

CMP Development Assignment - Element 2b: Essay

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Introduction

The increased interest and appeal of 'bedroom production', has been accelerated by the COVID-19 pandemic as well the growing access for producers and musicians to upload their work to music platforms such as Spotify, that provide exposure to audiences worldwide. 'Bedroom production' has birthed characteristics that in some ways define it as a sound and genre in its own right, with artists such as 'Verzache' and 'girl in red' leading the line of budding producers that make their music entirely at home. This growing appeal has in turn increased the demand for interactive musical tools, such as software plug-ins and digital instruments that music-makers can utilise at home.

'Bedroom production' formed the basis for my sample instrument, which I titled the 'The Bedroom Choir 1', or 'BC1' for short. The idea behind my creation was to sample my own voice into a playable instrument by recording each individual note within my vocal range. In addition, I also sampled percussive sounds from my house to enhance the versatility and scope of the product. This essay will outline the process of planning, creating, amending and improving my sample instrument; it will firstly discuss my process of planning and executing the project, an evaluation of the procedure and final instrument, identifying ideas for improvement and any challenges I encountered during the project, as well as research conducted on similar market instruments. This will be followed by an overview of the feedback I received and how I would implement any changes and critiques.

Creation Method

Before beginning the process of creating my instrument, I needed to first research factors that could impede on the quality and appeal of my project. Considering that I was going to be recording at home due to the current pandemic, I needed to take into consideration overcoming the restrictions that this presented - limited resources and low room treatment. Firstly, to ensure my recordings were of high quality, I needed to research how to get the best out of my condenser microphone setup. My research indicated that I needed to ensure a low room resonance in my audio, for a more professional sound. This I could achieve by assembling a home-made vocal booth with blankets or duvets to catch frequencies bouncing off the walls and objects in the room around me and specifically behind the microphone (Arenas et al., 2020). This reduction in environmental noise would improve the quality and refinement of the recordings and the final project's overall sound.

Secondly, once I had decided that the Logic EXS24 was the best sampler to build my instrument on, from what was available to me, I had to spend some time learning the details and intricacies of the plug-in. A further explanation of the settings within the EXS24 I used will be discussed later in my essay. Thirdly, I needed to determine what vowel sound would be the most beneficial for the ‘choral’ aspect of my project. My research showed that the most ‘open’ (in physiological terms) vowel to sing is ‘ah’ and that the more open a vowel sound is, the easier it is to sing and brighter it sounds (Choraegus, 2016). Moreover, darker, more closed vowel sounds are most commonly heard in settings such as churches, whereas “bright vowels are more what you’d hear in a contemporary artist’s concert” (Choraegus, 2016). Therefore, I decided that this vowel would be suitable for me to perform as a vocalist of average ability and henceforth would achieve the most desirable and commercial result.

Moving on, I then also decided that I would record each note at four different velocities to enhance the playability and user experience of my instrument, as my research found that most market MIDI instruments provided this detail. The use of velocity helps create an authentic and human sound, and a variation of velocities helps make an interesting instrument, which would improve the marketability of my product (Leach, 2013). I then established my vocal range using a piano and discovered I could comfortably sing the notes between A1 and D4, which was satisfactory as it would allow users to have the ability to play harmonically complex chords over more than two octaves. I did initially have the idea to transpose notes lower or higher to make up for a more extensive playable range, but after testing this, I decided against it as it took away from the natural sound I wanted to achieve.

Feeling prepared to carry out my project, I began setting out a simple bullet-point methodology, which would keep me focused in due course and ensure that no steps were missed and all-important criteria were met in order to make the sample instrument a success. Once I was satisfied with my home-made vocal booth, I began testing the recording sound, which also allowed me to gain-stage and establish a healthy signal. My aim was to avoid clipping and ensure I was not exceeding -10/-9dB as I knew I would need to apply a little bit of compression post-recording, in preparation to load my samples into the EXS24. This would also leave a satisfactory amount of headroom for users to do their own mixing and processing without the audio of the sample instrument clipping, being excessively loud or difficult to gain-stage. I used Logic’s pre-fader metering tool to efficiently and promptly determine this. Due to the large size of the project, I needed to arrange the session in a way that would maximise my workflow and thus increase productivity and minimise mistakes in the creative and patching process. Therefore, I decided to create a channel for each note which would allow for ease and clarity in arranging, editing and exporting my samples.

Having arranged my session and achieved a desirable recording sound, I needed to carry out one final step before recording - a vocal warm-up. This would, again, ensure that I maximised the

product quality, as the performance of my recordings was vital to the commerciality and appeal of the sample instrument. I knew I was going to have to do a certain amount of pitch and audio editing post-recording, but I wanted to keep this to a minimum so as not to take away from the authentic and natural sound I wanted to achieve. Vocal warm-ups are essential to strengthening the performance of notes and the solidity of your vocal range as well as minimising vocal fatigue (Heizmann, 2003, p.12), which was important as I would be singing for a number of hours throughout the day. Avoiding a decrease in performance quality as I moved further into the higher notes of my vocal range was essential. An additional point for consideration was that I needed to sing each note's velocity for a reasonable amount of time so that users could hold down keys for an extended period without notes ending too soon.

Following the recording of all my required and preplanned samples (see appendix 1), it was time to begin editing and chopping audio regions. The first port of call was to eliminate the silence around each sample, so that I could isolate each individual note and have the audio begin as soon as a MIDI key was triggered through the sampler. I had 120 samples overall (four for each note in my vocal range), so I decided to use the 'remove silence' function within Logic's track editing window to speed-up this process, tweaking the pre-attack and pre-release time to make sure that tiny parts of audio weren't being deleted either side of the samples (see appendix 2). Next, I added fade-ins and fade-outs to all samples to ensure they were triggered smoothly and without audio cracks. Considering my average vocal ability, an essential step of editing my vocal samples was using Logic's flex pitch to set all notes to 'perfect pitch' and removing vibrato to improve the accuracy of notes and eliminate dissonance when playing chords or creating harmonic effects using the instrument. Lastly, in order to enhance sample quality, I used a high-pass filter to remove unwanted low-frequency rumble and a little bit of compression to add bite and bring the audio forward dynamically.

Having prepared my vocal samples to be exported, it was time to move on to collecting 'found sound' percussion noises from my house. As I mentioned before, the idea behind my instrument was inception through the growing popularity of bedroom production (London, no date). Therefore, in the spirit of creating music at home with limited resources, during a pandemic and making-do and being creative with what is around you, I didn't have a methodology to collating these samples. I simply followed the notion of 'found sound' by recording objects that I thought sounded interesting, and often ones that I wouldn't usually think about including in a track (Computer Music, 2012). Once I was happy with my collection of found sounds, I began going through a similar audio editing process as I did with my vocal samples - removing silence, adding fades and utilising a little EQ and compression. At this stage, I could have altered and processed the samples to sound more like percussive hits and noises, but I strayed from the idea of changing them too much in order of giving users the capability to employ, shape and mould them in a way that they personally found most enjoyable.

Thereupon, I had all my samples ready to export and did so, organising them into five folders, one for my found sounds and one for each of the four velocities. This made it a whole lot easier for me to simply load them in groups into the EXS24 and arrange them to corresponding keys as required (see appendix 3). When loading the vocal samples in the EXS24, I made sure to switch off the 'pitch' option, which would play a sample on each key by changing its pitch but also stretching the audio, as I already had all the notes that were required for my instrument. I also switched off the '1Shot' option, which played a sample in its entirety every time a key was triggered. This was undesirable as I wanted users to be able to play rhythmic, harmonic parts and decide the length they wanted each note to be held down for.

Finally, I assigned each velocity group to different velocity parameters with regards to the vocal samples, e.g. the lowest velocity samples were triggered between the velocity range of 0 to 90, then 91 to 105, 106 to 115, and 116 to 127. This improved the dynamic and aesthetic capabilities of the instrument. In terms of the 'found sound' samples, I kept the '1Shot' option on, which made a lot more sense for a percussion aspect because users could trigger and programme intricate parts without samples cutting off before the 'single hit' audio had finished playing. The completion of this stage concluded the creation process of my sample instrument.

Challenges and Evaluation

Following the completion of my sample instrument, there were numerous challenges I encountered worth mentioning. Moreover, this section of the essay will analyse the outcomes of the product, what worked well and what did not, as well as elaborate on some improvements that could have been made to strengthen the instrument's final outcome.

From the onset, I realised that I would have to record my vocal samples at home, which would be somewhat of a slight hindrance. Whilst I was happy with the result of my vocal recordings in terms of sound and was successful in achieving a reasonably dry and professional audio, there is no question that access to a properly treated studio, and better microphone that was even more suited to my voice would have taken the project to a better level. On the contrary, the instrument's whole concept was to create something from home because of the pandemic situation and to fit into the bedroom production idea. Taking this into consideration, there is an argument to be made that the appeal was precisely in not having an overly polished sound.

As previously mentioned, my vocal ability is average and imperfect; therefore, this impacted the outcome of my performance and instrument to a slight degree. For example, I had to do a fair amount of pitch editing on each sample, which inevitably took away from the sound's overall natural vibe. In addition, my vocal range was just short of only two and a half octaves, so the scope of the project was reduced as the highest note that could be played was a D4 and the lowest an A1. Therefore, if I had to recreate the instrument, I would use an alternative singer

with a greater ability and a more extensive vocal range. I would maybe even use a male and female vocal or a number of different vocals simultaneously. This would also uncover the potential to improve the instrument's versatility if an option was made available for users to pick and choose between male, female, and different vocal styles. What's more is that I could record a skilled singer performing a number of different vowels, articulations, expressive phrases and adlibs in each key. This significant improvement would also naturally translate into an even more commercially viable, creatively useful and appealing product. In terms of audio editing, I could have bettered the process by using a higher quality pitch correction plug-in such as Melodyne or iZotope RX8, rather than just the basic Logic stock Flex Pitch utility, for an improved sound and accuracy in pitch editing.

Another realisation of an improvement that could be made was that when beginning to play and experiment with the sample instrument, I noticed that I had recorded all the vocal samples at a different length due to the fact I had not used a metronome. This meant that notes would end at different times when held down for the longest possible period, which, of course, was not ideal. I tried to overcome this issue by using the 'loop' utility inside the EXS24. This would allow me to choose an area of each sample's audio file, which would continue looping indefinitely as long as a key was pressed down. For this function to work, I had to select the exact same length of region for all of them because if I didn't, they would loop at different times and create a very disjointed feel. However, when attempting this improvement to my instrument, I realised that when the loops started to trigger, there was a 'pop' or 'crack' in the audio, which hindered the outcome. I tried to fix this by using the 'XFade' option within the loop editor in the EXS24, but when adding enough fade for the audio 'cracks' not to be heard, it created a dip in volume, which was an effect I didn't like either. Therefore, I decided to leave my samples without a looping capability. In the future, if I had the chance to recreate the project, I would use a different sampler plug-in, with slightly different and more user-friendly capabilities, such as Serato Sample or MOTU Machfive 3, to effectively achieve the looping effect. Alternatively, I would also record the samples to a metronome so that I could have the notes much longer and ending at the same time.

Another point of improvement I recognised once the instrument was completed was that there wasn't an overly recognisable difference in dynamic range between the four different velocities I recorded. This, again, would be improved if I was to use a singer with better vocal ability, as they would naturally have more control over their vocals and, therefore, over dynamics too. I would perhaps also record five or six different velocities instead of just four to improve the product's dynamic range.

Furthermore, looking back, I realise that I could have recorded my 'found sound' percussion samples in a more effective, professional and commercially viable way. The reason why I captured them with my phone was that it was a quick and mobile way to do so, which kept my

creativity and ideas flowing in the spirit of bedroom production. Instead of recording them with my phone, I could have used a dynamic microphone, which would have given an even more accurate representation of the sounds and undoubtedly pushed my overall project to an even more comprehensive and competent level. This would have been more difficult, of course, as I would have to carry my laptop, audio interface and microphone along with the XLR lead around the house, but if the method were streamlined, it would be beneficial for the overall result of the project. Furthermore, dynamic microphones are ideal for capturing percussive sounds and instruments and are often used in studios and live music settings to record drums (Senior, 2015).

With additional time and resources, I could have significantly enhanced my sample instrument by developing its very own software plug-in. Within this, I would have liked to include effects such as reverb, delay, filter and chorus, as well as the ability for users to input their own unique vocal and percussion samples. To complement this, I would add a capability for pitch editing, as well as a layout that would allow users to quickly input vocals onto the desired corresponding keys. Development and additions such as this would, in my opinion, make the instrument considerably more marketable and appealing for consumers. Moreover, it would allow for the product to compete with other prominent players in this genre of software instruments and plug-ins of the like. To sum up my evaluation of the project, aside from the identified challenges encountered and improvements-to-be-made, I thought I was successful in making a fully functioning sample instrument that encompassed the notion of creating a bedroom production artefact. It is valid to say that the instrument can be utilised to conceive and produce the main body of an idea for a song, which therefore makes the project an accomplishment and a tool that can be appropriate for any producer's virtual creative arsenal.

Comparison to Similar Market Instruments

In order to ensure that my instrument was competing with other similar products on the market, I had to do some research to discover what was appealing about such competitors and how I could translate this into the future development of my sample instrument project. I identified one related and comparable instrument in the VOC-25 by Love Hultén (APPENDIX 4), which was, in fact, much more advanced than my project in that it was a physical, three-part outboard playable instrument with speakers. The VOC-25 is described as a “conceptual vocal synthesizer based on the Axoloti Core and 25 sets of plastic teeth, each set representing a unique note on the keyboard” (Love Hultén, 2021). The novelty of the synthesizer, such as the use of plastic teeth, the retro computer style, bright colours, and the keyboard, aids the product's marketability and makes it enjoyable to use. The synthesizer uses raw vocal samples by using a USB, keyboard, and MIDI. The VOC-25 additionally enables users to add effects such as delay and reverb, which I would have liked to add to my own sample instrument, with additional time and resources. With the VOC-25, the user plays the connected keyboard, which directs the specific plastic teeth

to sound and can be used to create harmonies and melodies (Love Hultén, 2021). The synthesizer can also “be used standalone with its built-in speakers, but it also outputs mono in the back, and using external monitors is a good way to reduce mechanical noise” (Love Hultén, 2021). This versatility was an inspiration for my own sample instrument. Furthermore, the VOC-25 gave me other useful contextual ideas and inspiration for developments that could be made to the BC1, my own project. For instance, it could be valuable, in a commercial sense, to explore the notion of evolving my sample instrument into a physical and playable piece of gear. This would not only make the product more interactive and attractive to consumers but also give it a unique selling point, similarly to the idea behind the VOC-25.

A further similar market sample instrument is the Voices of Soul software plug-in developed by EastWest, who recorded the voice of C. C. White, singing several vocal syllables such as Ah, Doo, Ee, Eh, Ha, Ho, Oo and Wo, among others. The instrument encompasses a rich blend of genres (such as Funk, Soul, Reggae, Southern Blues, Gospel, R&B, Jazz and Latin) and a whole host of contrasting textures - from “soft and angelic” to “powerful and earth-shattering” (EastWest Sounds, 2021). The Voices of Soul software includes several patches, each with different styles, vowels and tone, which enables the user to create a vast variety of chords, projects and songs (EastWest Sounds, 2021). Furthermore, EastWest prizes their instrument as providing “expressive phrases” and “highly realistic true legato transitions” (EastWest Sounds, 2021). The Voices of Soul instrument really puts into context just how much development and expansion is perhaps needed on my own project. As I stated in the evaluation section of this essay, the addition of many more vowels and phrases, employed in a similar fashion as the EastWest product, would significantly progress and enhance the capabilities of the BC1, making it a great deal more competitive within this market sector.

User and Beta Feedback

Once my sample instrument was complete, I exported and sent my final project to several other producers, and asked them for feedback, including the utility of the project, features they enjoyed, any issues they ran into when using the instrument, and lastly any recommendations or criticisms. All users found that the instrument was easy to use, with all the notes correlating correctly and working effectively, with a satisfactory amount of differentiation made between the velocities of each note. However, several users noted the quality and quantity of the percussion samples could be improved on. As expected and outlined in my evaluation section, some users did run into issues when holding notes or chords down for an extended period of time, finding that they sometimes ended sooner than they wanted them to. A further criticism was that some of the higher notes of the instrument sounded a little unnatural, which could be to do with the pitch editing used in the creation process. Users specified that they enjoyed creating complex harmonies with the choral section and that the sound was interesting and satisfactory. One user noted that the instrument was a great tool for easily sketching vocal melody ideas for tracks and

several enjoyed the percussion section, stating that the samples were abstract and unique. Another user thought that the choral and percussion sections were complementary and that the instrument as a whole provided a lo-fi production vibe for musical ideas.

Conclusion

In conclusion, this essay has discussed and informed on my methodology during the research, creation and evaluation processes that led to the completion of the instrument. While this project was successful in delivering an effective, accessible and easy-to-use tool for music production and creativity, upon reflection, I have clearly outlined several aspects which require attention and improvement. The initial inspiration behind my project was the increased appeal of bedroom production and my aim was to develop a sample instrument that encompassed the bedroom production sound and vibe and was a genuinely useful tool that aided creativity at home. Despite the noted room for development, enhancement and expansion of my product, I felt that I did achieve said aim.

Bibliography

Arenas, J., Rey, R., Alba, J., Oltra, R. (2020) 'Sound-Absorption Properties of Material Made of Esparto Grass Fibers', *Sustainability*, 12 (5533), p. 1.

Computer Music (2012) *Advice for working with homegrown sounds*. [online]. Available at: <https://www.musicradar.com/tuition/tech/10-found-sound-production-tips-564339> (Accessed 20 March 2021)

Choraegus (2012) *Choral Diction*. [online]. Available at: <https://www.choraegus.com/learn/choral-diction/> (Accessed 2 March 2021)

EastWest Sounds (2021) *Voices of Soul*. [online]. Available at: <http://www.soundsonline.com/voices-of-soul> (Accessed 16 March 2021)

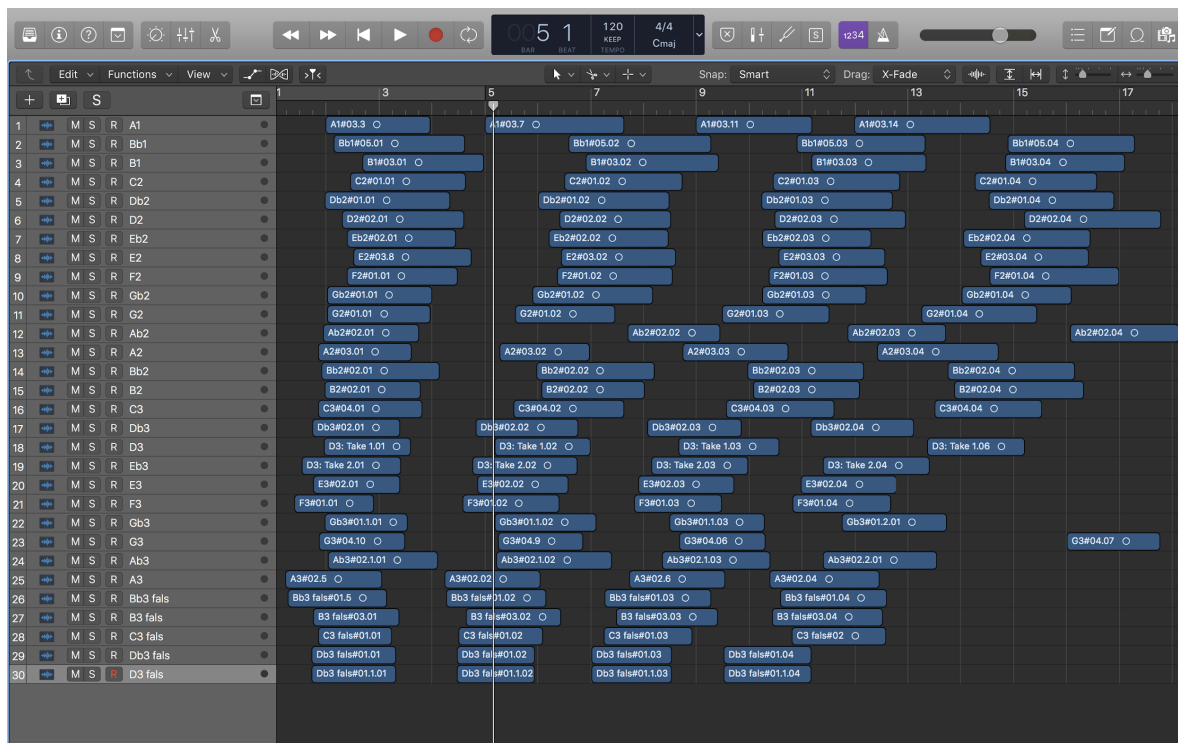
Heizmann, K., Carrington, S., and Heizmann, K. (2003) *Vocal warm-ups*, Mainz: Schott Music GmbH & Co, p. 12-13.

Leach, R. (2013) Seven Ways to Use and Edit MIDI Velocity. [online]. Available at: <https://music.tutsplus.com/tutorials/7-ways-to-use-and-edit-midi-velocity--audio-2338> (Accessed 18 March 2021)

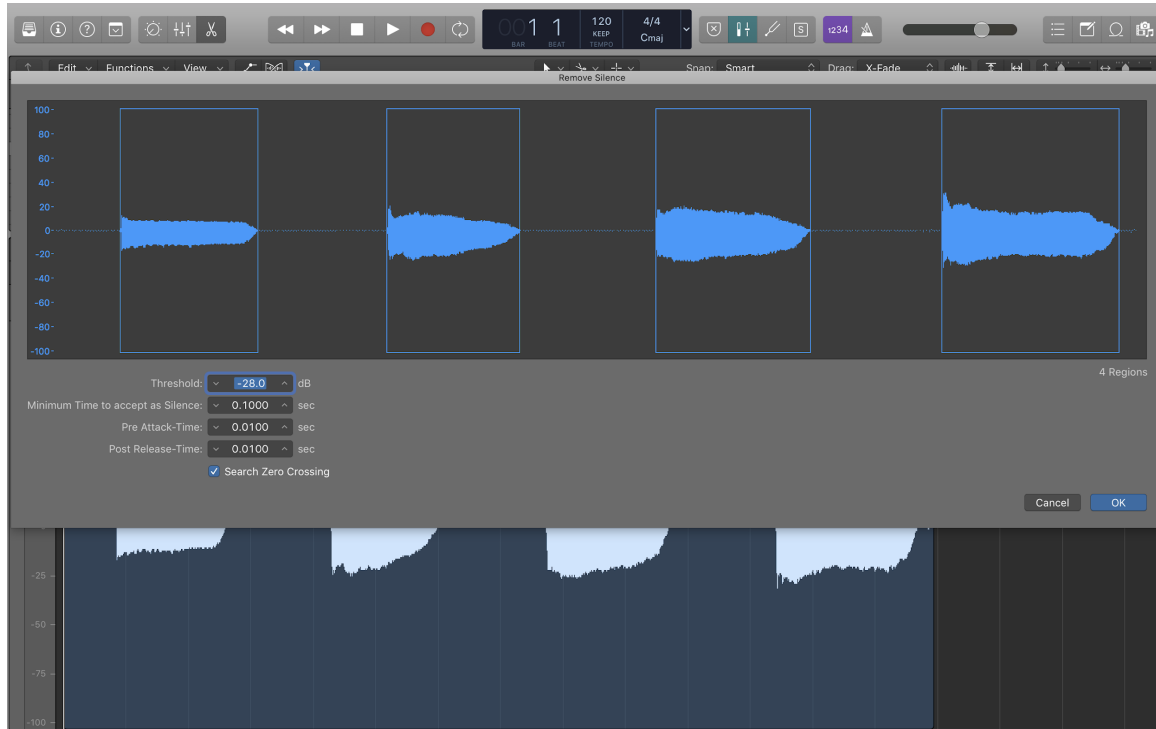
London, J. (no date) 'The Rise of the Bedroom Producer', *The Los Angeles Times*, Available at: <https://mylocal.latimes.com/articles/The-Rise-of-the-Bedroom-Producer> (Accessed 12 March 2021)

LOVE HULTÉN (2021) *VOC-25*. [online]. Available at: <https://www.lovehulten.com/voc25.html> (Accessed 12 March 2021)

Appendix 1 - Session layout after all samples chopped and edited.



Appendix 2 - Settings used within Logic's 'remove silence' tool.



Appendix 3 - EXS24 sample layout.

EXS24 Instrument Editor: My Vox Choir.eks

EXS24

Zones		Zone		Audio File		Pitch		Mixer		Key Range		Playback		Vel. Range				
Name	Name	Name	Key	Coarse	Fine	Vol.	Pan	Scale	Output	Lo	Hi	Pitch	1Shot	Reverse	Anchor	On	Lo	Hi
Ungrouped	Zone #1	NoteA1#03.3.wav	A1	0	0	0	0	0	Group	A1	A1					0	90	90
Vox Vel 1	Zone #2	NoteA2#03.01.wav	A2	0	0	0	0	0	Group	A2	A2					0	90	90
Percussion	Zone #3	NoteA3#02.5.wav	B1	0	0	0	0	0	Group	A3	A3					0	90	90
Vox Vel 2	Zone #4	NoteAb2#02.01.wav	C2	0	0	0	0	0	Group	G#2	G#2					0	90	90
Vox Vel 3	Zone #6	NoteB1#03.01.wav	D2	0	0	0	0	0	Group	B1	B1					0	90	90
Vox Vel 4	Zone #7	NoteB2#02.01.wav	D#2	0	0	0	0	0	Group	B2	B2					0	90	90
	Zone #8	NoteB3 fals#03.01...	E2	0	0	0	0	0	Group	B3	B3					0	90	90
	Zone #10	NoteBb2#02.01.wav	F#2	0	0	0	0	0	Group	A#2	A#2					0	90	90
	Zone #11	NoteBb3 fals#01.5...	G2	0	0	0	0	0	Group	A#3	A#3					0	90	90
	Zone #12	NoteC2#01.01.wav	G#2	0	0	0	0	0	Group	C2	C2					0	90	90
	Zone #13	NoteC3 fals#01.01...	A2	0	0	0	0	0	Group	C4	C4					0	90	90
	Zone #14	NoteC3#04.01.wav	A#2	0	0	0	0	0	Group	C3	C3					0	90	90
	Zone #15	NoteD2#02.01.wav	B2	0	0	0	0	0	Group	D2	D2					0	90	90
	Zone #16	NoteD3 Take 1.01.w...	C3	0	0	0	0	0	Group	D3	D3					0	90	90
	Zone #17	NoteD3 Take 2.01.w...	C#3	0	0	0	0	0	Group	D#3	D#3					0	90	90
	Zone #18	NoteDb2#01.01.wav	D3	0	0	0	0	0	Group	C#2	C#2					0	90	90
	Zone #19	NoteDb3 fals#01.1...	D#3	0	0	0	0	0	Group	D4	D4					0	90	90
	Zone #20	NoteDb3 fals#01.01...	E3	0	0	0	0	0	Group	C#4	C#4					0	90	90
	Zone #21	NoteDb3#02.01.wav	F3	0	0	0	0	0	Group	C#3	C#3					0	90	90
	Zone #22	NoteE2#03.8.wav	F#3	0	0	0	0	0	Group	E2	E2					0	90	90

The interface includes a piano roll at the bottom with a keyboard layout showing notes from C1 to C5.