

Carbon Based Lifeform & The Gelflings of Hyperspace

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Aim

I aimed to produce a piece of Electroacoustic/Ambient/abstract work (*The Gelflings of Hyperspace*) as well as a Techno/Acid based piece of music (*Carbon Based Lifeform*). For *Carbon Based Lifeform* I started experimenting with using the Roland System-1 (Figure 1) as a way of creating a contemporary approach to the same function that the Roland 303 is used for in Acid music. The 303 sound has been tried and tested over the years but there's always room for approaches using new equipment. The legendary status of the 303 device led to a situation where it was assumed that you must actually have that device in order to make the associated type of music. Much like having to own an electric guitar to make rock music. However the tricks of the 303 sound are more ephemeral than a guitar and are produced more by the way synthesisers work than anything intrinsically to do with the device. The "barking" and "squelch" sound of the 303 sounded the most interesting when it was echoing human vocal sounds. The 303 was a discovery of a composition technique rather than anything that relied exclusively on having the actual hardware device or software emulations of it.



Figure 1 - The Roland System-1 Soft Synth

Discussion

To be begin with I had to do some project reconstruction and some sleuthing to find out what techniques I had used (for example the stretch algorithm) before I moved on to editing and finalising. As Desantis points out this is due to the inherently chaotic creative process.

“Creativity is an intrinsically messy and uninhibited process. Editing, on the other hand, is about refinement and order.” (Desantis 2015: 37)

This was especially prevalent in *The Gelfings of Hyperspace* where I instinctively followed a “gut feeling” which allowed a piece to emerge in ways I could have not have planned in advance. This is quite a prevalent approach in electronic music production.

“ ... the way Barbieri works with her musical system harnesses the dynamics of complexity’s happy accidents at the edge of chaos, building upon them.” (Brett 2021: 25)

Both pieces exhibited the emergence of unexpected directions in their production.

“Moreover, since there are dependencies among a system’s components, new components added can cause the system to behave in unpredictable ways. Complex systems like traffic patterns and global climate are typically nonlinear and have built-in feedback loops. This leads the systems to exhibit a property known as emergence , a condition in which ‘the action of the whole is more than the sum of the actions of the parts’” (Brett 2021: 22)

To go along with the *Carbon Based Lifeform System-1* synth line I created a complex synthesised bass line using another one of the Roland Cloud emulations of a hardware synth, the Jupiter 4 Compuphonic (Figure 2).



Figure 2: Roland Jupiter 4 Softsynth

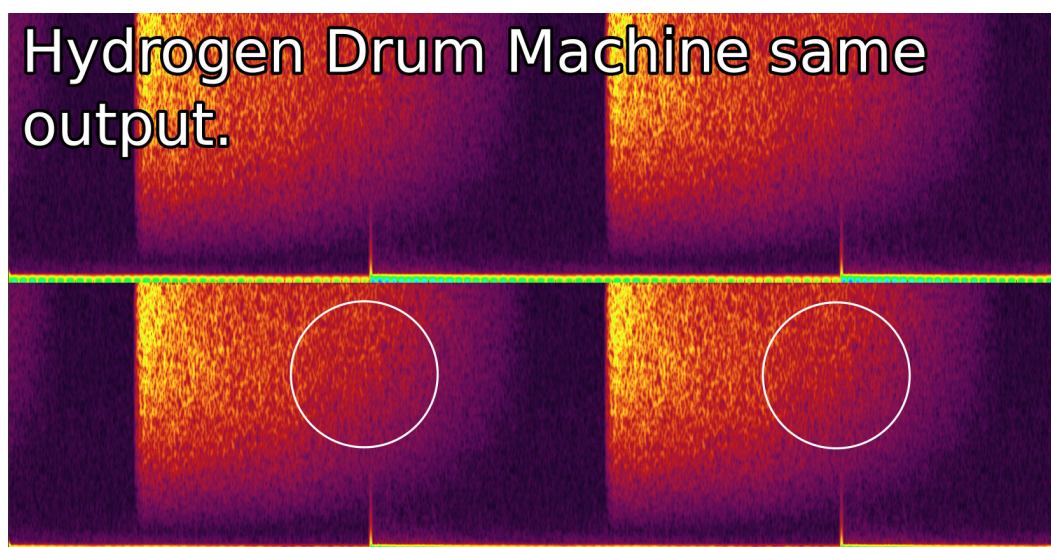
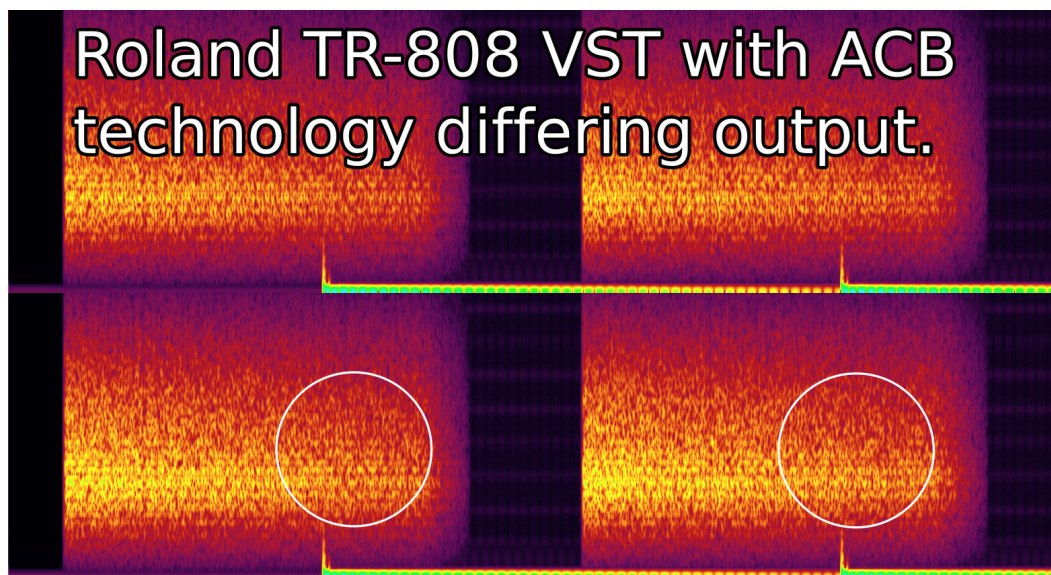


Figure 3 - Roland ACB Technology

Roland uses their own *Analog Circuit Behaviour* (ACB) technology (Valle 2014) which simulates the sound based on modelling the original circuit designs. Tests that I did (Freeman 2019) showed that recording the Roland TR-808 software emulation, versus a sample based emulation, confirmed that there is the kind of inaccurate and differing sound output per beat that you'd expect from a truly analogue instrument (Figure 3). Izhaki unequivocally got to the bottom of this distinction when he wrote about the difference between digital and analogue compressors.

"In practice, there is little challenge building a precise digital compressor. A quick online search will quickly yield a free algorithm for exactly such a compressor, but it won't have character. Analog designs have a character due to their lack of precision, and each compressor is inaccurate in its own unique way." (Izhaki 2018: 278)

In order to find an interesting and unusual sound for *Carbon Based Lifeform* I wrote a Python script to randomise software synth controls through OSC (Figure 4). This generates a random number between 0 and 1 for each control of the synth which is accessible through OSC (see line 32 in Figure 4). After some trial and error this provided an interesting starting point (Figure 5). The result was manually tuned. This can be seen in Figure 6 which shows the difference between two screenshots. The first taken after randomisation and the other after manual adjustment. The changed controls have white boxes around them.

```

1 # Copyright Michael Z Freeman 2023 for Falmouth University Creative Music Technology
2 # RESTRICTED: This work is copyrighted and is not for distribution.
3
4 from pythonosc import udp_client
5
6 import argparse
7 import random
8 import time
9
10 parser = argparse.ArgumentParser()
11 parser.add_argument("--ip", default="10.2.245.2", help="The ip of the OSC server")
12 parser.add_argument("--port", type=int, default=7000, help="The port the OSC server is listening on")
13 parser.add_argument("--track_id", type=int, default=0, help="Number of track (numbering starts from 0)")
14 parser.add_argument("--clip_id", type=int, default=0, help="Number of clip (numbering starts from 0)")
15 args = parser.parse_args()
16
17 client = udp_client.SimpleUDPClient(args.ip, args.port)
18
19 control = range(0,127)
20
21 # There are 24 controls 1 to 24 in first page. Don't yet know how to switch to next page.
22
23 # client.send_message("/5/par1", float(127))
24
25 pages = input("Number of Pages (instument panels)?: ")
26 print("Pages = " + pages)
27 pages = int(pages) + 1
28
29 for p in range (1, pages):
30     for i in range(1, 25):
31         # Should be from 0 to 0.9999999
32         control = random.uniform(0, 0.9999999)
33         # Print messages to console
34         print("/5/par" + str(i), control)
35         # Send the actual OSC message
36         client.send_message("/5/par" + str(i), control)
37         # OSC rate limiting
38         time.sleep(0.1)
39     # Change to next Page of the instrument panels (up to 25 pages but most synths only have 6 to 13).
40     continueToPage = input("Do you want to continue? (y/n): ")
41     if continueToPage.lower() == 'n':
42         break
43     print("Raise Page number.")
44     client.send_message("/5/page+", float(1))
45     client.send_message("/5/page+", float(0))
46     # Wait a moment ! Rate limiting on Page OSC message.
47     time.sleep(1)
48
49 # Takes pages back to first page
50 for p in range (1, pages):
51     # Send Page Change (up to 25 pages but most synths only have 6 to 13).
52     print("Lower Page number.")
53     client.send_message("/5/page-", float(1))
54     client.send_message("/5/page-", float(0))
55     # Rate limited
56     time.sleep(1)

```

Figure 4 - Synth Controls Randomisation Script



Figure 5 - Control positions on Jupiter after running randomisation script



Figure 6 - Changed controls

The Roland TR-8S hardware drum machine (Figure 7) was also used to provide a further bass-line for *Carbon Based Lifeform* alongside a Roland TR-909 software drum machine line.



Figure 7 - Roland TR-8S

For *The Gelfings of Hyperspace* an A capella vocal sample (Zutsuri 2017) was stretched in a way that misused a stretch algorithm in order to extensively change the timing and rhythm of the vocals (Figure 8). A drum kit recording (Keith 2022) was used in similar fashion by extensively stretching it.

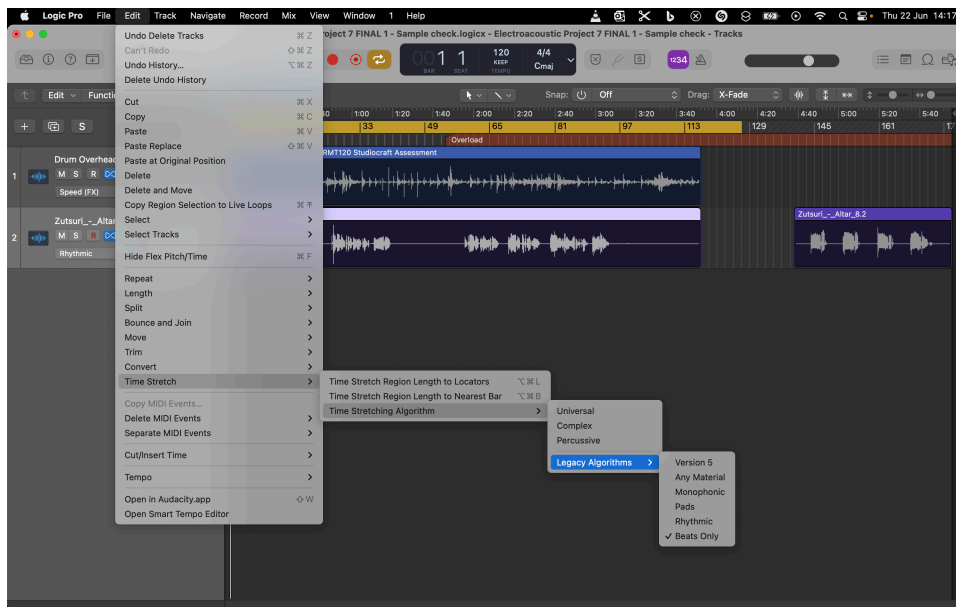


Figure 8 - Stretch Algorithm

Remix FX was used on both of these samples.

“Remix FX brings together many of the real-time audio processing tools available in Logic under a new streamlined single interface.” (Bennett 2021)

The sample used in *Carbon Based Lifeform* was a recording made by the author of the SpaceX USA headquarters telephone switchboard message (SpaceX 2022).

The Gelflings of Hyperspace is reminiscent of many Tangerine Dream pieces. Especially more abstract sequences in their work where they are not using arpeggiation or orchestral synths (Tangerine Dream 1981) (Tangerine Dream 1977) (Tangerine Dream 1980). The final effects of the use of the vocal sample reminded me of the work of Stockhausen. Even though the work *Atmen gibt das Leben* is an orchestral piece (Stockhausen 1984) the vocal work in *The Gelflings of Hyperspace* reminded me of the way Stockhausen uses vocals in his piece.

Carbon Based Lifeform was influenced by many Harthouse releases (Harthouse Compilation Chapter 3 1994) (Harthouse Compilation Chapter 5 1995) as well as 303 based Acid music (Ege Bam Yasi 1993) (Ege Bam Yasi 1994). The Jupiter bass line immediately reminded of ‘EFS 6’ by H.E.A.D (EFS 6 1993) who are an experimental techno ambient project from German musicians Khan and Kerosene. Their release is notable for the way it advanced the use of the 303 just when it seemed that nothing new could be done with it.

“By 1993 I was saturated in Acid. Over saturated! Since 1987 there had been an endless explosion of records from across the planet using the 303 and it seemed like the sonic possibilities offered by this little silver box had hit a dead end. And then in 1993, from Germany, came the Blue label with mind-blowing releases by Air Liquide and friends. It felt like a new paradigm, paying homage to Germany’s Kosmische Musik past while paying respect to the Chicago Acid House originators while simultaneously looking ahead to a new form of transcendental music. And then - BOOM! - the H.E.A.D. “EFS” double album drops.” (Optimo Music 2021).

The reference to Kosmische Musik (Krautrock), a German avant-garde / experimental rock movement that emerged at the end of the 1960’s, highlights the rich history and cultural

references in the music that go beyond a sound solely defined by the use of a single device, in this case the Roland TB-303. This lends credence to my approach of experimenting with the Roland System-1, based on my realisation that a whole music genre does not have to be defined by a single device, however important that device was in the evolution of that music.

Conclusion

I felt that I did meet my aim of producing an Electroacoustic/Ambient/abstract work and a Techno/Acid based piece of music. I was impressed by the way that using the randomisation technique allowed me to produce an unusual sound from the Jupiter. I also found that Roland's ACB technology is very effective at producing a truly analogue sound. I also managed to successfully transition track production from chaotic creative processes to a fully edited pieces. However I felt that the final mix of *Carbon Based Lifeform* did not successfully combine the elements of the mix together by using a common reverb on a shared bus. However this may be more an issue of taste than one of comparing to any final mastering benchmark.

The project went a long way to investigating and proving my approach to producing music of this type (especially *Carbon Based Lifeform*) after realising the analogue elements of it that get lost in modern DAW based music production. Especially the ACB technology. As well as highlighting the subtle audio cultural and historical contexts that add up to make a deep sound of a particular genre. This showed how those cultural and historical genre elements are often more important than the technology. This has improved my practice. Future study could include further techniques for approaching synth preset design as well as greater appreciation of the cultural and historical elements that contribute towards the final sound of a piece of music.

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Figure 7 - Roland TR-8S. May 2023. Photograph by the author.

Figure 8 - Stretch Algorithm. June 2023. Screenshot by the author.

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