



# Mixing Conventional Band Instruments with Elements of Electronic Music

Juho Kavasto

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## **ABSTRACT**

Tampereen ammattikorkeakoulu  
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Cyril Awakens is a musical act based in Helsinki, Finland. In their music, common contemporary band instruments such as acoustic drums and bass guitars are combined with computer programmed electronic elements like drum machine loops and synthesizer melodies. Whereas a small amount of crossover is common both by way of using a few acoustic elements in electronic music and vice versa, the kind of equal split exhibited in the music of Cyril Awakens is rarer. Therefore, special techniques must be utilised in the production of such music to make the two approaches blend together seamlessly.

In this thesis, the process of making the sophomore album of Cyril Awakens was outlined from pre-production all the way through to post-production. However, for the sake of conciseness, only four songs were chosen to be examined in detail instead of the whole album. Conclusions drawn from making the thesis project album itself were supplemented by researching the history, conventions, and theory of mixing, analyses of similar albums, and by conducting expert interviews. The core focus was on post-production techniques, especially the use of specialised mixing tools. Other techniques and details discussed included song arrangement in pre-production, microphone choices and placement during the recording phase, and methods of editing the recorded material.

The different phases of production came together to form a cohesive musical work where electronic elements worked well in tandem with common band instruments. To achieve this, methods that are characteristic of mixing electronic dance music were used together with methods characteristic of mixing band instruments. A key takeaway was that in order to interconnect these disciplines, it was often necessary to make the human elements more robotic, and to in turn create humanlike imperfections into the unerring electronic elements.

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Key words: music production, electronic music, pop music, pro tools, modelling technology

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## ABBREVIATIONS AND TERMS

BPM	Beats Per Minute
Compressor	A tool for manipulating the dynamic range of an audio signal
DAW	Digital Audio Workstation
De-esser	A tool for reducing sibilance in a recording of a vocal performance
Dry/wet	Used to indicate if an audio signal has effects on it or not; dry means the original signal, wet means effected
EQ	From “equalizer”; a tool used to manipulate the relative level of frequencies in an audio signal
Hardware	A physical tool or an instrument (as opposed to software)
Hz	Hertz, the SI unit of frequency (kHz is for kilohertz, i.e. a thousand hertz)
L-C-R	Left-Center-Right, signifying different panning positions in the stereo field of a mixdown
LFO	Low Frequency Oscillator
Mid-Side	Another way to describe or process a stereo audio signal; Mid is for information that is the same in both the left and the right channels, and Side is for the information that differs between them
Plugin	A software component that adds a specific feature to an existing computer program, e.g. virtual effects in a DAW
Polar pattern	The directionality of a microphone
Preset	Something preprogrammed into a device, e.g. a patch on a synthesizer
Sampling	Recording audio from a pre-existing piece of media, and using it in a new context
Synthesizer	An electronic musical instrument that generates and manipulates audio waveforms



## 1 INTRODUCTION

Cyril Awakens is a Helsinki-based band whose music combines contemporary band instruments like acoustic drums and electric bass guitars with elements that are commonplace in electronic dance music, e.g. drum machine loops, synthesizer basslines and samples from various sources. While it is not uncommon for dance music artists to include elements such as an acoustic guitar or a vocal performance in their songs, nor is it uncommon for a metal band to utilize synthesizers in their music, for example, Cyril Awakens's case is made interesting by the even split between the two approaches. (Huber & Runstein 2010, 342.)

During the year 2019, Cyril Awakens wrote and produced their second album "Ariel", which I mixed and co-produced. The album's physical instruments and vocals were recorded during a total of five days between July and October at Suomenlinnan Studio, where Mauri Syrjälä was the recording engineer. Additional programming was done between February and November.

All nine songs on the album featured an acoustic drum set played by Lauri Suutarinen as well as computer programmed drums made by me or the primary songwriter Konsta Koivisto. The acoustic drums and the electronic drums were almost always layered with each other, but which of the two drum styles created the rhythmic backbone varied on a song by song basis – one was always the focal point with the other playing a supporting role.

Bass instruments were handled a little bit differently; to avoid muddiness in the low frequency range, synthesizer basslines were not usually layered with bass guitars, but rather arranged in a way that they played in turns, or one was not used in a song at all in favour of the other. Other melodic elements on the album included vocals by Konsta Koivisto, a guest vocal appearance by Sophia Mitiku, and synthesizer chords or melodies on every song, with electric guitars, cellos, violas and various kinds of samples also making appearances here and there.

To make conventional band instruments and elements from electronic music blend together seamlessly when they are both in an essential role like they are on this album, special techniques must be utilised. I broke this objective down into smaller problems, such as how to achieve a sense of dimensional space common to all the elements, how to make space for two elements from different worlds that require the same amount of attention, and how to glue those elements together, as if they were interconnected from the start.

I have been involved in music production for over a decade, during which I've seen both sides of the coin; I primarily consider myself an electronic music producer through my solo endeavor in drum & bass, but I've also recorded and mixed traditional bands as well as played in them myself. In this thesis I aim to outline my thought processes and preferred methods of achieving a cohesive sound signature for "Ariel", all the while contrasting and comparing them with professional views from industry publications and expert interviews I conducted, as well as analyses of previously released music of similar styles.

## 2 EXPERT INTERVIEWS

Because music production isn't purely technical, but in fact has plenty of room for artistic interpretation, I contacted two industry professionals and interviewed them about how they approach combining band instruments with electronic elements. I asked both of them similar questions, but due to their different roles and backgrounds in music production, I received answers with very different emphases.

The first person I interviewed was Samuli Kukkola, perhaps best known for being a member of the band Ruusut, which is a unique, synthesizer-oriented pop band (YleX 2018). Kukkola was a part of making The Hearing's third album "Demian", which was released on Solina Records in 2019 (Solina Records n.d.). Kukkola had multiple roles in the making of the album, including song arrangement, recording, programming and mixing (Kukkola 2019).

I also interviewed Inka Heinonen, who is a full-time mixing engineer at Isolla Music. Heinonen has done mixing work for all the "Big Three" record labels, including songs for Pyhimys, Mira Luoti and Pete Parkkonen, as well as for independent releases such as Pykäri's sophomore album "O", which was released on PME Records. (mixedbyinka.com n.d.)

Kukkola's answers leaned more towards the philosophy of music production, arguing for the importance of pre-production and choosing sounds that work well in their intended context. Heinonen talked more about the technical aspect of mixing, stating some of her favourite plugins, where to use them, how and why. I've included English translations of the interviews as appendices to this thesis.

### **3 APPROACHES TO MIXING DIFFERENT GENRES**

There are as many ways to mix a song as there are mixing engineers. However, there are some conventions in how certain styles of music are usually mixed. The conventions tend to stem from limitations or features in what are the typical instruments and mixing tools used within that genre (either currently or in its history), or from mimicking live performances, as illustrated by some of the examples below.

#### **3.1 Conventions in mixing band music**

Mixing band music is commonly grounded in what live performances by the band in question would look like, i.e. the placements of instruments in the sound field are often based on positions of the players on stage (White 2006). Of course there are exceptions, but for example, if the guitarist of the band plays on the left side of the stage, it makes sense to pan his tracks to the left when mixing, too. Another contributing factor to the bold panning often heard in band music might be the fact that in the early stages of stereo mixing, mixing consoles only had three panning positions: hard left, hard right, and center (Owsinski 2006, 20).

When it comes to the balancing of a mix itself, many established mixing engineers swear by the idea of building up the mix from its foundation like a house. In practice, you would choose whether the very foundation is laid by the kick drum or the bass – one will go lower in the frequency spectrum than the other – and once they are both sitting together well, other elements are added one by one in order of importance. In most conventional band-oriented music, the vocals are the most important part of a song, so it's common to start working them into the mix as soon as possible to make sure they have enough room to shine. (Owsinski 2006, 15-16; White 2006.)

Although band music is often recorded in a way that the natural acoustic reverberation of the recording room is heard on the recordings, using an additional reverb device or plugin is common to give the recordings even more of

a sense of dimensional space and warmth. Often the reverb effects used in band music simulate the sound of a real life space, such as a concert hall or a room with wooden walls, or another natural reverberator, e.g. a metallic plate or a spring. (Huber & Runstein 2010, 507-508.)

On the Cyril Awakens album, I utilised many techniques associated with mixing band music. I originally began building the mix of one song from the foundation up (kick drum first) and expanded the same settings to the other songs from there. The conventional band instruments on the album were recorded in a way that they sounded natural, and I aimed to preserve the natural timbre on most of the instruments, although I did use some techniques to make them sound less natural in other ways. I also tried my best to utilise hard pannings wherever possible for which there were multiple reasons; in addition to keeping true to how band music has been mixed for decades, making space for distinctive reverbs and delays was one.

### **3.2 Conventions in mixing electronic dance music**

Electronic dance music doesn't necessarily include any elements that are meant to resemble a physical, acoustic real life instrument. Thus, many of the methods that are conventional in mixing band instruments are less relevant when mixing electronic music, since there often isn't a real life counterpart for the elements to be compared to. An obvious example are synthesizer patches – if the sound isn't trying to emulate another instrument, it can be heavily modified in the mixing process without having to worry so much about losing the character and identity of the sound. In fact, it is often necessary to attenuate or completely filter out large portions of synthesizer sounds, since synthesizers are capable of filling out the entire frequency spectrum, which is rarely beneficial to a song as a whole. (Levine 2018; Heinonen 2019.)

What's also particular about making electronic music is the fact that the production phase blends together with the mixing process, and they can both heavily influence each other. Many producers work on the mixdown while they compose and create the different elements for a song, and it can be hard to define

when sound design turns into mixing, for example. Some producers prefer to divide sessions for different purposes, but for me it's helpful to mix as I go. Sometimes a sound design or composition idea can lead to the mix taking on a completely different character, or the other way around. This also applies on an album scale as noted by Kukkola (2019); sometimes an epiphany made when working on one song can be applied to others as well. (Messitte 2017; Kukkola 2019.)

Electronic music also commonly has peculiarities in the stereo image. Because there often isn't a real life reference point for where to pan things (like imagining the band on stage when mixing band instruments), sometimes elements end up in strange – or alternatively, boring – positions. For example, in the 1990s it wasn't uncommon to use an autopanner on drum machine hihats, which resulted in an impression of the hihat continuously changing its physical location (Messitte 2018). Oftentimes most elements are panned very close to the stereo center, which can sound a little bit boring. This habit probably stems from the fact that many club soundsystems are mono, and because electronic dance music is primarily made for a club environment, panning is thought to be unimportant. Conversely, if an element is hard panned to one side, and a club sound system is stereo, that element might not be heard well enough on the other side of the club. (Sussman, cited in Owsinski 2006, 22; iZotope 2016.)

Another thing that's characteristic of electronic music mixes is having the kick drum and the bass in equally big roles in the low end of the frequency spectrum. A very common technique for making space for them both in electronic music is sidechain compression: using the kick drum's signal to attenuate the volume of the bass when the kick hits. While sidechaining isn't exclusive to electronic music, in electronic music it's often used as an effect in itself; intense sidechaining can make the bass pump or "breathe" audibly, creating further rhythmic interest (Levine 2018). On "Ariel", I usually set up the kick sidechains using a multiband compressor, so that only the bass frequencies around the kick drum's fundamental would be attenuated instead of the full spectrum of the bass.

### 3.3 Analyses of existing crossover albums

To gain more perspective on how to combine conventional band instruments with electronic elements, I analysed three albums from different eras that include such combinations. Of course, there are many examples of albums that include some degree of combining the two disciplines, such as Pendulum's "Immersion", Tycho's albums since "Awake", and practically any Nine Inch Nails album, but the albums I chose to analyse were the eponymous debut albums of Garbage and Little Dragon from 1995 and 2007, respectively, and Mount Kimbie's sophomore album "Cold Spring Fault Less Youth" from 2013. I focused primarily on the mixdowns, also making some observations about arrangements and sound sourcing, contrasting and comparing them with "Ariel".

#### 3.3.1 Garbage by Garbage

Garbage is a band consisting of American musicians Butch Vig, Steve Marker, and Duke Erikson, and Scottish singer Shirley Manson. Vig, Marker and Erikson have backgrounds in music production; Vig being perhaps the best known out of the three for producing Nirvana's album "Nevermind". Garbage's experimental rock tinged self-titled debut album was released on Almo Sounds in 1995. (Buskin 1997; Garbage n.d.)

The band used old (even at the time) hardware samplers to build the bases of the tracks, which is evident in how rhythmically tight the songs are. Sampled loops usually laid the rhythmic backbone, and other elements were overdubbed on top. Sometimes elements that were perceived as important at some point during the production were removed from the final mix after overdubs were done; for example, "As Heaven Is Wide" started out as a rock song with live drums and guitars, which were ultimately cut in favour of a more club oriented arrangement that was inspired by sampler loops made by Marker. (Buskin 1997.)

Bold panning is utilised all throughout the album. For example, "Only Happy When It Rains" begins with a drum machine loop that's panned hard left. In fact, drum and percussion loops are very commonly panned to the extremes,

sometimes with one loop on one side and a different one directly opposite it, like evident at 3:24-3:29 on “Queer”. A similar approach is often taken with melodic elements: e.g. also on “Queer”, a high pitched, sustained guitar melody is heard almost exclusively on the left, countered by a lower, shorter guitar lick that’s panned all the way to the right. An unusual panning trick is also used on “Vow”, where a guitar chord progression is panned from center to hard left and then to hard right in a rotating 8th note rhythm, which results in an interesting impression of spinning.

The space between the hard panned loops and melodic elements is often filled by wide, doubled or tripled – possibly even more – electric guitars. As another option, on “As Heaven Is Wide”, three separate fuzz bass recordings were overlaid on each other, resulting in an aggressive, “flangey” sound that fills a good portion of the stereo spectrum (Buskin 1997). As a whole, the panning principles I utilised on the Cyril Awakens album were very similar to the ones on “Garbage”; most instruments were panned far to the sides wherever possible – on some songs I even used panning effects not unlike the spinning effect of “Vow”. However, I didn’t usually fill the space between L-C-R with guitars or other rhythmic elements, but rather with spatial effects like delays, and especially with prominent reverbs, which I will talk about later with more detail.

Live acoustic drums are not in a particularly big role on “Garbage”. They are indeed often there, but usually masked by multiple loops. In fact, the live drums are so interwoven with the loops that it’s very difficult to differentiate between them at all. It seems to me that the drum recordings are often completely or almost completely mono in addition to being relatively low in volume. Contrastingly, on the Cyril Awakens album I wanted both the acoustic drums and the electronic drums to be prominent and distinguishable parts of the sound signature. On some songs the acoustic drums are in a leading role, on some songs it’s the other way around, but much more rarely are they interwoven together to the point of irrecognition like on “Garbage”.

Unlike “Ariel”, the mixdowns on “Garbage” are quite dry – that is to say there’s not much distinguishable reverb on the songs. Especially the vocals are very natural and upfront. Contrarily, delays are used more as a creative effect, most



noticeably on “A Stroke of Luck”, where the feedback tail of a delay creates additional texture and tension during the more mellow sections of the song. Similar delay textures were also utilised on “Ariel”.

### **3.3.2 Little Dragon by Little Dragon**

Little Dragon is a Swedish band consisting of multi-instrumentalists Håkan Wirenstrand and Fredrik Wallin, drummer Erik Bodin, and singer Yukimi Nagano. Founded in 1996 and operating somewhere within the realm of electronic pop and soul, the group released their self-titled debut album in 2007 on Peacefrog Records. (Rathe 2011; Ninja Tune n.d.)

The arrangements on the album are quite sparse, which generally allows for many different approaches to mixing. On this album, the mixing engineer has opted to keep the core elements of each song close to the center of the stereo field, reserving most of the room on the sides for reverbs, ping pong delays, and the occasional doubled lead vocal. Hard pannings are used sparingly, perhaps most noticeably for quirky surprises such the drum rolls appearing at 1:59 on “Turn Left”.

Seems like the brunt of the drum tracks on the album are loops created from original live recordings. The drums aren’t quantised per se, but rather all the individual hits are carefully placed in a deliberate position within a groove – sometimes on and sometimes off the grid – as spectacularly exhibited in “Constant Surprises”. Sometimes acoustic drum sections are layered atop each other to create seemingly natural grooves that would actually be impossible for a single drummer to play, such as the polyrhythm between the ride and the hihat on “After The Rain”. Other times natural drum hits are layered with what are clearly samples, like the claps on “Turn Left”, or a live drum part is sliced up into a rigid machine-like loop, like the hihats on “Place To Belong”. The way the drums are mixed and arranged on “Little Dragon” is reminiscent of my approach on “Ariel”; both acoustic and electronic drums are heard on many songs, always distinguishable from each other.

Although the acoustic drum set sees multiple forms on the album, and is completely absent on “Twice” and “Stormy Weather”, it’s still one of the elements that keeps the album sounding cohesive throughout, since the instrumentation between songs varies quite a lot. Nagano’s singing is actually the only element shared by every song. Generally, the soundscapes on the album can be divided into two categories – an electronic-oriented approach, where the drums and Nagano’s vocals are accompanied by various synthesizer patches, and on the other end of the spectrum, a more natural approach with more conventional instruments. A mainstay on the electronic-oriented songs (e.g. “Turn Left” and “Recommendation”) is a soft plucked bass instrument, similar to the ever-so-popular 808 bass. The more natural songs (such as “No Love”) utilise instruments like the double bass, guitars and pianos. Of course, many songs land in between the two categories, and utilise both acoustic and electronic sound sources.

An interesting aspect of the album’s mixdowns is the usage of reverbs and delays as creative effects, almost as instruments in their own right, reminiscent of dub mixing (Meschino 2017). The overall sound signature of the album is relatively dry, which makes the reverb and delay effects stand out even more. For example, sometimes individual parts of a track will suddenly be doused in a thick reverb or a slapback delay – both of which are heard liberally throughout “Forever”, for example.

The album was self-produced by the band, and as a whole, the mixes on it do have a home-made sound, for better or for worse (Little Dragon 2007; Comingore 2014). The album lacks a little bit of consistency when it comes to the levels of the vocals and the reverbs – both of which are important in order to maintain a cohesive sound signature as also noted by Heinonen (2019). The panning is approached very differently from “Garbage” and also from how I approached “Ariel”; on “Little Dragon” most things are kept close to the center, which is quite a safe decision, but results in a lack of depth in the finished product (Owsinski 2006, 19). All of this contributes to the fact that the album doesn’t sound entirely professional in a technical sense, which, however, fits the quirky mood of the album well, and makes the album very approachable.

### 3.3.3 Cold Spring Fault Less Youth by Mount Kimbie

Mount Kimbie is an English electronic music duo consisting of Dominic Maker and Kai Campos. Their second album “Cold Spring Fault Less Youth”, released via Warp Records in 2013, takes pop ideas to unconventional directions stemming from the duo’s “post-dubstep” background. (Nakiska 2013; Wright 2016; Warp Records n.d.)

The album is built on clever usage of samples and synthesizers in conjunction with some vocal, electric guitar, and bass guitar recordings. The rhythmic backbone mostly comes from syncopated drum rhythms, sometimes on grid and obviously from a drum machine, other times natural in an uncanny way. For example, “So Many Times, So Many Ways” features an unquantised drum loop with a pleasantly sloppy rhythmic sway, reminiscent of the work of J Dilla (Ludlow 2018). In an interview for Interview Magazine, Maker names the Dave Smith Tempest drum machine as a core instrument on the album, but also mentions a vintage drum machine called the Powerhouse as one of the sources of the unusual but natural drum sounds (Nakiska 2013). The GR International Bandmaster Powerhouse in question is a strange Scottish device from the 1970s that uses tape recordings of a real drummer playing different styles (Vintage Synth Explorer n.d.).

The mixdowns on the album are characterised by bold usage of delays and reverbs, which are utilised as instruments in their own right even more so than on “Little Dragon”. They are used very dynamically; sometimes sections or elements are kept completely dry, other times absolutely drowned in spatial effects. This might change from song to song or even between parts of a single song, like on “You Took Your Time”, where guest vocalist King Krule’s voice has no reverb on it at first, but eventually devolves into a blur or reverb and delay. This is an approach I didn’t utilise at all on the reverbs of “Ariel”, because the aim was to maintain an airy, spacious atmosphere throughout. Another example of dynamic usage of effects on the Mount Kimbie album is “Made To Stray”, where reverbs and delays are used as a riser-like tool to help with transitions: the drums are dry for the most part, but thick reverb and delay are added towards the ends of

phrases, then removed when the next section starts. The character of the effects is very natural; the effects in use are probably hardware tape delays, spring reverbs and such, or their analog modelling plugin counterparts. The lifelike tone of the effects helps ground the album to the real world in the midst of the machine and synthesizer-driven soundscapes.

Another technique that bridges the gap between the sequenced elements and the human touch is the creation of imperfections into some of the synthesizer sounds. A great example of this is when the synthesizer lead suddenly becomes lo-fi for just a brief moment at 2:08 on “Break Well”. Similarly, on “Ariel” I used some techniques to make certain synthesizer elements more lo-fi, most notably with a plugin that could model the wow and flutter of a worn tape machine.

Some songs also disregard or invert conventional mixing customs: for example, the synthesizer lead of “Blood and Form” is very loud and in the center of the stereo field, while the lead vocals are spread to the sides, residing behind the synthesizer in the soundscape. Similarly, “Meter, Pale, Tone” sees loud, dry acoustic drums take the center stage, while a lead vocal with delay effects mostly sits in the background. Sometimes the resonant feedback tails of delays are abruptly cut, like at 2:30 and onwards on “You Took Your Time”.

Overall this album is mixed very similarly to “Little Dragon”: most elements are positioned quite close to the center of the stereo field, and when it comes to the usage of spatial effects as well as to how the vocals are mixed, the songs differ quite a lot from each other. However, on “Cold Spring Fault Less Youth”, these decisions seem much more deliberate than on “Little Dragon”; nothing seems like an oversight, but rather, all the mixing quirks contribute to the unique mood of each song.

Although “Ariel” was by and large mixed more similarly to “Garbage”, some parallels can easily be drawn between the Cyril Awakens and the Mount Kimbie albums as well. For example, the reverb sounds utilised on both are similar thick, long reverbs that are big enough to envelop the whole soundscape in a pleasant sea of sound. Much like “Cold Spring Fault Less Youth”, “Ariel” also sees entire vocal passages sometimes effected beyond recognition and/or mixed far to the

background, which isn't really heard on "Garbage", where a much more upfront, pop-like approach was taken with the vocal mixing.

## 4 PRE-PRODUCTION OF ARIEL

The primary songwriter of Cyril Awakens, Konsta Koivisto, uses Logic Pro X as the framework for making demos of songs for the band. Koivisto is proficient with multiple instruments, including guitars and keyboards, but Logic offers the possibility to use Apple loops which can be a handy tool to quickly come up with a full arrangement without having to record everything from scratch (Apple 2019a). Sometimes some of these Apple loops, most often drum loops, will actually stay on the song throughout the production process and remain a part of the finished song, albeit often heavily modified during the mixing phase at the latest.

There is also a multitude of synthesizer and sampler presets to choose from in Logic (Apple 2019b). These presets can be used as a placeholder for different sound sources which will replace the Logic presets later on in the production process; for example, if a viola is planned to be used on a song, a viola sampler can be made to play the viola's part during the pre-production and composition phase of the song, which was the case on the song "Love". Live string instruments were later recorded in place of the sampler.

After finishing the full composition and arrangement of a song, Koivisto would bounce out each individual track containing a different instrument from Logic. These tracks were recreated with a more suitable sound source where necessary, i.e. Apple drum loops were sometimes replaced by drums programmed from scratch by me, or a synthesizer preset was replaced with a recording of a hardware synthesizer, such as the Korg Minilogue. Sometimes the original demo loops or presets were deemed good enough, especially when dealing with an element that would end up being a background element in a song.

With all the aforementioned tracks bounced out and replaced with an upgraded sound source where necessary, we were ready to go to the studio to lay down recordings of the band instrument parts of the album; namely acoustic drums and percussions, electric bass guitars, pianos, violas, cellos and vocals.

## 5 ARIEL RECORDING SESSIONS

While the drum machines, synthesizers, and samples on the album were programmed and recorded by Koivisto and myself in our home studios, the conventional band instruments as well as string instruments and vocals were recorded in a commercial recording studio. The studio we worked at was Suomenlinnan Studio, located on Suomenlinna Island off the coast of Helsinki, where the recording engineer was Mauri Syrjälä. A total of five working days were spent at the studio between July and October of 2019.

### 5.1 Drums and percussion

In sample based electronic music like hip hop and its derivatives, breakbeats are heavily utilised. A breakbeat, often simply called a break, is a section of a song where the song is broken down to just one or two core elements – usually only the drums. The most commonly sampled breakbeats are taken from 1960s and 1970s funk and soul records. (Ireland 2015.)

On “Ariel”, we wanted to mimic the sound of sampled breaks without compromising flexibility and control. That’s why we used a Premier drum set from the 70s and dark-toned, thin cymbals, similar to those used in the 60s, and opted for vintage microphones for the most important microphone positions.

The core of the drum sound was captured with a pair of Coles 4038 ribbon microphones. Originally designed by the BBC in the 1950s, the 4038 is a very smooth and natural sounding microphone with a figure of eight polar pattern (Shorter & Harwood 1955, 5, 9; Coles Electroacoustics n.d.). We placed the ribbon mics behind the drum set, quite low and close to the drummer’s shoulders, and angled them towards the kit in a configuration that feels like a mix between an AB pair and the Recorderman technique (McGlynn 2011).

A mono overhead microphone was also recorded with the intention that it could be used to enhance the transient response and clarity of the overall drum sound,

in case the ribbon pair's sound was too smooth after all. This role was filled by a Neumann U 67, which is a large diaphragm tube condenser microphone, originally made from 1960 to 1971 (Neumann n.d.). Another U 67 was used as a mono room microphone. The overhead U 67 was placed directly over the snare drum, approximately one and a half meters above it, while the room microphone was placed a couple of meters in front and to the right of the kit, slightly above the snare drum in height, pointing at the snare drum at a slight angle.

The kick drum was recorded with two microphones – one inside the drum, and one outside on the resonant head. The outside microphone was another vintage inspired choice, namely the Warm Audio WA-87 which mimics the Neumann U 87 and comes acceptably close to the original's rich mid-range tonality (Inglis 2017). The microphone inside the kick drum was an Electro-Voice RE-20, which doesn't go quite as low as your standard kick microphone would, but it provided a nice, tight and punchy sound which complemented the outside microphone well (Electro-Voice n.d.).

All the other close microphones were versatile, industry standard choices or their equivalents: a Sennheiser MD-441 on the top head of the snare and a Sennheiser e614 on the bottom, SM57s on the toms, an Oktava MK-012-01 on the hihat, and another e614 on the ride cymbal (Huber & Runstein 2010, 171-179).

Percussions such as tambourines and a variety of shakers were recorded with the same microphone setup as the drum set, with the percussion player sitting on the drum throne. However, only the three overhead microphones and the room microphone were actually captured in the percussion recordings.





PICTURE 1. Overview of the drum microphones – the Shure SM7B pictured on the snare here was ultimately switched for a Sennheiser MD-441 (Kavasto 2019)

## 5.2 Electric bass guitar and upright piano

Neither the bass guitars nor the pianos on the album were meant to be show stoppers, but rather to fill their role without taking too much attention for themselves. Both the bass guitars and piano tracks on the album were thus recorded with very common, versatile equipment and techniques (Huber & Runstein 2010, 154, 156-157). The bass recordings were done with a Fender Jazz Bass and an Ampeg B-15N amplifier with an Ampeg cabinet, which was recorded with an Electro-Voice RE-20 up close and a Neumann U 67 about a meter away from the cabinet. The DI signal was also recorded. Some additional bass recordings were done last minute at Väinö Karjalainen's Kvark Studios with a similar recording setup.



PICTURE 2. Bass recording setup at Suomenlinnan Studio (Kavasto 2019)

Suomenlinnan Studio's Rönisch upright piano was recorded with a stereo pair of AKG 414's and a mono U67 as close microphones. The piano was in the same room as the drums, but on a different wall, and the Coles ribbon microphones we used on the drum recordings were also used as room microphones for the piano, but they were not moved away from their position behind the drums.

### 5.3 Cellos and violas

Only one violist and one cellist were available for the recordings, but we wanted to achieve the sound of a much larger string ensemble, such as a string octet. Therefore, we separately recorded multiple takes of each section with both the cello and the viola, changing the player's position in the room between each take to mimic how a small string ensemble would actually be positioned when playing live. Some takes were also played from different octaves where possible to achieve an even thicker sound.



The microphones used were a Neumann U 67 as a mono room microphone and a spaced pair of Warm Audio WA-87s for stereo room tone capture. The room microphones were not moved between takes, unlike the Coles 4038 which was used as a close microphone and always followed the player. The four microphones and the multiple recording positions ultimately resulted in 32 string tracks per song.



PICTURE 3. Recording setup for the string instruments (Kavasto 2019)

## 5.4 Vocals

To start off the vocal recordings, we tested out all the vocal-appropriate microphones at the studio to find the one most suitable for the singer Koivisto's voice. We settled on the Neumann U 67, which had already been used extensively on other instruments. The U 67's relatively linear response and ability to handle high volumes without more than some pleasant tube saturation worked well with Koivisto's dynamic singing voice and large range.

For each vocal passage, we recorded two to three successful takes, which was enough to compile the perfect performance for every song without feeling swamped in too many takes. In addition to Koivisto's lead vocal parts on every song, there is an additional vocal performance by Sophia Mitiku on "Glass

House”, and a four-person choir on “Neon”, both of which were also recorded with the U 67. The omnidirectional polar pattern was used to record the choir instead of the standard cardioid pattern, as the choir members were positioned in a circle around the microphone.



PICTURE 4. Koivisto during the vocal recordings (Tommiska 2019)

## 6 POST-PRODUCTION OF ARIEL

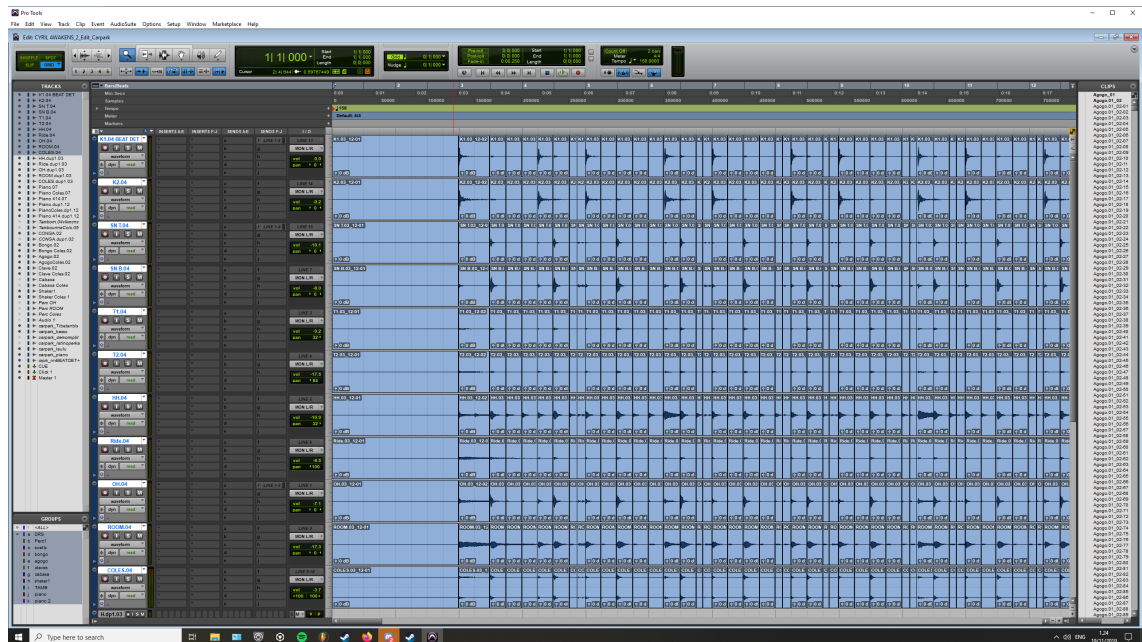
Broadly speaking, everything that was done after the recording sessions at Suomenlinnan Studio would be considered post-production. However, especially when dealing with parts that were programmed by me, pre-production and post-production bled into each other, which is common in the production of electronic music (Messitte 2017). To be more specific, during the mixing phase, I returned to some of the synthesizer or drum machine parts I had created, and modified or even completely recreated them. For the sake of clarity, this section will only deal with the editing and mixing.

### 6.1 Editing

Because of the prevalence of sequenced musical elements on the album, such as drum machine loops and synthesizer basslines, editing the timing of elements recorded by humans was necessary. The sequenced elements were perfectly on tempo and on grid, whereas humans make small errors in timing even when recording with a click track. To make sure all instruments – especially drums, percussions, and rhythmic bass guitar parts – adhere to the same tempo and groove, and thus sound cohesive, I quantised the recordings. Quantizing essentially means eliminating or alleviating imperfections in a performance (Childs 2018).

Pro Tools has a great tool called Beat Detective that makes quantizing very easy: Beat Detective can automatically detect transients, slice recordings at detected transients, adhere the slices to the grid, and fill any gaps that appear between the slices. The intensity of the quantization can also be adjusted via a percentage slider. The quantization process can be done simultaneously on multiple tracks, and especially in the case of multi-track drum recordings, absolutely should be done on all the tracks at the same time to avoid any phasing issues arising from different tracks being edited differently. (Price 2003.)

Although the process is very fast and partly automated on up-to-date versions of Pro Tools, care must be taken by the user; sometimes the algorithm can for example misdetect the exact start of a transient or miss one completely despite adjusting the quantization options. When this happens, the slice or slices in question must be manually corrected. Luckily, Pro Tools's playlists feature allows for a back-up of each step of the Beat Detective process to be kept inside the project file, easy to return to to fix any mistakes made during the quantization process (Pro Tools Reference Guide 2018, 11).



PICTURE 5. Pro Tools's edit view showing quantised audio slices (Kavasto 2019)

## 6.2 Mixing

After the editing phase, I switched from Pro Tools to FL Studio. Both are DAWs with more or less the same capabilities, but because of my experience in producing electronic music with FL Studio since 2007, I feel much more at home on FL Studio when doing anything other than recording or editing.

### 6.2.1 Common techniques

Due to the fact that the acoustic drum set and the lead vocals were the only instruments that were present in the same form on all nine songs, I felt it was important to start the mixing process by achieving a great tone for both of them: I could then use those settings as common ground for every song. I created these basic settings on the song “Glass House”, because it’s one of the most acoustic songs on the album and the acoustic drum set has a very prominent role in the song. “Glass House” also features guest vocals from Sophia Mitiku, and I wanted to create a vocal sound that would work well for both Koivisto’s and Mitiku’s voices.

The drum recordings sounded really pleasant from the get-go without any processing, so I proceeded carefully and tried not to make any big changes, only enhancing what was already great in the dry recordings. I only used a simple EQ on each of the individual drum microphone tracks, save for a multiband compressor on the Coles ribbon overheads, which was there to tame overt sibilance sometimes arising around 3 kHz from crashing the ride cymbal or opening the hihat. However, I bussed together the inside and outside kick microphones, and the top and bottom snare microphones to kick and snare buses, respectively. I gave both buses a little bit more character by carefully compressing the signals with no more than 3-4 dB of gain reduction with the FG-Stress, and then EQing with the FG-N, both of which are analog modelling plugins found in the Virtual Mix Rack by Slate Digital (Slate Digital n.d.a).

For the lead vocals, I created an effect chain that worked well and effortlessly for all of Koivisto’s vocal passages on the album as well as Mitiku’s guest vocals. The effect chain started with an EQ to cut out unnecessary low end rumble at around 160 Hz, to reduce a phone-like tone around 1 kHz, and to bring out some nice air above 4 kHz. After the EQ I placed a neutral sounding compressor, ruthlessly squeezing most of the dynamics out of the signal with a fast attack and release, after which I placed a de-esser which attenuated up to 10 dB of unpleasantly sibilant consonants between 5-10 kHz. Then followed a little bit of a secret weapon, a plugin called Nectar 3 Elements by iZotope, which is an algorithm-based multipurpose tool for processing vocals (iZotope n.d.). I used its

pitch correction, subtractive EQ, de-essing and compression modules to slightly alter the vocal sound – the plugin didn't do much in the big picture, but it was an incredibly easy way to make the vocals sound just a little bit better, so why not. To round out the chain, I used FabFilter's saturator plugin Saturn and a simple limiter for just a little bit of tape saturation and to catch any errant volume peaks, respectively.



PICTURE 6. The basic vocal effects chain used throughout "Ariel" (Kavasto 2019)

The cellos and violas on the album were recorded well in a great sounding room, so not much had to be done to them. I only utilised a little bit of equalization to keep the strings from playing too loudly around where the fundamental frequencies of the vocals were, and to bring back a little bit of high frequencies to the fairly dark ribbon microphone tone.

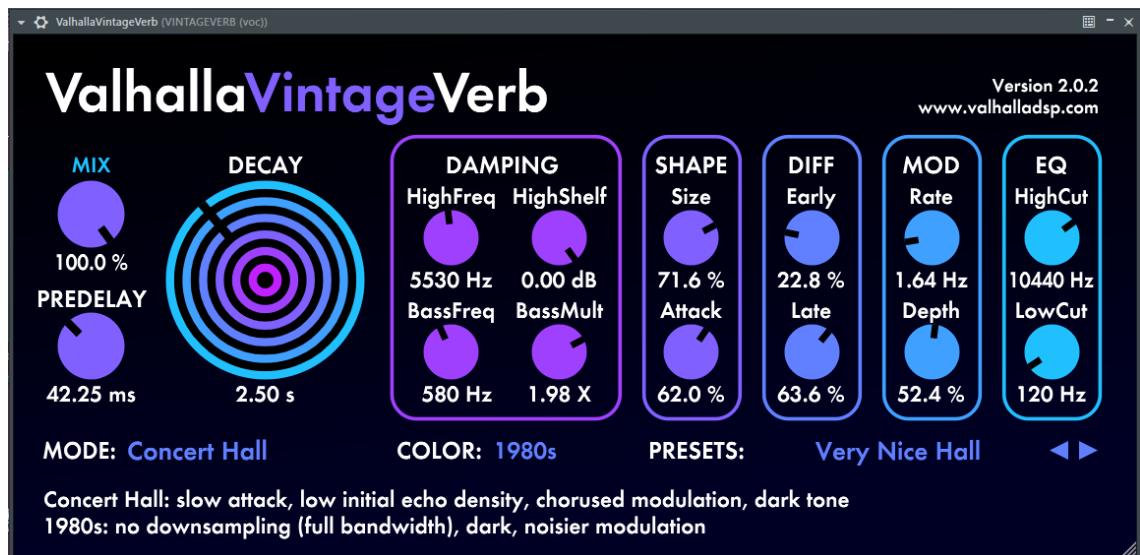
Like the drum and string recordings, the piano tracks also sounded good without any processing, albeit a little too boring or tame. Thus, I ended up not using the particularly tame sounding stereo close microphones at all, instead building the basis of the piano sound from the signal of the room microphones, the Coles ribbon pair that was still positioned behind the drum set during the piano recording. I used a bold high shelf attenuation of 9 dB at 585 Hz on the ribbon microphones's signal, which resulted in a pleasantly unclear stereo image and tone, which I finally supplemented with the low-passed signal of the mono close microphone to bring back some clarity.



All the other elements had to be approached on a song-by-song basis; the elements in question were mostly synthesizer tracks unique to each song. Most of the time all they needed were some small EQ tweaks to keep them from getting in the way of the vocals or masking the transients of percussive elements.

In addition to any processing that was specific to insert tracks, as outlined above, the brunt of the mixing work of course consisted of volume balancing as well as panning. I utilised bold panning, either keeping elements in the center or pushing them as far to the left or right as I dared whenever it made even a little bit of sense. For example, on “Love” I panned the main synth pluck 80% to the left, but then balanced it by panning a Soundtoys Crystallizer effect tail of the same synth 95% to the right. Similarly, I forwent conventional panning instructions for string instruments and panned the cellos and violas at least 70% to the left and right, respectively. The purpose of the bold panning was to reserve as much room for spatial effects as possible; L-C-R would be mostly reserved for dry signals, while everything in between would be the domain of reverbs and delays (Messitte 2018).

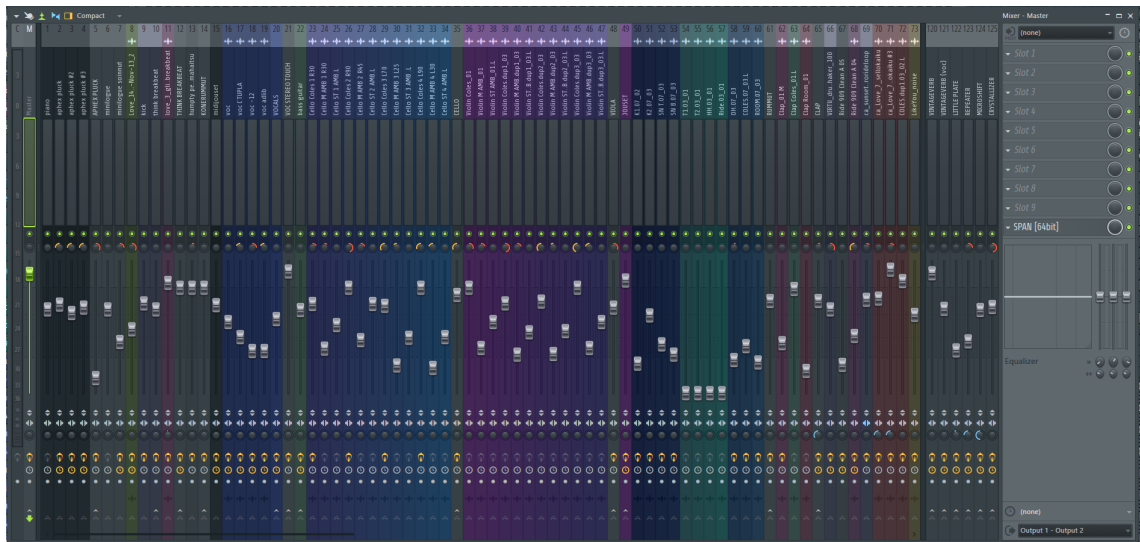
When it comes to the reverb tones themselves, the goal was to achieve a lush and interesting sense of space for the whole album (Huber & Runstein 2010, 33). I wanted the main reverb to be long but also to have some hearable, warm early reflections, not unlike the reverbs used on Mount Kimbie’s “Cold Spring Fault Less Youth”. I tried a few different reverb plugins to achieve this: The FabFilter Pro-R was a little bit too clean and uninteresting, while the D16 Toraverb was too lo-fi and messy. I eventually landed on the Valhalla DSP VintageVerb, which felt like a happy medium between the two. I used the “Very Nice Hall” preset, which was a 1980s style hall reverb with noisy, slightly chorused modulation. The preset initially had an 8,11 second decay, which I ended up toning down however much each song required, usually ending up between 2-4 seconds.



PICTURE 7. A screenshot of the reverb plugin I used, including a description of the characteristics of the "Very Nice Hall" preset (Kavasto 2019)

I used the VintageVerb on return tracks as is customary (Huber & Runstein 2010, 435). However, instead of using just one instance of the reverb plugin on each song, I actually set up two returns; one of them was only used for vocals, and the other for any other instrument I wanted to have a long reverb tail. The settings on the reverb plugins themselves on both returns were always identical in a song, but having separate returns allowed me to EQ them both differently, and to easily find a suitable reverb balance for each song without having to fiddle too much with send percentages. The separate returns also allowed me to use specific amounts of sidechain compression on each – I sidechained the reverb signals with the dry lead vocals, which is a good method to keep the reverb from getting in the way of the vocals (Heinonen 2019).

On another return I used a Soundtoys Little Plate reverb plugin with a 0,5 second reverb tail, which I used as a more natural reverb tone to further tie all the songs together in a realistic space (Huber & Runstein 2010, 506). Another send effect I had setup across the whole album was a delay plugin called Repeater by D16, which I didn't really ever keep in the foreground, except on the middle section of "Neon", where I used Repeater's tape delay modelling feedback to create an interesting texture that also built up tension before the song's climax – similarly to how it was used on "A Stroke of Luck" by Garbage.



PICTURE 8. A screenshot of FL Studio's mixer view on the song "Love". Note the string tracks and their respective buses on tracks 23-49, and the effect returns docked to the right on tracks 120-125 (Kavasto 2019)

## 6.2.2 Specialised techniques and plugins

Easily the most used creative effect on the album was the RC-20 Retro Color plugin by XLN Audio. It's a plugin designed to create vintage style imperfections familiar from analog recording equipment, such as the volume fluctuation of a worn out magnetic tape or the crackle of a dirty vinyl record (Erlandsson 2016, 1). Out of the six different modules on the plugin, the Wobble module saw the most use; it created very pleasant, subtle pitch variations, and what's more, in the stereo mode the pitch variations between the left and the right channel weren't synced, which resulted in pleasant stereo widening as well. The Noise module was also used a lot: the module's Follow parameter makes the noise created by the plugin follow the input signal level, which I put to good use to easily create noise layers for percussive elements. I utilised the RC-20 very liberally on all the songs, most prominently on synthesizer parts such as the sustained saw wave chords on "Florida", but also on choirs, drums, and percussions, as touched upon above.



PICTURE 9. The interface of RC-20 Retro Color, shown with the Noise and Wobble modules activated (Kavasto 2019)

All the lead vocal tracks were stereo-widened with Voxengo's free Stereo Touch plugin, which generates a stereo signal from a mono input signal (Voxengo n.d.). I placed Stereo Touch on a return track and completely muted the mid channel of the wet signal using another free Voxengo plugin, MSED. This setup allowed me to precisely control the stereo width of the vocals simply with the volume fader of the return track, as well as equalise the widened signal to my liking.

Another plugin I used a lot was Little AlterBoy by Soundtoys. It's a 4-in-1 vocal processor based on the Eventide H3000 hardware effect, which was originally created by some of the people who later went on to found Soundtoys (Soundtoys n.d.a). The plugin's intended primary use is real time formant and pitch shifting of vocals, which I did use quite a bit on the album: on many – if not most – of the songs on the album there are duplicated layers of the lead vocal which I pitched down by an octave with the plugin. Also, on the vocal ad libs at the end of "Florida", I pitch shifted the vocals up by a fifth and set the dry/wet mix to about 20% for an instant harmony.

I also put Little AlterBoy on some electronic drum tracks, pitched down by an octave and likewise set to around 20% wet, which pleasantly filled out some of the high mid range that can sometimes sound hollow or too resonant. However, the real kicker is that before update 5.3.1 fixed it, there was a bug that caused the left and right output channels to become unsynced in certain circumstances (Soundtoys 2019). This resulted in some interesting stereo effects that I really liked, hearable on the clap layers in “Florida”, for example – I still haven’t updated the plugin because I don’t want to lose the possibility to use those unintended stereo effects. Sometimes broken equipment leads to interesting results, as also observed by Kukkola (2019) regarding a broken multi effect that he had used on The Hearing’s album “Demian”.

“Florida” also saw me use MAutopan by MeldaProduction. It’s practically an LFO that automatically pans (hence the name) the input signal according to user set parameters. I used it on the fast, fluttering synthesizer layer, creating a custom LFO waveform shape which moved quickly through the center and spent a longer time on left and right in turns, resulting in added interest but still keeping the sound out of the way of more important elements in the middle of the stereo field.



PICTURE 10. MAutopan with the custom LFO shape I created for "Florida" (Kavasto 2019)

“Florida” is a slowly unfolding song, carried throughout by a 4th note electronic kick drum rhythm. It’s also quite a long song, clocking in at almost five minutes, so the kick drum would have become boring if it stayed unchanged all the way

through. I ended up duplicating the original kick sample, pitching down the duplicate by an octave and low passing it, then using only the soft pitched down layer until about the halfway point of the song. The whole electronic drum bus was also multiband saturated with a FabFilter Saturn; I saturated the transients of the drums to glue all the layers together. Multiband saturating drum buses was a technique used throughout the album on acoustic and electronic drums alike – sometimes even both bussed together – for the same purpose of glueing the elements together.



PICTURE 11. FabFilter Saturn on a drum bus. The middle band, set around where the transients of the drums reside, was saturated more than the high and low bands to bring the drums forward in the mix and to glue the drums together (Kavasto 2019)

Next to reverbs and delays, I also had a Soundtoys Crystallizer on a return track on the songs. Crystallizer is a pitch shifting granular reverse echo, also based on the Eventide H3000 just like Little AlterBoy (Soundtoys n.d.b). Crystallizer was used here and there on the album for a little extra texture, but on “Love” it had an integral role. The main pluck lead was fed into a Crystallizer after the song’s second chorus. I treated the effect tail created by the plugin as its own instrument and mixed it quite loud, giving a whole new, shimmering feel to the rest of the song.

“Neon” was a song that had quite a lot going on mix-wise, despite its relatively few separate elements. Very slow at just 80 bpm, it was important to make the synthetic 4th note kick drum that carries the song sound very powerful. Thus, in addition to making the kick dominate the low end of the mix in terms volume and frequencies, I used the kick’s signal level as an external controller for the intensity

of an effect on other instruments. In other words, whenever the kick hit, the dry/wet percentage of the effect on the other instruments would increase for the duration of the drum hit.



PICTURE 12. A visualisation of the volume curve of the synthetic kick drum which was used as a controller for tremolos on other instruments (Kavasto 2019)

The effect that the kick's signal controlled was a tremolo on the piano, the choir, the double-tempo layer of the acoustic drums, and an electronic percussion layer. The tremolo's rate was set in relation to the fundamental frequency of the synthetic kick drum which was 49 Hz, i.e. a G1 note; so, I set the tremolo's rate at 12.25 Hz, which is the equivalent of G-1 (two octaves below the synthetic kick drum). This resulted in the impression that the sheer power of the kick drum modulated the other instruments.



PICTURE 13. The interface of the tremolo plugin on the piano channel. Note the rate set to 12.25 Hz, i.e. G-1 (Kavasto 2019)



In addition, I used kiloHearts's Disperser plugin on the kick of the acoustic drum set on "Neon". As defined in the plugin's manual: "Disperser is a stack of all-pass filters tuned to cause frequency dependent delay in the signal" (Disperser Operator's Manual n.d.). In layman's terms, when the intensity of this effect is high, it can transform any percussive sound into a laser-like zap. On "Neon", I didn't go so far as to turn the acoustic kick into a laser, but the phase offset provided by the plugin helped the acoustic kick sit better with the loud synthetic kick drum. (Disperser Operator's Manual n.d.)

As a final touch to the mixdown of "Neon", I placed the Virtual Mixbuss plugin from Slate Digital's Virtual Mix Rack on the master mixer channel. Virtual Mixbuss emulates the sonic characteristics of classic hardware recording consoles, including their saturation characteristics (Slate Digital n.d.b). I took full advantage of the saturation modelling, and boosted the input gain on the plugin via automation towards the end of the track, and conversely automated the output gain downward to maintain a constant output level. The goal was to achieve the impression of the band playing so much louder toward the end of the track, that the hardware recording console started audibly distorting.



## 7 DISCUSSION

The process of mixing and co-producing this album, my analyses of other similar albums, and perhaps most importantly the insights from industry professionals and publications have definitely helped me particularise and hone in on my views about mixing, as well as expanded the techniques in my repertoire when it comes to combining band instruments with electronic elements. It's undeniable that arrangement is king, as noted by Kukkola (2019), as well; a great arrangement with fitting instruments and a thought out role for each of them makes the job of the mixing engineer that much easier.

When the instruments in a song feel disjointed, some potential ways to help interconnect them include processing them together in a bus, using synchronised effects on the inserts, and creating a sense of shared space for them by using a reverb return. In fact, the atmosphere of "Ariel" is primarily held together by liberal use of a lush reverb effect, the tone of which is the same throughout the album. These concepts can also be utilised on an album level to increase cohesion – on "Ariel", instruments that are heard consistently on every song are mixed to sound the same on each of them. Notably I also used mixing techniques that are characteristic of mixing conventional band instruments in tandem with techniques that are characteristic of mixing electronic music, the combination of which I felt was essential in achieving the unique sound signature of the album.

There are a few almost philosophical approaches to mixing that can really help achieve cohesiveness within the context of a single song as well as on a larger scale such as a full length album. I found it the most important to ground the elements to the real world – especially instruments that don't come from the real world, such as otherworldly synthesizer patches. I'm a big proponent of creating vintage style imperfections, like tape wow and flutter, to the otherwise unerring electronic elements. Conversely, it can be helpful to nudge acoustic instruments a little bit further away from the real world – perhaps by *removing* imperfections – so the two disciplines can meet in the middle, so to say.

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## APPENDICES

Appendix 1. Email interview with Samuli Kukkola 31.10.2019, English translation

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### **Can you briefly introduce yourself and outline your background as a music producer, and your role in the making of the album Demian by The Hearing?**

Song arrangements and production choices have interested me for a long time, but I haven't consciously categorised the different roles too much. I've always just thought that I am making music. Often there has been someone who has had a better understanding of the technical aspects, and I've been able to learn by following what they were doing. I have no formal training in making music, production or mixing. I've learned from whoever I've worked with at a time. It has been great that I've been able to make music with nice, visionary and skilled people. My interest in electronic music has "forced" and inspired me to learn the technical side and production side as well. Bringing your ideas to life requires you to at least be able to somehow execute what you have in mind.

I ended up working on Demian by originally helping Ringa [The Hearing] with a single song that was troublesome. Then I helped on a couple of other songs too, and eventually ended up making the whole album with Ringa. Ringa had composed and started production on songs that we then began finalizing both together and separately. Sometimes it required blowing up the whole song to pieces and putting them together again, sometimes all it took was a little volume and frequency tweaking. Thus, my role was quite free-form. I mixed, produced, recorded, programmed and even played something on the album. The album is the first one I've ever mixed. At some point the compositions, arrangements and production were so far along, it would have been weird to send it to anyone else to re-mix, although I'm sure many people would have done a technically better job than me.

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**In modern production a single song might utilise elements from very different sources, such as synthesizers and sample packs, but also human voice and acoustic instruments. What kind of production or mixing choices do you use to make sure that all the elements in a song sound natural together?**

It all stems from the fact that I think of all the elements as just sound, without thinking too much about the source. If you are able to choose the correct pieces, making sure they sound cohesive isn't such a big task. I also like picking things from different places; not everything even has to be "from the same world".

I begin by thinking what I want to do and achieve with each element and track. For example, there are a lot of vocal tracks on Demian. In addition to rich harmonies, we wanted to preserve an intimate mood on the songs. I used designated reverbs/delays for the lead vocals and made separate automations for them. The backing vocals got their own buses, so that their sound would be consistent. At the same time this allows for the lead vocal to have its own space in the song without getting lost in the backing vocals. This also allows for any nice choirs/backing vocals/harmonies to be made quite loud without them messing with the lead vocals.

Towards the end of the mixing/production process I made mix buses for different instrument groups to unify their sound. A lot of the time I had separate buses for basses, drums, melodics [lit. ringing sounds] and vocals. The initial settings for each bus might have been similar across different songs, and I'd further tweak them to fit each song.

**What about the previous question put in an album context; how do you make all the songs sound cohesive together even when the instrumentation between them all might be dramatically different?**

For me it's helpful to work on multiple songs at the same time. This way they are in constant interaction with each other and stay in context more easily. A composition or production epiphany in one song might well be utilised in one of the other songs being worked on. Although all the songs might have very different instrumentations, on an album scale the instruments, samples and plugins I am able to use aren't unlimited. Of course it's good to have some kind of a general idea of what you're trying to achieve with the album and how it could sound. You can make some rules, but then give yourself the permission to break them.

**Do you use specialised techniques for recording synthesizers or drum machines?**

If the space allows, I do use re-amping. For example, on the Ruusut album [Ruusut: Ruusut, Fullsteam Records 2018] re-amping had a crucial role in making the album sound three dimensional. We put individual instruments or groups through an amplifier in a big room and recorded it from afar with a condenser microphone. A big solid-state amp that you can overdrive works very well for this purpose.

On Demian most of the material was recorded straight to a line input, except for vocals and some field recordings. Some drums and certain synthesizer tracks were later put through hardware mixers or hardware effects, either individually or in groups.

The album was also stem mastered by Tommi Langen, and I was present during this process. We put different instrument groups through Langen's hardware compressors, equalizers and distortions, which had a big impact on the overall sound of the album.

**Do you feel that parts of songs that are produced with synthesizers or samples sometimes sound too perfect, robotic or soulless? If yes, what have you done to lessen that impression?**

It's probably possible, but it's more important to choose instruments, sounds and samples that you feel are right for a given song. Listening to a lot of music and knowing the culture behind the type of music you're working with is really helpful and inspirational. I think soullessness comes from something else than the use of synths and samples. Sometimes making something sound really plastic on purpose can be just the thing to bring "soul" into a song.

However, there are many ways to avoid a certain mechanical sound if it's not something you're looking for. Synthesizers can be either played or programmed, their sound can be tweaked during recording and so on. In my opinion an interesting result is often achieved by combining different ways to work. Not everything has to be on grid all the time! I like to put midi tracks through hardware synths and then onto the computer via a mixer, but also using software instruments. I also make a lot of big moves with automations, either in the DAW or with hardware already during the recording. Pitching, gaining, reversing, cutting and stretching samples can also achieve lots of variation.

**Are there any "secret weapon" plugins you can reveal, or other plugins or hardware effects that are important to your workflow?**

I used Soundtoys's, FabFilter's and UAD's plugins a lot on Demian. I also used Valhalla Vintageverb, and the StepFX plugin that is native to Logic, and an old, big Soundcraft mixer that distorts nicely. Most of the tracks on the album were recorded through the mixer. A slightly broken Lexicon multi effect that does unpredictable stereo effects is also heard on the album.



**Can you briefly introduce yourself and outline your background as a music producer and mixing engineer?**

My story is quite traditional: at first I had my own band that I made demos for at home. To advance the making of my own music, I started studying music technology in 2008 at Salpaus Further Education after graduating gymnasium. While there, I started to realise it would be cool to produce music for other people, as well. For a long time I only worked on my own music, but I did do some productions for my friends' bands too, and it all grew from there.

At some point I started getting asked more and more to work on projects where someone else had produced the material and I would mix them. That's when my own learning curve started to really rise, when I only had to focus on one area of production, and it didn't just feel like trying to salvage my own poorly recorded productions. :D

So, by background is firmly in band music, and I mostly did only that until 2016 when I made a management deal with Jonas Olsson and started as a full time mixing engineer at his company Isolla Music. Currently I yearly mix 100+ songs from all genres including schlager, pop, rap, and also still a lot of rock because of my background in band music.

**In modern production a single song might utilise elements from very different sources, such as synthesizers and sample packs, but also human voice and acoustic instruments. What kind of production or mixing choices do you use to make sure that all the elements in a song sound natural together?**

I would say that group processing is key, at least in my workflow. I usually have buses for each instrument group (drums, bass, synths, vocals etc.), in which I process each group as a whole. This way of working glues things together well in

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my opinion. And of course I use standard things like EQ on singular tracks to try and make each element a part of the same soundscape.

**What about the previous question put in an album context; how do you make all the songs sound cohesive together even when the instrumentation between them all might be dramatically different?**

I'm often involved in projects where the songs on an album come from multiple different producers. In these cases, I aim to start by utilising mix bus and group processing to achieve as coherent a frequency spectrum and dynamic response across all the songs as possible. For example, if the level of high mids and the bite of transients are similar between songs, it creates a sense of coherence even if the soundscapes are otherwise dissimilar. I also pay a lot of attention to the lead vocal, so that its sound is cohesive and its level compared to the instruments is similar on the whole album.

**If a song calls for a big sense of space and long reverbs, what kind of techniques can you use to make space for them in a mix without the overall sound of the song becoming messy?**

Sidechaining is the first thing that comes to mind. For example, by sidechaining the reverb of the lead vocals with the dry signal so that the wet signal is more upfront when there's no singing makes the reverb audible without taking space away from the vocal itself. It's also a good idea to EQ the reverb so that it's plays at frequency ranges where there isn't a lot of other stuff. A lot of the time it's also the goal to drench the whole song in a lot of reverb, which of course results in things being messy, but in a good way. In these cases, it's just important to preserve the pulse of the song and have the transients come through. For example, sidechaining and overemphasising the transients can help with this.

**Do you feel that parts of songs that are produced with synthesizers or samples sometimes sound too perfect, robotic or soulless? If yes, what have you done to lessen that impression?**

I think that if something sounds perfect, you don't have to do anything to it. :D The soullessness problem is more common, most often when the producer is not

so experienced, and the sounds sound like a bunch of Logic presets. The problem is often that the synth sounds take up too much space across the whole frequency spectrum and overly sibilant highs cover all dynamics. In these cases, I aim to preserve what's relevant about each sound, and just filtering out unnecessary highs, for example. This way the singular sounds themselves become smaller, but there is more space in the soundscape for things to happen and for the song to breathe.

**Are there any “secret weapon” plugins you can reveal, or other plugins or hardware effects that are important to your workflow?**

Yes, there are! :D

Probably the most important plugin overall has been HOFA 4U ProjectTime. I always keep it on, and it tells me how much time I've spent working on each session. This data has been great in evaluating my own work, and figuring out how much time each thing takes for me. This has helped me schedule projects correctly and also set the pricings for my work.

Another real secret weapon is Sound Radix's Pi. Well, I don't know how much of a secret it is, but anyway. A real space age plugin. It levels phases of different sound sources in real time [dynamically rotates the phases to achieve maximum correlation], which is vitally important in current day productions where there are often multiple kick or bass tracks playing at the same time, for example. Almost every time you put that plugin on e.g. basses, you instantly have a solid and good sounding low end.

A big tip of the hat to FabFilter's Pro-MB compressor, too. It's a bit backwards, but I don't use its multiband feature that much, it's just such a versatile plugin in other ways that if I could only take one compressor with me on a deserted island, this would be it.

Appendix 3. Thesis project album, Ariel by Cyril Awakens