



SURROUND SOUND AND AMERICAN EPIC REPORT

Recording on Location

VEPT30012

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Introduction

This portfolio covers a project about surround sound mixing and a comparison between a stereo mix and surround sound mix and a project about immersive nostalgic recording methods comparing a 1920s style recording to a 1970s style recording.

1. Project Analysis: Surround Sound Track

1.1 Overview/Aim

The project's aim is to produce a mix in surround sound 5.1 and a stereo mix to compare them against each other while discussing the pros and cons of each and discussing the steps taken to achieve each mix. While keeping the mixes as close to each other, processing wise.

1.2 Rationale

Bayley's (2008) dissertation is useful as he explains his process for mixing in stereo and then going to surround sound to carry on the mix. He also discusses his process of recording the track for surround sound and he makes a point to do a stereo mix before the surround sound mix. This was helpful for developing a methodology as it gave a game plan to approach the track when creating it and how to approach the mix.

Blauert and Rabenstein's (2012) article explains how 5.1 surround sound immersive listening goes by the simple panning rule of amplitude difference and Menzies and Fazi (2019) explains that amplitude difference panning is the method of creating a spatial audio image by combining two or more sound waves which are focused at the listening position and have the same signal but individual gains, this gave further explanation of panning and allowed for more insight to achieve better panning processing.

Mateo (2006) explains how using the centre speaker during the surround sound mixing/panning stage is just as effective in surround sound as regular stereo mixes. He goes on to say that using the centre channel for the tracks typically heard in the centre of a stereo mix, like the bass, kick, snare, and vocals can be effective in surround sound and really ground the mix. He lastly mentions how some mix engineers will not use the centre channel at all which causes confusion for the consumers and may cause the issue of nothing coming through on the playback.

1.3 Methodology

When planning this session, the choice to create the song at home was done due to ease of knowing the equipment and environment better than the studios also due to the time limits of the university's studios but the studios was used to record bass for the track as for the last section of the song, the choice to use a real bass instead of a VST instrument was decided upon (Figure 1).



Figure 1 Yamaha BBN4 Bass Guitar

The bass decision was done as the song's reference was Heretic, Hero by Martin O'Donnell which has a bass guitar come in at 1:25m and continues throughout the rest of the track. (O'Donnell, 2004)

After the song was wrote, some minor mixing was done to the track before doing the final mix in surround sound. The main mix processing elements that was done for this track was compression and equalisation.

The compression was used correctively and only slightly, most of the tracks had the threshold set to only react to the highest peaks, with a ratio of 3.00 : 1, attack set to 30ms, release at 753ms. With only the flute having a different ratio of 1:25 : 1. The compression was set like this for all the tracks as this helped keep the peaks consistent in level and helped bring up quieter bits of the tracks while also setting the release so it never properly stops keeping the compression active to remove any obvious level pumping of the tracks. (Owsinski, 2017)

(Figure 2) The flute only has a different ratio due to the timbre of the instrument, being generally quiet in terms of its peaks, the ratio was set accordingly to the peaks of the instrument. (Owsinski, 2017)

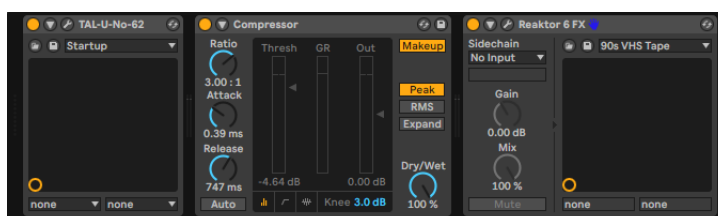


Figure 2 Compression

Only corrective EQ was used for each of the tracks, with every EQ being set to a band pass filter, this was done to remove any unwanted frequencies in the tracks, an example being the guitars, and as well to remove any excess weight from the track to allow for a more accurate RMS and a larger headroom. (Figure 3) (Case, 2011)



Figure 1 Corrective Band Pass EQ

After the mix was done it was time to take the stems to Studio 2 and make use of the 5.1 surround sound mixing system it has. (Bayley, 2008) (Figure 4)

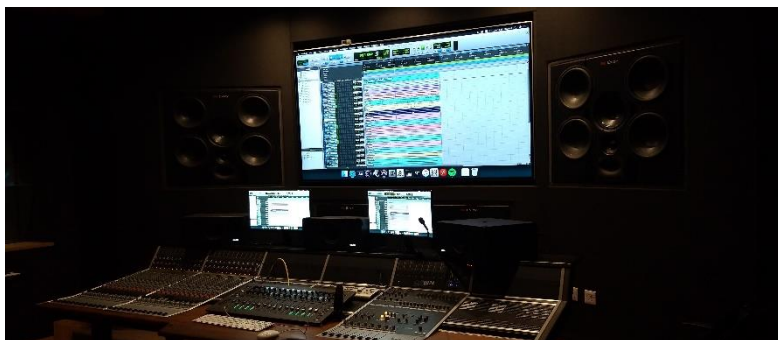


Figure 4 Studio 2 Mix

The first mixing step for the surround mix was a technique called mix building, which is the process of zeroing all the faders on the mixing desk, picking a track to focus on, which is usually the vocals and then raising its level until it sits around -10dB on the master fader, afterwards then raising all the other tracks to sit underneath the focus track as well as doing a level balance of all the tracks. (Owsinski, 2011) The focus track was Guitar 2 L/R as this was the driving force for the last part of the song, this method was adapted for the surround sound and stereo mix.

The next step in the surround mix was panning the tracks. The method for the panning was to do it like a stereo mix, but just make use of the extra spatial field, an example being the kick and bass was in the centre of the mix, while the percussion was far left. (Owsinski, 2011)

The main interesting development in terms of the panning was the arp synth and the part of the song where the guitars came in. The arp synth was automated to go around the listener, this was done by panning f/r pos left and right (Figure 5) which helped add a creative panning and effect utilizing the 5.1 system. With the stereo version, the arp synth was automated to travel from the left to right (Figure 6).

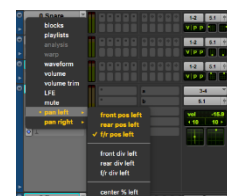


Figure 5 f/r pos left and right automation panning



Figure 6 Stereo automation

The next interesting automation panning done was for the last section of the song where the guitars come in, as without the automation the guitars, brass, clav, flute and juno all play at this section, with the current panning it became too crowded so the automation was set so the brass, clav, flute and juno would all be panned to the back of spatial field and the guitars would come in being panned hard left, right and in the centre making the spatial field clear again allowing for everything to breathe. (Owsinski, 2011) (White, 2009). Instead of an automation of panning positions in the stereo version, a level increase automation was done instead. (Figure 7)

The bass had a compressor set to these settings (Figure 8/9) (Owsinski, 2017). The reason why part 1 is different to part 2 is due to the sections of the song, part 1 takes place during the build-up the last section, whereas part 2 is the last section so the goal was to make the bass more impactful for the last section. (Owsinski, 2017). The same compression was done in stereo.



Figure 8 Part 1 Bass
Compression



Figure 9 Part 2 Bass
Compression

1.4 Data Analysis

The main comparisons between the surround and stereo tracks are the panning and spatial image, it goes without saying that the surround sound track is superior in this regard as it simply offers more spatial information and options for mixing, an example being the clav, juno, flute and brass being automated to the back of the surround sound track at 1.39 which helped clear up space for the guitars and bass to breath and carry the rest of the track, whereas there was no more space left in the stereo version so level automation had to be done to raise the volume of the four instruments. Neither are completely bad solutions, but the surround panning option has more creative and interesting choices instead of just raising the level. (Bayley, 2008)

Another comparison is that the surround soundtrack has a much larger spatial image, resulting in the mix sound much clearer as there is less masking and more room for each instrument to breath. (Bayley, 2008)

1.5 Evaluation

Panning is an important step of the mixing process to achieve a good sounding mix (Owsinski, 2011) but after this project it is fair to state that surround sound panning is much more important to the mix than stereo panning, due to the amount of space available, it offers opportunities to move instruments that mask each other and offer much more creative choices and outcomes, like the arp synth panning. This projects main negative factor is the shortage of time and lack of studio access due to the coronavirus, if this project were to be taken up again in the future it would be interesting to see how a full band recording and mix in surround sound and stereo would work and how the band react.

In terms of customer and client expectations it is safe to say that both versions of the track are fine and fit their role just fine, although the surround sound track version would be more awkward due to the surround sound systems not being entirely common place, but this problem would only be an issue if there was only the surround sound track, and even if there was only the surround sound track, the ease of simply re-mixing and panning the track to fit a stereo context is not challenging at all. (Bayley, 2008)

2. Project Analysis: American Epic Jazz Quartet

2.1 Overview/Aim

The aim of this project is to record an American Epic style track through studio 1's tape machine, The goal is recreate an authentic early style recording by keeping to the techniques used then, while comparing the tape machine recording to the Fourteen Rivers, fourteen floods track.

2.2 Rationale

American Epic is a series looking back at the history of when recording companies were made to search for new talents outside of their usual major cities. The main rationale from American epic is from the sessions, where they assembled the first electrical recording system from the 1920s and used one microphone to record the musicians, this made it a challenge for the musicians as they had really consider their volume as well as distance from the microphone. These sessions and series are the basis for this entire project. (Figure 1) (Figure 2) (PBS, 2017)



Figure 1 Close to the mic for vocal and guitar



Figure 2 Far away from mic for harmonica

Phonograph recording is a recording method of using an aluminium soap cylinder capture the recording by being etched onto it via a needle which vibrates from the sound traveling through the horn. The one shown in (Figure 3) is the Edison Phonograph which was created around 1903 to 1920. (Scallon, 2018) (Tripod, n.d). Phonograph recording was a difficult endeavour and even gave new musicians, horn fright, which was a term coined up due to the nervousness of recording on a phonograph. (Huber, 2014)



Figure 3 Edison Phonograph

Tape machines are typically used for getting a particular timbre, which is described as full, punchy, gutsy, and raw, that musicians and producers crave for in their sound. Limitations of tape often help towards the musician and producer's artistic style. Tape machines record the audio onto magnetized tape, this is what makes tape an analogue record as it transforms an electrical signal into magnetic energy to be playback and stored. (Huber, 2017)

2.3 Methodology

Due to not owning a phonograph recorder, a tape machine was used instead as it is a staple of early recording technology. (Huber, 2017). The microphones were set to a seating level as the vocalist, who is the main focus of the track was sitting down, all the other musicians were positioned around the microphones at certain distances and angles to achieve the best sound, as instead of doing the standard mixing done on the mixing desk, the idea of the American epic is to position the musicians differently to achieve a mix. (PBS, 2017) This was the case of recording onto a phonograph recorder as it did not give the choice of level faders. (Tripod, n.d) (Huber, 2014) (Scallon, 2018)

The microphone used for the tape recording was the M150 Neumann Tube microphone, as this has an excellent omnidirectional polar pattern, only having a minor setback at 16kHz within the 180° to 90° region (Figure 4) (Neumann, 2020).

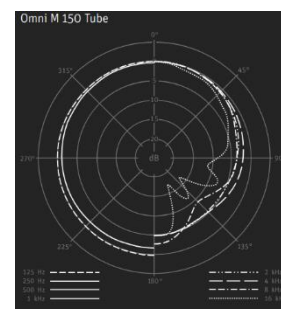


Figure 2 Omnidirectional polar pattern

After recording four takes, with adjusting the musicians for each one, the decision was made to choose the fourth take as it supplied the best positioning of each instrument and had the vocal sitting nicely in the front. (PBS, 2017)

Then to capture a digital and more easily accessible version of the tape recording, it was then play back through pro tools and recorded. (Figure 5)



Figure 3 Tape recording being recorded into pro tools

2.4 Data Analysis

Comparing the tape recording to the song fourteen rivers, fourteen floods by Beck a big different between the two is the quality of the recordings themselves, as the American Epic recording has low fidelity qualities about it as has a very raw, distorted tonality to it especially when the backing vocalists come in at 1:12 as well as a noticeable lack of high frequency content within the recording whereas the tape recording is clean and has no distortion or low fidelity aspects to it and does not suffer some a lack of frequencies (Figure 6)

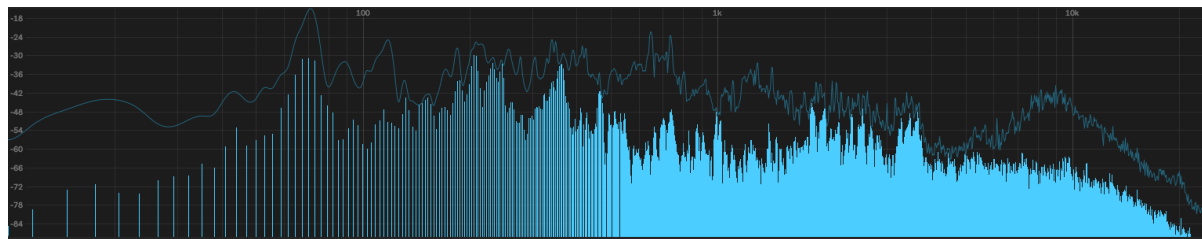


Figure 4 Frequency of Tape Recording

In terms of recording style and outcome, both are very much similar as they both sound like an early style recording and both have a good balance of all the instruments and primarily focus on the vocals and lead instruments but the tape recording suffers due to the use of the equipment, as it does not have that nostalgic characteristic like the Beck track and this is due the recording being too high fidelity and being too clean. (PBS, 2017)

2.5 Evaluation

The tape recording achieves its goal of being an American Epic style of recording, but due to this complete different in recording quality it is hard to listen to the tape recording and get that nostalgic quality to it, as Becks really sounds like it was recorded in the 1920s whereas the tape machine recording sounds like an artistic, creative attempt at capturing an early recording style. (PBS, 2017) (Scallon, 2018) (Tripod, n.d) (Huber, 2014).

The only thing in this project that could have been done differently is use more similar equipment to the American epic, a different microphone, and a different recorder but overall the tape machine recording is an effective recreation but lacks that low fidelity quality that the Beck recording has.

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Appendices

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