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Approach To Creating The Instrument

As a producer, one must have the ability to generate an array of sounds and be in a position to develop sound design for a track in a short time frame. This requires access and use of pre-recorded material, whether in a loop library format or in the form of a sample instrument. Therefore, I decided to approach this assignment by building both a library which could be used as a sample instrument. Sometimes, samplers generate their own loops and sound effects to initiate ideas and starting points. The only issue with this is there are a lot of producers using the same sample instruments, and therefore the result in the music is too much familiarity and mediocrity. A possible response to this problem is to generate your own samples and use a sample player such as *Arcade* by *Output*. It is key that the sample player is used as a creative tool and not just a plugin that plays back sound libraries in their original format. You don't need a sampler for this. However, with *Arcade*, you get a unique set of tools to manipulate samples and have them triggered in lots of creative yet obscure ways. This review states the unique approach and design of *Arcade* as a sample editor and sequencer:

“Throughout the entire experience, *Arcade* aims to maintain your focus in the playful and creative area of music making. There are many things to tweak and explore if you want. But you can also simply play” (Resound Sound, 2021).

To take this experience and step further, looping a guitar riff might seem a little too monotonous when triggered in its original form. However, *Arcade* has the ability to transform the original waveform using a variety of different playback and re-sequencing modes. These include reversing, randomising, skipping, layering, and reshaping the overall timbre using macros such as flanging, reverb, delay and chorusing etc. (Please see the accompaniment walkthrough video where I demonstrate its functionality, in context). In addition, the software can play numerous loops simultaneously to create interesting layers and textures that would

otherwise require a lot of time-consuming editing in your DAW. Of course, the producer would need to trigger these loops creatively and accurately for it to be effective in a given time signature and tempo of a given track. (The use of midi quantise should not be forgotten here). Furthermore, the producer must firstly understand the key signature of the loops, to then integrate them seamlessly and effectively into their project key. Therefore, I have taken the time and effort to label all of the loops according to their key signature and pitch.

However, for all of this to work successfully, there needs to be a clean and accurate recording of the loops in order for them to be triggered successfully in the software using *Arcade*. Therefore, my approach was to use my Fender Custom Shop Stratocaster guitar as the foundation of the sample library, which contains many loops in different keys all recorded at 120 bpm. This required a number of different recording approaches, involving well-known microphone techniques, and use of D.I, as well as post production such as compression, EQ and stomp pedal modelling. Naturally, every guitarist wants the best guitar tone for their tracks, but do they necessarily know which guitar tone they are looking for in a specific genre? Well that depends on the producer, but it's almost guaranteed that they have a 'sound' in mind before producing a song, and that will determine which loop library to use, and their guitar tone selection. For the most part, the Stratocaster tone is one that most listeners are familiar with since it's one of the biggest selling electric guitars of all time, and one that has been featured on countless hit records.

The production of the guitar loops was indeed a necessity for me as a producer as I found myself having to plug in the guitar and amp, then mic the amp cab, then find the right tone, then discover the right parts to play for the song. However, this is all quite time consuming and takes you away from actually producing the track. By the time you have found the right sound, you have lost some inspiration! Therefore, I wanted to create a guitar sound library of riffs and go-to licks that could be used as starting points, or perhaps repetitive hooks, that sit well in a mix but don't detract from the lead melody of a given production. My goal was to create musical electric guitar motifs that could be triggered specifically using the *Arcade* engine, then manipulated further with built-in macros and third-party plugin processing.

Principles of How the Instrument Works

My instrument is a sample library of guitar loops, which can be used in different genres and contexts depending on the producer's goals and intentions. In a guitar library such as this, it is essential that the producer has access to numerous riffs of different varieties and qualities. Also the tonal character of the loops needs to be varied, which is why I opted for different pickup positions on the 5-way pickup selector switch. With this in mind, the main principle behind the loops is that they are playable in different contexts and at different tempi and key signatures. Fortunately, *Arcade* features a fully compatible triggering system whereby the key signature and tempo of each loop can be mapped to your current project with perfect synchronicity. Although *Arcade* can be used in standalone mode, the best way to utilise the sampler is in a DAW session such as Logic or Pro Tools.

Arcade's principle features are "lines" and "kits" within their sampler which are included in the plugin when purchased on a subscription-based membership. So, these so-called lines and kits are useful to any producer and a game changer in the music industry since its inception in 2018. However, although these lines and kits cannot be altered, the end user has the option to create their own custom kits from existing samples that *Arcade* provides or your own samples

and loops. These can be one-shots as well as loops of any length of choice. Once *Arcade* is instantiated on a software instrument track in your DAW, you would then import my guitar loops into a user custom kit. You can only import 15 loops into any one custom kit at any one time. This means that you can import 15 separate riffs or licks into the sampler, before having to change to another kit for more sounds. Luckily though, the loops are automatically mapped to middle C on your midi keyboard controller, spanning two octaves.

Based on this principle each folder of my sample library is based on 15 separate riffs or loops that can be imported into a specific custom kit of your choice. For instance, if you were working on a song in a major key, then the library is designed to playback the samples in that original key. Due to the fact that *Arcade* defaults to C Major, the riffs have been recorded in this key as a starting point. This allows the plugin to fully transpose from C Major to any other major key. The same principle is true if you were in a minor key as a starting point, for instance C Minor. There are also a number of editor modifier keys whereby the original sample can be re-sequenced to playback in more creative and exciting ways. These include:

- Re-sequence: which basically allows the loop to be played back in a different sequence such as a random order. This is possible due to slicing the edited loop and selecting in which order they playback.
- Repeater: allows you to repeat portions of the loop which can be set at different repeat rates, based on rhythmic values such as $\frac{1}{2}$ notes or $\frac{1}{4}$ notes etc.
- Playhead: this feature allows you to select a portion of the audio and play it back in reverse, or you can change the speed of the loop using this function.

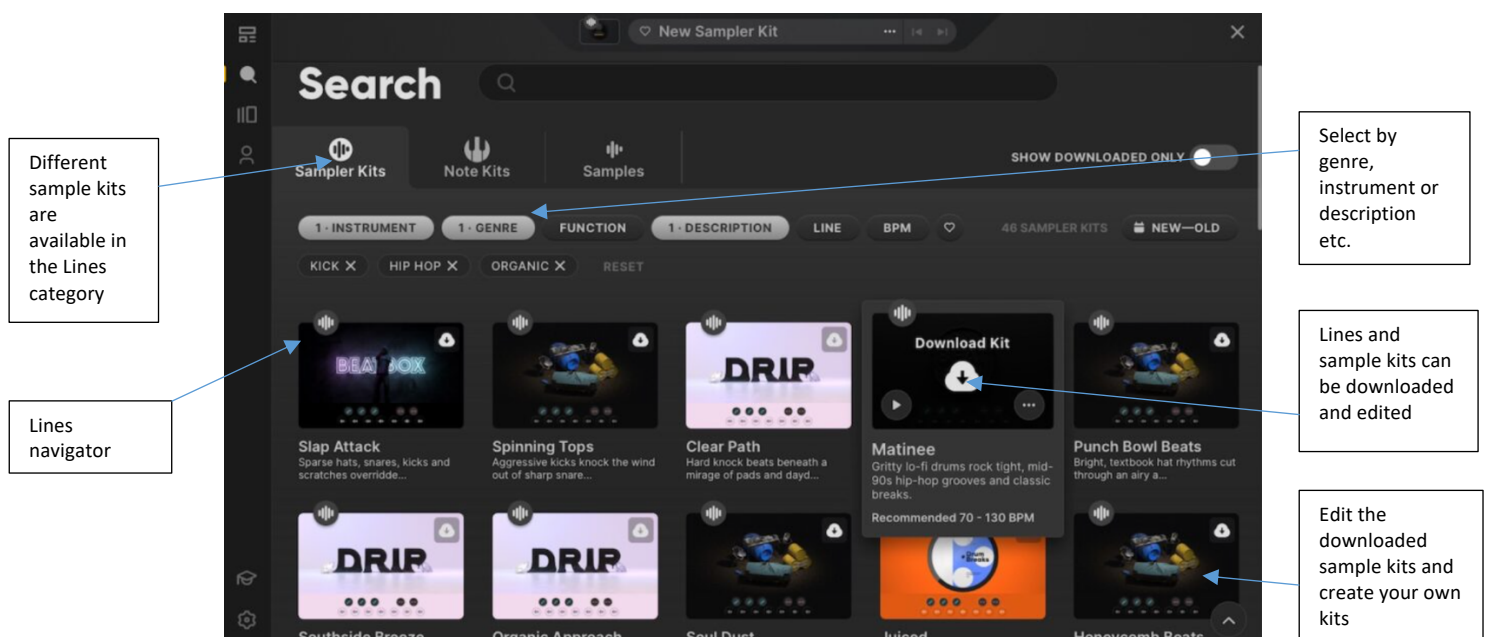


Figure 1.0. Arcade's home page displays the various Lines, sampler kits, note kits and samples to select from a specific Line.

Initial Reflection of The Sample Instrument

From a guitarist point of view, the sample instrument I have built is extremely useful and intuitive when re-triggered and re-amped using Arcade. Since the samples have been recorded with no particular genre in mind, they are designed to suit a wide range of

styles. Furthermore, since the Arcade engine has been designed to allow the user to manipulate the original loops, they have been recorded with this in mind. Therefore, the loops may come across as simplistic and generic, but this is entirely what I was going for due to the fact that if you manipulate a sound source that is already too complex, it is not generally going to perform well with further manipulation in *Arcade*. This was tested with some more complex loops when I recorded my first library for this project, and the software manipulated these loops so much that they were not ‘musical’ in a piece of music. For the instrument to work properly, I decided to keep it simple and user friendly, thereby allowing non-guitarists to use the instrument to their advantage. A purist guitarist might not take to the instrument at first but they may find some use for these loops from a tonal perspective. For instance, they may not own a Custom Shop Fender Stratocaster guitar, and so using this library brings them closer to that reality without having to purchase one. Also, a real guitarist might want to take it a step further and blend their own guitar sound with the library, forming a synthesis of guitar sounds, which could be further processed downstream.

The instrument has benefitted my music as I have utilised the library in two songs already, which are from different styles. For example I have incorporated a chord riff in a minor key into a new Deep House song called *I Can't Change Time*, and have also utilised the macros and editor switches to enhance the feel and character of the guitar within this track. It can be heard on this soundcloud link:

<https://soundcloud.com/tonystone82/i-cant-stop-time-ap-deep-house-cut>



Fig 1.1. Arcade Kit Generator window with various controls for macros and FX pre-sets.

In terms of the variety of sounds in the library, I decided to stay with ‘clean’ settings and not use distorted guitars. Clean settings are much more user friendly and again can be influenced and controlled easily using third party plugins or even the mixer in *Arcade* can provide an array of distortion characteristics where necessary. The other possibility is to generate a new kit from a single loop in the library, using *Arcade*’s kit generator. This feature allows the user to take a loop of your own and map this out on the keyboard, then

selecting one of the FX presets, you can mould the guitar sound for a specific character in your genre. For instance, in Dance music, you might opt for the ‘modern lift’ option. Conversely, the ‘spatial expanse’ pre-set could be optimised for more ethereal sounds in Film and TV scoring. Although, there is a limitation to this in *Arcade*, whereby only one loop can be used at any one point, there’s no limit to how many *Arcade* instances you can have open at any one time in your DAW. Therefore in theory, you could instantiate 15 separate tracks with each loop imported on a generator kit, and take advantage of the different FX pre-sets in each kit generation.

Issues Encountered Whilst Creating The Instrument

Whilst it would seem straightforward to record a guitar sample and import it into a sampler, the actual process is much more complicated and altogether problematic. As a starting point, one might think that it’s as simple as plugging in a guitar to an amplifier, then miking it up, feeding the miked signal into a mixer or interface, and pressing record. However, one must fully understand the timbre of that specific guitar as an instrument, as well as its frequency range and overtone characteristics when recorded using the aforementioned methods.

“The fundamentals of the average 22-fret guitar extend from E2 to D6 (82-1174 Hz) with overtones that extend much higher. When miking at a distance of less than 4 inches, mic/speaker placement becomes slightly more critical. By routing the direct output signal to a track, a cleaner, more present sound can be recorded.” (Huber, p156)

Based on Huber’s recommendations, an bonafide method would be to eliminate the miking process and record direct into the audio interface or mixing console via a D.I box. This method is attractive as it allows for the cleanest sample possible without any noise artifacts captured by the microphone or the unwanted hum and hiss of the amplifier. If you were to record via the amp and microphone method, there needs to be a process of restoration in the post-production phase during mixdown. This could entail, noise reduction, and perhaps de-essing, as well as EQ and compression to mould the sample into something more practical. This approach was taken at first when the recording of my samples were captured. I immediately noticed that there were too many anomalies in the quality of the audio, (especially amp hiss and cab noise) added to the fact that there was a slight latency whilst recording, which was controlled using a smaller I/O buffer size of around 128. All of the initial samples that were recorded using the amplifier method required noise reduction and restoration using Izotope’s RX9 plugin. I therefore, tried to adapt to these issues that I encountered in this phase and decided to record with D.I as well as an amp.

Methods of Improvements and Their Application

When using the instrument samples in the *Arcade* engine, there could be more fluidity in the instrument itself, especially when making changes within the sample editor. In figure 2.0 there are various tabs which link to the current depressed key, showing that you are affecting that specific loop which corresponds to that key. But if you happen to touch another key by accident then it will display the current key’s sample editor tabs.

This is not always a negative point since you can edit specific parameters more efficiently in the current loop that you have selected. The lack of ability to implement your own macros using the main sliders is a drawback, since this would be a much more accessible and efficient way of effecting a loop, and it would in turn apply the effect globally to every loop in the selected kit.

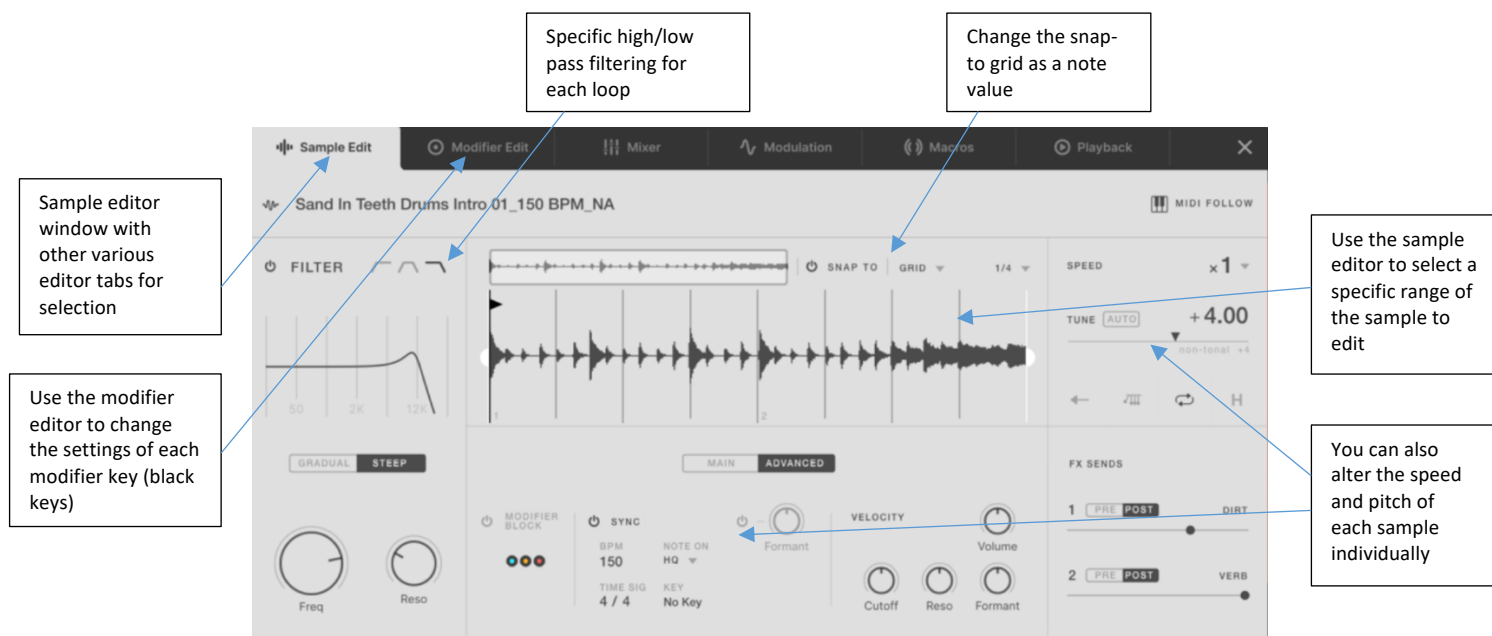


Fig. 2.0. The various tabs along the top of this window can modify the sound of the current depressed key only.

There are a variety of improvements that I could have made to the loops. Firstly, the major loops could be more varied, and they could have a wider range of genre in mind for the producer. If I were to make an adjustment to the sound quality, I may have recorded them at a higher sample rate? However, the file sizes would soon become too large, and the library itself would start to become larger in gigabytes than necessary. Moreover, the end user would need to firstly set their DAW project sample rate to the same as the loops such as 96 kHz, for example. As it stands, these loops were recorded at 48 kHz and 32 bit floating point, to add more clarity to the loops, as they will naturally be imported into an array of different projects with varied sample rates. By setting the sample rate to 48 kHz, the loops can be easily converted either way (on import) to 44.1 kHz or 96 kHz, depending on the project type and end user prerogative.

Not only are the loops recorded with a mic and an amplifier, I did record many of the loops in a D.I configuration, which brings the tonal qualities of the guitar much closer to the listener. Figure 3.1 shows the miking techniques used which was not favoured over the D.I sound, surprisingly. I thought the amp sound was more akin to a live sound, whereas, the D.I sound was more pure and contained more desirable tonal quality. The latter method allowed for more clarity and definition in the sound, but then the inaccuracies of the performance start to become more noticeable, therefore, I had to do many takes before the loops sounded perfect. When miking the guitar amp, I found that the room started to impact too much in the overall body and integrity of the instrument. In

his book, *Modern Recording Techniques* (2017), Huber discusses the phenomena of using guitar amplifiers in the recording process:

“High volume, wall-of-sound speaker stacks are rarely used in a session, as they’re harder to control in the studio and in a mix. By far the most popular mic type for picking up an electric guitar amp is the cardioid dynamic”. (Huber, p156)

My project studio is simply not big enough or sound proofed adequately enough to produce a better amp tone for the instrument at such a low volume. Therefore, I would somewhat disagree with Huber, and say that you can actually get better results with higher volumes, and larger rooms. As opposed to project studios, with less space to access the sweet spot of the amplifier. In this case a Fender 1957 Twin Amp does tend to find its sweet spot at around 5-6 on the volume pot. If you think about a live set-up, playing in a larger venue would have yielded more realistic results, but this was not practical at the time of recording.

I feel that the miked versions are not as clean and contain much more background noise (naturally), which is undesirable in a sample instrument kit.



Figure 3.0. D.I box used during the recording process.



Figure 3.1. 1957 Twin Amp used to record guitar samples, experimenting with both dynamic and condenser mics on each cone.



Figure 3.2. Fender Custom Shop Stratocaster used to record all of the samples

The guitar had brand new strings fitted and the action set up perfectly. However, the strings may have required more “bedding in” before recording, as some of the earlier loops that I recorded tended to pick up too much string noise and fret vibrations. That being said, some producers like this sound and therefore it may not be a disadvantage in that case. Overall though, I feel that the guitar set up was very good for its purpose, but perhaps a few more days of the strings ‘settling in’ might have resulted in a better tonal quality in the earlier stages of recording the loop library. There is a certain sweet spot with guitar strings, you don’t want them too new and you definitely don’t want them too old and over played.

In Comparison With Other Loop Libraries

“In pop music, guitars have a specific sound that can be hard to find. Sometimes, one guitar sample isn’t enough to inspire an entire track”

(Lavoie, LANDR article, 2020)

Lavoie is talking about the nature of the guitar sound here, and how it can be utilised to accentuate specific voicings and timbre in the song that you produce. So, when comparing my sample instrument to other existing commercial instruments on the market, it would be beneficial to discuss the contrasts and similarities between them. I firstly looked at Ghosthack Samples, which are very competitively priced, and cover a wide range of genre specific loops and one-shots. However, you tend to find their loops a little too generic and recorded on a perhaps a Gibson E335 or a Les Paul, which doesn’t cater for the Stratocaster aficionado.

Arguably, the best-selling loop provider, *Splice*, has developed a user-friendly way of delivering high quality loops which can be imported straight to your DAW project. This is advantageous since it will sync directly to your project tempo and can be pitch stretched to suit your project key. However, the drawback to *Splice* is that you cannot audition the sample with your project, before importing it into your DAW. Since it is an online based sample library, there is obviously the hurdle of subscribing to the membership for these loops as opposed to a one-off fee. Moreover, the library cannot be auditioned simultaneously in your DAW without the recent release of *Splice Bridge*. This additional plugin allows you to ‘bridge’ your project with the *Splice* online sample library. You can then take advantage of hearing the sample alongside your track before you download and import it. But therein lies another drawback, your selected sample firstly needs to be downloaded to your hard drive before being imported to the DAW.

All of this is quite time consuming and when you are in the flow of production and musical ideas come to you, you do not want to be wasting time downloading more samples. This is where offline sample libraries are more efficient and less time consuming. They also have the necessary metadata built into the sample file, so there’s no need to time stretch or re-sample a loop to match your project. Another advantage is the apple loop library integration. My guitar loops can be exported to the audio loops library in Logic Pro, meaning that they will conform to the project tempo and key. I found that exporting the loops as .wav files was the best option as majority of sample packs that you buy are generally in this format. Also, the *Arcade* plugin does not support apple loop files

such as .aac, .mp4 or .m4a at the moment, whereas the apple loop library can support .wav files as well as *Arcade*.

User Feedback and Beta Testing

In terms of user feedback, the general observation is that the loops are very usable within different genres of music. The beta tester did not have *Arcade* and decided to import the sampled guitar loops as audio tracks directly into the DAW, then processed them with third party plugins. According to the selected beta tester of the Strat-o-Sphere loop kit:

“These guitar loops are user friendly and have lots of potential, and there is a definitive and characterful tone quality to the guitar sound itself. The loops may also benefit from a wet and dry option, in terms of reverb or send effects. This would give more flexibility and options for those who don’t have the *Arcade* plugin, or don’t have the means to use a DAW such as Logic or Pro Tools”.
(Moseley, J. 2022, beta tester)

Having received this feedback from a beta tester, I made the decision to bounce each loop as a dry file, as well as a fully wet version, with use of Waves Stomp pedal modelling. These included reverb and delay and some slight chorusing effects added. This would allow non-*Arcade* users the ability to drag and drop the samples into their DAW without the need for third-party effects plugins. It would also aid those users who may not have a powerful system, where an already effected loop can be easily dropped into their project without further processing. This would definitely appeal to younger student producers, beginners or even intermediate users. Overall, the sample pack library is both usable and practical to any professional producers who want to discover electric guitar parts quickly, that fit into their already existing mix and workflow.

Bibliography:

Gibson, B. (2008) *Engineering and Producing: Hal Leonard Recording Method*. Hal Leonard Corporation.

Huber, M. (2017) *Modern Recording Techniques, 9th Edition*. Routledge.

Neyens, K. (2019) *Guitar Looping: The Creative Guide*. www.fundamental-changes.com; Illustrated edition (22 Jun. 2019)

Oltheten, W. (2018) *Mixing with Impact: Learning to Make Musical Choices*. Routledge.

Owsinski, B. (2017) *The Recording Engineers Handbook. 4th Edition*. Bobby Owsinski Media Group.

PalmerSmith, A. (2020) *Shaping Sound, A Practical Guide to Audio Effects*. Independently Published (15 Oct. 2020).

Sarafin, E. (2020) *Zen & The Art of Mixing*. Mixerman Publishes. Ashville, NC.

Warburton, A.O. (1979) *Harmony – New Edition*. Longman Group Ltd.

Snoman, R. (2019) *Dance Music Manual: Tools, Toys and Techniques*. Routledge.

Swindali, T. (2020) *Electronic Dance Music Production*. Tommy Swindali Publishing.

Websites:

<https://www.waves.com/1lib/pdf/plugins/gtr-solo.pdf> (Accessed: 16 May 2022)

<https://output.com/products/arcade> (Accessed: 21 May 2022)

<https://support.output.com/> (Accessed: 24 May 2022)

<https://support.apple.com/en-gb/guide/logicpro/lgcplde12b57/mac>
(Accessed: 24 May 2022)

<https://splice.com/blog/strategies-auditioning-samples/> (Accessed: 26 May 2022)

<https://www.native-instruments.com/en/products/komplete/guitar/guitar-rig-6-pro/effects-and-tools/>
(Accessed: 28 May 2022)

<https://splice.com/blog/how-to-use-splice-bridge/> (Accessed: 30 May 2022)

<https://www.native-instruments.com/en/products/komplete/guitar/guitar-rig-6-pro/amps-and-cabinets/>
(Accessed: 2 June 2022)

https://www.ghosthack.de/guitar-loops-and-one-shots/?gclid=EAIaIQobChMI1vLJt77f-AIVTe7tCh150ATWEAQYAiABEgJj7PD_BwE (Accessed: 8 June 2022)

<https://native-instruments.com/ni-tech-manuals/guitar-rig-manual/en/welcome-to-guitar-rig>
(Accessed: 12 June 2022)

<https://www.highpointmusic.com.au/blog/guitar-build-loops-lesson/>
(Accessed: 13 June 2022)

https://samples.landr.com/?utm_source=google&utm_medium=paid_search&utm_campaign=acquisition_samples_en_intl_generic_gsn_hop&utm_term=guitar%20loops&utm_content=605507395654&gclid=EAIaIQobChMI4KK6qrLi-AIVCe3tCh1xcQGDEAAAYAiAAEgLz1fD_BwE
(Accessed: 18 June 2022)

https://get.output.com/arcade/music?exp=guitar35&utm_source=google&utm_medium=search&utm_campaign=Arcade-Acquire-SER-Instruments-Subs-Prospect-INTL-Generic&utm_term=acoustic%20guitar%20samples%20free%20download&utm_content=120866250897&gclid=EAIaIQobChMIubKW1q7i-AIVd4BQBh1SHwQ8EAAYASAAEgJPDvD_BwE
(Accessed: 23 June 2022)

https://prsguitars.com/blog/post/tips_for_building_great_guitar_loops
(Accessed: 23 June 2022)

https://smokeyloops.com/?gclid=EAIaIQobChMI8YLjxbHi-AIV0N_tCh37xgdVEAMYAiAAEgJbQfD_BwE
(Accessed: 24 June 2022)

<https://theproaudiofiles.com/pitfalls-to-avoid-when-recording-electric-guitar/>
(Accessed: 28 June 2022)

<https://blog.landr.com/guitar-samples/> (Accessed: 2 July 2022)

Videography:

<https://www.youtube.com/watch?v=G5Wa-Vld2PQ>
(Accessed: 8 June 2022)

<https://www.youtube.com/watch?v=bT8O6XL4Zo>
(Accessed: 12 June 2022)

<https://www.youtube.com/watch?v=0O3UczxtkqU>
(Accessed: 13 June 2022)

<https://www.youtube.com/watch?v=nnWN38YS4bo>
(Accessed: 13 June 2022)

<https://www.youtube.com/watch?v=PNSkGdfZrRs&t=1s>
(Accessed: 17 June 2022)

<https://www.youtube.com/watch?v=HDW7yNhLpsg>
(Accessed: 24 June 2022)

Interview:

Moseley, J (June 28 2022). *Discussion with Jacob Moseley and his experience of using the plugin sample library as a beta test.*