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SHORT FILM SCORING

USING BRASS AND STRING INSTRUMENTS TO CREATE A FILM SCORE IN SURROUND SOUND

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ABSTRACT

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The sounds created by string and brass instruments have for centuries been the sonic source for strong emotional impact in storytelling. Starting from theatre, opera and symphonies it became a powerful way to enhance the emotional connection with what was perceived visually. Naturally it laid a strong foundation for film scoring and still to this day it is primarily what film makers rely on in order to gain a powerful effect on the audience.

This thesis explains the methods of using string and brass instruments in a film score and its effect on a contemporary short film. The characteristics of the instruments used are discussed and analyzed in order to understand their role in the story and the recording methods used. It is then explained how the recordings are processed for the films 5.1 surround sound environment.

Creating a score in 5.1 surround sound environment by recording strings and brass contains number of variabilities that are concluded in this thesis. From the creative process to the technical implementation, this process is explained in detail and supported by qualitative research that was gathered from various literature works and web sources made by experts in the field.

Key words: Short film score, 5.1 surround sound, strings, brass

CONTENTS

1   INTRODUCTION

Film music has the quality of adding a new dimension to the viewers perception. The music that is specifically designed to accompany a film is called a score. A score is composed in order to enhance the visual story seen on screen. With the power of evoking emotions that tap into a personal stream of thinking, it can control the attachment and expectations of the audience towards the story. The melodies and rhythms in the scenes and the design of the dramatic structure within the whole film is a creative process that requires time and thought. As technology has advanced at an exponential rate, film scoring has also adapted to the new methods. Classical orchestral compositions are now blending in with unconventional electronic sound design, creating an entirely new world of possibilities left to be explored.

The aim of this thesis is to explain the process of creating a score for a short film by composing, recording and arranging strings and brass to accompany the films sound design in a 5.1 surround sound sphere. The process requires research into the history and into the minds and techniques of film composers and story tellers. It dwells into the characteristics of the instruments chosen for the film and the utilization of them in the story telling process. The recording procedure is a vital part, in order to capture the natural characteristics of the acoustic instruments used in the score. It is therefore described in detail how the sound was ultimately captured, and how the audio can be processed after the recording.

FILM MUSIC

Music has a magical quality to evoke strong emotions in us. Rhythm and melody have a deep imprint in the human history and has the ability to lead the listeners into various states of mind. Film also drives to awake feelings in the audience through the story line and the use of colors and framing in the pictures. Seeing actors and actresses executing a perfect performance is easily the most approachable emotional connection that is available in cinema. However, when adopted rightly, music is the element that can move us without visualization or even verbalization. It has the capability of tapping into our imagination, into our fantasies, past, present, future and places we might have difficulties to describe. (Porter, S. 2015.)

Nanette Nielsen, a musicology researcher points out in an article on the psychological effects of film music that it is likely that sound and music affect our behaviours and moral attitudes. It affects us while watching films and after. The experience that we encounter through sound and music can help us to reflect on and influence our actions in the same manner that many other experiences can. (Pileberg, S. 2015.)

Music has always been a personal yet mysterious entity in human history. It has deep roots within our perception and has constantly questioned the ways we feel about things. The knowledge, and the skill to control this entity is a vastly precious tool when it comes to film story telling. Philip Brullmann refers in his essay *How Music Builds Character* (2013, 357) to Aristoteles, who wrote in *Politics VIII 5* on how music affects the characteristics of its listeners:

> In rhythms and melodies there is the greatest likeness to the true natures of anger and gentleness, and also of courage and temperance, all of their opposites, and the other characters. This is obvious from the facts: we undergo a change in our souls when we listen to such things. (Aristotele, transl. Kraut, R 1997, 1340a14–b5.)

In film music the melodies and rhythms play a key role in the story telling. Sometimes we may connect two worlds that have been entirely separate in our minds but make us realize something new in the way we have perceived before. For example, a nostalgic sound or an old piece of music we have a specific connection to, could be brought to us in a completely new light. It could be a new comic pattern we have not been able to see before and by connecting the sound and picture together we create a new way of perceiving something that we have already encountered and processed. (University of Groningen. sciencedaily. 2011.)

The procedure towards how these elements play together and create such affects in the listeners can be either very complex or very simple. Mostly it is the latter that has a more grasping effect because it gives the listeners space to imagine for themselves. Fernando Arroyo García Lascurain uses the term *musical tropes* when explaining the effective sonic means of a musical interpretation of a narrative entity in his dissertation: *Affect and Feelings: The Persuasive Power of Film Music*. He explains the term as: "Musical signifiers that have become conventional, be they harmonic progressions, melodic contours, instrumentation or the use of folk elements." (Lascurain, A, G. 2016, 2-3). Listening to film music we come across these musical tropes and attach narrative association to them (e.g., the high strings in the shower scene from Psycho, or the ostinato low strings in Jaws main theme, signifying danger or horror); these associations can be intrinsic, learned, direct or abstract (Lascurain, A, G. 2016, 2-3).

1.1 History of film music

Film music developed naturally from live symphony orchestrations, theatre and operas into the high-end surround sound cinemas we have today. Well renowned European classical composers moved to Hollywood in early 20th century to escape the conflicts in Europe and build a career in the new exciting medium of film scoring. The increasing development in sound and cinema technology was constantly changing the way film music was produced and perceived. The film industry had to keep up with the new trends that were set by the new cultural movements and attitudes. Film music has travelled a long way since its first days but still the core methods used to empower the visual story are present to this day. (Davis, R. 2010, 28, 35-40.)

1.1.1 The development of sound in cinematic entertainment

After Thomas Alva Edison had invented the phonogram in 1877 and after it quickly became the most popular household entertainment device of the century, Edison realized that a visual accompaniment had to be created. Edison and his assistant William Kennedy Laurie Dickson developed the Kinetograph along with the Kinetoscope in 1888 which made viewing of films possible. From there forth the device was copied and modified worldwide and eventually inspired the Lumiere brothers, Auguste and Louis, to invent

the first projector in 1895. (Sklar, R & Cook, D, A. 1998.) However, when moving pictures slowly started to be an actual form media in the late 19th century most of the time sound was added to the picture by live musicians. The first documented film screenings with musical accompaniments were some of the Lumiere families´ productions in 1895 and 1896 in London and Paris. After these screenings live orchestral music in theatre screenings grew widely popular. (Davis, R. 2010, 5.)

The need for film music was rising and inventions to compose accurate music for the films were emerging. The concept of actual tailored scores for film was well received but was simply too expensive for it to take hold in the early 20th century. An invention that helped the live music to fit the emotional display seen on screen was the Music Fake Books. These were books written by composers that included musical selections, composed to fit various moods for films. This then developed into the invention of musical "cue sheets" which were created each specially for the individual films. This invention allowed the musicians to have a musical script that followed the specific wishes of the film makers themselves. (Davis, R. 2010, 6,10.)

The development of synchronized sound to film began in the mid 1920s. By that time, Western Electric, had developed a sophisticated sound-on-disc system that went by the name of a Vitaphone. It was marketed to Hollywood in 1925 but was turned down by the major studios. Warner Bros, however, did find its potential. At the time still a minor studio, yet in the midst of major expansion, Warner Bros bought the system to provide synchronized music for its films at the second- and third-run exhibitors that could not afford an accompanied live orchestra. Warner Brothers debuted the system in 1926 the film Don Juan that featured a score performed by the New York Philharmonic Orchestra. Along with the enthusiastic response, Warner Brothers announced all of its releases to have synchronized musical accompaniment. This announcement led to the phenomenal premiere of The Jazz Singer in New York 1927, which included synchronized popular songs, incidental dialogue and an orchestral score. The film was a huge success and opened up a whole new era for cinema. (Davis, R. 2010, 13,14.), (Sklar, R & Cook, D, A. 1998.)

PICTURE 1. The Jazz Singer debuts as Warner's Theater at 1664 Brodway. (Photo: The Bowery Boys: New York City History. 2019)

After the sounds could be synchronized, musicals became a big part of cinema, everything was still recorded straight on set. The development of technology brought a lot of problems also for the film makers while aiming for the optimal goal of effectiveness in cinema. Actors had to be still while delivering their dialog to the microphones used. Microphones where clumsy and had very limited frequency range. Because of their omnidirectional pickup-pattern they also picked up all the sounds of the set. Cameras where noisy and had to be enclosed into soundproof glass boxes which restricted the cameras movement. This is the main cause of the static nature of the films during this time. (R. Sklar & D. A. Cook, 1998.)

In 1931 a new technology freed the music from the confines of the shooting set. It allowed music to be recorded separately and eventually allowed the music, dialog and sound effects to be mixed together. A process we know today as "dubbing". In the early half of the 20th century music studios and all the staff needed for the scoring projects worked under one roof. The film studios used to have all the staff for all individual departments hired for their projects and one film would often have a number of composers working

on a score. Nowadays everything is contracted outside the studio with one composer per score. (Davis, R. 2010, 15-23.)

1.1.2 Golden age of Hollywood

The golden age of Hollywood started as soon as the technology of the studios became advanced enough for films to have sounds and scores arranged and recorded for the films. Studios were in great need of accomplished composers at this time and a lot were sent for overseas from Europe. It was known for a number of European composers to have had conservatory training and well versed in classical music styles of the 18th and 19th centuries. This was the time before the second world war had started and a lot of Jewish originated composers fled the arising nightmare in Europe to settle in this exciting musical period in Hollywood. (Davis, R. 2010, 28.)

The dramatic scores were interpreter and composed by well renowned classical composers, yet the films were not specifically aimed at an intellectual, or well-educated audience. The target audience was at the great middle which accompanies why this period in time from 1930 to 1950 Americans were attending cinema more frequently than at any other time in history. However, a high standard was set for film music in Hollywood at this time. Including composers like Max Steiner, Erich Korngold, Branislau Kaper, Miklos Rozsa and Franz Waxman they composed in a style that was skillful, yet familiar to the audience and not too unconventional. Possibly the most well renowned composer of this period: Max Steiner, wrote over 300 scores including the ground-breaking score of King Kong. These composers had their background in styles from operetta to grand operas, and so were well versed in the combination of drama and music. For example, in opera, the use of the same musical phrase (theme of motif) was often used repeatedly to reinforce certain emotions during the story, therefore the harmonic structures and the thematic developments of the music were easily understood by the audience. These composers were also known for their strong influences of the 19th century late Romantics: Wagner, Brahms, Mahler, Verdi, Puccini and Strauss. (Davis, R. 2010, 28-30.) In the following, Elmer Bernstein describes the musical taste of director Cecil B. DeMille and what it meant to be influenced by Wagner:

> DeMille was a great Wagner lover. His concept of film scoring was utterly simple and very Wagnerian. Every character had to have a theme or motif. In addition to the characters having themes and leitmotifs, certain philosophical concepts had to

have motifs too. God, good, and evil each had to have a theme. The idea was that whenever a particular character was on the screen, his theme had to be present as well. It was all very Wagnerian. (DeMille as cited in Davis 2010.)

1.1.3 Breaking the conventional style

Up until the 1950s, film music had been deeply rooted in the influence of the 19th century style. Other styles were not even thought about by the film composers of this generation. However, by the early 1950s there was a number of American composers already working in the studios. Their background was not only in traditional learnings of harmony and theory influenced by composers like Bartok, Schoenberg and Stravinsky. They also had a thorough knowledge of jazz styles. This opened up a whole new inspiration for their compositions in film music. The film that broke the mold of the early 20th century film style visually and sonically was Citizen Kane, by Orson Welles and scored by Bernard Hermann. The unconventional style of Citizen Kane was surely ahead of its time in 1941. It was ten years from this film that movie makers and composers were to adapt to the style influenced by this production. (Davis, R. 2010, 35, 36.)

The 1950s was ground-braking time for film and music. The film industry was strongly influenced by the arrival of television and the birth of rock-and-roll music. Films started to address themes on youth, rebellion, alcoholism and drug addiction, also known as "rebel" films. Along with the rebel films also came a movement of big epics, often based on biblical stories like Ben-Hur and The Ten Commandments, that required a more conservative, Romantic approach to the scores. Film scores have a raw, edgy sound to them by using jazz elements and dissonance in the compositions. Other musical genres also started to rise strongly in the US. Not only jazz, but big-band swing and bebop started to have a big influence on the new musical culture amongst the youth and this could be noticed in the cinemas. (Davis, R. 2010, 35-40.)

After realizing the financial potential in the popular trends, studios have also realized the benefits of having a hit song in their films. Hit songs had the habit of luring audiences into the cinemas and with the copyrights owned by the studios, they could collect royalties from the song player on air as well as revenue from the records sold. At first these songs were either sung by a character on screen or played at the end of the movie along with the credits. After noticing the favor behind these songs in films, producers started to use them disembodied from the film. Moving, from having a dramatic reason or applicable lyrics, to just "dropping" songs in the film, for many, the reason of having a song in the film

became solely an endeavor of a big hit and the generation of royalties. (Davis, R. 2010, 41,42.)

The rise of rock´n oll started to have a huge impact in the soundtracks of the 60s films. A big push for the rock´n roll soundtracks came through the popularity of the Beatles films, A Hard Days Night and Help!. A good example of the soundtrack of this era can be heard in the cult classic, Easy Rider, that included a number of songs from the popular bands and artists of its time like The Grateful Dead, Bob Dylan and Simon And Garfunkel. (Davis, R. 2010, 42.)

The ´60s was also an experimental time for orchestral scores. The creative use of dissonance, meaning notes that do not sound pleasing to the ear when played together, was used to create a sound that had an unsettling and eerie effect on the audience. This was primarily used in westerns and from there moved to other genres like science fiction and suspense movies like Psycho (1960) and Planet of the Apes (1968) Instruments would also be used in unorthodox ways to create weird sounds that would be hard for the listeners to identify. This technique was also used to create an unsettling feeling for the listener. (evolution of music in movies, reelrundown, 2016.)

Spaghetti Westerns brought back orchestral scoring to an extent in the 1960s. The name spaghetti western was mainly used by American critics because of the films´ Italian directors and producers, but also had a widely international crew working on them, also from which Clint Eastwood became well known for. The western element to the otherwise orchestral score was created by adding Spanish trumpets, harmonicas and twangy guitars. The scores were designed to create a suspense to the films wide open spaces and looming shooting scenes. Most popular composer of this genre was Ennio Morricone whom collaborated often with the director Sergio Leone, whom was known to play Morricone´s music also on set to get the actors and actresses emotionally prepared for the scenes or even during the scenes. (reelrundown, 2016.)

1.1.4   From avant-garde to contemporary

Experimentations within the music production industry were raised to a new level after the exponential advancements of studio technology and especially multitrack recording. The music composers and producers had now more freedom to experiment with new

sounds and textures and this was making its way to the film scores. Jerry Goldsmith became well known for his experiments of sound textures in his compositions. One of his most famous works can be heard in the film Chinatown (1974) which boosted the films popularity alongside with Jack Nicholson´s capturing performance. Goldsmith created uniquely dark and mysterious textures for the score by using four pianos, two harps, a trumpet and strings. He especially experimented with the sounds of the pianos by detuning the them, playing the strings inside of the piano and damping the strings with various objects. (Davis, R. 2010, 46.)

From 1960s to 1970s a lot of movies favored the nontraditional approach to film music and instead of composers making orchestral scores for the films, it was popular music that often seemed to make it to the movies. However, at the same time as Goldsmith´s avant-garde score for Chinatown came out in 1964, John Williams´ score for Stephen Spielberg´s film Jaws was released. John Williams´ neo-Romantic arrangements developed into a suspenseful orchestral score that was believed to have begun a resurgence of traditional orchestral sound. A couple of years from this, in 1976 John Williams composed the score for Star Wars that made him the renowned composer he is to this day. (Davis, R. 2010, 46,47.)
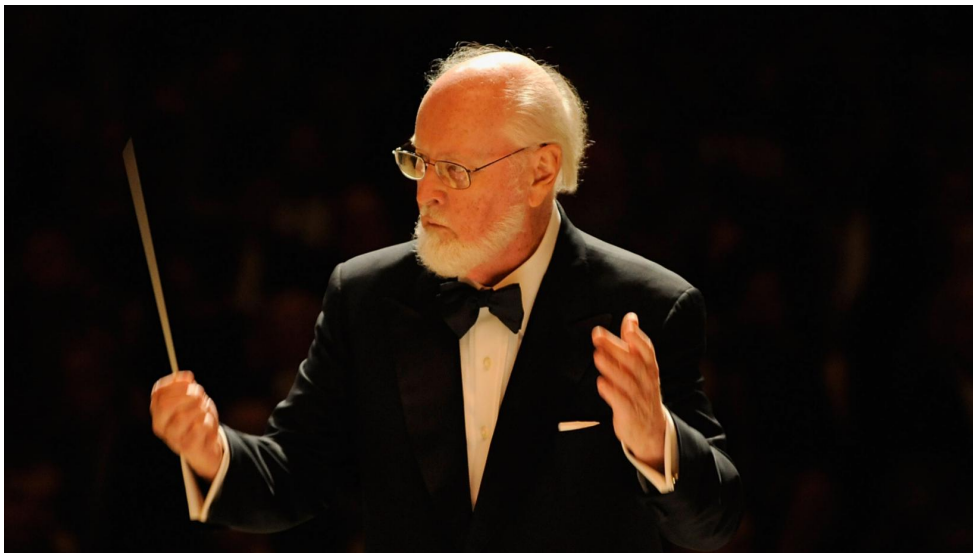
PICTURE 2. John Williams. (Photo: Paul Marotta 2018)

Another big phase reached the film industry in the late 1970s when synthesizer technology had advanced to the point of being available and affordable. Though used before, this technology was no longer a hard task to work with. Manufactures had also invented a technology called MIDI, Musical Instrument Digital Interface, that was a language used for the communication between synthesizers and computers. The synthesizer technology

was used before in films but only for spooky sound purposes. This all changed when Vangelis sored the 1981 film, Chariots of Fire, with a dramatic and emotional music by only using analog synthesizers. It was a huge impact on the success of the film and proceeded to becoming a commercial hit and selling millions of records. This score changed the way the whole industry perceived film scoring. Producers started to ask for similar music for their films and a lot of composers would learn the new technology. Though the new technology quickly moved from analog to digital and became extremely sophisticated, opening doors and enriching the possibilities of a lot of open-minded composers, it left a lot of live musicians and orchestras out of work. (Davis, R. 2010, 48-50.)

1.2   Modern film scoring technology

The rise of music technology gave birth to a whole new kind of film composers. Ones that were experts in synthesized sounds, MIDI technology and sampling. Analog tape was rarely used after synthesizers and samplers were recorded straight to a computer, also known then as sequencing. One of the masters of this art was the German born composer Hans Zimmer, whom with his team has been since driving this technology forward and developing new sounds with samplers and synthesizers. However, after realizing the potential of both, acoustic and electronic scoring, Zimmer has been combining both of these ways into magnificent interpretations of music in films still today. (Davis, R. 2010, 51.)

After the quick rise of synthesizers and their affordable and affective way to score films was soon seen to have a downside to the music itself. It became obvious that some producers were using this technology mostly to save a money on the budget and as a result orchestral sounds where produced by synthesizers and computers, ending up sounding dry and fake to the listeners ears. (Davis, R. 2010, 51.) They lacked the human element that only acoustic instruments could fully produce. After realizing that the real orchestral sound could be properly only produced by a real orchestral recording, composers started to combine these two worlds and adding the electronic element to the acoustic recording as a sweetener in a lot of cases. Composers started to use the MIDI technology to use as electronic demonstrations to the final score, also known as mockups. This was a far more efficient way to show to the producers and directors what the ending orchestral score would sound like, compared to demonstrations on piano. (Karlin, F, Wright, R, Williams, J. 2004, 101, 370.)

Through this technology, todays film composers are expected of a different skillset compared to the experts when film scoring first became a profession. Todays´ composers have their own studios and are surrounded with the latest music technology, helping them to produce the demanded high-quality mockups and final scores to the studios in an efficient time. While composers from the past were expected expertise in orchestration, composition and sometimes conducting, todays composers have to have the expertise in audio production and the technical side. (Davis, R. 2010, 55.) Composers today have everything they need for film scoring right at their fingertips. Digital Audio Workstations (DAW) are software´s (e.g Pro Tools, Logic pro, Ableton, Cubase) that withhold a vast number of synthesizers and sound samples that can be arranged easily to a film on a computer. Today composers have the possibility via internet to purchase different plugins for their DAWs that work as digital instruments or sound processors. The possibilities have become limitless within the music production field. (audiomentor.)

1.2.1 Unconventional methods

As described before there is a conventional mold that has formed through the decades of film scoring. The sonic dramatic structures have been canalled through the dynamics of orchestral instruments. As time moves on and the innovative nature of people evolve, unconventional approaches immerge. The technology we possess today has not only given sound designers possibilities of creating new sounds from synthesizers but has also given the possibility to manipulate recorded sounds into alien textures. Yet these textures may tap into a human resemblance of the origin of the sound. These new methods have given composers and sound designers an exciting new ground for sonic creation. (Finamore, E. BBC. 2018.)

Graeme Revell explained that the sampling of instruments and old synthesizers developed a kind of "recycling" approach to his sound design:

> The more atonal techniques and the aleatoric and what we call ramps, where the whole orchestra crescendos to a particular moment – often I will record those not to picture so I have a library of those. I´ll be able to time-stretch them and use them in a new situation. (Graeme Revell sites in Karlin, F, Wright, R, Williams, J. 2004.)

Carter Burwell also used some unconventional methods in the scoring for the film: Blair Witch 2 (2000). The inspiration came from the films´ idea having the evil hiding in the forest but is never really seen. Sounds were created with trash cans and bicycle spokes being played, which afterwards were processed to a point of being unrecognizable compared to the origin of the sound. He also recorded sounds of rocks being hit together, stones dropping into water to be played in a rhythmical fashion as to refer to the unknown evil in the forest. (Karlin, F, Wright, R, Williams, J. 2004, 374, 375.)

1.2.2 MIDI orchestration

Orchestrations created entirely within DAWs are called MIDI orchestrations. It uses samples of phrases of recorded real instruments that can be then digitally reproduced and played with a MIDI keyboard. This phrase can be played back at various pitches as instructed by the MIDI keyboard. (Davis, R. 2010, 58.) MIDI orchestration allows composers to work in a very efficient time frame and create music directly to the picture. Working this way in a DAW allows notation to be automatically produced within the software and the music can be easily recorded while played through MIDI. (Davis, R. 2010, 148.)

Though MIDI orchestration requires a lot of the same skills as real live orchestration, it is significantly more time saving mean of producing an orchestral score than to conduct a live orchestra. Paul Gilreath explained this method in his book: The Guide to MIDI Orchestration 4th edition:

> MIDI orchestration (also known as virtual orchestration) is more than composing and assigning different parts to various MIDI instrument. It is the total process of employing MIDI, samples and sampler, sound modules, processing hardware and software, and recording gear to achieve maximum realism, ultimately creating the wonderful experience and sound of having a true, living orchestra within your own working. (Gilreath, P. 2010, xi.)

The demand for big orchestral pieces has grown as the technology and ways to create realistic orchestral compositions through MIDI orchestration has exponentially advanced. Producers are aware that orchestral pieces have become a possibility even for low budget productions. Successful MIDI orchestrators are expected to have knowledge both in live orchestration and working with computers samples and MIDI. However, with this method comes also the responsibility of playing each instrument, processing the sound of the samples and adjusting volume and panning of the whole orchestra. Areas of work that otherwise would belong for conductors and players have now fallen on one person.

Though the new technology gives a vast amount of advances, it also brings a lot of specific detail for the composer to work on. Creating pieces for a number of instruments, is much more easily implemented virtually than a realistic sounding solo instrument. The sound of an individual instrument has a lot of detail to it which is hard to create without losing the humane feel of the sound. Instruments have each a significant timbre to their sound that is born through the material and shape of the instrument and the way it is played. It is not uncommon for composers to create MIDI orchestral compositions and add live recorded solo parts to it afterwards. Orchestras are also recorded often in large spaces which creates a natural reverberation to the recorded sound. In the end there is a lot of factors to consider when trying to simulate an orchestra virtually. (Gilreath, P. 2010, xii, xiii.)

2 APPROACH TO SCORE STRUCTURE

The approach to the composition of the films´ music was inspired by the changing emotional moods within the film and its slow and haunting phase. There is a lot of movements from cold to warm and from city to countryside, so the mixture of acoustic and electric instruments became strong theme. The whole feel of the movie is created through the stirring mixture between the comfort of love and presence of abandonment. There is an eerie presence to the whole film which is powered by the lingering unanswered questions and the absence of dialog. It became evident that the sounds of cello and violin would bring the feel of an old traditional atmosphere, yet through the composition of these instruments, an uncomfortable element could be summoned. The visuals of the film also play a lot with different spaces, moving from vast lake and forest shots to confined spaces. The thought of accompanying brass instruments to create a warm bedding for the string melodies and to give a sonic sense of space became evident. The whole theme for the overall structure for the score formed through the minimalistic requirements of the story.

2.1 Style and influence

The approach to the scoring of the film for this thesis was influenced by a lot of composers, music and film makers, but mainly the influences were drawn from the eerie yet beautiful scoring of Mica Levi and the jarring use of music in picture of David Lynch. Randall Poster, a music supervisor worked on films by Martin Scorsese and Wes Anderson, explains in an article by The New Yorker about what makes Mica Levi´s scoring unusual. In this case the score for the film Jackie, he says: "it's elemental to the storytelling—it's not a companion; it's the marrow of the narrative." The way the music is used in the film gives the scenes a whole new dimension to what is happening. The way the director of Jackie, Pablo Larrain, and Mica Levi worked together to arrange the music to the Film shows how two great minds an able to create a world otherwise unfound. For example, in a scene showing J.FK´s funeral procession Larrain picked a piece of music by Levi that had Bernard Herrmann-like strings and would have imagined being accompanied to a bleak and haunting scene. However, the music ended up in an emotional and patriotic scene. This was the style that a lot of the arranging for the score was made. The unconventional route of not layering a sad note on a sad scene was the style they ended up developing a liking to. (Beauman, 2017. newyorker.)

Levi´s First score of her career for the film, Under the Skin, in 2013, brought the attention of film makers after its hauntingly beautiful string melodies and slow rhythms made and unforgetful impact on the audience. Jayson Greene describes the way Levi´s score sets the mood in Under the Skin in an article on Pitchfork.com:

> The score opens with a locust plague of dry tremolos, the strings pressing down until the sound has reached a roar. It's a sound with tremendous menace and weight. From there, the roar shrinks into a whine, and enters a hazy nexus between digitally processed and live sound. The music unfolds as deliberately and as unconsciously as the dreamlike film itself. Levi drops in an arching, three-pitch motif at various points, one that lingers on its highest pitch the longest, like a hanging doubt. In "Lonely Void", this figure is colored in briefly by a furtive patch of tonal harmony, a startling appearance of warmth that scrubs itself out as quickly but leaves a powerful impression. (Greene, J. 2017.)

This score possesses the quality of entering inside the characters mind and adding haunting glissandos to twist the mind to a state of unplaced curiosity. Mica Levi explains the process of creating this kind of changes of atmosphere in an interview in the guardian sited in Pitchfork: "We were looking at the natural sound of an instrument to try and find something identifiably human in it, then slowing things down or changing the pitch of it to make it feel uncomfortable,". (Greene, J. 2017)

David Lynch uses music in his movies to a great extent. As a musician and a sound designer himself he involves himself in the sound production and musical directing. He approaches the film and music in his own experimental way. Often recording film music together with composer Angelo Badalamenti before there is even any picture created. (O´Falt, C. 2018.)

2.2   Composition

The composition was implemented within Logic pro x, a Digital Audio Workstation that has the properties of composing sheet music through MIDI programming. The raw cut of the film was sent to me and it was added to Logics video universe. In this way Logic enables you to compose music onto separate tracks within the same time frame when following the video content. Logic comes with a variety of plugins and audio samples of a vast variety of instruments and sounds. In the composition of this score I used a plugin called EXS24, which is a sampler that enables sophisticated modulations of any audio brought in. I used this sampler to do minor modulations for the string and brass instru-

ments that I used for the score composition. This sampler also allowed me to create glissandos for the string section. A minor problem that occurred at this stage was the translation of these glissandos to sheet music within Logic. This was because Logic creates the sheet music directly from the MIDI data but does not translate the modulations that are created through the plugins. Though these glissandos did not transfer into accurate markings on the sheet music, it was still a valuable feature that allowed me to demonstrate the desirable objective to the musicians.

The short film was 15 minutes long all together and included a four-minute music-video-like, fully electronic part, that I had composed specially for the scene. However, I wanted to add the elements of strings and brass for this scene to act as a link between the rest of the film. This piece of music was created around a choir sample which had been processed and dropped down in pitch. The choir sample heard in this track is used subtly as a motif through the film, making connections and acting as leads for the viewer. This scene was to be the source of everything that was happening in the film, which was why it needed the acoustic element of music that was present throughout the story. I added wave-like brass and strings swinging in and out at the end of the track creating a dreamy state for the scene, that worked as a stepping stone for the rest of the film.

I ended up creating three compositions for the film. Each one I composed with an idea of a scene in mind. However, all of the compositions were designed in a way that separate parts could be used in various scenes of the film and could work even when arranged together. The first composition carries a heavy theme that was originally composed for a viola, cello and two violins. The first number was originally composed for the starting scene of the film where the camera moves through a bleak forest with haunting violin glissandos. However, the composition turned out to be too heavy for the starting scene, but because of its style and minimalistic nature, I was able to use some of the individual glissandos in other parts of the film to emphasize the ominous entity that is present throughout this film.

The second composition is introduced by a soft melody played by French horns. There is a slow constant beat that follows throughout the composition but is hardly noticeable. The composition falls into a slow interaction of cello harmonies and French horns riding in and out in a slow rhythm. The low and slow beat adds a dragging rhythm, which played with the wavy harmonies of the strings and brass creates almost a trance like state for the scene. These harmonies are then accompanied by a solo violin and again by a solo cello.

This part of the composition is warm, hopeful and melancholic, but ends with an eerie violin accompanied by the slow beat, which are then surprised by horn crescendos. The ending part of this composition I used separately in scenes that required dark textures and ambiences. The warm nature of the horns and strings in this piece was a necessary requirement for the warm start of the film and the hopeful ending. The horns were edited to be played on their own for the starting scene. For the ending scene the horns and strings are played simultaneously to create an epic conclusion. A solo cello was also added to the ending scene to emphasize the emotional awakening of the main character.

The third piece consists of two French horns, two cellos and two violins. These instruments are arranged in a way that they are layered on top of each other creating harmonies that occur in a slow rhythmic way, always followed by a long pause. This arranging creates an eerie calling and ends up with fog horn-like cello repetitions which are then accompanied by ghostly violin glissandos. Sometimes in creating an uncomfortable feeling with strings the glissandos are layered so they are gliding in and out of tune with each other.

3   CAPTURING THE SOUND OF THE INSTRUMENTS

The instruments used in the creation of this score were decided on the characteristics of the sounds of each individual instrument and hence the feeling it would bring to the story. In an otherwise unconventional film with electronic music elements and unnatural scenarios it also has very relatable scenes that required a natural source of sound. The mood throughout the film is mostly set by long haunting visual scenes that score-wise required a minimalistic ambient-like sounds. For these reasons the traditional instruments of an orchestral setting were chosen.

When it comes to recording acoustic orchestral instruments like strings and brass there are a number of variables that have to be taken into consideration. Each instrument selected for the score have their own unique characteristics. The quality of the final sound captured is the sum of a variety of variables that occur in the recording session. Firstly, the quality of the instrument together with the skill of the musician (the sound source) is the most important of this signal chain. Secondly, the room in which the instrument is been recorded and how the microphone or microphones are placed within that room have a significant impact on the sound. Thirdly, the quality of the microphones used in the session and how they are placed in that room give the sound its final characteristics, which can vary quite drastically. The recording techniques are adjusted by the characteristics of the instruments and how the sound reacts in the recording space. The types of microphones and their pickup patterns have a crucial effect on the final sound. (Senior, M. 2015, 171,172.) Having in mind the final sound source that was going to be a surround 5.1 space can add up possibilities and variables in the recording session.

3.1   Timbre

Each instrument has its unique tone color to the sound in produces, or timbre, as it is also called. The timbre of each instrument is important in the process of designing a score and recording the instruments. The timbre of the instruments is created from the material and the way it is built and played. Each instrument produces a series of frequencies on top of the fundamental note played. These notes are called overtones, or the harmonic series. The timbre of the instruments can be modified by using different styles of playing, e.g.

violinist plucking the strings of the violin or applying extra pressure to the bow. Understanding the harmonic series of the instruments helps to produce the best sounding result when capturing the sound of the instruments and in the mixing stage. (teachmeaudio.)

3.2 Microphones

When picking the microphones for the recordings for this score I wanted a couple of good sounding pares that could be used for stereo miking, but also a warm sounding condenser microphone that could be mixed efficiently together in the final 5.1 sound space. Condenser microphones are good in picking up a wide frequency range of the instruments as well as the transient response. Especially a condenser microphone of a good quality will manage to capture subtle characteristics in timbre, resonances and the overtones of the instruments. (Tucker, A. 2017.)

The Neumann U87 (picture 4) was an ideal microphone to capture the warm nature of the strings. The U87 is a multidirectional condenser microphone which means that it is possible to choose from pickup-patters of: Omni directional, cardioid and figure of eight (See picture 3). These determine the direction of which the microphone captures sound and opens multiple options of microphone techniques that could be used. For the recording of the violin and cello I used the cardioid pickup-pattern which allowed the sound to be captured from front and sides concentrating on the direct source of the sound. (coutant.)
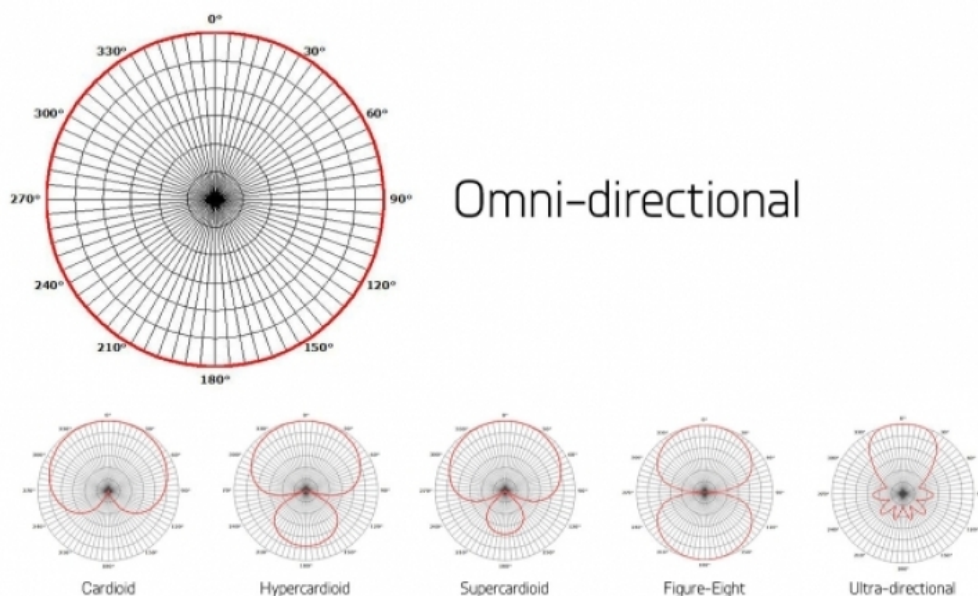
PICTURE 3. Microphone polar patterns. (By: soundtech)

(PICTURE 4. Neumann U87 Microphone. Photo: www.Coutant.org)

To capture a wider sound of the instruments I wanted a good stereo pair. For this the Rode NT5 microphones (picture 5) promised the best results. The NT5 is a small-diaphragm condenser microphone that suits the recording of acoustic instruments. The polar-pattern of these microphones are fixed to cardioid, which is perfect for stereo-pair recording. (rode.com) I used the NT5 microphones in all of the sessions: as a stereo pair with the violin and cello, and to capture the French horns direct sound from behind the players.

PICTURE 5. Rode NT5 microphone pair. (Photo: rode)

For the recording of the French horns I used a pair of AKG C414 large diaphragm micro-phones, seen in picture 6. These microphones also give the option of multiple pickup-patterns to choose from: Cardioid, Figure of eight, Hypercardioid, Omnidirectional, and Wide Cardioid (akg). For recording French horns this choice of microphones was ideal

to capture the wide harmony range of the horns and the natural reverberation of the recording space. The spatial result that was captured from the horns, using the C414 microphones added much needed tone and space to the score. The microphones were used as a wide stereo pair with the cardioid pattern selected which gave the sound the space it needed.

PICTURE 6. AKG C414 microphone. (Photo: AKG)

3.2.1 Phase

This phenomenon in recording with multiple microphones was important to take into consideration especially with the French horns and the microphone techniques used. When recording sound with more than one microphone it is important to understand the phasing issues that can occur when playing back the sound in the mix. In picture 6 the issues caused from unwanted audio phasing is visually explained. If a sound of the same source reaches the microphones at different times, some frequencies can start to cancel each other out. This phenomenon is due to the characteristics of a sound wave, which is essentially change in the air pressure. If one microphone captures the sound when the wave is at positive phase and the other microphone captures the sound when the wave is at a negative phase, the result is sound cancellation. (Keller, D.)
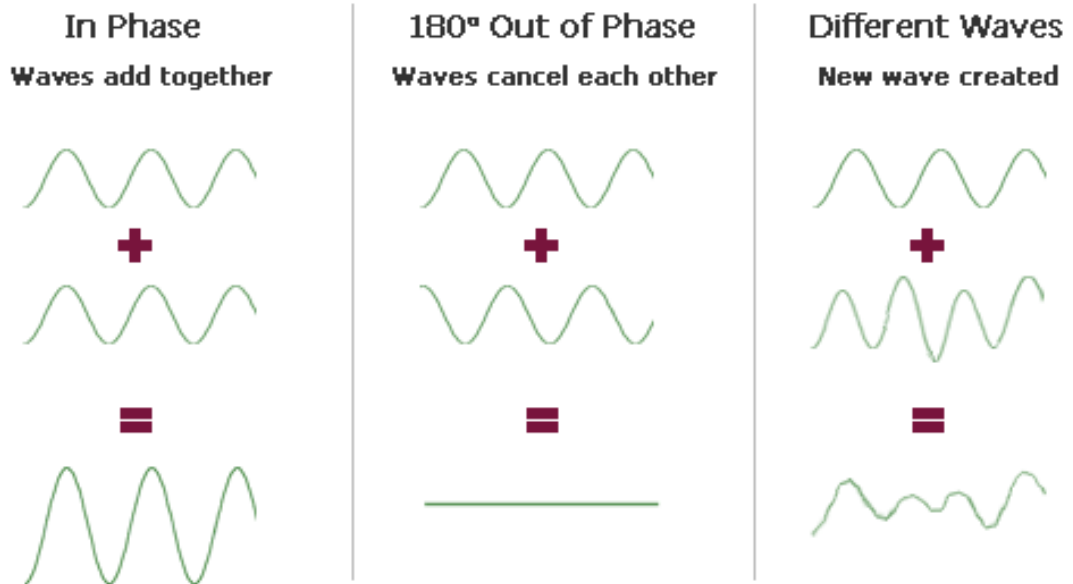
PICTURE 7. Audio phasing issue. (By: mediacollege.)

3.2.2 Techniques

There are many ways for capturing sounds via microphone placement. Microphones are placed in the recording space depending on the sound required and the eventual medium in which the sound is going to be played in. Angles of the microphones and their pick-up patterns are planned and decided with the final sound in mind. When creating a 5.1 mix for a film the music can be captured with multiple microphones to create a surround effect, but this is rarely done in the recording stage. Even in a 5.1 production, music is primarily recorded and mixed into a stereo setting and then slightly added to the surround channels only to create a wider sound.

To capture a slightly wider stereo image to accompany the mono sound from the string instruments I used a X/Y technique with a pair of Rode NT5 microphones. With the X/Y technique, small diaphragm condenser microphones are used such as the NT5. The cardioid pickup-pattern is essential with this method for the stereo image to sound correct. The microphones are placed at minimum 90 degrees angle with the front of the capsules aligned (see picture). It is an ideal method for close-mic applications and provides a clear stereo image with minimal phasing issues. (Sweetwater.)

PICTURE 8. (Photo by: Sami Rogers)

To capture the wide and rich sound of the French horns I used a technique called A/B or the spaced pair (see picture 9 for the different techniques). It uses a pair of omni- or cardioid microphones that are placed approximately 1 to 3 meters from each other and panned left and right in the mix to capture a wide image of the sound. (prosoundweb.com) This technique is effective when a wide image is wanted. However, there is a risk of running into phasing issues due to the long distance between the microphones. Some engineers adhere to the 3:1 rule, which means that the microphones are placed three times as far apart as either one is to the closest sound source. (sweetwater.)
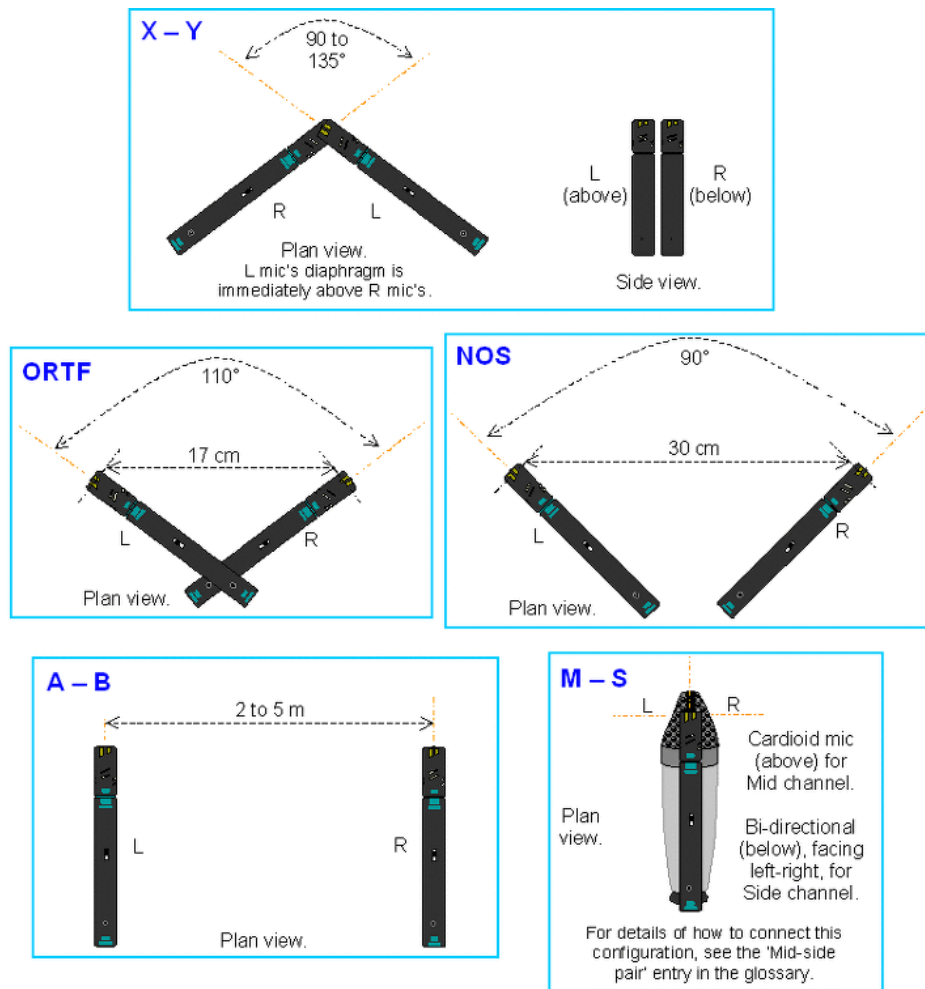
PICTURE 9. Microphone techniques. (Picture from: stevehoffman.)

3.3 Violin

The violin is capable of creating a wide range of emotional sounds from full and eloquent to dark and sustaining. The sound of the violin gives the listener a sense of humanity as the source of sound is produced by human interpretation and movement. The different ways a violin can be played effects the emotional responses of the listener. For example, the velocity and the dynamics of the playing as well as adding vibrato of glissandos have a strong impact on the mood produced. The timbre is therefore primarily determined by the bowing speed and bow pressure more than the actual strings and body specifics of the instrument itself. (Vienna Symphonic Library, 2002-2019.)

In an orchestral setting a when a number of violins all play together it sounds vast. The reason behind this full sound is derived from the various slight difference in tune that is created when all violins are played at once. Never does one violin sound exactly the same

as the next one. This is also something that was kept in mind when approaching the recordings for the film. Though the score was to be kept minimalistic I still wanted to have the effect of a fuller sound that is produced by a number of takes. The style of violin that was composed for the score of the film consisted of a number of long sustains and glissandos that are simple melodies but can be demanding for the violinist because of the long bow strokes.

There are different methods in recording the violin depending on the sound that is wanted. The closer the microphone is set to the instrument the more aggressive the sound becomes. For a more airy and silky sound it is good to get a little distance to the instrument, so the sound of the violin gets a chance to develop. Placing a good flat-response condenser microphone about 50cm to 1m over the bridge will be enough to capture a more natural sound of the violin. (Bartlett Bruce, Bartlett Jenny. 1992, 140.)

For the recording of the violin for the score I used a studio which was acoustically damp so I could add the reverberation afterward in the 5.1 mix. I used a Neumann U87 condenser microphone with the polar pattern selected to cardioid, placed about 1 meter from the violin pointing down towards the f hole of the instrument. I also placed a stereo pair of the Rode NT5 microphones using the XY stereo technique to capture a wider stereo image. This option opened the posibility of using different sounding microphones and techniques from the takes to add up a rich sound in the final mix. The NT5 pair was placed at the same distance as the U87 to avoid possible sound phase issues as seen in Picture.

3.4   Cello

The cello brings the low-end sound to the score. There are a number of instances where the sound produced by the cello is used in a soothing, humming fashion. It has the capability of creating a warm mellow mood and at the other end, a thick weighty presence. The Vienna Symphonic Library describes the characteristics of the cello in an accurate way:

> The cello possesses a wide variety of differing tone colors and means of expression, ranging from the calm and solemn in the lower register to bursts of passion in the uppermost register. Its underlying character has often been compared with the male voice. The transition between registers is smooth, although it cannot be denied that the individual strings have their own character, as they do on the violin and viola too.

> Basically, the cello is something of a split personality; one the hand it plays the part of the solid, reliable bass instrument; on the other hand, it aspires to the passion of a heroic tenor. (2002-2019 Vienna Symphonic Library.)

Because of these characteristics, the sound of the cello became vital for the score of the film. The possibility of getting the contrasted sound of ominous presence yet familiar lyrical tone became an effect that would be able to set the mood for the whole film.

The recording of the cello works in a similar way as with the violin. The biggest difference in recording low strings compared to high strings is that the microphone may have to be placed at a slightly longer distance for the low frequency waves to develop. (Music-Technology-Articles. 2018.) With string instruments, it is important to take the sound of the recording room into good consideration. However, if a good space for the recording is not available, the room should be acoustically dampened so the reverberation can be added to the dry sound later in the mixing stage. I this recording session, the same microphones and techniques were used as were with the violin. The placement of the Neumann U87 and the Rode NT5 stereo pair were set slightly lower because of the lower position in which the cello is played. Microphones were aimed towards the f holes of the cello, around the area where the bow comes to contact with the strings.

3.5   French horn

French horns are often used in classical orchestras to create a big epic sound, but it can also be played in a way that creates a smooth velvety tone. A technique where the sound of the horn is muffled by blocking the bell with a hand softens the tone of the horn and adds a distant touch to the sound. In this case the parts composed for the French horn required two horns playing simultaneously in harmony together. The soft harmonies and distant characteristics of the instrument were sought for the score of the film in order to add a touch of hopefulness into the otherwise ominous setting.

The recording of the French horn requires a reasonably large space. It is played in a way that the bell of the horn is facing at the wall behind the player, as seen in Picture 10. The best sound recorded from the French horn is from the front of the players, capturing the sound reflected from the back wall (Garrison, M. 2012). In this case I placed large panels of plywood to reflect the sound towards the microphones. This allowed the sound from

the horns to open up to its full potential and the natural reverberation that is significant to the characteristics of the instrument was captured efficiently.

The room that was used for this recording session was not the same acoustically dampened room that was used with the recording of the strings. The room used in this session was larger and had no sound dampening elements which allowed some natural reverberation for the French horns. The microphones I used to capture the reflected sound were a pair AKG C414 set to cardioid pickup pattern. An effective stereo separation is very wide, so the microphones were set at a distance of four meters from the players and two meters from each other. This stereo technique is called the A/B pair or the spaced pair because of its effective capability of capturing the wide space. However, this technique can also cause phasing issues and can create problems especially if the sound is mixed afterwards into mono. (sweetwater. 2016.)


PICTURE 10. (Photo. Sami Rogers)

The reflected sound captured from the French horns by the C414 pair was accompanied by a pair of Rode NT5 microphones placed behind the players. This captured the sound directly from the bell of the horn from about 1meter distance (see picture 11). This allowed the posibility of mixing some dryer sound later to the score if less sound of the room was needed.
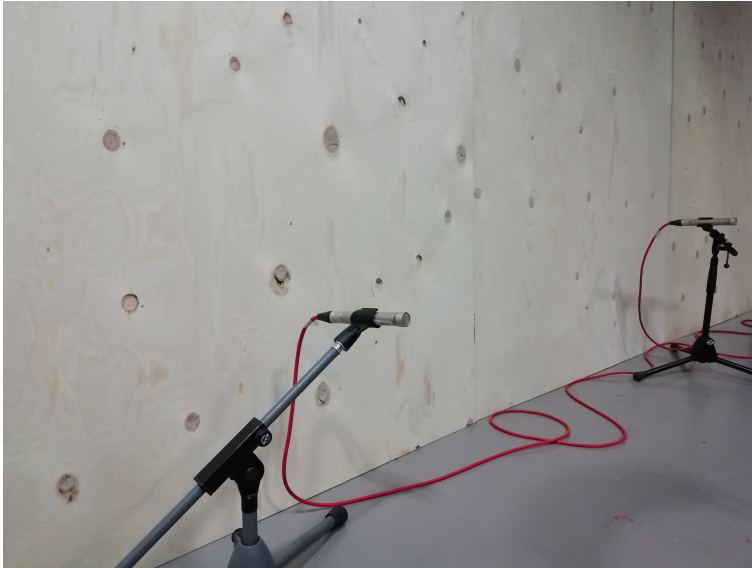
PICTURE 11. (Photo: Sami Rogers)

4   PROCESSING AND MIXING IN 5.1

The 5.1 surround sound system requires five full-range speakers, three (Left, Center, Right) lined across the front of the listener and two (Left surround and Right surround) at the back. With the 5.1 system the 0.1 speaker is referred as the Low Frequency Effect (LFE) which is designed only to add low frequency sounds to accompany the other channels. The five full range speakers or "full bandwidth channels" are capable of conveying audio signals spanning the audible frequency range from at least 20Hz to 20kHz (see picture12). The LFE subwoofer is designed to provide a maximum audio bandwidth of 120Hz. (Robjohns, H. 2001.) The 5.1 surround space adds a large variety of possibilities for the sound of a film. However, the surround sounds can be easily exaggerated, and the immersion of the film can be broken if not careful. (waves.)
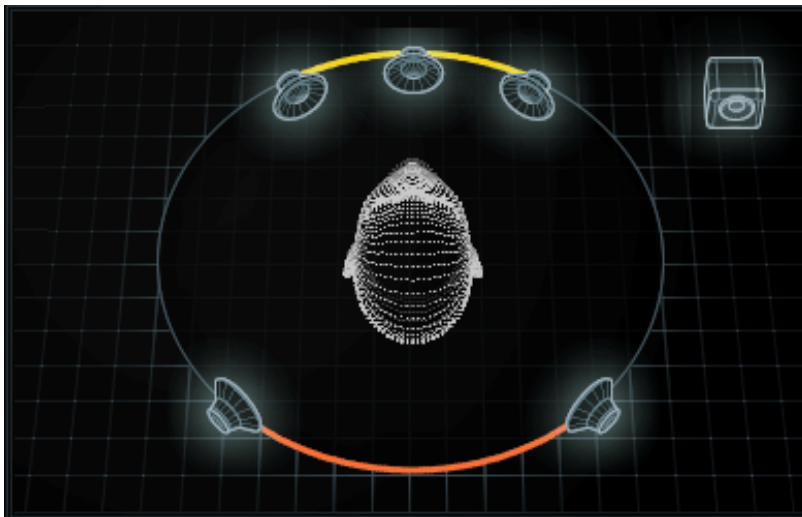

PICTURE 12. The 5.1 surround speakers. (By: waves)

4.1   Signal flow within the mix

When editing the score of a 5.1 film with several tracks that are being worked on in the same project can seem like a complicated situation. Having an order and creating the paths of the signals at the start of the mixing helps to navigate throughout the editing. Auxiliary sends are traditionally used to send signals from input channels to outboard gear that process the audio which is then returned to the main busses through auxiliary returns. (Holman, T. 121, 2008.) The same method is used here, but instead of sending the signal to outboard gear, it is sent to channels within the DAW (ProTools) that have plugins such as reverb or delay added to process the signal. With this particular project, I

had three tracks´ and all had their own reverb sends. Then, to control each track separately, I had each track running to their own 5.1 auxiliary which were then send to the overall 5.1 master channel. The picture below (Picture 13), shows an area of the ProTools project where the score is been worked on. It can be seen that the audio has been split into various segments to work with the film. It is also shown that there is a large number of tracks to control, which is made clearer and easier to control through the right setting up process of the signals.
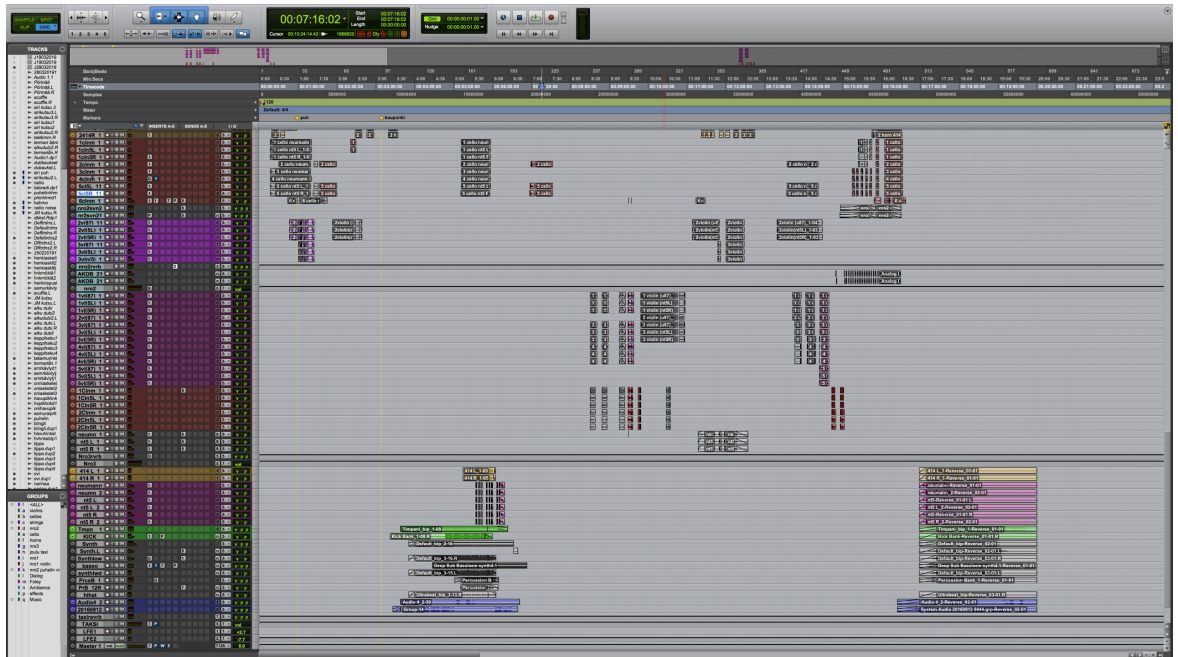
PICTURE 13. (Photo by: Sami Rogers)

4.2   Panning

Panning orchestral instruments are traditionally panned with violins left and left-center, viola right-center, cello right and French horn right-center (Becka, K. mixonline. 2007). However, when using only these three orchestral instruments as an effective score in an experimental short film, the traditional panning style was not used. Because of the few instruments used and the multi-microphone recordings captured, I placed mono and stereo tracks from different takes and different instruments to work together. Using a wider stereo recording of a cello (panned left and right) and adding a mono cello (panned to the center) from a different take, had a rich impact on the sound. Harmonic takes where then added to these tracks to create harmonic structures. Mostly using the mono takes and

panning them slightly off center. Violins were then added to the stereo field panned almost as the cello stereo tracks but just slightly narrower. This way, using different microphones, techniques and takes, created a sound that was free of phasing issues, rich and harmonious in sound and did not require a large number of instruments.

Panning in 5.1 adds a whole new dimension in panning. In this case it was mostly used to give a wide effect on the whole sound. Instruments were sent in the mix to a 5.1 channel that had some reverb added. The sound was then panned in this cannel to affect the front left and right speakers and the surround left and right speakers at the back.

4.3   Processing audio

The audio processing of this score involves some basic use of mixing tools that are used in overall musical mixing. These techniques are discussed along with processing effects that were used to create specific sounds wanted for this film.

4.3.1   Equalization and dynamic range

Once the panning of the instruments has been determined it is time to plan the tone and smoothness of the sound. If the sound of the mix is unsatisfactory, it is possible to use and equalizer to smooth out any strident spots in the tone or give individual parts a clearer sound in the mix (Becka, K. 2007). Especially when mixing strings there can be some variation in how the instruments sound at different parts:

> Strings have inconsistent timbre across their range and some notes can be harsh and brittle sounding. This is attributable to instrument construction, bowing style and even the room, which can accentuate unflattering tones. "Screechy" quality is especially noticeable with a solo part; a section tends to mask individual timbre problems. (Becka, K. 2007.)

If the mix has only some individual parts that need equalizing it is a good idea to use automation on the EQ plugin that is being used. This way it is possible to affect only the wanted area and not the whole track. With an EQ plugin it is possible to find the specific frequency by boosting narrow areas of the frequency range. When the unwanted frequency jumps out it is then identified and can be dropped to the required lower volume. (Becka, K. 2007.) The adjustments of the equalizer and the compressor to a single solo violin track can be seen below in picture 6. The high pass filter is cutting unwanted low frequencies away and a high shelf filter has been used to attenuate the high frequencies,

leaving some room for the middle warmth of the violin. In the compressor settings the adjustments are left at very minimum, only effecting the highest peaks of the violin. It can be seen that the knee of the compressor is also very light, so no hard compression is happening, and the natural sound of the violin is left unchanged.
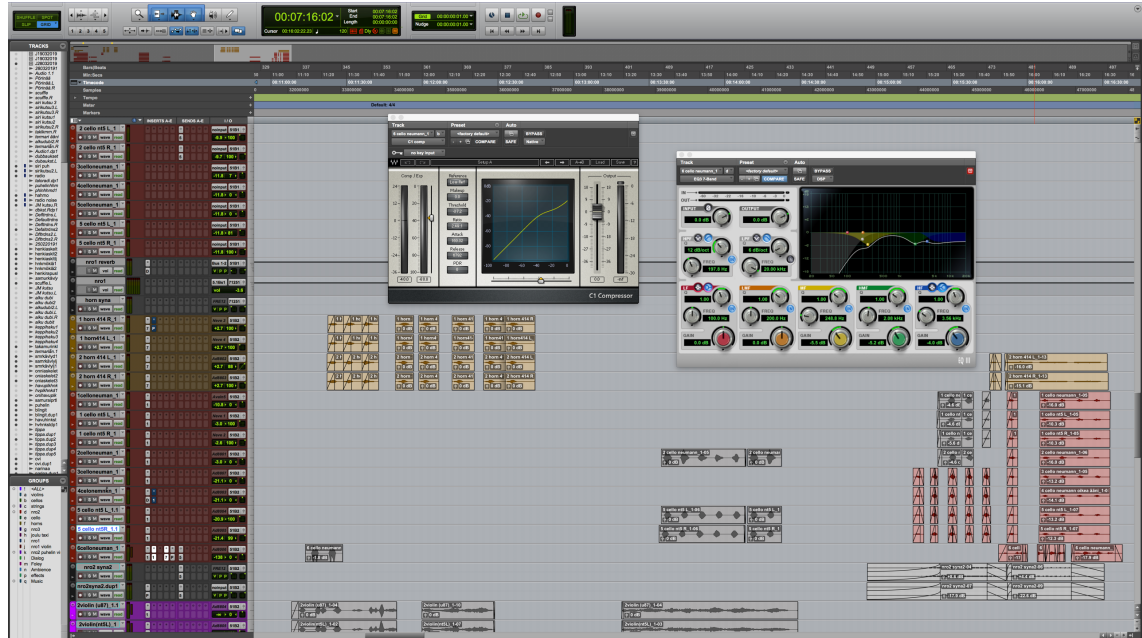
PICTURE 14. (Photo by Sami Rogers)

Some scenes in the film require some hard equalizing for the sound to match the film. For example, a scene was presented where dialog and music were heard in an outside shot of a cottage, without seeing the source of the sound (Non-diegetic sound). Then the picture moved indoors to a close up of an old radio, which in this case was the source of the sound (Diegetic sound). The camera then moved away from the radio to other rooms of the house with the radio still playing in the back ground. This kind of scenes require some hard equalization and some reverberation to fit the picture. Firstly, the scene changes from the big non-diegetic stereo sound to a smaller diegetic mono sound which is panned to fit the location of the radio. The radio in the picture was old and it was also taken into con-sideration with the sound editing. To emphasize the old sound of the radio, the bandwidth of the sound was narrowed by cutting the low-end frequency with a high-pass filter from about 500Hz and the high-end from about 3Khz, depending on how harsh the sound is wanted. The father away the radio is moved from the picture the narrower the bandwidth becomes, and the more reverberation is added to the sound. This all can be implemented by automation within the DAW, which becomes an essential tool with film sound editing. With automation the changes of the adjustments within the plugins, such as EQ and re-verb, can be programmed to change automatically over time (Bawiec, D. 2018).

After the equalizing it is good to check if the music has parts where some sounds are louder than required. These parts can be smoothened out by using a little compression. With orchestral instruments, too much compression can negatively affect the sound by eating the dynamic life out of the mix. This is why it is important to use the adjustments within the compressor only lightly. Setting the threshold of the compressor to a point where the unwanted areas peak and does not compress signals below the threshold. The ratio of the compression should be set to a mild setting and so should be with the knee adjustment also (see picture 14). This way the compression is only light, and the dynamics of the orchestral instruments will still be heard. (Becka, K. 2007.)

4.3.2   Reverb and pitch

After the equalization is in order, the ambient quality of the instruments is edited. Because reverb is sustained over time, it has the quality of building up energy that can mask some tonal issues, such as e.g. the transient detail of a violin bow crossing the strings. However, the reverb can be adjusted in a way to preserve the tonal and transient detail while still giving the parts a unique ambience. (Becka, K. 2007.) With the 5.1 mixing of the cello, violin and French horn, all the tracks were driven through some reverb that affected both the front and the surround speakers. This way the sound of the instruments would be able to appear wide and full for the audience. Because the violin and cello tracks were recorded in a dry room with no natural reverb, they required quite a lot of the reverb to give the sound an ambience it needed. On the other hand, the French horns were recorded in a room with some natural reverberation. The signal from the two microphones that were placed in front of the players, capturing the reflected sound was left dryer in the mix than the microphones placed behind the players, capturing the dry sound of the horns.

To strengthen a haunting mood in some of the scenes of the film, a selection of instruments, were dropped in pitch. Usually an effect that was made for cellos and French horns in needed parts of the film. This effect was then channeled through to a reverb channel, resulting in a low-pitched ominous humming type of a noise.

5   CONCLUSION

Constructing a score from acoustic string and brass instruments for an experimental short film like this, is a long creative, yet technical process. The starting point requires a good deal of creative thinking to create the right mood through harmonies and rhythmic qualities of the music. I found that leaving some creative space in the composition for the mixing and editing phase turned out to give a lot of opportunities for the film. Keeping the score minimalistic gave the freedom to edit small parts of the recordings in a different fashion to create stylistic sonic transitions in between scenes and also strengthen the mood of others.

The acoustic, orchestral quality of the instruments gave the film a natural and humane sound. However, the possibility of processing the audio into sounding slightly unnatural, e.g. with the pitch adjustments and long reverberations, gave the film an ominous feeling that it needed at parts. The characteristics of the sounds produced by these instruments vary from epic and nostalgic, to warm and eerie.

There is a lot to take into consideration when it comes to the technical side of the recording and fitting the sound into the 5.1 surround environment. To understand how to get the sound that is wanted can be directed, but in the end, it comes down to experimenting and finding microphones and placements that fit the sonic style of the end result in mind. If the recording phase is executed properly, it will make the mixing phase considerably easier. If the recordings are sound it will spare the 5.1 mix from a lot of awkward phase and equalization issues.

5.1 mixing is a both; a technical and a creative process that can have either a strong emotional effect on the film or fail the immersion completely. It is easy to over-do the effects that are available in the 5.1 surround space. With music it is to be used cautiously, just to make the sound wide and spacious enough for the audience to immerse into the picture. The possibility of using reverberation in the surround space especially opens a lot of creative opportunities for music in films.

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