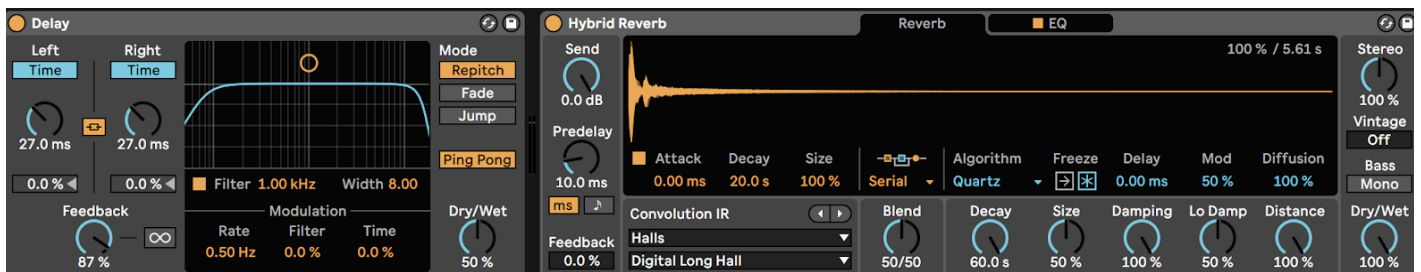


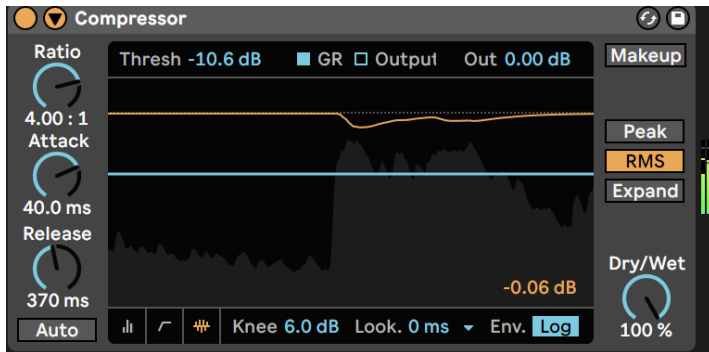
Figure 31: The settings used in the delay and reverb effects.

<sup>45</sup>A saturator is a device that introduces overtones into a signal. When using extreme drive settings, this will result in audible distortion.

<sup>46</sup>In all but perfect sine tone signals (which have no harmonics) all musical sounds have their own harmonic series preceding the fundamental signal. This series of harmonics (or overtones) is responsible for a signal's timbre.

### 8.5.6 Compression

The final piece of processing used was a compressor<sup>47</sup> (fig. 32 below), this was done to reduce the dynamic range which in effect has resulted in a slightly more sustained characteristic than otherwise have been the case. This serves the compositional intent as it allows for easier more cohesive looping in the sample instrument.



**Figure 32:** The compression settings utilized to achieve the desired result. The orange line represents the gain reduction (attenuation).

### 8.5.7 Before & After Processing (Audio Example)

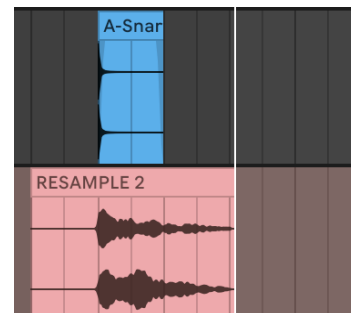
Before continuing, a comparison of the original snare sample and the post-processing result can be heard side by side via the link below for perspective.



[Soundcloud link to snare sample before and after processing.](https://soundcloud.com/user-970923641-105136395/before-and-after-processing-1/s-QPty93dFDBY?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)<sup>48</sup>

### 8.5.8 Resampling

After the processed audio was completed, the audio was resampled in preparation for sampling (fig. 33).



**Figure 33 (right):** The affected signals result being recorded (resampled) back into the session as an audio file.

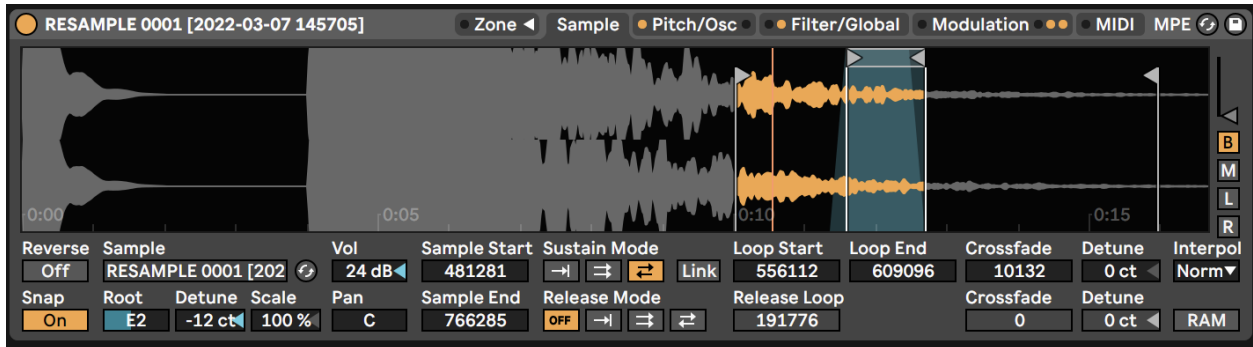
<sup>47</sup> A compressor is a device that manages loud level dynamics by engaging attenuation once a signal exceeds a predefined limit (threshold).

<sup>48</sup>[https://soundcloud.com/user-970923641-105136395/before-and-after-processing-1/s-QPty93dFDBY?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/before-and-after-processing-1/s-QPty93dFDBY?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)



### 8.5.9 Sampler instrument

Finally, once the affected audio exists in the form of a single stereo file, it can now be imported into a sampler instrument and performed as a tonal instrument (fig. 34). In this instance, the tail artifacts are used to create the tonal instrument rather than the head of the sample. In this particular example, this was simply done as it had a more euphonious characteristic.



**Figure 34:** Sampler instrument settings showing playback starting from the tail of the audio rather than the initial produced sound.

### 8.5.10 Audio Example (Final Result)

The following link (below) serves to show what this instrument sounds like within a musical context. It should be noted however that although no additional effects have been added to this result after the sampling stage, some pitch bending<sup>49</sup> has been added to the performance though MIDI controls for aesthetic reasons.



[Link to resulting instrument.](#)<sup>50</sup>

### 8.5.11 Summary

In this example, a new sampler instrument has been constructed through extensive manipulation of sound, where mixing-related processes and knowledge has heavily influenced the result. This has resulted in an instrument that is sonically unique where the substantive (initial snare sample) and ornamental (autofilter, EQs, delay, reverb, and compression-effects) elements have coalesced into a novel result. This is to say, this precise result could not have been easily achieved through any other means.

<sup>49</sup> Pitch bending refers to the pitch of the performance being dictated (up or down) by a programmable amount. This is a control feature available to all MIDI file formats.

<sup>50</sup>[https://soundcloud.com/user-970923641-105136395/final-result/s-DnTEDQULyFP?utm\\_source=clipboard&utm\\_medium=text&utm\\_campaign=social\\_sharing](https://soundcloud.com/user-970923641-105136395/final-result/s-DnTEDQULyFP?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

## 9. Discussion

Mixing has been defined by this paper as occupying three discrete states, traditional, contemporary, and compositional. It can be put forth that the key difference between traditional and contemporary *record production* (as it has been outlined in this thesis) aligns with one's sonic involvement in the creationary (production) realm where ITB and mix-as-you-go mentalities are the rule rather than the exception. As was elaborated by two highly esteemed mixing engineers (Scheps & Brower), it is evident that the production stage has experienced a profound shift in practice in recent years where contemporary age producers appear to be more inclined to engage in extensive mixing outside of its segregated, traditionally established connotations and presumably during general production. The reasoning behind this has been outlined as numerous with technological advancement (computers, DAWs, plugins, etc.), user preference (mix-as-you-go practices), self-learning, and cultural shifts all being noteworthy contributing factors. As pointed out in the literature, where technology and user preference are explicitly concerned, all technical and creationary processes can be housed together, resulting in effortless transitioning from one mode of work to another. All this serves to point to validate the emergence of a different *modus operandi* for producers where mixing is concerned when compared to traditional practices. In light of this, it can be stated that segregating the two mixing methods (traditional & contemporary) appears to be defensible.

Regarding compositional mixing, as it has been put forth in this thesis, has not been expressly acknowledged in the literature. It is not unthinkable that other sources may have been better suited to aid in indicating this, but none have been unveiled through the present work. Nevertheless, multiple sources have indicated a cohabitation between mixing and composition within the context of production. However, the precise nature of this cohabitation is only alluded to rather than defined with specificity.

To recap, compositional mixing has been defined in this thesis as: '*The act of enacting musicality (composing) through the medium of mixing tools, concepts, and practices.*'. For all the talk of the mixing being a process that, in practice, inhabits the realm of post-production, in compositional mixing, although the process is altogether more intertwined in the production process, this practice requires a musical catalyst in order to achieve its results (as expressed in the interview and shown in the examples). Based on the examples given from both the

interviews and compositional mixing example sections, the “*enacting*” aspects of this sentiment appear to be linguistically appropriate when expressing mixing as a medium in this way.

From a literary stance, while the concept of composition and mixing existing interchangeably has been acknowledged, finding sources to corroborate an *interdependence* has appeared to be a harder prospect. However, much has also been revealed. With regard to the interviews first, it has been shown that interdependency between composition and mixing gained validity as a concept. For example, when asked outright if the participants viewed mixing as a compositional tool, all responses (except Flatmate, who nevertheless was reluctant to denounce this entirely) agreed this was the case. However, in the preceding question (*Have you ever experienced musical ideas evolving from mixing-related activities? If so, do you have one or more examples?*) All could give examples of this. However, the nature of the examples given varied. In the case of EvenS, Alsmark & Flatmate, their experiences aligned with compositional mixing (as described in section 6.4). On the other hand, the examples given by AWR, VNTM & Getaz chose to express their sentiments in the form of scenarios that alluded to compositional intent through a broader, more production-oriented lens. Although far from invalid, the nature of these responses points to an altogether grander narrative than was initially theorized. In the case of Kill Ginger and MAUD, their examples were vocal-specific. These elaborations allude to another perspective where compositional intent can be shown to exist within (and be influenced by) the implications of vocal processing. As both of these producers are also vocalists, it is not hard to understand why this mindset holds value to them within their respective productions, as it is undoubtedly their intention to present their vocals and music within a given aesthetic. When coupled with the dual concepts of sonic causality & narrative (section 6.3), there also appears to be evidence of these concepts manifesting themselves in the collective consciousness of the interviewees where compositional mixing is concerned. The most notable examples of these concepts in practice appear can be shown in the elaborations given by the participants regarding the topic of inspiration (a topic that was not referred to in the questions). Inspiration was voiced by many of the participants throughout the interview section (Getaz, Alsmark, VNTM & Flatmate). A sentiment that was first alluded to by Jon Hopkins earlier (6.3.1). Although the nature of inspiration is doubtless of great relevance to the subject matter, its implications have also admittedly gone largely uninvestigated in this thesis. In summary, although the interviewees have been in agreement that their mixing practices exhibit compositional intent, what constitutes the compositional component appears to mean different things to the interviewees depending on their mandates as well as their notion of what this term implies.

With the various examples shown in section 8, the interdependent nature of compositional mixing received further validation. A validation that mostly comes from the predefine Five separate insights has served to express compositional interdependence from a more technically driven, detail-oriented stance. As has been shown, these examples have served to not only outline composition intent but have also served to express how sonic narratives and causalities can emerge from one's understanding of modern tools and practices. However, It can be conceded that the examples given were without question beyond what some might have been attempted by some. It can be observed for example that the processes used to achieve the results were closely associated with what the DAW (Ableton) had to offer in terms of functionality (drum rack, instrument rack, audio effects rack, control mapping, etc.). In other DAWs (such as Logic Pro, Pro Tools, FL Studios, etc), many of the functions expressed in the example chapter are either not stock functions or would prove to be time-consuming to the point of being counterproductive to repeat (should one desire efficiency). Although this section has served to outline compositional mixing in a technically specific capacity, in retrospect, this section also largely omitted elaborating on the aesthetic leaning and artistic inclinations apparent in some of the examples in favor of technical insights. With regard to context, it can also be stated that although some examples existed within the context of production (8.3, 8.4 & 8.5), others did not (8.1 & 8.2). The Reece bass example specifically (8.2) is an example of where a musical context would have perhaps served in understanding the nature of the problem being presented within the context of a production. This being said, however, the examples have also shown compositional intent in accordance with compositional mixings ascribed definition. For example, in section 8.5 (From Snare Drum to Tonal Instrument(Resampling)), it was shown that mixing related tools and practices can culminate in the invention of a novel instrument. In this example, the interdependent tradeoff between the mixing knowledge and the compositional intent was integral to achieving the outcome of the finished result and for this reason, strengthens compositional mixing as a concept.

Observing the interviews through the lens of what has been alluded to where mixing ideology is concerned, the sum of this inquiry points to notable ideological leanings in the interviewees. Although not without differing opinions, it has been shown that all the participants essentially agreed that:

1. Engaging in mixing while creating music was necessary/preferable.

2. There are creative advantages to mixing while producing.
3. Mixing had compositional implications in practice.

These testaments can be seen as valuable as they stand in direct contrast to the more linear, traditional definition of mixing. Nevertheless, there were some notable reservations. When asked if they agreed that there are creative advantages to mixing music, Flatmate and AWR were reluctant to commit entirely to this being the case. Flatmate indicated: *“I think the creative advantage is minimal if any, depending on how tied you are to the sonics in your work.”*. This sentiment holds value here as it implies that one's commitment to the sonic aspect dictates what the producer might be inclined to recognize as *relevant* from a creative standpoint. AWR echoed this in more general terms by indicating: *“Obviously, but there's disadvantages as well. Yes.”*. The indications are enlightening as they suggest that although the technology allows for it, it is not readily apparent that compositional mixing exists as an inevitability.

## 10. Conclusion

This thesis has aimed to expose the concept of compositional mixing as a practice. To repeat a general statement: music is sound. In this work, the examination has observed how the affiliation of sonic and musical processes exists in a contemporary space. This thesis has been guided by the assumption that tools, concepts, and practices related to mixing have, in light of relatively recent technological developments, evolved into a process that is musically inclined on a creationary level by some users. In light of an apparent lack of theoretical sources to support this presupposition, compositional mixing was introduced as a concept from which an investigation was conducted. This presupposition was spearheaded by two points of inquiry:

1. *Are mixing and composition existing interdependently in contemporary music production?*
2. *What implications do mixing ideologies have on contemporary music production?*

To answer these questions, an extensive literature review was conducted along with eight separate interviews and five practical examples. Throughout this process, a definition for compositional mixing took the shape of: *'The act of enacting musicality (composing) through the medium of mixing tools, concepts, and practices.'* The results have shown sufficient evidence to support that:

1. It is suggestive that composition and mixing exist interdependently in contemporary music production workflows.
2. Mixing-related practices can be observed as having a role that is supplementary on a creationary level within contemporary music production.

It has been shown that the processes that dictate music creation have experienced a significant change in modern times on all fronts as a consequence of technological development. A shift that manifests in practice, role (user), and consequently outcome where mixing and composition are concerned. This has been supported by many theoretical standpoints concerning:

1. Contemporary mix & production practices (ITB, plugins, automation, editing, mix-as-you-go workflows & micro level adjustment capabilities) are afforded by DAWs and surrounding computer-based technologies (CPU, RAM & GUI).

2. Sonic casualties and narratives.
3. Self-learning practices of modern producers.
4. The abolishment of constraints previously imposed by linear workflows.

The interviews have, moreover, helped to solidify compositional mixing as a concept by exposing:

1. Contemporary music production lacks separation between mixing and other production tasks (mix-while-you-go).
2. The preference for mixing one's own work in light of perceived creative benefits.
3. Mixing has compositional value.

Regarding the example section on compositional mixing specifically, it has been concluded that compositional intent can be found in mixing related tools, practices, and techniques and is a culmination of interdependent processes as a direct consequence of technological sophistication. The sum of the work here has contributed to the fields of music production in two primary ways: 1) Exposing how mixing practices can be shown to exhibit compositional intent. 2) Suggesting new terminology into the vernacular of music production. In conclusion, In light of the evidence acquired in this investigation, compositional mixing as a concept appears to hold validity in the lack of more precise, popularly recognized terminology. It can be stated here that, at the very least, this concept is not without value when describing unrecognized compositional practices where sonic processing is integral. Although it is impossible to predict without a larger-scale investigation, using the interviewees as a user base, it appears as though the implications of this concept have found both supporters and critics.

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## Appendix

**Appendix A:** Interview full-text responses and complete online survey results have been attached along with the delivery of this document. Individuals affiliated with UiA (University in Agder) can gain access to these documents [with this link](#). This file's contents have also been attached in the delivery of this document.