

# Menno Gorter

*This month we'd like to introduce you to Menno Gorter, a 45 year-old Dutchman who is known by the alias The Walker Dutchman. I suppose you can guess why.*

*By Hispabrick Magazine*

*Pictures by Menno Gorter and dutchbuttonworks.com*



Menno is a photographer and runs a shop where he specializes in large very high quality pictures, which explains the fabulous photography for the front page, although you might not expect that when you have a look at his BS gallery [1], but more about that later on.

**HM:** To start off, maybe you could tell us how you got started with LEGO®

**Menno:** There was LEGO in our house even before I can remember. My mother was a kindergarten teacher and fortunately she soon realized the great educational value of LEGO. It teaches you to think systematically, spatially and problem-solving; I can sincerely recommend it to all of you! ;-) Only then I had to share everything with my two sisters and brother. Later on we got electric motors and rails – that must have been my father's input; he was a civil engineer. By the time I was twelve I already earned some money and I was the only one in the family who spent his own money on LEGO, and eventually all of it ended up being mine as I was the only one who continued using it. I've never really had a dark-age; the way I used LEGO was not usually considered childish and that kept motivating me. I did have a period when I felt I was the only one to still "play" with LEGO (I keep calling it playing, because playing with LEGO is fun... [2] :-)). That lonely period lasted quite long, until about halfway the 90s when I got in touch with De Bouwsteen, a then still small LUG. Ironically the first thing I was asked by this LUG was whether I was a builder or collector. When I explained what I did with my LEGO the reply I got was that I was neither of those. :-) There were no members then who used Technic the way I did.

**HM:** So when did you start with LEGO Technic? Your oldest walker on BS is from 1979!

**Menno:** I built my first reasonably working LEGO walker in December 1972, only I didn't make pictures of my creations back then. I did already have LEGO motors, but in 1972 I got one of those sets with gears, universal joints and tread links and that opened up a whole new world of possibilities for me! In short, it was a construction that had something like the push rods of a steam engine and as a result it did not so much roll as walk with a walking frame. Before that I had tried something similar with the white turntables on the red rims that were available then, but the result was not what I wanted. Later on

I have even created six-legged walkers with really old LEGO. There were so many more possibilities after the introduction of LEGO Technic! That's the kind of walker you can see in the 1979 picture in my BS folder.

**HM:** Do you still build with other LEGO themes as well, or do you only use Technic/MINDSTORMS?

**Menno:** I still have quite a large amount of 1960s LEGO which I use on occasion as background for my pictures or as test course for my Trial vehicles. Also, I want my models to be more than just Technic beams so I have continued buying some 'normal' LEGO sets over the years, in order to add something extra to my models. As far as I'm concerned, Technic and MINDSTORMS are practically the same. The two supplement each other so well that in order to simplify I'd say I'm a Technic builder who uses MINDSTORMS. In my opinion LEGO® is

meant to be used all together, mixing elements from different lines and themes. That's why it frustrates me so much that some new systems are so hard to combine like NXT and PF; the old 9V was a much better standard. I know perfectly well why 9V was abandoned; only I would have loved to see it being replaced by a single system.

**HM:** Personally I am especially interested in your walkers and what moved you to start building them.

**Menno:** Building walkers is probably a matter "why make it simple when it can be complicated" :-). I don't mean to sound arrogant, but in general terms it is easier to build something on wheels than something that walks and a good hobby shouldn't be a five minute job. Also, I'd rather do things not everybody is doing already – in a way it's the urge to be different. I'm not easily satisfied with my models either. They need to be able to function over extended periods of time and they need to be able to carry their own energy source. If I find something that doesn't work well during an endurance test or an event like LEGOWORLD I'll always try to improve it.

**HM:** Can you describe the evolution of your walkers?

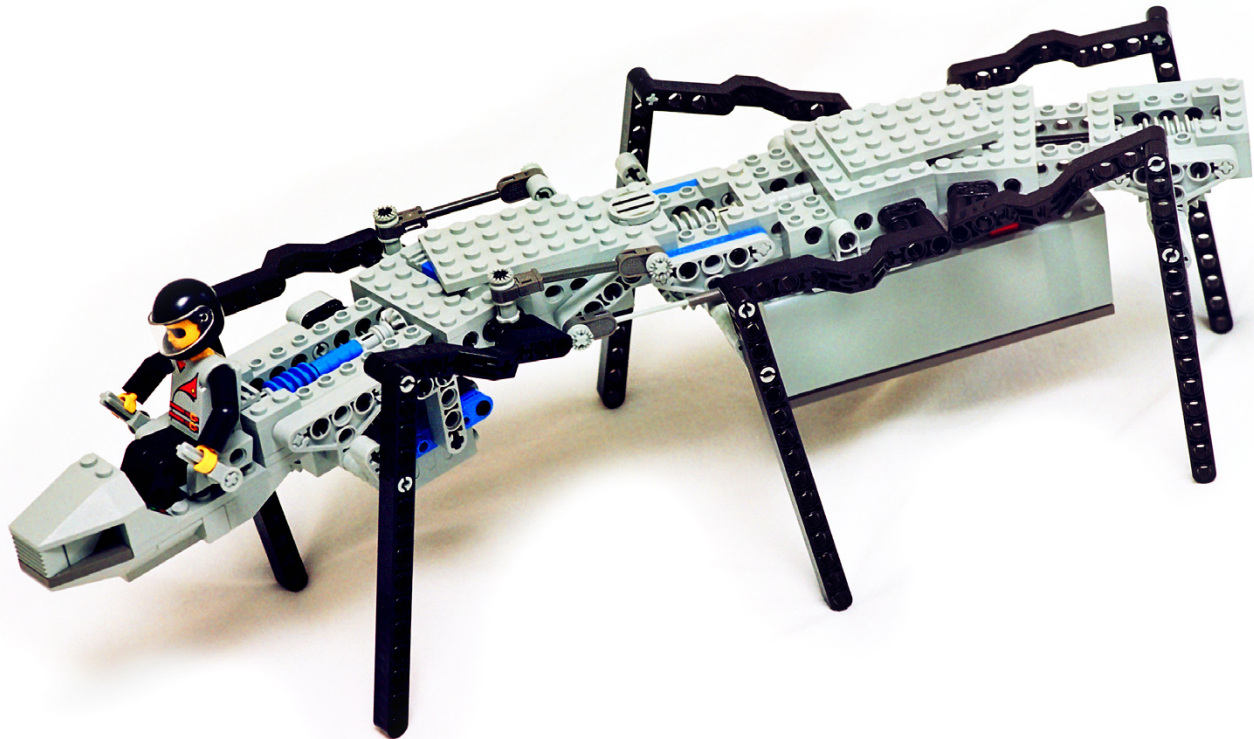
**Menno:** The evolution of my walkers is largely determined by the evolution of LEGO®. My main motivation in building walkers is to make them as efficient and reliable as possible. I was quite young when I started building walkers and didn't know much about physics, but I've learned a lot by observation. Simple walkers are mostly based on a crankshaft principle, which means they need to lift a lot of weight with each step. Ideally the body should stay parallel with the ground. At first I tried to get as much of the available energy as possible into the horizontal movement. My first six-legged walker had legs that made an elliptic movement. In this way forward movement was prioritized with respect to vertical movement. I also wanted to make my walkers bigger, only that wasn't so easy with the 4.5V motors available then;

bigger meant more reductions which meant slower and slower movement and finally breaking gears and axles. With the arrival of 9V and Pneumatics larger walkers were possible to make and it was so much easier to keep the body of the walker parallel to the ground. In 2001, on the first LEGOWORLD event, I showed a large six-legged pneumatic walker with on board compressors that could steer.

I got very positive reactions and that really motivated me. In 2002 I also started to include MINDSTORMS in my walkers. Also, I didn't need to disassemble everything anymore to be able to build something new. In 2005 it got to the point where I showed no less than 24 models at LEGOWORLD in a huge stand just for me. Many of those walkers could be played with by the children that came to the event. You can imagine that drew a lot of attention, but if you've ever been to LEGOWORLD you'll understand it took me at least a month to recover from the event. In 2006 I had access to the NXT through the MDP project. The big motors and rigid cables required some thinking. As it turned out, the trick was not to try to build those big elements into something, but to use them as the starting point and build onto them. The NXT-Crab and the NeXTosaurus are good first examples of that. Then in 2007 PF came out and I spent some years building purely mechanical intelligent walkers. Currently I build models that include a lot of everything together. I used the Scout with PF motors in the Scout-Spider and assembled NXT+PF in the NXT/PF-Aragna and the NXT/PF-Omnispider. The NXT/PF-Aragna is so big I have space to combine anything I like, especially since in such a big model weight is no longer so much of an issue as it is in smaller walkers. In my Current WIP, the NXT-Tripod[5], I have used a number of RCX sensors; 2 touch sensors and 3 rotation sensors. The nice thing about these sensors is that since they connect with the old 9V plugs it is easy to stack them, so I could connect 5 sensors to 3 sensor ports on the NXT. If you add the US sensor and the encoders, the NXT-Tripod uses a total of 9 sensors!







**HM:** It's interesting that you build purely mechanical walkers that can still avoid obstacles. How does that work?

**Menno:** It gets even more interesting if I tell you that I limit myself with a special rule: I only use one motor, and a maximum of two 'special' Technic elements (differential, turntable, switch, etc.).

I had been toying with the idea of building a small ant that could avoid obstacles mechanically. That was not particularly easy. The idea behind this was to do something like the 8472 Street 'n Mud Racer, which reverses when it bumps into something, only a walker has virtually no kinetic energy which makes mechanical switching quite difficult. Also, there was no space for a bumper on the rear body, which, in any case, wouldn't have looked good. The solution was an extra mechanism which makes the ant go forwards again after taking a few steps back. All of that is in the front of the ant. I named the model Geared-Ant and coined the term 'anti-mindstorms' to indicate it worked without any electronics. The second model works on an even simpler principle although that doesn't mean it's easier to explain. The PF-Raptor is derived from the NXTosaurus. While observing the model I realised this biped could avoid obstacles even when the sensors didn't work. I managed to amplify this effect. Basically it works like this: the walking movement of the biped makes the long nose section swing and when the nose bumps into something the biped takes a different direction at its next step. There are a few films on my YouTube channel where you can see this happening.

A third model has an automatic gear box that changes the direction when the walker gets stuck. It works, but I'm still not 100% satisfied with it, so for now it's in my prototype box. I'm never short of ideas and sometimes you need to let something rest to continue with something else.

**HM:** LEGO® Technic has changed a lot over the years. To what extent do those changes affect the way you build your models?

**Menno:** If you were to step straight from the time of the 850 into present day Technic you'd probably not know where to start :-). It's simply a challenge to make the most of what you have. During my time in MPD[4] (the NXT beta test program) some complained about the rough shapes of NXT motors and sensors. I looked at it differently. Instead of building that big motor into something you need to use it as a starting point and attach things to those motors. It's hard to find more sturdy elements! New elements mean new possibilities.

**HM:** How do you classify your walkers? By the number of legs, COG shifters, overlapping footprint etc...?

**Menno:** That's a tough question: the result could result in a very complex 5 or 6 dimensional model :-). One method could indeed be by number of legs, but there is also size, studless or not, Pneumatic, electronic (or not), and things like adder-subtractors, skid-steering, omni-directional, articulated steering, etc. (In my attic they are usually neatly arranged in plastic folding crates – that's a lot easier :-)). I'd rather keep it simple. Models are built with colours according to the type of elements that have been used: PF gets orange, 9V red, NXT orange and/or very light grey, RCX yellow, Buggy-RC black, Manas-RC orange and Pneumatic models mainly yellow. During a show I usually arrange them by colours :-).

**HM:** This is the second time you mention events. You have been to every LEGOWORLD Holland event in the last decade – How important is the AFOL community and participating in events for you? Has your view on events changed over the years?



**Menno:** Before the Internet, events were the only way to meet other LEGO® fans and to exchange ideas. Now it still is the best way to interact with the public. With everything I build I always keep in mind that I need to be able to show the model non-stop during a full week without any defects. Especially LEGOWORLD is an important endurance test while at the same time I can show my models really work, whereas I could fake things in a video. The last time I showed my models in Skærbæk the owner of LEGO[3] asked me why I wasn't afraid to let my models walk between the public. I told him it is the best and most enjoyable way to see how the public reacts to my creations. MINDSTORMS models also react to the public themselves of course and it isn't uncommon for children to lie flat on the floor to see how my 'animals' behave. Also, my models are quite sturdy and if anything should go wrong the models are usually quite easy to repair in a click or two. In response he lifted my Scout Spider up by one of its legs, shook it and remarked it was a good design. It is clear he looks at models in a different way than the general public; I like that.

In addition I have often spent time with people who later on have worked in Billund; it is quite special to see that kind of

development, especially when you have shared a stand on a convention for days and discussed many things, in addition to LEGO.

**HM:** In addition to walkers you also build other mechanisms, although you are less well known for those. Why do you prefer building walkers to vehicles or don't you?

**Menno:** I enjoy all types of constructions as long as they are highly challenging. It's not that at a certain point I decided to only build walkers, but it was especially the walkers that attracted people's attention and that stimulated me to focus mainly on those. In the past (and to a more limited extent that is still the case) I have built many different things; maybe the best description would be 'vehicles you don't see every day'. Wheels are, however, a ready made product: you click them on to something and it's good to go, and so the challenge to me is less. When the 8880 came out I bought two and for some time I built extremely powered vehicles. From 2000 on, especially inspired by trucktrial which could often be seen on Eurosport, and cranes with many big wheels and crab steering, I built several 8x8x8 vehicles with fully functional power steering (not



electrical steering, but electrically aided steering) and crab steering. Those vehicles could easily take an obstacle like the 8880 box! Maybe not as fast as is possible today with PF motors, but that slow speed certainly gave models something majestic and they were virtually unstoppable. Later, in 2005, a couple of Dutchmen came up with rules for LEGO®-Trucktrial (so that is not exactly a Polish invention). At meetings not even a dozen trucktrials could stop my 8x8x8: when I build something I go all the way. Other vehicles I have built include Killough platforms, vehicles with the big hailfire droid wheels, a lightweight mars-rover driven by micro-motors and the NXT-Grub: a vehicle with a single track that can steer because the track is flexible.

**HM:** Some people say it is a pity there are no better pictures of those creations and it is virtually impossible to see any construction details. Why is that?

**Menno:** I don't like to show technical details. You need to be able to see something works, but not exactly how – people will spend more time watching models that way. Additionally, I believe that if you want to learn something you shouldn't simply copy or follow building instructions. I am absolutely against the current 'cut and paste' culture. And to make things worse there are even people who claim those copied constructions as their own. Another reason is that I spend most of my day working with photographs. Since 1996, photography is an important part of my job, so at home I'd rather build than take pictures.

Anyway, when I did take more detailed pictures people were always asking for video footage and I suppose now they'd want building instructions... I do make videos now so people who cannot come to any of the events I go to can see my creations in action.

[1] <http://www.brickshelf.com/cgi-bin/gallery.cgi?m=Menno-Gorter>

[2] slogan used by LEGO to advertise their product in Holland

[3] Kjeld Kirk Kristiansen

[4] for more details on MPD read "MCP – the origins" in HBM 009

[5] you can see the NXT-tripod on the front page!

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