Yves Usson (aka yusynth) in front of his beloved analogue modular synthesizers (left : home-made yusynth modular; right : synthesizers.com modular).

GS: Yves, can you please tell us a bit about yourself?

Yves Usson: Well, I am 55 years old and I live in Grenoble in the French Alps. Ever since I was a child I have always been attracted by science and technology.

When I was a teenager in the 70s, I was very interested in ham-radio and this got me into learning myself electronics by reading books and electronics magazines and I eventually became head of the club of electronics at my high school. Then I went to university where I lost two boring years at the medical school before I switched to biology. Then I passed all the degrees in cellular and molecular biology and eventually I received a PhD in 1985.

Along all these years my hobby for electronics grew in strength while I tried building my own electronic music circuits and first modular synthesizer (the US1). Then I left France for a couple of years to work as a scientist in New Zealand. After what, I returned to Grenoble with a permanent position in the main scientific research agency in France (C.N.R.S.) working at the university as a fulltime researcher. However, this departure abroad marked a break in my interest in electronics and the start of 25 years of interest in computer programming. This lasted until year 2000 while surfing on the internet, I came across a site dedicated to SDIY (synthesizer do it yourself). I realized with internet a lot of resources (schematics, service manuals) were now available and that the basic electronic components (transistors, OPamps) for these where still available. That was it! My old passion was back, I had to build myself an analogue modular synthesizer.

Arturia MiniBrute – Synthesizer of the year 2012

GS: When did you start making music and what was your first synthesizer?

Yves Usson: When I was a child, I took lessons of music for two years. My wish was to learn playing accordion. Unfortunately the way music was taught in France (at least in these days) was academic and dull and I rapidly got bored and lost my interest.

This has been a complete fail and from this negative experience I always had a complex about not being a musician. This is probably why, synthesizers have attracted me when those appeared. Because they opened a new way of approaching music, that is, from a sonic rather than melodic point of view. Eventually I bought my first monophonic synthesizer with my first summer job wages. It was back in 78 and it was a Yamaha CS10. In those days, for the amount of money I had, the available synthesizers I could afford were the Yamaha CS10 and the Kawai 100F, the Korg MS20 was way to expensive for me. At the same time I started the project to build my own modular synthesizer (the US1, shamelessly standing for a “Usson Synth 1”).

My first DIY modular synthesizer, designed and built in 1980

GS: Do you record and perform your own music?

Yves Usson: Well, when I am back from work I use to play my synthesizers, it is a lot of fun and I appreciate these moments because they are very relaxing and soothing. I play my own music but I would not dare sharing it because I have no musical pretension and as far as I am concerned I do not consider myself as a decent musician. Once in a while, when I think I have produced something that I am not

ashamed of, I share it on my soundcloud account.

GS: Can you tell us about your website and about your SDIY projects?

Yves Usson: As a matter of fact I started to develop a web site dedicated to my hobbies on my university account back in 2000 as most of university staff members used to do with their personal page. But at the turn of 2005 I realized this was not adapted with the amount of data I wanted to make public when I started my yusynth project : building myself a professional like analogue modular synthesizer and sharing all my schematics and designs with the SDIY community. At that point I decided that I should have a site of my own. Therefore I selected a web hosting provider, bought a domain name (yusynth.net) and transferred all my stuff on this new account.

Yves wall of synthesizers!

Therefore, yusynth.net is the site where I share all my SDIY (Synthesizer Do It Yourself). Building synthesizers is a hobby of mine not a way of earning a living (besides I have a good and captivating job) and therefore I am happy to share it for free with all synthesizer enthusiasts around the world. For those willing to build their own analogue modular they will find all the useful data on my site: electronic schematics, printed circuit board drawings, face plate drawings. I am happy to say that a lot of people around the world have built yusynth modules and even very beautiful modular based on my designs. Some of them send me photos of their yusynth modular and sometimes care to send me the CD of their musical creation: that's a great feeling to listen to the songs that those musicians can create with my circuits.

A rare and worthy PPG-100 modular, Yves "it sounds krautrock as hell!"

My web site also let me show my electronic music studio and display some of the nice synthesizers I own: some neo-analogue machines such as Synthesizers.com, Macbeth M5, Club of the Knobs, MOS-LAB and so on, but also very nice pieces of vintage analogue such as a venerable PPG100 Modular, a Minimoog, a Yamaha CS10, a Yamaha CS15, a Roland SH5, a Roland SH7, a Teisco 100f and some other stuff…

Yves Club of the Knobs Modular

GS: Which synthesizers, beside the MiniBrute of course, are your favourite instruments and of which synthesizers does your current setup consist?

Yves Usson: That's some question here. As a matter of fact I love all my synthesizers, they all provide me with interesting and different sound palettes. That's also true that I might be using more some machines than others but this is never definitive. I always return to synthesizers I forgot about for a while and each time it's a real pleasure re-discovering the potential of a keyboard. But if I were to answer precisely your question I would say that in the modular category I have a lot of fun with my Club of the Knobs three cabinets system and for the monophonic keyboard category I am playing a lot with my Teisco 110F (although I am infatuated with my Minimoog D…).

Yves MOS-LAB Modular

GS: When did Arturia decide to make the quite unusual move from Software to Hardware and how did you get involved into Arturia's MiniBrute project?

Yves Usson: It was during spring 2010that Arturia decided to produce a small analogue hardware synthesizer. Frédéric Brun (C.E.O. of Arturia) told me they decided that after NAMM2010 when their contacts in American music stores reported that there was a recurrent request from their customers for a small, low priced and simple to use analogue synthesizer that would fit in a small home studio.

I got involved in this project by Antoine Back another analogue synthesizer lover that I knew from a French-speaking forum (www.anafrog.com) dedicated to analogue synthesizers. At that time he was in charge of the technical hotline of Arturia. When Arturia decided to start the MiniBrute project they realized that they were missing a hardware engineer with experience in analogue electronics that could design a fully featured analogue synthesizer. At this point Antoine said that he knew somebody not far away (in the same city as Arturia) who had a lot of experience in designing analogue modules. Frédéric thought it could be a good idea not to start from scratch but to rely on the competence of an experienced, even though amateur, designer. Eventually, I was invited to join the MiniBrute project by the beginning of June 2010. I am a hobbyist and such a proposal was quite new for me, and *a priori*, I would not have accepted this endeavour without being sure they wanted to produce a high quality and good sounding analogue synthesizer. Eventually, they convinced me and I was also glad that I could add my personal touch to the design choices.

Yves: “some vintage friends!”

GS: Can you please tell us about your responsibility and contribution to the MiniBrute?

Yves Usson: I have been hired by Arturia to design the analogue circuitry of the MiniBrute that is all the sound production path. My contribution was first to choose the features to implement in the MiniBrute with Arturia’s staff and I spent a couple of sessions with Arturia’s staff trying various combination of yusynth modules in order to choose the right modules and define what would be the sonic character of the MiniBrute. For this purpose I built a 12U cabinet that I stuffed with VCOs, VCFs, LFO, EGs… I must say this has been a very interesting and stimulating phase, and it was delightful to catch the sparkle in the eyes of the young Arturia engineers used to VSTs and discovering the sonic power of true analogue hardware.

Once this choice had been validated my responsibility was toprovide the electronic schematics for the analogue circuitry (I actually built a complete prototype with classic through hole components), follow the industrialization process and help to solve technical problems and eventually contribute to the writing the user manual. In particular, I wrote the analogue synthesis tutorial and the description and use of the MiniBrute’s features. It must be noted that the user manual has been first written in English by Antoine Back and myself, edited by Craig Anderton (which was an honour for me, Craig being a famous book writer in the domain of electronic music DIY) then translated to French and Japanese (but not to German, sorry about that).

During all these phases I have been working with enthusiastic and efficient young engineers (François Best, Antoine Back, Bruno Pillet and others) as well as talented sound designers (Jean-Michel Blanchet, Nori Ukibata) who are my friends now.

Test session at Arturia’s with a small cabinet filled of yusynth modules.
This purpose was to try and select the modules to be integrated in the MiniBrute

GS: Why did the team decide for the Steiner-Parker filter?

Yves Usson: The filter that was foreseen in the pre-project was one of the multimode kind. With such an option, 24db/octave is nearly out of competition since there is no simple implementation of multimode filtering with such a filtering slope. Although some people at Arturia’s were strongly pleading for a 24db/octave arguing that “customers would cry for 24db filters”, I proposed to choose a 12 dB/octave

multimode filter but offering a lot of character.

Therefore I packed three VCFs in my test cabinet: a Moog ladder VCF, a State Variable multimode VCF and a Steiner VCF; and we started a long series of tests. About a dozen of persons at Arturia participated to these comparisons. I did include the Steiner VCF in the line up because I have a little crush on it since I built one back in 1979 for my first modular synthesizer. I was convinced it would be a good and original choice for a new monosynth. I like its strong character, it can be sweet and creamy at low input levels and become very aggressive and harsh at high levels. Furthermore it provides multimode filtering that greatly expands the sonic palette.

At Arturia's workshop : Testing and trimming the thru-hole prototype with François Best

The Korg MS20 filter provides the same advantages but we did not want to go for this one because there were already machines on the market with the Korg filter (Korg Monotron and Monotribe). Besides, the idea of using a Moog like filter was simply no fun to me, although I love this filter I did not want to design yet another Moog sounding machine when there are so many products available with this kind of filter. Eventually after various testing, the majority voted for the Steiner VCF because of the sonic possibilities it offers and because it would position the MiniBrute as the first neo-analogue hardware monosynth based on this filter. Also it was in particular very much appreciated by the Arturia's sound designers who liked its versatile sound palette. I must say that it was a real gamble for Arturia to go for such a nonconformist choice. But it seems that the most of the customers are satisfied and appreciate that the MiniBrute offers a "different sound".

Still I had to modify slightly the original design of the filter to make it suitable for a production machine. As a matter of fact, those having a Steiner VCF in their modular rig know it, this filter tends to get instable when reaching high resonance and it can go berserk when it starts oscillating. I changed the feedback circuit such that the filter becomes more controllable and could auto-oscillate while keeping its byte. At a point, we got in touch with Nyle Steiner himself who validated the changes and suggested some improvement to extend the filter range.

GS: Can you elucidate bit more the „Brute factor" function?

Yves Usson: The Brute factor is an implementation of an old trick known by all Minimoog owners. It consists in feeding back the output of the synthesizer into the external input. This creates a feedback loop that integrates all the un-linearity of the VCF and of the VCA. At low feedback level the result is a nice and warm beefing up of the sound. For example, program your classic patch of trumpet on the MiniBrute and set the Brute factor between 11 and 13 o'clock and you'll get a nice and warm vintage sound. At high feedback level this creates chaotic oscillating behaviours.

From the thru-hole prototype of the MiniBrute to the results of the industrialization process: the cumbersome rat nest of the thru-hole prototype has turned into an elegant and compact piece of SMD (surface mount device) electronics.

GS: If you could design a monophonic synthesizer and the street price is nothing you need to care, what would it look like?

Yves Usson: This would be a synthesizer with four synchronizable VCOs (with saw, pulse, sine and metalizer) , three VCFs (one multi-mode 12 db/octave and two classical Moog ladder lowpass filter), two VCAs, four HADSR envelope generators, one three bands tuneable resonant filter, one ring modulator, three VC-LFOs, a noise generator and two random voltage sources. It would also integrate a fully featured digital sequencer. All these could be interconnected through a large very flexible modulation matrix.Also I would care very much for a classy panel and box design with plenty of brass plates and high quality wood.

GS: Congratulations to you and the Arturia team to the „Synthesizer of the year 2012“ and thank you very much for this interview!

Yves Usson: Thanks for the award!

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Find our Arturia MiniBrute review here.