Creative Music Production

Professional Project

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How Does Artistic and Technical Mixing Approaches Shape Modern Jazz Recordings

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Declaration

Declaration

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Abstract

This paper explores how artistic and technical mixing approaches shape modern jazz recordings, by incorporating mixing techniques and creativity that preserve the virtue of jazz music. In general, mixing plays a key role in shaping the final outcome of a musical recording, and jazz being an artform that takes pride in artistic expression through the reaction of energy between musicians, mixing is a way of representing those captured moments to listeners. This study further investigates how mixing choices that involve experimental techniques to clean and minimal processing can affect the emotional engagement and interpretation of listeners.

Through research methods, seven mixes of jazz recordings were produced to get an understanding of the mixing process in modern jazz music. Out of the seven mixes, two mixes were approached differently, one with bold experimental choices, and one with minimal processing —contrasted with a raw unmixed recording. These two mixes were then presented in a survey to gather qualitative data on participants listening experience. Also, interviews with professional jazz musicians and renowned mixing engineer provided insight on the mixing practices withing jazz.

The key findings gathered from this research is that while technical precision is valued, mixing is a creative process that leaves a strong impression on listeners through various choices. The study also reveals the importance of collaboration with musicians providing feedback in achieving a mix that encapsulates the artist's intent.

Introduction

Would jazz recordings be as important as they have been since the first jazz record (Band), if it wasn't for the evidence of documentation through sound? Jazz is a genre rooted in the world of artistic freedom and improvisational aspects that lead to spontaneity. Themes of syncopation, polyrhythms, time signatures evoke a sense of unpredictability that enables the listener to be aware, because no performance is the same. Jazz has gone through many genre developments, birthing sub-genres like swing, bebop, cool jazz, free jazz, jazz-fusion, spiritual jazz and many others (Fripp). Throughout jazz history, technology has been at the centre of it. From the acoustic recording era to pioneering audio engineers like Rudy Van Gelder who have helped shape the sound of jazz and how its perceived.

Alongside an important element within jazz production today is the mixing stage. Mixing is defined as a procedure that involves processing musical performances. The main goal to be achieved is processing the sound to achieve a natural and realistic recording. Mix engineers use tools that help them get the sound they're after. While mixing is not all technical, it also allows engineers to be creative and use mixing as an artform (Olsson). Roey Izhaki says in his book. *"A mix is a sonic portrait of the music. The same way different portraits of a person can each project a unique impression, different mixes can convey the essence of the music in extremely different ways. We are mixing engineers, but more importantly: we are sonic artists."*

The aim of this research is to ask the question, how does artistic and technical mixing approaches shape modern jazz recording? It is imperative for a mixing engineer to understand the reason behind every choice made in the mixing stage, as well as understanding how to balance creativity with technical expertise.

<u>Literature Review</u>

This chapter will consist of research gathered from academic papers, articles, and masterclasses of professional engineers. It will give a history of the evolution of recording since the early days of jazz, define artistic and technical mixing approaches, and finally exploring in-depth mixing processes of renowned mixing engineers for a better understanding of mixing jazz.

<u>Historical Context of Recording Jazz</u>

The contribution of Rudy Van Gelder during the 1950s and 60s serve as a principal source for understanding the audio engineering history of jazz and its impact on today's jazz. It is important to note that recording engineers of the mid-20th century, also took on the role of a mixing engineer, making critical decisions "on the fly" (Izhaki 2). Dan Skea in *"Rudy Van Gelder in Hackensack: Defining the Jazz Sound in the 1950s",* describes Van Gelder as the most accomplished and cutting-edge engineers who has shaped jazz through innovative usage of recording technology. An engineer whose sound crossed over thousands of recordings for multiple labels such as Blue Note, Prestige, Verve, Impluse and more, which are considered "classic" jazz albums because of their unique sonic imprint referred to as the "Blue Note Sound" and eventually the "Van Gelder Sound" (Skea). Before dissecting the characteristics of a "Van Gelder Sound", looking through the history of recorded jazz is crucial.

Benjamin Bierman sums up the recording method of early jazz from the beginning of the first jazz recordings, by the 1917 Original Dixieland Band. Music from this era was recorded through a recording horn, where musicians were placed in a formation that related to the sound of their instrument to ensure proper balance – this is regarded as the acoustic recording era (Bierman).

The electrical disk recording era by 1925, introduced microphones to the sound recording industry (Bierman 2). Michael Cuscuna states that *"It freed musicians tremendously to play in a more natural set-up.* Susan Schmidt points out the microphone, speaker and control panel presented much more control over the sound through monitoring during recording (Horning). According to Richard Capeless, Rudy Van Gelder utilized recording on 78-RPM lacquer disks during the 1930s and would mix the microphone signals using a straightforward custom-built mixer (Capeless, The Disk Recording Era).

A reflection on pivotal technology advancements is deeply explored in Dan Skea and Richard Capeless' research. The introduction of magnetic tape presented a shift in the recording industry, Van Gelder was an early adopter of recording equipment that used this new technology in jazz recording. This technology allowed jazz musicians to expand their improvisations as magnetic tape provided extended recording time than the disk recording era, high fidelity sound, improved frequency response, lower noise and made it possible for editing (Skea 8) (Capeless, The Arrival of Tape).

The conversion from mono to stereo in the late 1950s caused a cultural shift in the recording industry, engineers had to adapt to the new technological development of stereo recording through 2 and 3 track tape recorders. This gave engineers the ability to record individual instruments separately (Horning). Capeless states that Rudy Van Gelder began implementing multi-track recording in 1956 and by 1959 it was a common practice for the Blue Note label releasing albums in both mono and stereo formats (Capeless, Mono & Stereo). On Art Blakey's *Moanin'* Rudy utilises the left and right stereo field, placing the trumpet and piano left, and the saxophone, drums and bass on the right side (Blakey). Michael Cuscuna also gives an example of a 3-track stereo being used on Miles Davis's Kind of Blue engineered by Fred Plaut (Davis), track one(left) had tenor sax, piano, trumpet and bass on track two(middle), and alto sax and drums on track three(right) (Cuscuna 66). Multi-tracking exceeded its predecessor of 2 and 3-track recorders eventually growing to 8, 16, 24 and up to 48 tracks, providing all possibilities for engineers including much better control on individual tracks and overdubbing opportunities (Cuscuna 66). Cuscuna highlights the problem raised in multi-tracking jazz at the time, musicians where isolated due to bleed control from engineers which affected the spontaneity and interaction of the performance.

A primary source that details Van Gelder's philosophy is an interview with All About Jazz, Van Gelder is asked about his sound, and he responds.

> *"...you say it's "my sound," really what it is, is my feeling and my approach to the musicians I'm recording at a particular session. I really don't like to think of it as being "my sound." What I'm doing really is trying to let the musicians be heard the way they want to be heard. What it really is is the musicians' sound".* (Gelder)

"Van Gelder Sound"

The "Van Gelder Sound" is further analysed in the credible website *RVG Legacy* by Richard Capeless. Capeless uncovers the key characteristics that have formed his sound which

include, immediacy, low noise, large soundstage, and a distinctive piano sound. The immediacy element in Van Gelder's approach presented a sense of intimacy between instruments, this was achieved by close miking. A practice that involves placement of a microphone close to an instrument for capturing clarity and detail, which Rudy help popularise in jazz recordings at the time. The author continues to analyse the importance of low noise in Van Gelder's sound. To reduce the noise level that recording on tape produced, Rudy overcame this issue by pushing the signal levels high to the point of distortion, creating an aesthetic of tape saturation to his sound. Sonically Van Gelder pushed himself creatively by exploring the sense of space in his recordings through experimenting with artificial reverb such as the revolutionary EMT (Elektro-Mess-Technik) German produced reverb device, after experimenting with other reverb units that failed to please him. An effect he continued to use throughout his career from 1957. Richard finalizes the characteristic that completes the "Van Gelder Sound" is of his piano sound, described as "boxy" often featuring a dense, think sound. (Capeless, The Van Gelder Sound: Characteristics). As Richard Capeless highlighted, Rudy Van Gelder's recording techniques aimed to produce the purest recordings with precision, bringing the audience closer to the performance by showcasing the nuances of a jazz performance. Even through the evolution of technology in the 20th century, it is clear Van Gelder's vision was to serve jazz music, the artists and listeners by going beyond the limitations of technology during that period, to cater a sound that would forever change the recording of jazz to come. Richard characterizes Rudy Van Gelder by stating "*He played a central role in liberating the audio engineer from a strictly scientific outlook, and through proprietary techniques that produced the unique sounds on his records, he is one of the first well-known instances of an audio engineer being recognized for their artistry.* (Capeless, Innovation)*"* It is found after looking at Van Gelder's contribution, he made it possible for engineers to be regarded as artistic as musicians. Raising another question, "Is mixing an artform or purely technical?"

Artistic and Technical Mixing

"*A process in which multitrack material –whether recorded, sampled or synthesized–is balanced, treated and combined into a multichannel format, most commonly two-channel stereo. But a less technical definition –one that does justice to music–is that a mix is a sonic presentation of emotions, creative ideas and performance*"- a quote by Roey Izhaki in the book *"Mixing audio. Concepts, practices and tools"* describes the process of mixing as an

artform, as a universal creative process through all genres (Izhaki). In the article, *"Is Mixing an Art?"* by Jordi Graupera, reacting to this definition as a confirmation that mixing is indeed an art, stemming from the fact that "presentation of emotions, creative ideas and performance" are a result of mixing techniques that express this claim. It is hard for some to view mixing as a creative outlet, Izhaki identifies an issue with mixing being inaccurately represented as just merely technical or seen as just a way of fixing flawed recordings. He expands by acknowledging that, although mixing involves technicality such as level balancing, untamed dynamics and deficient frequency response, these are only several technical issues mixing engineers encounter. He finishes his argument by stating: *"...the true essence of mixing does not lie in these skills. Many mixes are technically great, but nothing more than that; equally, many mixes exhibit some technical flaws, but as a listening experience they are breathtaking. It is for their sheer creativity—not for their technical brilliance...* (Izhaki 2)*."*

Thoughts on what a jazz mixing engineer feels about this discussion of artistic and technical is necessary to explore in Bobby Owinski's *"The Mixing Engineer's Handbook: Second Edition".* Interviewing a renowned engineer in the jazz world Berni Kirsh, Kirsh expresses that there are more ways to mixing than the technical know-hows. Therefore, he believes creativity is different in jazz, in the sense that its 90% about the importance of human interaction and 10% is the technical side (Oswinski 183, 186). In result, it seems the artistic mixing approach, more specifically in jazz is one that relies on conveying the vision of the music through emotional connection and creativity. Technical tools serve as a helping hand to reach that artistic goal.

Mixing Process in Jazz

Due to limited academic sources to mixing jazz, masterclasses from professional engineers, were used to gather this information. Todd Whitelock in the masterclass analyses his philosophy, objective and creativity, when mixing a jazz performance. According to Whitelock, he aims to reproduce the soundstage in the perspective of the listener, this is achieved through means of technical procedures like panning certain instruments, equalization and preserving the dynamic nature of the jazz sound. Automation is a technique Todd implements in his mixes, such as automating the volume and equalization to highlight a

solo performance. He talks about subtle use of equalization to subtract rather than alter the core of the sound, comparing his precise actions to mastering (Center).

Another source that gives more insight of the practical elements of mixing jazz, is a masterclass by Nic Hard, a Grammy-winning engineer (SonicScoop). In the masterclass he goes into depth with his mixing approach, providing useful information on the use of plugins and their impact. The emphasis of decision making is evoked by Nic, understanding the "Why?" behind every choice done in the mixing stage. An example of this is when he decides to layer the snare mic with a Kontakt library sample during the chorus. Which according to him *"I wasn't getting enough excitement from the snare..."* Using Pro Tools (DAW), Nic uses a Snarky Puppy live session to showcase his mixing process. In terms of processing, like Todd Whitelock's approach, he uses subtle amounts of equalization to create space for each instrument to live in its frequency range, while keeping in mind mic bleed. Some EQing actions may seem extreme but according to Nic, pushing the frequencies allows them to pop out of the mix more. Automated controls are implemented also, for presence during a solo similarly to Whitelock's technique. The dynamics are controlled slightly in Nic's mix; compression is used to only tame the peaks of loud parts of a particular instrument. For example, fast compression settings are used on a drum bus channel to control the dynamic peaks. In comparison to Rudy Van Gelder, a room reverb is used by Nic to enhances the soundstage. Constantly recalling his objective for the mix as *"a sense of grandioseness and a bigger space"*. As mentioned before, some of the most acclaimed jazz recordings engineered by Rudy Van Gelder were recorded through tape produced an aesthetic of saturation which Van Gelder strived for (Capeless, The Van Gelder Sound: Characteristics). Nic Hard uses a tape emulation plugin to introduce warmth and character to his mix. An example is using this effect on the mix bus (master channel) for overall presence. Through this research, it is found that the universal goal of jazz mixing engineers, is to enhance the sound of jazz recordings by seeking to outline the global vision and preserve the integrity of the genre.

An additional source to exploring the mixing process in contemporary jazz is in Dan Moretti's Producing and Mixing Contemporary Jazz (Moretti).The book offers a detailed exploration of the modern jazz production process, combining technical strategies with a strong emphasis on preserving the genre's emotional and improvisational essence. Moretti bridges between traditional jazz values and contemporary production techniques. In the book Moretti provides practical guidance on EQ, dynamics, spatial processing. Emphasising on the importance of initial balancing and panning before mixing to get a picture of where the mix is

going, where balancing is the relative volume of each track and panning being the location of the track in the stereo image, from left to right. With equalization, he gives an example for mostly all instruments associated with jazz, for example when equalizing the saxophone – the aim is to remove drum bleed from drum mics in the higher frequency range, while adding warmth in the midrange, which Moretti states; *"even though the chart indicates muddiness in that range (Always use your ears)"* (Moretti 37). He continues to show his use of compression on the saxophone, by having minimal compression settings that reduces 1dB of peaks when the saxophone plays at high volumes. When talking about digital reverberation, Moretti describes the process as *"...a wash of echoing sound that can simulate an acoustic space, such as a concert hall or room, or a manufactured sound like a plate or spring reverb."* (Moretti ix). Moretti tends to use two different reverbs in a mix, one for the drums and for the rest of the instruments, explaining that the general rule of reverb settings for drums should be no longer than 1.00 second, as the time of the reverb must decay before the next attack. Like Nic Hard, Dan Moretti concludes the book by encouraging the reader to always question the intentions behind decision making during the mixing process. A common mindset that mixing engineers seem to understand when mixing jazz.

Moretti's views on mixing are particularly relevant to this study, which investigates how mixing approaches end up shaping modern jazz recordings. His insights reinforce the notion that the mixing process has an impact to either enhance or diminish the natural dynamics and interplay that are central to jazz, depending on how sound processing is used. Much more, Moretti's ten recommended classic jazz recordings that include *Kind of Blue* by Miles Davis (Davis), serve as pre-production research to studying the history and sonic qualities of these recordings.

To conclude this literature review, the evolution of technological advancements has undoubtedly impacted audio engineering in jazz music. These developments led engineers like Rudy Van Gelder to pioneer techniques that would inspire modern jazz engineers like Nic Hard and Todd Whitelock to jazz musician Dan Moretti. All secondary sources that have been analysed and evaluated will serve as a guide to further outline what is being researched in this paper.

Methodology

Introduction

The main research objective remains: How does artistic and technical mixing approaches shape jazz music in modern recordings? The decisions made in the mixing stage are critical and ultimately shape the final mix. This chapter discusses in detail the chosen methodological procedures to complete the final artefact. This chapter will be divided into four sub-sections, which are:

1. Multitrack gathering
2. Reference Critical Listening
3. Mixing
4. Interviews and Surveys

During this chapter, information gathered from the literature review chapter was referenced in order to create the project's artefact in a professional manner.

Multitrack Gathering

Sourcing multitrack sessions that were going to be used for mixing was an important first element. Without multitrack sessions which contain all the recording material of a particular track, mixing wouldn't take place. Six multitrack sessions were gathered from professional Irish jazz musicians and DCU jazz students. The sessions gathered featured live recordings of musicians playing all together in one room, however there were some sessions that utilized overdubbing techniques. A modern studio recording technique that allows recording a performance over an already existing recording, to either improve, fix mistakes, or add additional layers (Robjohns). Since these multitrack sessions were not sourced from one individual, that led to some sessions being gathered earlier than others and some later through the production phase of the project. The sub-genres of these performances ranged from improvised free jazz that embrace spontaneity in the moment of performance, to more structured performances in the form of jazz fusion.

Reference Critical Listening

Once multitrack sessions were collected, it was an important element to be exposed to as much jazz recordings as possible to understand the genres sonic nature. From classic jazz recordings recommended in Dan Moretti's book (Moretti), of the 50s and 60s such as Miles Davis' Kind of Blue not only because of its status as being the best-selling jazz album of all time (Armstrong), but also the sound the album is praised for – to Modern jazz recordings in the likes of Snarky Puppy, Esperanza Spalding, Kamasi Washington and many more were listened to extensively to recognise modern jazz mixing qualities. A shortlist of references was chosen according to the instrumentation of the multitrack sessions. The references were transferred into their respective Pro Tools session, where tools to analyse the references were used, analysing the frequency spectrum, the stereo image, and lastly to measure the transient nature and dynamic range of the reference tracks. These tools were decided on to get an understanding of the decisions made behind the mixes. Analysing the chosen references helps paint a picture of where mix can go, in terms of being inspired by mixing choices made from high-quality industry standard references, something that Dan Moretti emphasises on his book (Moretti).

Mixing

This method involved the major load of the project, the mixing stage of the project. In this method, mixing of the jazz recordings took place. Mixing was done on Pro Tools (a Digital Audio Workstation), this DAW was chosen because of comfortability and workflow efficiency, also because of its reputation as being an industry standard that professional mixing engineers tend to use. Pro Tools can be seen used in the literature review by professionals like Nic Hard and Dan Moretti. Inspired by the literature previously, mixing techniques such as balancing and panning, equalization, compression, using artistic effects, and automation were utilized throughout this stage. Mixing choices were determined by references chosen and aiming to achieve mix that was close as possible to the reference, decisions were also inspired through knowledge of listening to a widespread of classic and modern jazz recordings drawing common mixing qualities that can be applied to the mixes. As jazz music thrives in staying true to its roots of capturing the feel and moment, it was a priority to make sure mixing choice respected the core values of jazz music. However, to evaluate how mixing approaches can affect the perception of jazz music, experimentation did

take place to evaluate this study. Experimenting with processing effects such as long reverbs and delay effects to compare with a more minimal approached mix. As mixing was the main component of production, contacting musicians to receive feedback and improve the mixes was done frequently during mixing, especially with "Eyes That Are Not Clear" and "Earwicker's Dream" mixes. Through receiving feedback, this meant the mixes had to reflect the vision of the musicians rather than exactly matching references given, which helped at the beginning of mixing but as musicians proposed adjustments their needs started to become a priority while still staying true to the references.

Interviews & Surveys

This chosen research approach was part of qualitative research methods, that resulted in interviews and surveys. Quantitative methods did not fit in this research because opinions and personal perspective from primary sources was important to truly grasp the goal of this paper. Primary data was collected through interviews with two professional Irish jazz musicians who provided multitrack sessions, and a three-time Grammy Award winner jazz mixing engineer (Artist: Nic Hard). The interviews included carefully curated questions based on topics researched in the literature review relating to mixing techniques and their impact on modern jazz. Professional experts that understand the nuances of jazz music were the main target. The goal was to learn about the jazz mixing engineer's philosophy and to gain insights into the contributions of jazz musicians during the mixing process. The interviewed musicians provided insightful feedback regarding the mixing process of the recordings. Musicians provided constructive criticism on how to improve the mixes in terms of creativity and technical techniques.

A survey was then conducted to further analyse the impact of mixing and how this affects the listener's emotional perception of the mixes. Participants listened to three audios, different mixing approaches that explored experimental and minimal mixing choices, compared to a raw demo mix to investigate the listener's perception of the mixed tracks. Open-ended questions were asked for participants to express their perceptions and thoughts of the presented mixed tracks.

Conclusion

Elements in this methodology outlined the practical methods used from pre-production to the project's production phase to complete the final artefact, also reflecting on jazz mixing

techniques sourced from the literature review chapter. In terms of data analysis, qualitative research methods were chosen to capture in-depth personal perspectives through a interviews and surveys. This research design was a pragmatic way of exploring the practical means of mixing modern jazz recordings in a professional manner.

Analysis

Introduction

This chapter detail a breakdown of the technical aspects that went into the production stage of the major project, such as mixing techniques and processing effects used, will be delivered. Furthermore, a section of this chapter will discuss the data collected from interviews and the survey as discussed in the methodology chapter. An account of the outcomes from both methods will be thoroughly analysed to evaluate the impact of the mixing process in jazz music.

Production

As mentioned in the previous chapter, Pro Tools was the main DAW for mixing the recordings. In total, 7 jazz sessions were collected from jazz musicians. Before the initial mixing, the sessions were prepped by organising the tracks, colour-coding tracks, grouping similar instruments by creating AUX channels. *Ronan Guilfoyle's Earwicker's Dream* session was the first to be mixed as it was the first multitrack session to be received from the musician.

The mixing process began with volume balancing and panning to establish a clear stereo image, as recommended in Dan Moretti's methodology (Moretti). Initial focus was placed on the rhythm section—drums and bass guitar—to build a solid foundation. Equalisation (EQ) was then applied across all instruments to remove unwanted frequencies and create space for each element in the mix. An example of this can be seen in the session "Earwicker's Dream" by Ronan Guilfoyle, where the snare EQ involved cutting frequencies below 119 Hz to reduce kick drum mic bleed, attenuating muddiness at 444 Hz, boosting presence at 6.36 kHz, and rolling off high-end content above 11.68 kHz to remove harshness.

Following EQ, compression was used to manage dynamics, utilising various Waves vintage compressor plug-ins also employed by Nic Hard (SonicScoop). In the *Ba Soul* session, for

instance, compression was applied to the saxophone to control louder passages while preserving the dynamics of quieter performances.

To create a sense of depth and space, reverb was introduced—drawing influence from mixing engineers such as Nic Hard, Dan Moretti, and Rudy Van Gelder. The *Ba Soul* session used the Acoustic Room preset in Waves H-Reverb to simulate a natural room without altering the instrument's tone. An experimental version of the same session employed long reverb tails and delay effects to evoke a more atmospheric, dream-like quality. This version was included in the listener survey to contrast experimental and minimalistic mixing approaches.

To achieve cohesion in the "Passionate" mix, the Brainworx Townhouse Buss Compressor was employed on the stereo bus with settings including a fast attack and release, a 2:1 ratio, and no more than 4 dB of gain reduction. These settings preserved transients and natural dynamics; a technique drawn directly from Nic Hard's masterclass (SonicScoop).

In "Eyes That Are Not Clear", the original mono piano recording was widened using the Haas Effect. This involved duplicating the piano channel, panning left and right, and delaying the right signal by 12ms using Mod Delay 3 to simulate a stereo image. The same technique was used in "Passionate" to widen the electric guitars.

Automation was applied selectively, only on tracks where emphasis was needed. This included emphasizing soloing instruments in "Eyes That Are Not Clear", "Ba Soul", and *MJ Track 1*. The final step in the mixing process involved subtle stereo enhancement using SPL BiG on the master bus to match the reference's stereo width without compromising balance.

Referencing commercially released and well-mixed tracks was an essential component of the process. Analytical tools such as Voxengo SPAN were used to visualise frequency content, while Melda Stereoscope provided insight into stereo width. For example, Figure 1 shows how the frequency spectrum of "MJ Track 2" closely matches that of the reference track "Portsmouth Figurations" by John Scofield. Figure 2 illustrates a stereo image comparison using Melda Stereoscope.
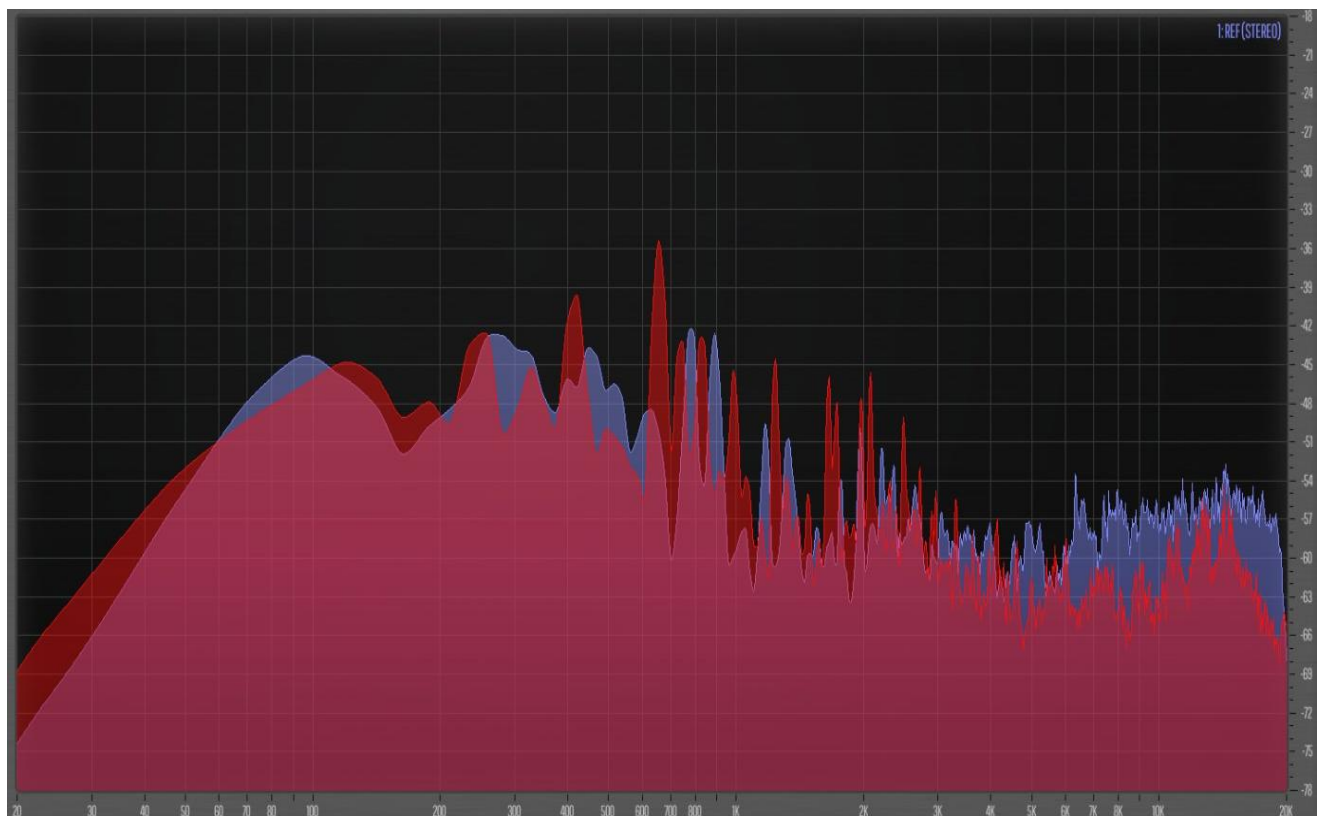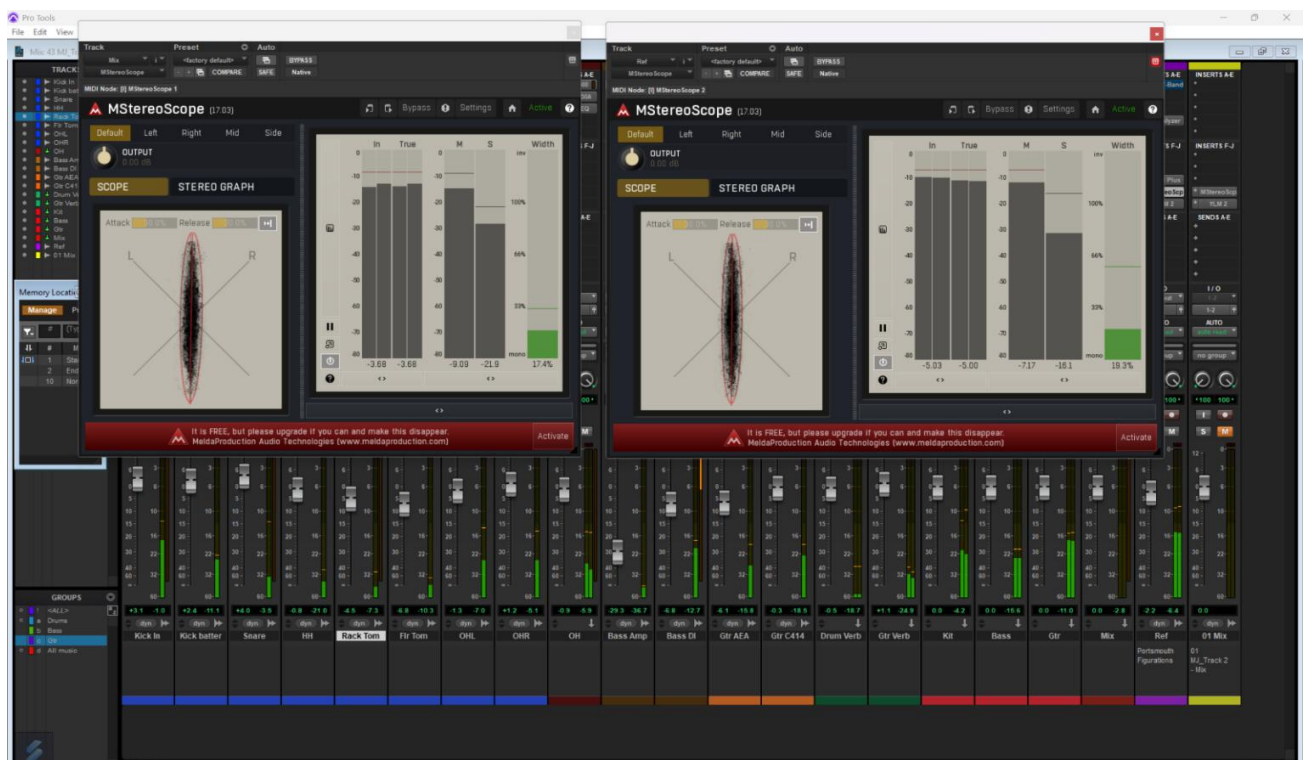
Figure 1

Figure 2

Youlean Loudness Meter was also utilized to measure the Peaks to Loudness Ratio levels of the references and mixes, which measures how dynamic and transient a piece of recording is. If the mixes had a high measurement of the PLR, compression would be used accordingly to suppress those high peaks and match the reference if needed.

Analysis of interviews

Once all mixing was completed interviews were arranged with two professional jazz musicians Mathew Jacobson & Ronan Guilfoyle, and a three-time Grammy Award winning jazz mixing engineer known for Snarky Puppy albums (Artist: Nic Hard). The questions asked were curated in a way to understand how important mixing plays in jazz and the significance of collaboration between musicians and the mixing engineer. See Appendix A for detailed results.

Jazz Musicians

Interview questions were divided into two sections: general perspectives on mixing and specific feedback on the mixed tracks. Full transcripts are available in the Appendices.

The first interview was with Mathew Jacobson, a jazz drummer who performed on "MJ Track 1 and 2". When asked about his involvement during the mixing process, Jacobson prefers to be involved throughout the mixing process, stating, "*I like to be involved… I work with the same engineer for recording and mixing.*" Ronan Guilfoyle expressed a similar approach, being involved at every stage. When asked if the mix can impact the perceived meaning of a piece, Guilfoyle believes it's important for an engineer to know their job and have great knowledge of jazz's recorded and mixing history. When asked about the balance of technical precision and artistic expression when working with a mixing engineer, both parties pointed out that they would give technical notes mostly on the recording side of things. Jacobson noted that once the technical side is solid, "it allows us to be more creative in the mix." Similarly, Guilfoyle states that while he shares preferences, he avoids dictating technical choices. On the topic of natural versus studio-enhanced mixes, both favoured authenticity and preserving the natural sound of the recording. However, views deviated on using creative effects: Jacobson adopted experimental uses that prioritize creativity, while Guilfoyle believed the choice depends on the musical context. Discussing spatial placement, Guilfoyle

preferred drums spread across the stereo field, bass cantered, and other instruments placed to reflect a live performance's stage perspective. The next question asked about their personal favourite sounding jazz recordings, both artists referenced Kind of Blue by Miles Davis as a sonic benchmark, proving its enduring influence as Guilfoyle states "So one of the greatest sounds of all time is Kind of Blue, right, It is one of the greatest."

After this set of questions focused on the mixes, to receive feedback from musicians. When asked about the mixing of the rhythm section in Guilfoyle's mix, Guilfoyle noted improvements in the second mix of his session, particularly in balance and spatial realism, which the first version lacked. When asked the same question relating to his mixes, Jacobson also provided feedback, suggesting small mix adjustments. When asked about the dynamic range of the overall mix, both musicians were satisfied with the overall dynamic range but recommended enhancing louder sections to reflect the music's energy better. The next questions were directed to both musicians' performances. Guilfoyle was asked; When listening to your bass solo, do you think the mixing enhances the focus of the solo? He stated "Yeah, I mean, I thought it was good. If we sat down together, I'd probably tweak it a little bit but not to the while." When Jacobson was asked; how do you think the transient nature of the drums is represented in both mixes? He felt this was represented well sonically. Jacobson appreciated how clearly the drum transients came through and complimented the way the instruments were spatially arranged, giving the mix a natural sense of depth. Guilfoyle was asked about the depth of space within the mix, he appreciated how the revised mix captured the room's depth more effectively than the earlier version. Jacobson, reflecting on reverb in MJ Track 2, thought it was tastefully used but could have been slightly more prominent. Further noting that when decisions are made during the performance such as effects being used, this limits the mixing engineer from being creative. As closing advice, Guilfoyle encouraged listening to jazz recordings and studying the production of influential albums such as "Kind of Blue" by Miles Davis and "A Love Supreme" by John Coltrane, emphasizing the value of being a lifelong student of jazz.

Mixing Engineer

When asked about balancing tradition and modernity in mixing jazz, mixing engineer Nic Hard thrives to push the boundaries of traditional mixing techniques of jazz that prioritise cleanliness, and incorporate modern techniques that work alongside the artist's vision. When

asked about an unusual creative technique was referenced in the literature review, Hard states that he uses MIDI triggers only in appropriate circumstances that require enhancing the sound, such as aiming to achieve a sound that wasn't done in the recording phase. Nic also states how this is a contentious topic, and he received criticism for it – "*I know I've had some feedback from people being like, oh, you can't do that…I think you can, as long as you're careful.*" The next question was about capturing the organic feel through mixing, Hard declares the use of room mics especially with a present audience. Also recording multiple room mics to provide options to use when later mixing. To add to the following question about utilizing reverbs for depth of space, Hard states using reverb to put instruments in a space especially when recorded in separate rooms. Proving Ronan Guilfoyle's comment on the importance of the acoustic space in a mix. When asked about his philosophy on mixing the rhythm section, he expresses the difficulty in getting the kick and bass to work cohesively, stating " *…you kind of have to like make a choice… about which is sort of occupying which, which space and which area and the low frequency*" When asked about Nic Hard's favourite sounding jazz recordings, which is interesting as he states that he does not come from a jazz background but rather a dance and techno music history which explains the low-end emphasis to Nic Hard's mixes. The next question asked about the collaborative process between musicians when mixing, Hard explained how the collaborative process is an important part of his workflow. He states that there is a lot of back and forth that happens with the artist in order to deliver and satisfy the artist's vision, further saying *"…I mean, at the end of the day, this isn't my record. This is the artist's record. So, it's like I really I really want them to like, to love their record."* Hard was then asked about what his favourite compressor which he mentions the LA2A for bass guitars but also because of their versatility, further encouraging that gear does not matter as you can get a lot done at your disposable. Lastly, Nic Hard provided advice on aspiring mixing engineers explaining the significance of building experience when beginning, also pointing out how to work with artists and learning to be open to ideas from the artists.

Surveys

To gauge whether mixing does shape modern jazz recordings, a survey was conducted to investigate the emotional perception of differently approached mixes from this project. See Appendix B for detailed results. A total of 9 people were surveyed. The 'Experimental' mix received a mixture of ratings in terms of how emotionally engaging it is, with the average

rating being 3.89 out of 5. When asked to give a reason for their answer on the 'Experimental' mix, one answer stated, "*The use of unusual mixing techniques created a much intriguing listen, with some other techniques like the phaser on the sax subverting expectation of what we usually get in a standard jazz song.*" Respondents described this mix as tense, vibrant and dramatic, with one participant stating, "*Exuding vibrant energy while maintaining a serene calmness.*" The next questions asked participants to rate the clarity and balance of the mix, an average of 4.56 out of 5 felt it was clear and well-balanced. Respondents felt the reverb used in the 'Experimental' mix affected the immersive feeling, one stating "*It certainly created more depth to the mix. Allowing for some instruments to have more space which creates its own unique tone.*" When asked on moments that stood out in the mix, one respondent mentioned the phasing effect on the saxophone stating, "*Not something you usually hear on a jazz track but I liked it*" In contrast to the 'Minimal' mix, respondents felt more emotionally engaged with an average of 4.44 out of 5 compared to the 'Experimental' mix. Giving reasons to support their answer, there was a common theme of respondents feeling this version was much polished and clean. When asked to describe the atmosphere of the mix, respondents felt it was calm and soothing compared to the intenseness of the 'Experimental' mix. An average of 4.44 of 5 was rated as participants felt the minimal mix was very clear and well-balanced. In terms of reverb in the minimal mix, respondents noted that the reverb was less obvious, one saying "*There feels to be very little reverb which creates a more intimate atmosphere and allows for much greater clarity of the mix*" When asked about the moments that stood out in the mix, one pointed out how well the drums were mixed. The next question asked which mix participants preferred, this was interesting as 5 respondents chose the 'Experimental' mix, and 4 respondents chose the 'Minimal' mix. The following question asked respondents which version sound most authentic or true to modern jazz recordings, one who favoured the experimental mix stated, "*Modern jazz often blends traditional instrumentation with contemporary production techniques, and this mix captured that balance well.*", another who favoured the minimal mix stated, "*Jazz I feel doesn't really get experimental with its mixing and more just allows the instruments to speak for themselves*" The final question asked respondents if mixing does play a role in the perception of music, all participants agreed and felt it does, one answer stated "*Yes, definitely. The balance, reverb and placement of sounds has a large role in how we perceive music. The two versions are the same in theory, but in practice they sound very different when different stylistic choices are made.*"

Conclusion

Throughout the productional aspects of this study, returning to the sources found in literature review served as a key element of direction in delivering professional mixes, that fully represents and preserves the essence of jazz music. The interviews and surveys revealed many learning points as to the important role of mixing jazz such as the factors in choices made during the mixing process. Collaboration between the musicians and mixing engineer being an essential part of mixing jazz. Overall, we can say that elements of reference analysis, mixing decisions and collaboration within mixing shape the final mix.

Discussion

Introduction

The aim of this study is to investigate the role that mixing has on modern jazz recordings and analyse mixing processes that make a successful jazz mix. The necessary steps taken have been discussed in the previous chapters. This chapter will discuss the significance of findings that provide a broad scope of understanding mixing in jazz, and what was learnt throughout the development of this project. This chapter will also explore limitations faced during the process.

Significance of Findings

One of the key findings of this research is the impact of mixing choices regarding the survey participants' perception of the different mixing approaches outlined in academic sources in the literature review. The objective of this study was to successfully mix modern jazz recordings by following industry mixing techniques that preserve and respects the genres essence. It is found that mixing jazz is unlike any other genre, mixing jazz requires a deep understanding of the genre's sonic nature and nuances. From the analysis of the survey results, it is deemed that decisions made in the mixing process appear to be vital in terms of shaping the final mixes which were presented in two approaches - experimental, minimal and compared with the raw recording. Although the mixes were from the recording, participants interpreted the experimental and minimal versions in interesting and unique ways that prove the power of mixing in music, how technical expertise paired with artistic expression can go hand in hand to shape the emotional engagement of listeners. With respondents mostly gravitating to the experimental mix, this encourages engineers to make more intentional and emotionally driven mixing decisions for jazz. Another primary component found is the collaborative aspects of mixing jazz. Communication between musicians played a huge role in executing the visions of the musicians by ensuring their pointers and adjustment demands were met. Although some musicians were unreachable for feedback, musicians who were contacted provided useful feedback upon every mix update, which aided clarity on the direction of the mix.

Qualitative research obtained from the interviews reveal the importance of collaboration in order to achieve what the artist visions for their project, as mixing engineer Nic Hard noted that it's in the collaborative process where creative possibilities can be found, between multiple ideas being generated from both parties, mixing engineer and musicians.

Creative development played an important role in the production of this research project. The experimental mix demanded creative mixing explorations which can be considered out of the norm in jazz music. Finding references that featured this kind of risk-taking mixing choices served as inspiration and as well as curiosity in terms where jazz mixing can be heading, and the survey results are evidence that bold mixing choices act as way of introducing interesting surprises that keeps listeners intrigued.

Limitations and Recommendations

Although this study managed to contribute in successfully mixing modern jazz recordings, it is essential to acknowledge the limitations of this study. Due to limited time interviewing mixing engineer Nic Hard, a longer interview could've allowed criticism and feedback of the artefact's mixes from the expert, to recognise areas of improvement within the mixes. Although this was out of the researcher's control, the data gathered is still insightful and beneficial for this study and future research on the topic of mixing jazz. Lack of communication with musicians on some of the mixes could have given more clarity to the direction of mixing, although references were adhered to, communicating with the actual musicians would have helped to follow the appropriate references, reflect on feedback, gain real-life experiences working with artists which Nic Hard encourages aspiring mixing engineers to develop.

Future studies extending the natures of this study could explore the benefits of collaborative mixing sessions with musicians present, allowing for instant feedback and stronger creative input from both engineers and musicians, much like what happens in professional studio settings. Incorporating diverse perspectives by including multiple mixing engineers or musicians to reflect different perspectives on the same mix, could underline how subjective and varied mixing decisions can be, and what choices resonate consistently with listeners.

Conclusion

This research has provided evidence on how the process of mixing jazz through technical and artistic mixing choices can shape modern jazz recordings and their perception. The project has achieved its objective of identifying the role that mixing has in the genre of jazz. The limitations reveal recommendations that could further lead to a refined study of understanding the nuances of mixing jazz and its impact to the listener.

Conclusion

From the research and analysis of the insightful data gathered through carrying out this study, it can be confidently stated that different mixing approaches that incorporate technical and artistic decisions have the influence to shape modern jazz recordings. The objective of this paper was to understand the role that the mixing process plays in a genre like jazz music, and through the success of mixing 7 jazz recordings, it is revealed that the decisions made in mixing are a major component to preserving the original intentions of the recording, while allowing room for creativity to take place.

Through the gathering of qualitative data, this study has collected insight from primary sources who live and breathe jazz to get an understanding of their perspectives on the mixing process. Communication between the mixing engineer and artist being a common element to achieving the artist's creative intentions, which this research implemented during the production process. This study reveals, through qualitative analysis, how different mixing decisions can shape the emotional response listeners have to music. Where mixing techniques such as balancing, panning, equalization, compression and using creative effects can all contribute to how people interpret jazz music. Whether creating atmospheres of intense energy, dramatic feelings, to soothing calmness atmospheres, all of which are a result of mixing decisions. The general perception of the presented tracks, "experimental" and "minimal" mixes was a success as listeners were able to distinguish between the two and express their reasons.

Although the study encountered some limitations, like limited interview time with jazz mixing engineer Nic Hard that constrained the depth of critical feedback on the artefact's mixes. Also including lack of communication with certain musicians may have affected the mix direction and artistic intent, nonetheless the project's objective was still successfully met. This study's insights and findings aim to enrich the field of jazz production, deepening our understanding of the mixing process and its influence on the evolution of jazz music. It is hoped that the work will be a meaningful contribution to ongoing discussions and research in this area.

Overall, this paper emphasizes the role of mixing in shaping the identity of modern jazz, encouraging engineers to balance technical precision with creative expression, a valuable principle within jazz music and genres across.

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Appendix

Ronan Guilfoyle - musician

How involved are you in the mixing process when it comes to your recordings?

"Very involved. If it's my recording, I'm in the studio every second of the mixing. I've done a lot of it so I'm very experienced at it. I know what I like, which is an important thing. So yeah, I'm very involved. I really have a view, I would have a view on pretty much everything on the sounds of the instrument, on the reverb they used as such etc. On the relative balanced between the instruments, which might change. You see, jazz is very dynamic music, so unlike a lot of modern commercial music which is quite processed, and everything is compressed and set, jazz can be changing all the time. So, if you've got a guy soloing, at that point you need to raise him or her above the level of the accompanying instruments, and then when they are finished, they can just come back down or something else needs to come up. So the two things I would be particularly paying attention to is the balance between the instruments, the dynamic balancing of the instruments, and then the sound of each instrument."

Do you think that the mix can change the perceived meaning or emotional tone of a piece? Do you think that mixing has that impact?

"Yes, it can, it depends. It's quite ...I think it's important in jazz situations to have somebody in the studio that really knows what they are doing. I think jazz is like one where, you need to understand the history of it, the history of recorded music and the sounds of those recordings. I mean everyone in jazz is familiar with the Blue Note Sound, there's also a difference in the ECM Sound they should probably know about. It's totally different sounds, but nearly every modern jazz musician would know both of those sounds as a prototype let's say, or a type. And then there are other ones too, you know, like the Impulse sound of difference, the Rudy Van Gelder Sound in general when he recorded for Impulse for example….So you'd know those kinds of things, it was the sound quality, the sound quality of the instruments and how they were recorded. So, I think you need that, that experience when you're mixing jazz, you need that experience for whoever is doing the mixing for you, if it's not you, you need someone who really knows what they are doing."

In your opinion, how do you balance technical precision with artistic expression when working with a mix engineer?

"Well, I wouldn't say to them I want it EQ'd like this, I'd say I need less treble, I need more bass, I need a great amount of body and little bit of reverb. The one thing I cannot stand on my bass is to hear just direct sound, I can't stand it. It's great on electric bass, you know, if

you're playing an absolute electric bass that's exactly what you want and then you modify it. On the acoustic it's just terrible, it's like mixing it like rubber bands or something, horrible sound."

Do you prefer a more natural/live-sounding mix or more polished/studio-enhanced approach?

"You can be really polished in what you do and make it sound natural. You know what? Because I guess the most important thing from a jazz player's perspective is their sound in terms of in the studio. Is what's being recorded does it sound to them like the sound that they make, right? Because everyone will have their own idea of their own sound, and sound is really important in jazz, in terms of telling somebody who you are… There's a wide range of individual sounds that are not only permitted in jazz but encouraged. That's not the same with all music, for example in classical music, there's quite a narrow bandwidth in terms of what constitutes an acceptable sound, that violin player would make, you know, or a saxophone player. Saxophone in classical music is a very specific sound that they have and nobody deviates that sound. Whereas in jazz, every saxophone player has a different sound, you know, and depending on you whether you like it or not, you know. But in classical they wouldn't allow that. So, in jazz, your sound is part of your identity.

So therefore, it's very important for that sound to be captured when you're recording, and that's where it can get tricky, you know, when you got people who don't know the genre. Yeah, and so they'll start compressing or they'll start, you know, taking off too much of the high end, or it's too much middle, you know, whatever, it can be anything. But really what you're looking for as a player is generally, does that sound like me when you're listening back, does that sound like me, to me, right. What I've noticed is that sometimes with jazz guys that they're too focused on that and not because of anything wrong with that, but they have no idea what to tell the guys about the other instruments. I've seen band leaders produce a mix that to me was horrendous, but they said, I love my sound on it, you know, because they love their sound, but they have no idea what the bass should sound like or the drums, you know, they don't really care that much, you know. Whereas, the best sound is produced by, I would say a combination of things. One, an engineer who really knows the tradition of the music. Two, a person who really knows what that sound is and how best to get it. Three, that same person has an understanding of all the other instruments and understanding of that history and what constitutes a good sound for those instruments. So to have those three things together is not always the case, you know, but that's when you get the best result for sure."

How do you feel about the use of effects (e.g., reverb, compression, EQ) in jazz mixing? Do they add or take away from the music's emotional depth?

"It depends, like jazz is such a broad church nowadays, you know there's people who use a lot of electronics and a lot of like electric instruments in their bands and all this stuff. So, it's horses, for courses, you know, just depends on what you're trying to do, you know what I

mean? So, no I don't think it takes away, in terms of an acoustic group, playing in an acoustic size, it's probably not necessary, you don't really need it. But if you're doing something conceptual, then you've got electric instruments, and you want to do. I mean I could think, you know if I've though about it for a while, I could think of loads of examples where that kind of stuff was used and very effectively too. So, no I don't think so…not automatically, it depends on the type of music you're playing, the concept that you have on which area of jazz you are coming from, because it is very broad these days."

Do you ever use kind of effects like chorus on your bass?

"Yeah, I do, but in a particular situation. The HR-9 I think it's called, or H-9, anyway it's amazing. It's got about 400 sounds in it and so I use that in those situations when I'm looking for more of a sonic palette. But if I was playing straight-ahead jazz, I wouldn't even take it out of the box."

How important is the spatial placement of instruments in the mix for conveying the energy and intimacy of a jazz performance?

"It's very important, I think for me when I'm mixing, I'd have the drums spread across the whole spectrum. I won't have the drums of one speaker, it'll be spread. The horns then will be put between, you know, like if you're looking at the stage, how does that sound, the saxophone's here, the trumpets there, where is the piano, you know. A thing about a piano, which would tend to have a wide palette, because its eight octaves will also be spread to some degree. And then the bass usually right in the middle."

What are your personal favourite sounding jazz records, in terms of sound?

"There are different ones because there are… ,. There are some ECM albums that are just got a phenomenal sound on them, it could be a lot of those. I guess, some of the bass recording on ECM is astonishing. See, Manfred Eicher you know, he was a bass player. That's why he always got a incredible bass sound on those albums. So, there's a Dave Holland album called Emerald Tears, which is just solo bass, recorded in 1977, I think. It's just double bass, him in the four strings and the truth, and it's incredible recording of the bass. That's one of my favourite recordings of all time of the bass. If you want something to rattle your speakers, that's it….It's so well recorded acoustically, it's just acoustic bass, probably just a couple of microphone placements in a decent space. Steve Coleman Black Science. That is a real studio recording, you know what I mean? Cause it has alto saxophone, electric keyboards, electric guitar, electric bass, and drums – so it's an electrical album"

How do you think the mixing of the rhythm section works along the melodic instruments in the mix?

"The second time was fine. The first one you just took the wrong approach (*this was related to the first mix I sent for feedback*). I mean, it was interesting for you to do that and for me to make that comment because I've experienced this so many times, you know, I don't blame

you. The ubiquitousness of the commonness of the other ways is everywhere, right? It's only specialist kinds of music where that's not the done, like classical music, Indian classical music and jazz, maybe a couple of other things but the most part, 78% of music you're ever gonna hear recorded, is gonna use that compressed kind of stuff, you know? So, I don't blame you for doing that, but the problem with that is the instruments don't sound like the way they sound in the room. And the number one thing with jazz recording is the instruments should sound like they sound.

But I think the balance was good…I was amazed at how quickly you actually got it…well I said how about this and do that, but actually the second time it just sounded great.”

How do you feel about the dynamic range of the overall mix? Does it reflect the original dynamics of the track?

“Yeah, yeah, that was a good job.”

When listening to your bass solo, do you think the mixing enhances the focus of the solo?

“Yeah, I mean, I thought it was good. If we sat down together, I’d probably tweak it a little bit but not to the while. I mean, I've many times heard my solo has been recorded where I cringed in terms of the sound that the guy gave me. But it wasn't the case which yours, you know, and it was fine, yeah, it was good.”

What do you think of the depth of space with the mix?

“Yeah it was good. There’s no comparison with the first one. To me it felt like the room. Obviously I don't hear the room from outside when I’m on the stage, but I have played in that room many times, and I know what the room sounds like from the audience perspective.”

Lastly, is there any advice you can give me going forward with mixing jazz?

“Listen to lots of jazz recordings. There are two books you could read, the one about Kind of Blue and the one about Love Supreme. Both books about the making of those recordings. Ashley Kahn is the name of the guy and he wrote these two books, one is on the making of Love Supreme and the other one’s on the making of Kind of Blue.”

How involved are you in the mixing process when it comes to your recordings?

"I like to be involved, often I would say with most of the records I've made, I work with the same engineer for recording and mixing. I kind of like that process and partly for the speed, you know, if the engineer has setup those microphones and he's labelled those files, you save a lot of time. uh when it comes to the mix and they sometimes just have a better sense than of the music, and also because the majority of the music that I record is live, it's not tracked. There's also almost, like not like there's less work to do in the mix, but it's a bit more about just capturing the live sound. So most of the work is done in the mix is really like, oh, maybe in the bass solo, the bass needs to come up a little bit. Maybe there's also, obviously the stuff of effects, but it's probably there's less of that. It's like, okay, finding a good base sound for each of the instruments and then it's just about fine tuning with levels…Yes but I do like to be involved, it's very rare to send of the mixes, and not actually be present. Like most of the time would be in the room with them.

In your opinion, how do you balance technical precision with artistic expression when working with a mix engineer?

"Yeah, that's a good question, I think often there's like an overall sound, maybe that we want to achieve and it's important to have that from the beginning. So, like the technical side is almost more the setup for the recording. Like, okay, what mics are we using and where are we placing them? And then at that point when we're happy, the kind of technical side is looked after in terms of, you know, getting a good sound that we feel represents us, then it allows us to be more creative in the mix. So, then it's like, okay, we actually already have a really good base level. We're kind of happy with how things sound and at that point, it's more about, like I said, yeah, maybe just general levels and the creative stuff, so certainly on some records, we've like really gone to town on the creative side. Like we go totally crazy in this section and it's kind of falling apart anyway and what if we just stick out of space echo…and my point is always I mean, if you recording in a studio, especially for like this music that live music, it's about the spontaneous interaction between musicians then what's the point in trying to make it sound like this super clean studio created thing. Like you're missing out already on the energy of humans in a room, like most of the time you play a live concert of improvised music, and you get something special back. Trying to play that music in the studio, it can be hard, like you try and replicate it and hopefully you're playing with musicians that bounce off each other and give each other energy. But I think there's often something missing and I don't see any reason why you can't try and like recreate some magic or add some extra special energy from being creative.

Do you prefer a more natural/live-sounding mix or more polished/studio-enhanced approach?

"Definitely more natural, rough and ready, personally I'm never looking for perfection because I don't really think that exists musically, that's never my goal. So, like editing things down to within and an inch of their life, like ideally I'm trying to have whole takes, of course, it doesn't always work like that, but I'm happy to have a few takes and maybe we take the first half of this, and the second half or that has a nice intro, and this has a nice melody in the middle and this guitar solo is really good, so let's combine those that's cool, but it's never about perfection…"

What are your personal favourite sounding jazz recordings.

"Initially the classics that a lot of people listen to like, John Coltrane (A Love Supreme, Crescent albums), obviously Miles' albums, and all of the albums from the 50s. Like the cooking, working and steamin and relaxing tracks, and then later his albums in the 60s like ESP and Nefertiti with Tony Williams and Ron Carter and they have such a live, really big sound. And then kind of more recent albums, I particularly love the production on the albums of Tim Berne, who's a saxophone player who lives in New York, and actually, I was thinking, when I listened back to your mixes and I guess we'll get onto this. But I was thinking, oh, I could have sent some references afterwards. I was like, oh, a good reference for that would have been a record with Tim Berne and a drummer called Nashi.., another drums and saxophone duo. There's a producer called David Torn, who works with Tim Berne and he's also a guitarist, but he's a pretty great producer and yeah to me…like what I was saying earlier about kind of just affecting things and having some like really creative little moments. I think he does that really well. There's an album by a bass player called Drew Gress called Seven Black Butterflies, and that's one of my favorite records and produced albums for the last 20 years, that's definitely a highlight.

And then also records by a band called Alasno Axis, run by a drummer called Jim Black, who I'm also, yeah, it was a big inspiration for me. It's drums, electric bass and a saxophone and guitar. And also just has it's quite rocky like this big groove, and it's just got a big sound, which I like yeah. A big sound, but then like with space inside it um like I like when things can get big, but also when they can breathe at other times, if its too big all the time then sometimes the music doesn't sit what I find. For maybe more recent albums from like the last, five, ten years, uh, I d love recordings by a singer, songwriter called Adrian Lenker and also the band she's in Big thief that's a little bit more kind of mainstream alternative folk music and I love the way they record the Big Thief albums. Some of them are produced by the drummer, and I love that drum sound. It's very dry but very powerful. and there's a lot of space in their recording of each other."

How do you think the mixing of the rhythm section works along with the melodic instruments in the mix?

"Yeah good I liked it - (*due to the recording cutting off after this point, the following is paraphrased)* – Mathew felt that the saxophone from the duo track mix could've been more

central than panned to the left. He also mentioned that the trio track mix was great but there were moments where the bass could've been more prominent especially in moments where he reacts to the guitar and drums.

How do you feel about the dynamic range of the overall mix? Does it reflect the original dynamics of the track?

Mathew felt the dynamic range worked well, the quiet parts where quiet and the louder bits felt loud. However, he did mention that during the louder section of the track, this could've felt more bigger to reflect the energy.

You are the driving groove of both performances; how do you think the transient nature of the drums are represented in both mixes?

Mathew felt that the transient nature of the drums were represented well.

What are your thoughts on the spatial placement of instruments in the mix? Do you feel it defines the soundstage of the piece?

(*From this point the recording was back*) – " Yeah, it felt kind of big, big sense, propelling things. And then, yeah because it's not like just a backbeat groove, like a bass drum-snare bass drum-snare, I think it's important for everything else to kind of again have this holistic sound, which yeah, I think you achieved.

What do you think of the reverb effect used on the guitar to create depth and space within the 2nd mix?

"I guess, it was hard to know as it often is in those situations, because he uses like pedals and effects, so sometimes it's hard to tell, I didn't know what was live or post-production, which is a good sign, and I mean, I've played with Simon a lot and you know, his sound, felt like it. It definitely sounded like him and it definitely wasn't too much for sure like in term of reverb or any effects on the guitar. Maybe kind of similar to the bass at times, it could be even bigger but again it's like a stylistic thing and it sounds really live which is great. Maybe at a couple points when Simon is really going for it, it could be maybe even bigger.

Yeah, again, I can't remember exactly how he was playing live or what effects he was using, so it's always, I think, like I was saying at the beginning getting that balance between, okay, yeah, here's the live sound. And if there's already a load of effects and different things happening in the live recording, then it kind of limits what you can do because you don't wanna…like there's decisions that were made in real time based on the guitarist reacting to what's happening and I think, yeah, then, there's not so much space for a mixing engineer to make more decisions on that."

KJ: How do you balance traditional jazz aesthetics with modern production techniques?

NH: "I mean, I think a lot of that comes down to the artist and more so on what they're doing and just like what's appropriate for each project. I know that when I started working with Snarky Puppy, for example, I really had it as a goal to kind of push the boundaries and what was comfortable for the band just to see, I don't know. I guess at that point I like jazz generally needed to be push a little bit further. And I remember the first round of mixes that I think I did for Mike for Culture Vulture, he was, I think he was in shock a little bit. And I mean, we dialled it back from there, but I think…just kind for the sake of progress, I thought it was important to kind of…explore territories and bring in, you know, more modern techniques and, not be as traditional in terms of cleanliness as had been going on for like the decades prior. So, I mean, yeah, I felt like it was an important step. And so with a lot of the projects, I'm looking for a way to, to bring that stuff in. to what would normally be traditional, but at the same time, it has to also go hand in hand with what the artist is doing and what's, I don't know, kind of what's appropriate for each project.

KJ: Yeah, that's great. That's great. And so, like for my literature review, in my thesis, I kind of referenced the video you did with…it's like a masterclass where you kind of upgrade a mix. The Snarky Puppy version where you had a mix originally, but then you upgraded it by making it kind of more better. In that video, you kind of like, you use kind of creative ways to like, again, enhance the sound. For example, on the drums, you kind of added like MIDI triggers to kind of make it more punchy, and would that be like…is that something that you typically do? Kind of like, if you don't like a particular sound or you know, like… amp emulations and stuff like that?'

NH: Yeah. Yeah. So that, I mean, that's a pretty… like doing the midi trigger thing is a pretty contentious subject, I think, especially in more of the jazz thing. And it's, it's not very typica. I do that because I mean, you know, for project like that, again, like the trying to get the drums to be really punchy and, you know, I wasn't there to record that one, and I just felt like it helped the… overall song. Also with, with jazz, you need to be way more careful, to try to maintain, you know, what the drummer played. And basically just like enhancing the sound,

but yeah, I know I've had some feedback from people being like, *oh that's, you can't do that*, I think that you can, as long as you're careful. Yeah

KJ: If it works, it works.

NH: Yeah. Yeah. Yeah. Yeah. So, I mean, I definitely do that some… again, when it's kind of appropriate or when I'm looking for something, different, but I mean, to me, it's not, it's not really any different than like, heavily eqing or manipulating a sound, it's just another way to kind of get to the same thing.

KJ: How do you approach mixing to preserve that kind of organic feel, even in a studio setting, how do you work your way?

NH: Yeah, I mean, I think by the use of room mics. So obviously in Snarky's case, there's usually an audience present, which is one thing. So, it's good to have like the audience reaction and stuff like that. But even just beyond that, even if it's just a closed session with just the musicians, recording room mics on pretty much everything, so that it doesn't sound like super dry and up close because, those sort of, kind of recording can kind of happen anywhere. ~ and this is another sort of area where, also in ~ later on, basically just recording a bunch of different options so that when in mixing, you can kind of like piece it together differently. So, you know, for example, like, ~ on a record with, with Bill Lawrence, I think I had like six, or eight mics on a piano. And not to say that I used them all, but just like, just had them there, and one pair of those was a mid room mic and one was a far room mic, but that kind of helps put it in a room and, can make it a little less there out, I guess.

KJ: Yeah. Which was going to be my next question, one of my favourite kind of elements of your mixes is how you kind of create like the depth and space within the recording. And I think the record with Michael League and Bill Lawrence ~ the duo, is one of my favourite kind of the way you can feel the space How do you utilize effect like reverb or room mics as well to create that depth feel?

NH: Yeah, I mean both. I think ~ on their two records, I • think it's been more or less the same in terms of there's some use of room mics. ~ But I think in that situation, it's a little bit more difficult with them because the piano being louder than the oud or the acoustic bass. • Or I think some songs, maybe we had them actually in separate rooms. ~ So, I think, yeah, using reverbs to kind of... pull them together or at least put them in a similar kind of space. Yeah.

KJ: That's great. I would also like to ask you about - kind of like how you mix the rhythm section. So, the drums and the bass, how they both intertwine, kind of how do you like approach kind of mixing? You find it maybe difficult at sometimes kind of making room for the kick or the bass?

NH: Yeah. I mean, that's, that's I think in any mix, like kick drum and bass ~ are usually the, it's the most difficult thing to kind of get to work. And you kind of have to like make a choice, ~ about which is sort of occupying which, which space and which area and the low frequency, • you know, where the kick drum has more the super lows or where the bass does. ~ but for me, I mean, I think ~ my default thing is usually the kick drum is kind of much bigger and stubbier and the bass is kind of like above that frequency range wise. And I think, I think actually that comes from, like a long time ago when I was into like, dance music and techno and stuff, obviously kick drum in that stuff is super present. And I think that kind of has carried through some even, even to today.

KJ: Okay. It makes more sense then, when you say that because I can definitely feel that impact of like that dance feel that, you know, kick heavy. Also like what are your personal favourite sounding jazz records?

NH: You know, I don't know that I do. I think, I mean, at least a lot of the music that I grew up on ~ I didn't really come from a jazz world. Occasionally people have played records for me that I think sound amazing, like a Mark… and things like that, but it wasn't ever something that came from me…. somebody's like, oh, you've got to check this out. But so yeah, I don't know if I have any like particular favourite like recordings. Yeah.

KJ: How collaborative is like the mixing process when you're working with musicians like especially in jazz, do musicians kind of generally have a strong say in the final mix? Or how do you incorporate like their feedback?

NH: Yes, that's a good question. So basically, I mean, I preface this when I start working with somebody new, I kind of have this discussion with them ahead of time and let them know, it's like oh on the first version of the mix that I do, I'm going to experiment and just kind of go with my gut and just see kind of like what happens. And the idea is that basically it's, it's my job to… deliver to them like the sound of the record that they want and that they're happy with. So, if I'm like, if I'm way off on the first version, I'll work with them to get it to kind of more what they were hearing. But at the same time, like I want to illustrate some of the possibilities because sometimes people don't know what kind of what's possible.

But so for me, the collaborative process is actually really important, and I actually enjoy that part. I mean, there are occasions where, you know, somebody sort of like wants to really like take some stuff out of it and keep it like the demo, but really like, usually there's a lot of back and forth and the sort of the creativity that's generated between multiple ideas and multiple people is, I don't know. It keeps it interesting. Sometimes I feel like if I'm just left to like do my own thing and I don't get feedback, then it's not as interesting. And I mean, at the end of the day, this isn't .my record. This is the artist's record. So, it's like I really want them to like, love their record.

KJ: What are some of your favourite go-to kind of compressors for dynamic heavy instruments, like the bass DI?

NH: Gotcha. I mean, yeah, ~ honestly, like I don't put a lot of emphasis on like which compressors ~ or like ~ which plugins I'm using. I feel like you can get a lot done with kind of like anything and what's at your disposal. But having said that, like the, things that I'll use, for example, on a bass, like an LA2A ~ and I tend to use Distressors a lot, because they/re versatile. But honestly man, if I was just left with the stock plugins from Avid, it would be fine. So yeah, I don't think that stuff is like the end all be all.

KJ: What advice would you give to someone looking to specialize in mixing jazz or aspiring to be a mixing engineer? Are there any particular skills or valuable mindsets that they should value, if you have any?

NH: I mean, I think a couple of things I mean, one just doing as basically as much as you can. And which includes like doing stuff for free, especially when you're starting out to kind of build not just your discography, but also your experience. Because people are hiring you for your experience. So if you can show that you've mixed a lot of records even if they haven't paid, you will have learned a lot during that process. And I think in terms of skills, I think learning how to work with artists is actually a big, I mean, or at least for me has been a big part of the job. It's learning how to listen and then interpret what somebody is saying. And also, like not, not being like sacred about ideas. I know that like people have told me that they'll be working with somebody and you know, when they disagree with the engineer, the guy gets like upset or like you know, like you've changed his ideas. So he's like grumpy or, he says, he knows that doesn't work or whatever… I think being open to the ideas and interpreting things differently. I mean, that's usually what happens is like when somebody asks me, like to change something and…even if the first reaction is like, oh that's a weird

thing to ask for and I don't really understand that…then I'll just try to like listen to actually what the idea is. And I'd say like eight time out of ten, it leads to something even if it's not that particular thing, it leads to something else. And then I kind of understand more what somebody was wanting. So, I think being open to like different creative processes is important.

Appendix B – Survey Results

B.1

1. I confirm that I understand the above study. I agree that the data collected will be anonymous can be used for academic researc h. I am overthe age of 18 years and I agree to take part in this research study.

● Yes	9
● No	0

100%
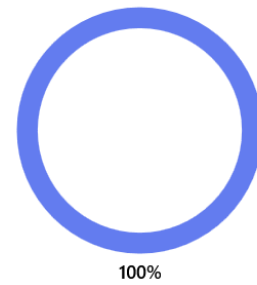
B.2

2. How familiar are you with audio engineering?

● Extremely familiar	3
● Somewhat familiar	5
● Heard about it but don't know much	1
● Not familiar at all	0

11%
33%
56%
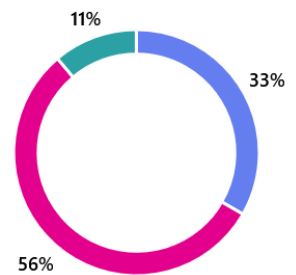
B.3

3. How often do you listen to jazz music?

● Everyday, it's my favorite genre.	2
● Every other day	3
● Monthly	3
● Not at all	1

11%
22%
33%
33%
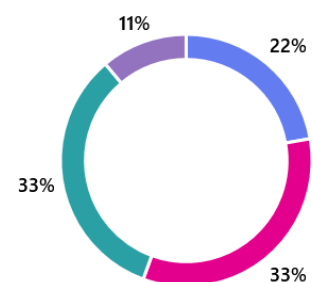
B.4

4. What kind of audio playback device will you be using during this survey?

- ● Headphones   8
- ● Phone speakers   1
- ● Laptop   0

11%

89%

B.5

5. On a scale of 1 - 5, how emotionally engaging did you find the Experimental version? *1 being not emotionally engaging at all* and *5 being extremely engaging*

3.89

Average Rating

① ② ③ ④ ⑤

Level 5	3
Level 4	3
Level 3	2
Level 2	1
Level 1	
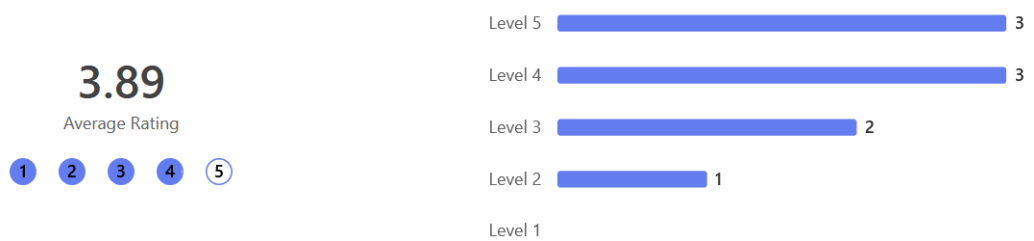
B.6

6. Please explain a reason for your answer.

9 Responses

ID ↑	Name	Responses
1	anonymous	The use of unusual mixing techniques created a much intriguing listen, with some other techniques like the phaser on the sax subverting expectation of what we usually get in a standard jazz song
2	anonymous	Everything is very well put together
3	anonymous	There where elements which i was not expecting to hear in a classic jazz track which kept kept my attention to see if any other elements would be added throughout the track.
4	anonymous	I found the interplay between the keys and the saxophone quite interesting.
5	anonymous	The use of spacey, big reverbs and delays gave the piece a sense of depth and atmosphere, making it feel more complete and immersive. These effects added an emotional weight that really allowed the music to resonate with me on a deeper level.
6	anonymous	I thought it was very well balanced and each element sounded clean.
7	anonymous	I feel like there was more happening / more depth to the experimental version. It felt very dynamic. Possibly there was a reverb on the saxophone or more saxophone parts added that made it feel this way.
8	anonymous	Horn section was too loud
9	anonymous	It wasn't really low enough comparing to the 2nd mix

B.7

7. How would you describe the overall vibe or atmosphere of this version, and how do you think the mixing choices contributed to it?

9 Responses

ID ↑	Name	Responses
1	anonymous	The feeling I get is a sort of tense atmosphereI. The phaser and reverb helped to create this allowing for my space and unusual sounds.think at times some of the mix was a little clustered, the use of delay taking up some frequency space. I understand the use of it to create a more experimental and spacey atmosphere but I think it just think it meant some instruments were not as obvious in the mix
2	anonymous	Atmosphere seems a little off due to the amount of use of cymbals and drums
3	anonymous	Modern, Contemporary.
4	anonymous	Exuding vibrant energy while maintaining a serene calmness.
5	anonymous	The piece feels far more dramatic in the experimental mix, almost like it could be used for an important movie scene.
6	anonymous	Very smooth and compositionally intricate. I liked how the saxophone was at the front in the mix.
7	anonymous	I think it has a vibe of there being a lot happening, however I think the mix was balanced well. I think whatever thought process went behind the balance and priority of different parts of the mix was done very well. I think the panning, especially of the saxophone parts, made it very engaging.
8	anonymous	Sounded very busy
9	anonymous	The vibe and atmosphere was very suspense and painting a picture of jazz club in 1980s

B.8

8. How would you rate the clarity and balance of the instruments? *1 being very unclear / unbalanced* and *5 being very clear and well-balanced*

4.56
Average Rating

① ② ③ ④ ⑤

Level 5 ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬ 6
Level 4 ▬▬▬▬ 2
Level 3 ▬▬ 1
Level 2
Level 1

B.9

9. Did the use of reverb in this version affect how spacious or immersive it felt to you? If so, how?

9 Responses

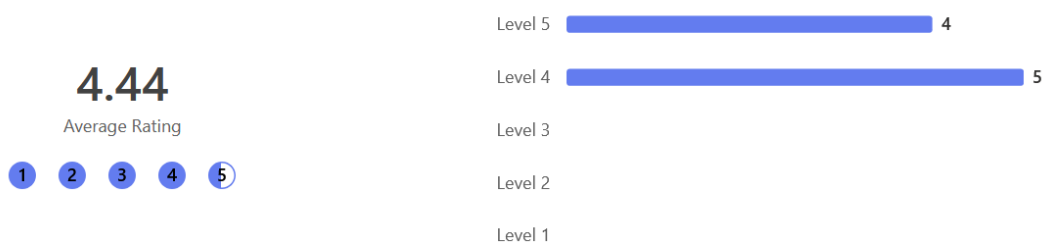| ID ↑	Name	Responses
1	anonymous	It certainly created more depth to the mix. Allowing for some instruments to have more space which creates its own unique tone
2	anonymous	It sounded great in terms of mixing
3	anonymous	Overall, the mix sounded well placed in comparison to the raw mix.
4	anonymous	The arrangement beautifully filled the room, with each instrument occupying its own distinct space.
5	anonymous	It gave the impression that the instruments were placed in an open environment, which pulled me into the music and made it feel more complete compared to the other versions.
6	anonymous	Although subtle, it added a natural space to the elements.
7	anonymous	Yes, the reverb made it feel more big. I associate jazz with terms like 'big band' so making it feel as dynamic as a big ensemble is a great achievement in my opinion. The reverb made it feel more improvisatory as well, it felt like I was listening to a band playing a jam session and experimenting with the music. It also felt sonically more immersive because of the way the reverb and panning filled up spaces in different ears.
8	anonymous	Yes sometimes it was too overpowering
9	anonymous	Yes the reverb contributed to the smoothness of transition and made things spacious and balanced.

B.10

10. Were there any particular moments in the mix that stood out to you?

9 Responses

ID ↑	Name	Responses
1	anonymous	The phasing on the saxophone. Not something you usually hear on a jazz track but I liked it
2	anonymous	To me i think there was too much cymbals and drums, jazz is usually softer
3	anonymous	the sound element which follows the bassline mostly stood out to me as ive never heard anything like it before.
4	anonymous	The way the piano complements the saxophone throughout is impressive.
5	anonymous	At 1:19 the delay on the saxophone makes it sound almost like a synth.
6	anonymous	The ascending saxophone bit
7	anonymous	The last 24 seconds stood out to me as being the part with the most activity / liveliness. I think the rest of the track does a good job of building up to this though.
8	anonymous	The vibe at the end changed drastically
9	anonymous	The saxophone was brilliantly mixed and stood out from the other instruments

B.11

11. On a scale of 1 - 5, how emotionally engaging did you find the Minimal version? *1 being not emotionally engaging at all* and *5 being extremely engaging*

4.44
Average Rating

① ② ③ ④ ⑤

Level 5	4
Level 4	5
Level 3	
Level 2	
Level 1	

B.12

12. Please explain a reason for your answer.

9 Responses

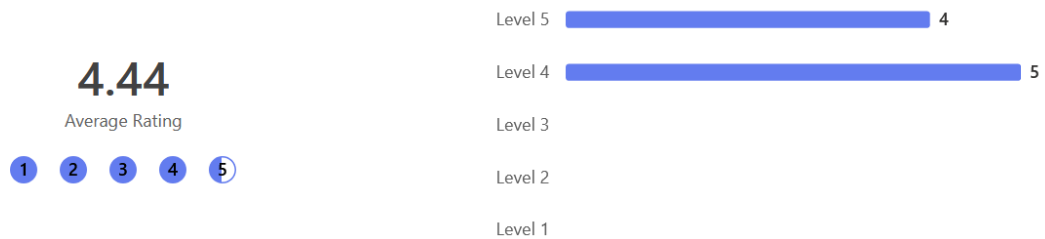| ID ↑	Name	Responses
1	anonymous	You know when you make that mmm yeah face. That's what I got I. The first bar
2	anonymous	It was just as engaging as the one prior
3	anonymous	I felt this mix was more traditional and as my preference in Jazz music usually stems to classic and not contemporary, the lack of additional elements as seen in the experimental mix, allowed me to enjoy the over mix.
4	anonymous	The bass and drums drew me in even more as they came alive.
5	anonymous	The mix is very well balanced. Each instrument is sitting perfectly in its own place.
6	anonymous	It sounded quite similar to the experimental mix with subtle difference. Maybe less reverb?
7	anonymous	I think the minimal version feels very clean and polished, but I think it loses a little bit of dynamic and liveliness that the experimental version has. It is a good mix, it just doesn't feel quite as sonically 'interesting' as the experimental one.
8	anonymous	The sound was much clearer then other versions
9	anonymous	It was balanced evenly with the saxophone being dominant

B.13

13. How would you describe the overall vibe or atmosphere of this version, and how do you think the mixing choices contributed to it?

9 Responses

ID ↑	Name	Responses
1	anonymous	Much less going on, no delay, very little if any reverb or any other effects.
2	anonymous	Slightly less atmosphere as there was slightly less mixing in this one than the one prior
3	anonymous	Classic jazz, clean mix, reminded me of (the birth of cool album)
4	anonymous	The overall feeling is soothing and not very intense.
5	anonymous	Its a more chill, laid-back vibe compared to the dramatic and intense atmosphere in the experimental version.
6	anonymous	Sounds just as good as the experimental mix i think
7	anonymous	I think this one is more studio-like, it sounds more polished and edited whereas the experimental version could be a track from a live album.
8	anonymous	It felt calmer and more clean
9	anonymous	The vibe gave the same as old school jazz club

B.14

14. How would you rate the clarity and balance of the instruments? *1 being very unclear / unbalanced* and *5 being very clear and well-balanced*

4.44
Average Rating

① ② ③ ④ ⑤

Level 5 — 4
Level 4 — 5
Level 3
Level 2
Level 1

B.15

15. Did the use of reverb in this version affect how spacious or immersive it felt to you? If so, how?

9 Responses

ID ↑	Name	Responses
1	anonymous	There feels to be very little reverb which creates a more intimate atmosphere and allows for much greater clarity of the mix
2	anonymous	I thought it was immersive as well but not as one as the one before it
3	anonymous	Everything appeared to be sitting exactly where it should in the mix,
4	anonymous	It drew me closer to the drums as I felt their sound was more pronounced.
5	anonymous	The lack of a big spacey reverb on the saxophone made the mix feel more vintage.
6	anonymous	Reverb was slightly less obvious in this version.
7	anonymous	I think it is difficult to say, it feels like it affected me less so than in the experimental version.
8	anonymous	I don't know
9	anonymous	Yes it made everything smooth

B.16

16. Were there any particular moments in the mix that stood out to you?

9 Responses

ID ↑	Name	Responses
1	anonymous	That very first opening bar. Oof. That little drum fill too
2	anonymous	Not necessarily
3	anonymous	The soloist instrument stands out to me as it sits perfectly and over all clarity it great
4	anonymous	The subtle buildup in the middle of the track really caught my attention.
5	anonymous	The drums are mixed very well thoroughout. I love the drum fill at 0:32
6	anonymous	Not really, I thought it was very similar to the experimental mix but with slight changes. Overall a very clean and high quality mix regardless.
7	anonymous	I like the saxophon from about 0:50 to about 1:07. It does sound cleaner and more precise than the experimental version so I would say I prefer that minimal version for those specific saxophone melodies.
8	anonymous	No
9	anonymous	Only the saxophone

B.17

17. Which version of the mix do you prefer the most?

- ● Experimental mix   5
- ● Minimal mix   4
- ● Raw demo mix   0

44%   56%
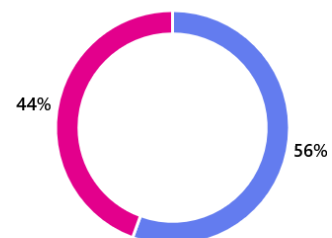
B.18

18. Which version sounded the most authentic or "true" to what you expect from modern jazz recordings?(Apart from the Raw Demo) Why?

9 Responses

ID ↑	Name	Responses
1	anonymous	Definitely the minimal mix. Jazz I feel doesn't really get experimental with its mixing and more just allows the instruments to speak for themselves
2	anonymous	Experimental
3	anonymous	Minimal mix
4	anonymous	I would describe the experimental mix, the arrangement of instruments, and how it fills each space.
5	anonymous	The Experimental Jazz Mix sounded the most authentic to what I expect from modern jazz recordings. Modern jazz often blends traditional instrumentation with contemporary production techniques, and this mix captured that balance well. The use of spacious reverbs and delays added a sense of atmosphere, which is a common trait in current jazz fusion and ambient-influenced recordings.
6	anonymous	I'm not a seasoned jazz listener but personally i felt that the experimental mix had more space. So I think I would prefer that over the minimal mix.
7	anonymous	Experimental, just because I think it sounds like a good mix between clean studio recording and live recording. It feels like it has the balance of a studio recording but the atmosphere of a live recording. I think jazz is often perceived as being played live and improvised also so this makes it more authentic to me.
8	anonymous	The minimal mix I felt the experimental mix was too over powering
9	anonymous	The minimal

B.19

19. Now that you've heard both mixing approaches, do you think that mixing in general plays a role in how we perceive music? (e.g. the balancing, placement of sounds, creative effects like reverb etc.)

9 Responses

ID ↑	Name	Responses
1	anonymous	Most definitely
2	anonymous	Yes it definitely does
3	anonymous	Absolutely
4	anonymous	I believe that achieving the right balance for each instrument, along with careful arrangement, plays a significant role in the overall sound and effectiveness of a musical piece.
5	anonymous	Yes mixing is very important to how we perceive music. The experimental mix sounds lush, spacious, and dreamlike, whereas the minimal mix sounds far more vintage and typical of older jazz records.
6	anonymous	Definitely. There was a massive shift in how engaged i was when listening to the raw demo mix and the other mixes. I liked how polished the other mixes were, which is something i would usually associate with jazz.
7	anonymous	Yes, definitely. The balance, reverb and placement of sounds has a large role in how we perceive music. The two versions are the same in theory, but in practice they sound very different when different stylistic choices are made.
8	anonymous	Yes it makes the music alot easier to listen to and makes the instruments stand out in a much cleared tone and you can hear exactly what is being played
9	anonymous	Yes mixing is so important, it fullfils the potential when it the audio is not mixed

B.20

20. Is there any comments you would like to provide on mixing approaches in jazz? If so, please do.

5 Responses

ID ↑	Name	Responses
1	anonymous	From a personal standpoint I would like it if some jazz mixes were a little bit more experimental. Take a look at maybe Mansur Brown and his albums. But not the point where the music is indistinguishable. Ps Kofi Will you marry me
2	anonymous	None at all that i can think of
3	anonymous	Only which them demo was a little longer
4	anonymous	Honestly, I thought both the minimal and experimental mix sounded great. I don't think i have anything negative to say about them.
5	anonymous	If it sounds, leave it.