

Development Assignment

Element D2b - Instrument Essay

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Word count: 3753

INTRODUCTION

For Element D2b of this assignment, I decided to create an instrument for Native Instrument's Kontakt sampler, based on recordings of myself playing tenor saxophone.

My vision was to create an instrument that had similar playability to orchestral sample libraries by companies such as Spitfire Audio. I wanted to create an instrument that would lend itself mainly to chordal and textural playing; something that many people might not initially consider saxophone for.

I noticed a gap in the market for the product that I envisioned. My research into existing saxophone virtual instruments only led me to discover instruments which were either focused on solo playing¹, or pop and jazz focused horn section playing².

To contrast these existing saxophone libraries, I thought it would be interesting to capture a layered saxophone ensemble sound, with a focus on sustained notes for chordal playing. My tone as a saxophonist is quite soft and airy (inspired by Stan Getz and Lester Young), which I thought could work particularly well for this style of instrument. I imagined that a saxophone library of this kind would become quite usable in my productions, as I could imagine myself using it for pad-like parts to add an interesting texture to my compositions, especially in media composition works.

On a lighter note, my vision for this instrument was also partially inspired by a comment by Spitfire Audio founder and media composer Christian Henson, when he stated in a YouTube livestream that saxophone is his least favourite instrument, because it is "too saucy" and tends to sound inappropriate in media compositions (Spitfire Audio, 2020).

I realised that I actually agreed with this thought in many ways; I have never wanted to use saxophone in my media compositions, because the instrument does often have quite an "abrasive" sound, often stealing too much attention and sounding out of place in media composition work.

¹ Such as Audio Modelling SWAM Saxophones and Embertone Sensual Saxophone.

² Such as Native Instruments Session Horns and Vir2 Instruments MOJO Horn section.

However, this thought also fueled a desire to attempt a saxophone instrument that sounded deliberately “non-saucy”; something that would not dominate arrangements but could instead blend into the background of productions and could become useful in media composition work.

GEAR CHOICES AND RECORDING TECHNIQUE

Before experimenting with Kontakt, I first wanted to experiment with my saxophone setup and recording methods to achieve the sound I desired.

Saxophone Setup

My first consideration was my saxophone setup. I have a variety of mouthpieces and reeds, as I’ll use different setups for different playing contexts. For a live performance where I need to play loudly and brightly with ease, I might use a softer reed (for less resistance) and a mouthpiece that encourages a brighter tone. However, when I record with this type of setup (and the nuance of my tone is more exposed), I don’t enjoy the tone quality, as I find it somewhat thin and “scratchy” sounding.

I experimented with recording sustained notes on a few different mouthpieces and eventually settled on a hard rubber Otto Link Tone Edge mouthpiece. This mouthpiece company is infamous for manufacturing inconsistencies (Neff, 2010), and the mouthpiece I own has quite a major flaw: the flat underside of the mouthpiece is slightly warped, meaning the reed cannot make a tight seal with the mouthpiece. This makes the response of the instrument inconsistent and “stuffy”. However, this defective mouthpiece does have an interesting tonal character that I enjoy; it helps me play with a particularly mellow, flute-like tone, which I thought would work well for this Kontakt instrument I envisioned.

Spitfire Audio is my favourite sample library developer, and what I mostly enjoy about their plugins is the level of character and personality that many of their sounds bring. I wanted to strive for a similar ethos with my instrument; aiming for a characterful and interesting sound, which was helped by playing this technically flawed mouthpiece.

I also chose to use a slightly harder reed than I'd usually perform with. The resistance of a harder reed added more breathiness and a "hollow", "unfocused" quality to the tone, which I wouldn't choose for solo playing, but I thought would work well for pad-like chordal playing.

Microphone choice and technique

My next consideration was the choice of microphone. My choice was between my SE 2200 condenser microphone and my Shure SM57 dynamic microphone.

I recorded myself playing on both microphones and compared the results. I also experimented with a few different microphone positions and then decided to place the microphone about 10 centimeters away from the instrument, at a height approximately half-way between the bell and the neck. Much of the instrument's sound is released from the tone holes in this area, not just from the bell (Audio-technica.com, 2022).

I wasn't very happy with the recordings from my condenser microphone. Though I was aiming for an indirect, hollow sound, the results were simply *too* hollow and indirect sounding for me. I did like how the high frequencies sounded, as the breathiness I aimed for was captured effectively, but I wasn't very happy with the tone of the low midrange frequencies, and I considered the overall sound to be too thin. I realised that the tone of the recording was likely being shaped highly by the acoustics of my untreated bedroom studio, with many room reflections (from my walls, hard floor and low ceiling) being picked up by the condenser microphone.

I was initially happier with the SM57 recordings, as the microphone is less sensitive to room reflections, which resulted in a more direct sound, with thicker-sounding low midrange frequencies. However, dynamic microphones have a poorer response in the high frequencies (Dempsey, 2020), and I missed the detail and "air" that the condenser captured in the breathy frequencies of my playing, as this breathiness was vital for the sample library I envisioned.

Therefore, I decided to use the condenser microphone, but decided that I needed to find a way to minimise the room reflections in the recordings.

I constructed a recording booth by draping sound absorbing blankets over a plastic pipe frame. I recorded some takes inside the booth with the condenser microphone and was much happier with the sound. The airy frequencies of my playing were captured effectively, and the recordings now sounded much more direct and thicker in the low and low-mid frequencies. The captured sound was very dry, which I thought

would be useful, as it would give users of the Kontakt instrument more control to shape the sound with software reverb.

INITIAL EXPERIMENTATION WITH KONTAKT

To get an initial feel for working with Kontakt, I wanted to create a very basic prototype instrument out of a single sustained saxophone note.

I recorded a single sustained note in the middle of my saxophone's range, imported it into Kontakt and spread it across the keyboard with the mapping editor. I knew from the outset that I wanted the modulation wheel of a MIDI keyboard to control the volume of the notes (like many orchestral sample libraries), so I programmed this in.

I then began to play the instrument on my MIDI keyboard and was instantly quite happy with the sound. With the single note being stretched across the whole keyboard, the high notes and low notes of the instrument did not sound like a real saxophone, but I still found them to be pleasant sounding. I found that the instrument had a slight organ-like quality when it was played in chords and I also found that the sound instantly reminded me of music I had heard in the soundtracks of Scandinavian Noir television series and movies.

I immediately realised an issue that needed fixing. I wanted the saxophone notes to be sustained indefinitely until the MIDI keyboard keys were released, however the notes were currently cutting out at the end of the sample. Also, Kontakt raises the pitch of samples by speeding the samples up, so the high notes of the instrument became especially short.

Using a tutorial video on YouTube, I learnt how to make the sustained notes play in an endless loop (Pianobook, 2020). I needed to use the crossfade feature to make the sample loop more seamlessly, so that it sounded like one continuous sustained note.

After making this adjustment, I was already quite happy with the general sound of the instrument.

STUDY OF SIMILAR PRODUCTS

Even after creating the basic prototype of my instrument, I began noticing similarities to the tone of some existing instrument plugins.

Spitfire Audio – Albion Neo

I realised that the prototype of my saxophone Kontakt instrument reminded me somewhat of the woodwind sounds I have heard from Spitfire Audio’s product “Albion Neo”.

Spitfire Audio’s “Albion” range products are all-in-one packages for media composers, containing a wide range of orchestral and synthesiser sounds, and the “Neo” edition specialises in allowing composers to achieve an “icy northern” sound (Spitfire, 2022). The woodwind ensemble sound inside Albion Neo differs from the traditional orchestral lineup; it features flutes, clarinets and saxophones. The use of saxophones instead of oboes and bassoons has been said to give the section an “attractive breathy sound which is softer-toned than conventional orchestral woodwinds” and a “beautiful, velvety, peaceful and solemn atmosphere” (Stewart, 2020).

I began to realise that my product could represent a convenient alternative to Albion Neo for some composers; they might be fond of the saxophone-laced woodwind sound of Albion Neo, but hesitant to purchase the whole product in order to acquire this one sound. I realised that my product, if executed correctly, could be seen as an affordable alternative that focuses specifically on saxophone; enabling composers to layer the instrument with other woodwind sample libraries to create a similar texture to the woodwind sounds of Albion Neo.

Orchestral Tools – Whisper

I stumbled upon an advertisement for a product by Orchestral Tools called “Whisper: Gentle Wind Instruments” and immediately noticed that its tone was very similar to my prototype saxophone instrument.

“Whisper” doesn’t actually feature a saxophone, instead featuring a flute, muted cornet, flugelhorn and bass clarinet (Orchestral Tools, 2022). However, when these instruments play in an ensemble (as heard in

the demos on the Orchestral Tools website), they create a sound that is quite evocative of my saxophone tone.

I thought it would be interesting to study the features of this product, in the hope that this may provide some direction for refining my Kontakt instrument.

I found one aspect of the instrument to be particularly inspiring to me; it contained patches labelled with names such as “sustains fragile” and “sustains whispered”, which were especially breathy sounding. I thought these sounds were very effective when I heard them in the demo track on YouTube (Orchestral Tools, 2021), as the breath noise added an interesting texture to the track when layered into the arrangement. This sparked an idea for my product – my library could perhaps have presets featuring especially breathy sounds, or, I could take a slightly different approach and add a knob on the instrument’s interface that controls the level of breath noise (discussed later).

DEVELOPING THE INSTRUMENT

Though I was already quite happy with the sound of the prototype instrument, I began to think about the many ways in which I could build upon it.

- Firstly, I knew that the instrument would sound more like a real saxophone if I sampled more notes across the range of my saxophone, instead of just stretching one sample across the whole range of the instrument.
- I also realised that the instrument could become more expressive if I sampled myself playing the saxophone at a variety of different volumes for each note. I could then map the modulation wheel control to blend between these different dynamic layers, instead of simply controlling the volume of a single dynamic layer. As a benchmark to compare against, I found out that Spitfire Audio use up to three dynamic layers across their BBC Symphony Orchestra sample library (Spitfireaudio.zendesk.com. 2021).
- Many high-end sample instruments use “round robins”. This means each dynamic layer of each note is sampled multiple times, and when the composer triggers the same note multiple times in a

row, the instrument alternates between a variety of slightly different sounding samples. Across Spitfire Audio's BBC Symphony Orchestra, up to eight round robins are used for each note of the orchestral instruments (Spitfireaudio.zendesk.com. 2021). This adds an extra level of realism and expressiveness to the sampled instruments. If time allowed, I thought this could be a good feature to include.

- I also felt a desire to attempt some more ambitious and interesting presets for the instrument. Inspired by Spitfire Audio, I thought it would be interesting to attempt a preset inspired by their "Swarm" instruments. These instruments feature samples of "multiple players performing short notes at random intervals to create an undulating swell of sound".

I envisioned a preset made of multiple layers of saxophone staccatos playing in irregular intervals, which could perhaps create a "trembling" effect when played in sustained chords.

Making the developments:

I unfortunately found myself short on time leading up to the submission date for the assignment, so didn't have time to attempt all of the above ideas.

I sampled 5 notes across the range of the saxophone, which did make the instrument sound noticeably more natural. However, I was not able to add round robins or multiple velocity layers to the instrument. These are developments that I would like to attempt in the future.

I did however attempt a very rough prototype of the "Swarm" - inspired preset. This preset needs further work, as I have currently only sampled one note for the whole range of the instrument, meaning that the high pitch samples are currently sounding too computerised for my liking.

USER FEEDBACK

I originally planned to do some beta testing and to gain some feedback on my instrument from a fellow music producer. However, I unfortunately wasn't able to allow time for this in the run up to the assignment deadline, so I had to plan another way to receive some feedback on the experience of using my instrument.

I decided to attempt to use my saxophone instrument in a composition I was working on, imagining that it was product I had purchased, so that I could experience how effective and usable it was in practice.

When using the instrument in the context of a full production, I soon noticed a major issue: the instrument was slightly out of tune with the rest of the instruments in the production. I needed to use a pitch shifting plugin on the channel strip of the instrument to get it to play in tune with the rest of the instruments.

I also noticed that the instrument seemed to sound most pleasing in the track when it had a generous amount of reverberation applied to it. It sounded especially pleasant when I used Valhalla DSP's "Valhalla Shimmer" plugin. I realised that it would perhaps be very convenient to have a great sounding shimmer reverb effect built into the instrument itself, controllable with a knob on the user interface.

Aside from this, I was very happy with the sound of the instrument. It seemed to blend cohesively with an arrangement featuring strings and flute, bringing an interesting texture to the track whilst also "thickening" and "warming" the track a little. I felt confident about having my instrument as a prominent aspect of my mix, which made me realise that I was generally pleased with how the instrument was turning out.

In the context of the full production, I especially enjoyed the breathy quality of my instrument, reinforcing my previous thought that it might be a good idea to add the breath noise knob, so the instrument could be made even breathier when desired.

ACTING ON THE FEEDBACK AND MAKING FURTHER DEVELOPMENTS

To fix the tuning issue with the instrument, I returned to the original samples that I'd imported into Kontakt and I used Cubase's VariAudio feature to pitch correct the samples before re-importing them back into Kontakt. Whilst pitch correcting the notes, I gently smoothed out any major pitch wobbles, but also made sure to retain a slight natural vibrato, to keep the samples sounding organic.

At this stage, I also had the idea that it might be effective to use layered stereo samples for the saxophone notes, instead of single mono notes. To achieve this, I layered each saxophone sample with two extra takes, panned hard right and left.

I eventually decided against my idea to add a shimmer reverb into the plugin, as I realised it would be a time-consuming task and I would likely struggle to achieve a great reverb sound that would stand up against the competition (such as Valhalla DSP plugins and Strymon pedals).

I did however want to add a knob to the instrument's interface that could control the level of breath noise.

I recorded a sample of myself blowing air through my saxophone without vibrating the reed, and imported this into Kontakt. To create a knob that could control the level of this additional sample layer, I needed to use Kontakt's script editor. A YouTube video by David Hilowitz proved very useful in showing me exactly how to do this (David Hilowitz Music, 2020).

OVERVIEW OF THE CURRENT INSTRUMENT

The instrument that I am submitting for this assignment contains four presets:

1. Tenor Saxophone Ensemble

This is the flagship sound of the plugin; soft-toned multitracked tenor saxophone sustains, featuring a knob to control the level of additional breath noise. For this preset, I wanted to create a detailed, intimate sound with a whispery-thin, husky tone.

The modulation wheel of a MIDI keyboard controls the volume of the saxophone tone, but not the breath noise. This allows the user to start notes with pure breath noise, and to then fade in the saxophone tone (similar to how a real saxophonist might swell into a note).

2. Layered Saxophone Ensemble

Similar to the above preset, however this instrument features multiple layers of pitch shifted samples for every note. This creates a thicker ensemble sound, mimicking the sound of multiple types of saxophones playing together (e.g., bass, baritone, tenor, alto and soprano).

3. Saxophone Tremolando

This preset is built from layers of staccato saxophone notes played at random rhythmic intervals. When played in chords, it creates a quivering, trembling sound, inspired by Spitfire Audio's "Swarm" sample libraries. This preset sounds most effective when the modulation wheel is used to create dynamic crescendos.

4. Sax Organ

This sound is based on the very basic initial prototype instrument that I created, where one single sample is spread across the whole keyboard. I decided to keep this sound in my submitted instrument, as I grew fond of the slightly organ-like sound and have found myself using this preset in some of my productions.

EVALUATION

Overall, I am generally happy with the Kontakt instrument I have created, though I still consider the instrument to be a rough prototype, and I have many ideas for improvements and additional features that could be added.

Improvements:

I'd like to make the crossfades of some of the looping samples more seamless, and would perhaps also like to record longer samples, so that they don't need to loop as quickly. This especially applies to the "Sax Organ" preset, as the looping sample currently sounds quite jolty.

I would like to record more samples across the range of my saxophone, ideally every note within its range, as this would probably make the instrument sound more natural, and also perhaps more colourful.

I would also like to record multiple dynamic layers for these notes, as I believe this could make the instrument sound more expressive when automating between different volumes.

Additional Features:

I believe it would be useful to add controls for attack, decay, sustain and release to the interface of the instrument, as this would enable users to control the dynamic shape of the notes, so that it can breathe coherently with their arrangements.

I would also like to add more articulations to the sample library, for example, staccatos and crescendos. It would also be interesting to attempt a legato preset for the instrument.

Also, I would like to record samples of me playing “growled” notes on the saxophone (the raspy sound saxophonists can create by humming at the same time as playing), and I would like to create a knob that controls the level of “growl” in the saxophone sound, following the same methodology that I used to create the breath knob.

I would also like to put some more thought into the mixing of the samples, before they are imported into Kontakt. For example, some EQ tweaks might be needed, and it could be interesting to perhaps apply some light tape distortion to the samples - many other sample libraries feature this, for example Spitfire Audio’s Albion Neo (Gale, 2020).

Also, I would like to experiment with ways of modifying the sound from the saxophone itself. For example, I could try damaging and splitting some old reeds and seeing what sound they produced, or I could place objects in the bell of the saxophone to dampen the sound.

CONCLUSION

I'm excited to continue refining my instrument, as I have many ideas for improvements and features to be added.

Once I have made some of the improvements mentioned above, I would like to upload a basic version of the instrument to the website Pianobook.com, which will enable fellow composers and music producers to download the instrument for free. This will also hopefully provide me with some user feedback, likely inspiring further improvements to the instrument.

Once I have refined the product and added some more of the functionalities mentioned above, I might decide to make it available for purchase for a small price, perhaps somewhere between £10 to £30. When marketing the product, I will likely try to hone in on its usability for the Scandinavian / Nordic Noir genre, as I have found that it works particularly well in this context, and this seems to be a niche realm to market within, with little competitor products.

Fellow composers might perhaps be excited by the idea of a budget friendly, small-download library dedicated specifically to this style of saxophone playing; something for them to layer with traditional orchestral sample libraries to instantly achieve a distinctively "Scandi Noir" sound, without needing to purchase the more premium alternatives such as Spitfire's Albion Neo or Orchestral Tools' Whisper.

I have already been finding use for this instrument in my compositions - for example, it features on Track 7 that I have submitted in my D3 music portfolio.

BIBLIOGRAPHY

Audio-technica.com. 2022. *Basic Recording Techniques: Saxophone*. [online] Available at: <<https://www.audio-technica.com/en-us/support/basic-recording-techniques-saxes/>> [Accessed 12 January 2022].

David Hilowitz Music, 2021. *Kontakt Tutorial: How to Make Mic Level Knobs (using Instrument Busses) + FREE KONTAKT SAMPLE* [Online video]. Available at: <https://www.youtube.com/watch?v=S0cYRHhML60> [Accessed 13 January]

Dempsey, J., 2020. *Condenser Microphone vs Dynamic: Key Differences*. [online] Dawsons.co.uk. Available at: <<https://www.dawsons.co.uk/blog/condenser-microphones-dynamic>> [Accessed 13 January 2022].

Gale, D., 2020. *Review: Spitfire Audio Albion Neo*. [online] Musictech.com. Available at: <<https://musictech.com/reviews/software-instruments/spitfire-audio-albion-neo/>> [Accessed 13 January 2022].

Neff, S., 2010. *Modern STM Otto Link Tenor Saxophone Mouthpiece Refaced by Brian Powell*. [Blog] Neff Music, Available at: <<https://www.neffmusic.com/blog/2010/06/modern-stm-otto-link-tenor-saxophone-mouthpiece-refaced-by-brian-powell/>> [Accessed 12 January 2022].

Orchestral Tools, 2021. *Creative Soundpacks: Whisper Walkthrough* [Online video]. Available at: https://www.youtube.com/watch?v=Ab_hGUeORPA [Accessed 13 January]

Orchestraltools.com. 2022. *Whisper*. [online] Available at: <<https://www.orchestraltools.com/store/collections/whisper>> [Accessed 13 January 2022].

PIANOBOOK, 2020. *How To LOOP SAMPLES (Kontakt / Logic Sampler)* [Online video]. Available at: <https://www.youtube.com/watch?v=mpfH9UkqKFU&t=83s> [Accessed 13 January]

Spitfire Audio, 2020. *Tombola Prize Draw – The Black Weekend* [Online video]. Available at: <https://www.youtube.com/watch?v=YBc-REqZISs> [Accessed 12 January 2022]

Spitfireaudio.zendesk.com. 2021. *Quick Orchestral Library Comparison*. [online] Available at: <<https://spitfireaudio.zendesk.com/hc/en-us/articles/360014474098-Quick-Orchestral-Library-Comparison>> [Accessed 13 January 2022].

Spitfireaudio.com. 2022. *Spitfire Audio — Albion NEO*. [online] Available at: <<https://www.spitfireaudio.com/shop/a-z/albion-neo/>> [Accessed 13 January 2022].

Stewart, D., 2020. *Spitfire Audio Albion Neo*. [online] Soundonsound.com. Available at: <<https://www.soundonsound.com/reviews/spitfire-audio-albion-neo>> [Accessed 13 January 2022].