

MA COMMERCIAL MUSIC PRODUCER

DEVELOPMENT

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SIMONE RECA

Word Count:

3742

Being a musician and having started my music career by playing guitar, the thought of having to build a synthesiser or an instrument of some kind really fascinated my mind at the beginning of the past second term, feeling that was then inflated by my adhd and lack of discipline necessary when dealing with number, codes and programming.

Some manual work helps me keeping engaged with what I'm doing so I thought that building an instrument would have been my way to go for this exam, so I started focusing on the concept.

I wanted to make something useful, that could help me dealing with some of the most boring and tedious actions to execute while producing, in order to benefit both my workflow and my creative process.

I then spent the next couple of weeks focusing on what was slowing me down during sessions and what used to interrupt the creativity towards building something that would help me in those moments to not interrupt the flow.

In the meantime, following Robyn Hails' brilliant guidance, I started understanding and practising the very basics of coding through website such as the Microsoft's "Microbit", researching kits to practice the manual labour of building a synth such as the ones from Daniel Dixon's article for the website "*The Vinyl Factory*" entitled "*8 DIY analogue synthesisers you can build at home*" (2019), reaching out to the editors and members of Synth Cafe' Blog, an Italian online community of hackers and synths masters and teachers which I am part of, and eventually by building my first synth: a stepped tone generator, also known as "Atari Punk Console" as it's "Well-known for enabling the creation of sounds just like classic Atari console games from the 1980s" said Star Simpson, a prominent maker, inventor and serial entrepreneur based in Los Angeles, who created and developed the project Circuit Classics, "an exquisitely designed series of finely crafted and highly detailed boards".

The stepped tone generator was invented by Forrest M. Mimms in 1982, whom explained it this way in the “Engineer’s Mini-Notebook: 555 Circuits” (1984) :“The circuit consists of a 556 dual-timer IC (equivalent to a pair of 555 timers) and half a dozen other parts. In operation, the first timer is connected as an audio frequency oscillator and the second as a monostable multivibrator. The oscillator drives the monostable, which emits square output pulses with a duration controlled by R3. You have to hear the end result to fully appreciate the stepped tones that are generated as R1 and/or R3 are adjusted. R1 controls the frequency of the audio oscillator. R2 controls the output pulse duration of the monostable multivibrator. R4 is an optional volume control that can be deleted by connecting the speaker directly to C3”.

Once the synth was built, I plugged it into the pedalboard by connecting the crocodile heads to a lead going into my fuzz pedal, first in the chain, onto the other guitar effects, and started experimenting with the sounds and coming up with a few interesting samples for my library. When the fun was over, I realised I had actually recorded around 50 samples that I liked and that fast forward a couple days sparked my creativity and actually made it into a single I co-wrote and produced for an artist who just signed to Sony.

That was a turning point for me as I realised how difficult it was going to be to build on my own a synthesiser that worked properly, especially with my poor handcraft skills.

I eventually figured out that I could have programmed a sample based digital instrument through Kontakt’s editor out of the stepped tone generator, so I started experimenting some more by adding analogue pedals and effects to it.

Still I wasn’t satisfied: the sounds that I was getting were too weird and not good enough, so while I was placing the home made synth on top of my Korg MS-20 Mini I had the idea to build a digital

instrument based on samples that I collected from the MS-20 in order to have a polyphonic version of it!

I knew that a digital version of this synth was already available and made by Korg, so what I had to do now was plug my guitar into the synth following Marcus Hamblett's tutorial video I found on YouTube ("*Korg MS20 Mini tracking guitar pitch using the external signal processor*", 2014) and then run it through my pedalboard in order to get some unusual but interesting sound and give my personal twist to the synthesiser.

This process was actually very stimulating for me, the idea of giving new life to the iconic MS-20 really made me excited, especially because after me and my flatmate purchased a Moog Minitaur module which is a great subharmonic bass machine, I kind of abandoned the Korg synthesiser to its destiny, letting it catch the dust for the past couple of months.

The thing about the Korg MS 20 is that you know what you're getting, once you figure out how it works you already know when you will be using it and what you're going to get out of it, so the idea of making something different and unexpected out of a synth I actually love so much really caught up with me and got me initiated to this project, with the goal of creating a plugin that instantly sparkles the user's creativity, a tool to go to when out of ideas or when you just want to have fun!

Let's start by saying that the Korg MS-20 was "one of the first affordable semi-modular synths" (Robehmed, N. 2019) that had "an analog two-oscillator monophonic lead and bass synth with hard wired and patchable connections" which made it "With two oscillators rather than MS-10's single oscillator, it produced perfect sounds for lead and bass parts".

Even though The patch bay already allowed the user to create some kind of pads which give the illusion of polyphony such as the one showcased in a YouTube video called "Korg MS 20: tips and

tricks - Chapter 4: Ambient Pad (2014) it still felt very limiting and not quite enough a turning point for the synth.

The first thing that I did, given the fact that the ms20 is an analogue synthesiser and it's not always 100% precise, I double checked on my DAW's tuner that the pitch was correct. I knew I could have fixed it on Ableton afterwards but I wanted to digitally alter the audio the less possible so I made sure everything was right beforehand.

I then started by tuning the second VCO to an interval of a fifth up to the other VCO, which already created some more movement and textures in the sound and it felt like a good starting point.

Once I achieved a sonority that I liked by tweaking only the synth's parameters and knobs, I started experimenting adding various effects from my analogue guitar pedals.

To achieve the sound that you can hear in the plugin, I added a drive pedal by MXR which really helps the sound clarity and tones and gives excitement, then I added the Ibanez TS9 Tube Screamer to add drive and some level and last but not least I used the Whammy pedal to actually get an harmony from the mono synth by having the whammy bar pinned upwards and on the 5th/4th harmony setting.

The harmony on the low end created a very driving and dark kind of pad.

At this point I started recording every note singularly for three octaves.

I could have done just two octaves, perhaps skip the semitones and do those digitally, but I wanted to preserve the transients as clean as the original as possible.

I also recorded on click in order to make the editing process a bit faster and smoother.

Once in my daw, I used a Waves plugin called X Noise to get rid of some of the noise due to the guitar pedals.

The dilemma here now was on how to emulate the human feel of playing and how the instrument would respond to a different trigger simulating the dynamics that you would normally have, to make the plugin sound less stiff and more real.

Synths respond to different dynamics with a volume alteration, so in order to achieve a good response to dynamics while playing the synths I had to work out a way to trigger a slightly different sample I recorded to respond to different dynamics.

I researched on how to achieve that and I found out about a technique called Round-robin, whose functionality is “offered by most samplers and employed by many ROMplers to authentically mimic the sounds of real-life instruments such as drums, guitar and bass. It enables us to assign two or more samples to a single key before playing them back either sequentially or in random order. By capturing several 'takes' of the same sound (snare drum hits, string plucks, etc) then triggering them via round-robin sampling, it's possible to avoid the repetitive, 'inhuman' sound of the same sample being used over and over again.” (Computer Music, 2015)

I did some research on how many groups there are in Kontakt's instruments and found out that it depends on the plugin, some had several while some had just a few or even one.

Since this was my first plugin, I decided to record the three octaves only three times again, changing slightly some of the parameters such as attack and cutoff, to have a soft, medium and high dynamic of each note.

I also applied a compressor in Ableton on soft and medium dynamics to work out the attack and release and a limiter on the hard dynamics to slightly increase the volume.

By watching James Yates' tutorial on how to build an instruments on Kontakt from sample recordings I found out that I had to assign a different velocity to different groups of notes in order to trigger them based on the dynamics simulation I wanted to achieve.

When working with MIDI, velocity basically “gives you control over the feel and the volume of notes” (Jones, H. 2017) and it well explained in video made by the music producer Joe Albano called “AudioPedia 109: MIDI - 5. Velocity” (2017).

In the tutorial that James recorded, he showed that it is possible to assign the velocity to the different groups of notes in Kontakt’s editor, so I left it at that and I cracked on with editing each clip I had recorded, in order to have the attack and release I wanted.

This process was made way smoother and faster by Ableton’s 11 new Link feature (“Ableton Live 11: What’s New?”, 2020) which allows you to edit and work on different tracks simultaneously, just like in Pro Tools.

Before bounce all the audios and head to Kontakt I decided to double check the tuning of the samples and surprisingly enough I found out that all the notes were slight sharp.

I spent some time researching how that could have happened but couldn’t get to the bottom of it.

I didn’t want to alter them digitally so I started to recreate the sound by adding the guitar pedals one by one and then checking the tuning and I found out that the Whammy pedal wasn’t super precise with its alterations and harmonisations and changing the transients it had also slightly pitch shifted the notes.

There was no way for me to overcome the problem outside of the daw, also cause I didn’t want to loose the Whammy effect as it was the main element of the sound, so I decided to correct them in Ableton.

At this point I exported the tracks, naming and labelling every clip accordingly to the note it was playing and the group it was part of, because I learnt from Yate’s lecture that Kontakt can automatically assign the notes to the relative key if they’re named correctly, which would save a lot of time in the long run, compared to assign every clip to the corresponding note manually.

Once in Kontakt, I created three different groups for the round robin and pasted all the samples inside the relative group.

Then I pasted the clips on the right keys and figured the velocity parameters for each group of the three different octaves I recorded, ending with three different dynamics and clip playing corresponding to each note, based on soft dynamics, medium dynamics (which was the largest group) and hard dynamics.

After spending some time playing with the plugin and experimenting a bit with the velocity settings, I had to get into the programme's editor and getting started on the proper coding and programming of the instrument.

To guide and help me I followed the instructions of Kontakt's manual, a video tutorial by David Hilowitz called "Kontakt tutorial: creating an instrument on Kontakt from start to finish [...]" (2018) and the James Yates videos that were available on beebop.

Due to my adhd this process has definitely been the most difficult challenge for me, I kept making silly mistakes due to distraction and it got me frustrated at times, but on the other hand it fuelled me to improve my work ethic and being focused on being focused basically, and setting the Master knob in the end was surprisingly quite a smooth operation.

I wanted the plugin to be as direct and easy to use as possible so I didn't want to over complicate it by adding many parameters and values to tweak, the only modulations I wanted to include were the high and low pass filters due to the fact that the main sound I developed was based on the harmonisation of low and high notes and it created a specific vibe due to the interval that the notes were playing, so I wanted to give the user the opportunity to isolate those notes and have a "cleaner" and more versatile version of the synth straight away.

Once I managed to set them up I tested them by playing the plugin and tweaking the filter knobs and realised they didn't sound as great as I thought so I decided to take them out.

I programmed a chorus effect (which I then liked so I coded the depth level of the chorus to be at 10 when the knob was at 0, so it'd be always slightly present) and a reverb just for the sake of the exams cause I didn't wanna look lazy and I wanted to prove that I genuinely learnt how to code inside Kontakt, but in my mind I picture the plugin to be as straight forward as possible and to instantly sound interesting and exciting.

After finishing the plugin and making sure that it was working as it was supposed to, I asked some friends to test it and get back to me with feedbacks on what they liked and what they didn't, asking their opinion on how they would improve it and what they would expect from a plugin like that.

Here's a collection of strengths and weaknesses:

STRENGTHS - Ready made.

By programming the instrument I realised that I want the sounds to be already heavy processed, which would then allow me to add no Kontakt's effects.

As a producer I know that we all have our favourite reverbs or distortions, so I don't see any point in coding all those effects into my plugin, cause I know I personally wouldn't use them anyways.

For this reason I want the sound to be already interesting, captivating and stimulating so that you can just open the plugin, pick one preset that you like and play.

Differentiation.

There is only one preset now but I'm working to add more and more, going from thick bass sounds to eerie ambience landscaping sounds to warm pads and many, many weird sounding presets.

The Concept.

Despite the existence of a polyphonic and digital version of the MS-20, my plugin would offer a more varied library of sounds that are not achievable with the synth on its own, due to the

processing of the sound through many guitar pedals and also some digital processing happening in my daw.

Easy to use.

Processing heavily the sound before loading them into Kontakt, there is no need for added modulation effects/knobs on the plugin's interface, which makes it nicer to look at and also very easy to use for any kind of user, from a less experienced one that can just open the plugin and play to a more experienced producer, who can then add their favourite effects to shape the sound closer to their taste.

WEAKNESSESS: Limitations.

The down side of being such a ready to go plugin is that there is no room for altering the sound inside the plugin/get back to a dryer signal.

Note lenght.

Some of the feedback that I received on the plugin stated that the note's sustain is too short and it just cuts off instantly.

This was a great comment as I actually didn't realise that so I will definitely put more focus towards refining that.

From the feedbacks I realised that I should have added parameters such as attack, sustain, decay so this, together with adding a couple more presets, will be the first modifications that I will do on the instrument.

I did actually tried to add these values to the instrument but I encountered a bug in Kontakt as once assigned a knob to the attack for instance, the value would only increase up to 3.3%.

No matter how I moved the knob, the value would always stick to 3.3%.

I tried assigning another parameter such as sustain but that didn't work either, so in order to implement these features I will need more time and possibly some help with coding those bits.

The side of image and branding of the project was really fun to develop as well as challenging, but eventually it all came together quite smoothly.

I'm very intrigued by design and all kinds of aesthetics, I take pictures myself with a couple analogue cameras that I own and I'm always paying attention to how movies are shot, the scene's colour palette etc., so having to create the interface for an instrument I programmed and trying to give sense to the whole project also on an visual aspect was definitely entertaining for me.

Lars Von Trier, a famous and successful director although quite controversial, in his last movie called "*The house that Jack built*" not only he directs but he also narrates some interludes during the film's scenes, and one of his arguments are that he "discovered that through the negatives, you could see the real inner quality of the light" (2018).

This sentence basically fuelled the whole project for me, it became the milestone around which I then built the whole work.

On a conceptual side, I also wanted to prove that perhaps the inner quality of this Korg synthesiser was to be polyphonic instead of mono and the fact that I own a limited white edition of the MS-20 simply gassed this whole idea.

At this point I knew that the main colours should have been black and white, perhaps having a majority of white background interfered by some black knobs, just like the real synth.

While I put an NBA game on the background of my laptop, I came up with names such as "InnerLight" or "The Sound Within" but they both sounded too serious.

Towards the end of the NBA game, the commentators voices stood out as they were excitedly screaming that James Harden had put another Triple Double, and there it stroke me: I wanted to call the plugin “TRIPLE DOUBLE”!

During a basketball game there are five positive statistics that are tracked: points, rebounds, assists, steals and shot blocks.

“If a player reaches double figures in any three of these categories in one game, they are said to have gotten a triple-double.” (Winkler, E. 2019)

This kinda reminded me of what I was doing with the plugin, turning a monophonic synthesiser into an instruments capable of playing harmonies: already by adding the whammy harmony it became double and then by being able to play chords up to eight voices over a midi keyboard it became triple, so Triple Double.

To create the plugin’s interface background I used a free online website called Canva which allowed me to upload a picture from my computer and edit it, as well as choosing from one of hundreds of fonts for the name.

I changed a few ones before deciding on the last one, I wanted to avoid looking too serious so in the end I chose a font where I could add some neon colours which worked well in my opinion, contrasting the black and white stiffness and adding some fun to the overall aesthetic.

I chose the colours pink and light blue for the neon lights as they’re the colour of Miami Heat’s away shirt, the team I support.

To design the knobs of the plugin I used a java based programme called “JKnobMan” which I found thanks to another video by David Hilowitz called “*Kontakt Tutorial: how to make knobs with custom graphics [...]* (2019).

The programme worked amazingly well, the interface was quite intuitive and gave a lot of editing options, as well as providing the user with a huge selection of knobs of all kinds to download for free, which you could then fourthly customise to your taste in the programs editor.

In conclusion, this has definitely been one of the most challenging and stimulating projects I've ever worked on.

It taught me an infinite amount of things, from coding and programming to actually building a synth, working on Kontakt and in my daw in a way that otherwise I would have never discovered and it unquestionably enlarged my views.

The feedbacks I received were overall quite positive, and thanks to the negative ones I already know what I need to do in order to better the plugin.

Even though I'm still at the very beginning of coding and programming I'm actually very excited to keep working on this plugin and I will not exclude the possibility of making some other instruments in the future!

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