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Issue 7, Volume 2 • Sept./October

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Brick Journal
Issue 7, Volume 2 • Sept./Oct. 2008
people • building • community

Contents

Right: Adam Reed Tucker's skyscrapers on display at the Chicago Museum of Science and Industry. Photo by Joe Meno.

BrickJournal
people • building • community

September/October 2009
Volume 2, Issue 7

About the Cover:
Fallingwater is the newest model from LEGO Architecture. Art provided by the LEGO Group, used with permission.

From the Editor:

It's been busy.

During this issue, I went to Brickworld and the San Diego Comic-Con on the behalf of the magazine. On the behalf of the LEGO Users Group I am in, I also helped out with not one, but two store openings! As a result, the group and I built sets and display models for the stores, which meant that the club built about 40 models over a month! And somewhere in there, the group did an event in a local bookstore, hosting a building contest and display.

It's been really busy and in spite of this, another issue of *BrickJournal* rolled out. This time the focus is on LEGO Architecture, with an article about Adam Reed Tucker's growing collection of landmark sets. With the architectural slant of this issue, we got a look at builder Spencer Rezkalla and also a model from Christopher Deck that is both Star Wars and architecture! There's also some more exclusive LEGO articles in this issue, as well as a look at how to get into FIRST LEGO League. And of course, much more!

So sit back and have a look....

Joe Meno
Editor, *BrickJournal*

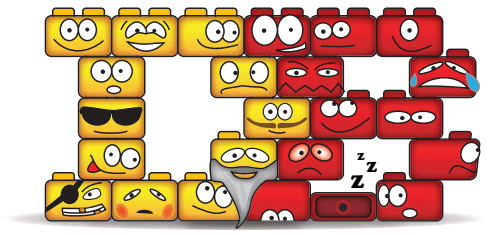
P.S. Have ideas or comments? Drop me a line at admin@brickjournal.com. Or go to www.lugnet.com and leave a comment on their forums! I'm open to suggestions and comments and will do my best to reply.

P.P.S.. Yes, *BrickJournal* has a website — www.brickjournal.com! You can check out the news there or look at the event calendar and see what is happening near you! There's photos of upcoming sets there now!

Glossary

AFOL (Adult Fan of LEGO)
NLSO (Non-LEGO Significant Other)
MOC (My Own Creation)
TLG (The LEGO Group)
BURP (Big Ugly Rock Piece)
LURP (Little Ugly Rock Piece)
POOP (Pieces—that can be or should be made—Of Other Pieces)
SNOT (Studs Not on Top)
LUG (LEGO Users Group)
LTC (LEGO Train Club)

BrickJournal *and its staff would like to thank the LDraw community for the software it makes available to the community, which we use for making all of the instructions and renderings in this magazine. We would especially like to thank Kevin Clague for his continued upgrades of the LPub tool that is a part of the LDraw suite. For more information, please visit http://www.ldraw.org.*



DoubleBrick Fest
Russia's First AFOL Event

Article by Alexander Horoshilov
Photography Courtesy of DoubleBrick

Our first AFOL event, DoubleBrick Fest, took place on the last two days of spring 2009. This was our first experience with a public event, as the AFOL community was founded in Russia just a few years ago. While it was small and modest in comparison with other annual worldwide known events and exhibitions, we're very proud that we made this first step with fan events.

While we were planning, we had discussions on whether the event should be closed for invited LEGO fans invited only, or whether general public would be allowed to go to the event as well. We selected the second choice. Our local community is still pretty small, so some of our major goals were to popularize our hobby and grow as much as possible for next year's event. For this reason, we decided to promote our event as a family-oriented event with free admission (participation was free also).

Our exhibition occupied about 200 sq. meters (2100 sq. feet) in total. The display area included two community-built layouts: City and Western. Members of the community built modules according to fixed standards and connected them one to another. The Western layout was a huge surprise for us. We didn't expect the response , as it was suggested only about 2 months before the event and became very popular in that short time.

Also, we had several large-scale projects. Our local LEGO division, LEGO Russia, provided us with large amount of 2x4 bricks for the duration of the event. Two members of our community used them to build a large landscape. It became the largest MOC built and shown in Moscow (it used about 120,000 of 2x4 bricks and was 300 kg in weight).

Since it was our first experience with fan events, we learned a lot of lessons. Even with a number of various issues, we thought it was very successful. We had about 50 participants and for the two full days, there were about 800 visitors. It's why right after the end of the event, we quickly decided to make it annual. We are going to make our next event better and to develop it and expand every year. With Moscow alone having a population of more than 10 million and about 150 million in Russia, we can definitely attract much more people.

Many thanks for the following for supporting our event: LEGO Russia, LEGO Community Development, "Premium Networks" company (who runs several LEGO stores in Russia) and the online shop "LegoSalon".

TOMARLEGO: Portugal's LEGO Event!

Article by Pedro Silva
Photography by Luis Baixinho and Ricardo Silva

The second TOMARLEGO took place in June 10-14, 2009, as a joint venture of Comunidade0937 and the Tomar Municipality. It was the largest event of its kind in Portugal thus far, with an average daily attendance of 5500.

This year, the event's star theme was Castle, which had a 9x2m (30x7ft) cooperative display by a total of 10 builders. The Castle display included features such as a battlefield with undead vs. humans, a large palace, a walled town, a farming landscape, a mine and a forest with plenty of action under the green cover. The Castle project took a full year of development, and was specially built for this event; the creators have decided it is not enough, though, so it will suffer a major expansion in next year's event.

One thing tried this year was the integration of nature in the displays. The Pirate layout was unusual in this regard - 3 large glass tanks were built to hold the scenery together. By not using blue baseplates, the underwater dimension could be exploited - and so a number of shipwrecks and marine animals were portrayed in their natural environment. Above water, the display featured three main scenes: a Pirate village, a fortress under attack, and a settlement/commercial outpost.

Technic too had a natural scenario - this time it was the setting for the Truck Trial competitions. Some of the guys have been working under strict rules to devise Trucks that can perform well in trial trails. Obstacles included logs, gravel, and the not-so-natural metal cans. The visitors watched carefully, as the slow-moving machines negotiated the circuit flawlessly.

There were a couple of other Technic projects on display. College students demonstrated their ideas of using both a wiimote (Wii controller) and a cellphone to control a NXT robot. The odd visitor was even able to test these features, which proved the versatility of LEGO's Mindstorms products - a number of them hadn't known LEGO was into robots!

There were a few Great Ball Contraption modules on display. This project has been slowly gathering enthusiasts, and the goal is now to increase the number of original modules in use.

The Technic Truck Trial run.

This year there was a change in the city organization - an layout was made by integrating both a 1980s city and a "present" city, using the 9V (9 volt) train both to separate and connect. The older city was comprised of classic sets of the 1980-1990 period; it's compact size was in stark contrast to the sturdier buildings of downtown modern Metropolis. A previous linear arrangement was rejected, resorting to a "sector" approach. There were a number of massive buildings - my favorite being the Train Station, aptly identified as "Tomar"; the public could not help notice the VIPs preparing for a premiere in the large theatre. The harbor area ended up being small for the huge oil tanker. The circus became one of my favorite "non-building" parts, since it contained many simple (yet clever) amusement rides. The city provided us with a good testing ground - some ideas worked better than others, and some accidents ended up becoming good ideas.


One side of the town layout.

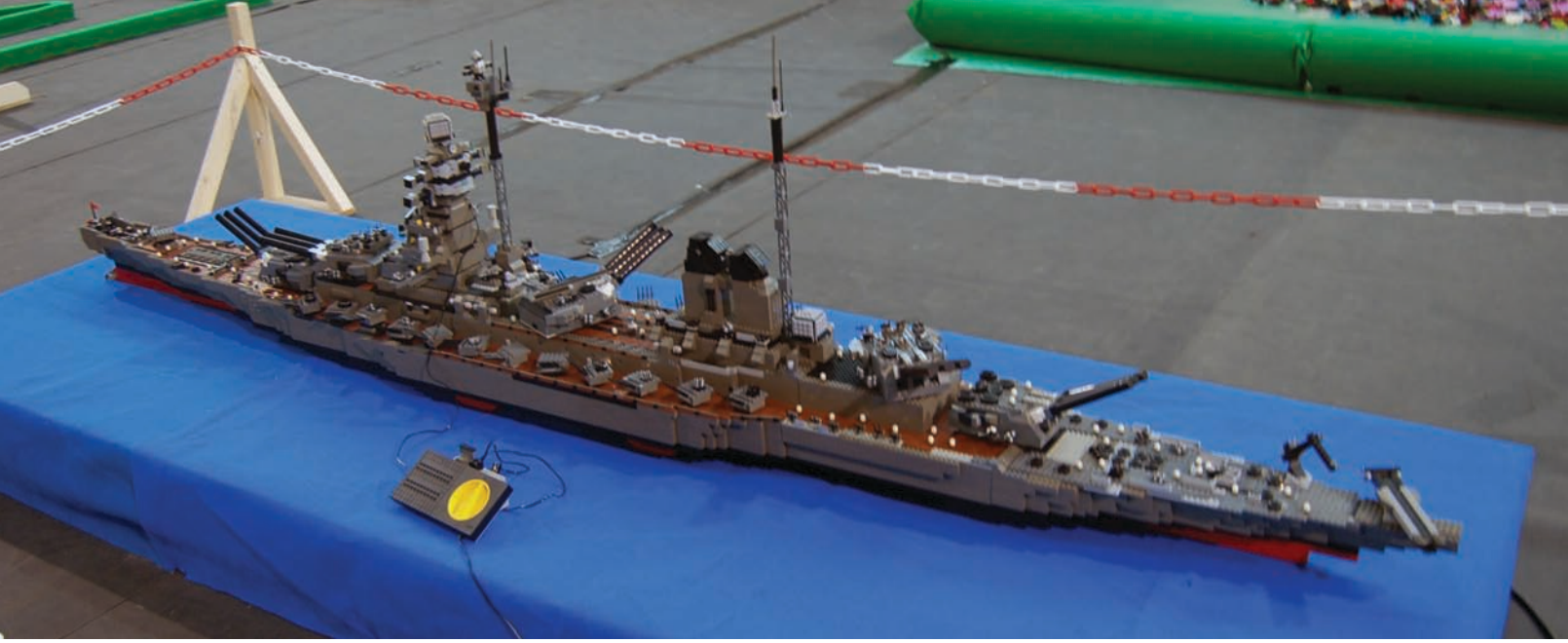
There was also a 1960s city, vintage style, with the old 1:87 vehicles. Due to its symbolic value, we thought glass protection was in order - the visitors understood that this city was of a different nature, and their curiosity started many a good conversation. A number of AFOLs could recognize their childhood toy in there, and after a while admitted to still being LEGO consumers. If anything, this has shown them they're not alone!

Another view of the town layout.

There was a western town on display. This was the smallest in area, but also the richest in gags and "hidden" detail. Rupi (well known for his vigs) did not cease to take notes on visitor's feedback, and has promised a renewed approach for 2010. Given his record - I bet we'll like the result!

There were two large MOCs on display; one of them, the St Macarius Cathedral by Romão Santos, already showcased in issue 4. The other was a surprising battleship by Eínon - 2.8m (9ft) long, with a motorized radar. The sheer number of guns made it an impressive sight; even though it was a fantasy ship, a number of people could swear they had seen "the real one"... Eínon has declared he's not entirely satisfied with the ship, so in good LEGO style he intends to scrap it and start over— bigger, and better!

The smaller MOCs that did not fit anywhere else were displayed in a large stand; people were quite curious with the Mosaics, and kept asking where they could have one made for them. Hear this, people in Billund? Yeah - costly as they may be, mosaics are great PR.



Warship built by Eînon.

Setting up the town layout.

There was room for a few LEGO sets; we wanted to show everyone that LEGO makes both licensed products and iconic landmarks. One of the sets, The Taj Mahal, became the focus of much attention.

There were four interactive activities. A Playstation was available for children to experience the magic of LEGO Star Wars and LEGO Indiana Jones. There was a table where a few people at a time were able to assemble brand new sets, kind of a test drive. There was a racers track (for quick races) and finally there was a large playzone - where kids could build and then join a daily MOC contest.

This event was more than a typical exhibition of LEGO MOCs and sets. For the first time, we managed to join four kinds of shops:

- LEGOwear; Portugal has a very high demand for LEGO brand clothes, and the regional franchise understood the promotional opportunity;

- a local toy shop, featuring the current range of LEGO sets;

- Aleks and Michael from Brickbaumarkt (a German shop), who had a vast array of discontinued sets and parts;

- and one small pick-a-brick, managed by the Community; it was the first time the concept was introduced in Portugal, website notwithstanding.

The 'wet' Pirate layout.

A number of contests also took place. The one that kept most people's cameras on was the "Find the 8 M8s". Eight tiny M8 robots (designed by Don Solo) were scattered around the displays, and a prize was awarded to the person with the best photos of the lot, which were published online.

The exhibitors took turns to attend to the displays, and were able to recruit volunteers for some tasks. There were a few guided tours: mostly, they were meant for schoolchildren, but a couple of adults took advantage as well. Despite the long hours, everyone was then able to enjoy the Tomar nightlife - and we're quite proud of having organized the first all-LEGO auction to take place in the centuries-old main square.

Saturday and the Missing Fire Station:

This year TOMARLEGO was honoured by the presence of Tormod Askildsen, head of LCD (LEGO Communiy Development). Tormod came to know this rowdy gang of people who does MOCs and organizes exhibitions in the edge of Europe, and he brought with him a tremendous amount of patience to deal with our Q&A session. He met everyone present, he asked about the MOCs, he "prodded" some of us - and yes, you got to feel the emotion. I got an autographed brick, even though I bet this rock-star welcome is common for him...

The greatest surprise of all was meant to be delivered by Tormod himself - set 10197 (Fire Brigade). UPS, however, lost it... so we were left to view the pictures of an awesome set before (almost) everyone else. And then we bid on it on an auction. Again. And again. Until the value was quite high, and everyone's jaws dropped all around. But the magnanimous bidder invited the whole gang for the grand opening of the yet-unboxed set; so nobody lost anything, much by the contrary, we all gained: the missing set was presented *twice*!

Part of the Castle layout.

Tormod Askildsen of LEGO Community Development fielding questions.

Group photo of TOMARLEGO attendees.

AFFOLs:
Adult Female Fans of LEGO

Heather (LEGOgirl) Braaten

Age: 32
Country: United States
Your hobbies: LEGO and Photography

I was introduced to LEGO as a little girl, I was about five when I got my first set for Christmas. My brother's friend built a house out of the set and I was instantly hooked. My best friend and I would build houses and cities and set up elaborate stories around our creations. My favorite theme was Town. LEGO Town made it possible for us to create our perfect world to fit our imaginations and then start anew the next time around. As a little girl, I thought that all little girls played with LEGO and it wasn't until recently that I found out that wasn't the case. LEGO is the perfect toy for a little girl's creativity and I loved every minute of it.

Why are you an AFOL?
I am an AFOL because LEGO is the perfect outlet for my creativity. As an adult, people will sometimes be skeptical when I tell them about my hobby, but once they see what you can really do with LEGO, they are always pleasantly surprised.

How many hours do you spend building with LEGO?
I finally finished setting up my own LEGO room, so I'm hoping that now I'll be able to build much more often.

What are your favorite building themes (both what LEGO produce and what you like to build yourself?)I am definitely into architectural themes like the new Café Corner and Green Grocer style themes.

What do you like most about LEGO and their products?
LEGO is the best building block out there as far as I'm concerned, they have been setting the standard for decades and they are constantly improving and listening to the community for their ideas.

5 parts you would love LEGO to produce:
A 1x1 round tile and a 1x1 double sided plate with studs on both sides are tops on my list of things I'd love to see. Other than that, I would really love to see more parts in the more "nature based" colors.

What is it like to be as a female in the AFOL world, which is dominated mostly by men?
I have always been treated well by my fellow AFOLs and I've always felt that I'm given the same respect and support as my male counterparts. This community is the best when it comes to support and encouragement.

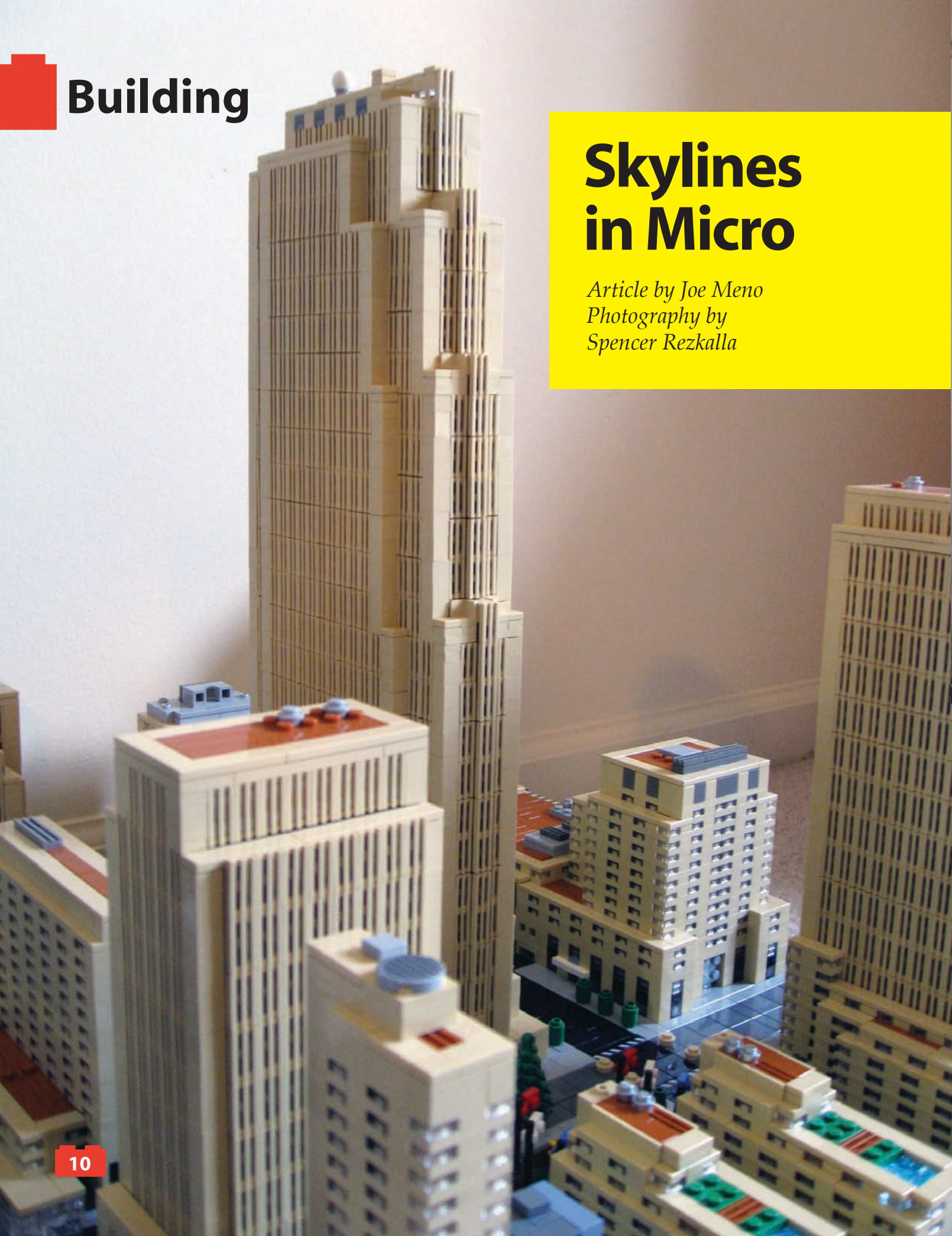
What would you suggest to LEGO to make their products more popular for girls?
I don't think that LEGO needs to change their products at all. I think it's about getting the parents to rethink the type of toys they are buying for their little girls. Just because LEGO isn't pink and frilly doesn't mean that girls won't enjoy playing with it. My little girl loves LEGO just like I did and I believe that all children can benefit from a toy that helps to build their imagination like LEGO does.

"Just because LEGO isn't pink and frilly doesn't mean that girls won't enjoy playing with it."

Is LEGO doing enough to promote their products towards girls?
I think that LEGO could use more hands-on promotions when it comes to getting girls involved in building. I'm convinced that they only need to give girls an opportunity to try it for themselves and the parents will be pleasantly surprised at how interested their little girls are in creating.

Skylines in Micro

Article by Joe Meno
Photography by Spencer Rezkalla



Left: Rockefeller Center in microscale.
Above: Spencer's skyline of New York skyscrapers.

Spencer Rezkalla has been an AFOL for almost a decade and has displayed in various displays. In the past couple of years, he has presented microscale skyscrapers of amazing detail. Spencer displayed at Brickworld this year, and BrickJournal was able to talk briefly to him about his models.

***BrickJournal:* What you do (exactly) in real life?**
Spencer Rezkalla: I am a product development engineer in the automotive industry. I help design and engineer automotive chassis systems. Surprisingly I have never bothered to build a working LEGO suspension model.

How did you get into the hobby?
I grew up in the LEGO "classic space" era of the late 70's and early 80's. I had a keen interest in spaceflight and I built many LEGO versions of the space shuttle. However, I never had enough pieces or the right colors to build it at minifig scale.

I later went through a 14 year "dark" period until late 2000. That fall, I found a few bulk tubs on sale at a local store and I decided for fun that I would try to complete my childhood orbiter dream. At the time I didn't have strong intentions on pursuing LEGO as a hobby, I merely wanted to create something I had been unable to do as a child.

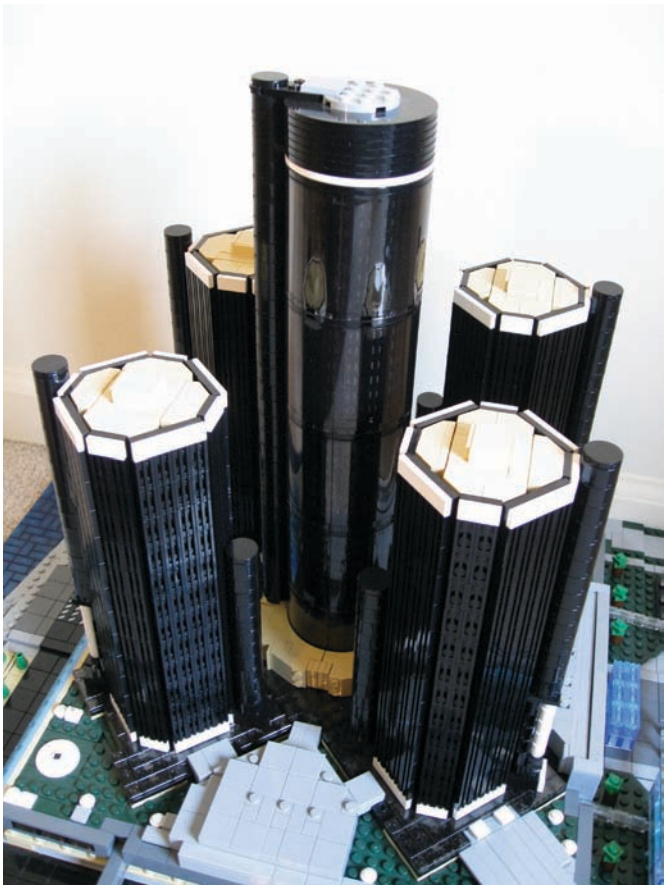
Why you moved from the space shuttle and planes to microscale buildings?
I've never felt that I have moved away from my interest in building aerospace vehicles - I just find that other genres such as trains or minifig scale cars are always in competition for my building free time.

The first microscale skyscraper I constructed was the World Trade Center. Having been born and raised near New York City in the early 70's, I've always held a special fascination with the towers. In their physical absence, building a LEGO model seemed to be a proper way to preserve the memory of what once was.

Upon completing the WTC model, I discovered I had accidentally settled on a natural scale that would allow me to model other famous buildings at roughly that same scale.

The primary focus of my skyscraper collection is about the size relationships between these huge landmarks.

Spencer's World Trade Center.



The Detroit Renaissance Center.

The Burj al Arab

The Eiffel Tower.

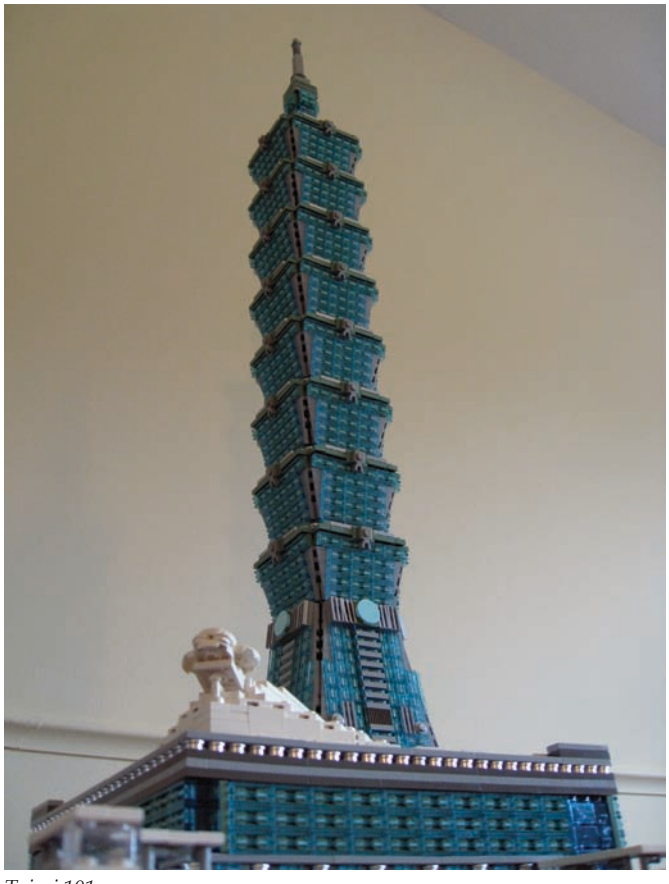
Why do you build?
I like to challenge myself. By building in a predetermined scale, it places enormous challenges on designing a model. The newer architecture forms can be difficult to emulate in LEGO, and that provides additional challenges. Technology has really opened up the design possibilities in modern architecture, there's a lot more curving forms present in today's skyscrapers.

Can you spotlight some techniques in your models?
It's important to train yourself to think outside conventional LEGO building paradigms. More experienced builders use so-called SNOT techniques. Over the past couple of years, I've worked to expand on those and to design in terms of part rotations, slip-plane construction methods, and curvatures with flex tubes. I'm trying to move beyond the basic mathematical increments inherent with the LEGO stud system and to create methods to place pieces at any spatial coordinate and any rotation within a model.

The most important piece of advice I give to people is to truly understand the object they are trying to model. LEGO modeling always involves trade-offs. The better the history, function, engineering, and design of that object is understood, the easier it is to decide between those trade-offs.

Spencer behind the wheel.

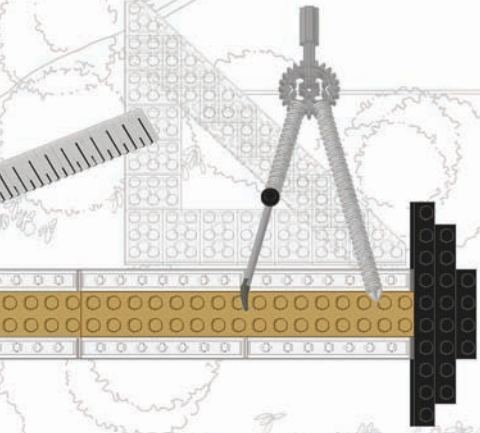
Another view of Rockefeller Center.

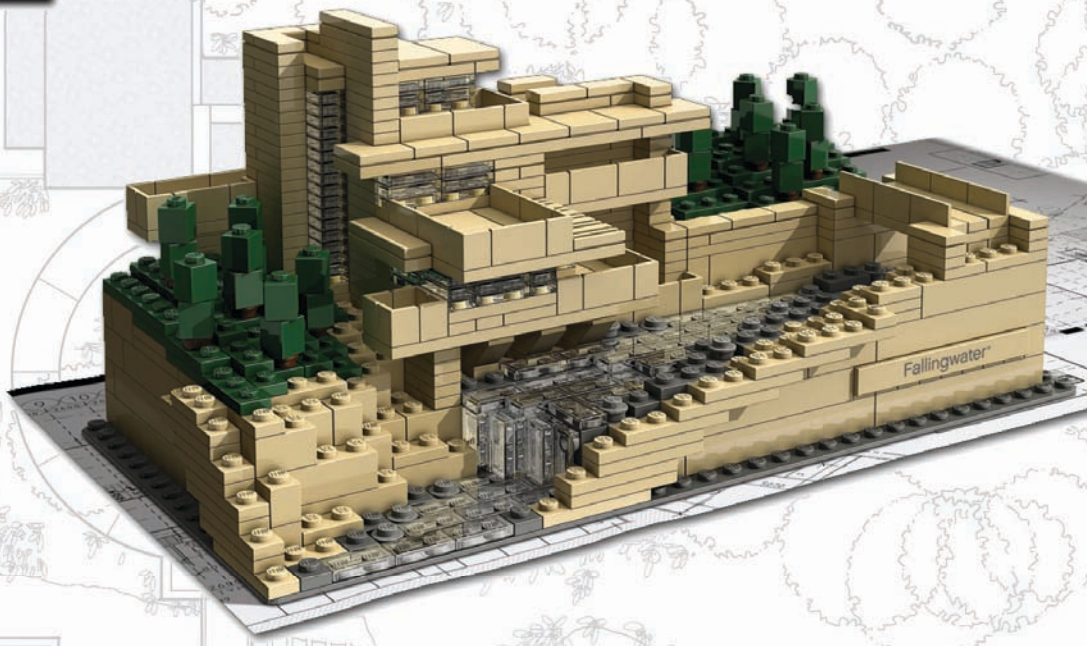


Taipei 101.

A trademark of Spencer's buildings is a well-placed LEGO logo brick. Here is the brick in the Taipei model, in a lower floor.

LEGO Architecture





Fallingwater

An interview with the creators of a new line of sets that is re-architecting the way people will view their world

Interview and article by

Geoff Gray

At BrickWorld 09, I had a chance to meet with Adam Reed Tucker, Paal Smith-Meyer and Christian Thor Larsen, the people who are pioneering a new line of sets. Paal and Christian both work for the LEGO Group, in a division called the "New Business Group." Adam is an architect and an avid fan of creating architecture with LEGO elements. They have already released five sets in a series called "Landmark", which are all doing very well. Now they are about to release a new line, and the first set is a model of Fallingwater, a house in Pennsylvania designed and built by Frank Lloyd Wright.

The four of us grabbed a table in the hotel restaurant, in a corner far away from the normal lunch noise. Using my cell phone for audio (since I did not have a proper tape recorder), we ordered lunch and had an informal chat about the model, the relationship between Adam and TLG, and about the New Business Group. Here is that interview:

Geoff: Gentlemen, great to have you here. Let's start out by getting a little bit on the background of the Architecture series and the creation of the Fallingwater project.

Adam: Hi. I had the opportunity back in 2006 to attend my first LEGO fan event, Brickfest, in Washington, DC, where I met Tormod Askildsen and Paal Smith-Meyer and we got a chance to talk about my idea of exploring the world of Architecture, and using the LEGO brick as a medium.

Paal: It was quite interesting meeting Adam and seeing a very different contribution and his presentation of Brick-Structures and the thought of bringing Architecture back into the LEGO portfolio. It wasn't really until the spring of 2007; actually April 2007, when Adam and myself got to sit down to discuss LEGO and architecture, and how we would do it. I remember saying this would only happen if an architect like Adam makes it happen. There's no one inside LEGO that could authentically make architecture today, so we need to collectively make this effort. That's where we were at Brickfest, kind of at the "exploring an idea" stage. We met again at Brickworld 2007, where Adam had made a small event kit of the Sears Tower, and it kind of continued from there. We met again in the fall and decided "let's go for it." That was kind of the lead in to the story for presenting this idea of architecture to the investment group inside LEGO.

Geoff: The end result of this was the release of 5 different kits in the "Landmark" series. The latest, the Guggenheim Museum might be seen as a bridge between the Landmark series and the new Architecture series. Is that the thought for the museum model?

Adam: I think it was seen as a bridge, but if did try to categorize it, it really could fall in either one.

Geoff: With the success of the landmark series and looking to expand on it, what brought the idea of this new Architecture series?

Adam: Initially when Paal and I were starting to brainstorm all of our ideas, we recognized and identified many different areas of architecture, and when looking at the Landmark series, we felt this series would be more of a "brushing the surface" for people who are interested but who don't want to take the experience too far, and so as a souvenir based component of LEGO Architecture, that satisfied that requirement. Second was taking that experience and enriching it further with the Architecture series, which we decided would start with Frank Lloyd Wright as the first architect because he is probably the most well known and most famous of US architects.

Geoff: Was there a discussion amongst all of you to use Fallingwater, or was that something that you [Adam] came up with on your own?

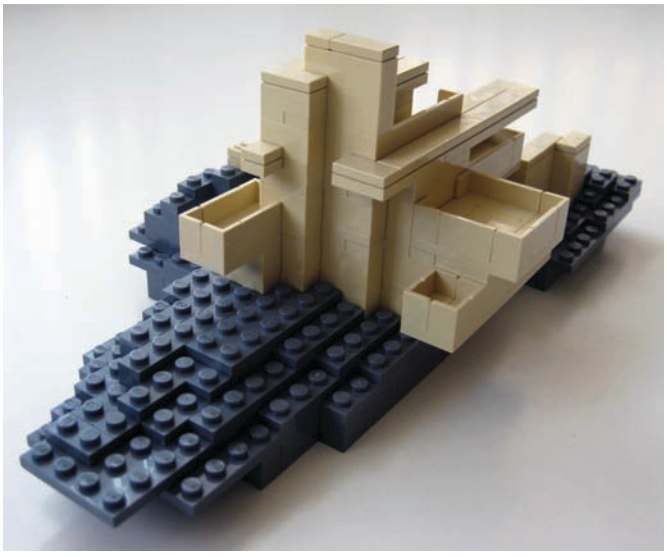
Adam holds a copy of an early concept model while standing in front of the entrance to the Frank Lloyd Wright Foundation

Adam: He is my favorite architect, and I just started playing around with how I could interpret his structures using the brick. We didn't have any pre-conceived notions of whether we would use Corbusier or Mies van der Rohe or Frank Gehre. It just kind of came to be that we created this model and it seemed to work, and it made sense to honor him as the first architect in the series.

Paal: You could kind of say "celebrating the history of architecture" and the pioneers of architecture. Frank Lloyd Wright was definitely a pioneer of modern architecture in America. Since LEGO Architecture is being launched only in America, this fit very well. It really was an obvious choice, and of course it really fits well with the LEGO bricks.

Adam: Timing was interesting also, since the debut of this set would coincide with some anniversary dates, which we thought would help propel some of the media exposure and the awareness of where we were going with LEGO Architecture.

Geoff: During the creation of this model, there were at least 14 different iterations made. When you started, was there already an idea of the size and scale you wanted to use?



One of the first concept models

Adam: The design of the model was pretty straight forward and pretty easy to knock out. Initially we thought this would be a good opportunity for change, since our first five models were static and really did not offer any type of "playability". We wanted to introduce a dynamic property into LEGO Architecture to embrace and engage you into the experience. We thought about a way to make this model come apart in a puzzle like fashion to get you into the root of the building and to understand the use of cantilevers and its forms, but we also had the challenge to do this without changing his design and being true to the form and to create this unique and interlocking components. The 14 iterations came into the delicate nature of figuring out how those parts worked, and then also meeting stringent guidelines for durability, making sure it wouldn't fall apart and finally making sure it would pass some of the design tests that all LEGO sets go through before they are released.

Facts about Fallingwater:

Quotes from the Western Pennsylvania Conservancy website.

"Fallingwater is the name of a very special house that is built over a waterfall. Frank Lloyd Wright, America's most famous architect, designed the house for his clients, the Kaufmann family. Fallingwater was built between 1936 and 1939. It instantly became famous, and today it is a National Historic Landmark."

"When the Kaufmanns first looked at Wright's drawings, they were very surprised! They thought their new house would have a wonderful view of the falls. But instead, with the house right on top of the falls, it was very difficult to even see them. But not to hear them! Frank Lloyd Wright told them that he wanted them to live with the waterfalls, to make them part of their everyday life, and not just to look at them now and then."

- Final cost: $155,000 (Included $8,000 architect's fees, and $4,500 for installed walnut furnishings)
- Square footage: The main house uses 5,330 square feet. (2885 sq. ft. interior; 2445 sq. ft. terraces) while the guest house uses 1,700 square feet.
- Fallingwater was featured on the cover of Time Magazine, January 1938
- Fallingwater is the only major Wright-designed house to open to the public with its furnishings, artwork, and setting intact.
- Over 4 million people have visited Fallingwater since it was opened to the public.
- Fallingwater is maintained by the Western Pennsylvania Conservancy (http://www.paconserve.org/).
- Given the humid environment directly over running water, the house also had mold problems. The senior Mr. Kaufmann called Fallingwater "a seven-bucket building" for its leaks, and nicknamed it "Rising Mildew" (Brand 1995).

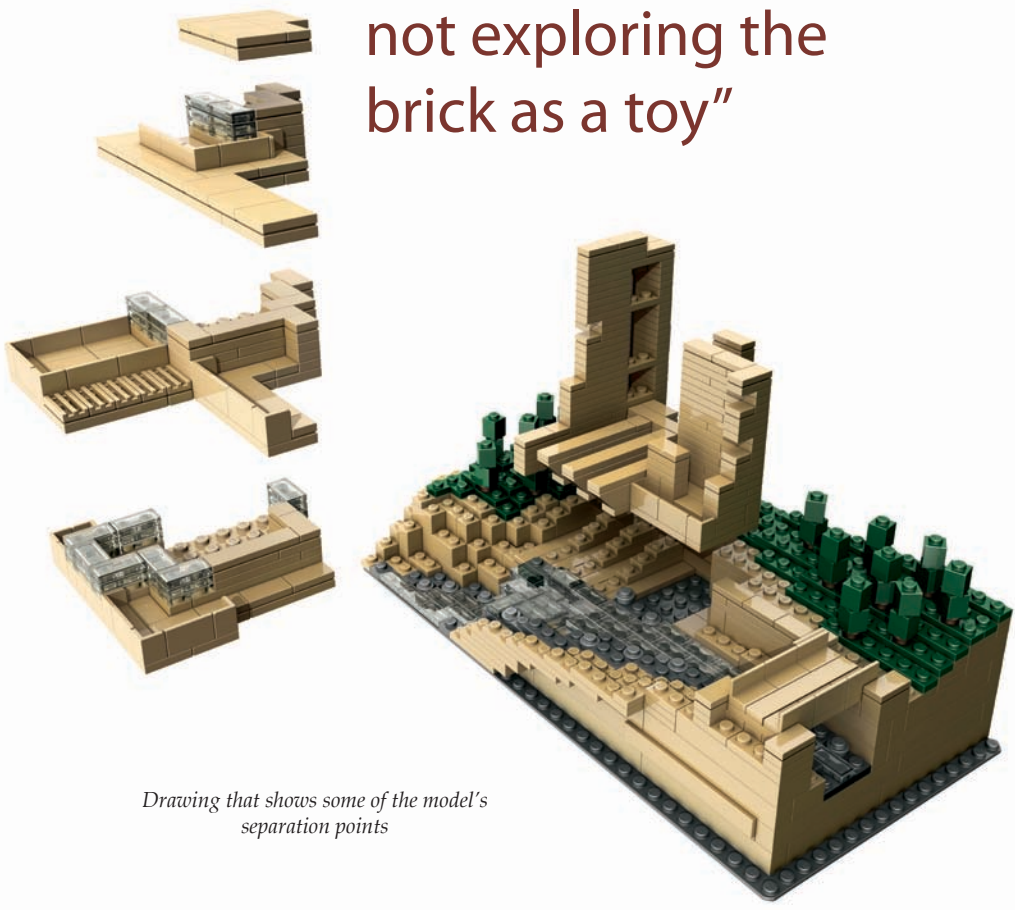
Geoff: I know that before you mentioned one of the big areas that was difficult to work throughwas the tall picture glass window that is on the building, and making sure that when a person took apart the model that you did not have to break the continuity of that window.

Adam: There definitely was some thought put into how the model was going to come apart, so the foundation was still stable without needing the core part when it came apart, but not jeopardizing the one strong vertical part that juxtaposes the horizontality of the overall design. We put a lot of thought into making sure we captured that and maintained the purity of the form.

Geoff: Tell us a little more about the benefits of the dynamic nature of the model.

Adam: By doing this [making the model dynamic], one can explore the roots of the building and the forms, and his use of cantilevers, and also taking it one step farther in the integration of the surrounding environment. By doing that, you show someone how a building is rooted into the ground and how the design is reflected in the environment around it. So by including subtle hints, such as taking simple 1x1 bricks and turning them slightly to hint at tree life in the natural environment, and also using flat clear tiles to represent the river and the waterfall and how that all works together, instead of just representing the house. It is a combination of all of these things that turns this into a masterpiece.

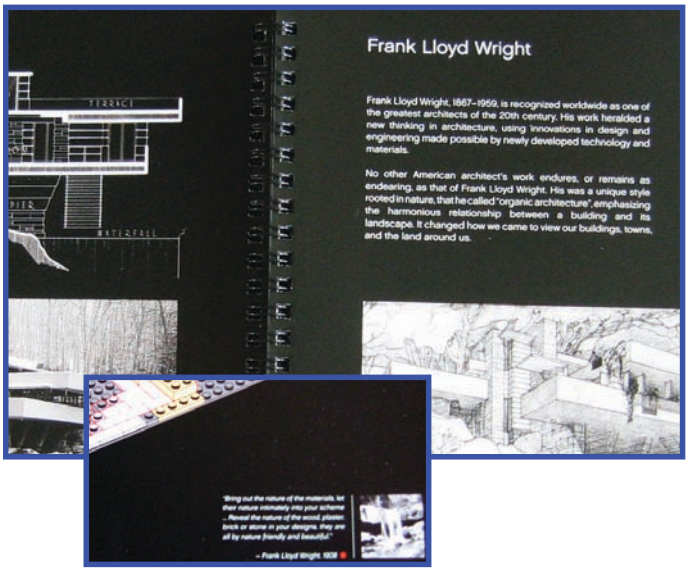
> "we're using the brick as a medium and we're not exploring the brick as a toy"



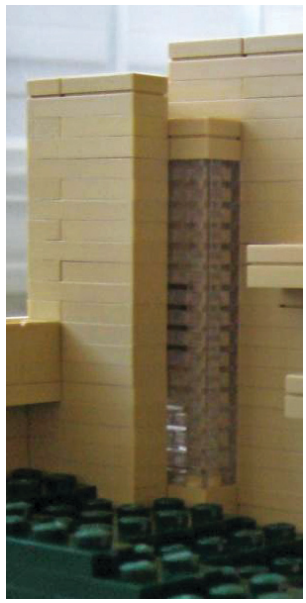
Drawing that shows some of the model's separation points

Geoff: When you were working with the different iterations, you made a decision to use flat tiles instead of bricks and plates for all of the visible surfaces of the actual building, and plates for the surrounding landscape, which is an effective way with LEGO media to really differentiate between the two, which is something you were not doing in the Landmark series. Tell us about this.

Adam: We took this opportunity to further explore the experience. We could have easily made a 200 piece count set at half the price, but we decided that there is a unique opportunity to celebrate the joints of plates being stacked, so instead of using a single brick, we could stack 3 plates and have the subtle effect of real joint lines, which adds to the reflection of the stone, and then also using the studs of



The book introduction has information about Mr. Wright and some of the instruction pages have quotes from him.



This is a comparison of the real picture window and the model's window. The use of plates really shines here.

the plates and bricks to push the idea of foliage, which, as I said before, is a start contrast to the smooth façade of the structure itself.

Geoff: Paal, as this was playing out and you were getting the different iterations from Adam, what were some of the conversations you had with respect to how this would play out, especially the final model and the higher piece count?

Paal: The discussion was primarily around how we could make a model that really represents Frank Lloyd Wright's Falling Water really well, but that also gives a really good building experience. Designs with a lot of plates can be quite challenging to build. A lot of the focus was on (because we didn't focus on a particular price point) getting the proportions right. That was a big challenge and we looked at it carefully through the iterations, trying to make it easier to build.

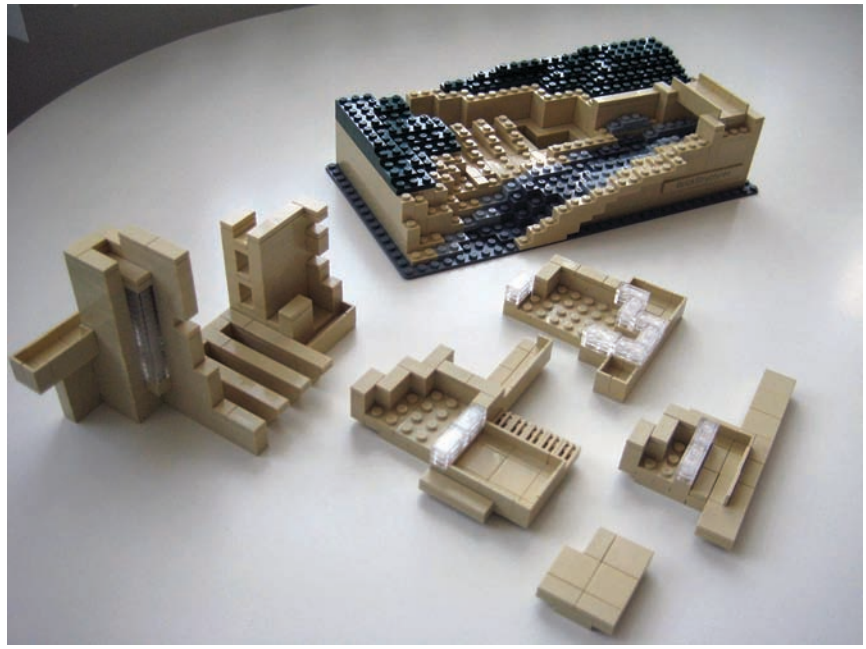
Adam: When I design something, I am not thinking about a lot of the criteria because I think it is vitally important for the first concept to use your imagination, use any plates or bricks you want, and then we can always come back and subtract or scale or refine that down. However I think it is very important to have that experience of capturing the spirit of the structure first and then do the refining afterward.

Christian: On that note, we are also quite fortunate to be working in the New Business Group where we have a large amount of freedom, and it's not the standard way of producing a LEGO item. In 90% of the cases, you would work your way down from a retail price which you have as a target, and here we were actually starting with a very big ceiling for where that final price for the model could go.

Geoff: One of the other ways you have diverged from the normal way of doing business is the inclusion of information in the instruction book that is not relevant to the build, but that expands the user's knowledge of the item being built. Whose idea was it to include this type of information and how did the plan come about?

Adam: I think the dialog between Paal and me a couple of years ago was like "Here's an opportunity to just get crazy. What do we want to do?" and Paal and I felt that this series, with new packaging, with a new look and a new audience deserved more attention at all phases, not only at the point of purchase with how the box looks, and not the building with all the use of integrated parts, but also the experience transcending through the book itself. So the booklet is composed of three areas; an informal introduction of some history and some architectural points of significance to get you interested. Then you have the building instructions, which takes up the body in the middle, and at the end you have a brief discussion from me about the construction and some of the challenges I went through. So if some things aren't obvious at first, I talk about the tricks of illusion with the elements, etc. and also the relationship with the LEGO Group, sort of paying homage to some of the earlier sets that Ole, Kirk and Godtfred launched for architects over 40 years ago (There were two sets in the 60s that, while called Model and Hobby Boxes, had a'Architectural Book' enclosed with model ideas based on basic architecture. About the same time, a version of smaller LEGO bricks [Modulex] were produced- *Ed.*).

Also, since we wanted to have an interactive experience through the entire process, we added some of Frank Lloyd Wright's quotes so as you're going through the building process you can have a few breaks and have some visions



The final model broken into its sections.

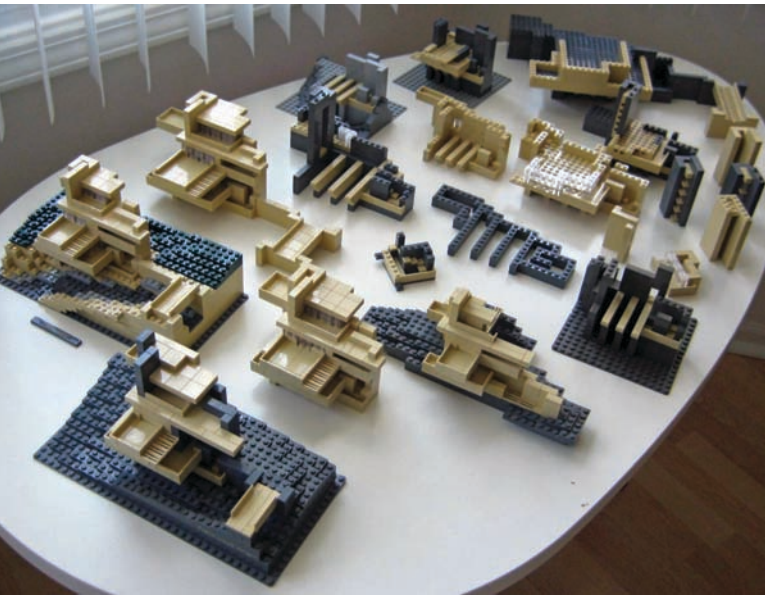
into Frank Lloyd Wright's thoughts. And these were placed at very specific points to align with the points in the building instructions that are indicative of the quote.

Geoff: I think all of this leads to the last point of difference between this kit and others, and that is the distribution point. This part is also quite a departure from the typical way of selling sets. Tell me a little about this.

Christian: It's really again Adam who has taken the first way of a different distribution model because it is clear that the LEGO group does not have a distribution setup automatically geared toward adult catered sets at this price point. We would not see this set do well at our classic sellers such as Toys'R Us or WalMart. So in that respect we decided to have a very unorthodox way of sales. We have setup a fairly effective way of marketing this type of model to the consumer who would most enjoy it and purchase it.

Adam: And to add to that point quickly, three years ago when I had this idea, I actually went to Barnes and Noble, which coincidentally is one of our distributors for this set, and was looking for some material to help me impress the LEGO Group. I am an architect and an artist and do not know the business side so I was thinking "Are they going to listen to me just because of some cool looking MOC? Probably not." There has to be some business case for it. It has to make sense, to be relevant. So part of what I was thinking was "How can I bring a new audience into the LEGO Group that they're not generating revenues from." I was thinking of all of these places of tourism, of airports, museums, things of that nature. It gets us away from the typical toy retailer and I think it's very fitting because here we're using the brick as a medium and we're not exploring the brick as a toy.

Paal: From a LEGO point of view, our mandate with the New Business Group is to explore new business opportunities that are outside of the toy industry. So with Architecture, to really go and focus on the niche area of architecture, we were able to uncover a great potential avenue. And since we're not currently selling in souvenir locations, it's a perfect match.



Several different iterations of the model are shown here.

A photograph of the interior showing some of the furniture Frank Lloyd Wright commissioned for the house.

A view of one of the terraces of the real house compared to the same terrace from the model.

At this point, we had to pay the bill and head off to get back to the convention. I thoroughly enjoyed chatting with everyone and am glad that I got to learn so much about a set, and a direction, that is so radically different than normal. I look forward to seeing what is next.

During the Brickworld convention in June, Adam asked 13-year-old Olivia Donahue to build and review the set. She readily agreed. Here is a little bit about Olivia (from her father):

"Olivia loves to build and play; she won the Inspiration Award at Brickworld 2007; she plays piano, runs on the track team, and does some swimming; she takes care of her four goldfish and her doggie, a coton de tuléar named Sophie; she's a great student, a wonderful sister and daughter, and a splendid friend."

Adam Reed Tucker and Olivia Donahue with the set.

Fallingwater: A Builder's View

I built Fallingwater in approximately three hours. These are my thoughts, looking back at a most enjoyable building experience, in no particular order:

• This set is certainly not a toy. From its black professional packaging to the detail in the work, Fallingwater is strictly for its architectural beauty and significance.

• The information is great, because you can learn a little bit about Frank Lloyd Wright, without seeming like you're reading a textbook.

• The highlighted red bricks in the instructions are helpful because of the set's unique building technique. Made mostly out of plates for texture and pattern, it can be hard to tell where to put the next plate. The clever puzzle box idea of sliding parts is something that I have never seen used before, but is awesome because they are so well hidden.

• Fallingwater is very artistic, and the quotes from Mr. Wright are, too. All the items of the set, from the box to the instructions to the lessons in the book to the model itself, fit within a consistent artistic theme.

• Fallingwater lets you see the difference between how Adam builds as an artist and how others build for play. The different building style really opens up your mind and your eyes to new ways to build.

• Even though Fallingwater looks fragile, it is still very sturdy underneath. It is also very heavy because it has so many pieces!

• The block's studs are used only for landscape texture, and the rest is all very smooth, like cut limestone.

• I like the waterfall because it adds texture contrasts between the water and the rocks.

• I like the fact that there are really only three colors. The dark green adds a serious tone but also adds a liveliness in contrast to the tan and dark gray.

• The unique use of just about only plates really does its job of creating the texture and pattern of limestone.

In summary, this set is nothing short of awesome. Although it doesn't have the playability of something like the Medieval Market, its artistry and elegance provide the builder with a most rewarding and enjoyable building experience. I recommend this set for older people who don't necessarily play with Lego but would enjoy building; however, younger people can enjoy it too! (Like me!)

Power Miners:
Mining a New Theme

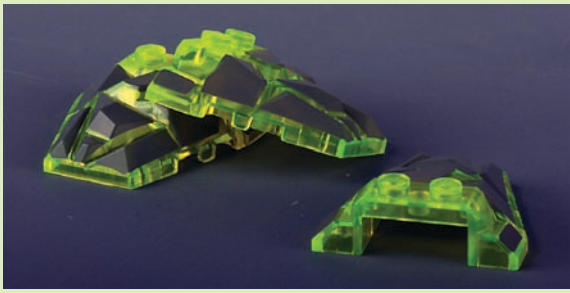
Power Miners was the result of design and development from LEGO designers and sculptors. BrickJournal was able to get a glimpse at some of the design work and models behind the theme!

Article and Photography provided by the LEGO Group

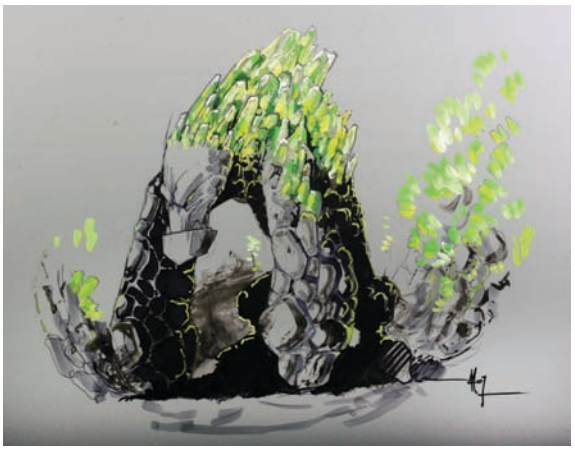
What could have been! This is a picture of the very first Power Miners figure, as suggested by The LEGO Groups Concept Lab (a lot of flying through huge caverns featured heavily in the these early concepts), an early color variant of a Power Miner from when the Set Designers took over the theme, and a final figure.

An earlier color variant of a Power Miner, complete with yellow dynamite, meets the final blue version of the figure!

Building Rocks



Development of the new rock texture brick was pretty straight forward. New elements are sculpted first, then scanned into a computer (some straightforward elements are created solely in the computer), then they are printed in a 3D printer, it can be many months later before the final elements arrive in the LEGO Design Studio.



Original Concept art for the Rock Monsters by Adam Grabowski (Mister Zumbi), though the final monster could not be this scary, this disproved the perception that the monster might be 'too cute'.

Monster Mashup

Transparent 3D prints of the first mini-monster concept. The original sculpture was created by Adam Grabowski.

The first 3D print of Gitte Thorsen's final Mini-monster sculpt.

Transparent 3D prints of the Mini-Monster.

Hand painted decoration of the Mini-Monsters by Mark Stafford.

First plastic printed bodies to arrive in the design studio, stickered eyes by Graphics Designer Kjeld Walther Sørensen. The sticker-eyed monsters appeared in some early images of Power Miners that leaked onto the websites of LEGO fans.

A triple scale Mini-Monster, one of only ten made for internal promotion of the Power Miners theme.

The final Mini-Monsters, now all they needed was naming! From left to right, Glaciator, Boulderax, Firox, Sulfurix and Meltrox.

Building a Bigger Monster

Midi-monster legs! The Mid-sized rock monster is made of several different moulds then joined together. This version was made to show where the legs needed to be printed.

First version of the midi-monster with all of the elements brought together.

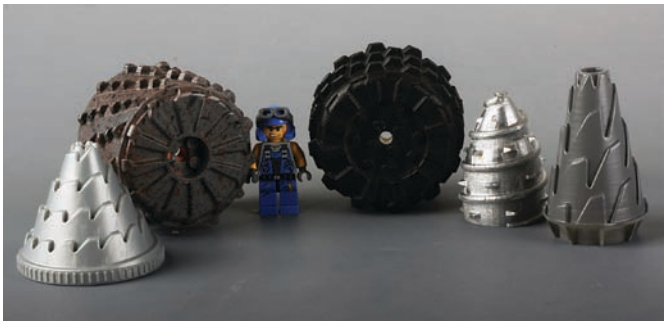
Trying to work out the shape and positioning of the eyes was not easy on the face of the midi-monster like 'Geolix' because it is asymmetrical.

Tremorox is either patting Sulfurix on the head or preparing to throw him by it!

An early version of the Crystal Kings head, a possible solution with no new elements, featuring grey bananas and a slope brick, hand painted by Mark Stafford.

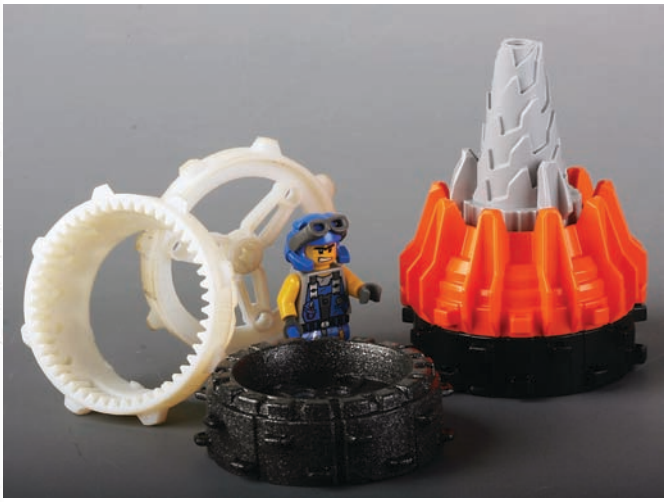
Working out minor details, like the eye ridge and eye shape/position on the final Crystal King head by Gitte Thorsen.

Final 3D print of the head and the finished product!



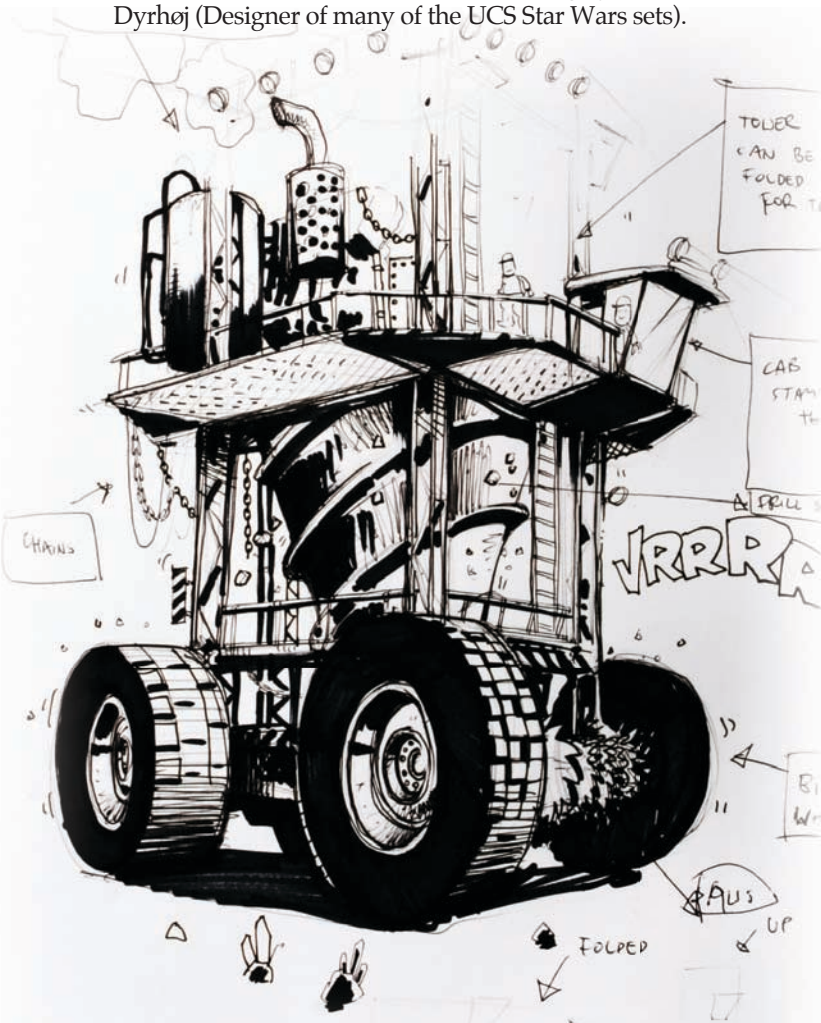
Early versions of the Power Miners drill elements. They need to convey strength and power and be adaptable for use as wheels, drill and other functional elements.

Later Versions of the drill elements, the development of these parts was undertaken by Jesper C. Nielsen. (Model Designer on many themes including Adventurers and Explorians.)



Late versions of the drill elements and the finished parts! The most fundamental breakthrough was a planetary gear ring inside two of the elements allowing them to spin in opposite directions.

Below: A quick sketch of how Adam Grabowski thought a Power Miners drilling rig should look. A lot of this concept went into the final Titanium Command Rig by Søren Gehlert Dyrhøj (Designer of many of the UCS Star Wars sets).



LEGO Behind the Scenes

Horsing Around:
Designing the Grand Carousel

Article by Megan Rothrock
Photography Courtesy of the LEGO Group and Steen Sig Andersen

BrickJournal *recently had a chance to meet with LEGO Designer Steen Sig Andersen and talk with him about the development of LEGO set # 10196, LEGO Shop-at-Home's newest premier LEGO set!*

BrickJournal: How was the decision to develop a LEGO Carousel for the Shop-at-Home range reached?

Steen Sig Anderson: Eva Henriksen, Marketing Assistant, LEGO Designer Jamie Berard and Steven Turco, Merchandising Director from LEGO USA all had a meeting to discuss the next project, They wanted to do something different from the past; we had already done buildings, cars, the Town Plan and such. It was actually Jamie that suggested we do an amusement park ride, and he pointed out that Americans were crazy about such things. I was not present during this process, as Jamie was busy developing the Green Grocer so I was invited to join in later — it sounded exciting and I said YES!

What was it like to develop a LEGO set based on such nostalgic subject matter?

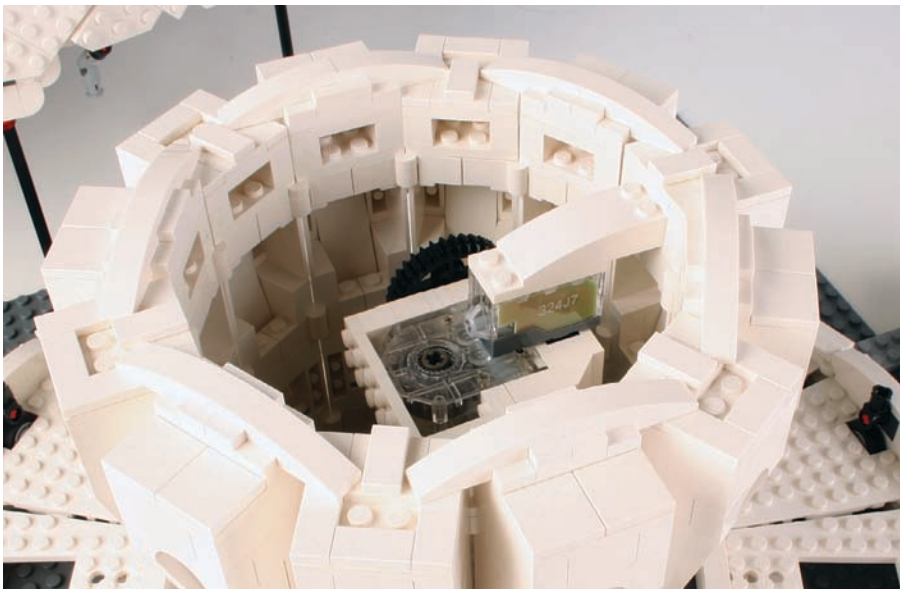
It was a bit harder then other models I'd designed in the past. For example, a LEGO set like The Eiffel Tower was easier to do since all you had to do was build a copy of it with LEGO bricks.

The mechanism of the model is very complex, with rotating horses moving up and down and playing music. How challenging was it to design?

There was definitely a challenge to get the main movement of the Carousel sorted. First, there needed to be a way to drive it, and second to have the horses to up and down. I tried several different ways to drive the Carousel, one had the motor inside and a gear with a 'tooth plate' element to drive it. Everything was built around one axle in the center, and it had a lot of weight on it. If you stopped it with your finger, the axle twisted. This was not a good thing at all, and after a lot more experimenting, I arrived at the design with the wheel on the outside. Then there was the matter

to find a tire with the right friction to smoothly drive the Carousel. We experimented with many different sizes and types, before we found that the 'low rider' harder tire worked best. I chose to use a shock (spring) rather then rubber bands, to help keep the pressure of the wheel against the Carousel. We found that the shock works better and doesn't need to be replaced over time like rubber bands would.

I also explored several ways of moving the horses up and down, with one of them having curves on the inside ring that the wheels would roll on, but this wasn't a smooth movement and the horses didn't move up and down very much, so I looked at how real ones worked, and found a solution by building in cams. Then there was the matter of the top of the Carousel - how to create that nice swoop that is on the top of it. Several brick-built canopies were built, but it took a lot of LEGO bricks to build it smoothly, and it added a lot of extra weight. So we decided that a textile element would be best.



Early Development: a prototype experimenting with a motor in the center of the carousel.

This prototype was built to create a different shape and scale for the carousel, and also use a roof built from plates.

The Carousel set has some very nice details. Did you carry out a lot of research on real carousels to achieve them?

Yes, there was a lot of research done before I started to build it. We looked at many different types of carousels (images from the internet) from all over the world. We found that they had some basic things in common, like horses and sleighs, and a center pier. It was challenging to find a way to include a lot of decorations and details that a real Carousel has with LEGO bricks, and also keeping it an interesting build for the AFOLs.

The first prototype I built was actually with only horses, but we found that to be a bit too boring. I wasn't the only one working on this project, so Jamie gave some input for how to build the details at the top, and he also chose to use the tan beard as a nice detail. Chris Johansen from our Graphics Lab worked with us to help give a unique style and details for the labels. We are no longer allowed to place a label over the brick's edges so Chris had to cut the design in half to get it to fit. Flemming Sørensen wrote the music, and did the electronics for the sound brick. The sound brick has a new chip in it, as he figured out a way to extend the sounds' playing time, and composed the music too-it's really great!

A lot of work was done to choose the final color scheme. Some real carousels are white with the details painted on panels. It was a bit tricky to get the right mix of color and detail in to the model. We also designed it so the sound brick could be turned off easily so you could display it at LEGO events.

One ticket please! This ticket booth didn't quite make into the final set.

Two examples of different plate-built roofs.

Prototype of the carousel with just horses. The team felt the set needed more variety and added a sled and basket to also ride in.

An early version of the mechanism that made the horses go up and down. The small wheel would roll over curves on top of the center pier.

A slightly different version of the horse mechanism, with horses also attached.

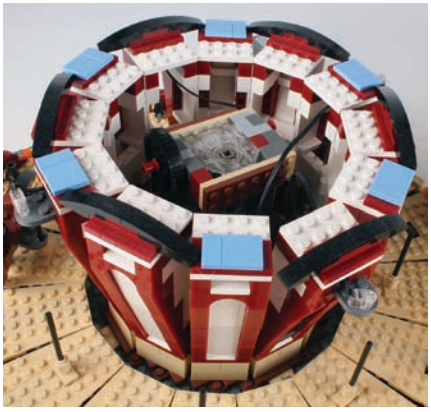
Did you have to build a lot of versions/prototypes to complete this model?
Well yes, quite a lot- I experimented with different scales, and sizes, taller ones and shorter wider ones. I think over all I did four to five sketches just to get the mechanisms and functions right, and after I had that sorted, a few more to achieve the final result.

How much time did you/the team have for the development of the Carousel?
I worked on building it for about three months.

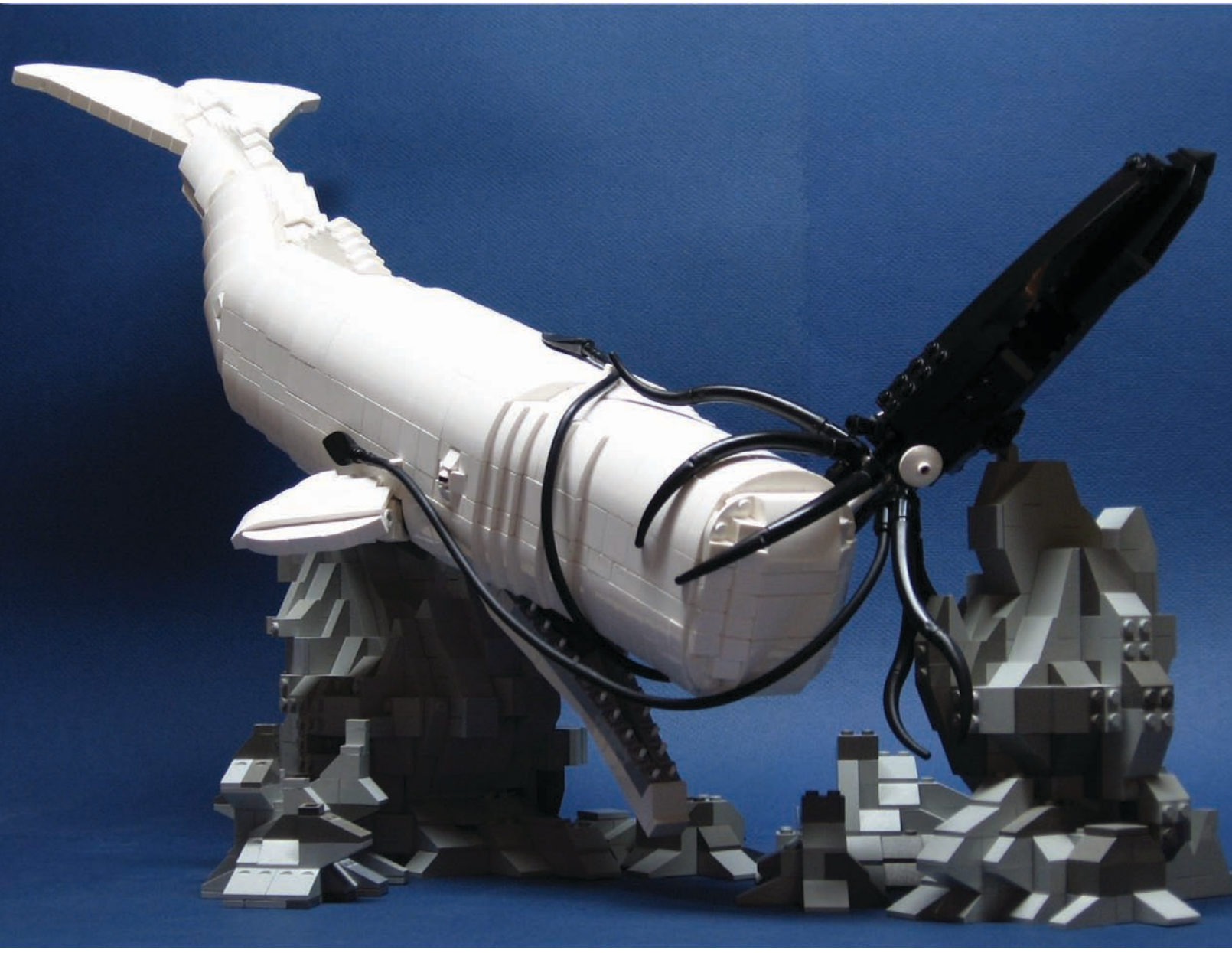
Had you ever tried to build a carousel or anything like it out of LEGO bricks before?
Not really, I've done some smaller things in the past with the LEGO Inventor set 4094 and Play and Record LEGO set 4095 which incorporated [moving] functions.

Is there anything else you would like to share with you readers regarding the LEGO Carousel?

It's always interesting when after you have made a LEGO model and it is finally shown to the public. I'm excited to hear what everyone thinks. It's great to read the feedback online, and we do take things into consideration for the future.



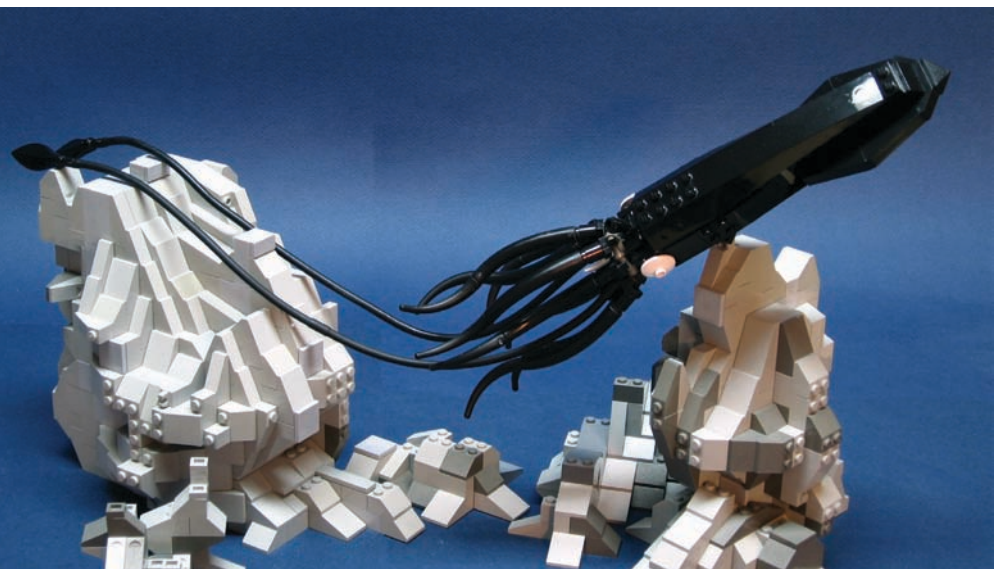
A color study of the center pier, exploring different decorations. At one point, there were lights in the model, but it was found that they were too distracting in the final version.



Battle of the Leviathans:
Sperm Whale vs. Giant Squid

Article and Photography by Ryan Rubino

Ever since I was ten years old I've been fascinated by wildlife. In college I majored in biology and spent many hours discussing marine biology with my zoology professor whose specialty was cetaceans. He related detailed information gleaned from a mass Sperm Whale stranding he attended. Much of the blood physiology and other quantitative information taken from these live whales has kept me interested all these years.

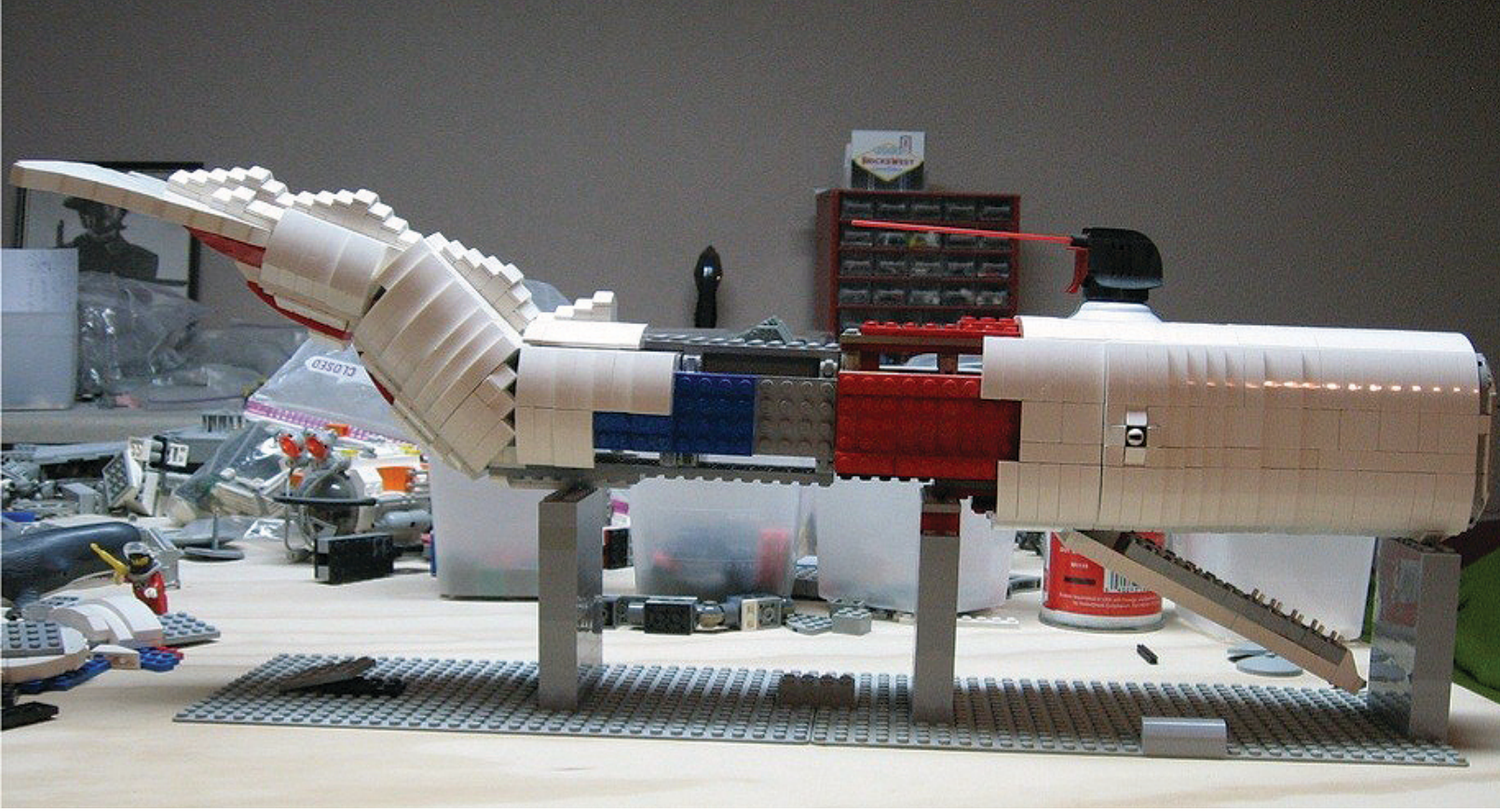


Sperm Whales *(Physeter macrocephalus)* are one of the most amazing athletes in the animal kingdom. Their dives in search of food can take them 4000 feet from the surface and deeper and last as long as 90 minutes. In order to achieve these feats they carry massive quantities of hemoglobin carrying red blood cells and their blood may constitute 1/3 of their total body weight. They are the largest toothed whales and their brain is largest of any animal weighing up to 12 pounds or more. Mature bulls may reach 60 feet in length and weigh 45 tons making them one of the largest animals in the sea.

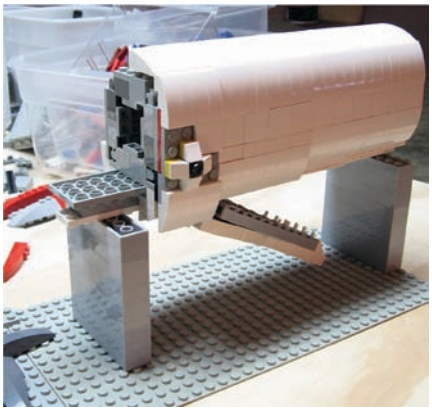
The Giant Squid *(Architeuthis dux)* is no less fascinating and has recently been in the public eye with still pictures and video finally captured of one of the Earth's most mysterious denizens. This giant cephalopod is an invertebrate of tremendous size and is related to other mollusks like octopus, snails, nautilus and cuttlefish. The mantle or body part of the squid can be 7 feet long in mature females. Its 8 long arms bring its length to near 16 feet and when the super long feeding tentacles are included the total length for the animal can reach 42 feet. Their eyes can be 10 inches across and are only exceeded by its larger cousin the Colossal Squid *(Mesonychoteuthis hamiltoni)*.

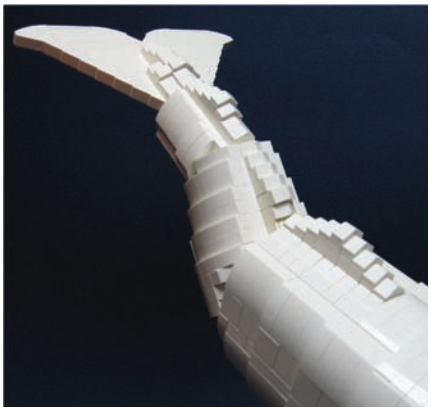
Early in 2007 while working on the Omicron Weekend (shown in *BrickJournal* Issue 1, vol. 2) I scratchbuilt this Giant Squid, which wasn't included in the final version. In the back of my mind I kept envisioning the squid battling a sperm whale built to scale. As luck would have it, I found myself working on a collaborative undersea diorama in 2008 with fellow builders Keith Goldman (one of the builders behind the Omicron Weekend) and Jon Palmer. The Lord Mandrake Memorial Sea Tower was mostly set underwater and I jumped at the opportunity or excuse to contribute a dramatic battle scene with the squid and a sperm whale. The diorama was cancelled so I started to construct the whale as a stand-alone sculpture to tangle with the squid.

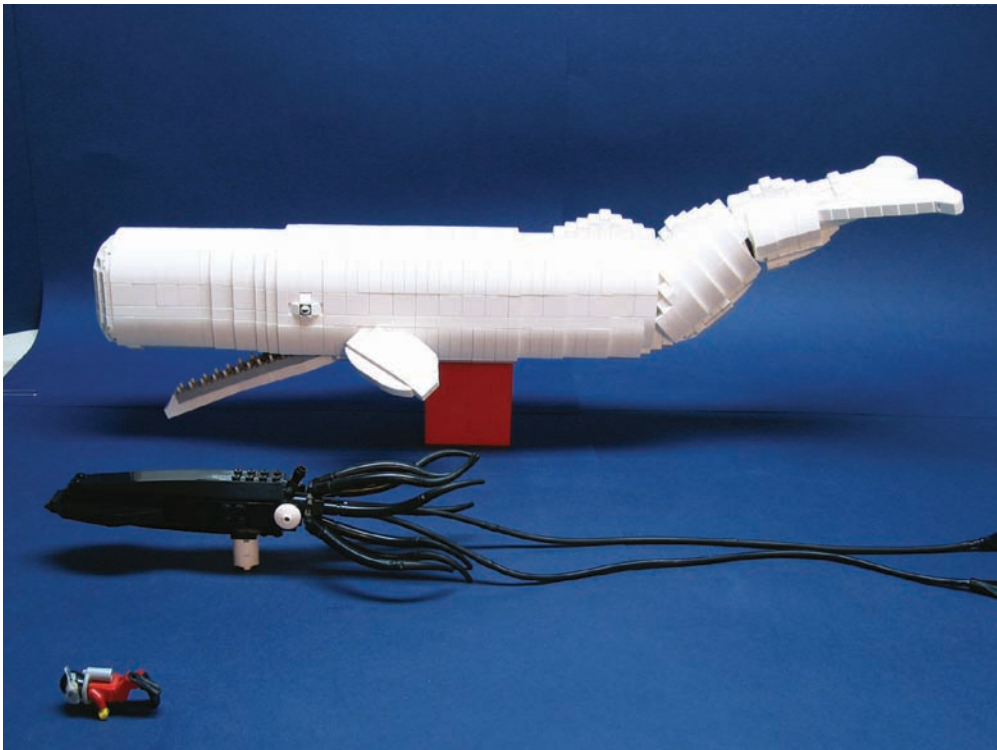
Here's a few notes on the build: Design and construction of the whale and rock formations was spaced over approximately 10 months. The whale was designed around a click hinge box frame with large plates in



a studs- out configuration on 4 sides. Brick and plate were used to sculpt the features and then most of the whale was skinned in over 400 1 by 3 curved slopes. Over 230 1 by 1 "cheese" slopes were used for sculpting in tight spots and for the distinctive humps on the back of the whale. The complete model of the whale is 24 inches long or approximately 76 studs. The peg-like teeth are minifig wrists inserted from the backside of headlight bricks.







Project Yamato: by Junpei Mitsui

Article and Photography by Nathan Bryan, BrickZen.com

Walking into the room there was the battleship in all of its glory.

This 1/40 scale model of the battleship *Yamato* was started in 2003, and built over the next six years and four months using over 200,000 bricks. The completed length is 6.5 meters (21.3 feet) long and over a meter (3 feet) at its widest point.

The original *Yamato* was built from 1937 to 1940 and launched late in 1941. It displaced more than 72,800 tons and was armed with the largest caliber naval artillery ever fitted to a battleship, nine 18.1-inch 40 cm/45 Type 94 naval guns.

Although it was sunk in April 1945, the ship still generates a great deal of interest in Japan. Numerous books that have been published, several museums have been built, and in 2005, there was even a film produced to tell the *Yamato's* story.

The builder of the LEGO Battleship *Yamato* is Junpei Mitsui (Brickshelf account: Junlego) A student at Tokyo University studying to become a materials engineer, he has been building since childhood. In high school, he started a LEGO education class. At Tokyo University he also started a LEGO club.

Because of his building skill, he was a semi-finalist and went to Denmark on the Japanese TV show "TV Champion." Besides building with LEGO bricks, he enjoys working with computers and shooting short animations (with minifigs of course!). Junpei has built many large scale MOCs including many famous Japanese architectural landmarks and a life-size Doraemon (a famous Japanese Anime character.)

Junpei and the Yamato

First Inspiration

When Junpei was in elementary school he saw a picture of the *Yamato* in an encyclopedia and knew immediately that someday he was going to create a MOC of it with LEGO bricks.

He started off by creating one of the smaller gun batteries, a 12.7cm, 40 caliber gun turret. His thinking was that if he could create an accurate replica of one of the gun batteries, then he would be able to build the whole ship.

Next he started a long series of trial and error builds to find the best way to create realistic lines for the bow and sides using SNOT (Studs Not On Top) techniques and plate elements. Getting realistic ship lines was one of the most difficult and challenging aspects of the project.

He then collected books, plastic models, ship plans, visited museums and gathered as much information as he could so that he could create a MOC that was true to the original ship. One of the problems that he encountered was that many models and even drawings in books often had what that particular artist thought were correct aspects of the ship, or had small details left out. In watching the movie about the *Yamato*, Junpei even came to notice how they created or changed certain parts of the ship for visual effects or to make the story run smoother.

The MOC was built in Junpei's "LEGO Studio", an apartment in Akashi city where his parents are. He would take one color with him at a time up to Tokyo to work on sections, and then bring the finished pieces back and add them to the MOC.

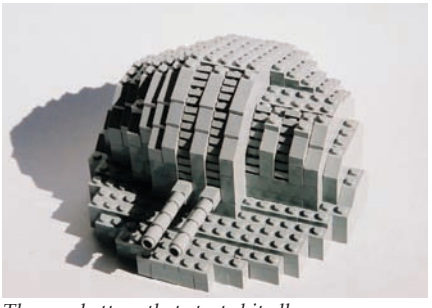
To determine what the finished size of the battleship needed to be, he calculated by using the size of a minifig a "standard" Japanese person size in 1940 and then calculated the length, breadth, height and other aspects of the vessel based on this standard.

The MOC uses mainly normal bricks for the interior structure and plates for the exterior areas. There are various special parts that he has used for the details.

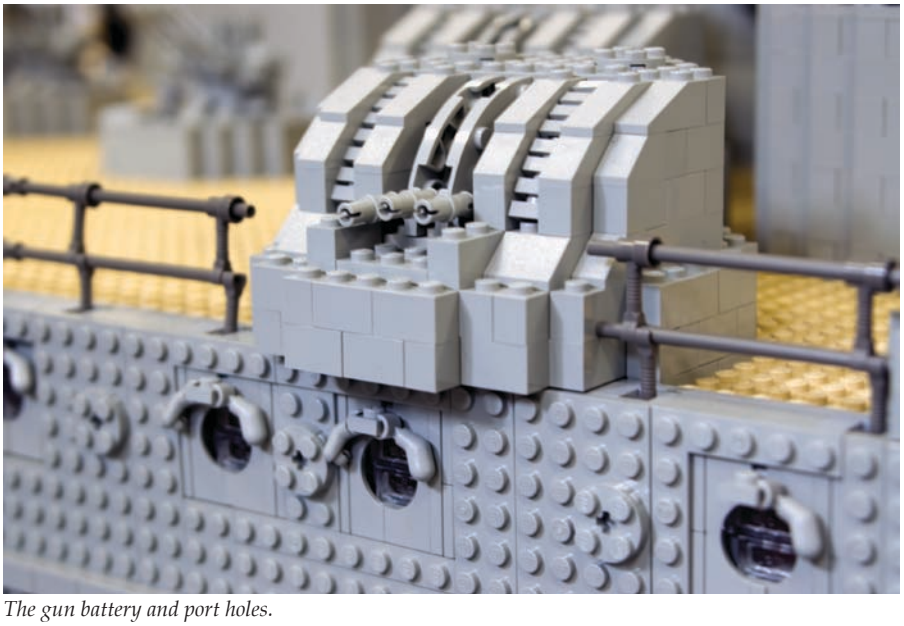
The meticulous attention to detail is incredible, from the Japanese flag made with 1x2 plates and 1x1 round plates to the biplanes on the back. He even created the two smaller vessels that the

Junpei's Doraemon.

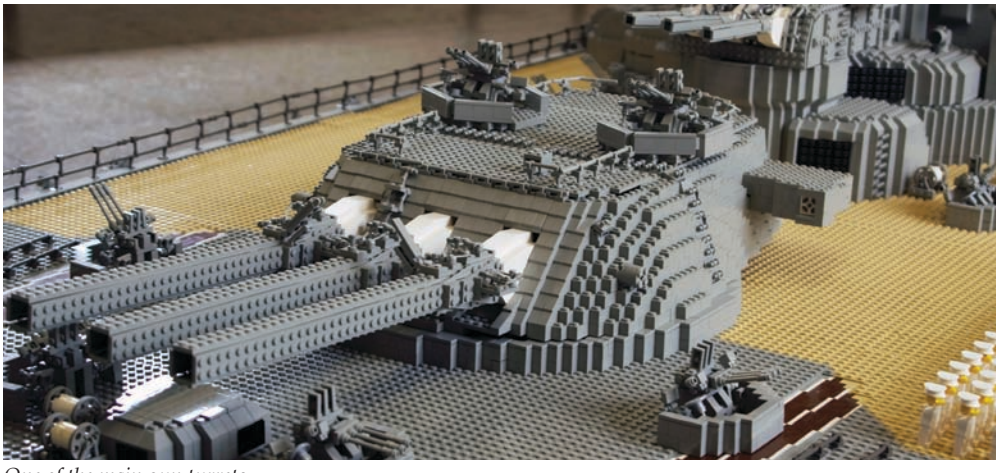
Todaiji created for the "TV Champion" show.



The gun battery that started it all.

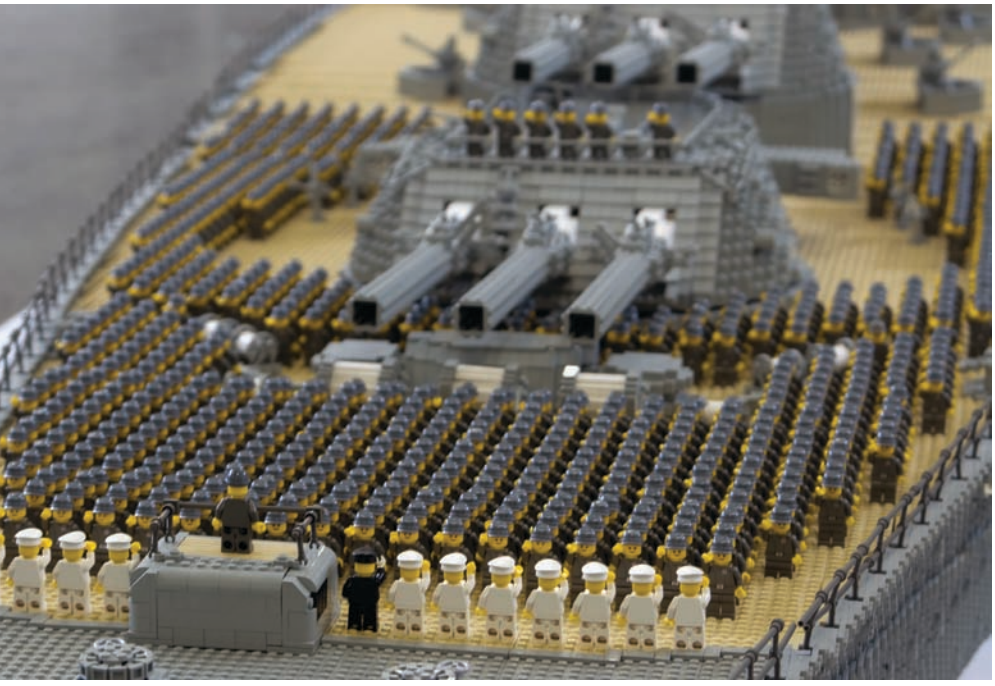


The gun battery and port holes.



One of the main gun turrets.

The Japanese flag rendered in LEGO plates.



The crewmen of the Yamato.

A biplane ready for launch.

Yamato would deploy from the back of the ship. From the ship bow to its stern, the various gun batteries, windows, railings, anchors, cranes, aircraft deployment areas, every external detail has been recreated to match the original.

He has over 3,000 minifigs on board the model, just as many as were in the original crew. The current "scene" that he has the MOC set up for is a scene from the *Yamato* movie where all of the crewmembers are on deck for a speech by the ship's admiral.

Collecting all of the bricks, specialized pieces and minifigs was a process that took many years and many Bricklink orders.

Currently the front main gun is motorized and can made to pivot left and right. It uses two large Hailfire Droid Wheels (set #4481) separated by LEGO soccer balls used as ball bearings. Gears are used to slow the pivot speed down to a speed that Junpei calculated to be as close to the actual speed of the original guns. It is run with one standard LEGO 9V Mini-Motor (part #71427c01). Eventually he would like to motorize all three of the main guns and even make each individual cannon move up and down as well.

The 6.5 meter length of the vessel is broken up into 15 sections of about 80 cm (31.5 in) each so that it can fit out of the door of his building room and be transported.

The model had been on display in a large gathering space in the same building that it was built. After looking over the MOC and talking with Junpei about it, three of us broke down the MOC and moved it piece by piece back to his building room.

The official public viewing for the model was put up on his home page on April 7th 2009. Junpei is not sure where the MOC might travel to or where it might eventually end up. Until then he hopes to continue to modify and work on the *Yamato* (even trying some realistic interior work). It is sure to bring wonder and amazement to everyone, AFOL or not, who sees it.

Home Page Links:

Mitsui-kun's Home Page:
http://www.geocities.jp/jun_brick/

Yamato Page:
http://www.geocities.jp/jun_brick/projectyamato.html

Tokyo University LEGO Club Page:
http://blog.goo.ne.jp/toudai_legoclub/

Videos:

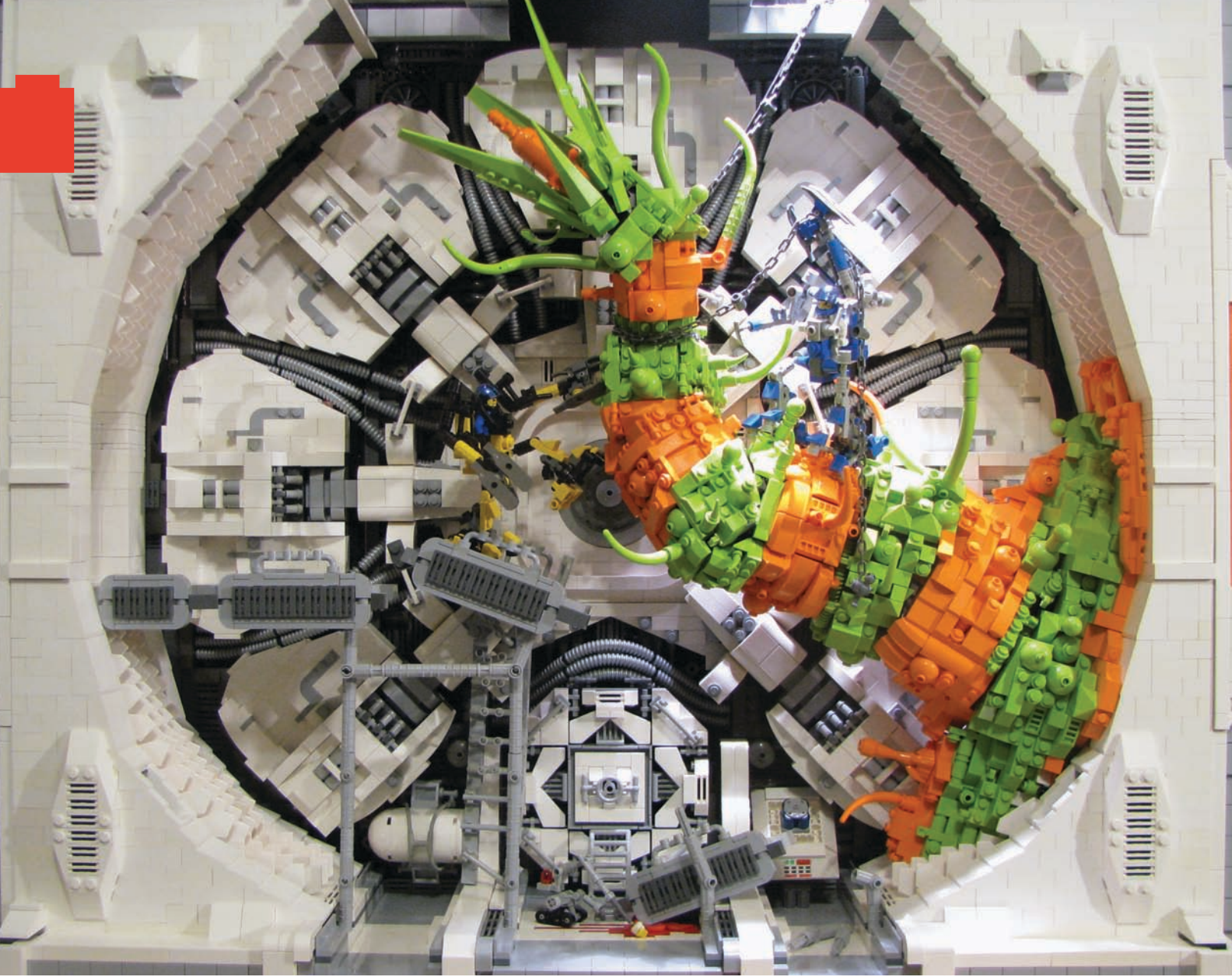
Yamato Walk Around:
http://www.youtube.com/watch?v=20iicREGgPo

Yamato Gun Turret:
http://www.youtube.com/watch?v=gU2BT8V65uE

Junpei readies one of the sections of the ship for attachment.

A bridge ready for launch.

Another look at the forward deck.



"Fighting for Life": Building an Award-Winning Model

Interview by Joe Meno
Photography by Chris Edwards

In 2008, this model won the "You Control the Action" contest. *BrickJournal* was able to talk to the builder and get a glimpse behind the scenes of this model!

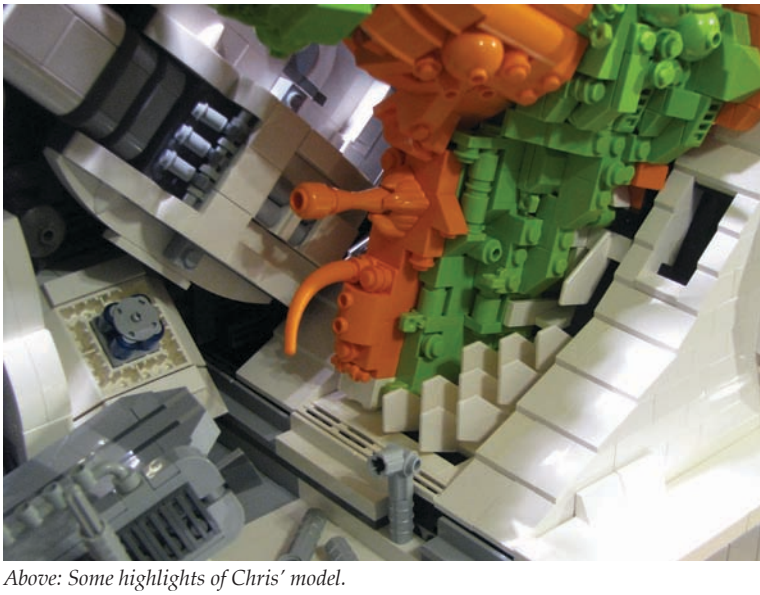
***BrickJournal:* Let's start with getting to know you. What do you do 'in the real world'?**
My name is Chris Edwards. I'm 29, I live just outside Philly, and I do internal tech support for Yellow Book (the phone book).

When did you start LEGO building? What do you like to build the most?
My earliest LEGO memory is from age 3. My pre-school class was temporarily held in a room normally used by older kids, and I got to play with some Fabuland stuff. I think I had played with DUPLO before that, but the LEGO pieces grabbed my attention in ways the DUPLO hadn't. I had some of my own before long, and I never looked back. I had a brief dark age in college, but mostly because I was separated from my collection. Two things changed that: I

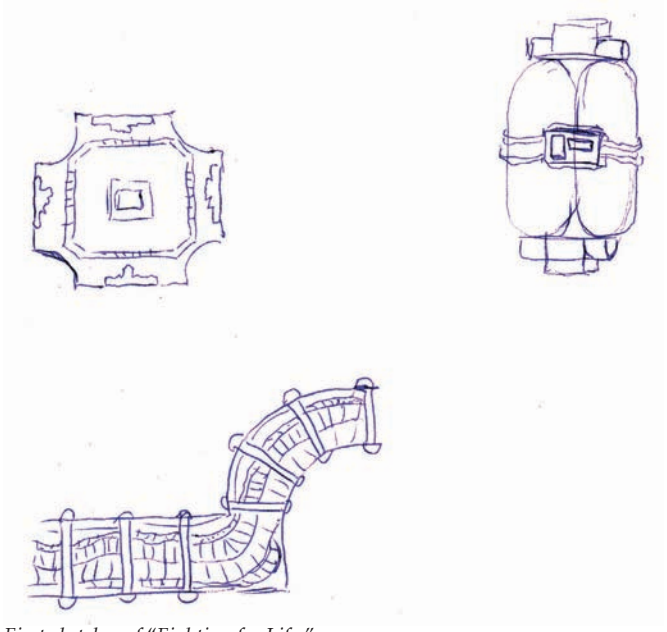
fell in love all over again when Star Wars was introduced, and around the same time I discovered Brickshelf and saw what was possible with a large LEGO collection. These days, I mostly build in two themes: castle and space (or other futuristic things). I like a lot of other themes too, but whenever I let my imagination set the course, it invariably leads to one of those two.

Can you explain the story behind your model?
The You Control the Action Contest was started by Keith Goldman in 2007. I was a huge admirer of Keith's work, with "2 Pits and a Pad" in particular having inspired me more than any other MOC, so there was no question that I would enter the contest. I started working on my entry ("Finding Hope") right away. My final entry was scaled way back from the original concept due to time constraints (I had planned to build a utopian city scene above the whole thing) and I had to rush with some of the details. Nevertheless, I was very surprised and honored to be chosen as the King of the Action! Feeling almost unworthy of that title, I immediately decided that I would have to step up to the plate and prove myself if the contest repeated the next year. Then I sort of forgot about the whole thing until late 2008.

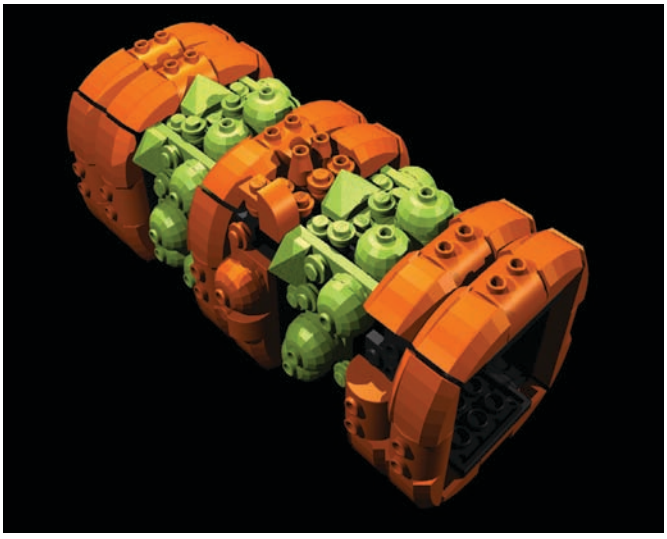
I was in Madrid for an extended business trip when Keith announced the second iteration of the contest. I started to run through some ideas for settings that I had left over from the year before. One of those ideas involved a gunfight in a zero-G environment--a large, round room in the center of a



Above: Some highlights of Chris' model.



First sketches of "Fighting for Life."



Digital render of worm segment.

Experimenting with parts - note the ring using tail fin plates.

space station. Because the theme of the contest the second time around was sci-fi horror, I knew I needed some kind of horrible creature. I chose the lime/orange color scheme as a continuation of my attempts to make bright colors scary (the castle-themed MOC "Family Reunion" was the first attempt). Within a few days, I had sketched a few things, mocked up the surface of the space worm with LDraw, and placed some Bricklink orders that would be waiting for me when I returned home. Meanwhile, I was enjoying Madrid so much that I was tempted to find a way to stay there forever (and my business trip had already expanded from three weeks to ten), but the pull of the space worm was stronger still.

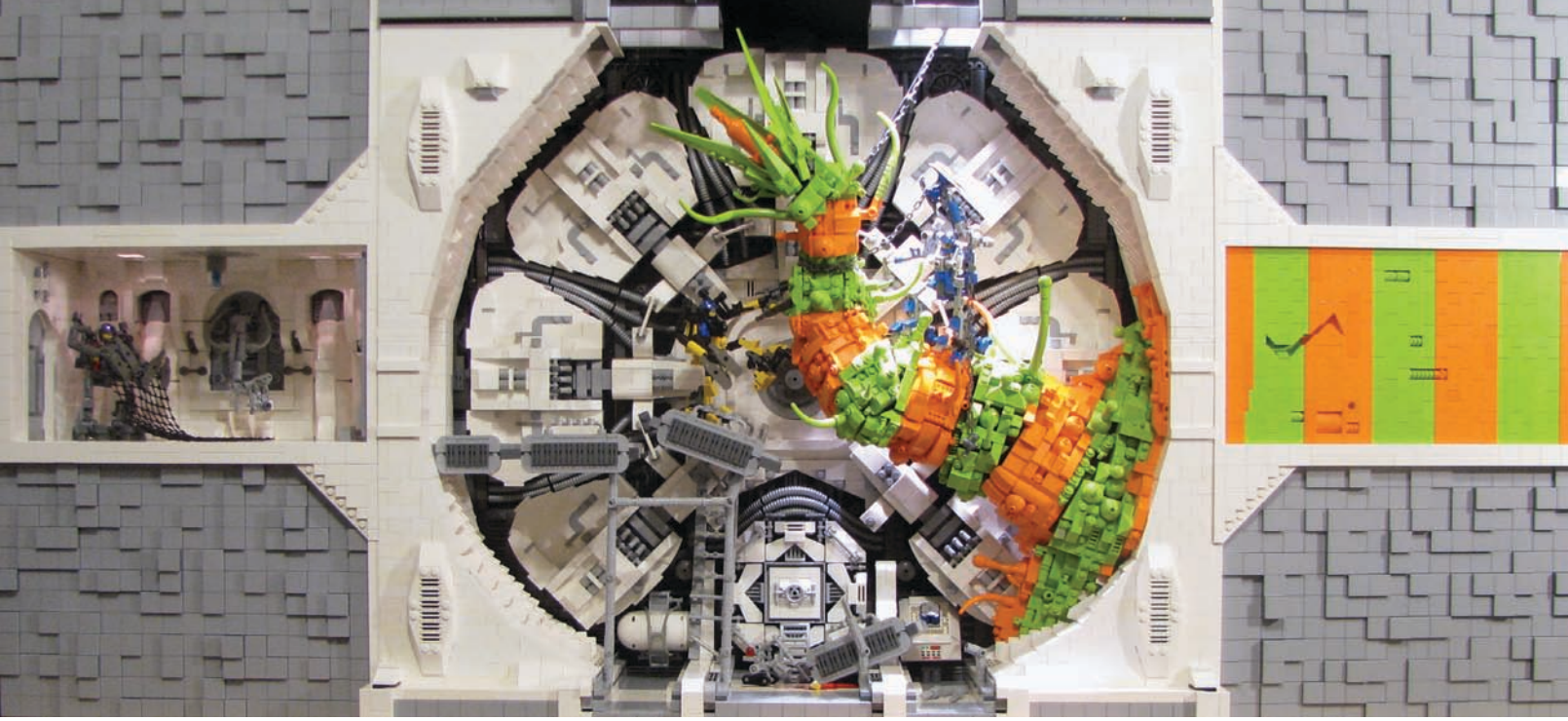
I got off a plane in Philly in mid-November, and that very same day (without even taking a nap) I was at a brand new local LEGO store whose grand-opening events I had missed out on, looking for interesting white pieces in the Pick-a-Brick wall. My most fortunate find was the small shuttle tail, of which I bought several hundred.

I started building with three main goals: to prove that I was worthy of the King of the Action title, to force myself to improve my SNOT ("studs-not-on-top") construction skills, and to create something that would make my roommate Tad, very creative himself and hard to impress, say "wow."

An additional goal was to make the whole thing morally ambiguous. It's not meant to be a story of good-vs-bad. The idea is that the humans captured a specimen (a very small space worm) and confined it in a lab in their space station without fully understanding it. There is plenty of danger (someone has already been crushed by a falling walkway), but the creature does not necessarily have murderous intentions. In the LEGO's official Mars Mission line, I actually consider the humans to be more like "bad guys" than the aliens, and I wanted to play with that idea a little bit.

How long did it take you to build, and what were some of the challenges you dealt with in building this?
I worked for two months straight (I was very glad for the extended deadlines this time around), changing things only slightly from my original idea (I ditched the zero-G because some of the things I was doing didn't fit it very well), and completed the massive construction the night of my birthday! I think the construction benefitted greatly from something that I did a little differently as compared to previous LEGO projects: whenever I felt like I was starting to lose focus or slipping into the dreaded territory of too much studs-up building, I would stop and put everything away, to wait until inspiration struck again. As the project went on, I was so pleased with how things were turning out that I never had to wait long to get inspired. Things actually went very smoothly, and the only big challenge I encountered was making sure the worm couldn't fall down. It is theoretically capable of holding itself up, but the core of click hinges (multi-angle joints) can give way if it's bumped. I ended up attaching the worm's neck to the ceiling with some LEGO string and then disguising it with the hanging chain, which in turn inspired the human characters' attempts to subdue the creature with it.

How did you create all the detail? - this won because of the levels of detail in the model.
While building Fighting for Life, I used an approach that I'm still striving to get accustomed to. Rather than building



The complete model.

from one end to the other, or from the bottom up, I started by building some small detailed sections, and then thought about how to fill in the gaps. The first things I built were the airlock door, the small center circle, one panel of fins, and a few bits of machinery. From there, I built a frame to connect it all and built from back to front. I started building the worm as soon as the frame was complete enough to hold it up. There were a lot of things that I didn't fasten securely until I was happy with the level of detail behind them. I spent a lot of time just holding things in place and thinking about how I wanted it to look. I wanted to make a scene that worked very well as a single image--viewed from one angle--and I think I put in almost too much detail for that. Looking at a small photograph doesn't do justice to the real thing.

Chris Edwards with his model.

There's also a distinct path for the eye to follow, starting on the left side to the right. You use color to do this can you talk about it?
I'm still trying to improve my graphic design skills. I didn't really have a left-to-right path in mind, actually. I visualized it as a partly symmetrical scene, with the humans and the worm each coming from one side, and the main action occurring at the center. The usage of color was all very deliberate. I made the background almost entirely monotone and then gave each major character (the worm and two of the humans) their own color scheme, with little overlap. I typically build that way; each color is given a specific role in the creation.

And one last question - what is your dream project?
My current dream project, which will hopefully come to fruition eventually, is to build a large castle situated within an even larger, complex landscape. The biggest obstacle will be finding space to build it without driving my roommate crazy more than I already have. (Sorry Tad!)

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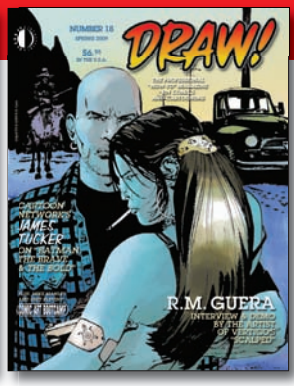

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Project Alpha: Dutch Moonbase

Photos by Joe Meno

At Frechen 2008, two LEGO fans built a layout of what they called Project Alpha, the first Dutch Moonbase. Marco Baas and Mike van Leeuwen built all the modules over four months. The moonbase took up an area of over 62 square feet and had 7 modules, each with interiors and working functions

Following are photos of the modules and their details.

Dutch Moonbase Layout

The moonbase was designed with all the components needed to sustain operations on the moon.

1. Landing platforms
2. Transferium
3. Air Factory
4. Museum
5. Living Quarters
6. Communications Tower
7. Power reactor
8. Mass Airlock

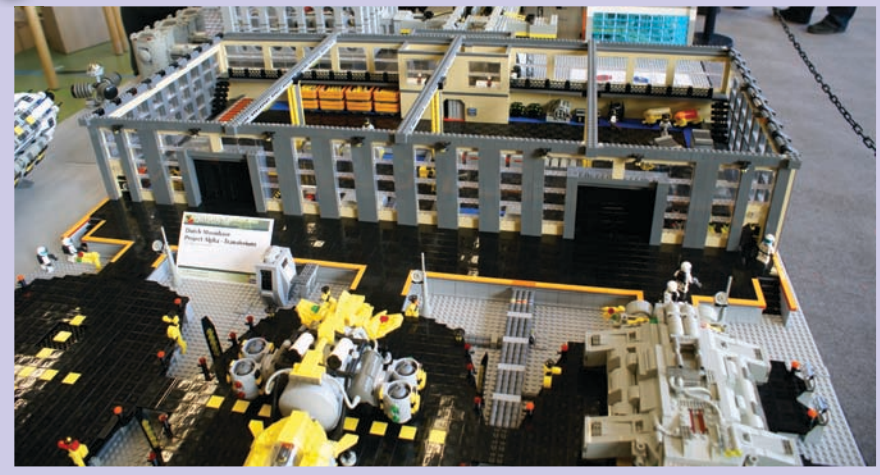
Marco Baas and Mike van Leeuwen, creators of Project Alpha.

1 Landing Platform

A spaceship awaits loading.

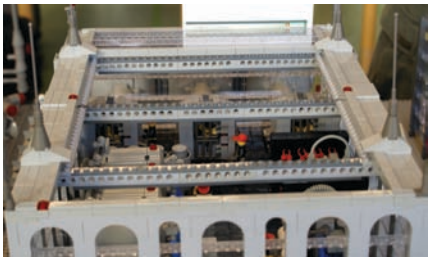
2 Lunar Transferium

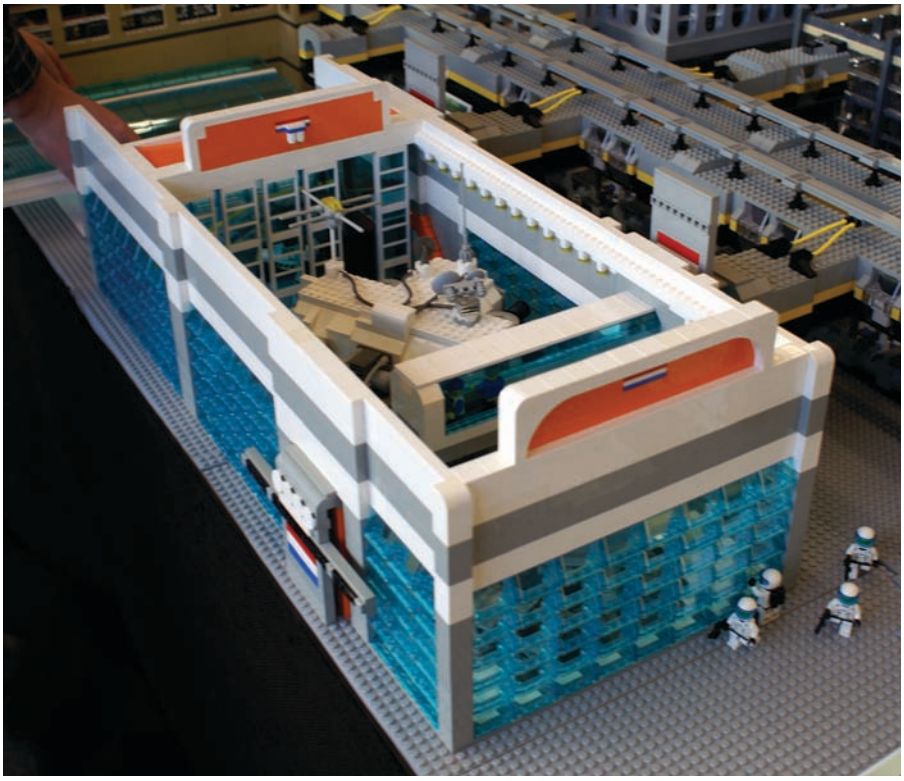
Supplies and cargo are tranferred here. The black doors are motorized.



Interior view of the transferium.

3 Air Factory
Project Alpha has a facility for atmospheric control and reclamation and filtration.



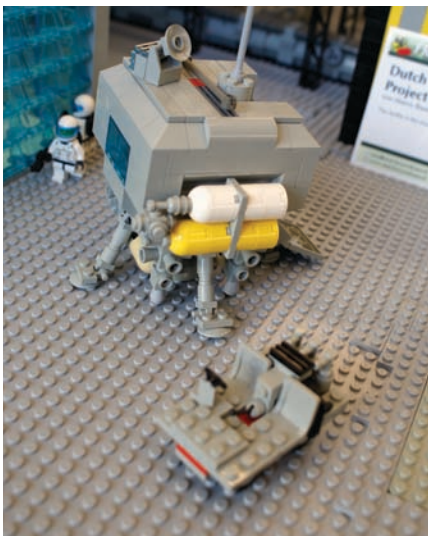


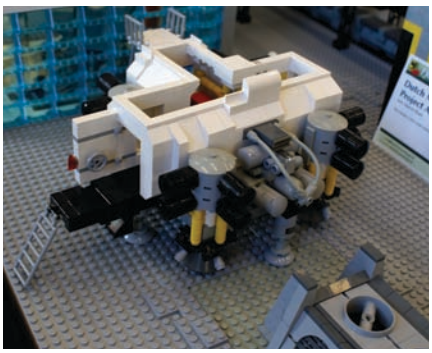
4 Museum
A module was built to display both the first Dutch lunar lander and Moonbase module and also serve as a museum for the Dutch lunar effort.

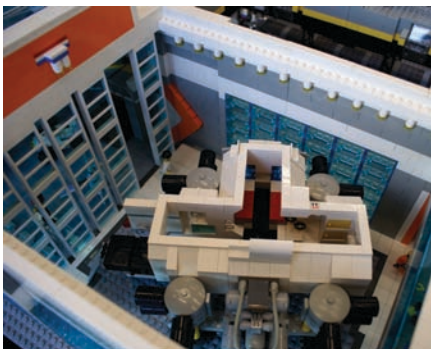
Bottom left is the first Dutch lunar lander, which also had a lunar rover.

Bottom center is the first moonbase module landed, Ekim 1.

Bottom right is the moonbase displayed in the museum.

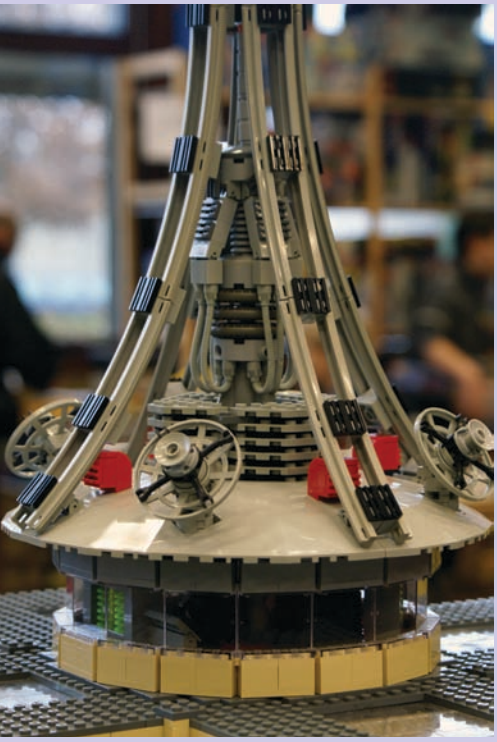


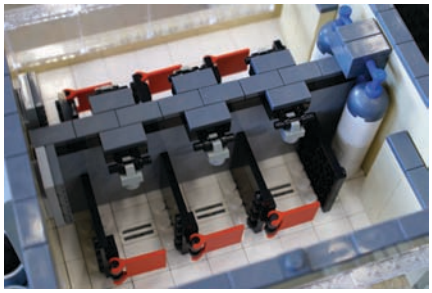


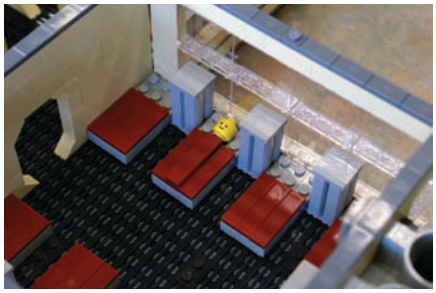


5 Living Quarters
A multilevel module, each floor has sleeping quarters (basic barracks can be seen bottom right) and shower facilities on separate wings, Offices are also here.

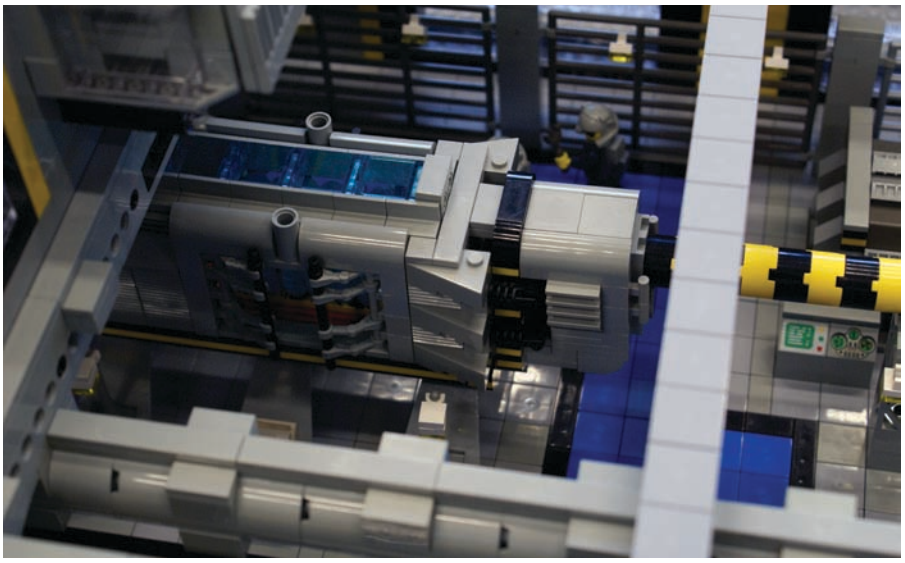
6 Communications Tower
The tallest feature on Project Alpha is the comm tower. Arrays are on the base, middle and top of the tower send signals earthward. At the base of the tower is a monitoring station for the moonbase.

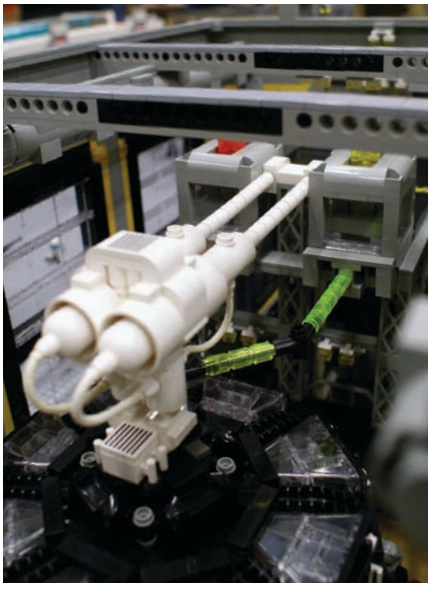


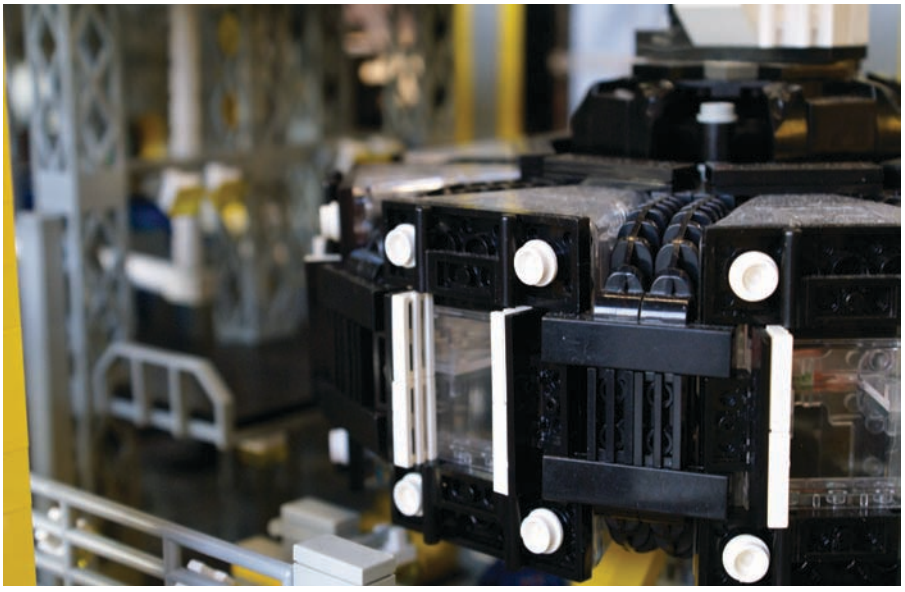




7 Power Reactor
Project Alpha's power reactor is a fusion reactor. The reactor can be seen as the black section - in operation, the unit rotates, and the energy lights up the internal chamber to the power trunks, which can be seen at the top right photo.







8 Mass Airlock
For lunar excursions, there is an airlock module, allowing for vehicles to be deployed on the surface and be serviced inside in a pressurized environment.

If you want to see the history of Project Alpha and more photos, you can go to: http://www.dutchmoonbase.com.

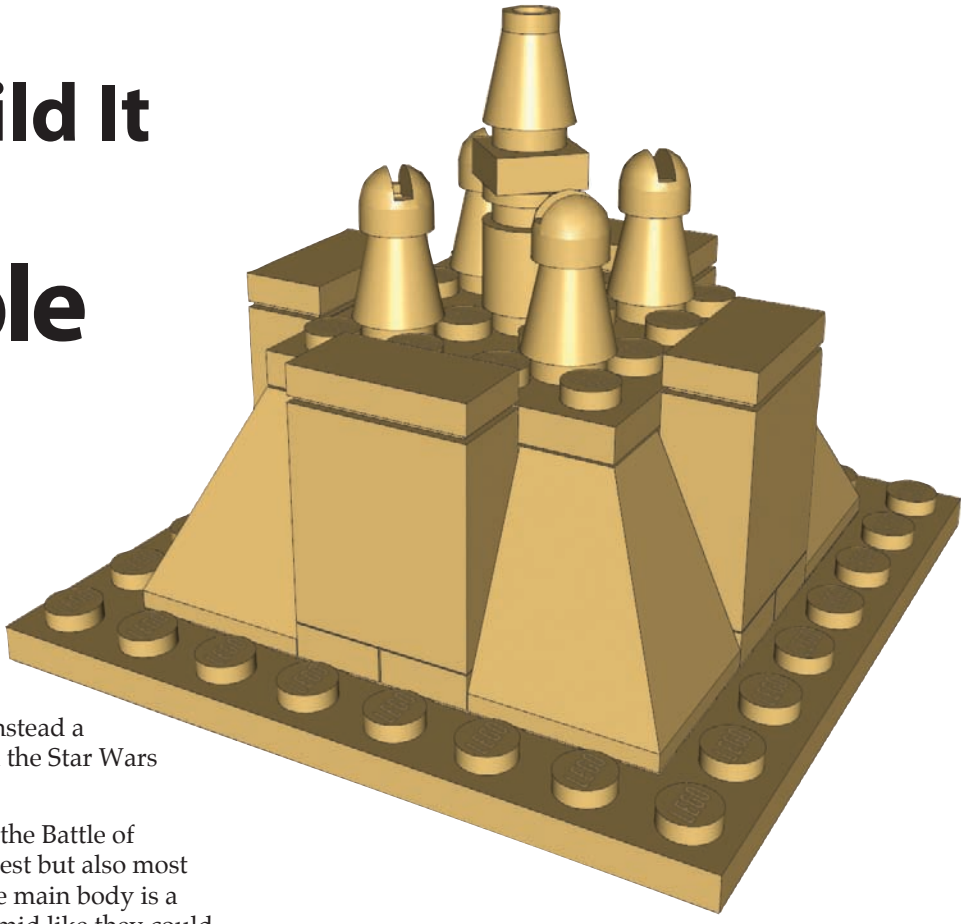
Many thanks to Marco Baas and Mike van Leeuwen.

You Can Build It

MINI Model

Jedi Temple

Design and Instructions
by Christopher Deck



Hello dear fellows, I'm certainly glad I could join again for another theme focused issue of *BrickJournal* about architecture. And that's why we're not building a mini starship this time but instead a miniaturized piece of architecture from the Star Wars universe.

Built about four thousand years before the Battle of Yavin, the Jedi Temple is one of the oldest but also most impressive buildings on Coruscant. The main body is a so-called ziggurat, a terraced step pyramid like they could be found in the ancient Mesopotamia.

Key piece for the construction of the Jedi Temple are double convex slopes for the edges. When you look at the image, everything looks pretty straight forward. A baseplate with four double convex slopes at the edges. But this impression is not what it seems to be. Double convex slopes with a height of two bricks unfortunately don't exist. And it's not a normal baseplate either.

We have to use a trick to get the correct shape at this small scale. As a baseplate we use a modified 8x8 plate with grill. This allows us to attach an inverted 6x6x2 quadruple slope in direction studs-down, which – attached in this way – looks like four single double convex edge slopes. We then stick technic half-pins in the bottom of the quadruple slope to normally attach a 4x4 plate, and are back in standard studs orientation. It's a trick no one will realize who is unaware of the non-existent 2x2x2 double convex slopes.

Of course you can use standard 2x2x3 double convex slopes for a bigger and thus more detailed model of the temple. But as a mini builder you always try to build as recognizable and detailed at the smallest possible scale, which often is more challenging.

If you want to build the bigger model nevertheless, check out http://www.deckdesigns.de for instructions.

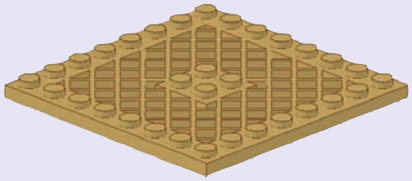
That's it for this time. I wish you happy building, and see you next time!

Yours, Chris Deck

Parts List

Numb.	Color	Part	Description
1	Tan	3062b.dat	Brick 1 x 1 Round with Hollow Stud
4	Tan	3245a.dat	Brick 1 x 2 x 2
5	Tan	4589.dat	Cone 1 x 1
4	Tan	4592.dat	Hinge Control Stick Base
1	Tan	3024.dat	Plate 1 x 1
1	Tan	6141.dat	Plate 1 x 1 Round
4	Tan	3023.dat	Plate 1 x 2
4	Tan	3623.dat	Plate 1 x 3
1	Tan	3031.dat	Plate 4 x 4
1	Tan	4151.dat	Plate 8 x 8 with Grille
1	Tan	30373.dat	Slope Brick 65 6 x 6 x 2 Inverted Quadruple
4	Blue	4274.dat	Technic Pin 1/2
8	Tan	3069b.dat	Tile 1 x 2 with Groove
1	Tan	3068b.dat	Tile 2 x 2 with Groove

1



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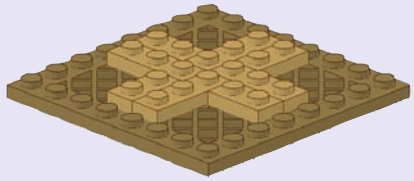

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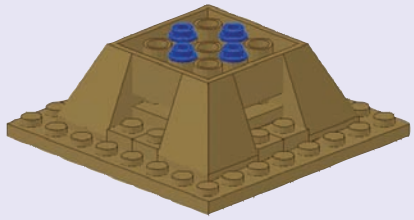

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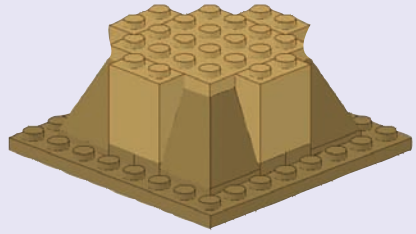

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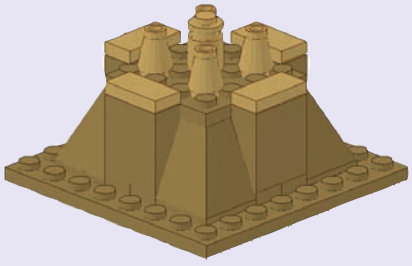

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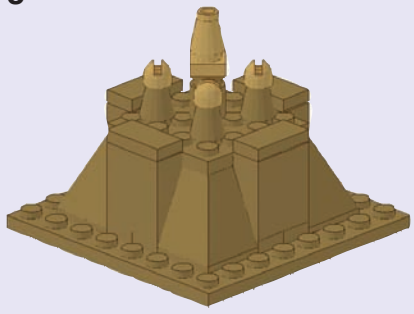

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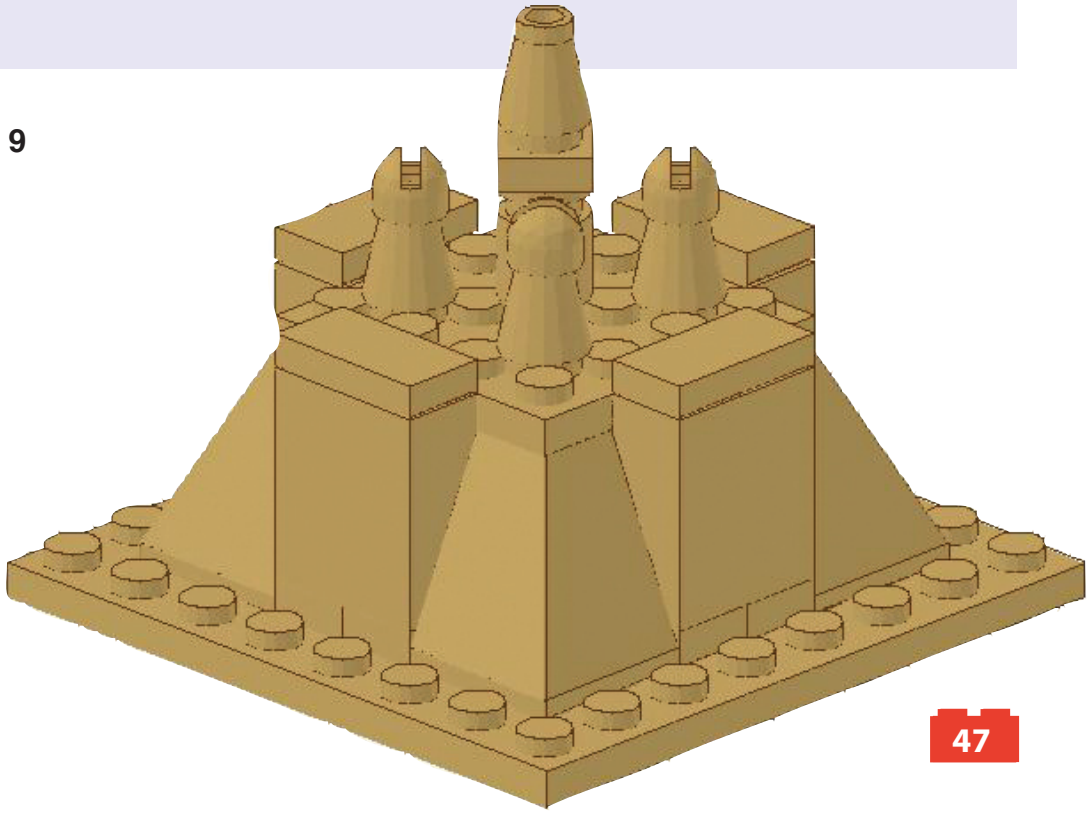
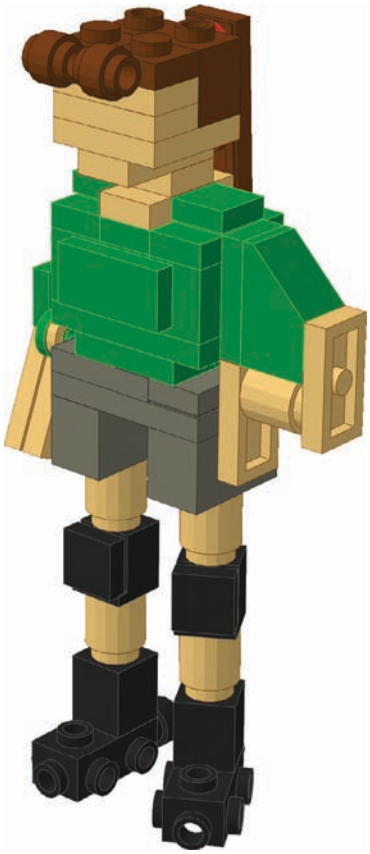


Miniland Building

The *Skater* Girl



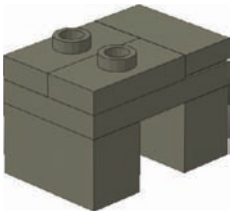
Article and photos by Didier Enjary

The skater we are going to build together today is a lovely brunette wearing a green teeshirt.It features some techniques and designs we have not studied before in the previous issues of *BrickJournal*.

First is the use of the modified 1 x 2 x 2/3 brick with studs on sides as roller skates. Originally used in the eighties as various features for space vehicles, it is used here in an original way in the Miniland world.

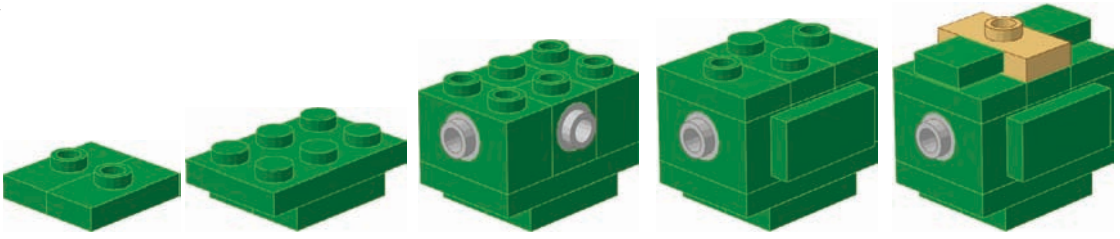
The kneepads are evoked and highlighted using the high contrast in color and shape between the black brick with tile and the tan (flesh color) round brick.

The legs are connected to the shorts in an unusual way. The top stud of the round brick is hollow and you can stack the underside bar of the 1x2 brick directly on it. This «bar to hollow stud» connection is as sturdy as the usual connection and allows half-stud offset and centered positioning. You give the character a more natural posture by slightly rotating the legs.

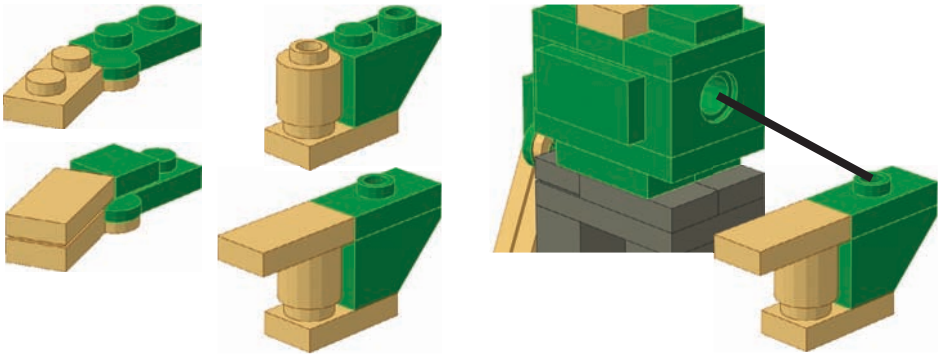


To create some sort of slim waistline, another half-stud offset technique using the jumper plate (the famous «only one stud» 1x2 plate) makes the transition between 2-studs and 3-studs wide layers.

The torso is of the female type with a prominent chest. Again, an offset technique, which allows to center a 2-stud wide part, do the trick. The 1x2 green tile is stacked on a Technic half pin inserted in a 1x1 Technic brick. Notice that the tile can slide freely as it has no underside knob.

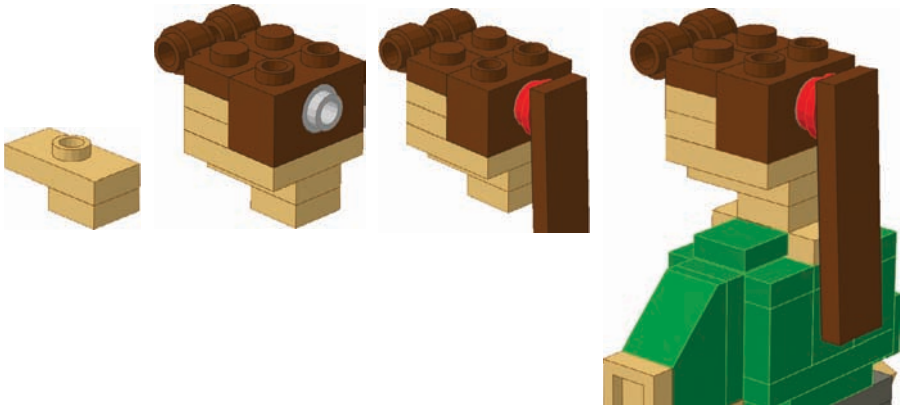


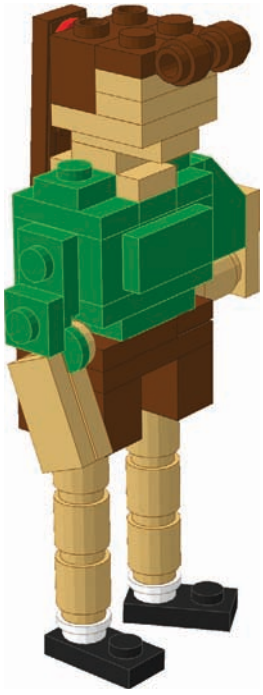
The right arm is of a well known conception - tiles stacked on a hinge. In LEGO sets, hinges consist of two parts of the same color, but nothing prevents you from using two different colors. The left arm which is based on a 1x2 inverted slope brick is held in place by a stud to Technic hole connection. With her hand on her hip, the girl is obviously waiting for something or someone.



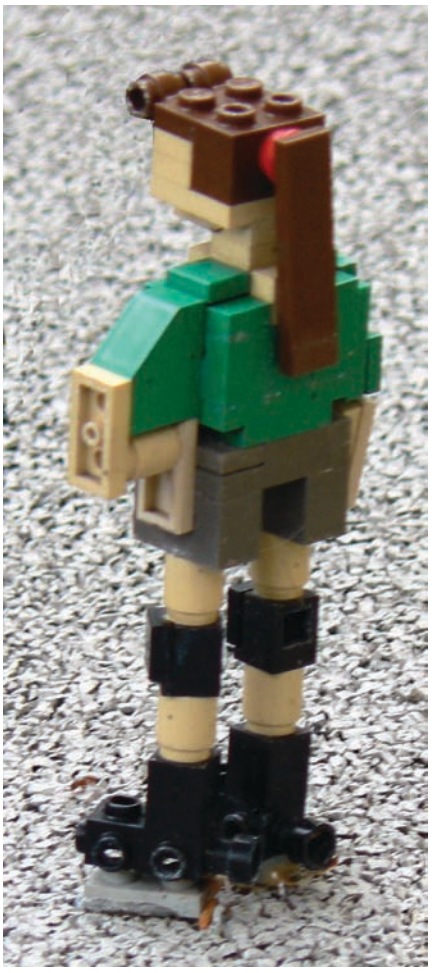
The head design, familiar to *BrickJournal* readers, features a pony tail. When you placing the head on the torso, you will notice that the 1x4 tile figuring the tail is slightly constrained to an angle in the back, without consequence on solidity.

The green 1x1 tile is very rare. When possible, substitute tiles for regular plates.





The green parts being hard to find, noticeably the 1x1 tile but also the Technic bricks, you could build a red or yellow version instead as an alternate model. However, the original model looks like a famous movie character. Take off the roller and kneepads, change the dark gray short pants for brown ones and replace the rare 1x1 green tiles with the more common 1x1 green plates. Yes, that's Lara Croft who invites you to share new adventures in the Miniland world!



You Can Build It

From Brickmodder's Lab:

Making a 'Legacy' 9v to Power Functions Adapter

Instructions and Photography by Rob Hendrix

This article will show you how to modify an 8886 Power Functions Extension Wire to allow you to use your 8884 Power Functions IR Receiver with the now "older" style 9v battery box, the 9v train speed regulator, RCX, etc. This could come in very handy in some space-constrained models (1x9v battery box) or in places where mains power was more suitable (train speed regulator).

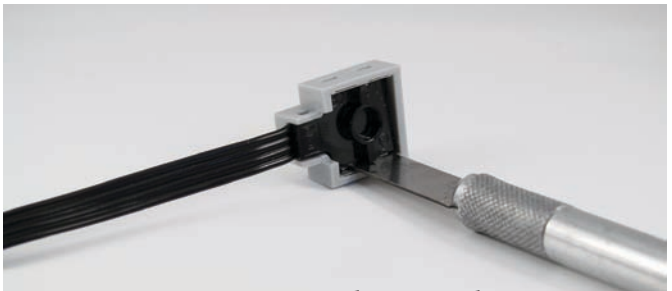
Some minor tool usage is shown in this tutorial. Small sharp tools can be very dangerous when using them as a prying mechanism as shown here. Please use extreme caution and always wear the proper safety equipment where needed. Use common sense and keep your eyes and fingers from getting cut or gouged!

Step 1: Modifying the 8886 Power Functions Extension Wire

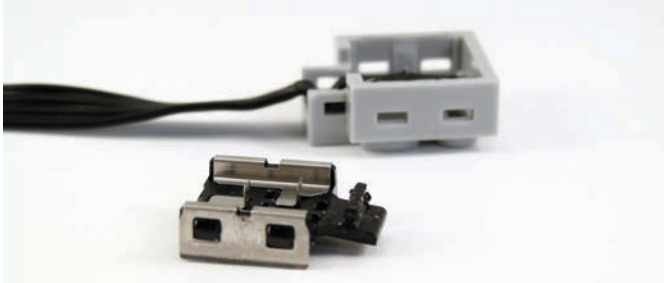
We'll be cutting this perfectly good piece modern technology, so purists beware!

Cut the cable in half. We'll be using the half with the light gray end.

Step 2: The Hard Part (Taking the Connector Apart)



Using a small flat tool, pry both sides of the gray housing away from the black insert.



This is what you should end up with after prying the two pieces apart.

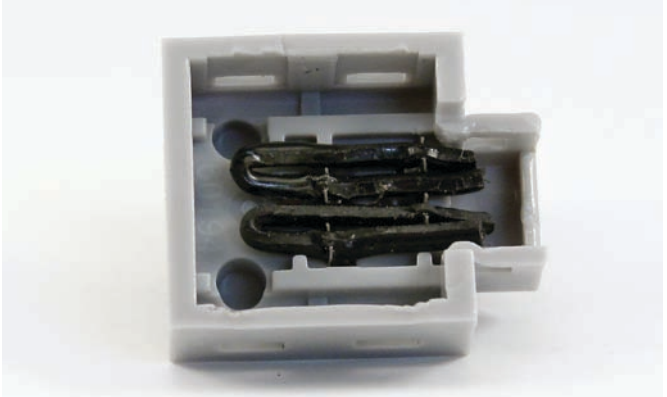
Step 3: Preparing the Wire

Remove the wire from the gray housing and cut a one-inch section from the other end.

Using a knife, split two of the wires from the four wires in the piece you just cut.

Step 4: Inserting the Wire into the Connector

Bend the two pieces of wire in half as shown.



Press the two bent pieces of wire onto the "V" notched contacts making sure the metal contacts pierce the wire jacketing. Insert the wires exactly as shown above.

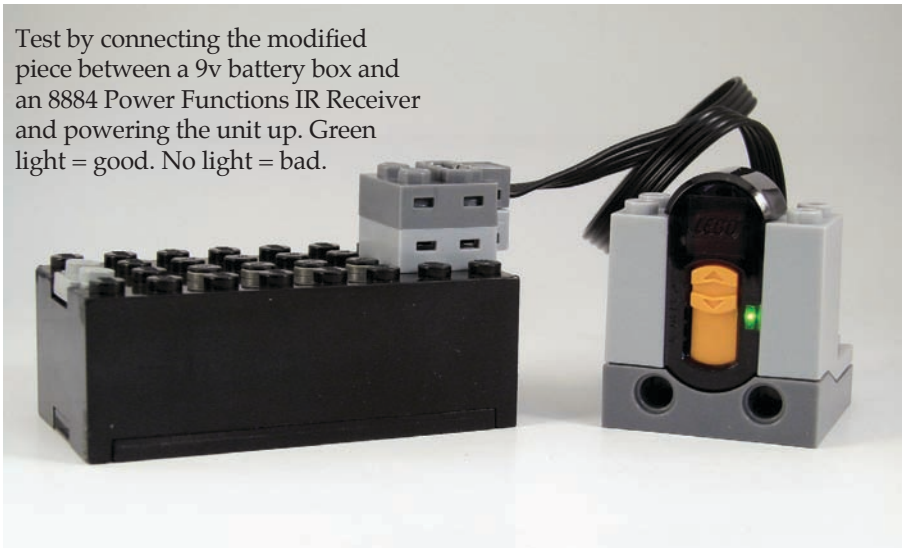
Step 5: Putting it Back Together

The black insert also has "V" notches that need to pierce the wires.

Line up the wires in the gray housing to the notches on the black insert and snap the insert back into place.

Make sure the tabs on the black insert are snapped into the holes on the gray housing.

Step 6: Finishing up and Testing



Test by connecting the modified piece between a 9v battery box and an 8884 Power Functions IR Receiver and powering the unit up. Green light = good. No light = bad.

Rob Hendrix is better known at the Brickmodder. His custom lighting sets and electronics are well-known in the LEGO fan community in North America. You can see his lighting work at www.brickmodder.net and his lighting kits at www.lifelites.com.

Advanced LEGO Element Modification

Article and Photography by Jared Burks

Previously this series has covered LEGO element modification techniques, where the tips presented were simple cut and paste techniques to get people to think outside the box and look at LEGO parts in new ways. Please review those articles for the basic techniques. Just to reassure those that believe it is sacrilegious to cut LEGO elements let's examine the meaning of the word LEGO in Latin, which means "I assemble." So let's assemble a new element by cutting, gluing, and adding to a LEGO element to create something new. Use your imagination, pull out some LEGO elements, and get to hacking them apart!

In this lesson we will be handling hobby knifes, razor blades, and rotary tools; all of which are sharp. If you are a younger reader please seek your parents' assistance in handling these items. If you are an older reader, please use care and caution; your fingers are not replaceable. Kevlar gloves are available to protect your fingers and I recommend these to all. They can be found in most woodworking/carving stores or online from hobby sites. I also recommend a non-slip cutting mat as well as good safety technique. The best lesson I have learned, after many trips to the ER for stitches, is to use sandpaper when possible as many items can be created by sanding, which is safer for your fingers.

Proper Cutting Technique

1. Always use adequate lighting.
2. Never cut towards your fingers, always cut away to avoid blade slips (Where the blade slips and can accidentally cut you).
3. Avoid holding parts in your hand while cutting. If you must hand hold a part to cut it, always wear a Kevlar glove.
4. If the part is thicker than 1/8 of an inch (Minifig handle thickness) use a hobby saw or Dremel Tool. These are much safer when cutting through thicker materials.
5. Use a hobby cutting mat and a desk or table, never cut parts in your lap or on odd or uneven surfaces.
6. Only use sharp tools, dull tools can hang and cause slips and accidents more frequently than sharp tools.

For this article will demonstrate the advanced modification techniques through the creation of a head piece for a Hawkgirl minifig inspired by the DC character. The creation of this part is going to demonstrate several techniques. Briefly, we will start with a LEGO hair piece, add a stud to attach her wings, cut down the top of the hair, add styrene supports for her mask, and sculpt the mask out of clay (We are adding the stud since the back bracket will not fit with the hair piece chosen for the project). After the initial part is created it could be molded and cast using the information in the previous articles to create a more durable plastic version.

When creating a new element like this it is important to think out the steps required in its creation. For example, if you started with the sculpting the clay mask it could be damaged by the rotary tool when attaching the stud for the wings. For this part

we are going to follow the steps below:

Creation Steps:

1. Rotary cut a circular flat spot on the back of the hair element.
2. Trim down a 1x1 round plate to the stud.
3. Fit the stud to the flat spot in the back of the hair.
4. Glue the stud in place with plastic weld glue.
5. Map out mask region on top of the hair piece.
6. Sand down the region to allow the clay some space.
7. Cut out styrene supports for wing portions of the helmet.
8. Glue supports to the head.
9. Cover in clay and shape the mask part.
10. Use hairdryer or hot water to cure clay.
11. Paint (or mold, cast, paint).

Figure 1: *This figure displays the starting element, the trimming of the 1x1 stud, the rotary tool bit used to create the flat spot on the back of the hair, the region the bit was used, the glue used, and the stud glued into place.*

There are several types of glue available. When attaching the stud to the back we will need a very strong bond. To get the best bond use a plastic welding glue (Plastruct Plastic Weld). These types of glues surface melt the plastic of the two parts and bond them together. It is CRITICAL to be careful when applying these glues to not damage the rest of the part. If you spill or misplace any plastic welding glue on other regions of the part, set it aside until the glue completely evaporates and then give it a few more minutes for the plastic to stabilize before continuing. Superglue could be used, but the strength will not be the same as that achieved when using plastic welding glue.

Now that we have the needed back stud to attach the wings (their creation will not be covered here) we need to modify the top of the head to make space for the mask. To start the area will be masked out with a marker to guide while the sanding. Using the rotary tool, with a sanding attachment, remove as much material as possible without damaging the interior structure of the hair piece from the masked region. This is needed to keep the mask from having an oversized appearance. This could be done with a hobby knife, but please exercise extreme caution. The rotary tool will make short work of the region and is much safer with the sanding attachment.

Now that we have the part prepped for the addition of the mask we need to find some styrene. Sheet styrene in various thicknesses is typically sold in hobby stores for model builders. We will use the styrene to cut out the basic shape of the mask wing and act as a support for the addition of the clay. As the front part of the mask will be too thin to hold styrene we are only adding it to the back of the mask. Styrene is an interesting item to work with; it doesn't need to be completely cut through. You can score the design and then bend the styrene and it will "pop" out.

Figure 2: This figure displays the progression of marking off the hair for the mask, removal of the area, wing supports cut from styrene and attached with plastic weld, and clay roughed out.

Once we have the basic shape cut out we can sand the two sides to make them identical. Attach the styrene to the head with the plastic weld glue.

Now that we have the clay supports it is time to add clay to the head and sculpt out the basic shape of the mask. When you are satisfied with the shape you will need to cure the clay. If you recall from the sculpting article there are multiple ways to cure polymer clay including; baking, hot water, or hairdryers. Basically anyway to heat the clay will help cure it. Since we have attached the clay to a LEGO element we can't simply place it in the oven for fear of melting the LEGO element. This leaves us hot water or the hairdryer. I prefer the hairdryer, however you can use either. If you choose the hairdryer it is best to use a lower heat setting for a longer period than high heat for a shorter period. The higher the heat the more risk to the LEGO element. Typically for a part like this (thickness) the clay will cure using a hairdryer in about 3-4 minutes. Once the clay is cured you can use a metal file to clean and accurately add the slits to the edge of the mask wing. Also, to give the clay a smooth finish you need to sand the cured clay ultra smooth. A commercial grade sand paper call Micro-mesh is great for this application. Micro-mesh sand paper is a nine step sanding process that will result in submicron scratches meaning that they are not visible to the human eye.

With the part constructed we are at a crossroads, either we paint the part or we mold and cast the part, then paint it. It is best not to paint before molding. Acrylic paints are the easiest to use. They quickly air dry with little to no fumes and clean up with water (see article on altering LEGO element colors). Now that we have the final painted part it is time to use the other techniques to finish the figure. To create the wings refer to the article on sculpting and for the decal design and application please refer to those respective articles.

You have now seen how all these techniques can be integrated let's see what you can create. Where does your imagination take you? What will you LEGO, "assemble?"

Figure 3: This figure demonstrates the finished shape to the mask. The part was then molded and cast in orange colored resin, which was sanded and painted. Once painted the eye decals were applied.

Next Time:

Minifig Customization 101 – The Minifig Customization Toolbox

2nd Anniversary of LEGO Millyard Project Completion Celebrated with Spruce-Up Event

Article by Mike Ripley
Courtesy of NELUG

On October 25, 2008 the major contributors to the building of the LEGO Millyard Project gathered at the SEE Science Center in Manchester, NH to "spruce-up" the display. Over 20 members from the New England LEGO Users Group (NELUG), Steve Gerling, Steve Witt and Megan Halpenny from The LEGO Group (TLG), Douglas Heuser and Adele Maurier from SEE, and über community volunteer Dan Faiella participated in the day long event, which was comprised of three major activities - cleaning and repairing the buildings, structures, and minifig vignettes that make up the display, building new content to add to the display to enhance the look (trees, wagons, etc.), and overhauling the train/camera system to ensure its continued operation. Much progress was made on all of these activities, providing the public with a cleaner, more enhanced display.

The LEGO Millyard Project began in 2001, when SEE Science Center benefactor Dean Kamen (inventor of the Segway PT) and TLG owner Kjeld Kristensen agreed to sponsor a project to recreate out of LEGO bricks a scale model of the Amoskeag Millyard complex built along the Merrimack River in Manchester, NH as a permanent display in the SEE Science Center. Through the generosity of the museum's board of directors, space in the mill building where SEE is located was secured, renovated and a 22'x95' (6.7m x 29.2m) deck was built on which the layout was built. The deck includes three different levels to simulate the slope of the land along the river, and a running water system where the canals and river are. TLG donated the brick for the project, and time for two master builders to work on the project.

As was immediately apparent to Steve Gerling and Erik Varsegi, the two LEGO Master Builders assigned to the project, in order to fill over 2000 sq. ft. (over 195m^3) with LEGO buildings, structures and vignettes, they would

need to work the project full time for years (which was not possible as they needed to maintain their full time jobs in Enfield), or tons of help was needed. The museum offered to call on the public for community volunteers to help, but some LEGO expertise was still needed to oversee and guide the building of the mill buildings. And, for more complicated buildings and structures, running trains, and minifig vignettes, people who do that kind of thing were really needed. Perhaps some AFOLs, or a LUG that has built city/train layouts... and that's where NELUG - the local AFOL group with a long history of doing large LEGO train/town layouts in the greater Boston area - came in.

In 2002 NELUG was approached by Erik and Steve to see if there was interest in the project. Steve and Erik were not sure if this was going to work, as the size, complexity and duration of the project necessitated a major commitment on the part of NELUG members. They even brought small LEGO sets to hand out at the initial meeting as a gesture of goodwill. The members, of course, saw it differently - who wouldn't jump at the chance to build with two master builders on a major project sponsored by TLG?

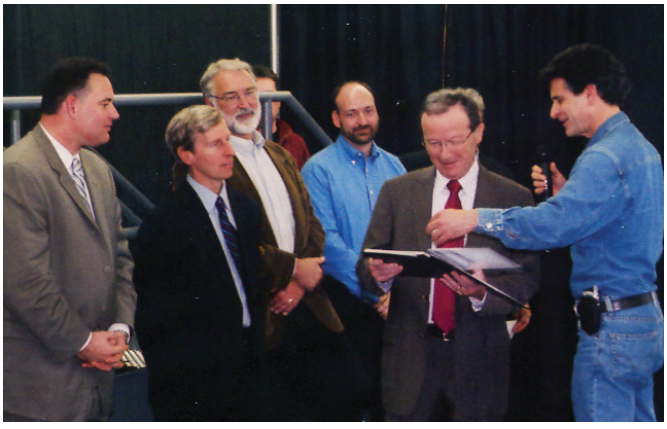
So on the weekend of October 16-17, 2004 Phase I of the LEGO Millyard Project was held. Steve and Erik did the basic building design, with input from NELUG. The mill buildings were designed so they could be mass assembled using sub-assemblies that were built by volunteers. Having sections of the mill buildings already built greatly sped up the assembly of a mill building, and allowed the less experienced volunteers to contribute in a very meaningful way. During the public building events, NELUG members oversaw the creation of mill buildings, helped organize volunteers for the sub-assemblies, and worked on more complicated non-mill buildings and structures for the layout.

Because the real mill buildings were all built using bricks and mortar, that effect was needed in the LEGO mill buildings. In order to get this effect, both old and new brown bricks were mixed together to build the mills. In order to mix such a large quantity of brick, Erik and Steve ended up dumping them all together on the floor and walking through the pile until they were mixed! The difference in shades makes for a nice brick-like look. An interesting coincidence of the overall timing of this project is the fact that had the project occurred 5 years earlier or 5 years later, not enough brick of both colors would have been available to do this.

For the layout itself, it was decided to pick around 1900 as the time period to model. This was before the decline of the textile industry in New England, trains had already been invented and were in heavy use to support the industry, but cars and trucks were not, allowing for horses and wagons to make the layout more interesting. In order to be as historic and accurate as feasible, scale models of the buildings were built and properly spaced on the deck. Extensive research was done to ensure the look of the LEGO Millyard was as accurate as possible. The Millyard Museum (located in the same mill building as SEE) was frequently used to depict the buildings and vignettes as true to the time period as possible. A plan of the Amoskeag mill complex from this time period was found, which formed the basis of the layout. Buildings that still exist were measured and photographed, and each was built according to these resources. Old photos were found for the buildings that have been torn down and were used for the rest.

Sprucing up the layout.

A cutaway view of one of the mills.



Dignitaries at the opening of the Millyard. The man holding the notebook is Kjeld Kristiansen of the LEGO Group, with Dean Kamen to the left side.

Building from Pictures

Because the time period chosen was around 1900, several important buildings that were part of the Manchester landscape of the time no longer exist. In those cases, buildings were created using old photos and postcards. Two buildings in particular, the old Manchester Train Station and the Franklin St. Church, were built using only historical references. The builders of the train station had many pictures and postcards to go from, and were able to create an exquisite replica. The builders of the Franklin St. Church only had one picture go to by, so several 'artistic liberties' were taken to create the final product.

At the time, 9V trains were still alive and well. The trains and track are therefore all 9V. But soon after the project began, the museum expressed a desire to put cameras in the trains so a live picture could be transmitted to a screen for visitors to see. It was a great idea but added immensely to the complexity of the trains. First, a decent camera and wireless transmitter system was needed. Since the model train hobby had been doing this for years, this was not a major problem. Also, several NELUG members had already built trains to do this for our layouts, so there was some knowledge about the cameras and building them into a LEGO train. Next, enough and consistent power was needed throughout the track to keep the trains going and the cameras on. Tests revealed that standard 9V transformers and power connectors were just not designed for this type of application. The museum is open 8 hours a day, 7 days a week, and the trains/camera run continuously during this time. Thanks to the electrical engineering expertise of several NELUG members, a custom power system was designed and installed. Time period locomotives were built with cameras and wireless transmitters installed, using custom connectors to standard 9V motors. The design also allows for museum personnel to swap out 9V motors when they wear out.

As the mill buildings began to populate the front section of the layout, it was realized that both some variety was needed to make the display more interesting, and something was needed to draw people to the back of the layout. Even though out of place with where it really is in relation to the Amoskeag mill complex, several iconic features of Manchester were built and placed on the layout. This proved to be a special bonus for the members of NELUG, because due to the wide variety of parts needed; the buildings for downtown could only be built in Enfield! This necessitated several building sessions in CT and then transporting the final products to Manchester.

First, a model of downtown Manchester itself was built, including the town hall, library, cigar building, Franklin St. Church, and a vibrant farmers' market. Next, Pine Island Park was recreated, which was a favorite place to enjoy Sunday with the family, including the old wooden roller coaster and swimming pond. Although not built until 1937, the iconic Notre Dame Bridge that spanned the Merrimack was also built, using all sand green elements to represent the original green steel structure. Lastly, the old Manchester train station was built using pictures from old postcards. Pine Island Park, the Notre Dame Bridge and the old train station no longer exist, but several times during the project older visitors to the museum exclaimed in joy at seeing the old structures from their childhood.

Despite wanting to add more and more to the layout, eventually it became time to end the project. The dedication was held on Nov. 29, 2006 and was attended by Dean Kamen, Kjeld Kristensen, the governor of NH, the mayor of Manchester, Steve, Erik and many TLG employees from Enfield and Billund, most of the NELUG participants, SEE Science Center staff and board members, several AFOLs (including our very own Joe Meno!), and many of the community volunteers who helped. NELUG, Erik and Steve were presented mementos from SEE, and NELUG presented Kjeld, Steve and Erik with official NELUG shirts. But the highlight of the event was all of the excitement and praise given to us by Kjeld himself. He truly loved the layout and marveled at all of the buildings, structures, trains and

vignettes that were created.

All in all, the project took 9 phases at the SEE Science Center and several more in Enfield to complete over the course of 2.5 years, and used between 2-3 million pieces. Most of the NELUG membership participated at some point in the project, as well as family members and numerous community volunteers. Erik and Steve stayed with it the whole time, and Douglas and Adele were gracious hosts throughout. The LEGO Millyard is the largest minifig scale display in North America, and is listed by the City of Manchester Dept. of Tourism as one of the major points of interest for visitors to the city.

Two years later, it felt like we never stopped. Everybody who helped with the spruce-up had a great time working on the layout again. With Erik, Steve, Douglas, Adele and all the members of NELUG there, it hardly felt like two years had gone by. The only real visible sign of time was the dust, and how much Dan Faiella (now 16) had grown. For the members of NELUG, it was the experience of a lifetime - and we even impressed Kjeld!!

For general information about the SEE Science Center please visit: http://www.see-sciencecenter.org/

For information about the Amoskeag Millyard please visit the Manchester Historic Association at: http://www.manchesterhistoric.org/

Videos from the trains traveling through the LEGO Millyard can be found at: http://www.youtube.com/user/IkVar77

For pictures and stories about the LEGO Millyard Project please visit: http://www.nelug.org/article.php?story=20061130213415274 and http://www.nelug.org/mediagallery/album.php?aid=254&page=1

For general information about the New England LEGO Users Group please visit: http://www.nelug.org

We also recommend that you search on-line for 'LEGO Millyard' to find many other resources about the display.

Coaster Building Overseas

While all of the LEGO structures have stories about their creation, the wooden roller coaster is particularly interesting. When the LEGO Millyard Project began, Jamie Berard was an AFOL, and as a NELUG member, volunteered for several of the building phases. After being hired by TLG and moving to Billund, Jamie monitored the progress of the project in the NELUG member forums, and when he saw that planning was underway to recreate Pine Island Park, he volunteered to build the roller coaster (note – Jamie is a huge roller coaster fan!). He coordinated the size and scale on-line, built the roller coaster in Billund, and arranged to have it flown over to the USA with Kjeld Kristensen when Kjeld came for the dedication ceremony. A custom made box arrived at the SEE Science Center 2 days before the dedication, and after carefully opening the box the completed roller coaster (with very minimal damage that Steve Gerling repaired) was placed on the deck and ready to go!

Building the Afro-American Cultural Center

Article by Mariann Asanuma
Photography by Geoff Gray

Many LEGO hobbyists young and old make buildings of one sort or another. Depending on their LEGO supply or the building that they choose, their model can range from several inches in height to several feet. They can make the models whatever way they want. Whether real or imaginary, big or small, micro or minifig scale, it's all up to them. When making commissioned models as a LEGO artist, however, it's a little different.

In January of 2009 I was asked by the Main Event and Pride Communications in North Carolina to build a replica of the Afro-American Cultural Center (AACC) during the Lowes Pride Awards in Charlotte, North Carolina.

Although I would be 'building' the model at the event, the actual process of building and designing took place in my LEGO studio at home. Despite the fact that this was a fairly simple project I ran into a few design challenges. The first obstacle was the lack of reference materials I had. Now normally when designing a building I prefer to actually go to the location and take my own pictures. That way I can pay attention to all the little details that the average person would most likely not look at when they see the building. If it is a relatively famous building like the Empire State Building or Seattle's Space Needle, for example, you can often find pretty good images on the internet. If at all

possible, I like to have the blueprints or original design images of the building as well, since that will render all the proportions accurately.

For the AACC however, my client gave me only *four* reference photos – the front, back, and each side of the building. Through my own research online I did find a couple of other images (one an artist's drawing) but that was it! To put this into perspective, when I worked at LEGOLAND California and we built Miniland Las Vegas in 2007 we had hundreds of images for each hotel that we created; consisting of wide-angle shots all the way down to the kind of doors and trash cans each casino has. Just to build my version of the MGM lion sculpture I had nearly fifty images of that part of the MGM Grand hotel.

So, with only a handful of pictures I went to work. My client had asked for a roughly two foot square model (it ended up being two feet wide by three and a half feet long by two feet tall). Using that as a starting point I began to draw out my building's design on brick paper (LEGO graph paper). Because the two sides of the building were mostly a mirror image of each other, I decided to only draw half the building. By visually estimating the building's dimensions from the pictures, the first part that I designed was the front doors. Determining the door size was crucial to the rest of the building process. Once I knew the size for the doors I could extrapolate everything else – the columns, windows, etc.

Early on in the design process I had to decide whether or not I wanted to use arch elements. This was a major decision because although arch elements are convenient, they also can somewhat limit what you can do build-wise in a model. After some quick but careful consideration I decided that for this building the arches would work in getting the look I wanted.

Due to the repetitive nature of the doors and windows in this building, I did very little actual prototyping before I began to build the final model. Most of the model design was done on the brick paper instead of building with bricks. By doing this, I saved myself a lot of design time because it is much faster to erase a drawn line than to take the bricks apart and start over when I make a mistake.

Once I did start the final model I began the foundation layers (the first two or three rows) of my building and added an interior bracing structure for extra support. Because of the building's relatively small size, as noted above, it only needed bracing on the top and bottom of the model.

When I was finally done with my model (after two and a half weeks worth of work) I was not finished. Remember – I was to build it at the event. So, as soon as I finished I had to take the model apart again.

Now you are probably asking yourself, "What? How can she re-build a model that took so long in one day?" Well, there is a trick to it. I didn't completely take apart my model. What I did was take it apart in sections and chunks – windows, doors, walls, etc. – and put each section in bubble wrap. I also used clear tape and wrote notes to myself on the inside of each section telling me where on the building it came from.

Construction Photos

by Mariann Asanuma

Mariann and her model.

So, although I was only in North Carolina for a couple of days, I had to take two large suitcases literally jam-packed with my model and some extra LEGO bricks. My bags were so stuffed I barely had room for my clothes!

Knowing how well the airlines "respect" a person's luggage I gave myself an extra day prior to the event in North Carolina to repair all the damages the flight inflicted. It took nearly half the day to rebuild all the broken sections.

Even with all my careful planning I have to admit I was a little nervous in the hours before the event, wondering whether or not I could get it all finished on time. As the event progressed, I found that my worries were groundless. With all my little notes and careful planning it was like assembling a puzzle into which I knew where all the pieces fit.

At the end of the night the model was formally presented to the Afro-American Cultural Center and will eventually be on permanent display in downtown Charlotte, North Carolina.

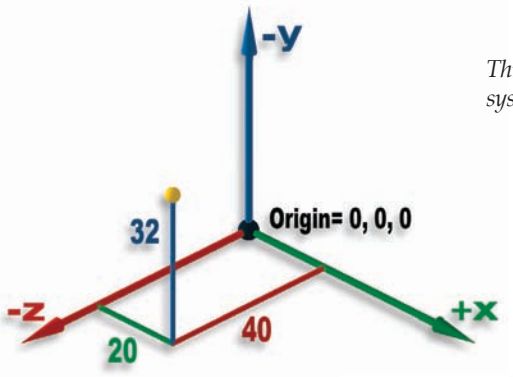
Bits 'n Pieces

Many people build models virtually with editors like MLCad, Leo, SR 3D or Bricksmith but just a handful know how to create a part for these programs to use or what's needed before a part can show up in the preview window of your preferred building editor. Here's a crash course in LDraw part authoring and learn that you don't have to be a math guru or hack your way through a jungle of ones or zeros.

Article and renderings by Willy Tschager

Authoring an LDraw part is like playing with LEGO bricks where loads of single pieces are going to model a complex shape – with a tiny difference: instead of thousands of different bricks you only have five basic elements, but you can arrange them at any angle and in every size. But before you learn how LDraw parts authors bake them into a simple Plate 1x1 or a complex Bionicle claw, let me first guide you through an elementary class in geometry .

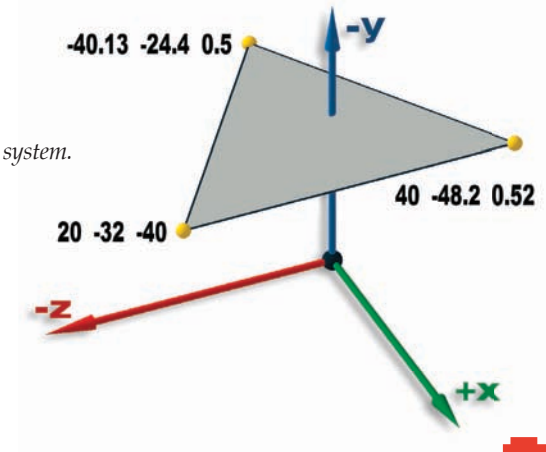
The Cartesian coordinate system and beyond. Got one of those fancy gadgets where you can hammer in some GPS coordinates instead of your mother-in-law's home address? Add a third figure and you've defined the location of your first point in the three dimensional LDraw universe. Starting from a defined point called "origin" where all values are zero, you move the point (the mathematical terms is "vertex") on all three axes gaining "length", "width" and "height". Since mathematicians are known to be lazy people, they use x, y, z instead and the vertex in the picture would be defined as "20 -32 -40" because LDraw uses a right-handed coordinate system where -Y is "up". When I started authoring LDraw parts back in 2002, I didn't remember much math but I recalled that I need at least two vertices to define a straight line and three vertices to describe the simplest surface: the triangle! (OK, the code-gods down here at LDraw.org would argue that a disc is even simpler but since the LDraw system knows nothing about "Area = $r^2 \cdot \pi$" I think it's OK.)



Three dimensional Cartesian coordinate system in a isometric projection

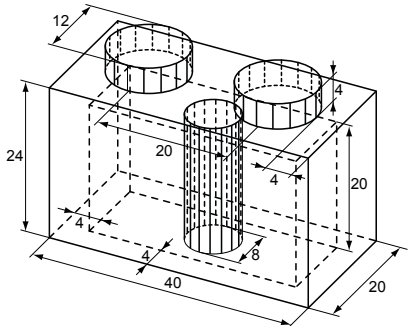
Opening an LDraw file in a text editor, you would see thousands of numbers piling up row after row and if the triangle shown in the image would be part of it, its code would look like this:

3 6 20 -32 -40 -40.13 -24.4 0.5 40 -48.2 0.52



Coordinates of a triangle in a 3D system.

You'll surely recognize the first set of three numbers (also known as a "triple") are used to indicate the first vertex and have figured out that the second and third triples are the other vertices of the filled triangle. The very first number

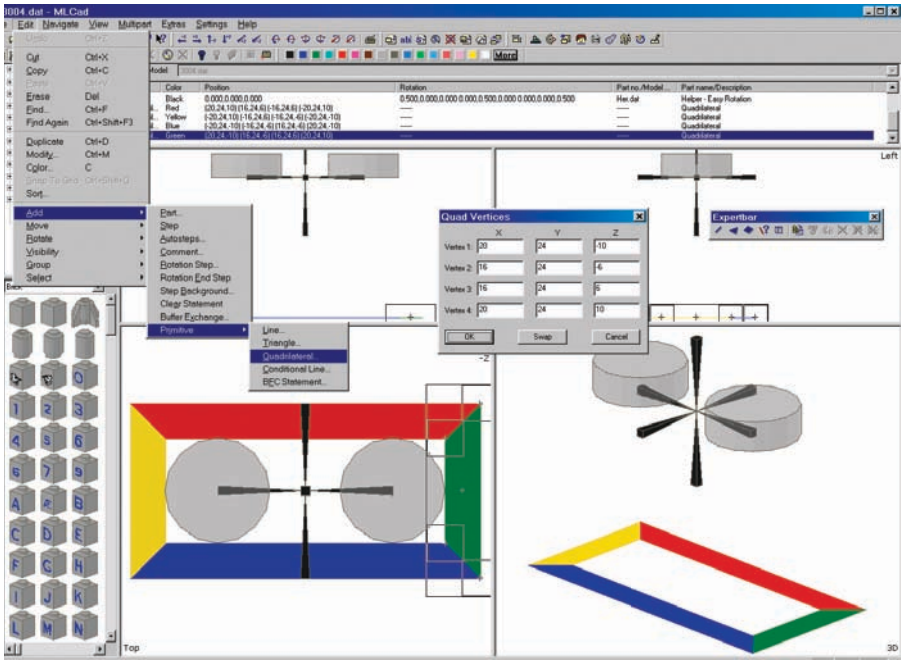


A Brick 1x2 with LDU measurements.

called "line type" tells the programs that in this case they are dealing with a triangle and that three triples have to be calculated. The line types range from 0 to 5 and the LDraw File Format Version 1.0.0 lists them as:

- 0: Comment or META Command
- 1: Sub-file reference
- 2: Line
- 3: Triangle
- 4: Quadrilateral
- 5: Optional Line

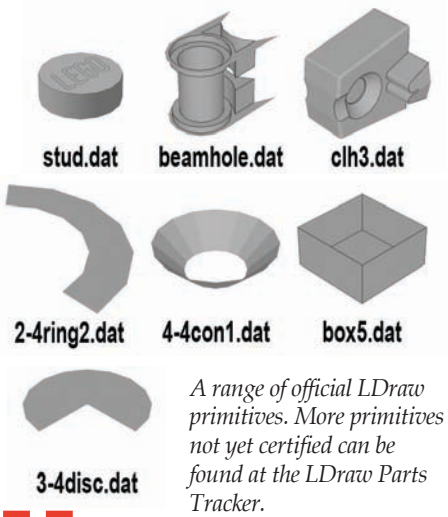
These are the "bricks" an author has at his or her disposal, and that's all that's needed to build the brick 1x2 I'm going to author. The explanation for one entry in the line is missing, right? The number in second position represents the color of the part – according to the LDraw color table "6" is Old Light Gray.



Screenshot of MLCad showing the black Helper setting the part's Origin and the vertices of the green quadrilateral. Select Edit -> Modify... from the menu bar or double click the selected element in the parts list pane to edit the coordinates of the elements

Preliminaries. The first step in re-engineering a brick into its CAD format is measuring the real part with a caliper or a micrometer screw and converting the millimeters or inches into LDraw's own measuring units: LDraw Units (LDUs) where 1 LDU corresponds to 0.4 mm or 0.016 inch. A handy tool to use for these conversions is LDCalc, an LDraw Calculator written by Michael Heidemann. Some people measure all lengths in one rush and draw a rough sketch before they start working, while others proceed step-by-step and go back and forth between the real part and its digital counterpart. There are even more variations when it comes down to tools and the ways authors code a part. Some use commercial CAD tools like AutoCAD, SolidWorks or Maya, while others are happy with the available LDraw tools and editors like MLCad or LDDP, whereas very nerdy hardcore part authors program their own tools or hack an OpenOffice Calc spreadsheet.

Coding with MLCad. A simple part like a 3004.dat - brick 1x2 can be assembled in MLCad without much effort just like building a model out of bricks. The first step is defining the origin of the part. This is usually the top from where the studs rise, but checking back with already existing parts helps a lot. To get visual feedback I use a special helper part I have written. I also take to heart a hint given by Niels Bugge in his Reviewing-Parts tutorial (found online at: http://www.l3go.bugge.com/articles/Reviewing-parts-tutorial.shtml): "a good way to arrange a part is much like an onion is structured, in a logical sequence with the innermost objects first and the rest of the file slowly growing out from there."

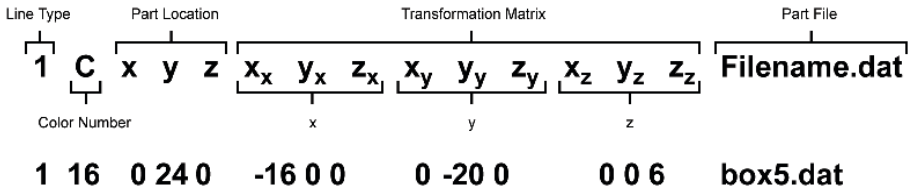


A range of official LDraw primitives. More primitives not yet certified can be found at the LDraw Parts Tracker.

The bottom rim, 24 LDUs below the origin, is made of four quadrilaterals (the CAD-jargon uses "quad" for abbreviation) arranged in a way to avoid a so-called T-Junction. Most authors also color the single sections to better distinguish them and assign the usual LDraw main color number "16" only at the very end. At this stage I would also add line types 2, the edges, to highlight the borders, but they are already included in the primitive I'm going to use. Primitives are the most powerful elements in the LDraw system. Think of them as a collection of highly reusable components made of lines, triangles and quads, which can be incorporated into several parts.

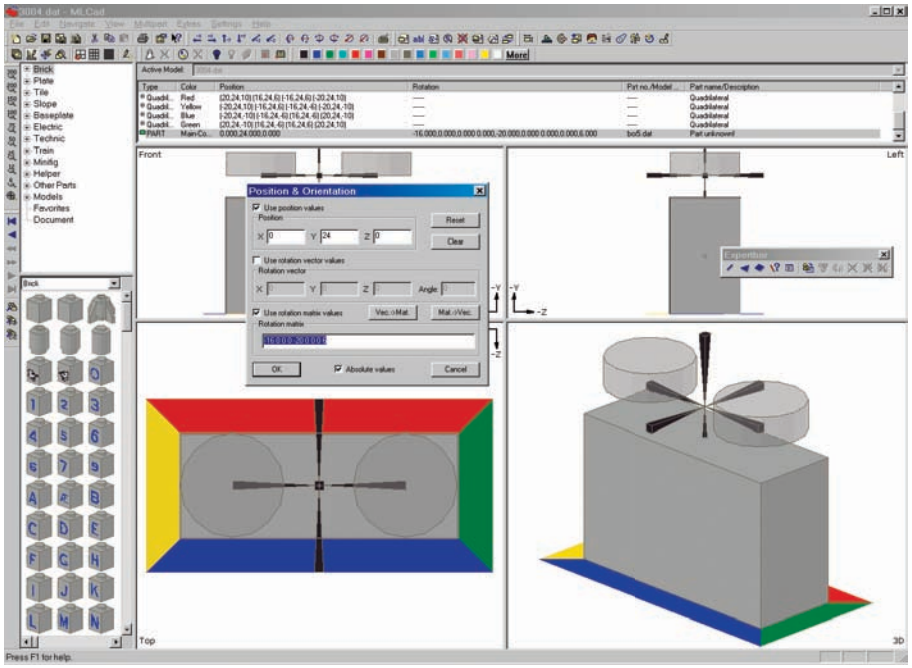
There are two dimensional primitives like discs and rings, 3D components such as cones, boxes and cylinders, and LEGO specific primitives for special purposes. The most prominent among the latter are inner and outer studs, but there are also Technic

connectors, click-lock hinges, axles and all sorts of clips. For the inner cavity I use a box5.dat, a cuboid with 5 faces and all edges except the top, which can be found in the ldraw\p\ directory. Properly rotated and resized primitives save a lot of work. The tricky thing is that although their code looks like as if there were four triples of coordinates it is actually driven by a "top left 3x3 matrix of a standard 4x4 homogeneous transformation matrix". Sound complicated? It is! Let me quote from *The Matrix* movie, "Unfortunately, no one can be told what the Matrix is. You have to see it for yourself." A very generic explanation would be:



- The first triple (0 24 0) are the coordinates - where the primitive is located in reference to the origin
- The values in the transformation matrix define the overall size
- The distribution of the numbers over the 9 available positions and whether they are positive or negative rotates and/or distorts the part

For a deeper insight there are plenty of sources available on the Internet but a bit of trial and error and analyzing other people's parts and code also does the trick. Select the primitive in one of MLCad's panes and chose **Enter Pos. + Rot...** from the contextual menu or click the **Keyboard** icon in the **Transformation** toolbar. Playing around with the values in the popping up **Position & Orientation** dialog might gets you some clues too.

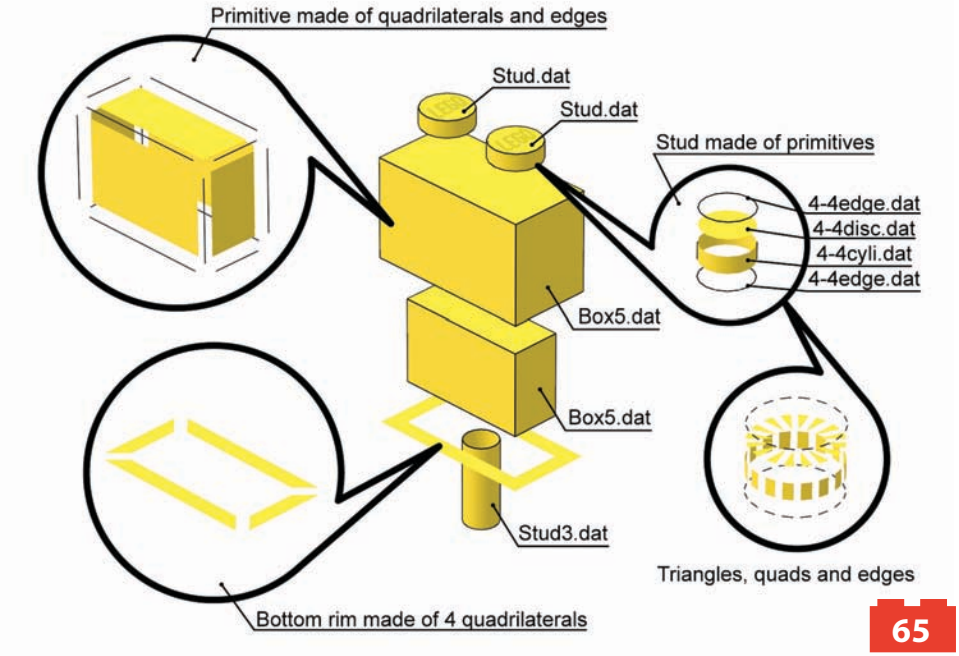


Screenshot of MLCad showing the dialog to manipulate the coordinates and the transformation matrix of a primitive or sub-file

Time to add the missing pieces: the outer shell (another box5), the two top studs and the inner Stud3.dat and "color" them with the LDraw main color number "16", which allows to be substituted with other colors in a building editor. Some documentation using the line type "0" also doesn't hurt. The final code will look like this:

```
0 Brick 1 x 2
0 Name: 3004.dat

0 // Bottom rim
4 16 20 24 10 16 24 6 -16 24 6 -20 24 10
4 16 -20 24 10 -16 24 6 -16 24 -6 -20 24 -10
4 16 -20 24 -10 -16 24 -6 16 24 -6 20 24 -10
4 16 20 24 -10 16 24 -6 16 24 6 20 24 10
0 // Inner box
1 16 0 24 0 16 0 0 0 -20 0 0 0 6 box5.dat
0 // Outer box
1 16 0 24 0 20 0 0 0 -24 0 0 0 10 box5.dat
0 // Inner Stud
1 16 0 4 0 1 0 0 0 -5 0 0 0 1 stud3.dat
0 // Top Studs
1 16 10 0 0 1 0 0 0 1 0 0 0 1 stud.dat
1 16 -10 0 0 1 0 0 0 1 0 0 0 1 stud.dat
0
```



Facts & Figures

The LDraw Parts Library, managed by Parts Tracker Administrator Chris Dee, contains 2854 parts plus some 2205 parts currently in the queue for review and certification. So far 88 authors have contributed to the Library – some just one part other hundreds. You will find the first 3001.dat - Brick 2x4 made by James Jessiman as well as part shapes in the LDraw file format coming from the LEGO® Group through the LEGO Universe Team. The 2008-01 Update - a complete re-issue of the official library with the primary purpose of aligning the library with the Contributor Agreement and to standardizes the file headers - has been downloaded over 12000 times in the three months following its release.

Opening the official 3004.dat file in the ldraw\parts\ directory with MLCad or a text editor will show the same content differing only in the sequence of the code lines. At this stage I would save the work and perform some additional tweaks and checks in LDDP – LDraw Design Pad, which will be described in more detail in the article "Pattern it" in the next issue of *BrickJournal*.

Final thoughts. While most novice part authors succeed in relatively short time authoring a shape, it sometimes takes weeks or months to learn about the restrictions for certified parts: vertex sequences, BFC, conditional lines, header specification, precision, format... Since "LDrawers" prefer writing a part over writing a tutorial, the only way is learning by doing. I learned some tricks only after I had submitted my parts to the Parts Tracker for certification and they got commented on by senior authors and reviewers. Some complain that today's entrance bar is too high, that all the restrictions, the perfectionism and non-documented tribal-knowledge scare people away. I guess the reason why there are only a handful of authors adding new parts to the library is the complexity of today's LEGO bricks. Simple shapes, like the 1x1 slope which requires no more than half an hour to author and would be a perfect playground for newbies, are rare these days (and tend to get 'whipped up' in short order by advanced part authors who want to use the new part). Instead, the LEGO company puts out tons of curvy free-formed parts every year, requiring thousands of lines of code which keep even the most experienced authors busy for weeks. The "3947.dat - baseplate 32 x 32 with craters" for example is made of 5500 triangles, and it took me 3 months to get the shape right. The "Blue Torso Western Cowboy Brown Vest, Buckle, String Bowtie Pattern" that I'm currently working on will hopefully take less time. If you like it, you might vote for the part in the "POTM – Part Of The Month" contest at LDraw.org or other Part-MOCs I was able to finish in time.

Links to Tools and Their Documentation:

- LDraw Parts Library: http://www.ldraw.org/Downloads-req-viewdownload-cid-1.html
- LDCalc: http://ldcalc.mikeheide.kilu.de/
- Reviewing-Parts-Tutorial: http://www.l3go.bugge.com/articles/reviewing-parts-tutorial.shtml
- MLCad: http://www.lm-software.com/mlcad/
- Avoiding T-Junctions: http://www.ldraw.org/article526.html
- Primitives reference: http://www.ldraw.org/library/primref/
- LDraw File Format 1.0.0: http://www.ldraw.org/article218.html
- LDraw.org File Format Restrictions for Official Parts: http://www.ldraw.org/Article512.html
- LDraw Part Of The Month contest: http://www.ldraw.org/module-ldrawMOTM.html

The Microbots FIRST LEGO League team from North Carolina - Randy Miller, one of the coaches and one of the authors of this article, is on the far right.

Mastering FIRST LEGO League

Part I: What is FIRST LEGO® League?

Article by Randy Miller and Tatiana Znayenko-Miller

This is the first in a series of articles about both basic and advanced techniques that can help your FIRST LEGO League team achieve mastery of the robot and the game. This article discusses the basics of FIRST LEGO League from the perspective of a coach and a mentor of a championship team. The goal of this article is to help you make the decision to enter this challenging but exciting and rewarding program for future engineers. In Part II of this on-going series, we will discuss, just in time for competition, how to calibrate the robot.

FIRST LEGO League is to engineering what Little League is to professional baseball. It is an opportunity for young engineers (9-14 in the U.S. and Canada, 9-16 elsewhere) to participate in a team activity that allows them to build and program a LEGO robot. If you have never been involved with the program, it sounds more like a play date than an organized learning experience. Nothing could be farther from the truth.

There is some truth to the idea that FIRST LEGO League often starts with a desire to play with the LEGO bricks and beams. Young kids usually get involved in FIRST LEGO League because they like building the models that they have acquired as Christmas and Birthday presents. They may see it as an extension of their LEGO building skills or even an opportunity to play with their friends. This "hook" is what makes building these robots so popular.

As the kids enter the program, they discover that building LEGO robots is different than building the kits that they got as presents. The kids must build as a team instead of building their own models as they did at home. They must learn to program. They must do a research presentation. Their play becomes work and work becomes play. A seriousness and intensity develops as the kids realize their play is competitive. Their building, programming, presentation, and team skills develop as they grow with the program.

They will learn that, like Little League, FIRST LEGO League is highly competitive. The judges at the regional and state competitions will not want to talk to their coaches, but they will want to talk to them. These competitions will be challenging and difficult. But it is a chance for the bright young engineers of tomorrow to discover and display their talent early. As the educational system has realized the potential of this program, more and more schools have added FIRST LEGO League to the programs available to their students.

A Brief History

FIRST LEGO League was formed in 1998 when FIRST and LEGO , two companies already involved in changing the lives of young people, joined forces. FIRST (For Inspiration and Recognition of Science and Technology) was a non-profit organization already involved in organizing robotic competitions at the high school level. Professional mentors help these high school students solve sophisticated problems by building a large, industrial-strength robot in a very short period of time.

The LEGO Group was looking to make more technologically advanced educational products. The LEGO MINDSTORMS brand had already ventured into creating robotic components for young people. When LEGO and FIRST collaborated, their product, the FIRST LEGO League would encourage young people to begin experimenting with engineering at a very early age. In 1998, FIRST LEGO League entered a pilot with 1600 students participating in 2 pilot competitions. Since that initial pilot, the FIRST LEGO League program has grown every year.

Today, competitions exist in every state in the United States and many countries all over the world (40 as of 2008). There are thousands of teams and hundreds of thousands of team members. Many of these young men and women will go on to become future engineers. If they advance to the next level,

The FIRST LEGO League World Festival, held annually in Atlanta, Georgia, is host to many of the best teams worldwide, such as the ones above and below.

The US Nationals Championships took place in Dayton, Ohio - while there were robot competitions, there were also team dances and songs performed at competitions!

FIRST, they will be eligible for millions of dollars in college scholarships.

Kids are often drawn to LEGO years before they join a FIRST LEGO League team. By the time that they are ready to join a team, they probably want to learn how to make their LEGO do so much more. By the end of a FIRST LEGO League season, a nine year old team member can program a LEGO robot to move adeptly around the 4x8 foot table. Even more importantly, they learn a skill that will be applicable to their later engineering career, the ability to solve a complex engineering problem as a team.

FIRST LEGO Defined

FIRST LEGO League is fun. It has often been described as the best experience that a young man or woman can have. A FIRST LEGO League team consists of a team of six to ten kids. They will have approximately 12 weeks to complete a research project and develop a robot that can complete as many challenges as possible. The research project and the challenges will change from year to year.

The FIRST LEGO League season begins in early September with the announcement and the shipment of the challenges. Once the challenges are assembled (they are made of LEGO), the team must plot a strategy for completing the challenges. Since they only have two and a half minutes to maximize their points scored, the strategy plays an important part in a team's performance. While most teams concentrate on maximizing their points for the robotic challenges, it is only one quarter of their overall score in competition.

At the same time, the team must also do a research project. The research project is a significant undertaking which they will have to present to the judges in competition. The research theme is announced in January before the season begins and the project details are announced when the challenges are shipped. This project will comprise another 25% of their total score.

The competition will test the team's technical and team skills as well. Each of these areas is also worth a quarter of the team's overall score. Most teams develop these skills in the process of solving the challenges and researching the year's theme. It is these areas that show a team's full potential.

The timeline below and on the following pages gives you some idea of the topics that FLL kids have studied over the years. The research topics are based on these themes. As a result, grade and middle school students are often exposed to high school and college level concepts through FLL.

1998	1999	2000
Race Against Time (Pilot)	**First Contact**	**Volcanic Panic**
Teams: 200	Teams: 960	Teams: 1540
In this pilot challenge, LEGO robots race through a maze to determine the fastest time. How fast can your robot make it through the maze?	A group of astronauts is stranded in a space station. Your robot has three minutes to complete five missions to save the astronauts. Can you move the astronauts and supply the necessary oxygen with your robot?	A volcano is about to erupt. Can your robot rescue a stranded scientist, barricade a village from lava rocks, deploy a gas sensor, and retrieve crates of samples to maximize its points?

The Fundamentals

Since each of these four areas (research project, robot runs, teamwork, and technical skills) are interrelated and necessary to win a FIRST LEGO League Regional, State, or World championship, a team must become proficient in all of them. There are many strategies for teams that wish to accomplish this goal. We will examine several of these in the articles to come.

However, a good strategy can only take you so far. Hard work, experience, liking your teammates, dedication, kids doing the work, and solid mentoring and coaching are fundamental elements of a FIRST LEGO League that support a team's strategy. Absence of any of these fundamental elements will sabotage the team's performance at competition. Under the stress of the competition and interviews, very few teams can fake these fundamental elements. Future articles will describe how you can build the pillars that support your team's competitive performance.

Some teams will do FIRST LEGO League for fun and others will do it to win. Hard work is therefore relative depending on how you define winning. Young men and women need outlets and FIRST LEGO League should be fun. The team members should define their goals at the beginning of the season and work toward achieving these goals. These goals should be realistic and attainable.

The intensity of this work often depends on your local competition. Some states have competitions starting just after Thanksgiving while others will start in late January. If you wish to put in 100 hours of work into the competition, spacing it over five months is much easier than three. The intensity of competing in a state where competitions arrive before you know it is so much greater. The thing to keep in mind is that your competitors are hit with the same deadlines.

A FIRST LEGO League team is a team. It relies on all of its members to pull their weight. Dedication is perhaps the single most important element in being part of a winning team. When the team sets their goals, you should speak up if your schedule will not allow you to participate as frequently as the team needs you. The needs are obvious different if you are the team captain then if you are part of the "run" team. However, your teammates are relying on you to be there and your ability or inability to meet that need will impact the team.

Experience will influence the capabilities of both players and coaches. Winning a regional or state championship as a first year team, while certainly possible, is uncommon. (First year teams have been known to win first or second place in a single area such as research quality, teamwork, technical,

Much of the work done at FLL is teamwork. Here, the Microbots are checking the programming to their robot.

2001	2002	2003
Arctic Impact	**City Sights**	**Mission Mars**
Teams: 1902	Teams: 3001	Teams: 4331
In the remote Arctic, robots face extreme weather such as ice storms, 120 mile per hour winds, and very cold temperatures. Can your robot retrieve medicine barrels and rescue stranded scientists from polar bears?	Urban planning was the theme focusing on basic services such as clean water, safety, education, and mass transportation. Can your robot complete tasks such as clearing rocks off a soccer field, harvesting and delivering food, and collecting toxic barrels?	LEGO created an entire set of products around this theme in 2007. The challenge was inspired by a Mars Rover mission that year. Your robot's missions include removing rocks from a solar panel and collecting soil and rock samples. How quickly can your robot move in the Martian desert landscape?

The robot challenge is a race against time and allows only two team members to be at their table, so timing and precision is important.

The robot challenge is a race against time and allows only two team members to be at their table, so timing and precision is important.

robot performance or programming. I encourage new teams to strive to do the best that they can). Set realistic or even slightly lower expectations as this will take pressure off of the team. At your first completion, be prepared but also suggest to the team that it is "a learning experience." Tell all of the judges that you encounter during this first competition that you are a rookie team. After the competition, encourage the team to think about all that happened , both the good things and the things that they would like to improve on..

Veteran teams can set higher goals. Coaches who have been through a competition or two will know how difficult is to win. Often, a single school or team may dominate the competition every year. If you are the underdog, you can turn this into a benefit for your team. Many techniques such as videotaping your team's runs and interviews can pinpoint areas for the team to work on during the off-season.

FLL Values

(from the 2009 FIRST LEGO League Coaches' Handbook)

You can tell a lot about an organization based on the values that it expects competitors to uphold. FIRST LEGO League expects not only the team members to uphold these values, but expects the same from coaches, mentors, parents, and other family members.

Values

- Respect each other in the best spirit of teamwork
- Behave with courtesy and compassion for others at all times
- Honor the spirit of friendly competition
- Act with integrity
- Demonstrate gracious professionalism
- Focus on the experience and not the awards
- Remember that the children do the work
- Encourage others to adopt these values

Most teams post the values in their work area and will occasionally go through them. Very few first year teams can recite them verbatim but judges will ask questions designed to spot violations. A first year team works pretty hard just to learn programming in addition to completing some of the missions.

Team members, you are about to spend a lot of time with six to ten other kids. Liking and respecting each other is pretty important. They will make mistakes. You will make mistakes. How you treat each other will have some bearing on your

2004	2005	2006
No Limits	**Ocean Odyssey**	**Nanoquest**
Teams: 5859	Teams: 7501	Teams: 8847
The challenge focused on meeting the needs of the disabled. The challenges included shooting a ball into a hoop, picking up a large pair of eyeglasses, setting a table, and climbing stairs.	The ocean is still the source of many mysteries. One of the more challenging obstacles was to move up a ship-shaped ramp to get a submarine model. Can your robot accurately climb a bumpy ramp made of LEGO?	Very small things can be as interesting as any space or sea adventure. This challenge features elements such as the Atomic Force Microscope, Space Elevator, and Molecular Motor. This challenge proves that small things can add up to big points.

interviews and performance under pressure. Remember, part of your score is based on teamwork. When teammates snipe at each other, they do not show gracious professionalism. Mentors and coaches should quickly step in as conflicts will arise.

If there is one thing that judges look for in the interviews, it is that the kids did the work. The huge investment that you make in teaching the kids to be self-sufficient will pay dividends in relaxation when the team decides to make the drive for the win. Self-sufficiency is more easily achieved in older teams but with enough work, can be achieve in young teams as well.

A team must completely live the FLL values to expect to do well at the National and World Championship level. In these competitions, they are judges whose job it is to be constantly looking for both good and bad behavior. The FLL values are probably the most important aspect of FLL but it is difficult to understand and focus on this as a new team.

These values will also be critical for those kids who want to move on to the next level, FIRST. This high-school program that builds high-end, metal robots is built on cooperating while competing. Many FLL kids make ideal FIRST teammates as they already understand what is expected of them as far as the values are concerned.

Conclusion

FIRST LEGO League provides a means to teach kids important skills for their future. Teamwork, leadership, programming, public speaking, mechanical engineering, research, and grace under pressure are some of the many skills that an FLL team member will learn. What is important is that they will learn these skills in grade and middle school. The FLL experience is like no other and kids that strive to excel in FLL will later excel in life.

Coaches and mentors play a huge role in the success of a team. As FIRST LEGO League can be as strenuous on the coaches as it is on the team, multiple coaches are recommended where possible. Mentors are usually high-school or college students who want to help the team. Mentors play an important part on winning teams and a good mentor or two is extremely valuable. New coaches should not be afraid to ask for help from veteran teams. Most veterans will gladly help a rookie team in need.

Another part of the competition is the team's project presentation. Here, the Microbots present their project, which included a environmentally friendly house designed in LEGO Digital Designer.

Excited team members get ready for a robot game. The high energy level on the game floor is contagious.

The smiles are everywhere at an FLL event.

2007	2008	2009
Power Puzzle	**Climate Connection**	**Smart Move**
Teams: 10941	Teams: 13705	Teams: TBD
Your robot must gather resources to make energy such as corn (for ethanol) and uranium (for nuclear). Move power lines and a dam to maximize your energy production and points.	The climate is always an interesting topic and this year's challenge looks at connecting two different areas of the world. Raise a house, deliver a polar bear, and retrieve an ice core all to maximize your robot's score.	Teams consider the various modes of transportation. A smart move is to pick the best modes to maximize your points.

The number of teams for each challenge year came from the 2009 FIRST Championship Program Guide.

Building the DUPLO® Brand, pt. 2

Article by Inge Aaen
Photography Courtesy of the LEGO Idea House

A New Building System is Born

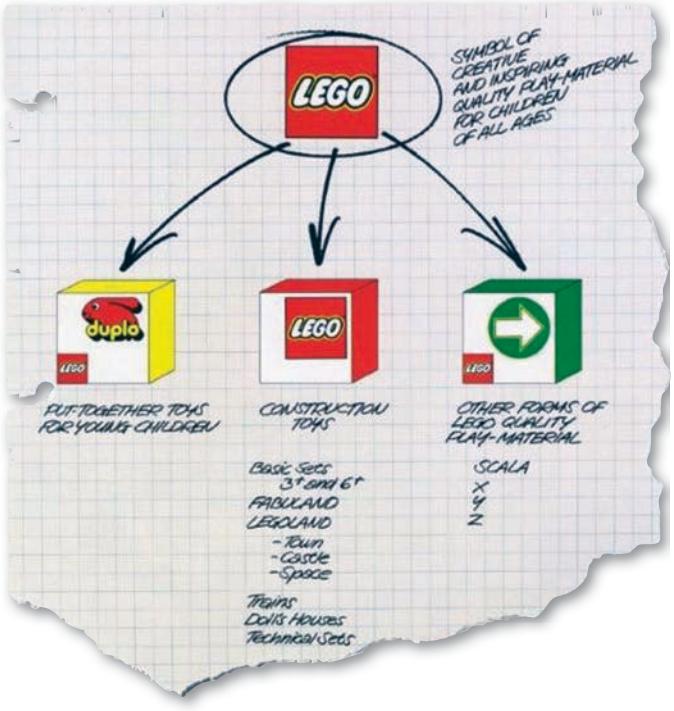
After the international launch of the LEGO DUPLO® product in 1969, development of the DUPLO® universe was based on the child's immediate environment, familiar surroundings, with the emergence of role-play products – all born of a unique building system.

Sprouting wheels, the first natural development of the building system — the car and the train — are born. Figures and animals also arrive on the scene. The first generation is fairly square – their shapes are rounded off from a brick. Development of the next 3-4 generations of DUPLO moves from the abstract to more realistic, from square forms to soft and round forms.

A New Product Strategy

After a turbulent organisational period, with product development almost at a halt, LEGO owner Kjeld Kirk Kristiansen announces his long-term product-development model for the LEGO company at a marketing conference in 1978.

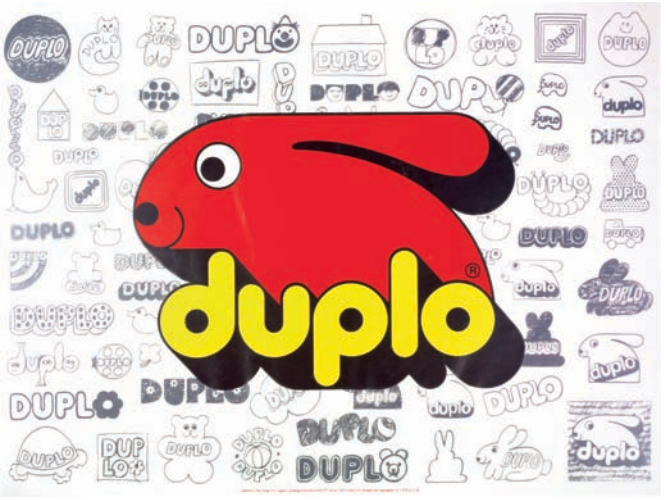
The model creates a "system within the system", with the company's product range divided into independent product programmes: "LEGO construction toys" and "Pre-school toys from LEGO", each with its own **age profile, concept and play idea**.



Kjeld Kirk Kristiansen harnesses the development potential of the LEGO product idea to make it more dynamic.

An Independent LEGO DUPLO Brand: The DUPLO Rabbit

As a logo, the rabbit turns up in some of the very first sketches. The rabbit and the DUPLO name in various colour combinations are tested individually and together – but the little red rabbit with the yellow DUPLO name and black shading wins hands down. The DUPLO rabbit logo is developed and registered as a trademark.



On July 20, 1978, at 12:36 the DUPLO rabbit logo is registered as a trademark, and is used on packaging in 1980.

Role Play Grows From the Building System

Elements and themes are developed from learning that the younger DUPLO target group differs radically from the older group that uses the standard brick. Recognition and handling are especially important for this group, as their awareness and dexterity is not as developed as older children.

Figures, animals, and environments (playstarters) are included in this range. These are complete elements which stimulate the child's recognition, imagination and encourage role playing.

Bright colors and interesting pieces appeal to children and stimulate their imaginations.

"Helping Parents Help Children Grow"

In early 2000 the LEGO Group worked closely with child-development experts to evolve a new child-development system to help parents stimulate the development of their children. In 2002, LEGO Explore® was launched – the Complete Discovery System for Preschoolers with the four universes: Explore Being Me, Explore Together, Explore Imagination and Explore Logic.

With the launch of LEGO Explore, the red rabbit and the DUPLO name lose their significance - and disappear as icons for products for preschool children.

LEGO Explore's Intellitrain - from the Explore Logic universe.

The LEGO DUPLO brand returns!

However, in 2004 the familiar DUPLO rabbit returns to the front of LEGO sets for the youngest in response to the repeated feedback the company has received from retailers and users. LEGO Explore is phased out.

LEGO Ville® 2004

The LEGO Ville universe signals the start of the next chapter in the story of the LEGO DUPLO product range. LEGO Ville is based on a full concept of all that is familiar in the child's universe, symbolised in the photo below, not on an assorted collection of individual products.

The idea of playstarter elements – vehicles, people, animals – continues.

LEGO DUPLO "The LEGO Ville universe"

LEGO Ville brings a system to familiar settings – fire station, police, farm and zoo – and a number of dynamic settings such as post office and waste collection. The intention is that the current active range should at all times reflect the child's complete universe.

The key components in the universe have undergone design development to enhance the emotional characteristics that are such an essential part of the product. Figures have been given rounded forms. Over the years, animals have taken on a softer, more emotional look. Vehicles have had a facelift. A house-building system has been developed which makes it easier and faster for the child to build houses in LEGO Ville. Generational change which also reflects movements in production techniques.

The universe will continue to be developed and improved – but the core will remain faithful to the original concept. LEGO Ville is the sum of the experience and know-how accumulated since the DUPLO brick first saw the light of day more than 40 years ago.

To date, the LEGO Group has manufactured over 12 billion LEGO DUPLO bricks.

Not Quite LEGO

It's time for another edition of "Not Quite LEGO" –the column that takes a look at some of the other toys out there that are "not quite LEGO." No, we're not talking about Mega-Bloks, but about other toys that are sometimes similar to LEGO, or may be of interest to LEGO fans in general!

This issue:
Stikfas does the Classic LEGO themes!

Article and photos by Greg Hyland

Stikfas are a toy line from Singapore; a toy line that is an interesting combination between action figures and model kits. The Stikfas figure size (3 1/4 inches) was designed to be in scale with a popular line of Japanese car and motorcycle models kits, and the figures' hands will grip the standard handle of a LEGO accessory (like a sword or lightsaber hilt, or the popular megaphone). The figures are also very posable, due to their unique ball-joint design. This makes them easy to put together (and take apart) without the need for glue.

Originally billed as "customizable action figures," the kits were meant to be painted and sculpted (which many people do, as seen on websites like The Stikfas Customizers Guild http://www.stikcustomizers.com and The Stikfas Workshop http://stikfasworkshop.tripod.com). But Stikfas achieved a larger and loyal fan base by making figure sets with all sorts of characters and themes. Each individual set comes with a large number of props, weapons and tools. They also come with sticker sheets with eyes and mouths in all sorts of expressions, plus other decorations, like tattoos, scars and (quite often) band-aids! And, like a mini-figure, there are no noses! With all the various props and stickers included, each figure becomes almost infinitely customizable.

While there have been dozens of different themed figures produced in the Stikfas line, some of the most popular ones interestingly follow some of LEGO's most popular classic themes:

Castle

After starting out with figures that came with military accessories, the first new area Stikfas branched out into were figures with medieval accessories.

Omega Male Armored Knight with Stallion
This is the extra beefy Omega Male figure, who comes with a lot of armor and weapons... too many weapons for him to carry them all! He even comes with two different styles of helmet. The stallion is great; it is composed of many pieces allowing for much posabilty—even the ears move! This is one tough looking knight, and you almost want to get two of these sets for the knights to fight each other–which became easier to do when they re-released the set with the knight coming with dark red amour. You also have the opportunity to get the knight on his own, in the "Black Knight" set, which has the knight with a translucent black body and black armor.

Beta Female Warrior with Dragon
This pack was the first appearance of a female Stikfa, and she is as tough as any of the male figures! While she is well armed and armored, the coolest thing is the dragon that she comes with. The dragon is huge, with an almost 14 inch wingspan, and measures almost 13 inches head to tail. Both the neck and tail are segmented, allowing for maximum posability, and the wings are made of three pieces each, again allowing for many poses. Even the dragon's jaw is hinged. The pack also comes with a saddle so the Female Warrior can ride the dragon. Originally released with a black figure with dark red amour and a black dragon, the set was re-released with a black figure with white amour and a red dragon, and again more recently with a red figure with black amour and a green dragon.

While this is a great set, there are a couple major problems. First, there is an error in the assembly instructions. When assembling the main part of the dragon's body there is a peg that needs to be included, but the instructions don't show that it needs to be added. You'll figure it out when you realize there is no way to attach the neck to the body. Then you might have to crack the body apart to add in this peg. The other major problem is the wing assembly is somewhat difficult to do unless you have really strong and really small hands. I ended up using needle-nose pliers to get them to work. These problems make assembly frustrating, but once the model is completed you'll (hopefully) forget about them and enjoy the set.

Alpha Male Phantom / Alpha Male Glow-in-the-Dark Phantom

As the classic LEGO Ghost made its appearance in the Castle theme, I'm including Stikfa's own Phantom. Originally, this figure was made with clear plastic (who wouldn't want an all-clear plastic mini-figure?). This was a great idea, but the problem was that the plastic was sort of fragile and the parts broke easily. The figure was later re-released with a glow-in-the-dark body. Both versions of the Phantom come with a soft plastic "shroud," and various props ranging from ghostly ball and chains to a "Grim Reaper" like scythe. You also got a pair of glasses and a hat, allowing you to make The Invisible Man–which made sense with the clear plastic figure, but is kind of odd with the glow-in-the-dark figure.

Space

The Stikfas designers seem to have a real love of "retro" design with their science fiction inspired figures, which makes all their space figure sets awesome!

Mechana Segmented Robot
Possibly the most posable figure in the line, if not ever! The "retro space" design is obvious, but with a nod to the robot in Hayao Miyazaki's Castle in the Sky, and even a little bit of the Iron Giant thrown in. The robot's arms are made of four large jointed balls, and the hands each have articulated fingers (which are great, but a real pain to put together. Get your pliers out!). This allows him to hold the cool retro space gun. Plus, for some reason, the robot comes with a teddy bear (The teddy bear figure proved to be so popular it spawned Stikfas to produce a line of pre-assembled teddy bear figures called "mbear.").

Alpha Male Spaceman
This one is one of my all-time favorite Stikfas figures and a must-have for any Stikfas collector, in my opinion. The clear dome helmet clinches it for me! Plus there are some interesting accessories, like rocket boots and giant claw hands. And if you look closely, you'll see that the controls on his belt buckle are really an old Nintendo game pad!

G2 Alpha Male with Dome Robot Walker
The concept of this figure and set is incredible. You have a

pilot sitting in a clear domed cockpit on two walking legs with two smaller arms hanging below. You get the choice of making the arms have hands (the same as a regular Stikfas figure's hand, allowing the Walker to hold any Stikfas accessory), a very retro gun or a drill.

Again this is a great finished set, but here are a few problems. The instructions are minimal (like all Stikfas instructions) and vague. There are two parts in the leg assembly that are similar looking, but different lengths. It took me a little bit of "trial and error" to figure out which piece went where. The overall leg assembly is designed to allow for maximum flexibility and posability and because of this I found some of the ball joints ended up being a little too loose, making my walker not strong enough to support it's own weight. I have to pose it with the bottom of the dome resting on the legs.

Pirates

Stikfas only really did one Pirate figure, but seeing how popular pirates are in LEGO, I felt I had to include it.

Alpha Male Pirate with Skeleton
I find the Pirate figure on it's own not that exciting. You do get all the typical pirate accessories, such as peg legs, hook hands, eye patches and appropriate hats and weapons and even a parrot. But what makes the set neat is it also comes with a skeleton figure. The nice thing about the skeleton is that you can put all the regular pirate accessories (or any Stikfas accessory)

on it. Stikfas even went on to release a line of pre-assembled skeleton figures under the name "Darkland." The skeletons, which all have names like "Scrawny Johnny" and "Bones Jones," and come in different colors and with various accessories from the Pirate or Viking figures.

Ninjas

While ninjas were never a huge LEGO theme, historical Asian figures have played a big part in the Stikfas line-up (not surprising seeing they are an Asian company!).

Alpha Male Samurai Warrior/ Alpha Male Dark Samurai
I think this has to be my favorite figures. I'm not even a big fan of Samurai in general, but this one won me over. The look

of the armor is simple, but very effective. Plus, he comes with all the weapons any samurai could want, from katanas and swords, to a long bow with arrows. The Samurai, originally with reddish terra-cotta colored amour, was re-released with blue amour and then more recently as the "Dark Samurai with translucent black amour.

Alpha Male Samurai with Stallion
The same Samurai as above, but now on a horse. There's nothing special about the horse, as it's exactly the same one that came with the Knight, except this time in white. The Samurai comes with red armor.

G2 Alpha Chinese Warrior Monk
The Chinese Warrior Monk introduced a major redesign to the standard male Stikfas figure–double ball-jointed elbows and knees, allowing the elbows and knees to bend more than 90 degrees. This makes the figures a little more time consuming (and annoying) to put together, but allows for a figure that can be posed in practically any pose. The Warrior Monk comes with a fantastic set of weapons that provide a nice compliment to the traditional Oriental weapons that the Samurai comes with.

G2 Alpha Ninja/G2 Alpha Male 2 Pack Ninja Duel
The Ninja first came in what Stikfas called the "Lite Pack." Lite Packs were smaller, less expensive sets that come with a full figure, but less accessories. The Ninja, released in both black and blue versions, didn't come with any amour, but did have a good set of ninja weapons, such as words and throwing stars. The Ninja also utilized the more flexible G2 body. Recently, the Ninjas were re-released in a two pack, giving you two full ninjas, one in black, one in white.

G2 Alpha Male Master Assassin
The Master Assassin is the Ninja-on-Steroids! Besides the traditional Ninja weapons, he comes with some amour, a ninja face mask, flowing belts and some crazy ninja weapons, like giant throwing stars!

Stikfas also produced figures in other LEGO-ish themes, such as Town (they did a nurse, a fire fighter and a police officer), Vikings (the Viking figure they made is also one of my favorites), Western cowboys, Divers, and Adventurers (they did an "Indiana Jones" inspires Safari female figure and an Egyptian warrior). They also produced several themed figures that LEGO doesn't do, such as a lot of well armed military figures, angels, devils, super heroes and villains, gladiators, gangsters and, my favorite, the Fairy (who comes with a giant mallet!).

So if you're looking for a fun change from LEGO, you might want to check out Stickfas. Stikfas can be found at most good comic shops or specialty toy stores, and can be easily ordered on-line through the Stikfas website (http://www.stikfas.com).

Last Word

So ends another issue of *BrickJournal*. 80 pages may look like a lot, but it fills up pretty quickly once all the articles are laid out. There's a lot that happened and was built that didn't make to this issue.

What's good is that we are going to a bimonthly schedule now, so there are more pages to get all the articles and photos we were not always able to get in before. Having six issues per year instead of four makes it a little easier to work with the LEGO Group to get the really cool behind the scenes stories that we have begun to get - thanks to the work of the European Bureau! There's other stories coming, too - from the Japanese Bureau and all our writers.

Even with the all the people who are writing and submitting ideas, though, there are things that are missed. In this issue, there are a few articles that didn't get in, such as reports on Brickworld (!), FIRST LEGO League World Festival and US Nationals. They will be coming soon - even sooner since the next issue is coming in two months!

There will be more fun stuff coming too - next issue is themed to Castle! And I can't wait to see what next issue holds!

Till then, keep building!

Joe Meno
Editor

AFOLs

by **Greg Hyland**

THANKS TO NADINE FOR THIS ONE!

BrickJournal

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