

JENNIFER JADE BEVAN - 2123646 - INSTRUMENT ESSAY (D2b)

Rise of the Gamer

WORD COUNT: 3827

Approach to creating the instrument

When I began to consider how I might approach the creation of an electronic instrument, my first instinct was to go down the route of recording analogue sounds and digitalising those. I play a lot of computer games and so whilst out and about I would be aware of sounds that could lend themselves to being used as ambient sounds in an atmospheric, first-person perspective, story driven game such as *The Witcher* (2015) or *The Last Of Us* (2013). I went out into the woods and recorded sounds using my iPhone such as creaking gates and snapping twigs. I started watching Foley artists on Youtube for inspiration, then came across a video I found particularly fascinating which was *The Beautiful Lies of Sound Design* (TEDx Talks, 2016) which shone a light on the psychology behind how we perceive sound, and how images that accompany them manipulate our perception, and so I considered recording a few sounds and pairing them with animations or videos that didn't represent what the sound truly was, but that would influence how the listener perceived the sound (an example of the from *The Beautiful Lies of Sound Design* was bacon sizzling paired with an image of rain - and the audio sounded completely fitting to the image). I would have used Logic Pro to process these recordings, and although Logic is a software that I'm familiar with I suspected I would encounter issues by using ambient sounds, for example struggling to get rid of the unwanted background sounds like wind that could end up clouding the sound that I was trying to isolate. I was also concerned about the potential limitations when it came to sourcing physical objects. On the one hand the possibilities are endless and the idea that anything can become an instrument or be used as a sound effect is quite an exciting one, but I didn't want to find myself stuck if sourcing appropriate materials became a struggle. Plus, although I have an interest in computer games, I decided in the end that I would prefer not to stray too far from my true passion, music.

By creating a digital instrument from scratch I was able to experiment with a mixture of sound effects and melodic sounds that could be used for commercial tracks as well as computer games, and I felt more confident that I'd end up with a sound that is clean, easily marketable - and perhaps even something I could end up using in one of my own tracks. I decided to create my instrument using Reaktor 6 by Komplete - Native Instruments. I wasn't familiar with this software and had to learn how to use it from scratch, but it straight away appealed to me visually as something that would make intuitive sense due to its design, and I thought I could get to grips with it quicker than I might with the alternatives such as Max MSP. Reaktor 6 is a tool that enables you to 'build custom synths, samplers, effects and sound design tools' and 'experiment with rack-style modular patching using Blocks' (native-instruments.com). I navigated my way through getting to grips with Reaktor 6 by using video tutorials and blogs.

The problem with creating a digital sound from scratch is that it's difficult knowing where to begin. The Tedx Talk video about the 'lies of sound design' set me down a track of researching auditory illusions, and it was then that I discovered the Shepard tone - a tone that is created by having notes played an octave apart on a continual loop. This gives the listener the illusion that the note is forever rising in pitch whilst at the same time decreasing in pitch, which creates a very tense atmosphere perfect for dramatic film scenes (Hooton, 2017). As a starting point I began researching how to create an instrument that exploited or incorporated auditory illusions. I would have liked to experiment with creating sounds that appear to be coming from a particular places, for example in one ear and then the other, but I didn't have enough equipment to make that a possibility. I realised I needed to pare it back and think more simple if I was to get something completed in the allotted time.

In the end I decided to create an instrument that is reminiscent of popular computer games from the 1980s such as Tetris and Super Mario, since eighties pop-culture is very in vogue at the moment. Eighties music and other media is being sampled on television shows such as *Stranger Things*, and to a positive reception from audiences, as shown by Kate Bush's *Running Up That Hill* getting back into the charts (Savage, 2022). Whether they are experiencing it as something completely new or whether it's a form of nostalgia, audiences of all ages currently seem to 'crave that sugar-hit of the Eighties' (Bennion, 2022), and so I thought that a sound that conjures the vibrant simplicity of games such as Tetris, Pacman and Space Invaders would be a good starting place and something with good commercial viability - perhaps to be used as sound for a new console or mobile game that's marketed as an 80s nostalgia piece. And so I began trying to create an instrument that was reminiscent of the very synth-y, high pitched 'plink plonk' sound that's used in those games.

At first I was set on creating a timbre that is bright and high-pitched with a bubbly/metallic tone (what I've described above as the 'plink plonk' sound). I listened to a selection of different video game sounds from the 1980s: Tetris (1984), Pacman (1980), Vanguard (1981), Super Mario Land (1989) and was struck by how unique each sound was, even though it was easy to put them all in the same category. I knew I wanted my sound to be fun, interesting, maybe a little annoying but ultimately almost addictive. In a lecture by Library of Congress it is mentioned how with the 'the iconic bullet chomping sounds' in Pacman 'you get this sense of satisfaction running through the maze and chomping. It's almost like you can't stop. But that's how important the audio is in the game and makes Pacman the experience that it was' (2020), and my aim was to create something similar.

Issues I encountered during the development stage

The sounds I began creating were ones that were reminiscent of the sound effects I would hear as a child whilst playing computer games. I imagined the loud, artificial sound as one that would appeal particularly to someone young. As is probably typical for a lot of kids, I would attempt to imitate the sound of the game whilst I was playing it, but would playfully adapt and add to the sound as well, often oscillating a single note manually with my lips to create a wobbly 'WAAaaWAAaa' sound. I was curious to know how this effect would sound on the instrument itself, considering that this may make it more exciting and appealing to a young demographic, so I used a flanger to create the fluctuating note. A consequence of doing this was that there was now a thumping sound accompanying the note, like an unwanted plosive from an unfiltered mic. To get around this I went through each module and soloed them to source the cause, and in doing this discovered that it was caused by the input level on the MOD A of the VCA being too high, and so I turned it down.

This created a staccato effect that I preferred, and the thudding sound had split from the note which created a novel effect whereby it thumped on pressing the key and played the 'Tetris' like note on releasing the key. This press/release effect along with the staccato note meant I had more control over the sound than I did when the thud plus note occurred simultaneously, and it created a satisfying, 'full' sound as though there was a synth instrument and a percussion instrument working in harmony. But although this was quite fun, it still wasn't the sound I was going for, and there was still feedback in the overall instrument. I realised that MOD B needed turning down, which reduced the feedback. I eventually also took out the amp which was causing the thudding sound, as although the split thud/tone was quite novel it wasn't the clean sound I was going for - and it was being caused by a signal going into the amp and creating an overload so it wasn't something that was 'supposed' to be there.

I have a very big issue with my instrument at the moment, and that is that when the ENS file is opened on any machine other than the one it was created on, although the file opens and looks as it should, and appears to receive a signal, no sound can be created from any input. I believe that the only way of getting around this is by paying for an expensive licence, so at the moment my instrument can be for demonstration purposes only and could not be available on the market. To get my instrument beta tested I had to either ask people to come into my studio or bring my laptop to them.

Principles behind how my instrument works

If in the future I purchased a licence, to access my instrument a user would need to download Native Access from native-instruments.com, download Reaktor 6 Player, or Komplete Kontrol, then open the ENS file. The instrument can be hooked up to a digital piano or keyboard, and played using the keys with each key corresponding to a different note on a rising and falling A-G scale as with a traditional analogue instrument. Someone without a keyboard could play the instrument using their computer keys, but to get the most out of the instrument a piano keyboard would be desirable. The instrument can then either be used to create standalone sound effects, or melodies. The instrument spans seven octaves - the range of a standard piano - however the instrument cannot be played quite like a piano. The only way to play a melody is to release one key entirely before playing the next one. When notes are played simultaneously or even if they overlap very marginally, that is when you get a whining 'alarm' or screaming 'firework' type sound. With this method it almost sounds like one continuous note bending rather than separate notes being played. Also, if you press any of the pads on a MIDI keyboard at the same time as one of the normal piano keys, it interrupts and distorts the note with a 'pew pew' laser-type sound effect.

After I'd completed my instrument I thought that there was something lacking. It looked fun and bright and could be beneficial to someone who needs these particular types of sound, but I wanted something a little gimmicky that the casual user could play with. I therefore decided to add three additional preset dials onto the interface which can be controlled by a computer mouse and alter the sound of the instrument. I labeled the dials with words reminiscent of the sound effects they added: 'alien' for the wobbly, extra-terrestrial inspired sound, 'terror' for a sound that has a disconcertingly grating undertone, and 'laser' for a sound that sounds a bit like a laser (although a different type of laser to the one created by the MIDI pads).

Reflection on the results of my finished instrument

I moved away from the staccato 'plink plonk' sound that I was originally working with - a sound that was very heavily inspired by games such as Tetris and Pacman - and ended with a sound that is more sustained and psychedelic sounding. Although originally my instrument was intended to be marketed purely for generic 'computer game' sound effects, such as a sound that might accompany a character running or jumping, or an object moving, I ended up with an instrument that was a lot more versatile. Depending on the octave and combination/order of notes played, the instrument could be used for various much more specific sound effects, for example an alarm, a siren and vehicle sounds. The higher pitched notes, especially the sharps and flats could be used for 'fantasy creature' sound effects, a couple of the lower notes sound

like a spinning blade (e.g. for a helicopter or ceiling fan), and the lowest pitches sound like a machine gun. If several very high-pitched notes are played in a descending scale it sounds like a screaming firework. They are quite realistic sounding on their own with no accompanying image, but as evidenced in the video *The Beautiful Lies of Sound Design*, as soon as you put an appropriate corresponding image with the sound effect it is hard then to think of the sound as being anything other than what you're being 'told' they are. This is hopefully successfully demonstrated in my presentation. The mid-range notes have an eerie sound that could lend itself to a game or film that is aiming for a spooky effect. The instrument also has the potential to be used in commercial music tracks, most likely ones in the dance/techno genre. An ascending scale could work well as a 'riser' building up to an explosive chorus. Returning to the 80s theme, the instrument could be used to play a simple melody in a synthpop track that would enable a musician to capture the same recognisable sound that can be heard in tracks such as *Are Friends Electric* (1979), *Running Up That Hill* (1985) or *Take On Me* (1985). The instrument can therefore be used across a number of different mediums: video and mobile games, sound effects for mobiles such as ringtones/alarms, television/film and commercial music.

I will go into more detail about marketing angles in my presentation, but a potential issue I considered whilst developing my instrument was marketing related. The wide range of sounds and effects my instrument could potentially be used for isn't necessarily beneficial from a commercial point of view. A package of diverse, unrelated sound effects may be difficult to find a market for. I did consider honing in on one particular category of sound with a view to marketing that only (for example marketing it as an instrument that plays 80s inspired synth melodies), or splitting the sounds up and marketing them all as separate entities that could each be purchased for £1 or £2 each, which is a model I have seen used for sound effects during my research of comparable instruments online (for example on audiojungle.net).

When it came to designing the graphics for my instrument I was again inspired by the retro 80s concept, so that is probably the theme I will stick to in my marketing strategy. I used a bright orange cartoon joystick as the main graphic on a backdrop of bright blue. It looks a little like the sun in the sky, and across these graphics in bold font is the name of my instrument: 'Rise Of The Gamer'. I think that the bold colours and simplicity of the graphics and font evoke the style of game-art of the 80s (as does the joystick of course), and the name, along with the evocation of a sun rising in the sky, is suggestive of the new era of gaming that was born in the early 80s - the 8-bit home gaming consoles which brought 'colourful graphics and inventive Japanese game design to the global masses' (BBC Archive).

Comparison to other electronic instruments on the market

I researched four main existing electronic instruments whilst developing Rise of the Gamer: to start with, Analog Dreams by Kontakt, 80's Touch by Joerg Holzamner and Synth Pads by Spitfire. Analog Dreams (Appendix B) 'combines the classic sounds of iconic hardware synthesizers with modern processing and creative effects' and is used in the soundtracks of iconic 80s movies such as *Blade Runner* (1982) and *The Terminator* (1985) (www.native-instruments.com, 2022), and is still used today by producers who are looking to replicate an 80s synth sound. It is an extremely well designed and comprehensive instrument and quite reasonably priced compared with many comparable instruments on the market, and it's also well marketed with a slick, attractive design and graphics. It has around one hundred different sounds organised into five categories (bass, FX, leads, pads, plucks), and each is infinitely customisable. I was quite inspired and influenced by Analog Dreams, and although I couldn't hope to make an instrument that was quite as full-scale and sophisticated, I had in mind that I wanted to replicate its stylishness and intuitiveness. I did originally have several dials on my instrument's interface giving the user the ability to customise the sound (Appendix A), but I had some trouble getting them to work effectively and thought it made the interface look a little messier than it needed to for little benefit. I therefore removed these in favour of just three dials which are loaded with the aforementioned pre-set effects. This means that my instrument is no longer customisable, but it is cleaner than it was, and very user-friendly (providing the user is happy to use it as it is without the ability to make nuanced modifications to the sounds). The instrument is really geared towards being used for sound effects and simple melodies rather than complex tracks.

I also looked at 80's Touch by Joerg Holzamner (Appendix C). This has a very different interface to Analog Dreams and is much more reminiscent of my original version of Rise of the Gamer (Appendix A) with its analogue-style graphics including knobs and dials that are labelled straightforwardly according to what they do, such as 'cutoff' and 'res' (whereas the sound alteration options in Analog Dreams are labelled a bit more poetically with things like 'summer hill' and 'dark star', in-keeping with its brand). Synth Pads by Spitfire [Appendix D] has a very different interface again. It is by far the simplest and cleanest of the four instruments in terms of graphics. Like 80's Touch, though, it gives clear options that enable you to modify attack, decay, release and so on.

As I began to realise how many sound effects my instrument seemed capable of creating, I started to research what sound effect plugins are already on the market. Modified 8-bit Madness has pre-programmed sounds and effects that users can select using a drop-down list.

Although I have not included this option on my instrument, this is the first improvement I would make to the instrument if I were to develop it further.

Beta testing and user feedback

I was able to get feedback from six different beta testers. A couple of the testers were disappointed that there wasn't an option to play the instrument with both hands. As mentioned above two notes cannot be played simultaneously but rather one will interrupt and take over another. The beta testers who would be more disposed toward using an instrument to make sound effects or to assist with melodies in dance tracks however were a lot more enthused, and one particularly liked the way the notes 'bend' when you play them close together (the feature that enables the 'siren' effect). My first two beta tests took place after I removed the first lot of dials that enabled users to modify the sound, but before I added the three dials with presets. It was after the initial feedback that I decided to add these three presets, as both testers commented that they were expecting to be able to do more with the instrument. The testers who used the instrument after the three preset dials were added seemed to have a more positive experience with the instrument. None of the people who tested my instrument mentioned specifically that they would like to be able to customise the sound to the extent that you can in Analog Dreams etc, although I do suspect that many users would potentially feel this way. I would have to be careful to market it to target an audience who wouldn't have this expectation. All of my beta testers seemed to have fun playing with the instrument, so I think I've succeeded in my aim to make a fun 'addictive' sound. Most of the beta testers commented that the versatility of the instrument was very appealing in the sense that they could completely alter the sound of the notes just by changing the octave or the way that they played the notes (namely the ability to create the wailing siren effect). I deliberately didn't tell half of them anything about my thought process behind the instrument or my intentions for it, and one out of those three actually mentioned that they could imagine it being used in an 80s pop song, and another said that it would be perfect to use to make a tune for a mobile game, so I found those comments very promising.

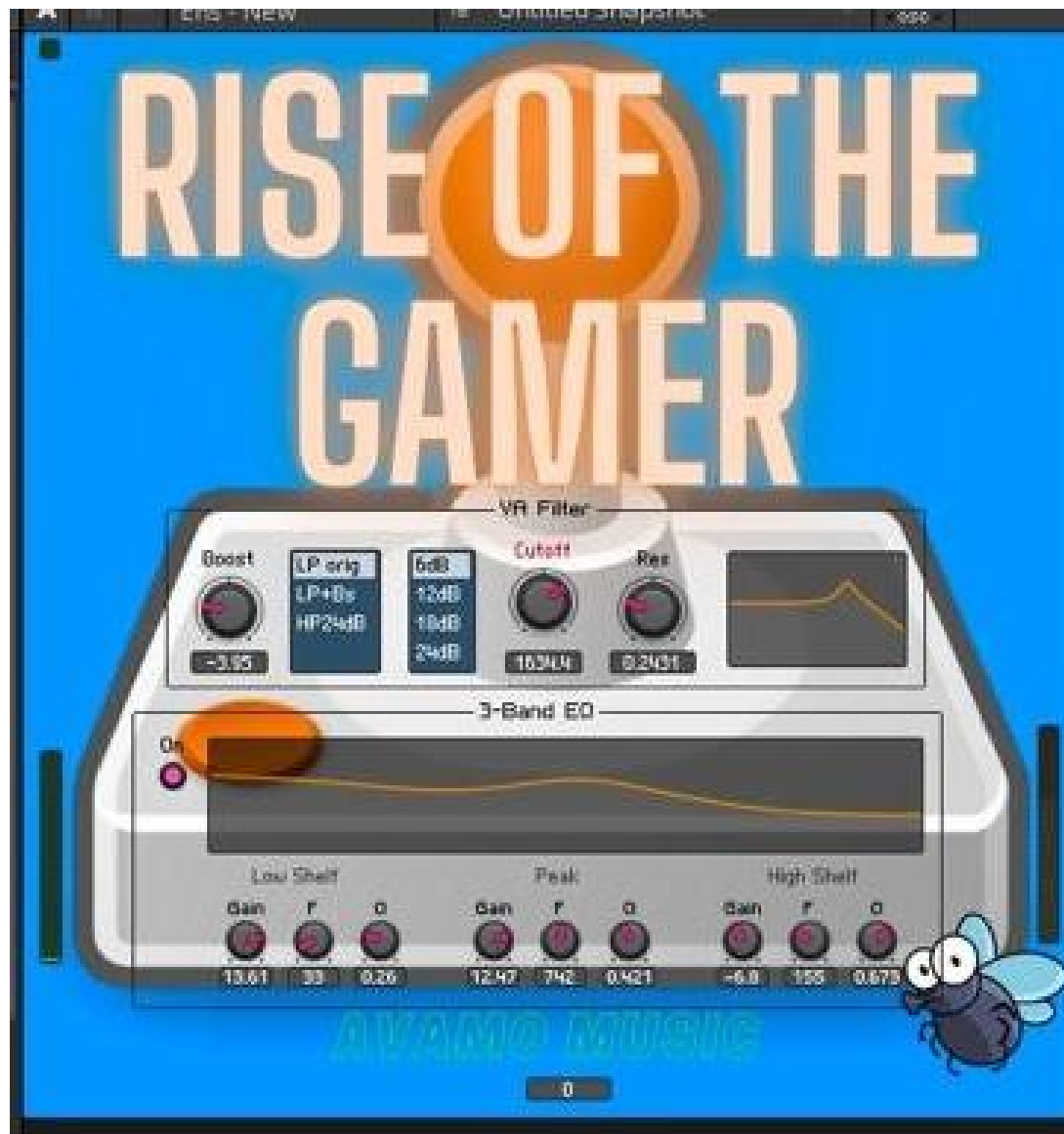
Possible improvements

At the moment my instrument has three pre-sets, but I would plan to market it as an instrument that can make real-world sound effects, and at the moment you can only do that from playing particular key/s. If I were to develop my instrument further I would add an option to the interface that enables the user to easily select a particular sound effect rather than needing to discover them by playing around. I would add a drop-down menu with several pre-sets (air raid siren, car alarm, horn, firework, and so on) so that an effect could be accessed on demand as

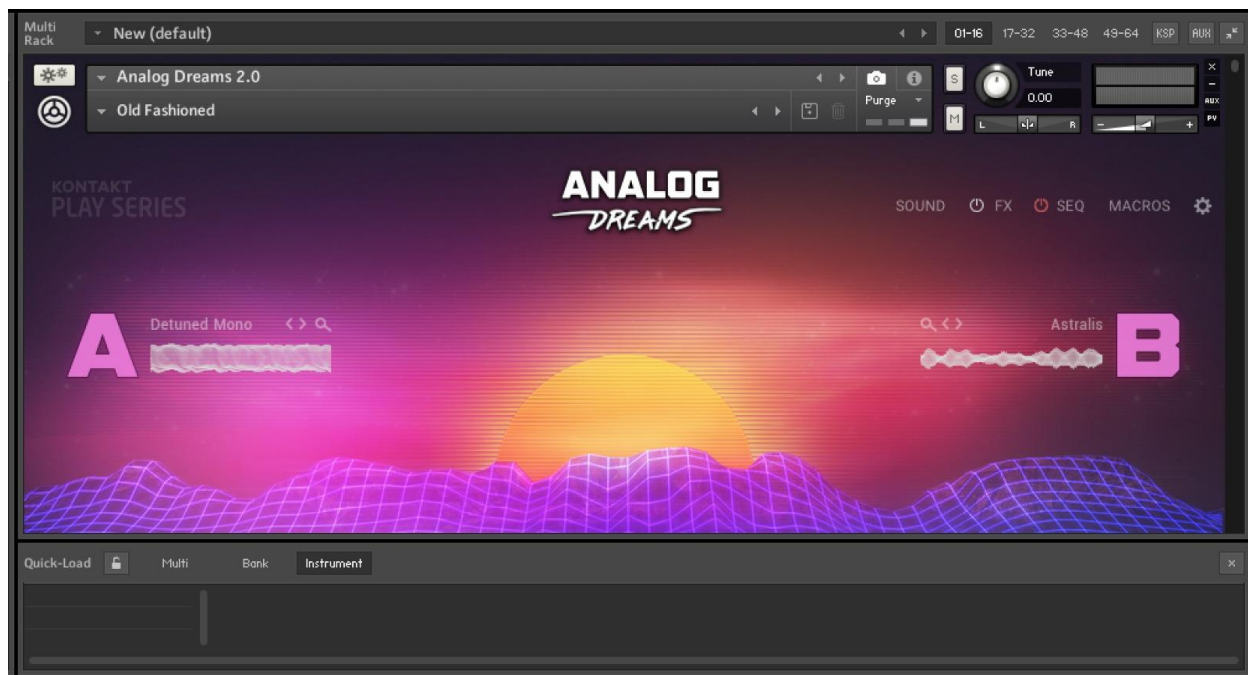
with Modified 8-bit madness by Native Instrument. I would also like to add a couple of arpeggio chord kits, also inspired by Modified 8-bit Madness. So as to better exploit the sense of eerie/spookiness that the mid-keys offer, I would create a version of them that includes more of an echo effect and that would be the pre-set that was added to the drop down menu as the 'spooky' sound effect. I would have a feature whereby you have the option to switch a 'sustain' mode off and on as well for the keys. This would be a desirable option to have in general, but it is actually essential for sound effects that need to go on for as long as you need them to (the helicopter and machine gun, for instance).

I am still curious about the digital instrument that never was - i.e. the sounds that I recorded in the woods, and keep coming across sounds in everyday life which I think would be interesting to record and do something with digitally. I had at one point considered creating animations to go with the sounds but knew that wasn't realistic given the timeframe as I have no idea how to create my own animation - but it's still something that I might like to pursue in the future as a separate project.

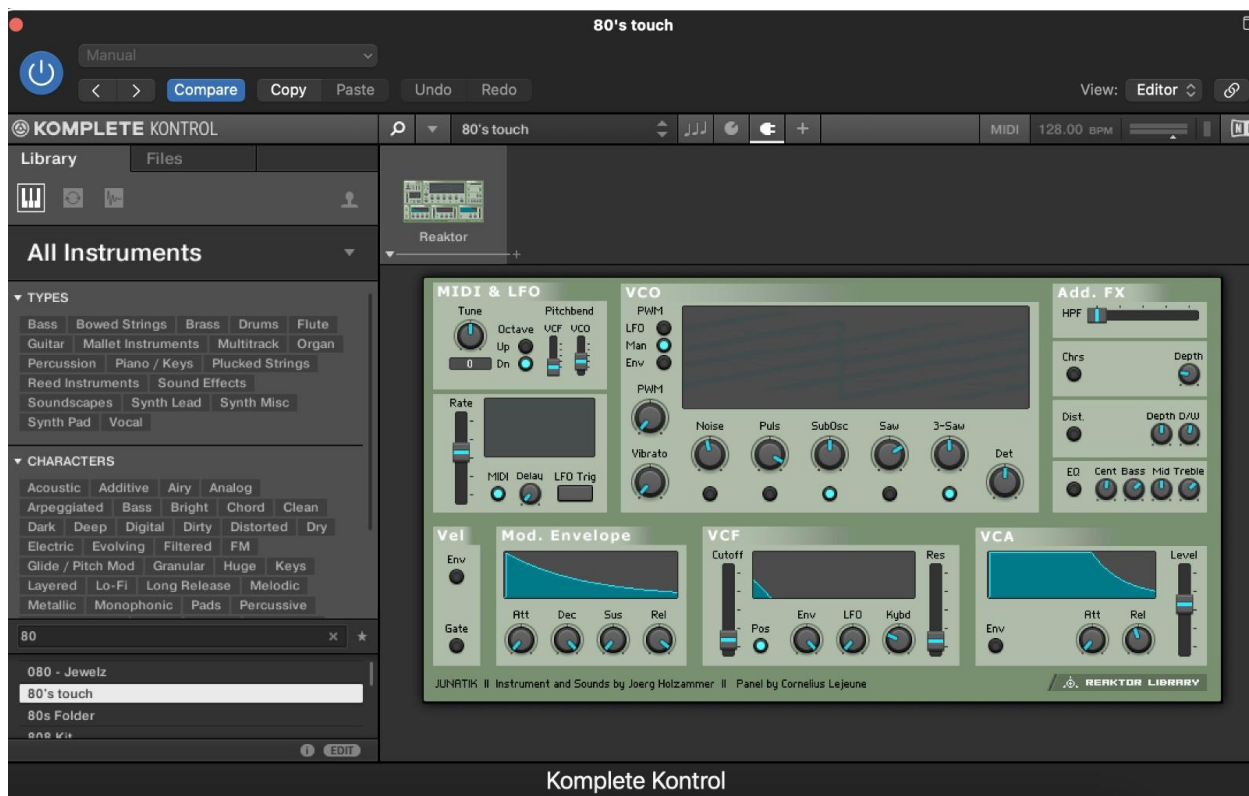
Appendix



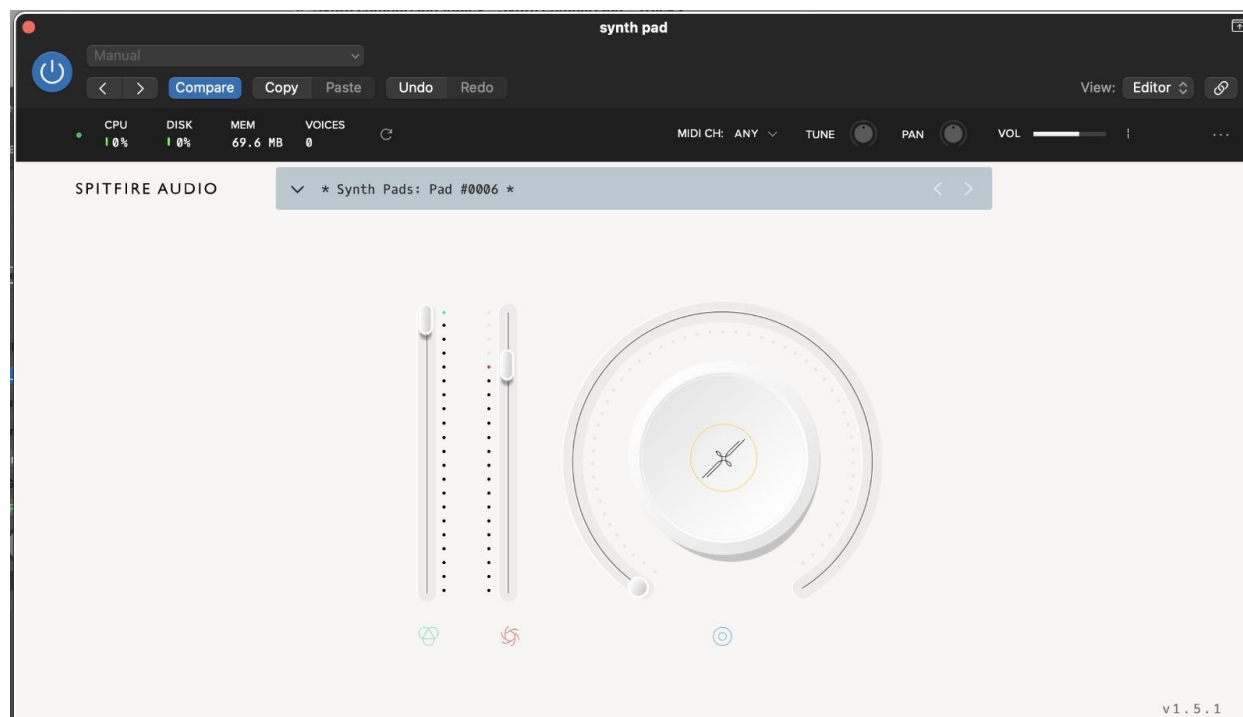
Appendix A: Original interface for my instrument



Appendix B: Analog Dreams by Kontakt



Appendix C: 80's Touch by Joerg Holzammer



Appendix D: Synth Pads by Spitfire

Bibliography

A-ha (1985) 'Take On Me', *Hunting High and Low*. Available at: Spotify (Accessed 17 June).

Blade Runner (1982) Directed by Ridley Scott [DVD]. United States: Warner Bros.

Bush, K (1985) 'Running Up That Hill', *Hounds of Love*. Available at: Spotify (Accessed 17 June).

BBC Archive (n.d.) *The 8 Generations of Video Game Consoles*. Available at:

<https://www.bbc.co.uk/archive/the-8-generations-of-video-game-consoles/zvcjkty#:~:text=1972%3A%20First%20generation%20%E2%80%93%20dots%20and> (Accessed 28 June 2022).

Bennion, C. (2022) Stranger Things, season 4, review: 1980s Americana sci-fi is irresistible – but parents be warned. *The Telegraph*, 27th May. Available at:

<https://www.telegraph.co.uk/tv/0/stranger-things-season-4-review-13-hours-1980s-americana-theme/> (Accessed 16 June 2022).

Hahn, M. (2020) Synth Pads: How to Create Atmospheric Synth Sounds. Available at:

<https://blog.landr.com/synth-pads/> (Accessed 9 June 2022).

Hooton, C. (2021). The Shepard tone: The auditory illusion that makes Hans Zimmer's Dunkirk score so powerful and even shaped the screenplay. *The Independent*, 27th July. Available at:

<https://www.independent.co.uk/arts-entertainment/films/news/the-shepard-tone-dunkirk-hans-zimmer-video-scale-score-soundtrack-christopher-nolan-inception-prestige-a7862211.html> (Accessed 11 June 2022).

Library of Congress. (2020) *A Brief History of Video Game Music* [video]. Available at:

<https://www.youtube.com/watch?v=eSSgqeMkuJM> (Accessed 21 June 2022).

Native Instruments (2019) *How to build your first digital synth with REAKTOR Blocks* [video]. Available at: https://www.youtube.com/watch?v=BmZwu9P3z_c (Accessed 8 June 2022).

Numan, G (1979) 'Are Friends Electric', *Replicas Redux*. Available at: Spotify (Accessed 17 June).
Point Blank Music School (2016) *Reaktor 6 Tutorial: Creating Subtractive and FM Synths in Blocks* [video]. Available at: [Reaktor 6 Tutorial: Creating Subtractive and FM Synths in Blocks - YouTube](#) (Accessed 8 June 2022).

SAMTIME (2016). *How To Make a Brain-Melting 3D Audio Illusion!!* [video]. Available at <https://www.youtube.com/watch?v=pgo55J3V1rA> (Accessed 14 June 2022).

Savage, M. (2022) *Kate Bush heading to number one after chart rule reset*, 14th June. Available at <https://www.bbc.co.uk/news/entertainment-arts-61797012> [Accessed 16 June 2022].

The Action Lab (2021) *The Infinite Sound That Can Drive You Insane—Shepard Tones* [video]. Available at: <https://www.youtube.com/watch?v=oEW3F8B-lhU> (Accessed 11 June 2022).

TEDx Talk (2016) *The Beautiful Lies of Sound Design* [video]. Available at: <https://www.youtube.com/watch?v=jDy5j0c6TrU> (Accessed 1 June 2022).

The Columbian (2016) *Foley artist shows how sounds effects are made* [video]. Available at: <https://www.youtube.com/watch?v=E0pOLukIB4s> (Accessed 1 June 2022).

The Last Of Us (standard edition). 2013. Playstation 3 [Game]. Sony Computer Entertainment: Los Angeles.

The Terminator (1985) Directed by James Cameron [DVD]. United States: Orion Pictures.

The Witcher 3: Wild Hunt (standard edition). 2015. Xbox One [Game]. CD Projekt: Warsaw.

Variety (2017) *'The Hunger Games' & 'Frozen' Foley Artists Turn the Sound of Junk into Miracles* / *Art of Sound Ep.3* [video]. Available at: <https://www.youtube.com/watch?v=EB6Wjty-MNk> (Accessed 1 June 2022).

www.native-instruments.com (2022) *Welcome to ANALOG DREAMS*. Available at: <https://www.native-instruments.com/ni-tech-manuals/analog-dreams-manual/en/welcome-to-analog-dreams> (Accessed 3 July 2022).