The Minimoog

¡Smoogy, moogy... MOOOOOOG!

By arvo & Adam Khoury

Anyone who has experienced in their own flesh the sensation of touching a synthesizer, slowly pressed the keys, closed their eyes and heard the delicate and gentle vibration that majestically evolves into something grand and disgustingly grotesque, which is able to thrill even those who got more than an A in their A levels...

.. will know what we are talking about.

We'll maybe it's not that dramatic. If you've ever listened to Junco, Triana or the international José Manuel Soto it's enough. The "moog sound" is something unmistakable for all of those who are avid enthusiasts of both the instruments and the music of the electronic genre, and the brand name is to synthesizers what LEGO® is to constructions blocks.

We aren't the only ones to say so. These bricks are the only ones that can 'appease' the beasts. All the frustration that came from not being able to have certain items is now history. We already did so with the Nord Modular and we can promise it worked. For a couple of months we managed to forget "the real one" and its very presence subdues the desire to own that "strange, red and tiny" device.

The years have gone by, and although the model has changed, al the morbid need to enjoy what we do not even deserve (especially pathological in these cases)... is back!

"A creation worthy only of the gods of beauty"

- New Herald Tribune

It is neither the place nor the time to do a historical overview, but the "Minimoog" is considered by many the most widespread model of all times... so much that last year it celebrated its 40th anniversary with a very special and luxurious edition. Despite its fame, it is one of the synthesizers that, from an aesthetic point of view, you either love or loathe. There is no middle ground, although, like in our case, you can loathe it first and love it later.

The last time we saw so much wood was when Ramón broke his bed imitating Hulk Hogan. He did a great impersonation, but in addition to sleeping on the floor for a couple of days (which suited him fine) he got a splinter that prevented any further imitations.

To us, victims of the 8-bit fanfare, anything short of a DX7 or that did not stink of plastic casing aroused suspicion and even rejection, causing a reaction not unlike what you'd expect of a some chimpanzees who find a GameBoy Color (batteries included) in their cage.

As we were saying, time has gone by and our way of building has changed as well as the way we conceive our models. We've understood that one way to prolong the "experience", i.e. to enjoy the building process more and longer, is to look at each stage in the process as if it were a new construction.

... with its own character and putting the same effort into each one of them. Things that didn't get attention before because they were "hidden" are now equally important and require the same effort dedication and skill.

This idea brought the need to make a new MOC "from start to finish, from inside to outside". The keys needed to work, the modulation wheels and pitch benders as well as every other knob and switch ... everything had to be as real as possible, without losing sight of our motto:

"... if it works, fine, if it's a botch job, ok …but for the love of god!!!...Make it look cool…"

<div align="right">- New Herald Tribune</div>

But what about the sound? would it work, where would it come from? what would generate it? to what degree could it be edited or sequenced?

Not know the first thing about electronics has been a real handicap. The model as originally conceived would have required some circuitry to take up as little space as possible while being readily accessible for activation... absolutely impossible, but it has been possible to integrate some very recent "MIDI nano controllers", capable of transmitting messages for activating tones, opening filters o modulations, making this MOC possible. We've used two of these, one to control the keyboard and another for sound edition.

Without going into too much detail in secondary subjects, it would be convenient to briefly explain that MDI messages are transmitted to a computer which hosts software that communicates those instructions to the real source of the sounds as well as the audio recording device.

Just like in the case of the Kaneda motorbike, the appearance of certain indispensable parts have made this MOC possible, something which is pretty frustrating if you are usually rather short on patience.

In any case, in this way the imitation reaches an even higher level... it's not just about evoking an image, we want to get to the very essence, corrupt its soul and finish off the myth.
... it's time to go for it!!!

Menu of the day: Deconstruction of a MOOG with a LEGO® caramel.

The size of the aforementioned controllers made us realize from the beginning the difficulty of recreating the proportions of the model we wanted to reproduce. It's true that after having demonstrated countless times that the subject of proportions is one we still need to learn a lot about, and since we were conscious that the bigger our determination to respect them the more things tend to get out of hand, we stopped worrying about that little detail and basically concentrated on the mechanisms that would activate the devices.

The first of those is the most visible: the keyboard.

It was the first thing we built, even before the casing! That's how we do things, spend hours upon hours on parts we are not even sure will work or fit... virtually without reference, roughly calculating and fortunately no mayor modifications were necessary this whole part in the general structure of the MOC.

A 32-stud long axle saved us a lot of headaches, allowing us to string together 24 of the 27 keys in one go.

Thanks to the incorporation of brackets it has been possible to adjust the width of the key to what was strictly necessary. The 2x1x2 panels on the sides provide a finish that is very similar to certain keyboard from the 60s and 70s.

Each one of them has its own (soft) suspension and we ended up using three of these axles in parallel, one for each type of key (black and white) and a third to keep the other end of the shock absorber in place. After assembling the system and placing it over the corresponding controller, the separation between keys was adjusted and their height (no two shock absorbers are the same).

The result is a kind of black and white serpent, easy to manipulate, but not very practical if you want to modify anything. In case any change is necessary, a lot of plastic needs to be 'undone' before you get to the part you need to substitute.
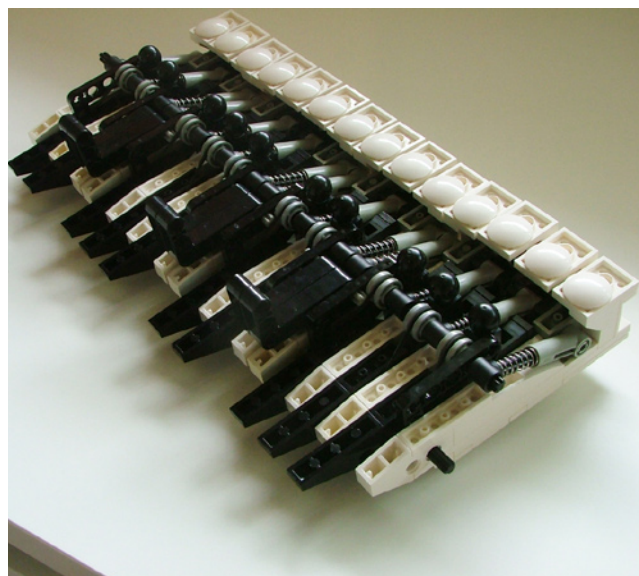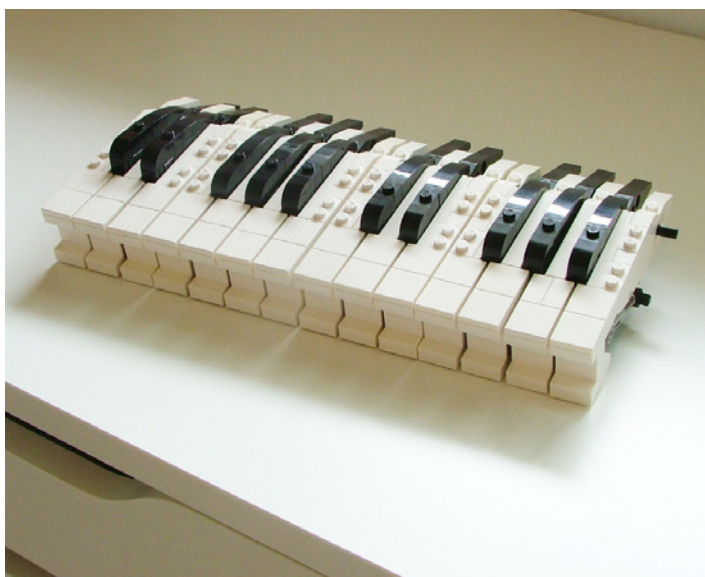
The great length of the axles allows for continuity in the system. The absence of "weak" points or discontinuities in most of the development of the MOC guarantees great reliability in its operation.

Due to the length of the axle, the keyboard is more flexible than it ought to be. To avoid undesired effects it has been fixed in three locations to fix it in its position and reduce deformation.

The three remaining keys were included later using a completely different approach, based on the use of hinge plates.

It was absolutely necessary to reduce the volume of this part as much as possible. Although we like big and stocky MOCs, we were forced to limit the final height of the keyboard so the keys would be at a 'reasonable' height for the overall dimensions of the MOC. Fortunately the controller is less than 2cm thick, which gave us some leeway in the design of the mechanism.

With this part finished it was time to start working on the section that controls modulation and pitch, as well as change of octave, the tone control. Despite the fact that this part includes very few pieces, there was an added difficulty. All parameters are activated by means of press switches, but the normal thing would be to have turning knobs. On the other hand, each turning knob has a different feel, or rather a different response: the modulation wheel stays in the position you leave it, whereas the pitch wheel returns to centre when you let go of it (another spring to be used).

So it was necessary to create a new set of mechanisms that would translate turning into button press.
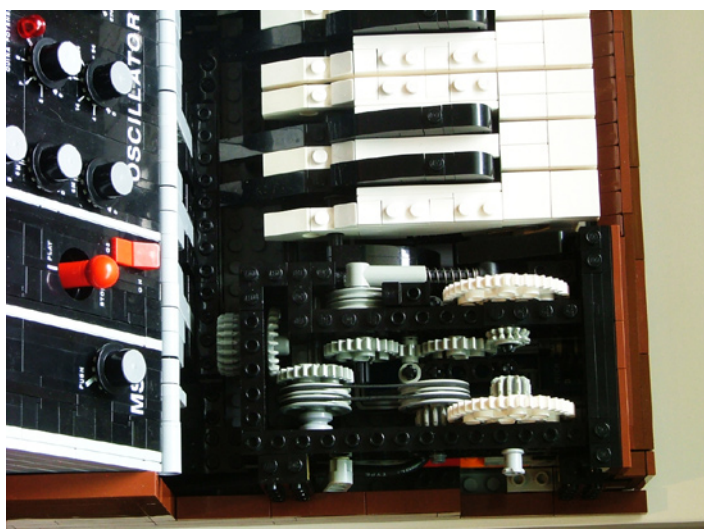
The Technic elements appear to fight for a breath of air, but finally we managed to make them fit. Each time we look at this part we can't help thinking there are really infinite possible combinations, and many of them would be infinitely better, but if we're not able to consider something sufficiently good, we would be sorely tempted to never try to finish the model out of sheer weariness.

Space constrictions were tough with the keyboard, but in this case they turned into a real nightmare. In less than the size of a packet of cigarettes we needed to fit gears, shock absorbers, liftarms and pulleys. All of this need to be reasonable calibrated to obtain the characteristic feel.

The feel of the keyboard and the tone control section is not perfect by a long shot, but a lot better than what we expected from a system built with tiny pieces. It won't serve to play Rachmaninov, but for the Rambo soundtrack... it's a blast.

We are happy about the result and the solidity of the MOC is good enough for it to put up with anything.

It wasn't excessively difficult to give it a finishing that would evoke the Minimoog; after all it's a simple model that is characterised by it basically being a wooden box! SO a little SNOT and some brown was all we needed. We tried to avoid showing studs whenever possible, because although we stopped worrying about that a long time ago, it simply doesn't suit this model very well.

The model is completed with a control panel. The soul of the device, responsible for modifying the sound in real time. In this last stage of the process we found new difficulties. Although space was no longer as much of an issue as it had been before, the configuration of the panel, the choice of parts for the knobs, their distributions, and especially their labelling were true challenges.

This stage of the process started with the construction of the receptacle for the controller, a kind of sarcophagus of Tutan Com'on!! which was built carefully choosing the closing elements to obtain a recess that, without being too heavy, would be as sturdy as possible. In addition, this "box" needed to tilt (on demand, coming out of its flat position, like in the real one) so we included a mega-hinge along its entire length.

On each of the corners different combinations of brackets have been used to ensure a "solid" closure. Inconvenience: any modification requiring the box to be opened would have been more than complicated once the box was closed - in order to open it a very rigorous order must be followed... pretty tedious. Once completed, the weight of the panel is significant. The hinge that was built links parts that need to be strongly united inside the receptacle and in the technical structure that serves as base for the keyboard.

The second controller, the one that corresponds to the control panel, presents a special configuration, mixing faders, knobs and switches. All in all it doesn't have even half the ones on a Minimoog, so it was necessary to choose a configuration that, using all the features of the controller, would reproduce a reasonable similarity with the panel of the real model.

Before choosing the pieces that will serve as knobs but with the distribution decided upon, it is time to build the mechanisms that activate the controller. Fortunately the dimensions of the device are almost to LEGO® size and it was not very difficult to adapt the necessary the gears, wheels, worm gears and liftarms.

We gave ourselves some latitude (quite a bold step considering "who" we are) with the introduction of a small joystick on the left of the panel, in order to make full use of the controller.

The panel is divided into two sections, each of which is in charge of very specific parameters for generating and modifying sound. The real model has many more elements in its panel, but the distribution is very similar to what was obtained, so the overall look is quite similar to that of the original.

It includes buttons for sequencing sound, and although these do not take part in the generation or modification of the sound, we did not want to leave them out. To this end, and in order to "differentiate" this function from the others, we decided to use this kind of interface, which is well known to players of Gauntlet, Army Mover, Army Moves II and Goody!
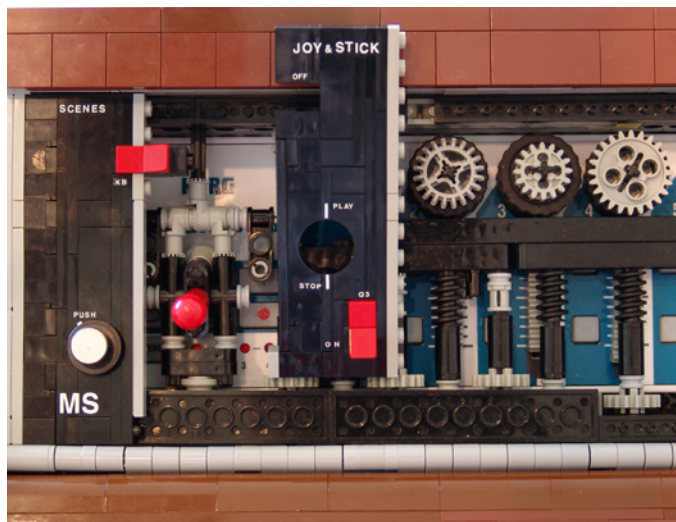
Some elements were resolved almost immediately and directly, others, like the faders, required a system that would transmit the turning of the pot meter to the sliding of the fader on the controller in very little space. Fortunately the worm gears do just that... and much more.

It certainly is rather crazy to slap a joystick on a Minimoog. To make up for the impudence we made it look so fitting to the rest of the elements that we have started to believe it was a mistake not to have one of these on the original Minimoog; it's so beautiful and at the same time so perfect... we love the pureness of it.

As builders who basically look for the aesthetics for its own sake, we were quite worried about finding the right piece to reproduce the pot meters of the real Minimoog. Those knobs are probably the probably the "strangest" ones ever seen on a synthesizer. They are placed on a musical instrument but might as well have been on an oven, an oscilloscope or a grannies coat; their size appears to be designed to control them with your armpits and the metallic finishing clearly indicate they were meant for a fan of trinkets... even so, they are characteristic of the device and without them it would completely lose its identity

Is there any piece that combines all those fatal characteristics? ... all of them!!!, but there is a minifig hat that without being the perfect fit has a very good size, the only drawback, the metallic finishing.

Achieving that final touch became an odyssey that might well deserve an article in "House and Garden".   We tried lots of things and when we thought we had found the final solution we had to start over from scratch. We even tried painting it, and we became so good at it the damned things looked like they were made that way. The texture, glitter and finishing were perfect, no specks, no bubbles, no.... nothing!!

We painted a full set of 22 hats, placed them on the controller to see the effect and fantasied for hours with the result. We put Chronology on full blast and for an instant we could hear the ecstatic audience, almost a trance, they were chanting our names in splendiferous 44.1 KHz stereo. The performance ended, the lights went out and silence flooded our room of less than 10 m2, 9 usable...

...pain...we only felt pain.

No-one warned us, who might have suspected, the pre-technology classes were behind us and upon seeing our mandrill-like hand full (absolutely full) of the damn silver paint... we looked like visitors from the future, but what was most pathetic of all was noticing the metallic smudges in the corners of the eyes on each other's faces... pretending to be Jarre would excite anyone.

So, after a 48-hour wait the pint was completely dry, but any prolonged friction (even if not strong) spoiled the finish we had felt so proud about. It was like inventing a water powered engine, only to discover that after 10 minutes of use... the engine...drowns, of course! it drowns!! HAHAHAha..hahaha.. aaa...

...ehrm..it was painful.

We even built a small "lathe" to paint more quickly and easily. We extracted the paint from markers and applied it with a sponge paintbrush. The process was so ridiculously fast we painted all 22 hats in about 15 minutes.

In the end we decided to use silver coloured stickers - the result is not as spectacular, but perfectly stable. The stickers are printed on vinyl and were produced by a printer who specializes in publicity, not for any special reason, but because we simply could not find anything on the market with a 9mm diameter.

After placing the hats in their respective places the brick building process was finished. The last hurdle was to finish the "printing" of the model. To our disappointment, the "bare" MOC was blander than we had originally imagined, but far from feeling discouraged, we then realized that any "addition" could only make it more beautiful or at least more interesting to look at.

The panel of a synthesizer is, normally, full of printed markers; especially in the analogue models in which each parameter has its own control element. In this respect we had to be extremely careful in choosing a solution which, while being as eye-catching as possible, would respect the pieces to the highest degree.

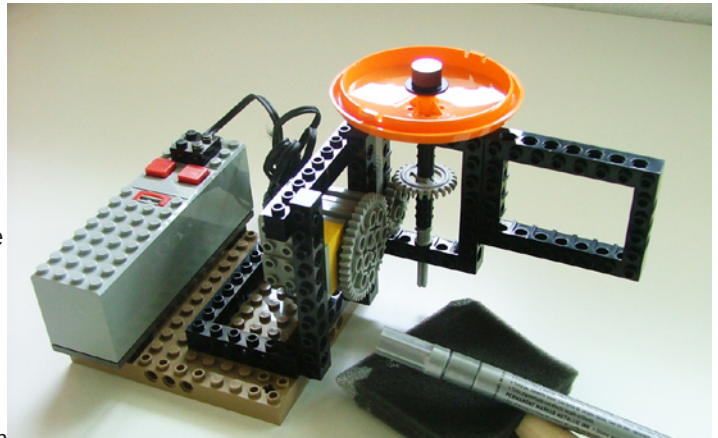We studied the following options:

- **Engraving**: just like the pieces that are used as event souvenirs, etc. Evidently this is the most "professional" solution, and, although it has the disadvantage that the pieces cannot be reused, the real disadvantage is finding someone who can do the job. You can't begin to imagine the times we have had to leave specialised companies with burning cheeks; engraving a name on a piece is one thing, but a whole panel with lines, numbers, letters indifferent sizes and orientations is another thing.


If we compare the "painted" hats to the one with stickers, there is no comparison in the "shine", but if you fiddle with the painted ones for a couple of minutes you will soon come to the conclusion that the ones with the stickers are "nicer"

... more than one company owner would have liked to pull a sawn-off shotgun from under the counter to get us out of their property.

- **Silk-screen printing**: like the torsos o customized minifigs. This is an intermediate solution between engraving and using stickers. Again it is not easy to find someone who can do it. We found one person, but the price was more than excessive.

- **Decals**: of the same type used in scale models (we would like to thank pulipuli for his help in this matter, a completely new area of expertise for us, and in which we have found great possibilities and finishing options).

Unfortunately there was an inconvenience that completely ruined our expectations for this kind of solution. We wanted to print white on a black background and the decals that best fitted our "needs" (transparent ones) did not offer good results in those conditions.

- **Transfer paper**: paper with "transferable" letters and numbers. These provide a finishing that is very similar to decals (even better for our needs in this case) and without needing a printer, solvents, knives and paint brushes: just scratch the paper. It is a big advantage that the symbols we needed were only alphanumerical. We just needed to find the right pages with an acceptable font, in a reasonable size, and above all....white!

We had never seen anything like it, but ...what about the internet?

- **Stickers**: of the same type you get with SuperPop, the largest collection of which (in Spain) is owned by a certain "manti" (verified by notary). It was our last option and we'd anything before recurring to it. Their "thickness" makes them an uncomfortable addition, there would be too many of them, to the point where they would cover up the pieces which, after all, should be stars of the MOC
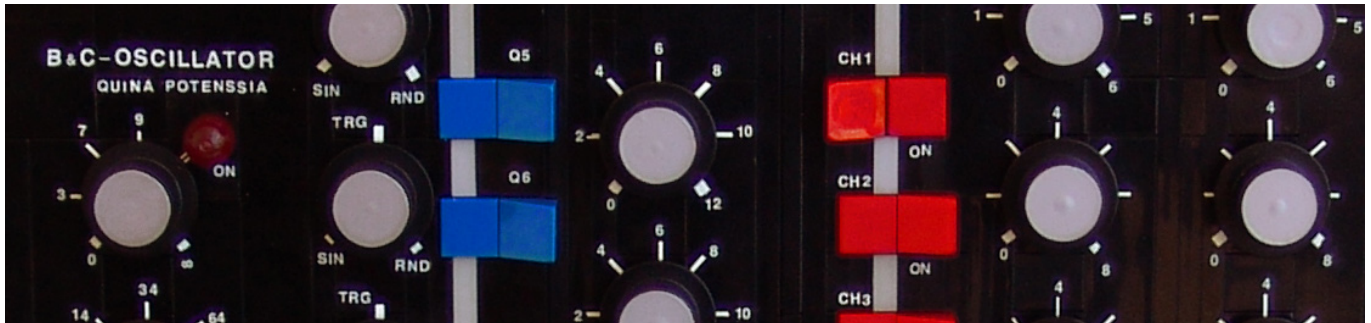
After searching and searching, we finally found some transfer paper that suite our needs pretty well. After considering all options, it was the only option for decorating and finishing the MOC, obtaining a result that was on par with the dedication a project of this scale requires, in which we used many more elements than we are used to.

We really like the final result. We've given continuity to a subject that fascinates us and that we had almost left aside since the NordModular. It has taken us a very long time, the constant interruptions have even made us forget when we started it, but what we do remember is that we wanted a Moog, or at least something that looked like a Moog ... although if we could have both, so much the better ;) ;).
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