BrickJournal

Issue 5, Summer 2006

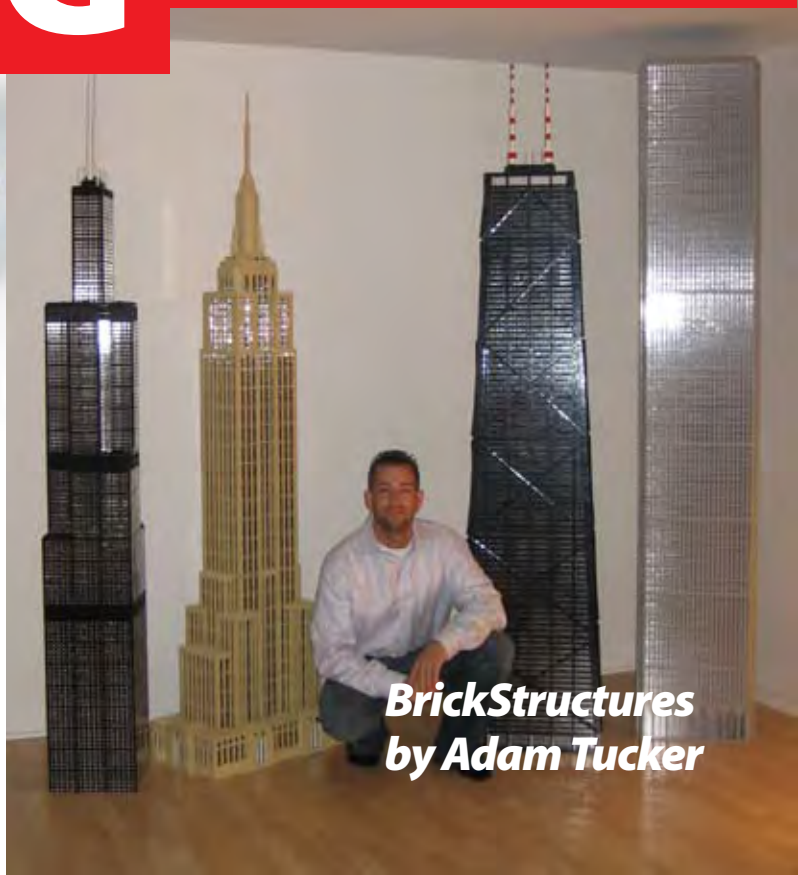
people • building • community

Finding the Builders of Tomorrow

USS Harry S. Truman
by Malle Hawking

THE BIG ISSUE

Big Boys Toys
by Mark Stafford



BrickStructures
by Adam Tucker

Event Reports
The Real LEGO Factory
AND MORE!

Now in its 4th Printing!

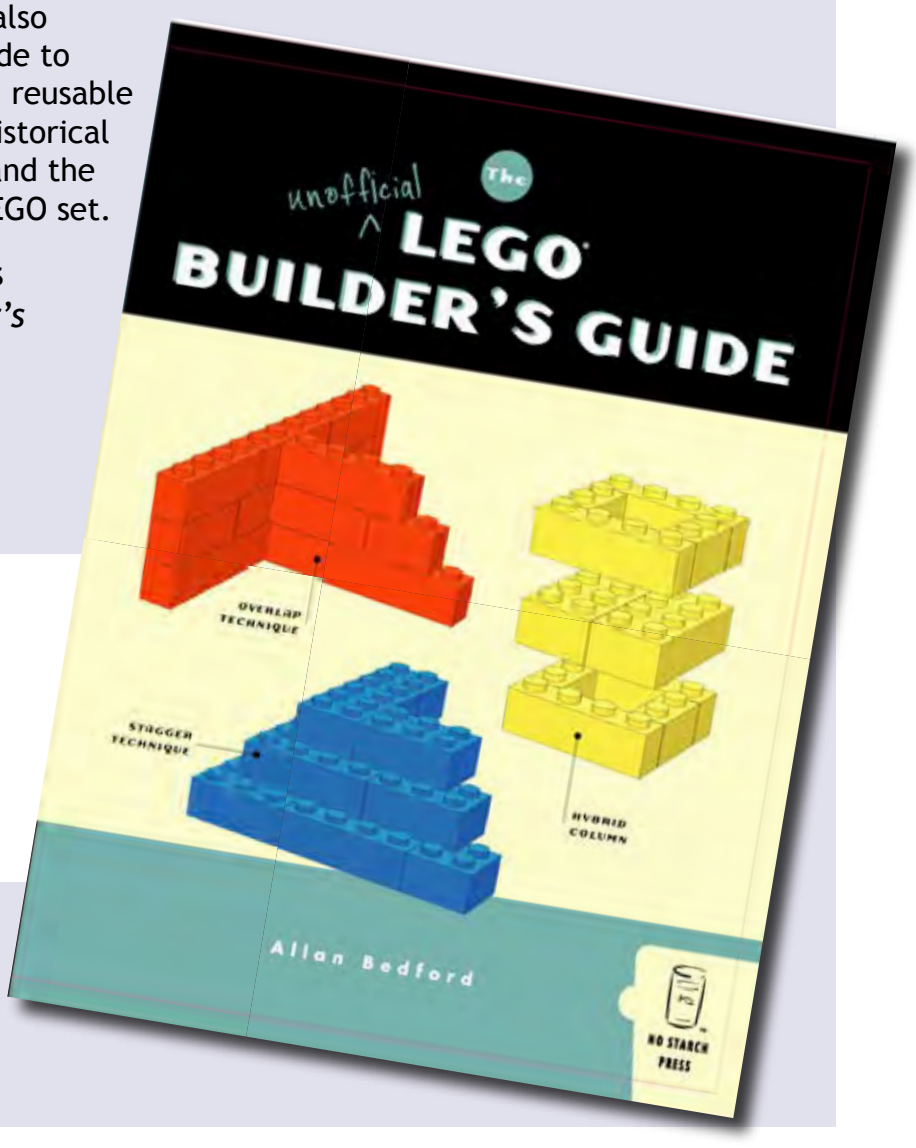
Build A Firm Foundation for Your LEGO® Hobby!

Have you ever wondered about the basics (and the not-so-basics) of LEGO building? What exactly is a slope? What's the difference between a tile and a plate? Why is it bad to simply stack bricks in columns to make a wall? *The Unofficial LEGO Builder's Guide* is here to answer your questions. You'll learn:

- The best ways to connect bricks and creative uses for those patterns
- Tricks for calculating and using scale (it's not as hard as you think)
- The step-by-step plans to create a train station on the scale of LEGO people (aka minifigs)
- How to build spheres, jumbo-sized LEGO bricks, micro-scaled models, and a mini space shuttle
- Tips for sorting and storing all of your LEGO pieces

The Unofficial LEGO Builder's Guide also includes the Brickopedia, a visual guide to more than 300 of the most useful and reusable elements of the LEGO system, with historical notes, common uses, part numbers, and the year each piece first appeared in a LEGO set.

Focusing on building actual models with real bricks, *The LEGO Builder's Guide* comes with complete instructions to build several cool models but also encourages you to use your imagination to build fantastic creations!



The Unofficial LEGO Builder's Guide
by Allan Bedford
No Starch Press
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AVAILABLE NOW

Available in bookstores everywhere or directly from the publisher at www.nostarch.com. Visit the author's website at www.apotome.com for more information.

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Volume #1
Issue 5

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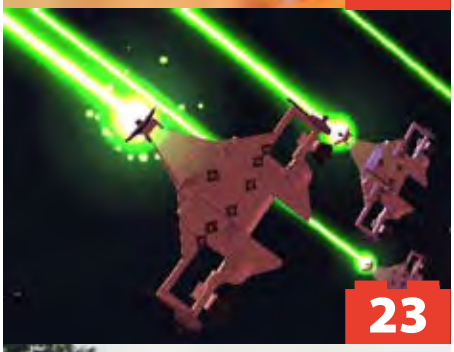

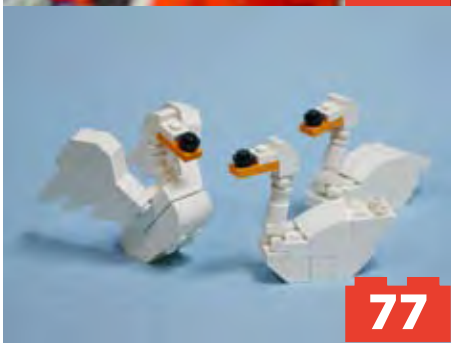

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About the Cover:

Well, they are all big! Photos by the LEGO Group, Malle Hawking, Mark Stafford and Adam Tucker

From the Editor:

I'm late.

Real late.

I got overloaded with some things, so I couldn't attend to *BrickJournal* - and I apologize. Things got real busy and some things that were more immediate got my attention.

The biggest thing that I worked on while I was away was BrickFest®. That was a tiring, exhausting, fun and exhilarating project - and I am happy thatI was able to do it! And there will be coverage next issue on BrickFest and many other conventions in the US and elsewhere—the LEGO hobby is an international hobby, and *BrickJournal* will be going where the events are happening!

Other things are happening too—*BrickJournal* is starting to work toward becoming a true print publication! Some planning is being done right now, and well, I was dared at BrickFest to get this printed, so do I have a choice? :-)

This issue's theme is Megastructures, or as I call them, Really Big Things. WHile most of us are used to building models of houses and cars, a few of us in the community buld larger. Much larger. So this issue spotlights a few of them and their creations, from skyscrapers to ships to everything between!

On another subject, *BrickJournal* passed its first year of publication - and it's been a good year! We have gone a long way, with hundreds of pages written by dozens of writers from all over the world. The LEGO Group is also supporting us, which is a testament to the staff and their work. Way back when, the question was whether or not BrickJournal could maintain a quality quarterly 48 page magazine. There are no questions about that now.

There's a lot more stories to tell and places to explore, so there will be more pages to write and more photos to show, so hang on for the ride!

And check out what the LEGO Group gave as a birthday card!

Joe Meno
Editor

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

The Future of 9 Volt Trains?

The question has been on many builders' minds this year, and a LEGO employee raises some possibilities...

Article and photos by Maike Büscher

Most LEGO fans will know that at the beginning of 2006, the LEGO Group announced the possibility of discontinuing the 9 Volt (9V) train system. A new remote controlled system was developed that tested very well with children. However, adult fans all over the world are outraged, sad and disappointed to see one of their most favourite themes within the LEGO product range go. These adult fans (not just a few of them) are very loyal to the 9V system. There are more than 30 clubs dedicated to LEGO trains in the worldwide and extensive train displays have been a regular feature at LEGO fan events like BrickFest®, 1000SteineLand and LEGO World. In particular, the huge LEGO Train display put together and manned by the International LEGO Train Club Organization (ILTCO) in collaboration with several LEGO Train Clubs at the NMRA (National Model Railroad Association) show in 2005 and 2006 was incredible.

Emotions are running high and AFOLs are discussing the future of their beloved LEGO trains on discussion forum websites. Their arguments, like their passion, are strong and difficult for the LEGO Group to ignore. The LEGO Ambassador Eric Kingsley, for example, estimates that his yearly spending of around $5,000 on LEGO products would decrease to around $1,000. Most of his purchases supplement his train layouts, so he thinks that sales of other lines would also be negatively affected by discontinuing 9V trains.

Another 9V fan, J.P. Manalo, wrote on the "Save the 9V trains" forum that he believes the best chance for the LEGO Group is to keep selling 9V elements via LEGO Shop At Home. And that is exactly what is happening at the moment. As tracks and motors become increasingly rare in retail stores, LEGO Shop At Home and LEGO Brand Retail stores are the best chance for fans to satisfy their need for these products as well as other accessories. In Europe, the online shop is doing its best to boost sales via a marketing campaign aimed at adult 9V train fans. All products currently available can be seen on www.LEGOshop.com/9V trains.

Another challenge the 9V system faces is the lack of new locomotives and carriages being added to the line. Fortunately LEGO Factory provides a good solution. With around 200 models currently displayed in the train category alone, LEGO Factory is the perfect platform for fans to build their dream model and allow others to purchase it with the click of a button. Also, LEGO Shop At Home will launch the Holiday Train in time for the 2006 Christmas season. This train is not remote controlled and a 9V motor can easily be integrated by exchanging a few bricks and plates.

So not all is lost for 9V trains. AFOLs will certainly continue to remain loyal even if the decision is eventually made to discontinue the line. They will however have difficulties recruiting new fans to a range for which there are no new product launches. If in early 2007 the LEGO Group makes the decision to discontinue the product range, its survival will depend on the perseverance of its fans and whether the LEGO Group will find the means to sustain the 9V system as part of the exclusive range. This decision will be based on business factors like sales performance and profitability which is in stark contrast to the emotions and passion shown by the fans. Let us hope that they will have their way and a solution will be found to keep the range alive!

Maike Büscher started working for the LEGO Group in the European Contact Centre during the 2005 Christmas season. LEGO Shop At Home quickly realised her potential and took her on as Marketing Assistant in February 2006. Since then, Maike has been involved in producing Shop At Home catalogues, email campaigns, press releases and other miscellaneous projects. She misses the daily contact with consumers via the phone, but keeps in touch with the LEGO communities by talking to her former colleagues in the contact centre and visiting events like LEGO World.

Examples of train models created on www.LEGOFactory.com

Flying Scotsman, designed by Bignick222

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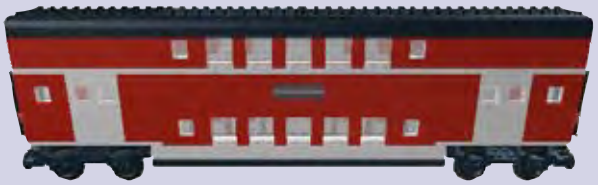
Commuter Train, designed by thakius



Doppelstockwagen, designed by gansweith

Railroad Crossing designed by freebee

Event:
Klodsfest 2006

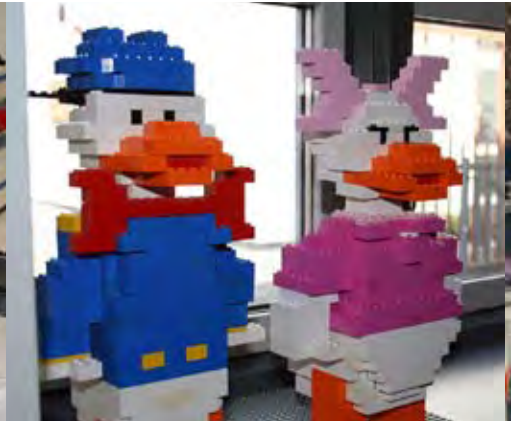
Denmark Calling!

Chris Paton reports on the LEGO event held by Byggepladen, the Danish LEGO fan club!

Photos by members of Byggepladen

It's all about the bricks or klods (Danish for brick) depending upon where you come from. In the case of Byggepladen (the Danish LEGO enthusiasts club) members prepare much of the year in anticipation an annual event that has come to be known as Klodsfest. There have been three Klodsfests during the three years since Byggepladen's inception. Klodsfest 2006 was the first time the doors were opened to the public.

In April 2006 some 30 members met on the island of Zealand, just outside of Copenhagen, for a weekend of pure LEGO. Some members met on the Friday night to set up tables and pave the way for the building of the town and train layout. During breakfast on Saturday more Byggepladen AFOLs started to show up, shuttling back and forth from their cars with boxes and boxes of MOCs and bricks. As members started to position their models according to the plan there were regular interruptions to admire each others LEGO creations. Some of the previously unseen MOCs included the MACK truck from the film *Convoy* in 1:13 scale and a MÆRSK container ship in minifig scale! Other large MOCs revealed at Klodsfest included the entire podracing scene from *Star Wars Episode I* and a previous Japanese television contest MOC: a Viking Longboat with a train inside.


The town layout itself was huge and challenging to coordinate. Some members were finished placing their models inside of a half hour, others did not finish until hours later! Such is the LEGO hobby.

An important part of Klodsfest is meeting other club members and putting a face to the avatar on the internet forum. In this way Klodsfest allows for the development of the club born out of a common enthusiasm for LEGO. Byggepladen's annual general meeting (AGM) was also held during the Klodsfest weekend. But it was not all hard work. One of several competitions was the "Timed Building Contest", a popular competition, and this year the challenge was to see who could build an 8664 Road Hero set inside the bag!

During the evening dinner the future of LEGO was discussed with Jan Beyer, Project Manager LEGO Community Development, and Knud Thomsen, LEGO Ambassador Denmark, who fielded questions and took notes. After dinner the majority of members returned to the community centre to enjoy a few more hours of play before the doors opened to the public. When the public finally got a chance to see our creations on Sunday we were overwhelmed by the response. During the AGM the club had anticipated a modest response of perhaps 150 visitors. During the four hours the doors were open we received 570 visitors! We also quickly realised that space was an issue. Not space MOCs—we had many fine examples—but floor and table space was at a premium!

"...the club had anticipated a modest response of perhaps 150 visitors. During the four hours the doors were open we received 570 visitors!"

Future Klodsfests will have to have a bigger venue to accommodate our layout. The response of the visitors, their comments and remarks made Klodsfest 2006 a huge success for Byggepladen. We are all looking forward to 2007!

Chris Paton is a long time LEGO enthusiast who's biggest claim to fame is never having had a Dark Age! Chris's passion for plastic bricks took him from England to Denmark where he married a Dane. Chris lives in Greenland and works as a teacher on the island of Uummannaq.

Now available in stores:

Fun and Games in Atlanta:

FIRST LEGO League World Festival

Here's a challenge for you:

- Design and build a robot that can take on a set of nine missions dealing with ocean exploration and conservation.
- This robot must be able to accomplish each mission autonomously, with conversions manually done only if need be.
- The missions include: deploying a submarine, transect mapping, protecting a pump station, servicing a pipeline, releasing a dolphin, tagging a fish species, moving an artificial reef, cleaning up a cargo accident and search and recovery of underwater artifacts.
- All the materials must be LEGO elements and electronic components, and use a MINDSTORMS RCX programmable brick.
- And you have two and a half minutes to complete all the missions!

Welcome to FIRST LEGO League's 2005 Ocean Odyssey Challenge. >>

Article by Joe Meno
Photos by Joe Meno, JR Hicks and Jake Ingman

One of the many participants of the World Festival lines up her team's robot. Photo by Jake Ingman, courtesy of FLL

FIRST LEGO League is an international program for children 9-14 (9-16 in Europe) that is a sort of robotic Olympics that gives the kids the opportunity to do hands-on building and programming as well as develop team building, problem solving, creativity, and analytical skills.

In early 2006, the Super Powerful Intelligent Determined Energetic Robot Scientists (SPIDERS) team, based in Honolulu, Hawaii placed 1st in Robotic Performance in a local competition. The team was then selected by FIRST LEGO League to compete at the Ocean Odyssey World Festival in Atlanta, Georgia held April 27-29, 2006. The coach of this team, Kevin Dang, is a very laid back guy. His team is comprised entirely of kids.

Kevin, a Welding Engineer at Pearl Harbor Naval Shipyard, had been working with the team for only two years when they were selected to compete in Atlanta.

Kevin's not the only adult who helped out. The assistant coach, Trisha Lam, is the mother to the team captain, Carter. The team's parents all pitched in and many went to Atlanta to cheer on the SPIDERS.

The Ocean Odyssey actually had two parts: the "Robot Game" challenge and the "Research Assignment" presentation. While the challenge was comprised of designing and building a robot using LEGO MINDSTORMS components, the presentation was completely different. An aspect of ocean (or natural water) protection had to be researched with problems and solutions defined and discussed. The SPIDERS chose a very specific type of ocean pollution – ballast tank drainage .

Ships traveling empty from port to port have to take ballast water into their hulls. This ballast has to be released to allow for the weight cargo. However, water from Port A isn't necessarily the same as water from Port B – the microscopic organisms living in the water get transferred, and become invasive species. SPIDERS' topic was, "How can we use technology to filter out indigenous marine life before it is brought into the ballast tank?"

To do their research, the team attended lectures at the University of Hawaii's Hanauma Bay Education Program. They reviewed national and international environmental ocean protection guidelines and gathered research from local community groups concerned about invasive species in Hawaiian waters. Interviews with a Safety Environmental Systems Manager and an Environmental Safety Officer from Norwegian Cruise Lines further added to their knowledge.

The team proposed two solutions for the problem:

Filtration and Nanotechnology – In this solution ocean water is forced into ballast tanks through a filtration system to remove all foreign particles. Nanobots (microscopic robots) with sensors detect and neutralize toxins and microscopic invasive species.

Multiple Filtration system, Hydrocyclones and Edible Glue – This solution involves ocean water forced into ballast tanks through a filtration system. Hydrocyclones are devices that use centrifugal action to force invasive species to stick to the edible glue.

The end result of both methods is that only 'invasive species free' water is released into the ocean.

The team created a display to show their findings. A presentation was also created for discussion and judging, using a newscast/interview format to discuss the project and solutions.

SPIDERS competed in an unofficial competition in Hawaii, since there were no Official Tournaments close by. While they won the competition, the team still had to be selected to go to Atlanta by

application. SPIDERS didn't find out until mid-February that they would be going to the World Festival. That was great except they then had only nine weeks to raise the funds to go!

The team needed to raise almost $20,000 for travel expenses by fundraising and community sponsorships in that short time. Thanks to the generosity of local citizens and companies SPIDERS was able to raise almost all the funds needed to go to Atlanta.

FIRST LEGO League emphasizes using children's natural curiosity and creativity to look at possibilities and innovating solutions to technological problems and opportunities. And in meeting the SPIDERS team, it's easy to see why.

The team is eight youngsters, six boys and two girls. They share common traits – they are enthusiastic, smart, and team-oriented. After wearing their Ocean Odyssey shirts the first day of the World Festival, they wore - you guessed it – red Hawaiian shirts donated by a local store at home.

This isn't unique. The World Festival is exactly that – with teams from places as far as Japan and Singapore, there is a feeling of friendship that is simply wonderful. While this is supposed to be a competition, the festival atmosphere is much stronger. The adults of the Norwegian team wear blond wigs and mermaid tails, while Japanese team members wear native costumes. And each team's booth is a window to their home – a Japanese team's parents give out origami paper and origami cranes, while others give out pins and brochures about their research topics. And while there is time to compete, there is time to explore and meet. It's not long before some people have vests loaded with the pins they got from all the booths, and it's not long before people make new friends.

Upon arriving, the SPIDERS quickly set up camp, unpacked their gear and took their robot to the practice table area.

Their robot was basically a yellow MINDSTORMS RCX brick with motors, wheels and sensors attached to it. There was no mistaking that it was made of LEGO elements. Sensor bricks were attached to the front and hoses bristled from the sides.

Once switched on, the robot chirped, rolled across the table then stopped momentarily when one of its sensors saw a black line. At that point the robot began to zigzag between this and another line with the hoses tipping flags on the table down and then back up. But where the robot was supposed to go straight, it veered to the side away from the flags, running them over.

The team was surprised by this, but everyone quickly assumed their roles: programmers, designers, builders. Christa Brown took her place at the laptop, looking at the program that was set up for the robot, looking for places to adjust. Everyone else looked at the practice table and the robot in an attempt to determine the problem. They realized the lighting was different in Atlanta than in Hawaii. And the team set to work to redesigning and reprogramming.

In Hawaii, the team had spent afternoons learning about gears, motors and mechanics. They also learned, when the robot sometimes didn't respond as expected, that the light sensor had to be adjusted to the time of day the test runs were done. As a result, there were a couple versions of the program that were used for light and dark conditions, but none of these settings match the lighting in Atlanta. A solution involving a minifig cloak eventually overcomes the lighting problem.

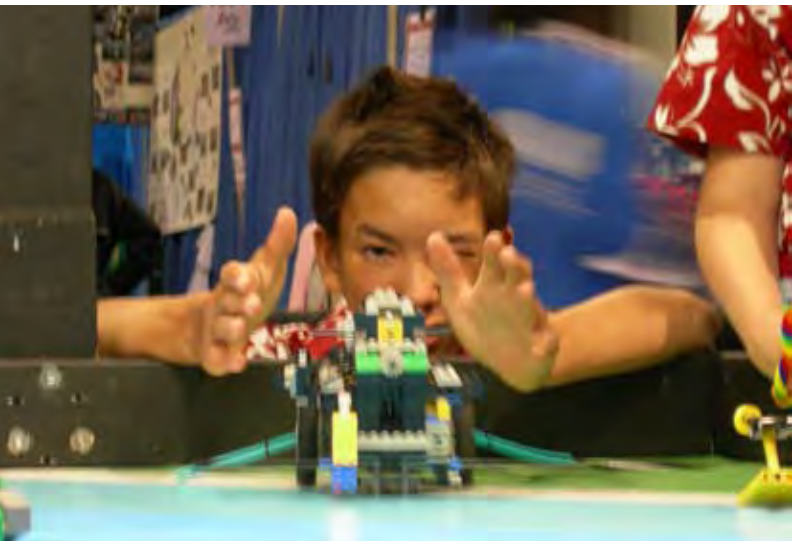
The many teams that came to the World Festival hailed from places like South Africa, China, Japan, Denmark (the home of the LEGO Group), Singapore, Canada, England, Mexico, Germany, France,

More Faces of FIRST LEGO League

Photo by Jake Ingman

Photo by JR Hicks

Photo by Jake Ingman



and Holland. Teams representing 39 American states also attended; the SPIDERS coming from the greatest distance.

With all these teams and their supporters, the atmosphere was not competitive – every team had a common goal and that created a fellowship. This is one of the many FIRST LEGO League Values, which are defined as "acting with respect for each other, behaving with courtesy and compassion for others at all times, honoring the spirit of friendly competition, acting with integrity, demonstrating Gracious Professionalism and to encourage everyone they encounter to do the same."

Gracious Professionalism is a core value of FLL, even though it is left undefined. This value has different meanings for different people. Professionals have special knowledge and are entrusted to use that knowledge responsibly by society. Gracious attitudes are positive – respecting others and showing that respect in their actions. Gracious Professionals contribute in a manner pleasing to others and themselves.

In learning about the designing and building, as well as researching, the teams become professionals, and by sharing their insights with each other, they become Gracious Professionals. All the teams win when they have fun, support each other, learn new ideas, develop new skills and find new abilities in themselves. And this explains how, in a display hall with over 80 teams, there were no arguments heard.

In the Georgia Dome, competition heats continued, but the festival atmosphere still prevailed. A Japanese flag was waved by two fans in the stands to the team below. In the front rows, a group of supporters cheered wildly for their team from Brooklyn and then cheered just as wildly for the next team competing. A team from New Orleans competed wearing jester's hats and Mardi Gras colors. Their fans in the stands wore beads and cheered them on. The Dome was filled with energy, hope and the optimism held by the next generation. It was really something to behold.

On the way to another heat at the Georgia Dome, SPIDERS quickly gathered at the urging of the assistant coach, Trisha Lam. They circled for a short prayer, as their robot was not performing as well as it did in Hawaii. They didn't pray to win, but to be able to find solutions to the challenges they are facing. From that moment on there was a new feeling of focus as they went into competition.

As the robot was placed at its starting position, the team held its collective breath; pint-sized feet shuffled and nervous chatter ceased. There were nine tasks for the robot. In Hawaii it performed all of them within the time allotted. One member of the team was selected to initiate the mission.

The robot was switched on and rolled to the middle of the table. It turned and backed into a LEGO pipe frame that rotated into place between two other frames. Just like that the robot completed its first mission! From there, it went forward and tipped a basket at the edge of the table releasing a dolphin; another mission was completed..

A team member scooped the robot off the table and a long arm was placed on the front end. The robot was returned to a corner starting point on the table. A short distance away there was a large LEGO built container that had spilled out 'boxes' built of LEGO bricks. Farther down the table there was a pump station with a protective structure beside it. With a chirp the robot started toward the spill and as the robot passed it (with a deft rotation) the arm slapped the protective structure over the pump station. The robot then moved back past the container, as the task here was to move the container and boxes to the starting point to 'clean up' the spill. The robot, after

rolling back to the spilled boxes stops and reached over the spill and the container with its arm. Dropping the arm down, the robot reversed and dragged the container and the spill in one motion to the corner – finishing another mission!

The arm was replaced with another arm ending in an improvised hook and was placed back on the table pointing in the direction of the next two missions. Activated, the robot rolled toward what looked like a boat deck balanced on only one of its edges. At the far edge was a submarine that had a hoop at the top. The robot, dropped its arm to catch the sub, approached the boat deck, and was successful in retrieving the sub. With the whir of a motor the arm raised and the sub was taken off the deck and lowered onto the table. Turning to head back to its starting point the arm grabbed an 'artificial reef' and slid it to a place that was defined as shallow water – finishing two more tasks!

The robot arm was swapped out again, this time set for the most difficult set of missions – flipping up a set of flags and moving an artifact. The difficulty with the flags was that they overlapped each other so they had to be raised twice. There were also two rows, so the best solution was to go between them. The artifact was in a small space between the flags and the table edge. This was the area that the team has been trying to rework, and there was a tense hush as this occurred.

The robot started moving and approached the flags finding the line as it did. Zigzagging as programmed it suddenly changed direction and ran over the flags, just as the team ran out of time. SPIDERS was momentarily stumped.

The adjustments just weren't enough for the lighting at the Dome, so the team regrouped on the way to their space and the debugging process continued. The light sensor problem proved to be a major one, and the team members worked fervently to find solutions.

The SPIDERS, wearing their red Hawaiian shirts, the girls in hula skirts, went into the Georgia Dome for the last heat. Everything had been tweaked to the best of the team's ability, and they prepared for their last run. The robot again failed to complete the flag task. (It was later discovered that the light sensor was not used by other teams because of its sensitivity.)

But a wonderful thing happened just the same. After joining with three other teams to do an alliance match, the team turned back into children. They began to play and talk to other kids on other teams and started sharing. One memorable moment came when the SPIDERS girls started teaching hula dancing to the others. And suddenly, the values of FLL became very clear:

"People who work together do not always agree, and everyone has something special to contribute to society. FLL Values are about appreciating our differences, and learning that those differences add to our lives."

SPIDERS finished in the top half of the FLL teams for Robotic Performance, and even beat their first place score in Hawaii! More importantly, the fellow FLL teams awarded SPIDERS with the Gracious Professionalism Award. BrickJournal congratulates SPIDERS and all the other teams that competed in Atlanta this year.

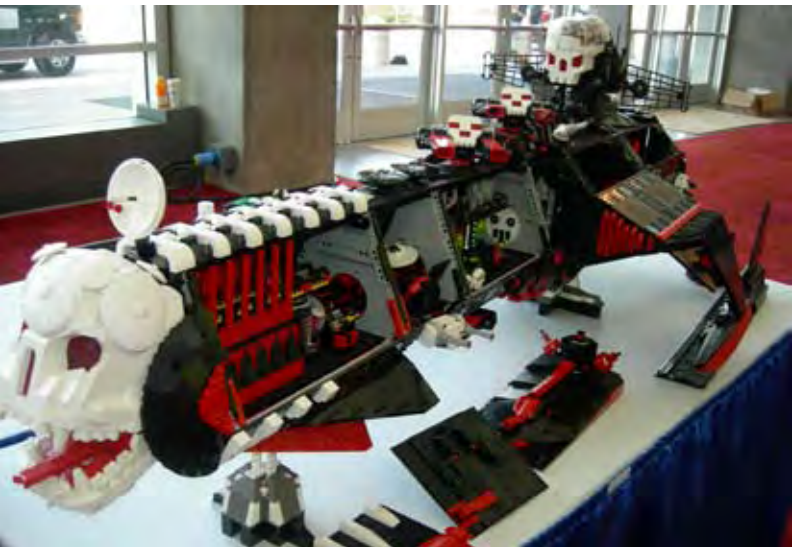
Students and teachers interested in participating in FIRST LEGO League can find out more information at http://www.firstLEGOleague.org/

Photo by Jake Ingman

World Festival Gallery

There were other LEGO activities at the Festival, including one of the first displays of the MINDSTORMS NXT, and a LEGO fan display! Here's a few pictures from the LEGO events - enjoy!

Photo above by Jake Ingman All other photos by Joe Meno



Celebrities help launch "LEGO Builders of Tomorrow" campaign

LEGO Certified Professionals build models for the event

Think about the word "IMAGINE" – what does it mean? What images and thoughts does it conjure up in your mind?

Now imagine a world without imagination. According to The LEGO Group, children spend over 6 hours a day in front of computers, video games and television. At school, they're cultivated into "test-takers", and on weekends they're scheduled into organized activities by their parents. The multi-media glitz during kids' leisure hours and the regimented routine during their school hours are leaving little or no time for kids to foster and cultivate their imagination.

>>

Story by Sean Kenney
Photos courtesy of Sean Kenney and the LEGO Group

To help return kids to the world of imagination, on April 6, 2006 The LEGO Group held a conference at Manhattan's prestigious Café Gray, officially launching the "LEGO Builders of Tomorrow" campaign. This campaign hopes to remind parents "to actually take out an hour every week to spend creative time with their children.", says Jørgen Vig Knudstorp, The LEGO Group's CEO.

At the kickoff event, The LEGO Group invited a panel of celebrities and educators to speak about the importance of creativity, and asked LEGO Certified Professionals Sean Kenney and Nathan Sawaya to incorporate the LEGO brand and philosophy into the event by building LEGO models for centerpieces and decorations.

Watch a 15-minute video of the event at LEGObuildersoftomorrow.com

In a room surrounded by 2 foot tall LEGO letters forming the word "IMAGINE", a life-sized reproduction of an Eileen Fisher dress made of LEGO bricks, and personalized LEGO nameplates, actor Matthew Broderick, fashion designer Eileen Fisher, NASA-sponsored educator Meri Cummings, director of MIT's "Lifelong Kindergarten Group" Mitch Resnick, and radio hosts Heather Reider and Mary Goulet formed a panel that spoke about the importance of creative play, as well as how LEGO has played an important part in their lives.

Children are increasingly losing their play time and becoming overscheduled. "My eight-year-old comes home sick to his stomach with headaches every day, because they're getting ready for the big tests," said Reider. "His biggest complaint about going from kindergarten to the first grade was 'no free time'." To combat the problem, the panelists make sure that free time becomes part of the schedule. Broderick encourages "unstructured time" with his son. "It's OK if he just wants to lie and stare at the ceiling and hum for awhile … it's good to let him control it."

The panelists felt that the creative process is lost with most toys. Rather than purchase a toy truck, why not build one with blocks? Resnick showed the attendees a model cat that a child had made; when you pet the cat, it meowed. He joked that "pre-made" toys that create sounds or motion are popular, but "I think the people at the toy company learned a lot by building it. So, I'm a little worried that the kids aren't learning so much."

Reider lets her children learn by building LEGO models, "Just letting them build it and destroy it and build it again and sit back, it's really hard as a mom or a parent to not want to get in there and solve the problem for your kids, or make it right, or make them play according to your rules." But doing so lets them learn from their mistakes as well as their achievements.

In launching the Builders of Tomorrow campaign, The LEGO Group is taking steps to do its part encourage imagination and creativity and continue to design toys that inspire children to create, to think, and to play.

So where does creativity come from? "I don't know where it comes from," Broderick says. "A lot of it probably came from LEGO."

The LEGO models

As the panelists spoke about creativity and child learning, attendees sat surrounded by large LEGO centerpieces and decorations set up around the room.

Life-size LEGO outfit

LEGO Certified Professional Nathan Sawaya was approached by The LEGO Group and asked to build a life-size replica of a fashion ensemble designed by panelist Eileen Fisher. The outfit consisted of pants, a dress and a scarf, which Sawaya meticulously replicated over the course of two weeks.

"I wanted to make sure the outfit really looked like clothing hanging on a mannequin, so my first priority was obtaining a mannequin. Once I had the mannequin in my studio, the rest was trial and error." The building process was a challenge for Sawaya because the width of the LEGO bricks is thicker than actual fabric. "I ended up replacing parts of the mannequin with actual brick so as not to make the mannequin seem more shapely than necessary."

The entire model was built over the course of 60 hours and used about 5,500 bricks. It is over four feet tall and is built on to a sturdy mannequin base. It is currently on display at the Time Warner Center at Columbus Circle in New York City.

Regarding the wearability of the design, Sawaya says "the LEGO outfit is a bit painful to wear and causes chafing in certain places. I know."

See more pictures of the LEGO outfit at http://www.nathanbrickartist.com/eileen_fisher_outfit.html

LEGO lettering and centerpieces

The LEGO Group also asked Certified Professional Sean Kenney to build table centerpieces and nameplates for the panelists. For table centerpieces, Kenney built the word "IMAGINE" in two-foot tall block letters; each letter used between 3,000 and 5,000 LEGO bricks. In all, the giant word used over 23,000 LEGO bricks and took about 60 hours to design, build, and glue.

Kenney also built matching 1-inch-tall models of the word "imagine", to sit at the base of each larger letter. "To build legible lettering in such a tight space, you can turn LEGO bricks upright and build the models sideways," Kenney commented. "Since our alphabet uses more vertical lines than horizontal lines, you can use the thinness of LEGO plates to your advantage. You get more detail than with a standard studs-up design."

Using the same "sideways lettering" technique, Kenney created nameplates for each panelist. To personalize them, a mini-model unique to the panelist's line of work was attached to each, such as a space shuttle (for Cummings) or an apple (for Resnick).

Julie Stern, representative for The LEGO Group, said "The panelists loved their name plates and all took them home with them. I'm sure they'll end up on their desks!"

See more pictures of the LEGO lettering and nameplates at http://www.seankenney.com

LEGO Certified Professionals

The LEGO Certified Professionals program was recently co-developed by The LEGO Group and by adult LEGO enthusiasts to provide an official way for The LEGO Group to support people that are actively engaging the LEGO brick as a full-time or part-time career.

The program is still in its infancy. In mid-2004, a small group of adult LEGO enthusiasts began working regularly with The LEGO Group to sculpt and create this program. It was announced a year later under the name "LEGO Affiliates", but was soon renamed after suggestions by LUGNET community members. Now only a year later, the program is still being shaped; it aims to provide a solid means for people to work with members of The LEGO Group on projects of mutual benefit. It is the hope of The LEGO Group that this program will continue to expand, and because it was designed to be internally self-sufficient and pose no financial impact on the company, the program is poised to be around for a long time.

Certified Professionals (left to right): Dan Parker, Robin Sather, Nathan Sawaya, and Sean Kenney

The LEGO Certified Professionals program is similar in many ways to the LEGO Ambassadors program; Certified Professionals often act much like "commercial ambassadors", by spreading the good word of LEGO and engaging the public via commercial activities. The Ambassadors program and Certified Professional program were created together, to exist as complementary programs.

LEGO Certified Professionals are not employees of The LEGO Group; they are self-employed individuals that have established an ongoing business relationship with the company. They meet regularly to discuss and refine the program, work on projects, and help each other. Currently, there are four LEGO Certified Professionals. They are:

Sean Kenney (New York, NY)
http://www.seankenney.com

Dan Parker (Seattle, WA)
TpB Group

Robin Sather (Vancouver, Canada)
Brickville DesignWorks, http://www.brickville.ca

Nathan Sawaya (New York, NY)
http://www.nathanbrickartist.com

"The BrickJournal is simply the strongest and most authentic expression of the LEGO values in real life. It is astonishing and encouraging to feel the energy and creativity. That's what's LEGO is and shall be all about"

Torben Ballegaard Sørensen, Member of the LEGO Group Board, CEO, Bang & Olufsen

"I am deeply impressed with BrickJournal. An amazing collection of articles for and about LEGO enthusiasts. I have read and enjoyed every single issue published to date"

Kjeld Kirk Kristiansen

"BrickJournal is just an incredible and inspirational publication that brings LEGO Fans together from all over the World. Congratulations to all concerned"

Richard Stollery, Senior Director, LEGO Consumer Services

HAPPY FIRST BIRTHDAY!

YOU ARE GROWING UP SO FAST!

"Dear Joe and everyone involved in the making of BrickJournal. This is the most powerful testimony of the LEGO community to date. BrickJournal brings it all together and makes me both humble and proud. I have asked colleagues across the LEGO Group to send you an anniversary greeting – here it goes"

Tormod Askildsen and the LEGO Community Development team

"The BrickJournal is a great example of the power of the LEGO community and a great way to tie the LEGO community together. It is a high quality magazine and I enjoy reading every issue. It also teaches me more about the community. Congratulations with the anniversary"

Søren Lund, Director, LEGO MINDSTORMS

"It's easy for us to get caught thinking only about the day-to-day operations of our business, so I like to read BrickJournal because it's a fantastic reminder of the power of our brand at work. Keep up the great work."

Søren Torp Laursen, President, LEGO Market Group 3 (Americas, Pacific, UK/Ireland)

"I am amazed by the size and professionalism of the BrickJournal. It is a great testimony to the extent, depth and involvement of the LEGO community. I am so proud to be associated with LEGO whenever I read the journal"

Jørgen Vig Knudstorp, CEO LEGO Group

"Congratulations! There are few things as challenging as putting out a magazine, especially one as ambitious as BrickJournal – and few things more rewarding than doing one about something that you love. Best wishes for continued success."

Greg Farshtey, Editor, LEGO Magazine, LEGO BrickMaster

"To me, BrickJournal illustrates the richness of creativity within the LEGO community. It is both a tribute to the creator of LEGO and to the fans who take a single brick and through their own imaginations continuously push the limits of what is possible. One cannot help but be inspired by the contents of this magazine."

Keith Malone, Senior Design Director, LEGO Marketing Communications

"BrickJournal is a wonderful reminder of why it's such a privilege to work for the LEGO Company. The creativity and imagination of our fans will never cease to amaze me. Congratulations Brick Journal on capturing the magic of LEGO."

Jill Wilfert, Head of Partnership and Alliance Management

"As we look to the future, we anticipate an increased cooperation with our best users on products, marketing programs and partnership in inspiring families. The passion you have for your LEGO hobby and shared stories through BrickJournal excites us about further collaboration. Congratulations on an outstanding first year."

Mike Moynihan, Senior Director of Marketing, LEGO Systems Inc.

"Brick Journal is a fantastic magazine which really highlights the passion and enthusiasm so many LEGO fans have with our brand. It illustrates the full potential of what can be created from our products, with just a pile bricks and a lot of imagination.....amazing and inspiring stuff guys!!! Keep it up!!! It's things like this that make me so proud to be part of the LEGO Group!"

Matthew Ashton, Creative Director, Playthemes / Licensed Properties

"I am always amazed by what the LEGO community can do with our products, but it's so much more than just product. BrickJournal is a great example of how you also celebrate the LEGO experience. Keep up the great work!"

Chuck McLeish, Director of Marketing, LEGO Systems Inc.

"There are few communities that produce a magazine of this caliber -- evidence of your commitment to creativity, quality and shared connections for which our brand is so well known and loved. Congratulations on continuously raising the bar and all best for continued success."

Michael McNally, Senior Brand Relations Manager, LEGO Systems Inc.

"Most brands dream of the commitment and passion the LEGO community shares. We truly appreciate the creativity you pour into your creations, community activities and public shows – all perfectly reflected in every issue of BrickJournal. Great work!"

Eric Wolfe, Senior Director of Marketing, LEGO Systems Inc.

"I am so impressed with the level of quality and professionalism in Brick Journal and the enthusiasm shown by all the fans contributing. Congratulations to Joe and the team - Well done!"

Lisbeth Valther Pallesen, Vice President, LEGO Business Development

"WOW!! I am continually impressed with the strength of your content and your understanding of the unlimited possibilities contained in the BRICK. If the first year is any indication of what is to come, I am eagerly awaiting my next download of BrickJournal!"

Jeremy Brazeal, Senior Art Director, LEGO Magazine, LEGO BrickMaster

"I find the BrickJournal very inspiring – and I am deeply impressed by the insight and competence of the authors. Sometimes, I wish I knew as much about LEGO as they do..."

Mads Nipper, Senior Vice President, Product & Marketing Development

Event:
Paris International Model Show

Bricks in Paris

FreeLUG displayed and BrickJournal *has a report!*

Article by Didier Malon
Photos by FreeLUG members

Immeuble d'Eric - Eric Letang's building

BB63000 de Pascal - Pascal Bréard's BB63000

Once again invited this year by the FFMF, FreeLUG took part in the Paris International Model Show at the Porte de Versailles exhibition center..and once again we were considered a big success from thousands of visitors.

The many FreeLUG members who participated to the event, under Didier Malon's coordination, didn't take a rest in order to be available to answer several questions coming from the audience, who did not think it was be true that our 16m² layout was built only with LEGO bricks.

Set in the middle of the classic train models in HO or N gauge, it was easy to see our fully colored layout was most attractive, especially for kids. But the oldest were also very curious and they expressed lot of compliments and congratulations.

Despite the 9v Train where the kids enjoyed seeing the Hogwarts Express and the TGV, 12v tracks were also set to let see all the automatic items such as lights and switching tracks and the nice BB63000 heading a freight train.

Most of the attendants were French but we had also with us some friends from Belgium and the Netherlands, bringing with them nice creations, especially realistic buildings.

The first surprise, even before we started installing our layout, was a call from a French TV reporter who asked if he could make a report on our exhibition.

So we set a rendezvous the morning of the installation day and the TV team, who previously planned to spend just the morning with us, stayed all the day, talking with us and taking a lot footage of the install. Unfortunately, despite our early arrival at 9:00 am, we got the tables at 5:00 pm, only after several calls to the organization crew of the exhibition center.

The second surprise was that our friends from the French Model Train association (FFMF) set our booth in the middle of their area. We were close to the Morsang-sur-Orge and Arpajon model clubs (Note for our foreign readers that the legal address of our FreeLUG association is located in a town close to Morsang and Arpajon...)

Our strategic position made a major impact driving all the families to the train booths and everybody, kids and parents alike, stayed a while, looking at all the small details on our layout.

The TV team, including Laurent Hirsch (interview), Mathieu Dreujou (camera), Emmanuel Rassat (sound) and Bernard Gazet (editor) came back on the first day of the public opening to get some visitors comments —all were positive! I noticed some hysterical behavior; especially from a young child who didn't want to leave our booth, claiming to his parents "It's too nice !" and of course a deep interest from the adults asking us a lot of questions about the way we get the bricks, the time we spent to build our creations, the set references and where to get the building instructions.

The day after the TV broadcast, we met a 70 year old AFOL, playing with LEGO toys for 40 years and happy to see that he was not alone !

And in the following days, we met several other people telling us that they came especially for us after the TV show.

With such feedback, the display was worth all the efforts and sacrifices made to prepare this event.

Our Dutch friends Casper Van Nimwegen and Jan-Albert Van Ree were really appreciated for their coming and the high quality level

of their models. They took the opportunity of their trip to make a visit to Paris and add some more pleasure to the fun !

From Belgium Vincent Meeuw, Jean De Gobba and his family brought with them nice elements to show. I've got the feeling that it is easier to build European community with LEGO bricks than waiting for political decisions between nations...

When Pascal was shouting "The 12, get out !", I didin't think he was talking about the voltage of his LEGO train, because it was another opportunity to show old stuff and also to discuss the coming developments in LEGO trains, giving some information about the new train sets and the new plastic tracks. (Actually in France a big TV advertising campaign is running in order to promote the new numbers for the telephone information service - The old number was the 12 and all private operators are now proposing new dialing numbers. One slogan is "The 12, get out !"). Pascal used some minifigs to make some jokes making reference to this campaign. Eric from his side did also some allusions on his building. They left Gilles alone; he was too busy managing his skating rink.

The realistic details from Erik Amzallag (another Eric, but with a k like Kristiansen - unfortunately no relation) were also noticed by a train model magazine reporter (Loco Revue) and gave us the opportunity to explain some building techniques.

And some LEGO builders are secretly dreaming about putting Loy Bailly's fire station on their wish list!

The highland made by Denis Laurençon, who contributed but could not attend, left some places regarding the other parts of the layout and gave an opportunity for Jean to display his collection of 70's sets. The masterpiece was the "Pavillon d'Amour - Love kiosk" made by Casper, signed as usual with his running fool minifig with a special dedication to his girlfriend Barbara who stayed at home for this time...

Jan-Albert and Vincent pleased everybody with their trains and Didier Enjary brought few micro-scale models (by Jason Allemann, Tony Hafner, Kecia Hansen and Paul Janssen) in order to illustrate that imagination is not linked with the quantity of bricks available.

We were not the only "big boys" to play with our LEGO toys, some other tools (with a T and not a F) were presented by Richard Olivero on the official LEGO booth, where with the LEGO Company assistance, he presented a "premiere" of the new MINDSTORMS® NXT, that is expected be released in France in October.

Pascal thought that the LEGO toys were not shown enough, so with Médérik Guilbert he found a way to the boat pool and did a demo with the new Police boat. (It didn't sink !! It just didn't float so well...)

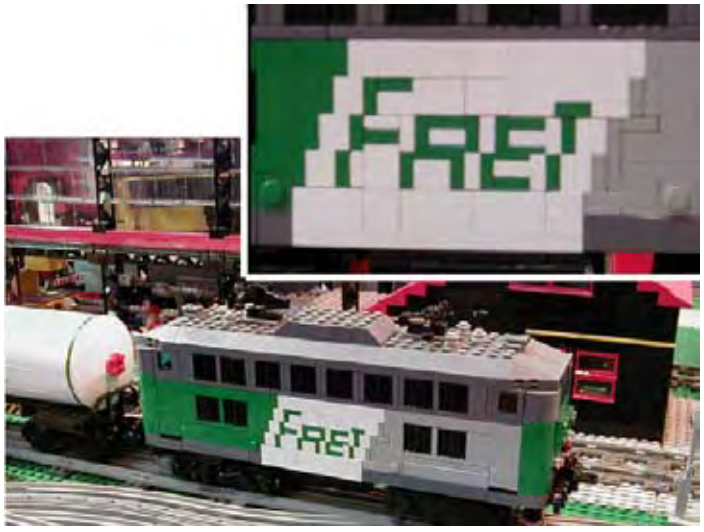
So Pascal is now thinking about attending next year to the car area with Racers and I'm sure he is dreaming of a flying MOC, in order to be seen everywhere in the exhibition center !

Feedback from the attendees

Phillipe Label: A very funny exhibition in several respects. Always smiling attendants - it's true that these events are a good opportunity to play together with our LEGO in a better way than we could do alone at home. The reward from the audience's comments and congratulations was a real pleasure. The organization provided by the French Model Train Association was helpful. It was a nice experience and lot of fun. It was great for Didier to be there to manage all details. Thanks Didier ! I hope to attend the next show soon! >>

Maison Schröder-Schräder, par Jan Albert - Schröder-Schräder House, by Jan Albert Van Ree

70 years old, 40 years of LEGO building



BB25500 en livrée Fret d'Erik - Freight BB25500 designed by Erik Amzallag

Trains miniatures - Micro scale trains

Grogneuneu IV et Dremel II - Richard's drilling table

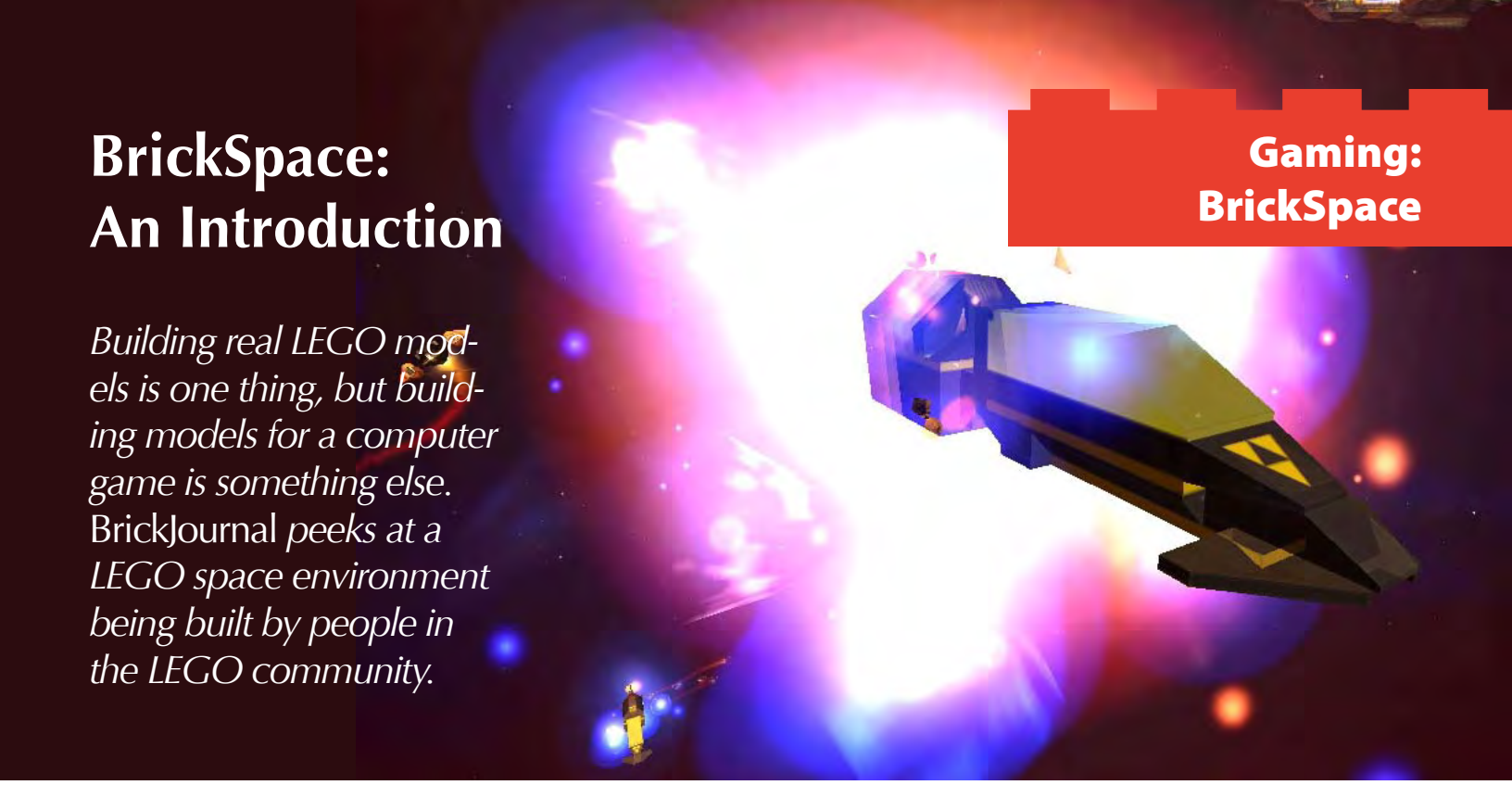
Loys Bailly: As usual, it was the pleasure we could see in the kid's eyes that was the mark of our success. Of course, Didier managed the event in a professional way. From the LEGO model point of view, to present 7 "SNCF" (Société Nationale des Chemins de Fer Français —French railway company) loco had a tremendous impact, especially for the train modelers around us. And what about the animated buildings... no more to say, it was absolutely great !!! We need to meet for the next show...

Pascal Bréard: I was impatient to attend this exhibition and I was thinking that the 5 days duration might be long, but at least I did see the time going on... Big thanks to Didier Malon for the management and for the sacrifice of one of his buildings that because of a misunderstanding was in the way of my haunted house. No time to say anything, the building was already in pieces, but Didier could be confident it was the last exhibition for the haunted house. I'm thinking about rebuilding it another way because 10 minutes before the opening I faced some technical problems that stuck the opening doors of the house. Even so, it was a really super exhibition and a lot of fun ! A few words about Richard Olivero and his Dremel driller: the drill failed, but the LEGO bricks didn't. This is good proof of his mechanical creation. Congratulations, Richard !

Didier Malon is a key member of FreeLUG, involved in event and meeting organization and store relations. He is also a Train connoisseur, and is responsible for initiating and maintaining a close relationship with the French Model Train Association.

BrickSpace: An Introduction

Building real LEGO models is one thing, but building models for a computer game is something else. BrickJournal *peeks at a LEGO space environment being built by people in the LEGO community.*

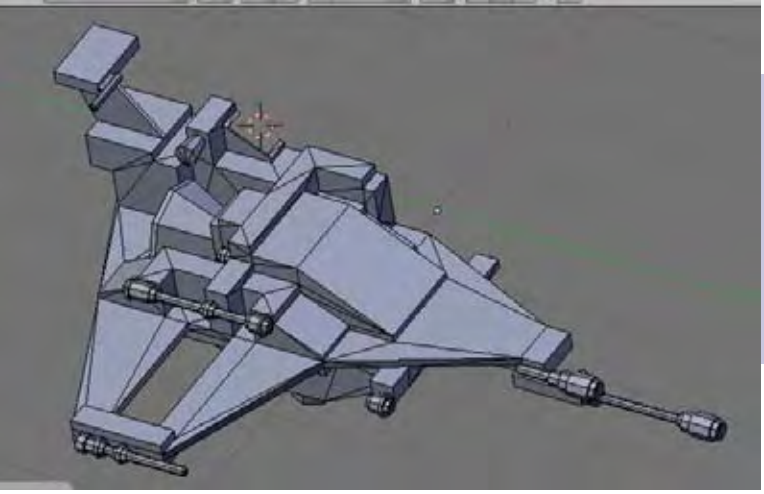


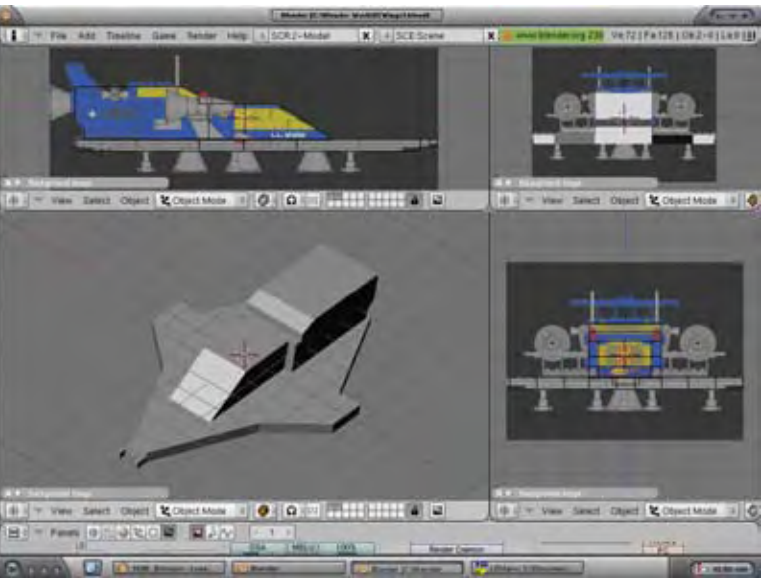
Article and screen shots by Stefan Garcia

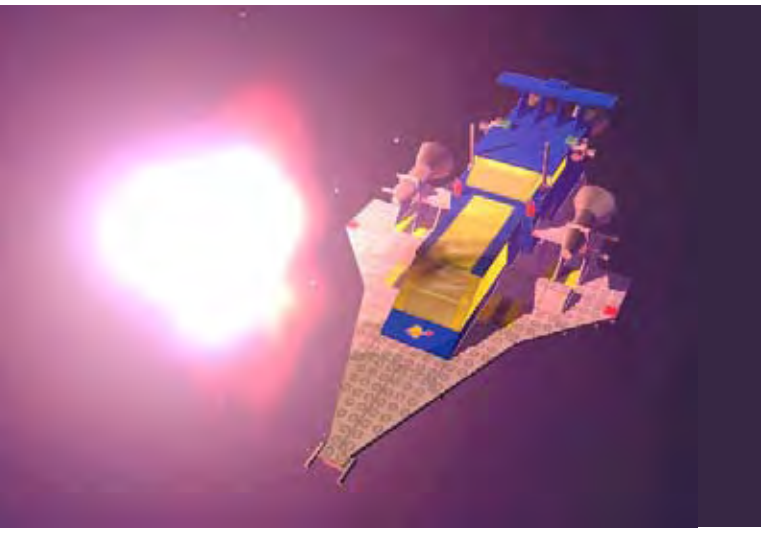
It started with the question - "What if?" What if, all those little LEGO spaceships of our youth were no longer confined to firing imaginary laser beams and or being propelled by swooshing noises really made by us? What if they could be brought to 'virtual' life, out of the haze of our memories and into the vivid life of our computer monitors? I found the means to answer those questions in form of the computer games Homeworld 1 and 2, by Relic.

Homeworld 1 is a space-based real-time-strategy game. In it, the player controls their fleet through an epic and sweeping campaign as a group of exiles seeking to reclaim their lost home. Acclaimed for it's engrossing story and sense of being immersed in a complete world, the game was also a technological wonder when first released. The Homeworld games were groundbreaking in their use and appreciation of space. Rather than being confined to an two-dimensional invisible plane, where all ships skate around as if on an invisible sheet of ice, ships could move in any direction. As I ran the game for the first time, I marveled at the sense of infinite space that Relic had created. It seemed as if the game world went on in all directions, with no boundary. Homeworld had made a permanent impression on me.

A few months after buying the game, I was talking to friends when it occurred to me I wanted to learn how to put a LEGO ship I'd made into the game. Altering games and creating new content is hardly an original idea—all over the Internet are communities of "modders" working on modifications for various games. Given Homeworld's somewhat generic format (and thus ease of being turned into Star Wars, Star Trek, or even Farscape themed worlds, just to name a few), there was already a large community for it, sponsored by no less than Homeworld's creators: Relic. A vast library of fan-made tools and tutorials were available, I just had to jump in and start learning. After a few weeks of trial and error, and reading through numerous tutorials, I added a simple model to the game, just a little lump of polygons (the virtual triangles of which all 3D computer models are made), but it was a definite start. From there, I imported a small MOC of mine into the game. As I watched that ship twirl and flit about, launching its weapons, and even destroying enemy ships, I was dumbstruck. This was LEGO play as I had only been able to dream about. I didn't have to make "pshoo" sounds for the weapons; they were blaring out of my speakers; I didn't have to imagine an exhaust trail streaming from the engines as the ship whirled around for a weapons pass, the trails were right there on my monitor. At that point though, I wasn't quite sure where to go next. The thought occurred to add some more of my ships into the game, but my MOCs at that point weren't quite up to par with my peers. It so happened that the group of friends I had been talking to were Spacers, and more specifically, the Spacers that would go on to form the Classic-Space.com forums in the subsequent months. After they pointed out the immense array of ships LEGO had once produced for its Space themes, I knew what I'd make. I would bring to life the memories of old. But first, I had to learn even more.







I had already worked out the creation and how to import it to the game, but that was hardly the end of it. To generate the test ship I had made a virtual model of it in MLCad, and then used LDView to render a background image. Next I traced the image in the 3D modeling program Blender (an open-source program available at www.blender.org), and created a 3D model of the object. After this, I took the model I had made, and using a script I found online for Blender, "unfolded" the surfaces of the model so that I could apply textures to it in Photoshop.

Once this whole affair was done, I would have to export the model and use yet another program to finally convert my model to the file format (in this case, .peo) that Homeworld uses for its ship models. Needless to say, this was quite a confusing process at times! Still to learn were such things as animation, hardpoints (those guns don't decide themselves where they'll go after all!), special abilities, new weapon effects, and a whole slew of other items. To add to the difficulty, it looked as though I would need to make an .ldr (LDraw) file for every Classic-Space model I wanted to use. As with the test models, I needed to use a .ldr for each model I wanted to create for the game. Then I ran across Koyan's Brickshelf gallery (http://www.brickshelf.com/cgi-bin/gallery.cgi?f=98083). With more attention to detail and patience than I ever could have imagined or achieved myself, he had replicated every Classic-Space set in LDraw form. Thanks to him, my project got a jump start of several months. Now it just needed a name. I knew I couldn't have "LEGO" in the name, so I followed popular tradition, and used "Brick" instead. Since it was set in space, the rest was obvious: it would be called BrickSpace.

At the time, I had disregarded the idea of a game modification for Homeworld's sequel, Homeworld 2. However, as BrickSpace added more and more ships to its roster, I began to push the limits of Homeworld's aging engine. A game engine can only support so many textures, so many things onscreen at once, and is only so flexible. BrickSpace was quickly running into every limit Homeworld had. Finally, I could resist the allure of Homeworld 2 no more, and tackled it's more daunting modification process. In time, it became routine, and I saw just how much more potential resided there. Homeworld 2 is almost infinitely extendible, as it was written with "modders" in mind. Much of the game's previously hidden and hardcoded functions are accessible through the Lua scripting language. Whereas in Homeworld 1 your fleet had to be a certain size, Homeworld 2 allows for as many ships as you want. Fleet rosters can be large or small. Ships can perform any role you want them to. And you can alter and edit much of the way the game feels and looks. Much of this I've not yet touched on, being focused primarily on getting ships into the game. Currently, there is a complete fleet of Blacktron vessels, and the Classic-Space ships are slowly being ported over from Homeworld 1 or remade from scratch to a new, higher-detail standard. The modifications created for both games are currently available for download from my web site, www.brickspace.net. Completion is still a long way off for BrickSpace, but every day a new ship or detail is added and brings it one step closer. Already, you can enter into a world where imagination becomes reality, where the sets of old cruise the stars, and where they obey your every whim. Welcome to the world of BrickSpace!

Stefan Valentin Alvarez Garcia was born in San Antonio, Texas. He currently resides in the frozen northern state of Michigan. His favorite themes are Space and Train. However, after stumbling across the world of "game modding" he has put most of his energies into BrickSpace, with little time to build with real bricks, much to the annoyance of his friends in #LEGO (an online chat group).

Building LEGOLAND

LEGOLAND's history is examined by Jim Hughes

Photos compiled by Jim Hughes

At first glance a theme park in the middle of the Jutland moors seems a folly, and in a sense, it perhaps was. But Denmark does have a long history in this regard: the two oldest amusement parks in the world are both located there. Dyrehavsbakken, in Klampenborg, was established in 1583 and the famous Tivoli Gardens in Copenhagen, the inspiration behind Disneyland, was established in 1843.

Of course Godtfred Kirk Christiansen, the son of the founder, Ole, and now sole owner of LEGO, did not initially set out to build a Tivoli Gardens or even a Dyrehavsbakken. That would come later. Initially Godtfred just wanted everyone out of his factory! LEGO's large display models, intended for department stores and trade shows, had so captivated everyone's imagination that LEGO could not keep up with requests by families and school groups to visit and see them. By the mid 1960's the distractions brought on by the large numbers of visitors – almost 20,000 a year - so annoyed Godtfred that he decided to set up an outdoor display of the models to keep everyone out of the factory. After all, he did have a business to run.

He initially envisioned just a small display featuring some of the work of the model shop. In a 1980 interview Godtfred stated his initial ideas:

"What I had in mind first was something in the way of a large open-air show, maybe the size of a football field, where a pensioner couple could sell tickets and perhaps run a small cafeteria. But when we eventually, in the mid 1960's, got down to putting our ideas on paper the plan and our ambitions had grown. But just about everybody shook their heads - it was a utopian notion to think that you could set up tourist attraction in the middle of the bleak Jutland moors, where people had no desire to come. But I've inherited a good chunk of my father's obstinacy."

Arnold Boutrup. Spring 1968.
Image courtesy and copyright the LEGO Group

The obstinacy of Ole Kirk Christiansen was legendary, but the fact was Godtfred's ideas had grown so large and so rapidly that he soon realized that he was way out of his league. He needed someone to manage this growing project and found that person in Arnold Boutroup. At the time Boutroup was the chief designer for the Anva Department Store in Copenhagen. He was heavily influenced by the post-war modernist movement of Danish art and design and by the mid-1950's he was creating ground-breaking displays at Anva; displays that caught the attention of not only Copenhagen's shoppers, but Godtfred as well. Godtfred finally managed to lure Boutroup from Copenhagen to Billund by offering him the position of the General Director and they began to develop what would become LEGOLAND.

The Madurodam

The ideas for an attraction in Billund came, no doubt, from the Tivoli Gardens, and perhaps from Disneyland in Anaheim, which had revolutionized the idea of a theme park just a decade earlier. But the true inspiration, the breakthrough moment as it were, came after Godtfred visited the Madurodam while on a trip to the Netherlands.

The Madurodam, in the Hague, opened in 1952 as both a war memorial and a charitable organization. It is a miniature city with exact 1:25 scale replicas of many of buildings in Holland set among a perfectly scaled landscape.

Godtfred and Boutroup decided that this would be an excellent format for their park. Rather than simply showcasing promotional models they would build scale models of real structures placed in their proper context. A large scale, cohesive design would be the perfect showcase for the model builders and the focal point for an attraction that could appeal to more than just local families or school groups. The result would become Miniland, the centerpiece of LEGOLAND. It would be the LEGO version of Madurodam.

Madurodam, Hague, from a 1958 postcard, vs. Miniland, 2004. Image courtesy Maico Arts

Dagny

Of course it's one thing to think about the perfect attraction but quite another to actually execute it. Fortunately for Godtfred, they already had the perfect person working for LEGO: Dagny Holm.

Dagny, who was Godtfred's cousin, was classically trained in art as a sculptor and had joined the model shop in the early 1960's. It took some time for her to appreciate the artistic possibilities of the LEGO brick, but when she finally mastered the new medium she began creating models that completely changed the idea of a display model. Her designs were realistic but also showed a unique sense of humor that has since become a trademark for LEGO. She was largely responsible for the deluge of visitors to the factory in the early 1960's and now became responsible for solving the problem. She, and her small staff, began to build Miniland.

Working from photographs, drawings, plans, and even site visits, Dagny and the model shop began recreating many of the structures of Europe out of ordinary LEGO elements in perfect 1:25 scale. They built a Dutch town, a Swedish fishing village, and, of course, many famous Danish landmarks. By the time the park opened they had built several hundred structures using close to six million bricks.

Groundbreaking on the site was in 1966. They chose a 13,000 m^2 (3 acre) heath sandwiched between the factory and airport in Billund. The terracing of Miniland would require several thousand truckloads of soil, which had to be brought in from surrounding areas. Over the next year and a half they built a complete amusement park on the site. By the time they finished construction in 1968 the park consisted of:

-Miniland. A perfectly realized 1:20 scale miniature world, the centerpiece and focus of the park

-The LEGOLAND Driving School

-A life-size LEGO Train

-A Children's puppet theater

-Fort LEGOredo. An Indian encampment

-A LEGO Building area

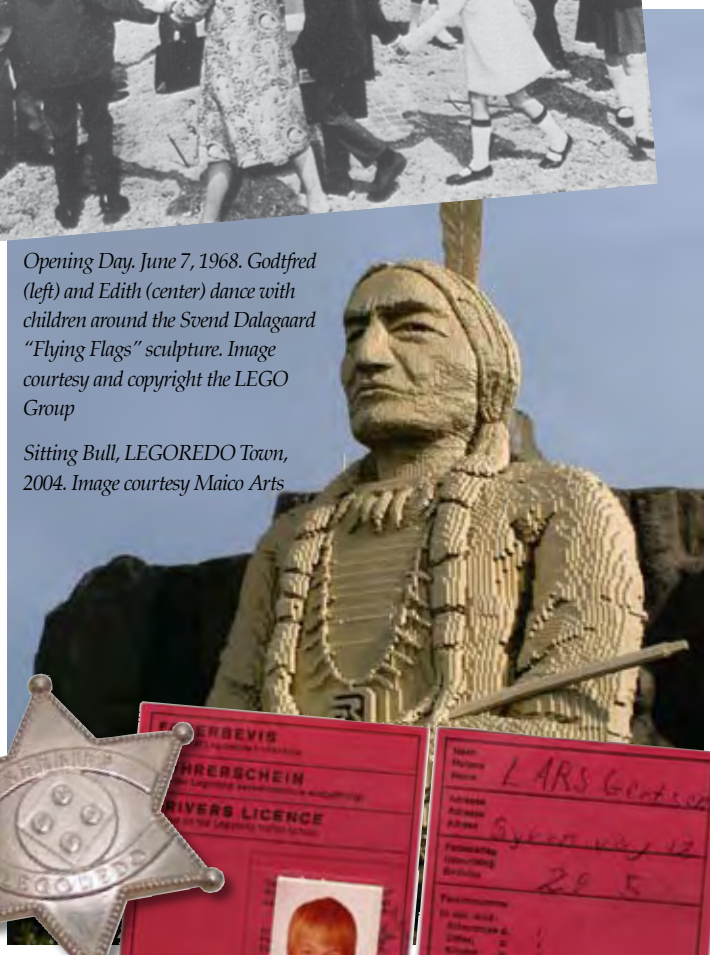
-An Antique Doll Collection

So Godtfred, Arnold and Dagny had finished their amusement park in the middle of pretty much nowhere, but the question still remained: would anyone come? It didn't hurt that the park was directly adjacent to an airport (in fact LEGOLAND and the Billund Airport shared a common parking lot for many years), but still, Billund is not an Odense, not an Arhus, and certainly not a Copenhagen.

Dagny Holm. Spring 1968. Image courtesy and copyright the LEGO Group.

Miniland 1968. Image courtesy and copyright the LEGO Group.

Opening Day. June 7, 1968. Godtfred (left) and Edith (center) dance with children around the Svend Dalagaard "Flying Flags" sculpture. Image courtesy and copyright the LEGO Group



Sitting Bull, LEGOREDO Town, 2004. Image courtesy Maico Arts

LEGOLAND Sheriff badge. 1978. Image courtesy Sonnich Jensen

LEGOLAND Drivers license. 1971 Image courtesy of the driver, Lars Gertsen

The LEGOLAND Band. 1978. Image courtesy Sonnich Jensen

If You Build It They Will Come – Maybe

LEGOLAND opened it's doors to the public on Friday, June 7th, 1968 and drew some 3000 visitors on the opening day. Despite its remote location the park was an overwhelming success. As Godtfred recounts:

"During the few months the season lasted we had no fewer than 625,000 paying visitors. It knocked all of our planning to the moon: at most we expected only half that figure."

Godtfred, Arnold, and their planners were wholly unprepared for the number of visitors that first season. LEGO pressed many of their employees into emergency service at the park. It was not uncommon to see senior management staffing the cafeteria on weekends that first summer.

The first visitors were Danish families, no doubt spurred on by pre-opening publicity from both local newspapers and family-oriented media. The Danish magazine *Familie Journalen* even called the opening "the most important event for families of the year"

Over time, however, the park began to attract families from Northern Europe, and later, as more direct flights into Billund Airport were possible, visitors from all over Europe.

The Richter Commissions

By 1970 the park had expanded to nearly eight times its original size and Godtfred began to envision much larger LEGO models not limited by the scale of Miniland. They chose the Danish artist Bjørn Richter to create a series of large scale sculptures.

Richter, who had traveled to the American West and became deeply interested in the history and culture of the American Indian, began a series of three commissions for the park.

His first, a massive replica of Mt. Rushmore, was installed in 1974 and required 1.4 million LEGO bricks and more than 40,000 Duplo bricks. But that was just the warm-up.

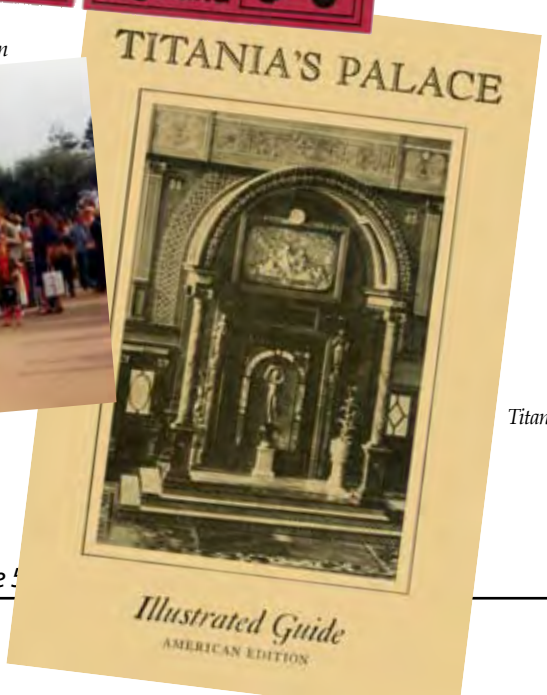
Richter followed this with two completely original sculptures; the massive and remarkably realistic Great Bison Hunt relief and the Chief Sitting Bull monument.

Richter spent more than two years in his studio designing and building the stunning monument to the Lakota Sioux Chief. When it was finally installed in the park it stood 36 feet tall and required more than 1.75 million bricks. Some 30 years later it remains the largest Sitting Bull monument in the world and is still perhaps the most impressive installation in LEGOLAND.

The Really Expensive Dollhouse

For years the Kirk Christiansen family had been quietly amassing one of the world's most important collections of antique dolls and mechanical toys. Part of the collection was shown in an indoor display at the park. However the toy displays were never fully appreciated until LEGO decided to buy the most famous, and most expensive, dollhouse in the world. In 1978 they paid over 200,000 USD for Titania's Palace from an auction at Christie's

Titania's Palace was built in Dublin by Major Sir Nevile Wilkinson for his daughter Gwendolyn. It took 15 years to complete and was opened by Queen Mary in 1922.



Titania's Palace Guide book. 1926

The 18 room dollhouse contained more than 3000 miniatures and was exhibited around the world. After LEGO acquired it they spent a year and a half restoring it before placing it in a newly-built display in LEGOLAND. It would serve as the focal point for the antique toy and doll collections. It is estimated that more than one million people visit the display each year. Sadly, LEGO dispersed the doll collection in a highly-publicized auction in July 2006.

Meanwhile, Back in Miniland

As the park grew over the next two decades, Miniland also grew. In the early 1980's the model shop undertook their most ambitious project yet, a recreation of the Copenhagen Harbor, including the Nyhavn district, perhaps the most photographed locale in Denmark. It would take eight people over a year to recreate the entire harbor. The total project, completed in 1984, consisted of 123 buildings, 41 ships and was constructed with more than three million bricks, more than half the amount of the entire original Miniland.

Over time the models, not just in Miniland, but throughout the park, were becoming much more complex and realistic. Old models, deteriorated over time by the weather and UV radiation, would be replaced by newer, and in most cases, much more detailed, versions. It seems somehow fitting that the last major renovation in Miniland was not of some exotic palace or foreign landmark, but of the building right next door. For many years there has been a LEGO version of an airport in Miniland so when the new Billund Airport terminal was inaugurated in 2002 the model shop immediately began to build an exact scale copy. Their model of the airport, opened in 2004, is the largest single structure in Miniland.

While Miniland was being expanded and constantly rebuilt, the rest of the park wasn't just sitting still. Over the years the park has opened many new rides and attractions and LEGOLAND began to change from a LEGO-based amusement park to a full-fledged theme park, albeit one for ages 3-12. The children's area, Fabuland, was opened in 1980. The Knight's Castle, the single largest capital investment ever, opened in 1997. The high-tech Power Builders ride opened in 2004 and the newest attraction, the Vikings River Splash opened in 2006. Today LEGOLAND has eight different areas themed around LEGO product lines and over 50 rides and attractions. It draws 1.6 million visitors a year, half of them from abroad, and is the 2nd largest tourist attraction in Denmark, behind only the Tivoli Gardens.

The Sierksdorf License

With the obvious success of LEGOLAND why did it take 25 years to open another one?

The answer is Sierksdorf, a small town on the Baltic Sea in Northern Germany. The success of the LEGOLAND caught the attention of a lot of park planners in Europe, including a German consortium which approached Godtfred with the idea to license the LEGOLAND idea and set up their own park. LEGOLAND Sierksdorf opened on June 1, 1973. As time went on, however, Godtfred became progressively more irritated with the arrangement and pulled the license after the 1976 season. He was determined never again to cooperate with anyone in the theme park business or expand outside of Billund. And he remained true to his word. It would be his son, Kjeld Kirk Kristiansen, who would pursue the idea again in 1989.

By the late 1980's the entire theme park industry was enjoying record attendance and profits and by this time LEGOLAND had clearly developed into a true theme park. A park whose concepts could be easily exported and could help promote the LEGO brand.

Top: Nyhavn, Copenhagen, 2004. Image Courtesy Janet Skipper.
Bottom: Nyhavn, Miniland, 2003. Image courtesy Maico Arts

Billund Airport, Miniland, 2005. Image courtesy Stef Robb

LEGOLAND Sierksdorf. 1973. Image courtesy Martin Bruun

This time around LEGO would not rely on the assistance of outsiders but would control the entire development process. They would plan, design, build and, perhaps most importantly, bankroll the parks entirely on their own. They developed an ambitious plan to open no less than five theme parks around the world and managed to actually build three of them. You know the details: LEGOLAND Windsor opened March 29, 1996, LEGOLAND California opened March, 20, 1999, and LEGOLAND Deutschland opened May 17, 2002.

The next park on the drawing board would have been Tokyo.

In An Ironic Turn of Events…

Godtfred could not have imagined how his idea for a simple outdoor display had grown over 35 years. In 2003 the LEGOLAND Empire consisted of four parks on two continents, had more than 3400 seasonal employees and had welcomed more than 5.5 million visitors.

In June 2006 LEGOLAND Billund received its 40 millionth visitor.

The only problem is that the parks were not making any money. The high costs of operating the parks, the relatively flat attendance in very competitive markets, and the extraordinary capital investment required to open the three newer parks meant that they were hurting the bottom line. By this time the LEGO Group was in a financial crisis and couldn't afford any more hits on the bottom line. So when Jørgen Vig Knudstrup, the new CEO of the LEGO Group, announced a drastic restructuring plan in 2004 the parks were the first thing to go.

It took over six months to find a buyer and finally on July, 1, 2005 a 70% share of the parks was sold to the US investment firm, The Blackstone Group, and operated by the newly created Merlin Entertainments Group.

What this new ownership means for the future direction of LEGOLAND is still uncertain, although it is already clear that Merlin intends to proceed much differently than LEGO has in the past. Current advertising is downplaying the LEGO Miniland aspect and is focusing on the rides and attractions. They are also, as Merlin CEO Nick Varney stated, in an expansion mode and currently they are working with an outside developer on a possible 5th LEGOLAND outside of Kansas City.

But whatever happens to LEGOLAND in the future, it has provided 35+ years of fond memories, and this is true no matter what age you are or where in the world you live.

The author would like to thank all of those who shared their prized childhood artifacts, such as Lars Gertsen from Denmark or Sonnich Jensen from Estonia, or their current vacation snapshots, such as Christopher Dannug from Detroit or Yusuke Tomioka from Toyko.

During the day Jim Hughes spends his time far away from LEGO in the healthcare industry. In the evenings he has an interest in LEGO Technic and LEGO history. He maintains his LEGO history at www.brickfetish.com.

Photos from top:

Queen Elizabeth and Kjeld Kirk Kristiansen (owner of the LEGO Group), June 19, 2003. Image courtesy and copyright the LEGO Group

London, Miniland, LEGOLAND Windsor. 2006. Image courtesy David Lam.

New York City, Miniland, LEGOLAND California. 2006. Image courtesy Christopher Dannug

Miniland, LEGOLAND Deutschland. 2003. Image courtesy Yusuke Tomioka.

The Real LEGO Factory

Article by Geoff Gray
Photos by the BrickJournal *Staff*

On June 7, 2006, the senior staff of *BrickJournal* was driven to a manufacturing building outside of Billund, Denmark and introduced to a gentleman by the name of Niels Duedahl, who is the head of manufacturing at the LEGO Systems A/S production facility. The meeting started off in a conference room with a chat that laid out the philosophies LEGO Systems uses for the production decisions and processes. This chat was a real eye opener, but it was nothing compared to the jaw-dropping sights and facts we would get when we actually went into the plant. Niels is a very pleasant man who exudes a sense of pride and openness about his job and his company (a mentality we got from almost everyone we met). He explained that he gives tours all of the time to different companies interested in learning manufacturing techniques and quality control. I assumed that since we are a small freelance, community driven publication we wouldn't warrant the same treatment that his large corporate visitors. I was very quickly proven wrong. Niels was eager to answer our questions (and those of you that know me know, I can ask a LOT of questions). The following is a compilation of our discussions and a [brief] account of LEGO Systems manufacturing.

Niels was quick to point out that the LEGO Experience begins at the beginning, which indicates the importance of quality control throughout the design and manufacture process. "The best is not good enough starts at manufacturing" Niels said. He then went on to explain, "there are three parts of the play experience; clutch power of the brick, prepackage accuracy, and appropriate building instructions. These 3 considerations are what separate LEGO toys from the competition."

Clutch power is the measure of how well two elements connect and stay connected while in use. The secret for this is to make the clutch power strong enough to allow a toy to be used during play, yet not so strong that children cannot put two elements together or separate them when necessary. Different elements have different tolerances based on their use and the raw material used to make the element. We are used to thinking of LEGO elements being made out of ABS (acrylonitrile butadiene styrene), but many elements are made out of other materials. For example, transparent elements are made from a different type of plastic, and Technic beams are made out of yet a third type of plastic. The reasons for the different materials vary. For instance, Technic beams are made from a more dense plastic so that the thin walls of the beams will be rigid enough to retain their shape under load.

Prepackage accuracy assures that when a child receives a kit, the parts they need will be present. This is the single biggest complaint given to toy manufacturers; "Parts were missing or incorrect and it ruined the fun for my child." The building instruction aspect is also truly important because the manuals need to be complete, and intelligible to the age level of child targeted for by the kit. The instructions need to take into account the abilities and comprehension skills of the age range, and must also be universal in nature since they will be the same for all of the different nations in which LEGO kits are sold.

As Niels led us into the plant, he explained that this facility is the world's largest molding plant. We started by going through the raw plastic storage rooms. There are huge boxes of colored plastic granules, some on storage shelves and others sitting on the floor with a vacuum tube pulling material from each box into the molding machine feeder pipes. Niels explained that the plastic comes from a variety of manufacturers, which accounts for some of the variations in color.

Plastic granules - the raw materials used for making LEGO elements

The two halves of a mold. Plastic is injected into the mold to make the 2 x 4 brick shown.

One of the things LEGO manufacturing is doing to help with color consistency is converting molding machines to allow them to mix white plastic with dyes to create the color as the piece is molded. We saw several of these machines in operation, but it is still a small percentage of the overall manufacturing process.

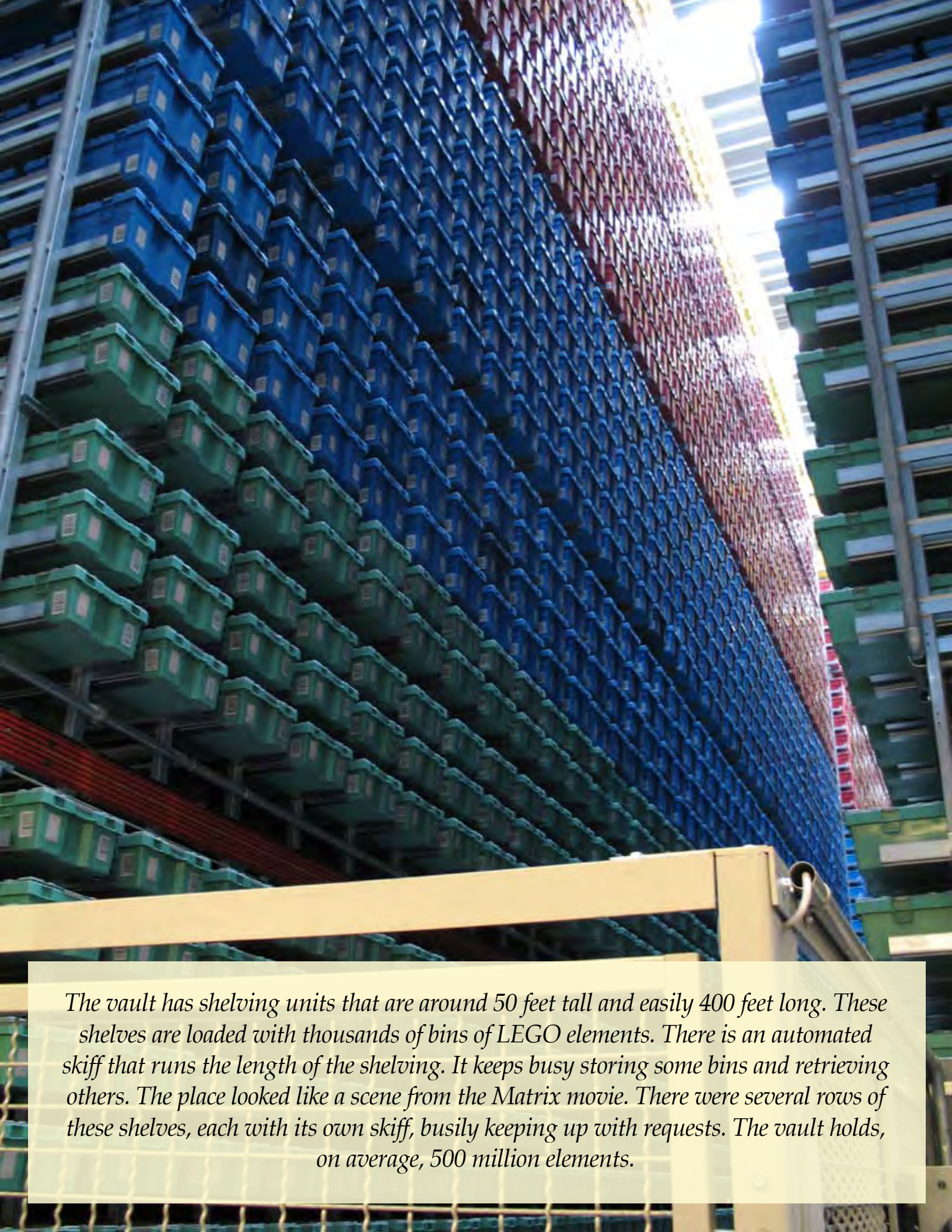
We next entered one of the molding halls. There are 12 halls like this one inside the plant. Each hall holds 64 molding machines and a slew of conveyors, robots and automation equipment. The machines mold pieces by heating the plastic, injecting it into the mold, and applying anywhere between 25 and 150 tons of pressure. Seven seconds later the elements are ejected from the molds and drop into a colored bin at the end of the machine. When the machine has filled the bin, it signals a robot that comes over, removes the full bin and places an empty bin back on the machine so molding can continue. The robot then carries the full bin to a conveyor system that transports the bin to the main storage repository. This process continues 24 hours a day, 7 days a week. The automation is so complete that the entire 64 machine molding hall has only two people working in it at any one time.

When we left the molding hall, we worked our way to a room that reminded me of a freight distribution center. The filled bins come in one side of the room through small trap doors in the wall. They are then picked up by automated forklifts and driven to a check-in station on the other side. There, the bin will either go to the storage vault, or directly to the packaging plant. We chose the former and headed through the maze of equipment into one of the most amazing places I have ever seen: the storage vault. The vault has shelving units that are around 50 feet tall and easily 400 feet long. These shelves are loaded with thousands of bins of LEGO elements. There is an automated skiff that runs the length of the shelving. It keeps busy storing some bins and retrieving others. The place looked like a scene from the Matrix movie. There were several rows of these shelves, each with its own skiff, busily keeping up with requests. The vault holds, on average, 500 million elements.

Our next stop put us in one of the packaging halls (we did not enter the portion of the plant where elements are painted and pre-assembled). Here the elements are sorted and checked, the polybags are filled, the boxes are folded and glued, the stickers and instructions are added and the bags and loose parts are placed in the boxes. While most of this is automated, there are several steps that require human intervention.

I want to go into a little detail about the process that happens in these rooms. This portion of the trip was probably the most eye-opening, especially with my engineering background. This plant is a model of quality control that is unrivaled by any standards. There are a number of checks that happen during this stage to ensure the quality of the pieces, and the quality of the packaging. The following checks occur during the process:

1. Every element (20 billion a year) gets sorted and sent to a scale to weigh the element for possible molding defects. Let me say that again…EVERY element gets checked. That's 20 billion measurements a year. The machine that does this looks like a giant funnel with a rail around the edge. The elements are poured into the middle of the funnel and vibration causes the elements to start 'climbing' up the edge. As they do this, they separate so that they fall out of the top one at a time. This allows a conveyor to take each individual element and drop it onto the scale. If it is within tolerance it is sent to the polybag packager. If it is not it is dumped into a bucket on the floor, where it will be ground down and either molded into a new element or recycled in some other fashion.



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2. Each box gets folded and then gets the instructions and inserts added. The box then passes onto a scale to insure that the instructions are complete. Yes, the scale is sensitive enough to detect missing pages in a manual. Then the box continues down the conveyor where polybags of parts and loose parts are added. After the box has received all the parts it is sealed and then weighed again for accuracy. It is then packaged into the shipping box with other copies of the same kit and sent to shipping.

3. The machines that are responsible for filling the polybags have scales as well. After the bag is filled, it is sealed and sent to the scale. If it meets tolerance, it will be passed to the kit packaging area. If not, it gets sent to the rejects bin for processing.

The plant has various levels of automation in this area. Some polybag machines will feed the bags directly to the packaging machines while others will simply fill a bin and an operator will carry the bin to a packaging machine when it is full. One of the questions I had about the bagging was why there are two different types of polybags used (solid and holed). Niels explained that the decision to use one or the other depends on the type of elements put in the bags. The solid bags are less expensive, but they can more easily tear during the loading process, therefore elements that can easily rip those bags will go into the holed bags. The other consideration is the volume of air in the bag. The holed bags will flatten better if there is an issue with room in one of the box sets. Niels also explained that the rate of packaging rejects due to tolerances or damage to the bags averages around one to one and a half percent.

At the end of this tour we went back to the conference room to discuss some of the business considerations that play into how things are done here. There is a time known as 'low season' where up to 40% of the molding machines are turned off. The machines that are still running during this time are usually producing very common elements, such as bricks, plates, etc. so they will be available when production returns to normal. The more specialized elements (like a spider-web or a Batman accessory) will be made on demand. Demand is figured by three variables: the average SKU (item barcode) lifetime (of around 18 months), the seasonality of the SKU, and the novelty share of the SKU. One of the big problems they face is 'hostile demand.' This occurs when there is a spike in demand that was unexpected or is brought about by fluctuating markets. There is about a 30% variance in production accuracy. One of the big initiatives in progress to deal with this is to cut the mean time to shipping with SKUs. Presently, sets now take up to 28 days to go from molding to shipping. But by streamlining the current process and shortening the physical distance traveled by the elements, as they get turned into sets, this time will be reduced to around three days.

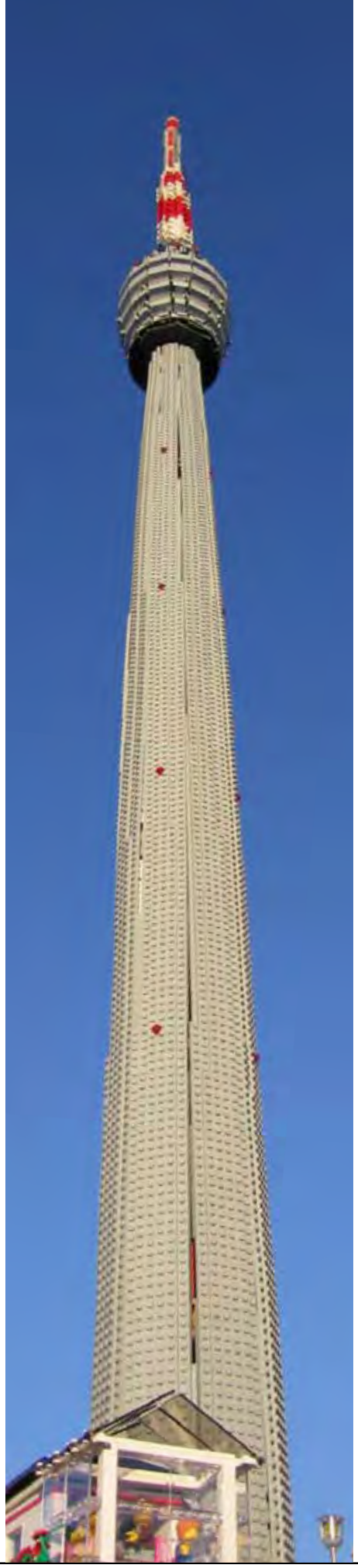
We left the factory with a renewed respect for what this company does to guarantee quality. It truly is impressive for all of this work to go into a little plastic toy, but as Niels told us, "The Best is not Good Enough." BrickJournal is grateful for the chance to have taken this tour and to be allowed to share this story with our readers. Niels and the rest of the LEGO Systems staff are a wonderful group of people.

Geoff Gray is the Photo Editor of BrickJournal.

Big rides.
Big buildings.
Big ships.
Big spaceships.

These are the creations of megabuilders—people who build massive models that sometimes dwarf the builders themselves.

How does one build something so large? What are the challenges? *BrickJournal* found a few mega-builders and asked them in the following pages.



Television Tower in Stuttgart, Germany

The first of its kind
(in reality and in LEGO-ality)

Article and Photos
by Holger Matthes

The Television Tower in Stuttgart

It took 20 months to build Stuttgart's television tower. On February 5th, 1956 it began operation. At that time, no other place in the world had such a bold mixture of chimney, tower and Greek columns. Ten years later, Stuttgart's television tower already had a considerable number of descendants. Despite its imposing height of 217 meters, the television tower – which has been the prototype of modern television towers all over the world – has remained a giant "en miniature". Real giants among its sons in Toronto and Moscow have even exceeded the 500 meter benchmark.

In the beginning, the broadcasting company "Sueddeutscher Rundfunk" had intended to install its antennas for the transmission of television and FM-radio-broadcasts on a 200 meter high iron-grating pole secured with wire tethers, which was the usual method of construction at that time. The Stuttgart engineer Dr. Fritz Leonhardt, who was well-regarded in bridge-building and statics, was called to coordinate this monstrous project. His idea was to build an elegant concrete needle rising out from the Stuttgart-Degerloch forest and equip the upper part with a basket-like casing for an observation deck and restaurant for tourists. The Sueddeutscher Rundfunk enthusiastically accepted the proposal hoping that the building expenses, in the amount of 4.2 million German Marks, would be paid off by visitors. Hundreds of thousands of tourists visited, and as a result, the tower was paid off within five years.

A hole 30 meters wide and 8 meters deep was excavated for the foundation of the tower. Into this "hole" a 3.25 meter wide foundation ring with an external diameter of 27 meters was laid, held together by a slab of prestressed concrete of the same size. This slab, attached to the reinforced foundation ring and the foundation slab in the middle, form the lowest part of the tower. In order to prevent the tower with its 3,000 tons weight from pushing the foundation ring away from the centre, the concrete slab contains strong steel wires, 8 millimetres thick, which cut across the ring like the spokes of a bicycle wheel to hold the foundation ring together. The base, sufficient for a 215 meter high chimney, needs 60 % less material when compared with traditional building methods.

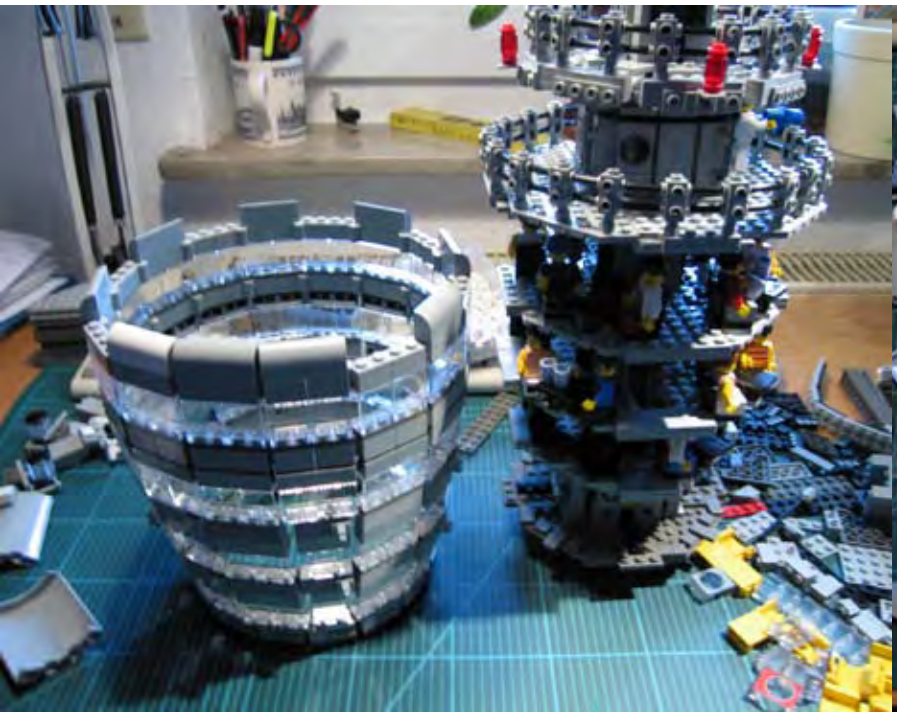
[from: Television Tower guide. Fernsehturm-Betriebs-GmbH, Stuttgart 1991]

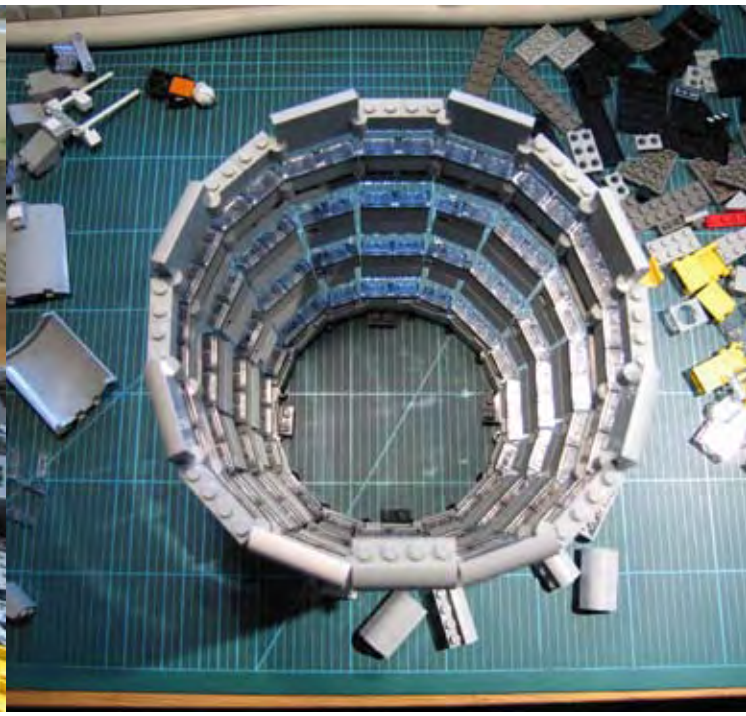
The LEGO model

A colleague at my office in Stuttgart, with a nice view of the television tower, once said while looking at my LEGO Venice pics: "Go on and build the television tower with LEGO." Since then I was caught by the idea of building a tower several feet high only with LEGO elements. I found some figures of the real tower at the homepage of the Television Tower Stuttgart and started to calculate some different scales.

Above: A closeup of the "REAL" TV tower.

Below: construction shots of the observation deck. The glass and walls acted as a skin to the inner structure, seen in the photo on the left





A realistic scale to build seemed to be 1:80 (minifig scale is approximately 1:40). In comparison to the real tower I didn't start with the foundations. I started with the upper basket-like section. It's not easy building a round structure with LEGO, and it's even more complicated to build a cone-shape at the first three levels. Hinge bricks in all varieties were used,as the outer "skin" of this section isn't really solid.

Next I built the inner structure: the sky restaurant, the technic room at the lowest level and both of the observation decks. At the end the "skin" was fixed to this inner structure.

The antenna was easier to build. At the wider lower section I used the same building method as I used before for the boom of my Mobile Crane. The upper antenna had to be fixed exactly in the middle of the lower section – which took some patience and trial and error. But I made it.

The column was an exciting building experience. Could a 170 cm high column carry the basket and the antenna without falling over? And how could I recreate the slim cone-shape of the real column? At the base, the scale calculations said it should be 13 cm in diameter and at the top only 6 cm. Not much over a distance of 170 cm. I decided to use an octagonal style for the LEGO column. The whole column is covered with countless grey plates. The cad-picture (bottom left) shows the inner structure of the column.

Around the inner structure I've fixed some long, light grey technic beams to support the column and to have a chance to hold all the cover-plates. The biggest challenge was again the cone-shape and the very narrow top of the column. All beams seem to concentrate in one point.

To cover the gaps at the cover-plates, I used several hundred doorrail plates which I was able to find on Bricklink. The main advantage of these elements is their size. The 2- or 8-studs long plates are 1.5 studs wide. This helps a lot to cover caps when building round structures or cone-shape structures.

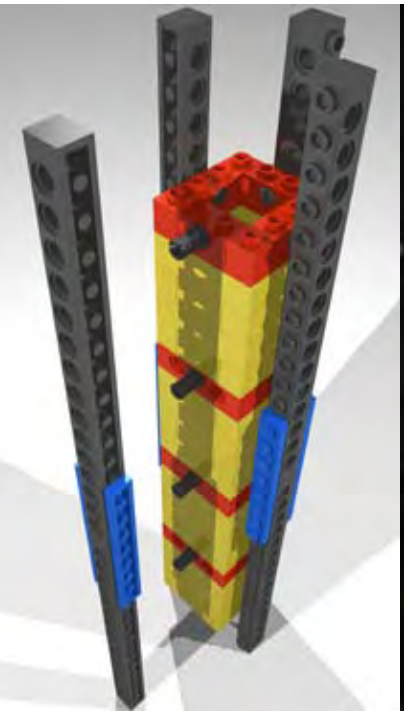
Media interest

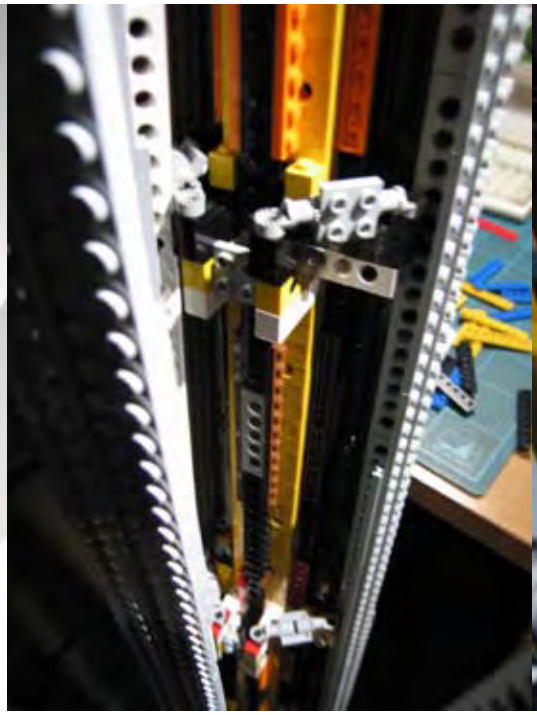
A few days after the first official show with the tower, the local newspaper published a short article about this famous site and its LEGO counterpart. It was fun for me to realize who is reading the newspapers - even my dentist asked me about my LEGO hobby.

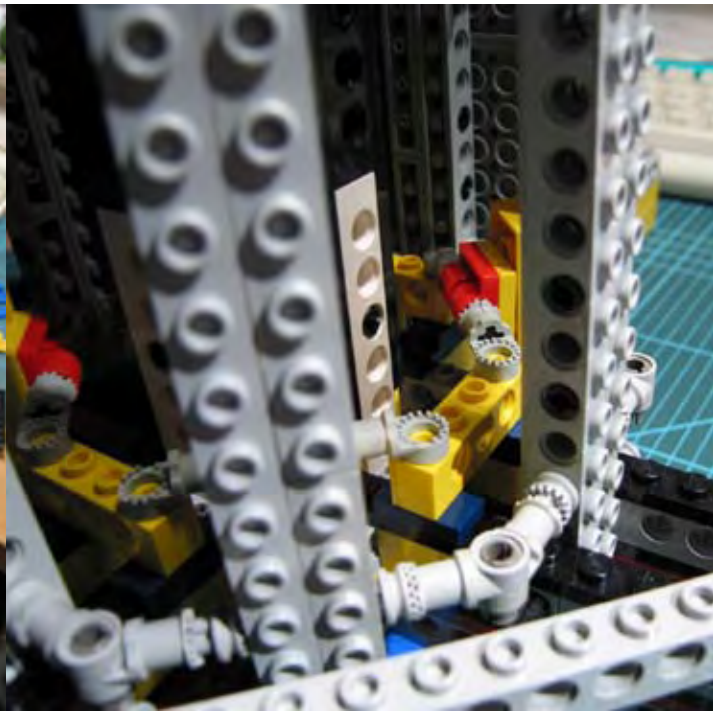
Above: A closeup of the LEGO tower.

Below left: A diagram of the internal strcture of the tower allowing plates to be placed with studs facing outside.

Below center and right: Closeups of the interior structure of the tower







The TV Towers Compared

	Television Tower in Stuttgart	LEGO model
Purpose:	to carry TV and VHF antennas	reaching the sky with LEGO
Location:	Stuttgart-Degerloch (southwest Germany)	various, different LEGO shows
Design and Building:	Dr. Ing. Fritz Leonhardt and Dipl.-Ing. Erwin Heinle	Dipl Tech. Red. Holger Matthes
Dates of Construction:	laying of foundation stone: 10.06.1954	X-MAS 2004 till New Year's Day, 2005
Opening:	05.02.1956	9 January 2005, 1000steine meeting in Freschen
Construction Period:	20 months	8 days (40 work hours)
Building Material:	1430 t of cement, 5250 m³ of gravel and sand, 340 t of reinforced and pre-stressing steel, 680 m³ wood, 55.000 clinker bricks and 85.000 bricks (!)	only LEGO bricks, mostly light grey. Number of pieces unknown. Longest element are 1x16 Technic bricks
Heights:	height of tower including antenna: 217 m	275 cm / 9.02 ft (1:80 scale)
Weights:	3000 t above ground, 1500 t foundations, 3000 t of soil on foundations	total weight ca. 7.5 kg (tower 4.5 kg, foundations ca. 1 kg, upper section and antenna ca. 2 kg)

Above: Holger Matthes building.
Left: The LEGO Tower

Building Medieval, LEGO Style!

Magnus Lauglo discusses building techniques used to build his castle.

Building any kind of megastructure is a real project and generally involves some planning, but that doesn't mean you can't slowly build your way up from a medium sized MOC to something much larger. I interviewed Bob Carney back in *BrickJournal* 2, and his method of building castles (that are all modeled on real life castles) involves planning as much as possible in advance. Conversely, when I started building a castle from my own imagination, I didn't know exactly what it would look like in the end. As a result, I went about the building process very differently.

Many of the most impressive medieval castles are massive fortifications consisting of a dizzying array of walls, gatehouses and towers; but most of them were built over many years and were constantly being expanded and modernized. Building a LEGO Castle doesn't have to be any different.

But even if you don't plan everything, there are certain things that should be kept in mind from the beginning. Modularity is key. Making big models out of smaller sections makes it easy to expand your castle over time and transport it around. Think a little about scale too - if you are starting with the gatehouse, don't make it so huge that you'll never be able to finish the rest of the castle. Finally, don't get so hung up on building the biggest castle possible that you forget about the all important little details that will bring your castle to life.

This is Falconsgate Fortress, a concentric castle, modeled on Northern European castles in the High Middle Ages. It took me about nine months to build.

Photo by Joe Meno

When I started on Falconsgate I didn't know how many bricks I would be able to collect, I didn't know how much space I would have to store or display it and I didn't know how much building time I would have in the nine months before BrickFest 2004. I wanted to display it there but wasn't sure if I could have it finished by then. I also wasn't exactly sure what I wanted it to look like in the end, although I knew there were certain architectural features I wanted to use. I wanted two separate sets of walls, I wanted to incorporate some non-right angles and asymmetry and build a large rounded tower. And I knew I wanted it to be big. >>

I ultimately ended up beginning in the same way a medieval architect might have – I built a large main tower (or keep) that can either be surrounded by or incorporated into a curtain wall. I mounted the keep on a raised baseplate for some extra height and ended up with a design I was pretty happy with. In the 10th through 12th Centuries, a structure a little like this would have been the central defensive point of many European castles.

I knew I wanted to build the curtain walls on a scale considerably more imposing than the classic eight brick high LEGO castle walls, and ended up with a thirteen brick high, six-brick wide solution that had me scouring Bricklink for three-brick high slopes. I made as best use possible of LEGO wall sections, and offered the defenders four-brick high battlements to hide behind. The walls aren't solid all the way through, but I created an illusion of thickness by building a solid foundation beneath a sort of gallery, from which archers can shoot out of the windows underneath the battlements.

Each of these wall sections is modular, in much the same way as the Classic Castle City system (found at http://www.classic-castle.com/ccc/standard.html), That standard was inspired by the modular LEGO sets of the '80s. I can easily swap wall sections around, and I can always make the castle bigger by building more wall sections. Also, if I want to create a smaller castle, I can go all the way down to a two by two baseplate area by just using the corner sections, perhaps for a small display or maybe a BrickWars battle. Moving and storing my castle would be impossible if it were all one massive spread of LEGO. The modular wall sections include a great hall with kitchen, a stable, a blacksmith shop, a dungeon tower as well as the corner pieces and a few gatehouses. Ultimately I had enough wall sections to completely surround a three by four baseplate area and there was enough space on the inside to start building a second inner wall.

In the late 12th century, European castle builders began building concentric castles by adding additional rings of walls; making castles even harder to storm. The inner wall was typically higher than the outer one, so that an attacker who had taken the outer wall would still be unprotected from the remaining defenders. From the very beginning, I had known that I wanted to develop Falconsgate into a concentric castle.

Top: Falconsgate's Keep. Middle Left: Modular corner wall section. Middle Right: Wall section, with joining pin. Botttom Row: Inner castle showing main great inner gatehouse and half rounded tower. Photos by Joe Meno

Constructing the inner wall. or inner castle was far more challenging, as I was building on a much bigger scale. And though the whole inner castle is built in sections for easy moving and storage, it is not truly modular. I'm most satisfied with the side facing the front, that includes an imposing gatehouse, living accommodations for the lord and his family and a large semicircular tower housing a throne room and war room. The inner castle also includes a great hall, kitchen, chapel, a Harry Potter-style spiral staircase built into a corner tower, and a rear gate to access the outer curtain wall directly via a drawbridge. I intentionally tried to make the architecture of the inner ward look a little more complex and interesting, suggesting that it had been built at a later date than the outer wall and keep.

By the end of the Middle Ages the keep had largely become obsolete, no longer dominating the skyline above modern walls and towers, which had become increasingly high and thick. I could have built the inner wall around the keep, but ultimately decided to keep it separate. When I set up Falconsgate I usually display the keep separately, as it is dwarfed by the inner ward and makes the castle look unbalanced if it is incorporated into the curtain wall.

It goes without saying that a big castle will use a lot of bricks of whatever color you are using for the walls. Try to come up with some interesting architectural features so you don't end up with a vast bland-looking wall. The bigger the wall is, the more important it is to add some sort of detailing. Windows, arches, projecting battlements, and sloped walls can all be used to make a gray wall look interesting. You can also use more than one color for the walls if you get the combination right.

One of the challenges of LEGO building is dealing with scale. In the case of castle building the problem is typically that you are trying to compress the detail, bulk and sprawl of a very large structure into an area far smaller than it would have realistically been. Falconsgate is a large MOC, but its footprint of five by six baseplates is the scale equivalent of maybe 150 by 180 feet, which is far smaller than most real castles. If you were to build a minifig scale (one stud equals one square foot) replica of the Tower of London for example, the White Tower, which only takes up a small fraction of the castle's inner ward would alone take up about a three by three baseplate area. The walls on many castles were so high and thick that replicating them completely accurately in "true" minifig scale would be a hopeless endeavor for anyone without a limitless supply of brick.

LEGO castle builders get around this with a couple of neat little scaling tricks. For example my curtain walls are thirteen bricks high, of which the battlements make up four bricks. I decided against having projecting battlements (machicolations) on the outer walls because then almost a third of the height of my wall would be projecting, and the battlements would look far too big for the wall. The walls of the inner ward are much higher, so I can get away with machicolations there. Real battlements would usually be higher than a man, but I felt four bricks was a good compromise between scaling the battlements to the minifigs and to the rest of the castle. Whereas real castles would have had walls many feet thick, I usually went with either one stud thick walls wherever I had to make space for rooms on the other side. But the battlements on the keep and inner ward are two bricks thick so as to create the illusion of a thick and solid wall underneath them. >>

Top: The inner ward of Falconsgate. Photo by Joe Meno. Middle. The castle at BrickFest 2006. Photo by Magnus Lauglo. Bottom: Detail of door. Photo by Magnus Lauglo.

When it comes to LEGO MOCs, size is often impressive in and of itself, but actually bringing a MOC to life has more to do with the minifig-based details.

Little details really bring a big old gray castle to life. Don't be afraid to use colorful bricks for anything that isn't meant to represent stone. Having built the castle, I began furnishing the insides and to this day, I've never actually quite finished that. At present I have furnished the interiors of most of the inner ward and almost all the outer wall buildings. All of the rooms are accessible by opening walls or ceilings, and ultimately I'd like to have the whole thing completed on the inside.

Think creatively about how to break up those expansive walls and battlements. To some extent you'll end up having to balance realism with aesthetics (color, asymmetry, curves and angles, landscape, etc). After all you aren't building a mini version of a real castle. The colors you have to choose from are limited and the minifigs who will be populating the castle don't look like real people. A LEGO Castle, no matter how lovingly rendered, will never look like a scale model in a museum. It shouldn't. A great LEGO MOC isn't a perfect scale model so much as a representation of something realized so well that it is immediately recognizable.

Castles were always works in progress, and many continued to be modified throughout the centuries in various architectural styles after the Middle Ages to accommodate cannons and modern weapons, provide increased comfort for their wealthy inhabitants, and later to facilitate tourism and art collections. A LEGO castle is a great example of a MOC that can always be expanded on, even when it seems finished. Most recently I added a newer gatehouse with a barbican (an outer gate) to the curtain wall.

Other possibilities for expansion include landscaping and motorizing parts of the castle, however finding parts in old gray has become harder and more expensive. So Falconsgate, for the moment, is complete – until I add something else.

Magnus Lauglo is a regular contributor to BrickJournal, *having written about Castle building previously.*

You can find more out at http://www.classic-castle.com.

Top: Another view of Falconsgate. Photo by Joe Meno. Middle. Great inner gatehouse. Photo by Magnus Lauglo. Bottom: Throne Room. Photo by Joe Meno. Bottom right: Magnus Lauglo poses with castle at Brick-Fest 2005. Photo provided by Magnus Lauglo

A minifigure's view of the coaster. Photo by Thomas Michon

What a Ride!

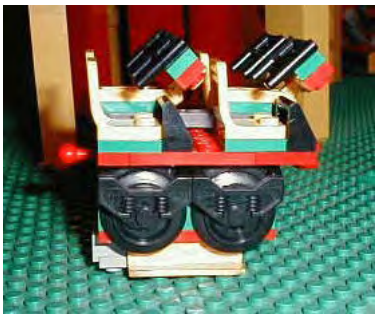
Matthew Chiles talks to BrickJournal *about the challenges of building a working LEGO rollercoaster...*

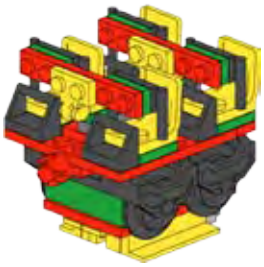
Article and photos by Matthew Chiles, except where noted

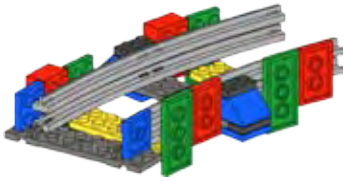
I first got the idea to do a roller coaster back in 1994 in the days of the rec.toys.LEGO newsgroup. There was a discussion on how to build a working roller coaster, and Eileen Keeney suggested the concept of 4.5v train rails set on edge so their tops faced each other. LEGO themselves had also designed a roller coaster using this technique in the 241 Idea Book from the 1970's.

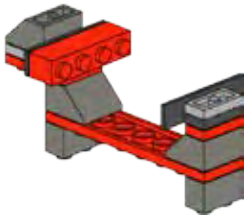
The idea just kept nagging at me. So sometime back in 2000 I started messing around with a bunch of the old 4.5v track I had come across. I decided any roller coaster I would build had to have a loop! So the first thing to do was figure out the correct spacing, build a loop and a test car. It was a lot of trial and error.

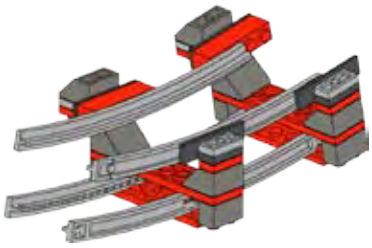
A group of coasterheads finish a ride. Photo by Thomas Michon











Different views of the coaster

The Car

I needed a way for the car to stay on the track and work reliably both when the car is going "on the level" around a curve, when the track is laid flat, and when the car is going up and down and through loops, when the track is laid on edge. What I ended up with is a car that uses regular 9v train wheels on top, which are very low friction. I experimented with various "wheels underneath" configurations to keep the car on the track, but they all were too bulky. I ended up using 1x4 lattice fence pieces stuck on edge as my "wheels underneath", so the fence goes under the rail to hold the train car on. When the train is upside down or otherwise experiencing negative gravity, it "slides" on those fences. The fences also gave very low clearance so I could make the level curves strong, since the rails in those curves are held by edge in "pony-ear" fashion. In later versions of the train cars the lattice fences were replaced by 1x4 thin wall pieces, and the original underside of the car has gone though extensive modifications to make it stronger with tighter clearances.

The Track

The track spacing for rails placed on edge (used in the hills and loops) was quite challenging. It developed at the same time, mutually, with the basic train car. The spacing ended up being a little less than standard LEGO track gauge. This kept the train wheels from falling "though" the tracks, which can happen at high speed under the stresses of the roller coaster. A special "tie" was needed to give the proper spacing, make the tops of two rails face each other and look good. I used 13 pieces, including 2 1x4-1x2 car headlight brackets.

Once I had a car and track that would work I "threw" the car through the loop on several test runs until I was sure it would function. I then built a hill for the car to go down to do the "throwing" for me. I kept adding sections to the hill height until it was enough to run through the loop smoothly and keep going. Once it did that, I knew for sure that I could make the whole roller coaster work.

My hill ended up being almost twice as high as the loop, which is less than it probably should have been - I understand real roller coaster hills are 2 to 2 1/2 times higher than their loops.

Monorail track is used to support the highest part. It's not terribly strong, but it looks good. The hill down is supported by a lattice of 12v train track, electric rails and plates pony eared together. There are 124 sections of track for a scale length of 1984 feet (1 stud per foot - look at minifig feet if you don't believe me). The scale height is about 175 feet. Top scale speed has been estimated at 140 mph, with a 65 mph average speed once gravity takes over at the top. I started working in earnest on the project, usually on Sunday afternoons.

After a few weeks and several revisions, I had a good functioning hill and loop. I devised a double layer track system for strengthening, which also used up extra track - I only used the inside rails for the loop, but the outside rails are built in as structural support to maintain the curve. The loop uses 17 sections of track.

For horizontal curves I had to suspend 4.5v rails by their outer edges, so the train wheels could travel on them, and the pieces that keep the cars from leaving the track could travel under them. I used the "pony ear" technique (see set 6075 Yellow Castle) extensively in these areas to put my running rails in place, shaped by another layer of correctly built 4.5v track underneath.

I found there was enough momentum after going through the loop and around the bin to add a dip, hump and spiral before returning to the station. Originally I planned to go straight to the elevator hill

after the loop, hopefully stopping for a station. That would have been good enough. But I saw it could go up some more. I tried a level curve after going up, but that didn't work very well. After much tweaking I decided to ditch that idea and do a banked curve. That worked very well and added a lot of character and fun to the project.

The Station

The station was very fun to design and build. The area is fully functional and motorized to adjust the train, start, stop or reverse it, and to get it on and off the track for maintenance. I always liked working with motors and Technic stuff. The one thing I never did to the station that I always hoped to do was detail it out so that the people in line get a "story" of the coaster. I envisioned a dragon theme, with a large dragon sculpture, a burned village, a worried king and you, the rider, get to be a brave knight. But I have never been good at sculpture and I ran out of time, so I just did a basic path to the loading deck and have never changed it.

The most difficult part of the build was the elevator to the top. It uses a total of 4 Technic motors, one for the little elevator just out of the station and 3 for the big one. The train is pulled up most of the way with Technic chain, with Technic bulldozer chain links actually grabbing the car. For the curvy parts at the top and bottom of the hill I used the newer rubber bulldozer tracks like those found in Mindstorms sets.

Altogether there are about 8000 pieces. Most pieces were in my collection, but I did buy the chain (about 10 feet) and a number of 1x4/1x2 brackets separately. The color scheme is primary colors, and reflects what pieces I had at the time. I am glad I was limited because it forced a nice colorful roller coaster, which I am quite happy with.

The coaster made its debut at the Great American Train Show in Portland, OR in February 2002, after about 2 years of work. Since then it has been shown at BrickFest PDX in 2004, NWBrickCon in 2004, and 2005 in Seattle, at Science World in Vancouver BC, Canada for 4 months in 2005 by BrickVille, and at the PGE Expo in Vancouver in 2005. Well over a million people have had a chance to see it perform at the various venues.

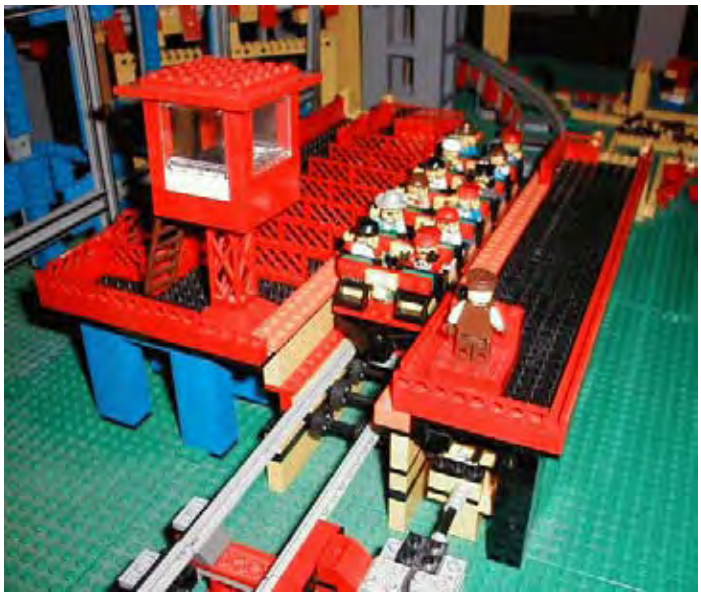
The coaster table is actually 3 tables, and the coaster breaks into about 15 large components for travel. I carry it under the canopy of my full size pickup truck. It takes about an hour to set up to running condition, assuming it traveled well.

When running in top condition it is very safe and can go for quite a while. The best noted record was at Science World, where it performed for over an hour straight with absolutely no help, running well over 50 runs (the exact total wasn't counted). Under typical conditions some maintenance is required every 10 or 20 runs.

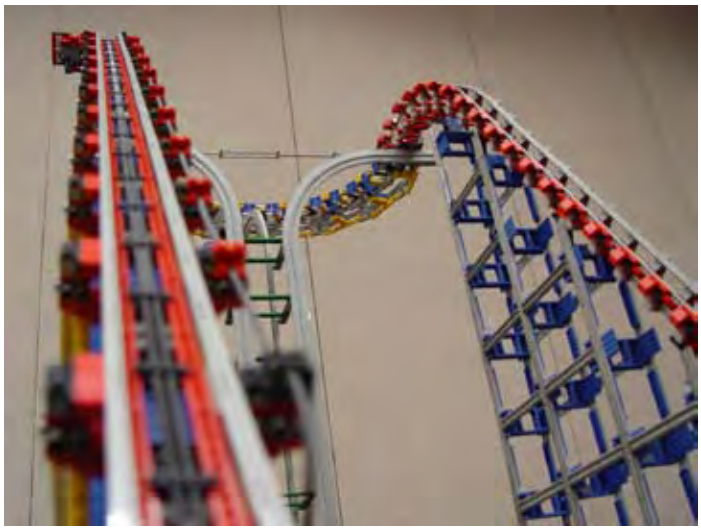
The coaster is currently in my barn, disassembled.

But with a little notice it is ready to show again, and looking for a Semi-permanent home! At this point it is still the only fully functional LEGO roller coaster with a loop that I know of, although I am in off-and-on communication with a couple other parties who are attempting one. View tons of pictures and more details at my website - www.auctionbrick.com/mchiles.

Matt Chiles lives outside of Centerville, Washington, with his wife Lisa and 4 kids, Katie, Kristy, Charity and Nathaniel. He works as Ranch Manager on his parents nearby cattle ranch, and is active in his church where he plays guitar in the worship band. He has been active in the online LEGO community since 1994, runs www.auctionbrick.com, and is a member of Greater Portland LEGO Railroaders and its predecessor club Pacific Northwest LEGO Train Club.



Taking minifigs from the station



Looking up the slope of the coaster. Photo by Thomas Michon

Matt looking through his creation

Ferryboats, Rockets, Towers and Totems

Seattle Area Builder Wayne Hussey Takes 25 Years To Complete Realistic Sculptures

Story by Ashley Glennon. Photos by Wayne Hussey.

Imagine a LEGO structure so unique that it took 25 years to plan and build. For Wayne Hussey of Federal Way, Washington, this is exactly how long it took for him to design, build and re-build a seven foot long, multi-level ferryboat. Built to minifig scale, Hussey's ferryboat uses approximately 35,000 pieces, contains a fully detailed interior, is two feet wide, two and a half feet tall and weighs about 120 pounds.

In 1975, a newspaper story revealed that a Seattle-area shipyard would begin construction of a new class of commuter ferry for WA residents and Hussey was hooked. Hussey immediately started prototyping and planning this super-structure and had a six-foot long section in his living room in no time—and then construction work nearly stopped. In 1975, the parts needed to complete the ferry to Hussey's specifications were not available, so Hussey changed his approach. "Because bricks and other elements were limited in both quantity and size at the time—and there were no big, inverse slopes—I started building the hull upside down using regular slopes," Hussey said.

Colors were limited as well, but Hussey persisted using every blue and white brick he could find. After reaching physical and aesthetic limitations on the design, Hussey shifted his focus entirely toward planning. "Using graph paper, newspaper clippings and photographs, I worked out every possible detail of every section I could, " Hussey said, "so if the parts became available, I would be ready."

By 2001, the parts and colors Wayne had envisioned many years before were finally available, in large part due to the arrival of fan-based, online parts sales. "By 2002 I had completely redesigned the ferry boat, and spent about four hours a day for about three months building it, " Hussey noted.

In 2002, Hussey revealed his giant creation at NWBrickCon. Hussey's long-term planning and patience had paid off. The ferry was a huge hit, attracting thousands of visitors who passed through the Seattle Center to visit the Pacific Northwest's first LEGO fan convention.

Shortly after the event, Hussey loaned the ferry to the Odyssey Maritime Discovery Center—a Seattle waterfront museum—where the ferry remains on display today.

But Hussey's large-scale building does not stop with the Ferry.

As LEGO Shop at Home bricks became available, Hussey built a six-foot tall Empire State Building. Then, inspired by 1950's science fiction films, Hussey built a six-foot tall, red, yellow and blue rocket that would make Flash Gordon or Marvin Martian feel at home.

In 2000, Wayne built a 22 foot long cable-stayed bridge that contained a 16-foot open span. The bridge was built using thousands of the now dated ZNAP elements.

In 2004, Hussey built his tallest creation to date, an eight foot tall, minifig scale version of the Smith Tower, a Seattle landmark erected by the typewriter and rifle tycoon, Lyman C. Smith. The white and gray tower uses approximately 37,000 pieces, of which 4,000 are windows.

Hussey, 52, has been building mega-stuctures longer than many modern LEGO fans have been alive, and offers the following advice to those who wish to build big:

1. Plan ahead. Draw, render or graph your model in advance to save you trouble when you start building. This allows you to plan your parts purchases in advance.

2. Make a decision about the defining attribute of a structure you want to build, then choose a scale that allows you to create that attribute to your satisfaction. For the Smith Tower, Hussey wanted to faithfully recreate the sculpted area above each window and the pointed roofline. From these specific details, Wayne determined that minifig scale would work best.

3. Be aware of the physical limitations of your structure. Be sure to enforce or reinforce your structure appropriately. Hussey notes that walls can collapse or structures will warp under heavy loads that are not properly constructed.

4. Plan in advance for how you are going to transport your creation. Hussey notes that his buildings and his Ferry are built in removable, stable sections.

5. Be cognizant of color. Hussey notes that the lack of colored elements in the quantities one may need for building a mega-structure should be a serious consideration, as a project can prove financially prohibitive.

At this year's (2006) NWBrickCon, Hussey plans to reveal yet another mega-structure: a life-sized totem pole. With a 19-inch diameter and an impressive Thunderbird with a 7- foot wingspan, this 20,000-piece sculpture is one of Hussey's first, organic creations.

Hussey has amassed over a million elements in his collection, spread among 2000 bins, but this totem pole is taking its toll, just like the ferry 25 years ago.

"I just can't get enough brown," Hussey says.

You can find Wayne's LEGO construction photos at his brickshelf account:

http://www.brickshelf.com/cgi-bin/gallery.cgi?f=25801

Ashley Glennon is a regular contributor to BrickJournal *and lives in Seattle, where he will be attending NWBrickcon!*

Shipbuilding LEGO Style

Malle Hawking talks about building an aircraft carrier - in minifigure scale!

Article and photos by Malle Hawking

When you think of "Maverick" and "Goose" hitting the deck in the TOP GUN movie you surely remember the huge carrier and lots of navy fighters, smoke from the catapults and a large ballet of multi-coloured jacket-wearing seamen handling the traffic on the 4.5 acre airfield of an US aircraft carrier. Now you can see the building of this vessel with LEGOs in minifig scale, a building project nearly every man has thought about in his childhood days. The carrier now has been realized by a builder from the 1000Steine.de Community in Munich: Malle Hawking, known as "Weebleleezer" at Brickshelf.com,eg.

" I watched a documentary about aircraft carriers on TV - that was the start of a project that took over a year to complete, costing thousands and causing lots of arguments at home!"

The model of the *USS. Harry S. Truman,* CVN 75 is divided into 6 modules to be able to carry the 160 Kilogram model. The building process started with the stern (rear) of the *Nimitz*-class carrier with no plans, layouts or other helpful figures to scale the parts and details into Minifig Scale (about 1:48-1:50 scale). Searching through the Internet, I was able to find a few photos of the *Truman* and after printing them to use as reference, the building started. The first module contains the old stock of bricks from childhood days and some of the precious older light grey, which isn't produced anymore. If you know about the difficulties to buy or even discover larger stocks of light grey bricks in 2005-2006 at Bricklink or Ebay you know the challenge I had…but a large number of community members and the local LEGO Store were able to provide the kilos of the bricks I needed. Most of the parts I used were 2x2 and 2x3 inverted slopes to make the most detailed body structure and 2x8, 2x6 and 2x10 bricks to give the structure more stiffness. The inside of the modules were filled and mounted with other coloured bricks to keep the superstructure assembled. This was done by also using a huge amount of plates to connect the hangar ceiling and flight deck. Most of them were attached to the fuselage body structure to shape the "skeleton" of the superstructure of each module. This was also a very intensive use of large amounts of light grey bricks.

After filling up the LEGO shelf in the basement, the pics from the internet and lots of creativity (more than I thought I had) helped to complete the first Module of six in Feb 2005, after 4 weeks of hard work.

"It was then to decide whether the project will continue or will become history"

I had no idea of the difficulties in shaping minifig sized ships and those details with all the LEGO parts available. The dimensions and the sheer size of it would take more than just a short visit at BrickLink and a few hours to build something no one has ever had built before. After the completion of the second and third modules, there was a short break to build the aircraft and other support vehicles onboard.

" I spent a whole month to create the "Hornets", "Tomcats" and the "Hawkeyes" which was somehow easy to do so compared to the vessel in my cellar"

Detailed Pics of the Fighters from the Internet where helpful and after building and rebuilding more than 150 pieces too many times, the 54 Aircraft were finished. Some of them have electrical lights and moving parts, like the radar dish of the "Hawkeye". The electrical additions were accomplished with lots of help from Karsten Hildebrand, who has done a lot of modified LEGO Models with lights.

I made the rear two modules moveable to give a view inside the 5 decks which are just a slight show of the veritable matrix of an infrastructure onboard the *Truman*. Electric lights give them a special touch and the minifigs placed in the decks make the modules more realistic. Since I built the carrier with thousands of details and the scaling problems it is hard to remember of each challenge I ran into.

"Manifold difficulties in building each of the sections sometimes took me to the limit. When I created the side structure with its inverted slopes I always had less bricks in my box, therefore I always needed to order more and our postman was carrying very heavy boxes ...I think he is still angry about that!"

Because I missed some details on photos I had to reassemble module 4 and 5 because I forgot the bearing for the elevators. I also couldn't get details of the so called "Island" which is the control tower at the side of the carrier. Neither Internet nor available books could provide needed workarounds. So I purchased a book about the carrier wing 3 with pictures of the *Truman* included and progress continued.

Building the modules was quite easy till I got to the hangar bay area and the "Island" !" I placed some Minifigs inside and the lighting still needs to be attached... but this can be done later as winter nights are coming up.

After rebuilding the modules to strengthen them and a having a very empty stock of bricks the first "Bricking Bavaria" took place in September 05, 2005 in Munich and it was first time to present the Truman to the public as 3 finished modules with the "Island" and a nice dry dock scenario beside. The feedback and comments of the visitors and other AFOLs pushed the project to the next steps in the following months. Most of them were quite exited about this huge and massive brick creation. The scaled details were the largest impression the model gave to viewers. Also the attention on this model was growing on the internet. After a labor-intensive search I found more than 200 sites who had blogs, comments and pics about my LEGO Model. Even the questions for some manuals or booklets were nice but not possible to create. It was quite exciting to read about the posts people have replied and there were "uuhhs" and "aahhs" and lots of them were asking if the Moc could float. The Pics you now see are the answer to this question. They were taken on a lake at my hometown and I needed special permission from the local authorities to be allowed to take pictures. But to make the Model really float it would need to be rebuilt, and this is a "no go"!

Afraid of Heights?

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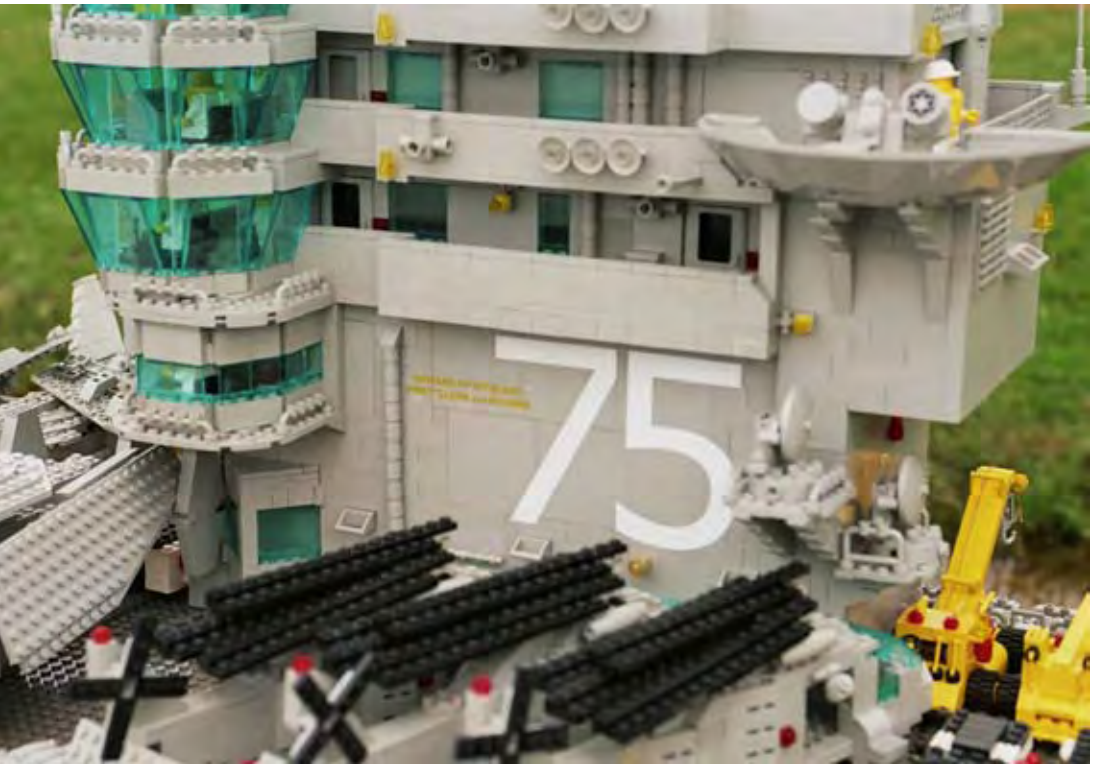
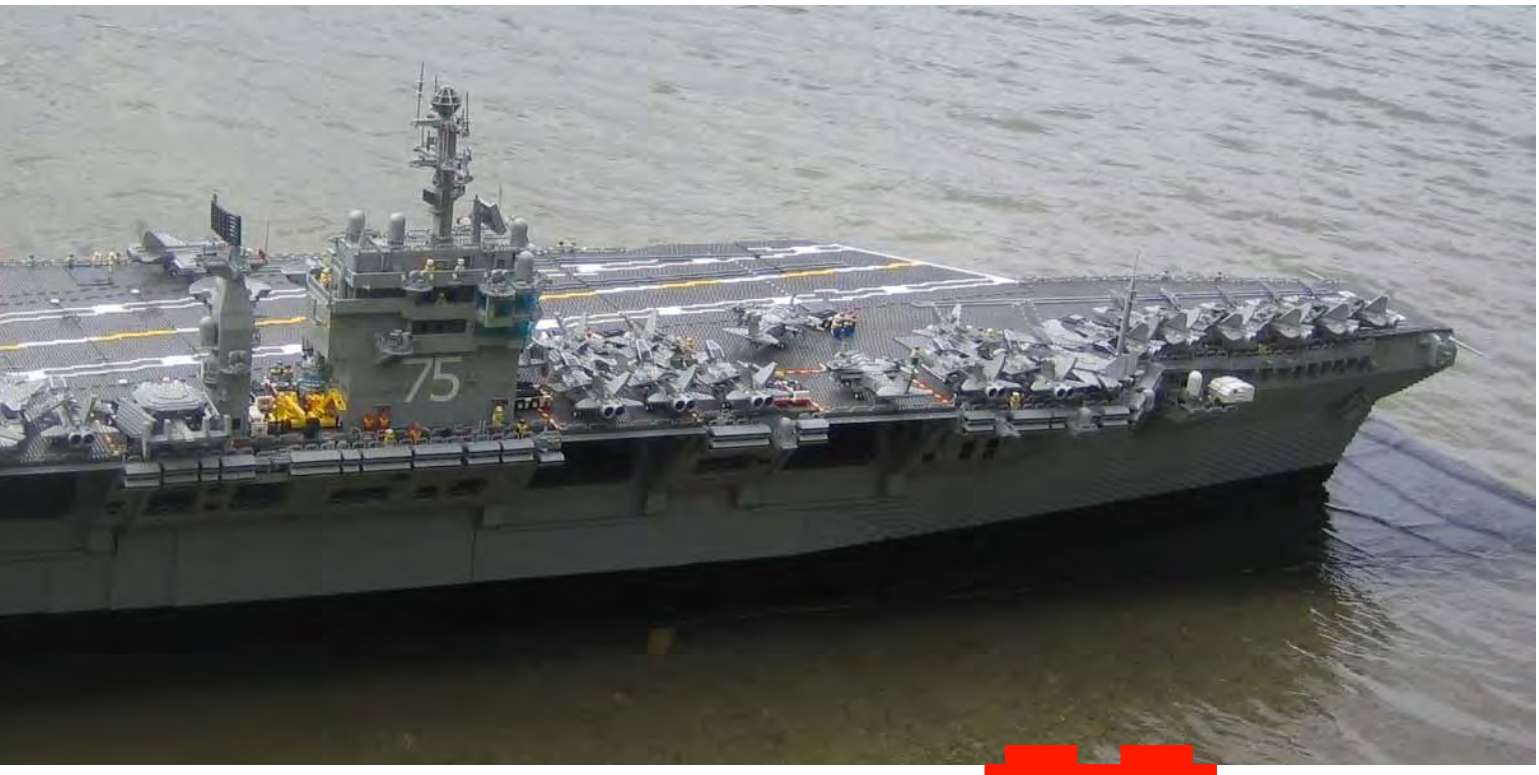


USS Harry S.Truman



BrickJournal
people • building • community

BrickJournal Is Coming to Your Town...Layout!

In support of *BrickJournal*, ME Models has created a Delivery Truck (ME #1004) and a London Bus (ME #1005). Both models are sporting the exclusive *BrickJournal* logos, with proceeds from the sale of every model going to support the magazine. Each model comes in a sealed collector box with high quality laser printed instructions and decals. The models may be purchased by going to this website: **http://www.me-models.com.**

ALL buyers and multiple orders welcome. PAYPAL, cash, money orders and personal checks are accepted. Postage will be calculated when you place your order.

BrickJournal Delivery Truck
(comes with minifigure driver) **$22**

BrickJournal London Bus
(comes with minifigure driver) **$25**

ME Models "Add a little realism to your hobby"
www.me-models.com

Please e-mail ME Models if you have any questions at memodels@me-models.com .

The last section, module 6 took 3 Months to complete due to scaling problems and the very highly detailed bow of the ship. Each of the modules were built with about 20 pics of the carrier. Even the detailed hangar bay is also modelled with electrical lights and a webcam to let the viewers take a look inside. The Flightdeck has also some electrical lights and a real "Meatball", which signals the landing aircraft. The whole 9v electrical arrangement took about 3 months to be implemented and final touches on the working catapult is ongoing. There are more electrical gimmicks on board but you will have to discover them yourselves when the Truman will come to Brickfest 2007!

"Creating the functional elevators in module 4 and 5 gave me quite a idea of what is possible to build with LEGOs. Also the angled flight deck and the structure below were challenging."

After assembling over 200,000 Bricks it was time to finalize the model and implement the last few bricks needed, give attention to details on the flight deck and to throw a glance on the 16 feet model. The tiles on the flightdeck were often reassembled in order to give the angled deck its original and detailed look.

An average of 35,000 Bricks per module raised the height to 60 cm and the width to 1.40m. Initially, I had some working space in my study room but after assembling the first 2 modules I needed to move down in the cellar to complete. It took me months to purchase the needed parts and besides assembling sessions after work, I cant think of anything I have done in my life before that was so exhausting as sorting bricks and to fiddle about - You builders all know what it's about!

The 6 Modules are shock-proof structured and have their own transport box to make sure the bricks remain on top of each other. I wasn't aware that I needed special wood shipping containers for delivery to the US, but I will have 6 of them thanks to Rainer Schmidt from the Munich "Bricking Bavaria" Community. The entire group of boxes can now be shipped via airmail or container ship.

The most amazing thing about building the *Truman* minifig scale was the feedback from the Public Affairs Office (POA) from the real Truman (CVN-75) at Norfolk, Virginia. I contacted them at beginning of the year and they were quite excited about the LEGO Model of their vessel. After a few mails and pictures I have sent to the POA we now have scheduled a visit to the *Truman* and display the largest LEGO Ship to the US Navy -a wonderfully unexpected result from this project I started last year.

The contact was very positive and I am looking forward to the opportunity to step onboard and take a deeper look at the original and see how daily work looks like. A single LEGO Tomcat remains onboard the real ship as a gift and for the appreciation of the outstanding work the seaman are doing daily at the *Truman*, especially at the most dangerous workplace you can find on earth: The flight deck of a *Nimitz*-class aircraft carrier! I will set foot on deck when travel arrangements have been sorted out for next years exhibitions.

I also created a Nuclear Sub and a Destroyer who escort the ship and are participants of the so called "Battle Group" which consist of 2 guided missile cruisers, 2 guided missile destroyers, a frigate and 2 attack submarines. It has its supply usually from an Sacramento class auxiliary ship. This huge Battle Group (The navy operates 12 of them!) supports and protects the carrier. But to build all of them would make the space for exhibitions too rare and some arguments at home too noisy!

My Son Niklas (4) and his friends will have the opportunity to play with the Fighters and be "Maverick" and "Goose" soon while I continue with my latest project: A Liner from the Cunard shipping company in Minifig Scale! But there is still a lack of black basic bricks so it will take another few months to raise a stock of needed parts. I'm still thinking about creating another ship model which is the "P&O Nedlloyd Manet", the biggest container ship ever constructed. I just build Ships and will continue till I tire, but I'm sure this will never happen. Creating such models is recreation to me and is a nice way to spend some time with my son, who also did some small work on the Truman.

But after such a large navy project, the next steps are upcoming exhibitions and displays - such as "Tausend Steine Land (TSL)" in Berlin from 18th till 20th August. During my 4th stay in the United States next year I plan to participate at "BrickFest" with other German Members from "1000Steine.de" to give everyone all the opportunity to take a look at the amazing models of our community! This is another challenge to face but I am sure we will meet at an US LEGO Event!

Here you can find some more nice pics and additional infos:
http://www.1000steine.com
http://www.brickshelf.com/cgi-bin/gallery.cgi?f=126969
http://www.truman.navy.mil

Mark's Modular Movers

Mark Stafford has been building big for some time and has shown his models at LEGO World in the Netherlands. In this issue of BrickJournal*, he showcases some of his most recent models, which are much more than what they first appear!*

Article and Photos by Mark Stafford

As long as I can remember I've been fitting smaller spacecraft into bigger ones. I think it started when I first saw the LEGO Galaxy Explorer and a small buggy being inside just blew me away. I went home, built a boxy LEGO spacecraft with swing doors at the back, filled it with small buggies and haven't looked back since.

I was born in 1971 in East Yorkshire, England. I sneaked past the overlords and was eventually educated to the degree level and have a 2:1 BA in Graphic Design. I don't remember my first LEGO set, though it was pre-minifig as the 'man' had his hands moulded into his pockets and had no face.

When real minifigs (with arms, legs, hands and faces) arrived, roughly at the same time as Star Wars warped my young mind, I spent the rest of my childhood building space bases and wishing I had more pocket money.

At 13 or 14 I packed my LEGO in a box and concentrated on trying to be a 'grown-up' (I'm still not very good at it). However I think the LEGO Company was secretly targeting me and kept hitting the people I lived with. I shared a flat at University with a friend who suddenly decided to collect all of the LEGO castle sets he could get hold of. Then shortly after I moved to London and I ended up sharing a house with Steve Burge (an AFOL and member of the Brickish Association) and his massive collection of Space, Pirate and anything else he can get hold of. Later I moved to The Netherlands and met and fell in love with Megan Rothrock (a Californian living in The Netherlands) and she turned out to be an AFOL too! Of course all this exposure had beaten me down and shortly after the Star Wars license began (in 1999) I was back in the build zone!

The first large ships I built coming out of my dark ages were throwbacks to those I built when much younger. These gradually progressed into the Outrageous Fortune [fig 01]. This is a classic space style carrier ship that had twelve smaller ships inside or attached and was designed to be a very thorough first contact vessel It could land, say 'hi,' send out lots of reconnaissance vehicles, and it also carried a few weapons too.

However, only with full-on, kick-butt military space vehicles do I feel the modularity / Russian-doll aspect of my space construction has begun to reveal its full potential. Let me give you a tour of a couple of them.

The Big Boys Toys

A war vehicle for a Spaceforce cavalry or mobile infantry forces, the Big Boys Toys is a single vehicle that can creep through a border or other secure perimeter and then become a fully deployed force of great adaptability and variety.

First the main vehicle can split in two, allowing the assault force to form a two-pronged pincer attack.










In the front end is a large gunship with plasma rockets, heavy magnetic rail guns and normal projectile weapons.

This unit carries its own small reconnaissance force of an assault buggy and a motorcycle and these units can either be deployed on cliff tops, the other side of canyons or can join with the troops in the rear end vehicle for larger assaults.

The front end also has a smaller flyer used for long term or rapid deployment reconnaissance This unit sits quietly for hours or days in concealed areas while the pilot sends 'blip' reports of highly compressed data back to the main vehicle.

When both of these flyers are out of the main body of the front end it can deploy the cockpit of the Tank Commander. This converts the front end into a fast moving and very destructive mobile gun vehicle. This is equipped with heavy particle weapons with plasma compression jackets that can penetrate all but the strongest of force-fields and all known forms of vehicle armour.

The rear end of the Big Boys Toys is equipped with several smaller units and a small high altitude spy plane from the front for long-range covert reconnaissance.

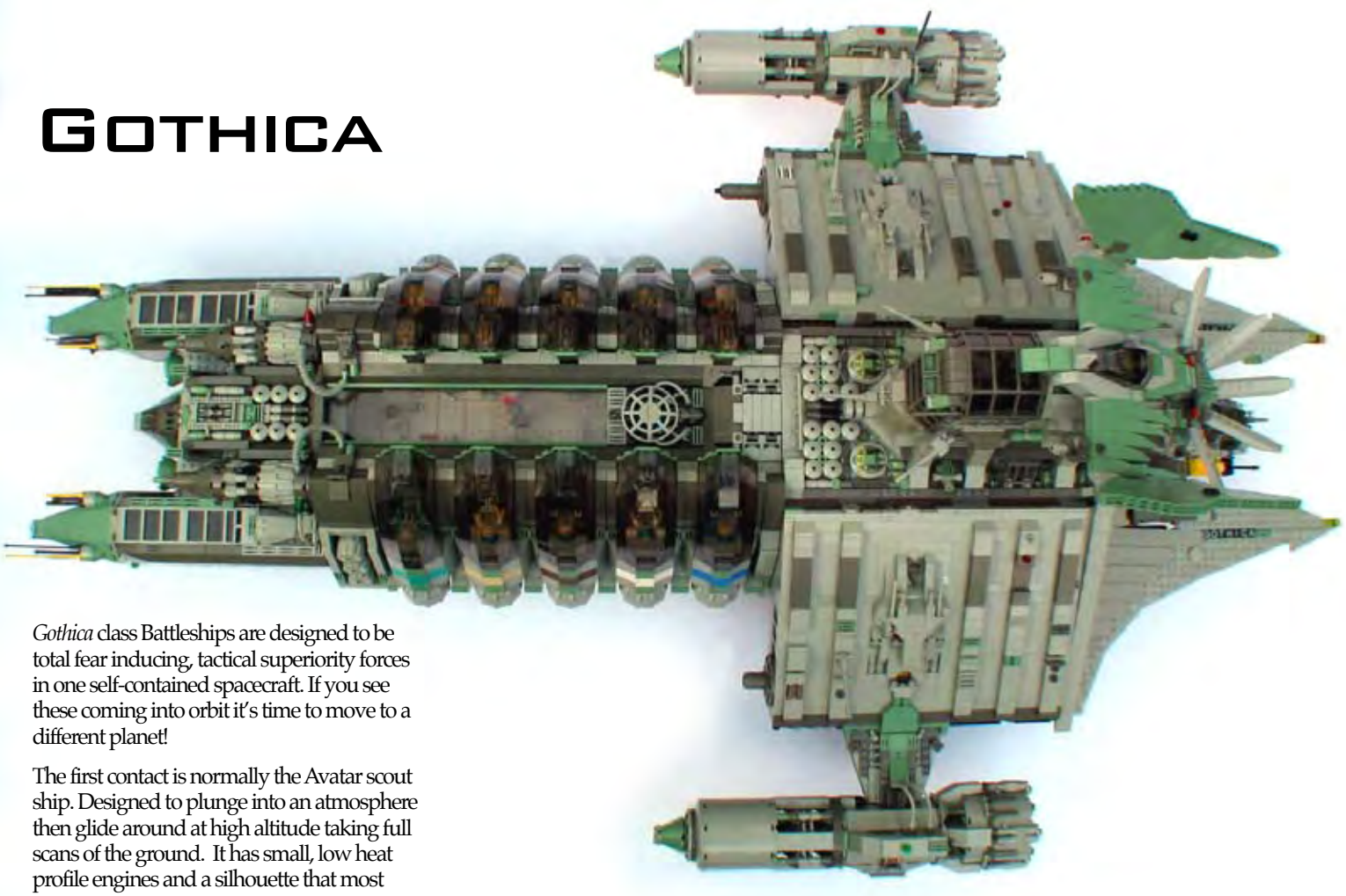
The rest of the rear end is an effective ground attack force; an infantry support flyer can launch from the centre and deploy its anti-personnel weaponry. This flyer is for close support and hovers just above the heads of the Big Boys Toys troopers picking off enemy forces.

In the back of the rear end are two assault buggies and four stealth troopers in body armour.

When all of these are deployed the rear end of the Big Boys Toys is controlled from the extendable gun platform built in near the rear. This has four light particle weapons, eight plasma rocket launchers, and can assist in any overt ground assault. There is also an extendable aerial in this part of the vehicle for send reports back to main base.

The Big Boys Toys is a valuable asset to any Spaceforce or security service.

Gothica



Gothica class Battleships are designed to be total fear inducing, tactical superiority forces in one self-contained spacecraft. If you see these coming into orbit it's time to move to a different planet!

The first contact is normally the Avatar scout ship. Designed to plunge into an atmosphere then glide around at high altitude taking full scans of the ground. It has small, low heat profile engines and a silhouette that most eyewitnesses would guess is a bird.

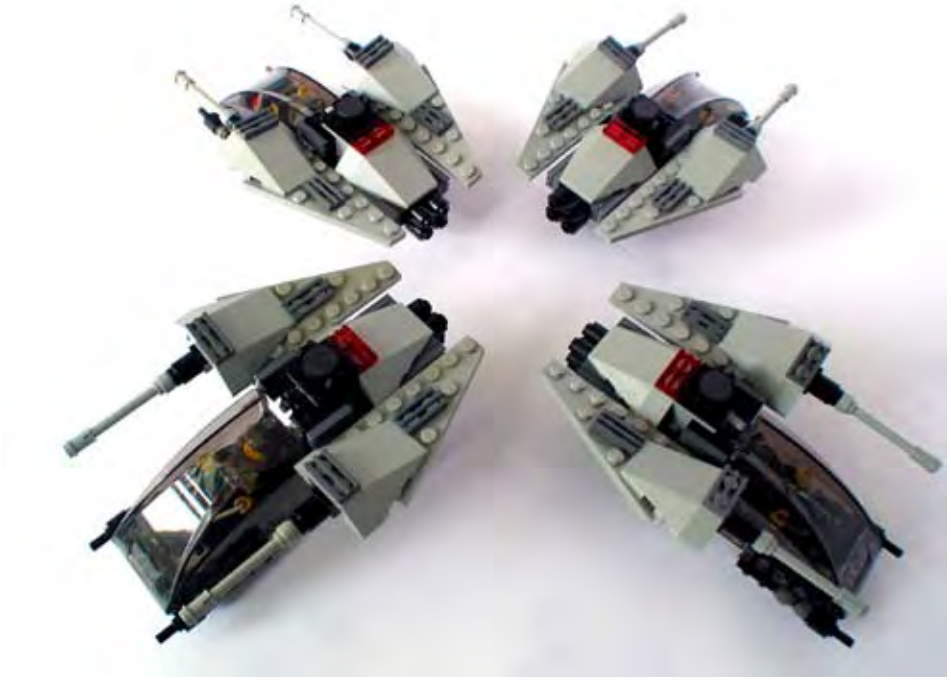
If the Avatar is not spotted, then the first warning planetary defence forces get that they are under attack from *Gothica* class spacecraft is on their sensor displays. One large ship enters the atmosphere and swiftly deploys ten smaller ships.

Arch Fighters are swift and deadly fighters equipped with plasma rockets. These ten ships split into five wings and take out strategic targets as plotted by the Avatar.

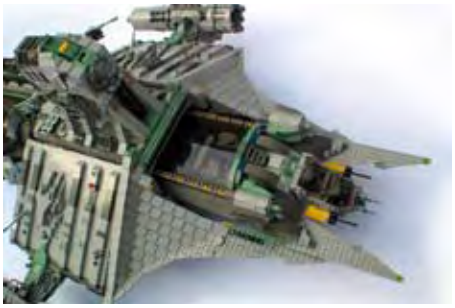
Meanwhile the *Gothica* deploys its second strength fighters, the Valkyries. These smaller, more agile fighters are designed for dogfighting and stick relatively close to the Gothica at this stage, waiting to see the response of the defenders. Armed with Magnetic Rail guns they are capable of defeating most similar sized fighter aircraft.

Once above the main target the *Gothica* initialises its Antigravity generator and floats just above normal ground based weapon range. Anything remotely threatening is targeted by the main guns at the lower front of the vessel and removed from the battlefield.

The *Gothica* is also equipped with several Magnetic Rail guns of its own just in case resistance is stronger then expected and some enemy vessels get within range.



Once air superiority is secured then the ground assault can begin. The Turtle, a troop drop ship, emerges from the aft section of the *Gothica*.



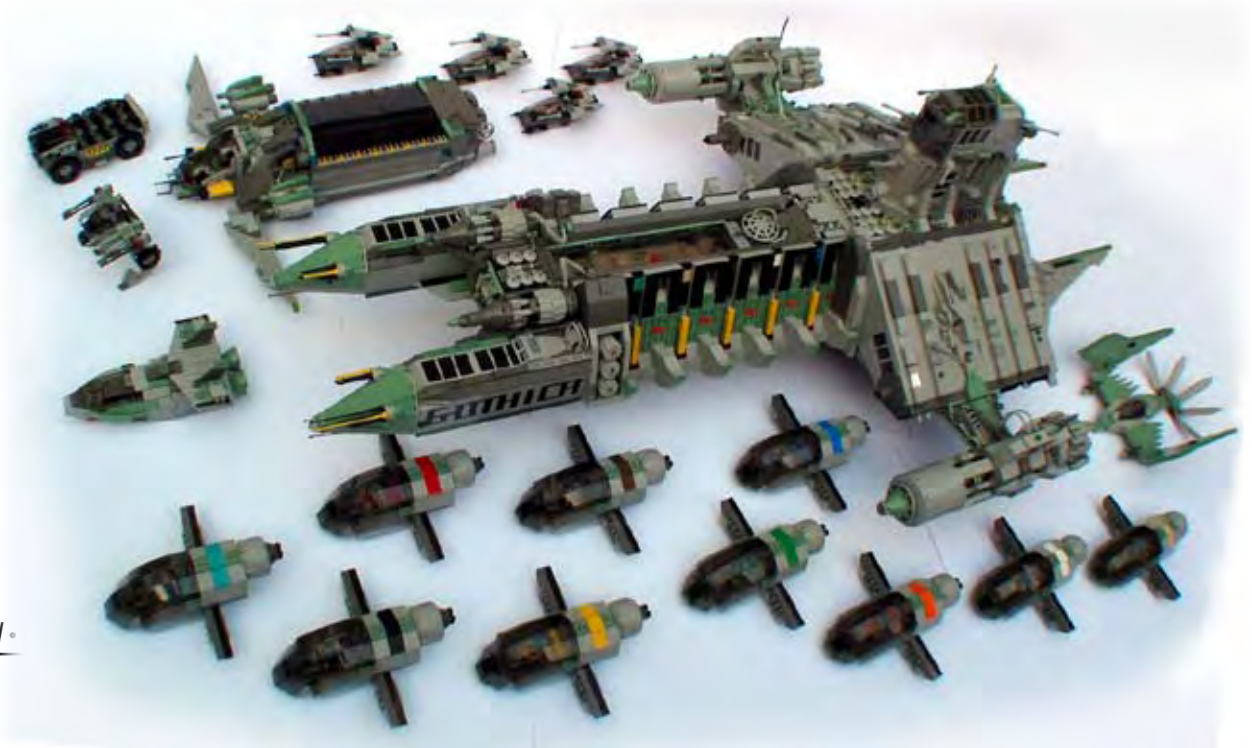
Though the Turtle can be used for just troops (carrying over sixty troopers if required) it comes with the Venator troop carrier as standard equipment. The speed of deployment of an eight man squad of troopers in this heavily armed vehicle can be more of an advantage then sheer numbers in most assaults.

The Venator also comes equipped with the trailer 'Trach' Mecha. It, in turn, is equipped with rail guns, plasma rockets and old-fashioned projectile weaponry it giving it a formidable advantage in any ground action.

Now fully deployed as an attacking force the *Gothica* still has one last trick left. Built into the heavily armoured front section of the vessel is the Nephilim medical evacuation ship. This can be dispatched to retrieve any injured troops or rescue downed pilots. Troops are then returned to the *Gothica* for treatment in the state of the art medical bay.

(Some complaints have been received about the lack of proper airlock technology in the Nephilim docking process. But lets be honest, if you're injured on a planet or space platform with a poisonous atmosphere—or worse, no atmosphere, then you're not going to live long enough for med-evac anyway!)

Lastly a word on the design theory of the *Gothica* Battleship. This vessel is designed to look good, very expensive, to echo the battles and fortresses of the past, and to remind the opposition of the human price of warfare. In point of fact it's designed to be so damned cool that most opposing forces will just back down and go home without offering serious resistance. If you can afford to send in a *Gothica* then you are to be taken very seriously indeed. The *Gothica* is the best a Spaceforce can get.



Reaching the Sky with LEGO Buildings

Adam Tucker builds LEGO skyscrapers and BrickJournal *talks with him about building and a new way to build tall!*

Article and photos by Adam Reed Tucker

BrickJournal: ***So who is Adam Tucker?***

Adam Tucker: I grew up and have lived in the Chicagoland area all my life, except for my "college years" when I lived in and around the Kansas City area. There I received my Professional Degree in Architecture with an emphasis on the Philosophy of Design Theory at Kansas State University in 1996. I am now an architect and in my free time enjoy designing & building LEGO & non-LEGO robotic & animatronics systems aside from my LEGO architectural interests. In addition, I have a passion for all disciplines of engineering: be it structural, mechanical, electrical, industrial, etc... Aside from this and Architecture, I enjoy graphic design, volunteering, college football and playing ice hockey.

BJ: ***When did you begin to build with LEGO?***

AT: At the age of 4 in 1975. Growing up I remember vividly receiving only LEGO sets for birthdays & holidays. As I got older I soon graduated to the Expert Builder series sets and equally enjoyed building with Kenner's Girder & Panel sets. (I did not make the connection between the two until almost 30 years later, more on this to come).

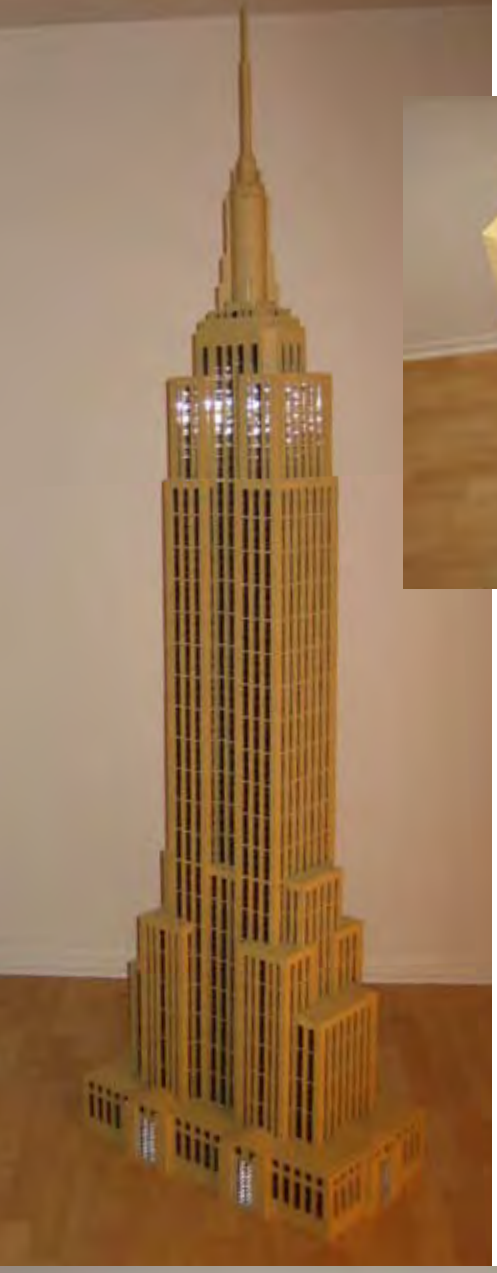
BJ: ***Did you experience a 'Dark Age,' where you stopped building for an extended time?***

AT: I am really no different than most Adult Fan of LEGO enthusiasts (AFOL). I did experience a "Dark Age" from about 1986 through 1996; a span of about 10 years. This was primarily the years spent from high school through college.

BJ: ***When did you notice the architectural possibilities with LEGO building?***

AT: I had run across an old LEGO book entitled "The World of LEGO Toys" by Henry Wiencek published back in 1987. As I was thumbing through it I noticed a really neat article on the architectural possibilities with LEGO bricks found on pages 110 -111. It was then logical for me to make the connection between my favorite building bricks and my favorite architectural building type: The Skyscraper. Again, as an architect I have always been fascinated with skyscrapers, so I decided to start constructing realistic LEGO versions and most uniquely enjoy the process of translating the real building in adaptation with LEGO bricks.

That pretty much started it all back in 2000. (I guess it also helps to live in a city where many famous skyscrapers have been erected). The design criteria I chose when deciding on which buildings I do are fairly simple, It must be a Skyscraper. Basically, any building topping out at or around 100 stories in overall height. Aside from that I consider the building challenge, building technique and overall appeal.



Empire State Building,
New York City

BJ: ***What buildings have you built?***

AT: Completed buildings are:

Sears Tower, Chicago, USA , World Trade Center One, New York, USA, John Hancock Center, Chicago, USA, Empire State Building, New York, USA

BJ: ***What buildings are in progress?***

AT: In progress buildings are:

Aon Center, Chicago, USA, Jin Mao Tower, Shanghai, China, Burj Dubai, Dubai, United Arab Emirates

BJ: ***What buildings are up for consideration?***

AT: Chrysler Building, New York, USA, Miglin-Beitler Skyneedle, Chicago, USA (never built), 7 South Dearborn, Chicago, USA (never built), Fordham Spire, Chicago, USA, Petronas Towers, Kuala Lumpur, Malaysia, Taipei 101, Taipei, Taiwan, 2 International Finance Centre, Hong Kong, China

BJ: ***You use a lot of LEGO elements, so how long does it take you to build a skyscraper?***
AT: Basically, there are 3 phases: Planning, Designing, and the Final Build. The Planning takes up roughly 50% of the time. This phase is image gathering, scaling conversions, various technique studies (I have easily had to build and re-build sections up to a dozen times before getting it just right), and most importantly the actual interpretation or LEGO transformation for the real life design elements into its LEGO form. The hardest part in all of this is actually buying and keeping track of all my "Bricklink" orders. I can easily have 60 – 130 orders placed within any given month. Most buildings use roughly between 15,000 -40,000 pieces and take 2 months from conception to placing the last piece. It should also be known that I make a full effort to reconstruct a given buildings complete internal super-structure, the way it would have been built in real life. I do this not only to be accurate but also because at the scale I build at the internal structural system becomes an important and integral part of the design and building phase.

BJ: ***You developed a new way to build skyscrapers, what is it called?***
AT: Yes, I have. It is called BrickStructures. BrickStructures is an innovative system of joining pre-existing LEGO pieces to replicate the way real-life structures are built.

BJ: ***I know you struggled with the name - How did you decide on BrickStructures?***

AT: I felt it was important to convey both LEGO & Architecture in the name. The "Brick" represents LEGO and the word Structures defines both Architecture and Engineering. I felt that BrickStructures best represents that combination.

BJ: ***Ok, now tell us a bit more about BrickStructures and its conception.***

AT: Due to the scale and size of my accurately portrayed towers, I noticed that the internal structure began to mimic the way a real building was structured; this naturally led to wanting to develop my buildings into real life engineering systems. In real life you have girders and beams....and I had a flashback to Kenner's Girder & Panel sets. When I had made this connection I realized that I could use about 1/10 parts to produce about the same model in scope, scale and size. I also realized that LEGO has not really touched on architecture before, in terms of offering it in set form. LEGO Dacta Educational division does offer a primitive "Structures" set that focuses more on using LEGO as an engineering tool rather

Sears Tower, Chicago

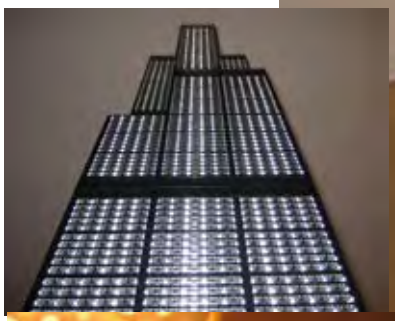
than an Architectural one. Seeing as how LEGO is a "Building Toy" it seems to lend itself naturally also as a "Building Tool" as well, an area that LEGO has not pursued when relating engineering, construction, and architecture to each other.

BJ: ***You came up with a very interesting concept for this connection that you have innovated. Can you discuss how this reflects real world building methods?***

AT: Structural systems for the most part are based on three-dimensional grid coordinate systems. This is achieved and quite recognizable in my building set using the unique 6-point connection, thus allowing the girders and columns to reflect the way real buildings are design and built. Furthermore, one's own imagination can take the parts in any one of my sets and freely design a half-dozen other building configurations. To further enhance and truly provided an unlimited design experience I will be developing some triangular, circular and half-grided adaptations to my basic line.

BJ: ***This is a pretty neat overall building innovation, what are your eventual plans for this?***

AT: First off let me explain the two divisions I am exploring. The first is BrickArchitecture. This will be an outlet for offering my buildings for a selected client as a sculptural conversation piece. Basically, offering a scaled replica of their unique building for use as a display piece in their respective lobby. These will be the large 7-12 foot models containing 20,000+ pieces much like the fully detailed buildings I build for myself. The second is BrickStructures. This is meant as the educational building sets offered in the more affordable kits. I do not consider my sets / kits to be a toy, but rather more along the lines as an educational / engineering exploration, a display or 3-D diagram of the structural systems used in building skyscrapers, towers, bridges, etc. BrickStructures will further develop and eventually go on to umbrella many different subsets. To give you a hint at some of these to come are: BrickArtchitecture, BrickSpaceframes, BrickTowers, BrickBridges, BrickBuildings, and BrickSkyscrapers. While my kits can be used in cityscapes or as backdrops for train layouts and the like, my real hope is that the kits can be used as real life sculptural and/or educational tools. I think of my idea as more a technical / learning / display set rather than an actual play themed type set. Don't get me wrong they are really fun to build, you feel like you're the crane operator erecting a building just like they would in real life. The initial BrickStructures sets will feature landmark recognizable buildings such as office buildings, towers... Eventually, I will be introducing specific lines, such as "World Famous Buildings," such as the Sears Tower, the Empire State Building, in addition to generic building types, such as a factory, department store or office buildings. In the interim, my hope is to offer the kits as limited runs, via my website or through Brick events and Brick conventions. I plan on further developing this idea and pitching it to the LEGO group for possible collaboration, further development or even greater unrealized possibilities.



BJ: ***What inspired this different direction?***

AT: Growing up I was fascinated with what I believe to be the 2 most amazing construction sets of the 70's, LEGO's Expert Builder line and Kenner's Girder & Panel sets. It simply came to me one late night. I thought about combining the structural accuracy and real-life construction methods found in Kenner's Girder & Panel sets with the high quality and great versatility of LEGO's Expert Builder line (Now known as Technic). I soon

World Trade Center,
New York City

realized that it would be a great method to offer my buildings for fellow enthusiasts that would be both affordable and challenging to build just like a real building is constructed. I wanted to offer people affordable kits where they could construct world famous buildings in a practical and affordable manner. So, the idea was born and I began exploring the best ways to fulfill the connection I made.

BJ. How did you go about combining Kenner's technique using LEGO's bricks?

AT: There are ONLY two adaptations to make that connection realized. The first is the unique 6-point connection that I developed through a simple modification: adding a pair of adaptive holes to each end of a traditional 1x8 Technic beam. This modification does not change in any way its original design intent, but actually only increases its versatility and usefulness. The second is my proprietary "curtain wall or skin" building panels, much like the Girder & Panels sets offered. Overall my kits are composed of five integral parts:

1. The "Column", which is a standard 1x1x5 brick
2. The "Girder", which is a standard 1x8 Technic beam
3. The "Connector", which is a standard 1x1 four sided studded brick
4. The "Panel, which is my proprietary 7x8 "curtain wall" piece
5. The "Roof", which is a standard 8 x 8 plate

I will also be offering spare parts and expansion sets to further refine and detail an existing model. This might include elevator shafts, stairways, etc.

BJ: ***Can you explain how you developed the panels that are used with the traditional LEGO elements?***

AT: The panels were designed and developed to be used in conjunction with basic LEGO elements. The panels are simply pinned into place using the half pin connectors. This is achieved by pre-die cut holes found at the top and bottom of each panel.

BJ: ***Can you discuss for us the different panels that will be offered?***

AT: At this time, we are offering three different types for each building. A basic lobby level panel, main building or body panel, and the mechanical equipment louvered panels found at the top of most skyscrapers. Currently, my supplier has no limit on the designs or colors to be offered, but the variety will naturally increase with time as new buildings are offered.

BJ: ***What all LEGO fans can really appreciate is that LEGO has always been the #1 building toy for quality. How have you developed your panel to maintain a similar quality?***

AT: There are two main areas of quality that one will notice from the start. The panels were designed with three main quality criteria in mind:

1. They had to be durable. The panels are made from a 30 mil thick rigid PVC/PET plastic. To give you an idea of what it looks & feels like, simply pull out a credit card from your wallet and there you go.
2. They are UV resistant.
3. The actual panel design graphics will never scratch off. Our design images are actually embedded within by use of a laminated protective layer.

BJ: ***You mentioned that these sets will be limited editions. Can you go into more detail on that?***

AT: Based on the supply of parts at any given time and the color choices available to me, these kits will have to be produced as a series of "runs." These will be offered when they are available. However, I will be offering limited editions from time to time or as a show promotion. I have incorporated a chronological serial number to each kit identifying it from run to run.

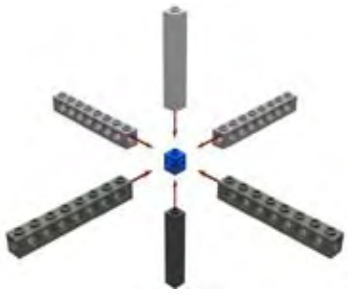
BJ: ***What sets will you be offering?***

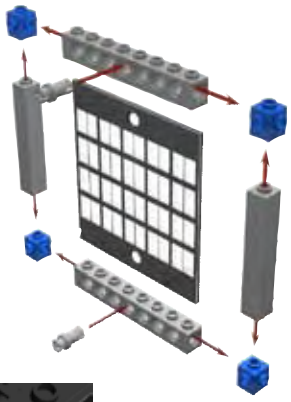
AT: As of this interview, I am still figuring all of that out. Specifically, the Sears Tower will be one of the first larger sets offered and it will be right around 5 feet tall with around a 1500 piece count. It appears that I will be offering sets that range from 100 – 2500 pieces. Again, all of this is very new. Accomplishing the panels and figuring out how the 6-point connection worked was the biggest challenge to overcome. Now that is all behind me I can begin choosing the buildings to offer and designing the sets. Each kit will contain brand new parts, all parts needed to complete the set or given building, an instruction manual, CD-ROM construction animation, and an Identification & Building Facts card. This will all be contained in a unique storage package reminiscent of the old style building toy packaging of the early 1970's.

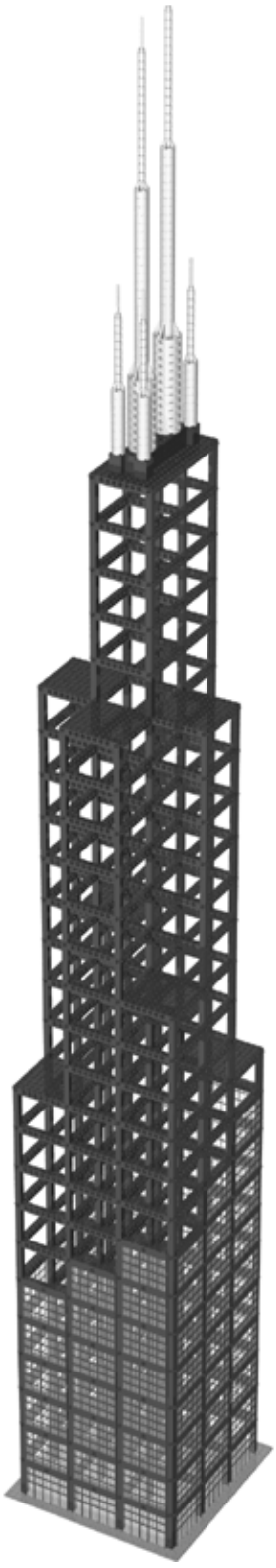
BJ: ***Aside form your Architectural work and the launch of your new idea BrickStructures, what else do you build using LEGO?***
AT: Generally, anything mechanical including robotics, pneumatics and gearing systems. Since my buildings are so static I stay balanced by this very dynamic opposing interest. I love the process of tinkering, creating the seemingly impossible, and exploring it with different techniques. I also enjoy designing Retro/Art Deco Flash Gordon styled Rocketships from the 1950's era.

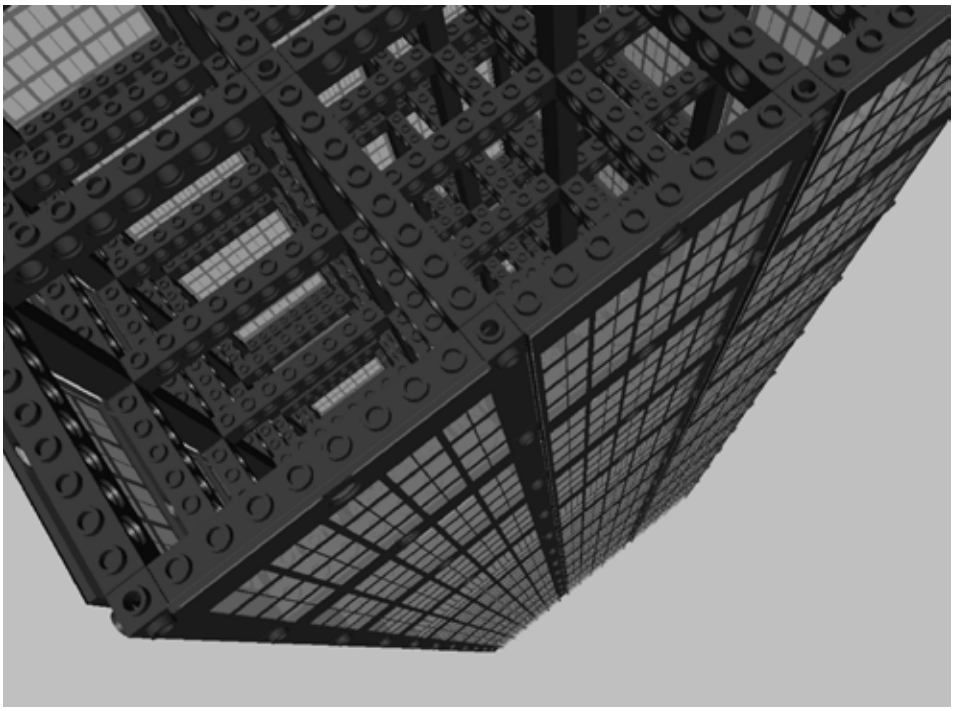
More information will become available by visiting www.BrickStructures.com.

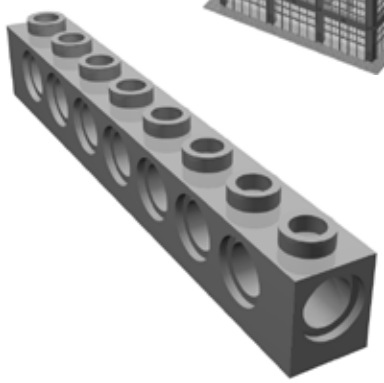
Sears Tower, BrickStructures











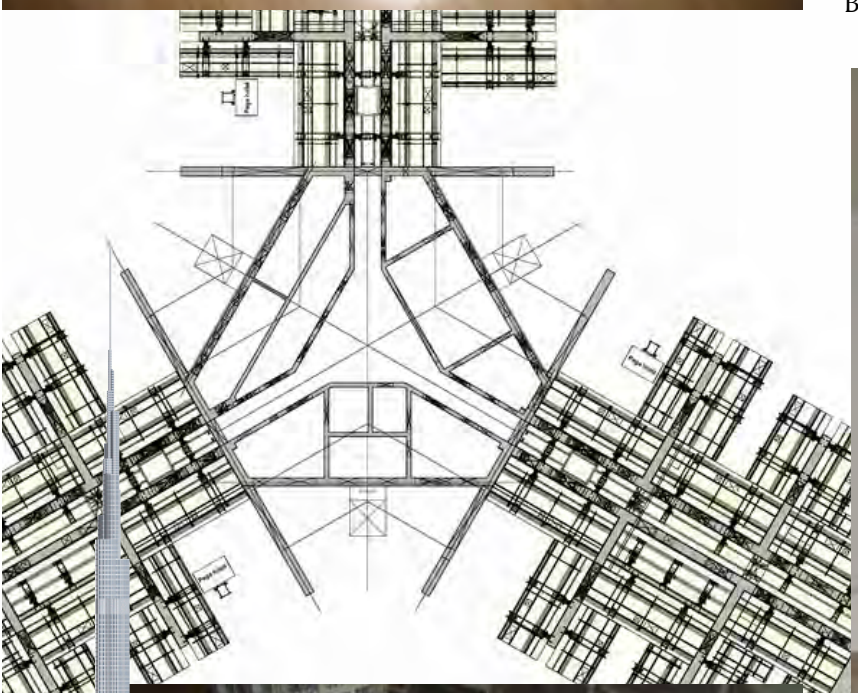
Burj Dubai,
Dubai, United Arab Emirates

This is a building Adam is working on that has not been completed, but *BrickJournal* was lucky enough to get a sneak preview of the building in progress!

The final height of this building is 16 feet (over 5 meters), making it among the tallest buildings constructed by a single builder (there have been towers done by groups that have gone higher, but they have been specifically for record-breaking attempts)

Final construction is set to be done by late August, in time for it's first display at BrickFest in Washington, DC.

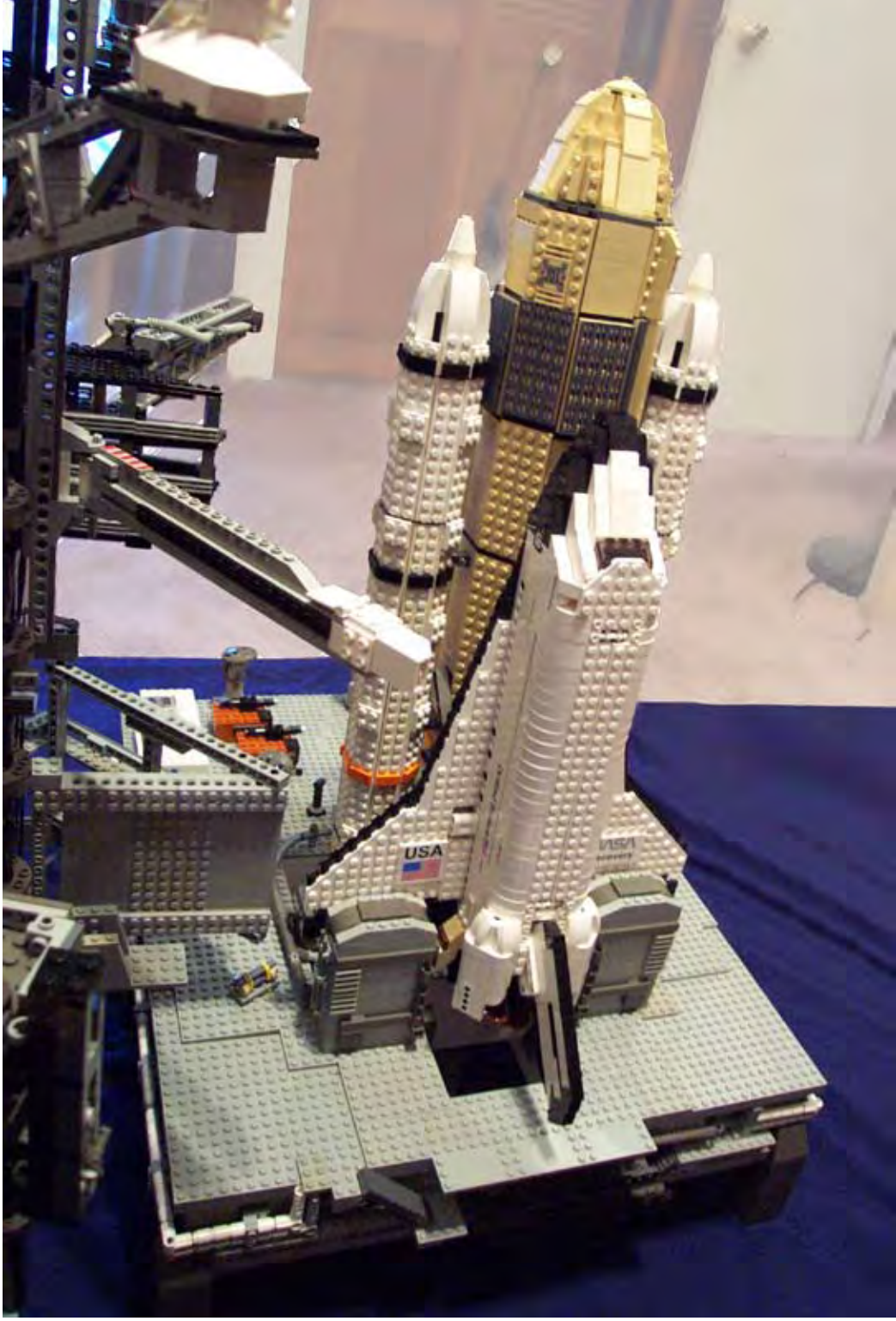
You'll see more pictures of this model when *BrickJournal* covers BrickFest!



"And the Countdown is at T-minus 30.."

One of the most complex machines ever designed is the Space Shuttle. Builder Brian Hastings took on the challenge of building this spaceship and its launch pad. BrickJournal *was able to briefly discuss his observations about building this massive project.*

Article and photos by Brian Hastings



***BrickJournal:* Tell us about yourself. When did you start building?**

Brian Hastings: I have no idea if I'm a 'typical' AFOL or not, but the ones I know are an eclectic and fun bunch, so at least I'm in good company… I am 32 years old and very fortunate to be married to someone who in addition to all of her excellent qualities – is supportive of my LEGO habit… I pastor a church in Fond du Lac, Wisconsin, and when I do have free time, it gets split between LEGO, playing computer games and paintball with friends, and a little bit of amateur astronomy and storm chasing on the side.

My very first LEGO set was a Christmas present; one of the Universal Building Sets from the late 1970's. From there, even though there were periods of time when I wasn't building much, I was usually in the middle of some project or other. I took a big container of LEGO with me to college, but I really started getting back into the hobby when LEGO began to release the Star Wars sets. Like a bunch of fans my age, I was building Star Wars vehicles out of LEGO long before the sets came out – and having the right parts and minifigs to do the job was wonderful.

And what inspired you to do space models?

From about as far back as I can remember, the whole idea of travelling into space fascinated me. Unfortunately, since I'm rotten at science and so-so at math, and since I don't expect to ever have 20 million dollars to pay for a week's vacation on the ISS, those trips are pretty much locked into my imagination. LEGO has been a way to explore and express that interest, and hopefully spark the imagination of others too.

In the past few years, my larger projects have been the result of encouragement from friends in the Sheboygan Astronomical Society, many of whom participate in an annual educational program called Rockets for Schools. It's an excellent program that allows teams from middle and high schools to build and launch high powered rockets. Along with the launch activities are special speakers, interactive materials and booths that promote science education and fun. I've built LEGO displays for that event for the past four years, and though I'm kind of surprised at the reaction these models have gotten, it's been a great motivation to build.

My latest model began with the LEGO NASA/Discovery Shuttle, and from there I built as much of the launch complex as I could. The idea to do the tractor-crawler and launch platform had been in my head for a while, but when the Star Wars Sandcrawler came out I began to think it was really workable. My wife (did I mention how wonderful she is?) got me that set for my birthday, and though I didn't have the heart to take the whole thing apart right after I built it; those treads were gone in a week, and the NASA crawler was underway. It took a long time to build, partly because of a lack of free time, and partly because it was an on again/off again process of research, sketches and experimentation.

About half of the build time of my space projects are devoted to research, which includes a lot of time on NASA websites, 'google' searches for as many pictures and diagrams as possible, and whatever print sources I can get my hands on. I draw sketches, and use powerpoint to create slide shows in order to skim through my reference pictures more easily.

The problem with pictures is that although they're great for getting a sense of detail, it's sometimes hard to understand exactly what is going on in a three-dimensional sense, especially with complex structures. This gave me lots of headaches when it came to the service structures of the launch platform, especially because good 360 degree coverage in pictures (especially top-down) was hard to come by. The folks at the Glenn Research Center were helpful, but oddly, it was at a French website that I found some incredibly helpful schematics.

The techniques I used in the build were not all that complex; since the structure would be fairly large, I wanted to use SNOT (Studs Not on Top) for detail and regular techniques to support the weight. The real challenge was trying to recreate scale, structure, and detail as accurately as possible across several different components that were interrelated; the crawler, the shuttle stack, the launch pad, the fixed service structure, and the rotating service structure. The shuttle solid rocket boosters and the external fuel tank both took some work to be reasonably strong and scaled correctly. I borrowed some of the design for the external fuel tank from Reto (Warhawk) Geiger, who has made some absolutely impressive space models, including the capsules for the Mercury, Gemini and Apollo spacecraft.

Several times, I thought I had the scale transferred correctly, only to find that I'd made a mistake that had implications for how the rest of the build came together – since all of the components (built separately) had to be correctly proportioned in all three dimensions.

Another challenge in building a model this big is part and color consistency – I almost always feel like I could do a better job *if only* I had more of this part or that part. Finding the best compromise with the parts I had on hand (or could reasonably obtain) was a constant struggle. I didn't achieve all that I wanted to in this model because of this, but there were several truly bright spots. My Astronomy group allocated some funds for a Bricklink purchase that made a big difference in the launch platform, which was a generous thing to do – and the first time I used Bricklink (I think I'm hooked!). I also had the chance to visit the LEGO store at the Mall of America, and met some terrific people who bent over backwards to help me find bricks that would work in the model. Joe and Judy – you rule! I guess there's always something I would add or do differently; I was working late into the night right before the Rockets for Schools event, and even brought a tray of LEGO parts with me to add some greebling; but eventually just had to let it stand as is.

Building Bugs

Pat Bunn talks about building his unique creations to BrickJournal *- and where his inspiration comes from.*

Article and photos by Pat Bunn

It's midnight. There is a sound coming from the basement. It's a crunching, shuffling, stirring type sound. Not quite the sound of broken glass. Scrunch, scrunch, scrunch. And then…Aha! There it is! The piece I needed that was buried in the bottom of the bin, sorted into the wrong pieces. It's exactly what I needed to connect parts A and B in just the right way.

I am making a robot. Not a real robot. It's a science fiction type robot with a little guy inside to drive it. I drew it the other afternoon when the class I was in became so boring I was lost in my doodles and sketches of what I would be building if I was in my LEGO room. I do that a lot. Wishing I were in my LEGO room working on some way to connect four Star Wars Gun pieces so that they would work as a leg.

I have a secret weapon. I went to an art school, the Maryland Institute College of Art. I have a degree in Sculpture. I just wish it were in engineering, because the way I build is like knitting a spider web and the slightest push on the wrong point crumbles my entire creation. I look at things in the world and think "I could build that". Like Google image searches for Goliath and Rhino Beetles, the old 80's cartoons like Robotech and the Herculoids or flying wing aircrafts. So I work in LEGO but not as Art. It is a release of my creative juices that I don't get from work, that is immediately a finished product I can play with and crash around and rebuild again and again.

My robot is oddly shaped. It doesn't follow the usual anthropomorphic design of two arms, two legs, a head and body. Yet again I have made a Bug. I often make bug shaped robots. I figure if you are going to make a science fiction creation, a spider tank is a good place to start; better yet a spider driving a tank, or best of all, an alien driving a spider that is the size of a tank! This is the sort of creation I have built the most.

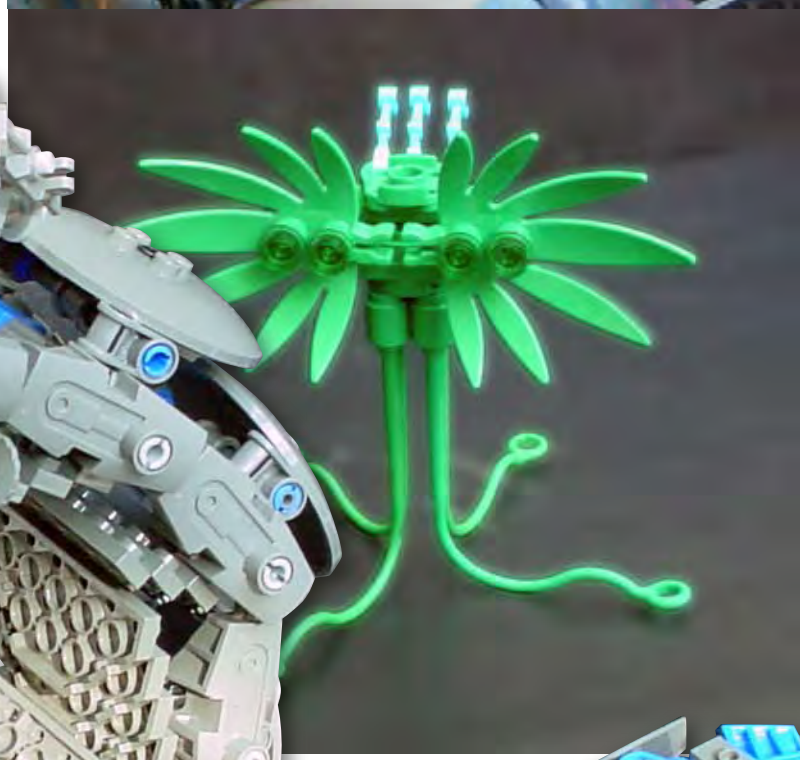
I love to dig into the bins and find a piece that I haven't used yet, like a sliding board or a dinosaur tail. Then figure out how they could be used for a space ship, robot or alien. When you are a science fiction builder all of your LEGO pieces become useful. Pirate ships become airships or heavy robot armor, a dump truck bucket makes an excellent engine cowling, and an ATV trike without the wheels is the chassis for a mecha. The best part of using science fiction as your genre of choice is you don't have to worry about scale or whether it would actually work or not. It just has to look really cool when you are done. If you add a few touches like vents, handles, wheels, dials, hoses and things you would expect to find on a craft of this type, then it looks believable.

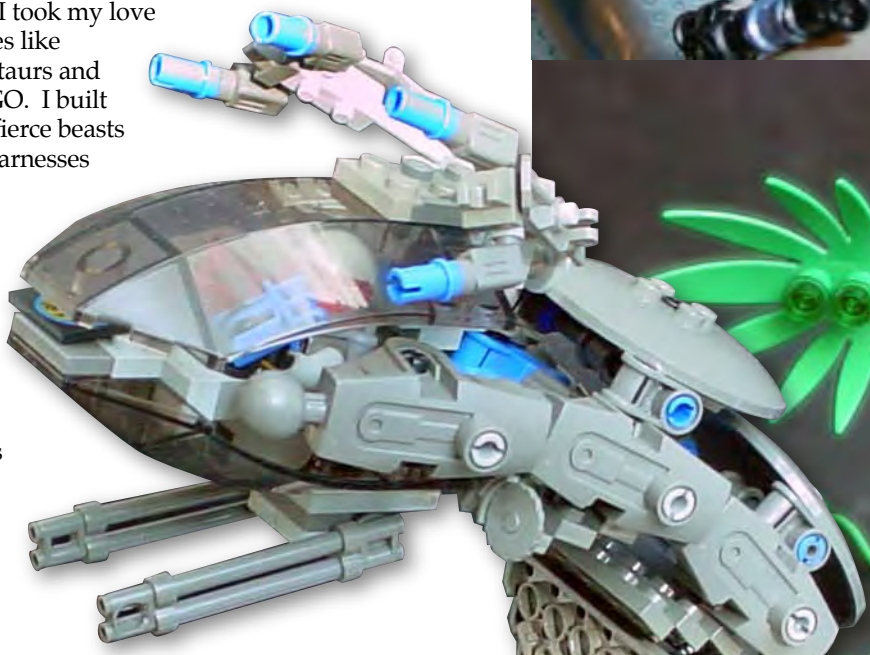
Anime and Japanese comics have a lot to do with what I build. Though I don't directly reference any one thing, they all influence what I make. Movies and comics like "Appleseed", "A.D. Tank Police", "Ghost in the Shell", and "Robotech" are all there rattling around in my brain. "Robotech" was on tv when I was in middle school. I made a point to watch it everyday. I loved the two legged battle pods and the other Mechs from the shows. Toys are a big part of my hobby money. For twenty years I've picked up every action figure, robot, dinosaur, or space ship I could find at yard sales, flea markets, and thrift stores. I sold a lot of them to make room for LEGOs but I still have all my favorites: My Shogun Warrior, the cap firing ED-209 and a box full of Sectaurs, not to mention about a thousand Star Wars figures and vehicles.

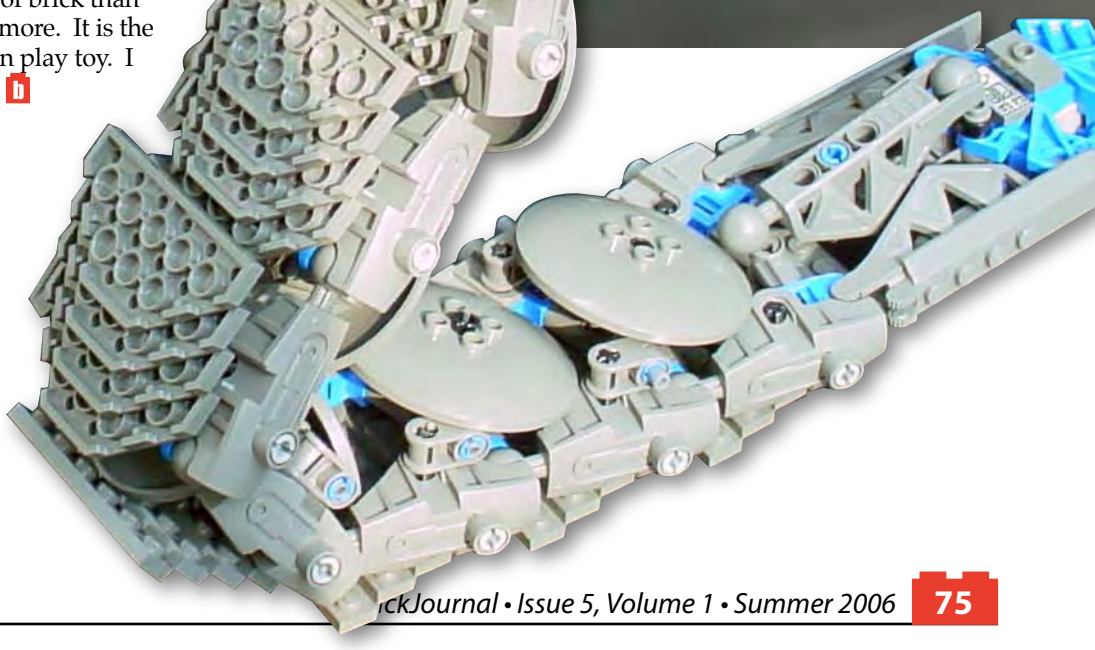
For every creation I finish there are four or five I haven't started. My most intriguing idea with which I haven't done much is based on the Uplift novels of David Brin. In the future,

man has tinkered with apes and dolphins making them able to talk and work alongside people. Dolphins make excellent star pilots since they naturally travel in three dimensions. I haven't made a dolphin piloted ship but it's on the drawing board. I did make a monkey driven robot but it wasn't an original design so I haven't showed it off. The other end of the creative process is the cast-offs or ideas that don't go anywhere. I have lots of pieces of things that may or may not make their way into some future creation.

In 1997 LEGO blew me away with the alien minifigs in the U.F.O. line. Then they did it again with the Insectoids. I thought this was a great idea to change the figs heads and have them be aliens. But what if you used something other than a minifig head? I had seen it done on Brickshelf.com and thought I would come up with a few of my own. After creating a whole group of new races of aliens it was suggested that they need crafts to move around in. I was inspired to greatness. Alien technology doesn't have to look like anything real. I took my love for the action figures like Dinoriders and Sectaurs and applied that to LEGO. I built aliens riding huge fierce beasts with cupolas and harnesses holding weaponry and technology on the backs. Space ships would be next as not all the aliens were earthbound. I am a slow builder though, working in bits and snatches of time when I am not obligated elsewhere or putting children to bed.







LEGO did it to me. They've messed me up pretty good. 10 years ago I was minding my own business and LEGO came back into my life. Is there a cure? I think if I build until I've run out of brick than I'll be done. Only, LEGO keeps making more. It is the perfect combination of collectible and fun play toy. I couldn't ask for a more enjoyable hobby.

You can find more of Pat's models at: http://www.brickshelf.com/cgi-bin/gallery.cgi?m=nnubtap

A LEGO Aviary:

The Models of MisaQa

MisaQa, a builder in Japan, has built elegant models that show a almost origamic approach to form and design. Here, she describes where she started building and shows some of her recent models for her calendar.

Article and photos by MisaQa

When I was a child, LEGO was very expensive in Japan. At that time (and even now) the most popular brick construction toy was DiaBlock. I was a girl who grew up with no interest in LEGO at all.

When I grew up, I realized LEGO was excellent as an expressive medium. It was at that time when I saw the big pirate, whom a professional builder created, and the LEGO built town in LEGOLAND Billund and other inspiring LEGO models.

When our daughter was born, we gave her LEGO as a learning toy, because I knew the excellence of the power of expression of LEGO. LEGO was popular also in Japan in those days, though DiaBlock was more popular. However, it was not my daughter but I that became crazy with LEGO building. I enjoyed assembling a lot of models. And I wanted to create an original work. But I couldn't find my own theme to create.

I got a #2250 (the 2000 Advent Calendar) at that time. All the models in this set are cute, peaceful, and joyful. My daughter picked them up with her small hand, and began to play happily. At that moment I found the theme to create! I imitated #2250, and began to make small models. They are small enough size to fit her palm. She smiled more and more.

Since then, I enjoy creating this lovely theme with which is so pleasing to my child. Moreover, all the models in #2250 are designed small, simply, and symbolically, which matches to my sense of beauty and design as Japanese. And, it became the style of my creations.

Afterwards I kept creating Angels and Dogs. The holiday calendar announced every year was my ideal.

However, when I looked at #7324 (the 2005 Advent Calendar), I was disappointed. The technique is more complex than all the old holiday calendars. Also, the theme was different from what I hoped, so I produced the holiday calendar for me. I chose a theme of the bird. It is cheerful, and has the same sense of design . I liked this theme so much, I continued creating Birds even after the holiday season.

Birds are really varied and beautiful. Dogs are also similar. There are a lot of living things in the world, and they are all unique.

Therefore, my desire to build is never exhausted.

MisaQa

http://STUD-and-TUBE.com

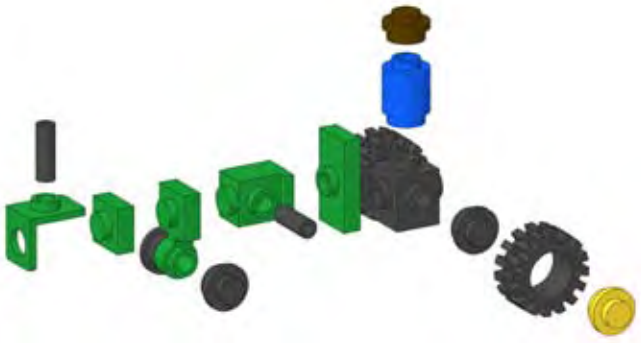
You Can Build it:
Tractor and Equipment

Photos and Art
by Jason Allemann

This microtractor was first seen at BrickFest 2005 on an award-winning layout by Jason Allemann. He has since built some more farm equipment, and *BrickJournal* is proud to present the tractor and a disk harrow to build.

Jason's micro building is very clever, and a great example of "less is more" - and you can see more of his micro work at this webpage:

http://www.truedimensions.com/LEGO/customs/micro.htm



You Can Build It: *MINI Invisible Hand*

by Christopher Deck

Hello everyone, I am glad we meet again in this jubilee issue! As in previous issues I want to continue the line of miniatures from the latest Star Wars movie – *Revenge of the Sith*. For this special issue I made a special vessel, a spot-on capital ship from the opening scene of the movie. For those who have not guessed it yet, it's the *Invisible Hand*, flagship of the infamous General Grievous.

This particular model is a bit larger than my usual mini size, as the Invisible Hand is a long and sleek ship, but it definitely deserves a detailed mini model of its own. It is built from many slopes and wedges, which I love to use. The building style is pretty straightforward without any complicated sections. Furthermore, it consists of two main sections which you can pull apart at exactly the point where the ship breaks apart in the movie!

The model does not have any ultra hard to find pieces, but let me give you some hints anyway. The nose of the ship is made from the well-known "space wing" or "space nose" which is an older part no longer produced, but still readily available at the usual online marketplaces for bricks (ex. www.Bricklink.com). The transparent bricks for the hangar unfortunately only come in one set, but you can use any transparent 1x4 brick here. The 2x3 slope with one yellow stripe is from the popular "Skyhopper" set, but if you don't have any, you can just use one without a stripe, although you lose a detail with that. The 2x2 slope with diagonal yellow stripes is a common part which came in almost every "Rock Raiders" set, and thus is readily available.

A last comment for the instructions: That particular slope with diagonal yellow stripes does not yet exist for the software used to create the instructions, so I used a similar element in a colour that doesn't exist in reality. It's only for instruction purposes. You have to use the one from the "Rock Raider" sets, although the unreal slope would have been more accurate.

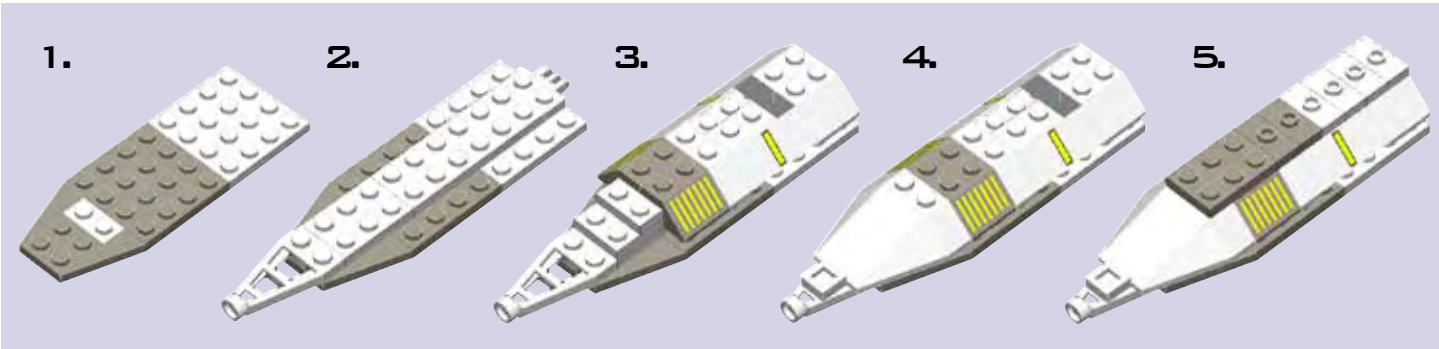
unreal slope

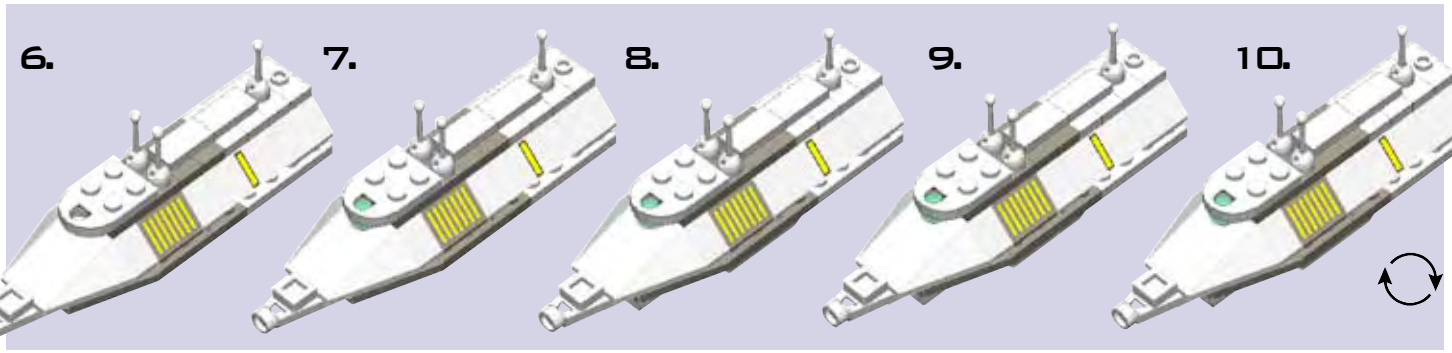
real slope

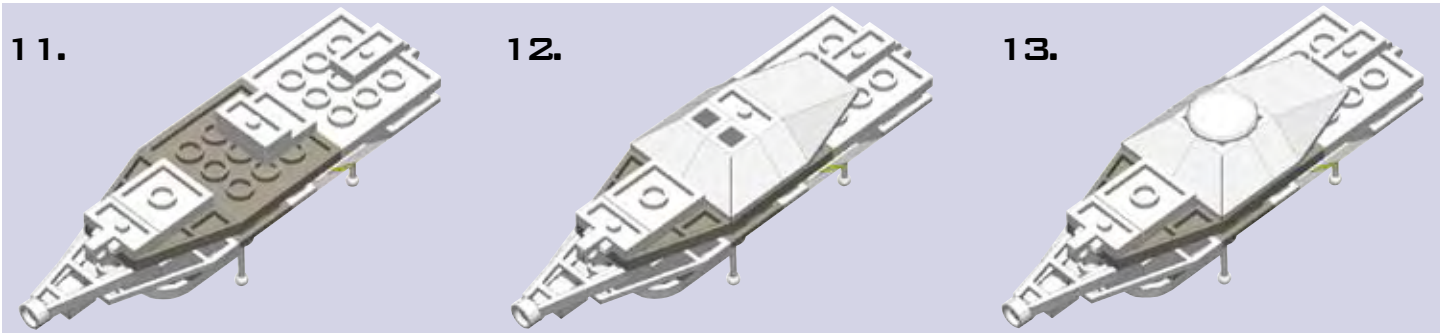
With that, I am done, and wish you happy building and will see you next time!

Invisible Hand Front Parts List

1 Light-Gray	Dish 2 x 2
3 Light-Gray	Hinge Control Stick
3 Light-Gray	Hinge Control Stick Base
1 Light-Gray	Hinge Plate 1 x 2 Locking with Single Finger On Side Vertical
1 Light-Gray	Hinge Plate 1 x 2 with 3 Fingers On Side
1 Light-Gray	Plate 1 x 1
1 Trans-Black	Plate 1 x 1 Round
3 Light-Gray	Plate 1 x 2
5 Light-Gray	Plate 1 x 2 with 1 Stud
2 Dark-Gray	Plate 1 x 2 with 1 Stud
3 Light-Gray	Plate 2 x 2
1 Light-Gray	Plate 2 x 3
1 Dark-Gray	Plate 2 x 3
1 Light-Gray	Plate 2 x 6
1 Light-Gray	Plate 3 x 2 with Hole
1 Light-Gray	Plate 4 x 4
1 Dark-Gray	Plate 4 x 4
2 Light-Gray	Slope 45 2 x 3 with Vertical Yellow Line Pattern
2 Light-Gray	Slope Brick 45 2 x 1
2 Light-Gray	Slope Brick 45 2 x 2
2 Light-Gray	Slope Brick 45 2 x 2 Inverted Double Convex
2 Dark-Gray	Slope Brick 45 2 x 2 with Yellow Grille Pattern
1 Light-Gray	Space Wing 4 x 2
2 Light-Gray	Tile 1 x 2 with Groove
1 Dark-Gray	Wedge 3 x 4 Plate
1 Light-Gray	Wedge 4 x 4 Triple
1 Light-Gray	Wedge 4 x 4 Triple Inverted

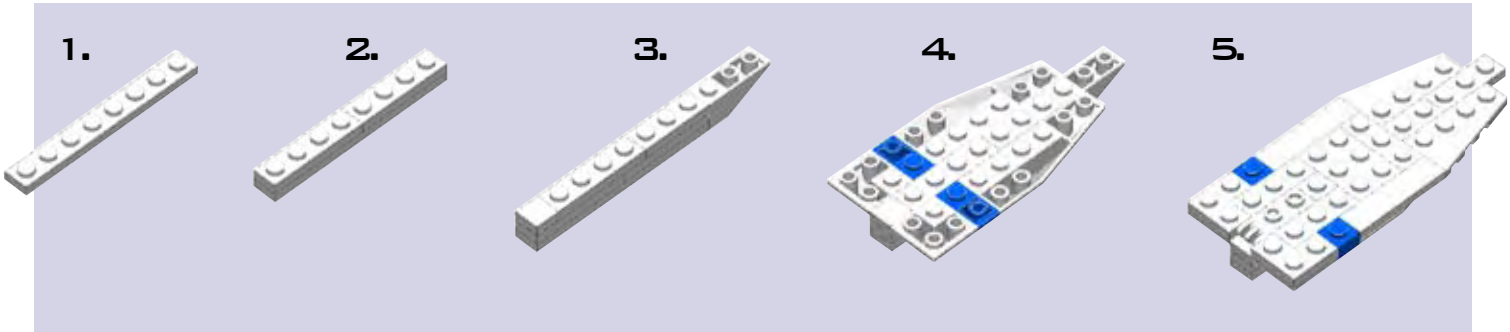


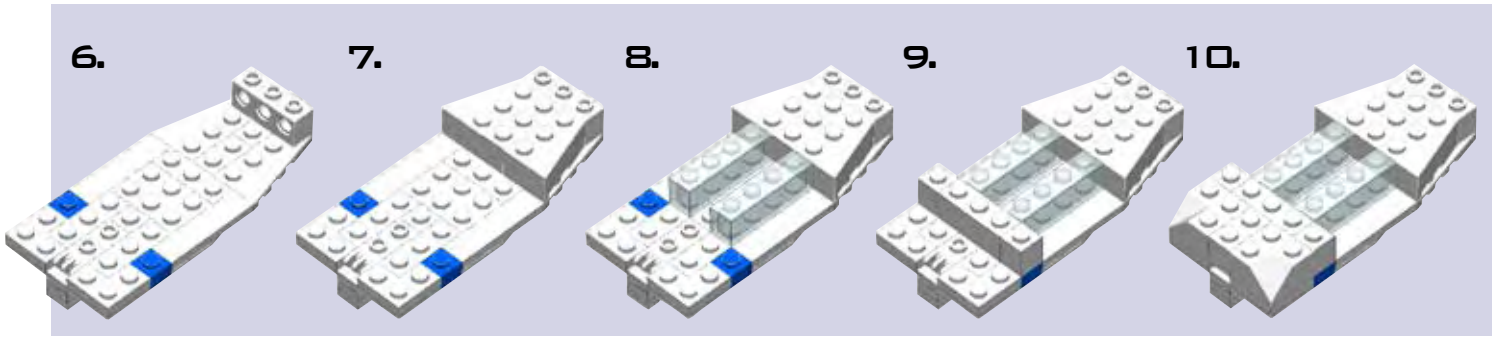




Invisible Hand Back Parts List

2 Light-Gray	Brick 1 x 1	1 Dark-Gray	Plate 1 x 2	1 Light-Gray	Tail 4 x 1 x 3
3 Dark-Gray	Brick 1 x 1 Round with Hollow Stud	5 Light-Gray	Plate 1 x 3	1 Light-Gray	Technic Brick 1 x 1 with Hole
		1 Dark-Gray	Plate 1 x 3		
1 Dark-Gray	Brick 1 x 1 with Headlight	4 Light-Gray	Plate 1 x 4	1 Light-Gray	Technic Brick 1 x 2 with Holes
		1 Dark-Gray	Plate 1 x 6		
1 Light-Gray	Brick 1 x 2	2 Light-Gray	Plate 1 x 8	1 Light-Gray	Technic Plate 1 x 4 with Holes
1 Light-Gray	Brick 1 x 2 x 2/3 with Studs on Sides	2 Light-Gray	Plate 2 x 2 Corner		
		1 Light-Gray	Plate 2 x 3	2 Blue	Tile 1 x 1 with Groove
2 Light-Gray	Brick 1 x 3	1 Light-Gray	Slope Brick 33 3 x 1	9 Light-Gray	Tile 1 x 1 with Groove
2 Light-Gray	Brick 1 x 4	1 Light-Gray	Slope Brick 33 3 x 1 Inverted	2 Blue	Tile 1 x 2 with Groove
2 Trans-Light-Blue	Brick 1 x 4 without Centre Studs			4 Light-Gray	Tile 1 x 2 with Groove
		2 Blue	Slope Brick 45 2 x 1	2 Light-Gray	Tile 1 x 4
1 Light-Gray	Hinge Control Stick	2 Blue	Slope Brick 45 2 x 1 Inverted	1 Light-Gray	Wedge 2 x 6 Double Inverted Left
2 Light-Gray	Hinge Control Stick Base	1 Light-Gray	Slope Brick 45 2 x 1 Inverted	1 Light-Gray	Wedge 2 x 6 Double Inverted Right
1 Light-Gray	Hinge Plate 1 x 2 with 3 Fingers	2 Light-Gray	Slope Brick 45 2 x 1 without Centre Stud	1 Light-Gray	Wedge 2 x 6 Double Left
1 Light-Gray	Minifig Tool Binoculars Town	2 Blue	Slope Brick 45 2 x 2	1 Light-Gray	Wedge 2 x 6 Double Right
2 Blue	Plate 1 x 1	2 Light-Gray	Slope Brick 45 2 x 2 Double Concave	1 Light-Gray	Wedge 3 x 2 Left
2 Light-Gray	Plate 1 x 1			1 Light-Gray	Wedge 3 x 2 Right
1 Light-Gray	Plate 1 x 1 Round	2 Light-Gray	Slope Brick 45 2 x 2 Double Convex	1 Light-Gray	Wing 2 x 4 Left
2 Trans-Black	Plate 1 x 1 Round			1 Light-Gray	Wing 2 x 4 Right
3 Trans-Light-Blue	Plate 1 x 1 Round	2 Light-Gray	Slope Brick 45 2 x 2 Inverted Double Convex		
1 Light-Gray	Plate 1 x 2				

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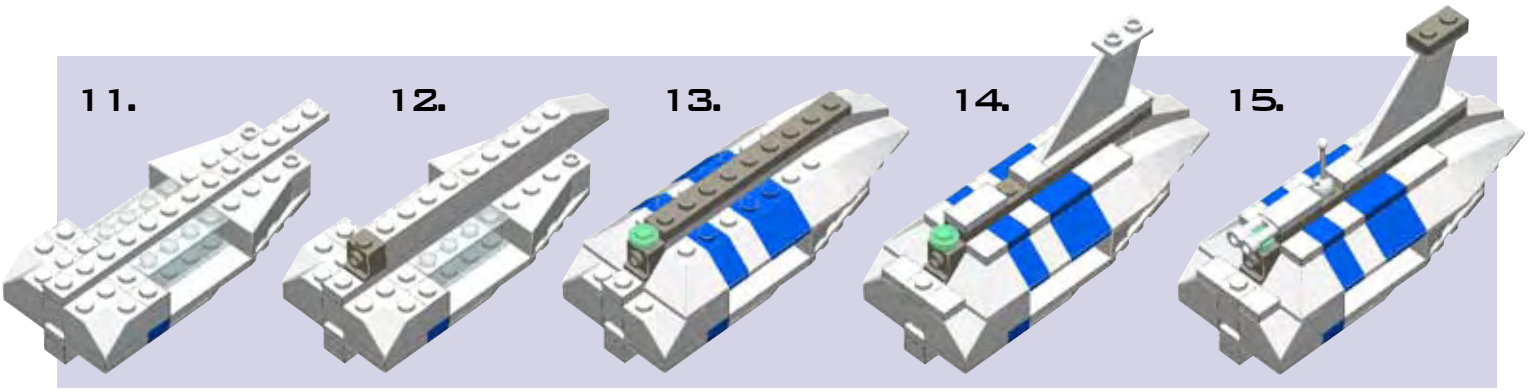
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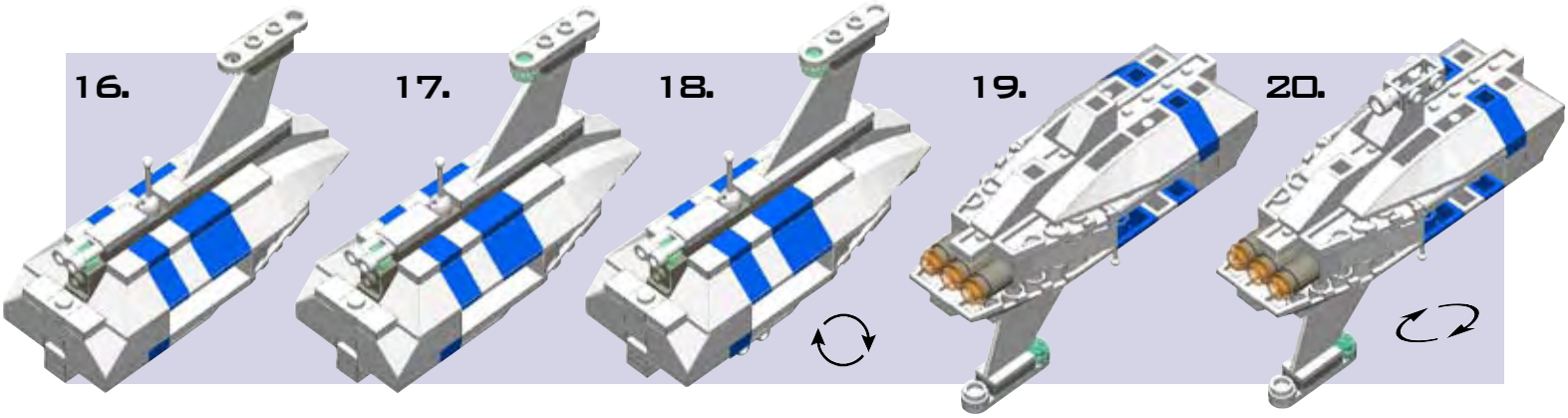
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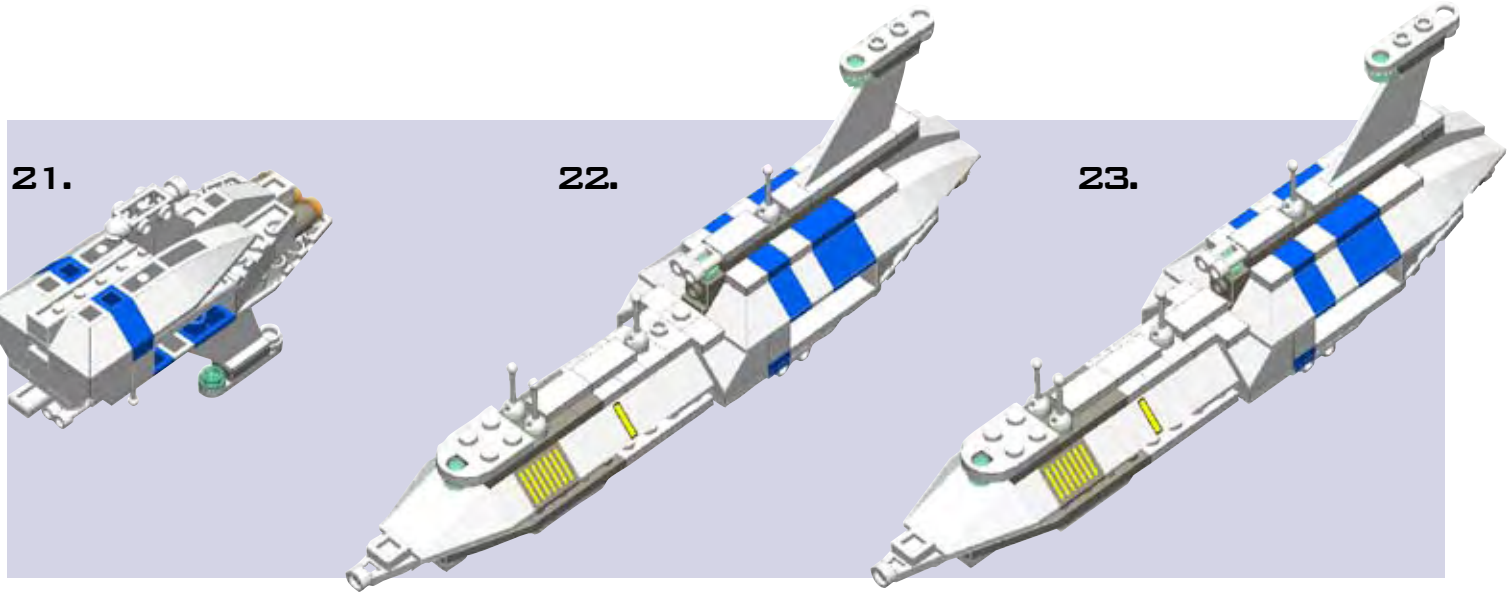
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Microscale Train Building

One of the more challenging and rewarding building themes is microscale, and some of the hardest models to build are of trains. Didier Enjary takes a look at the challenges and rewards of building small!

Article, photos, and art by Didier Enjary

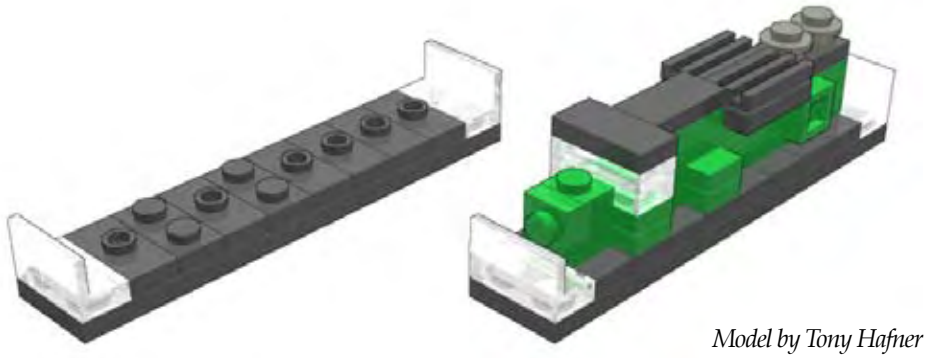
What are microscale trains? Microscales are scales under the Minifig scale which is about 1:48. Some authors consider that in microscale, people should be less than four plates tall which leads to a 1:150 scale. After a quick search on the internet, it appears that microscale LEGO trains are mostly 2-wide (that is 2 studs wide), corresponding to a 1:200 scale.

Official LEGO train models are 6-wide. Some specific parts exist that can be reused in creations in 8 or 7-wide: train wheels, couplings, train bases, windscreens, motors etc. It is easy to see that these parts are not as reusable when you deal with microscale. Every part of the model has to be reinvented.

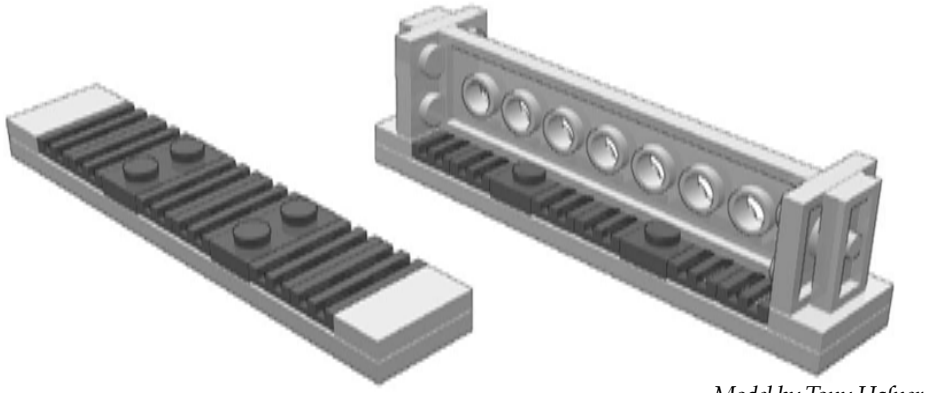
Microscale has advantages: it needs only a few parts and you can realise scenery and landscape even though you have a small room... and it requires great creativity. The knowledge and pertinent use of building techniques is part of this creativity.

Offset building techniques have their obvious uses in microscale. When you deal with minifig scale, one stud resolution (studs stacked directly over each other) is enough, microscale needs half-stud offsets to recreate details. In other words, offset building techniques allow one to center parts on or under 2xN plates or, more generally, to center parts between two studs. What are these techniques?

Building Techniques



Model by Tony Hafner



Model by Tony Hafner

The best known (and simplest) offset technique uses the famous jumper plate (plate 1 x 2 with one stud). It is extensively used in microscale train models. Have a bunch of these parts handy as you begin to explorebuilding at this scale.

The second offset technique is the stud-to-tube technique. It's quite simple. Rather than stacking the underside tubes between the studs in a classic way, you stack them directly on the studs. This technique works fine only if the plate you stack is bigger than the one it is placed on, because of the effect of the edges.

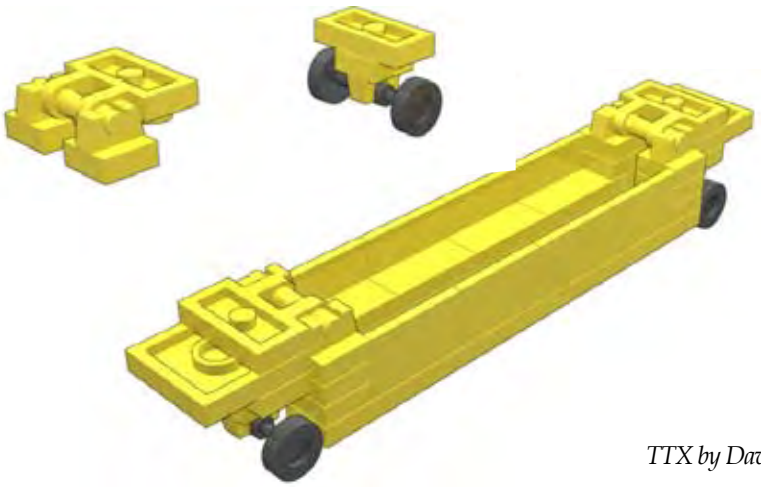
In microscale trains, 2xN plates are logically used as train bases. They are common, available in a wide variety of colours and sizes. A warning though! The use of side-by-side 1xn plates is to be avoided as they will prevent you from centering bogies (wheelsets, trucks).

There are other offset tricks as well. Among them the "pony eared" trick (a plate wedged between studs).

Building Wheels

Creativity is good but has limits. We are able to make wheels for our microscale trains but they aren't functional, only decorative. The size of wheels and the scale (micro) naturally leads to a few choices:

BOB by James Mathis



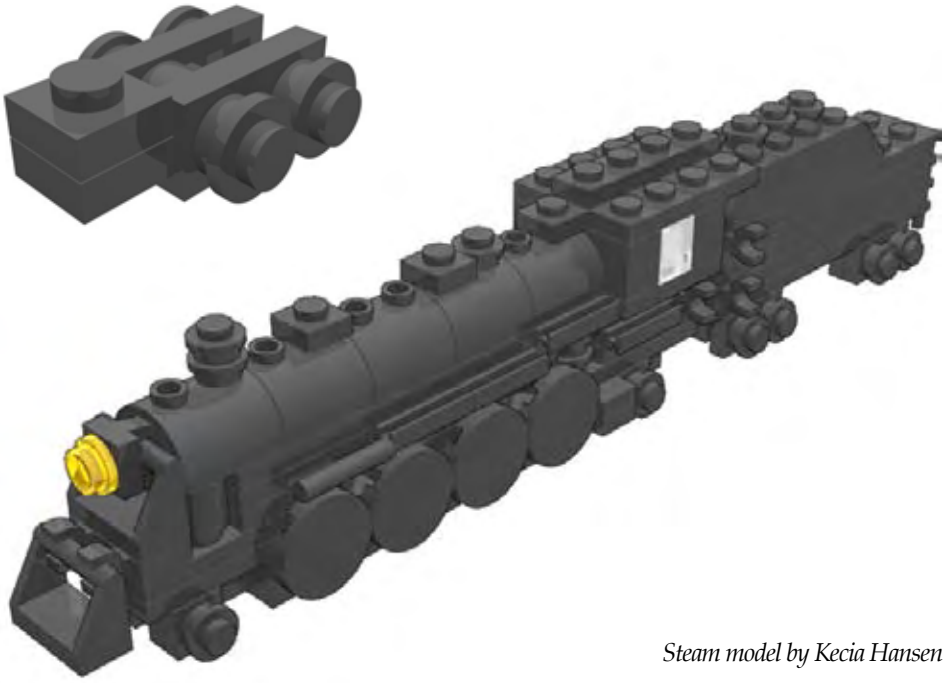
TTX by David Vinzant

Hinges 1x2 top (http://www.peeron.com/inv/parts/3938) are pretty easy to use (no SNOT or offset building techniques required) but are probably undersized. They will fit well only for metros (subways), some EMUs (see BOB by James Mathis) or for specific models such as low bed and shared trucks.

A wheel trolley (http://www.peeron.com/inv/parts/2496) clipped on tile 1x1 with clip (http://www.peeron.com/inv/parts/2555) requires some SNOT180 (building upside down). As they are bigger, they will probably fit most of rolling stock models but they lack a flange, that makes them quite unrealistic.

In many situations the plate 1x1 round (http://www.peeron.com/inv/parts/4073) is the best choice. They can be used torepresent train wheels perfectly with a tread and a flange. Some SNOT building techniques are required. The simplest one in this particular case is the use of the 1x1 plate with clip light (http://www.peeron.com/inv/parts/4081b).

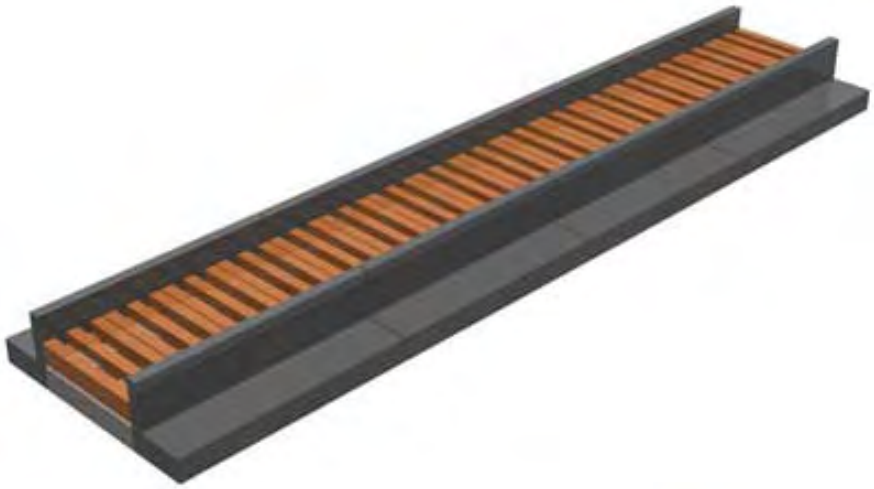
These solutions for making wheelsets are also good for the front pilot wheels or trailing idler wheels of steam locomotives. The coupled wheels (drivers) will benefit from round 2x2 parts such as round tiles (http://www.peeron.com/inv/parts/4150) or dishes (http://www.peeron.com/inv/parts/2654)

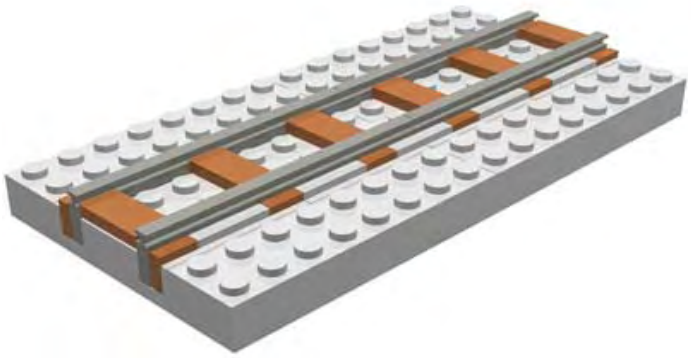


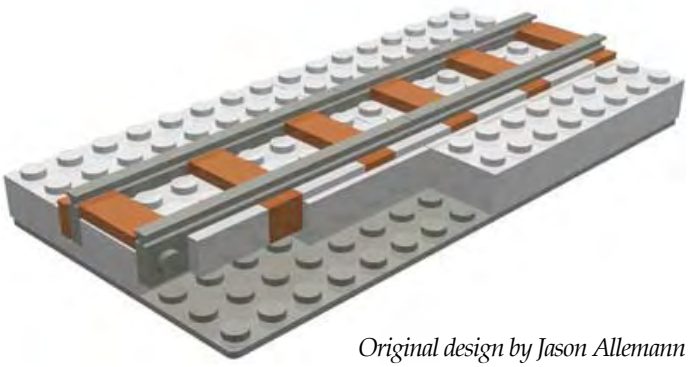
Steam model by Kecia Hansen

Building Rails

Real life rail tracks are made of rails and sleepers. LEGO Rails can be made easily with the use of snotted 1x8 plates with door rail or more simply 1x4x1 panels. Sleepers are nicely represented by brown (wood) or gray (concrete) tiles, and can be modified with grilles.



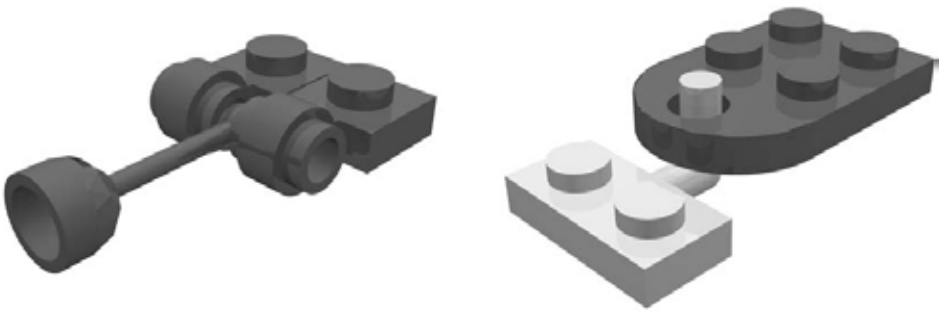




Original design by Jason Allemann

Building Joints

As 2-wide trains are not functional, couplings or couplers are not of high interest. You can recreate some in a decorative way with 1x1 plate with clip for instance.



The usual LEGO balls and sockets are too big for 2-wide trains. Jason Allemann used a very nice idea in his microscale farm by using a lever and 1x1 tile with clip light.

Again Jason proposed the use of a plate 3x2 with hole and plate 1x2 with bar as couplers. The plate 3x2 with hole can also be used in association with Technic half pins.

James Mathis proposed the use of bar and clips which is more compact but has one drawback: friction (see BOB model on page 86).

Powering Your Microtrain

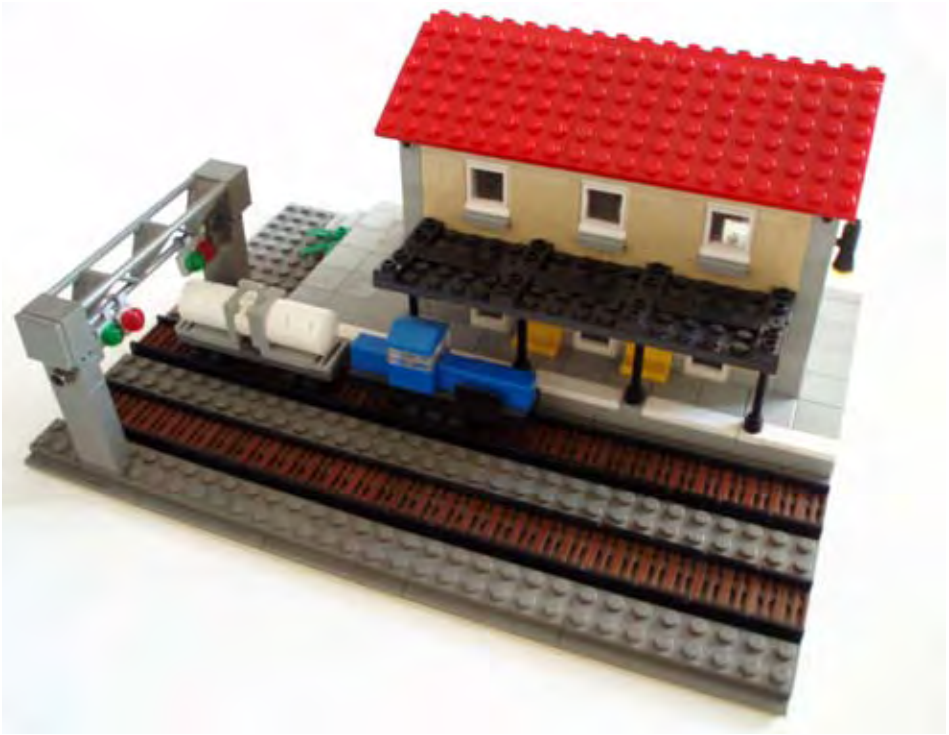
Finally, motorising may seem simply impossible. It's not. To motorise microscale trains, two ways have been used so far: magnets and modding.

For magnetic powering, just place a LEGO magnet in the model. Instead of building rail tracks, just a build a flat track with tiles. On the underside, use your Technic skills, a 9v Technic motor, some gears and tread links. It's quite easy then to let your microtrain run.

Another way for motorising A LEGO purist won't practice is modding (modifying parts). Build your model, glue it and cut out the inner part of it. It gives you enough room to put in some model train motors with wheelsets and couplings if you choose Z scale (1:220) accessories.

Many things have been done. As far as I know, however, nobody has motorised a 2-wide train with a micromotor.

I've talked about train bases, wheelsets, couplings and tracks: the previous discussion is just an overview of the main design components of trains. Thanks to the following collection of links, you will definitely free your creativity using ideas for pantograph and lights, windows and windshields, containers and sideways structures. It's your go now. *Play Well!*



Didier Enjary is a member of FreeLUG, a French LEGO User's group, and is a regular contributor and correspondent to BrickJournal.

Credits and Links

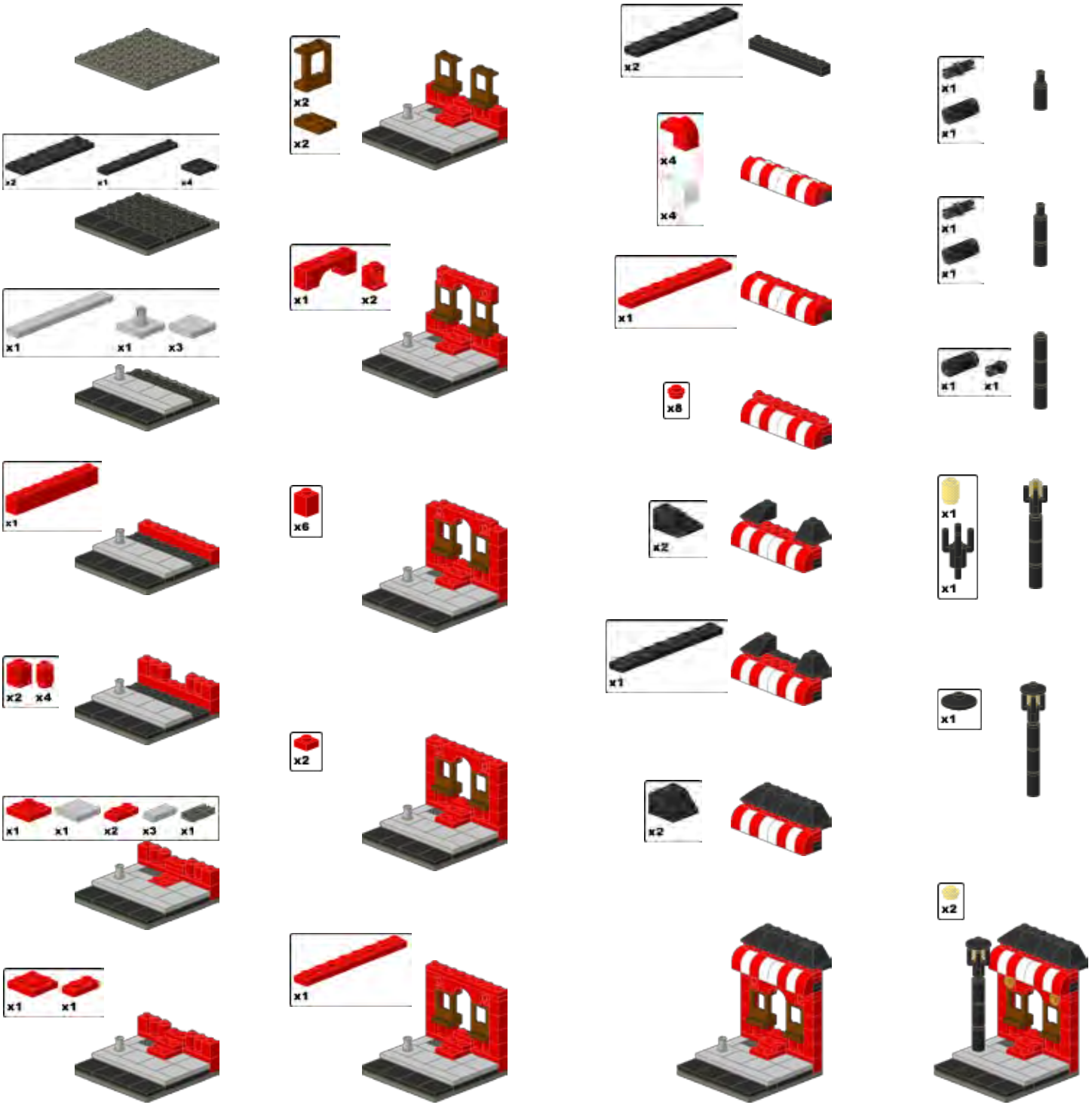
Jason Allemann :	http://www.truedimensions.com/LEGO/customs/micro.htm
John Barnes :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=108296
Didier Deses :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=77092
Timothy Gould :	http://www.brickshelf.com/cgi-bin/gallery.cgi?i=1654347
Tony Hafner :	http://www.hafhead.com/LEGO/mytrain/index.html http://www.brickshelf.com/cgi-bin/gallery.cgi?f=13862 http://www.hafhead.com/LEGO/mytrain/2wmckee/
Kecia Hansen :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=77728
Hitahita :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=141239
Mijasper :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=127994
Anders Isak :	http://www.brickshelf.com/cgi-bin/gallery.cgi?i=565188
Paul Janssen :	http://news.lugnet.com/build/microscale/?n=573
Peer Kreuger :	http://news.lugnet.com/announce/moc/?n=2998
Antony Lau :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=155116
LEGOloverman :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=180039
James Mathis :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=3416 http://www.brickshelf.com/cgi-bin/gallery.cgi?f=170973
Alban Nanty :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=107483
Ross Neal :	http://www.brickshelf.com/cgi-bin/gallery.cgi?i=339317
Sullis3 :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=15285
David Vinzant :	http://www.brickshelf.com/cgi-bin/gallery.cgi?f=118430

Bricks for Thought

A note about this particular creation: This was done by Kjeld Kirk Kristiansen, the owner of the LEGO Group, when *BrickJournal* visited earlier this year.

You Can Build It:
Street Vignette

One of the more recent building styles that have emerged has been the vignette, which is a small scene done on a plate, which usually is 8 studs by 8 studs wide. While this may seem limiting, there have been some great examples of the genre by Nelson Yrizarry and Bruce Hietbrink, who can be found on LUGNET in the lugnet.build.vignette newsgroup. Here's a vignette built by Geoff Gray, who also provided the art. Enjoy!!



Faster Than Fire!

You Can Build It:
CL415 Firefighting Plane

Article and Art by Allan Bedford

What do you do when flames erupt on a hillside and threaten to engulf an entire canyon? If you're a fire service lucky enough to have a Bombardier CL 415 standing by you call for help from above. One of the plane's primary roles is to act as an 'initial attack' aircraft and attempt to suppress a forest fire in its earliest stages.

The amphibious CL 415 is a direct descendent of the CL 215; a plane that first saw action back in the 1960s. The newer plane isn't much larger than its legendary predecessor. It is, however, a more effective fire fighting apparatus thanks to increased operating weight and speed. This flying fire engine can accommodate 6160 litres (1622 US gal) of water/foam mixture and has the amazing ability to skim just above the surface of a body of water and refill its tanks. It can completely fill the tanks in a blazing 12 seconds!

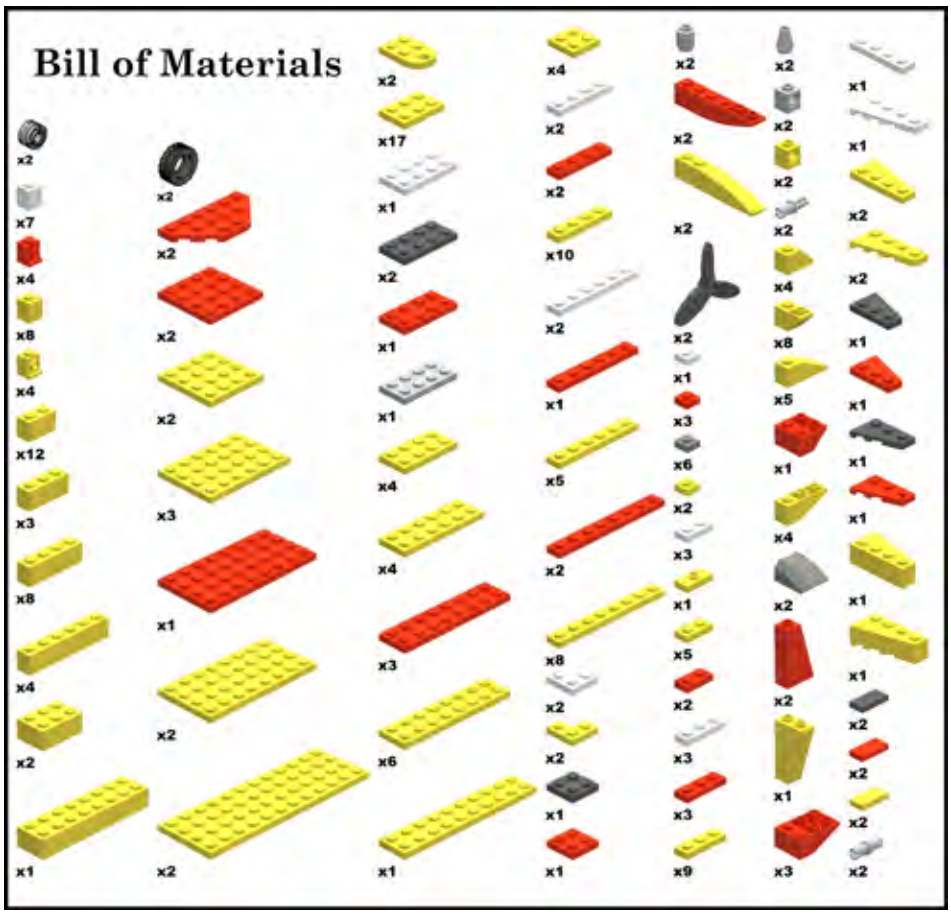
Today, the plane is in use in countries such as France, Greece, Italy, and Croatia. Of course, the 415 is also flown in Canada where all of them are built. The first production version was delivered in late 1994 and to date the 415s have collectively logged more than 190,000 water drops.

Creating a model of the Bombardier 415 out of LEGO elements was something I've wanted to do for a long time. The screen saver on my computer features a number of images of this aircraft. I love it's disproportionately wide wings that allow it to fly low and slow; a critical feature for a plane undertaking its fire fighting role. And I also love the fact that it's often painted in yellow/red combinations that remind me of those same colored LEGO pieces. The challenge in building the 415 as a "small" model was to figure out just how small to make it. I wanted to maintain the overall look and feel of the plane but knew I couldn't replicate every last detail. As with many of my projects I picked one piece upon which to base the scale of the rest of the model. In this case it was the 3 bladed propeller part (#4617) and I used it as a base to decide how long/wide/high everything else should be. This article provides all the information you need in order to build your own copy.

CL 415 Statistics

Wings Span	28.6 m
Overall Length	19.82 m
Overall Height	8.98 m
Cabin Length	9.38 m
Max. Prescooping Weight	16 420 kg
Max. Afterscooping Weight	21 319 kg
Max. Cruise Speed @ 10 000 ft	375 km/h
Typical Drop Speed	195 km/h

Notes: The colors of parts shown above represent those used in the instructions that follow. In some cases you may not have the same parts in the same color. Don't be afraid to substitute parts in different colors as needed. If you search for images of the Bombardier 415 on the Internet you'll find it is painted in a variety of patterns of yellows, reds, whites and blacks. Customize your model using the parts you have on hand.



In fact, in order to actually build the model you also may need to substitute when you simply don't have the parts listed regardless of color. In those cases just try to match up the size/shape of the missing part as best you can. For example, a 1x6 brick could possibly be replaced by two 1x3s or a 1x4 plus a 1x2. If you don't have the exact wheel and tire combination shown, then simply use whatever ones you have that are roughly the same size. When building the wings, as another example, you can use whatever sizes and shapes of plates you have in your collection. Just try to end up with a final combination that is about as long and wide as the one shown in the instructions below.

Of course, you can always use a site like www.bricklink.com to obtain the parts you're missing but not having each and every part shown above shouldn't keep you from trying to build this model. Sometimes finding an alternative part solution is half the fun. Now… on to the instructions!

Fuselage

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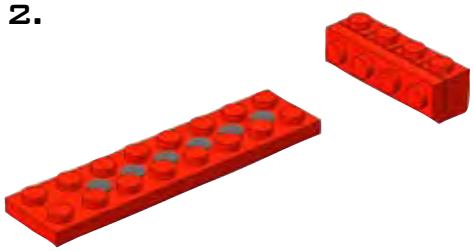
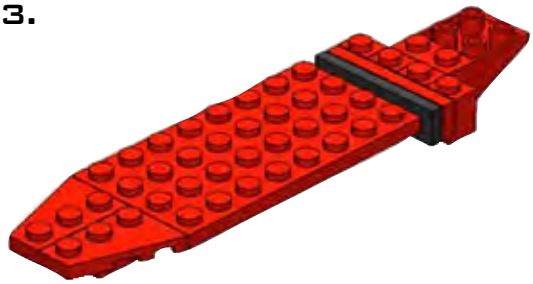


*** The grey dots show you where the 1 x 6 plate from the previous step is located under the 2 x 8 plate.*

3.



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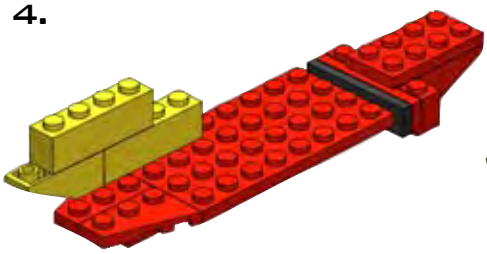

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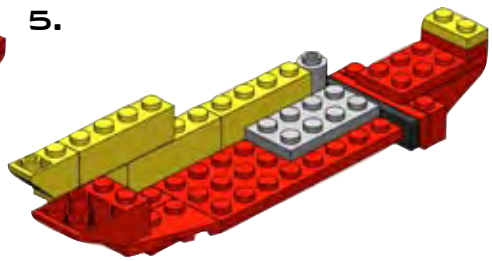

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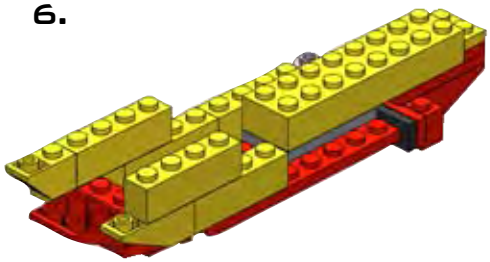

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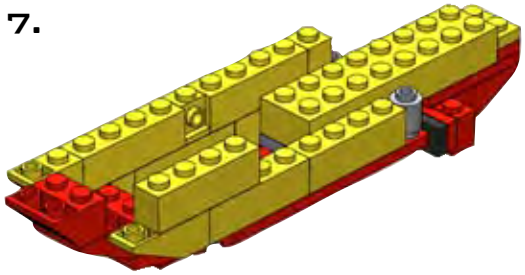

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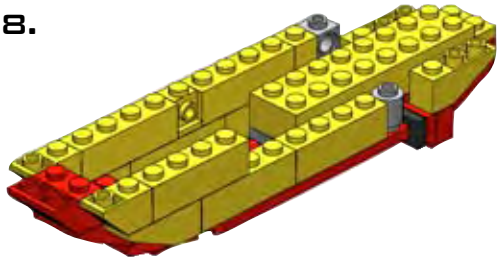

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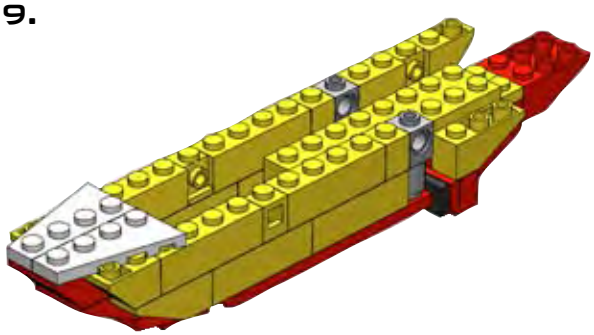

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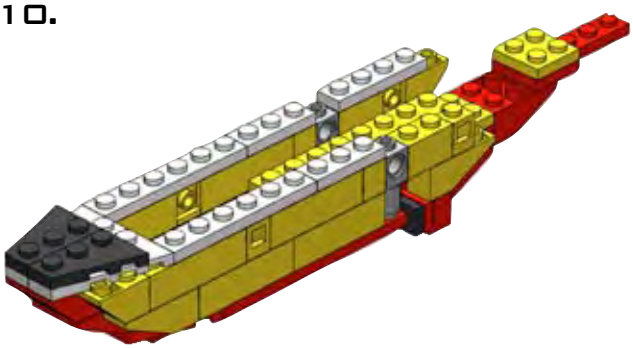

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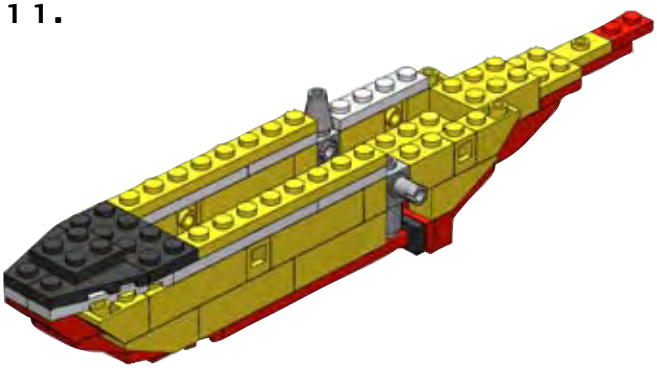

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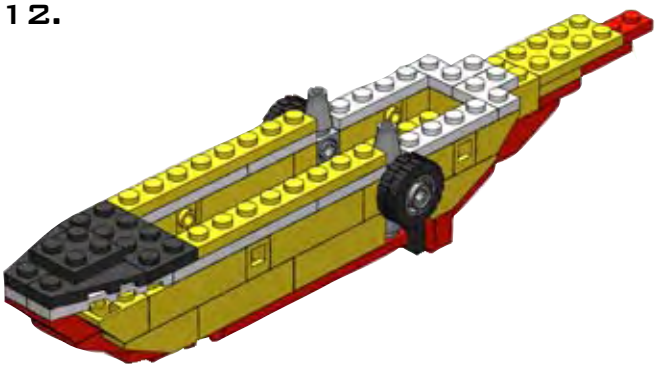

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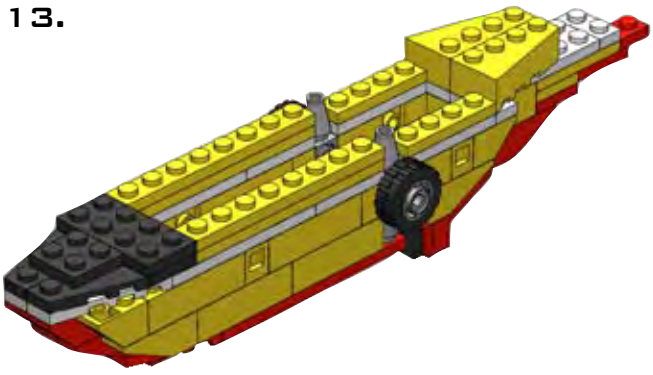

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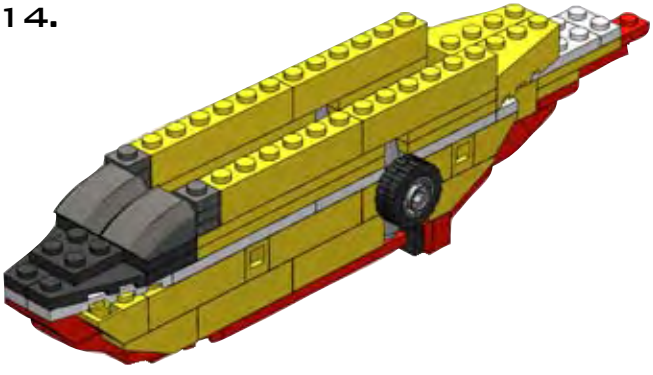

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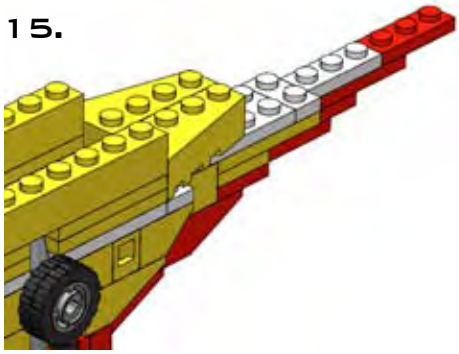

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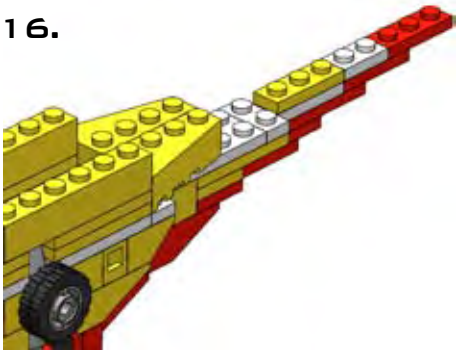

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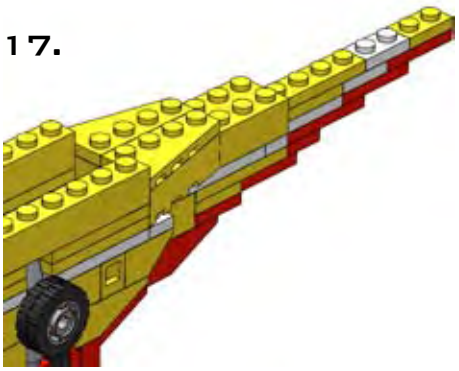

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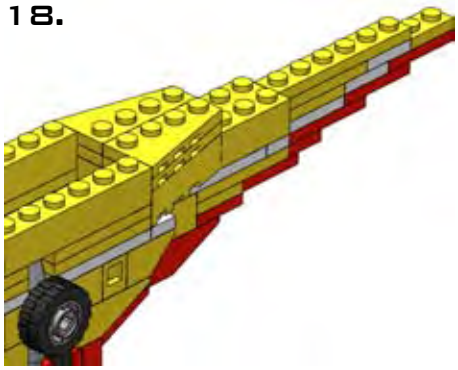

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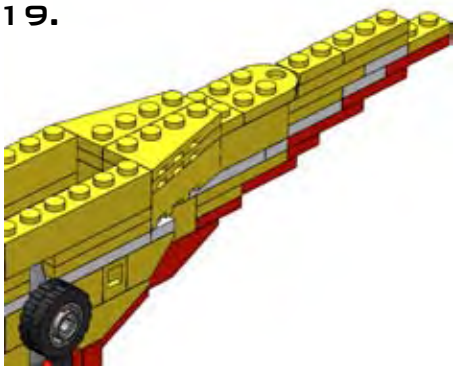

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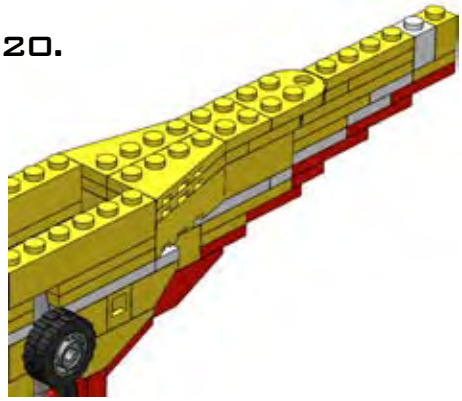

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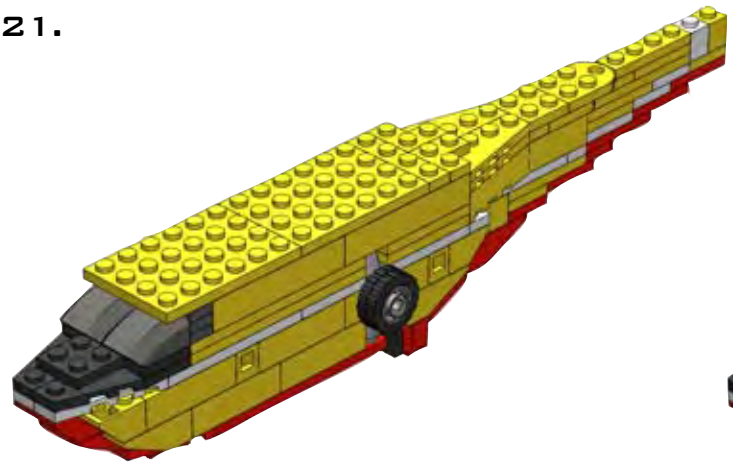

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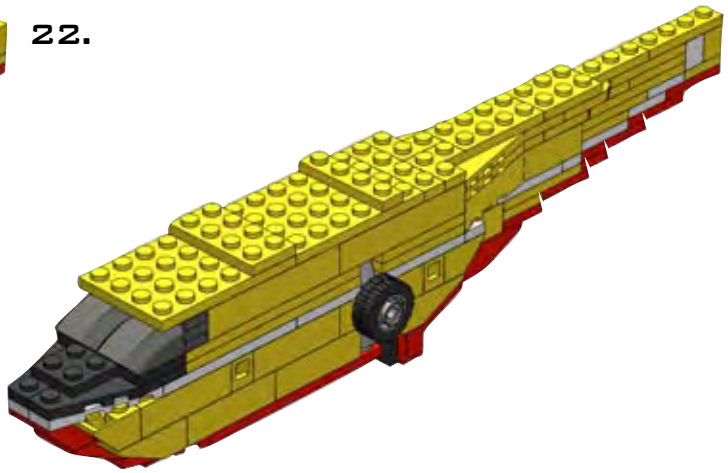

Left Wing

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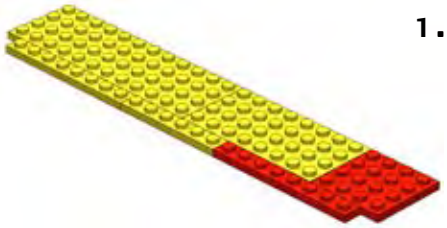

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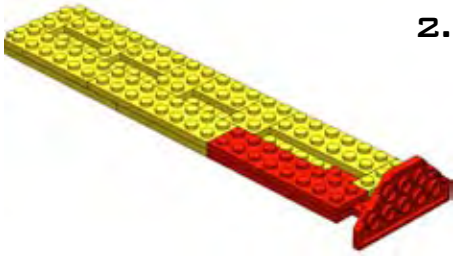

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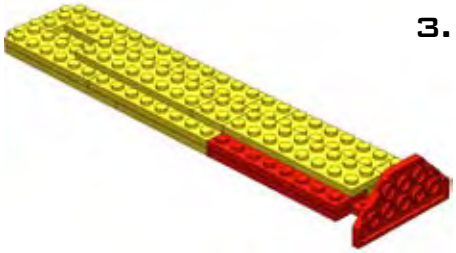

Right Wing

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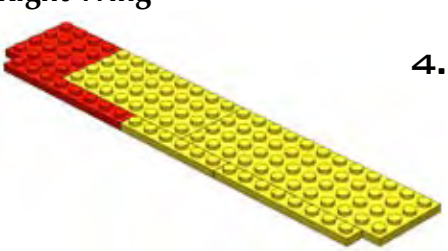

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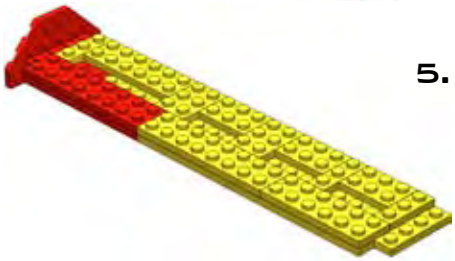

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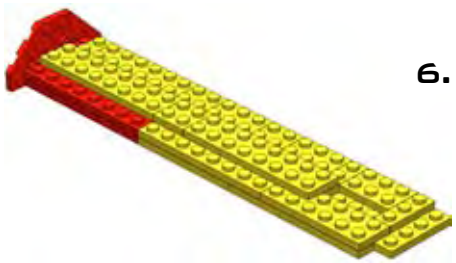
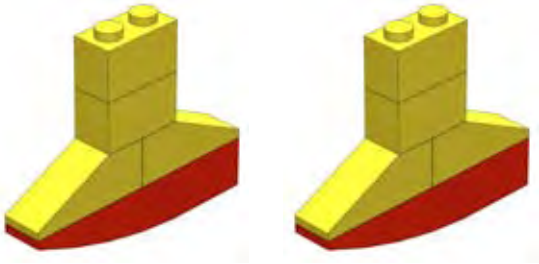


Pontoons (2x)



Engines (2x)

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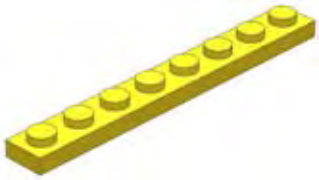

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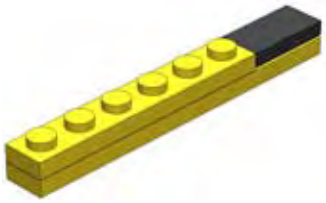

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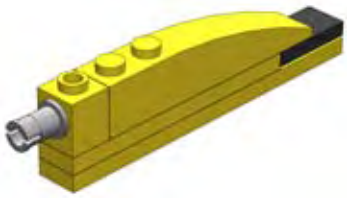

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Tail

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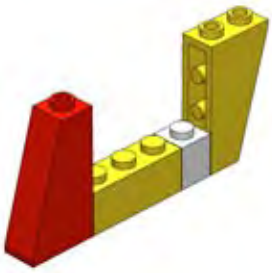

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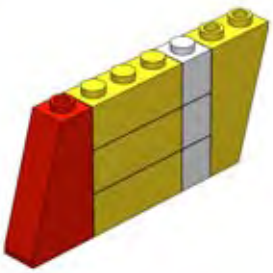

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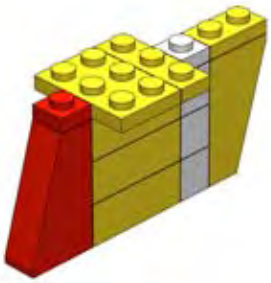

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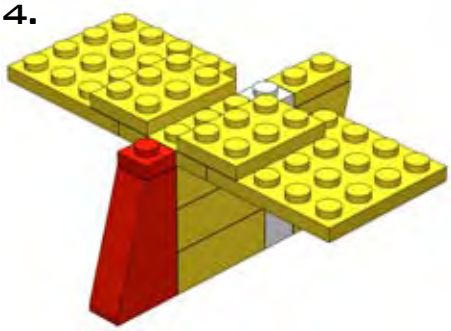

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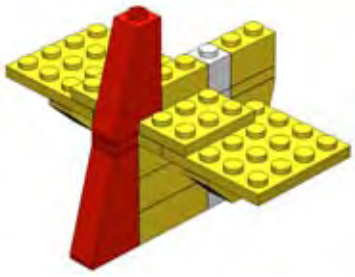

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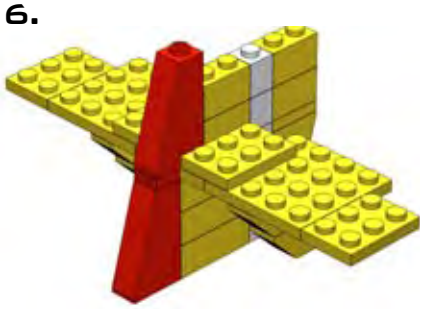

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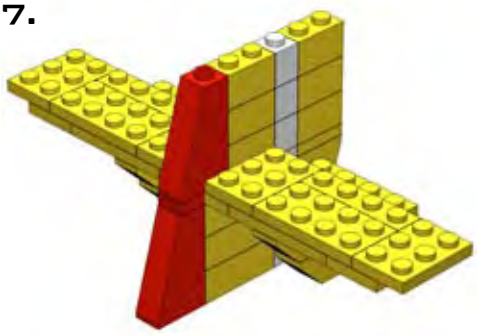

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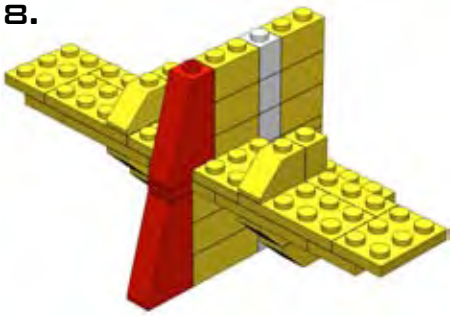

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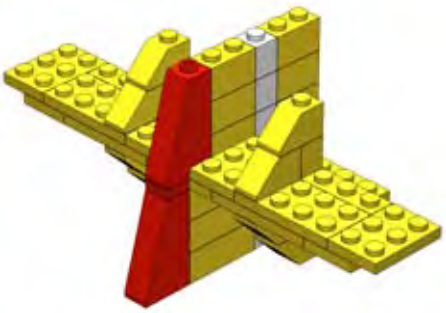

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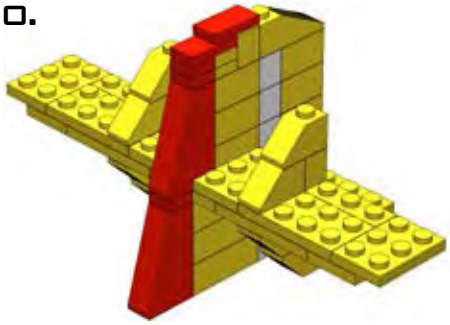
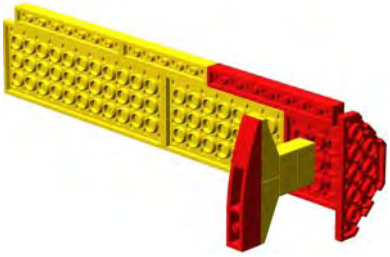


Final Assembly

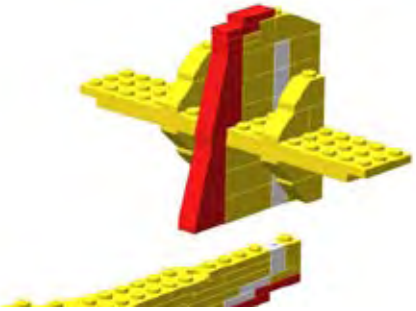
Now you've got all the components you need to finish your version of the Bombardier 415. Here's how to bring them all together into a model you'll want to 'swoosh' around the room.

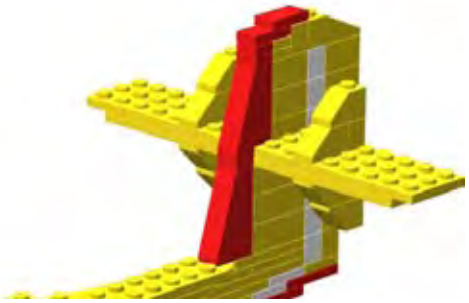
Pontoon Locations

The pontoons attach underneath each wing, nearly at the tip. Repeat this step for the right wing.



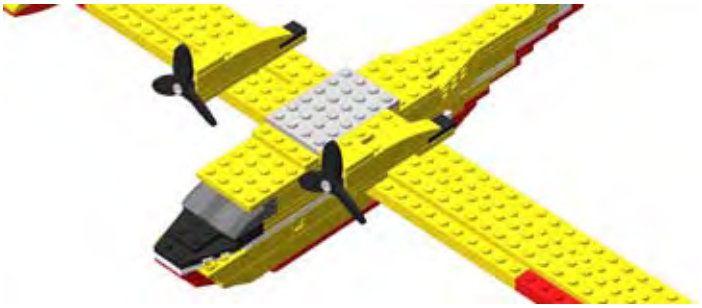
Tail Location





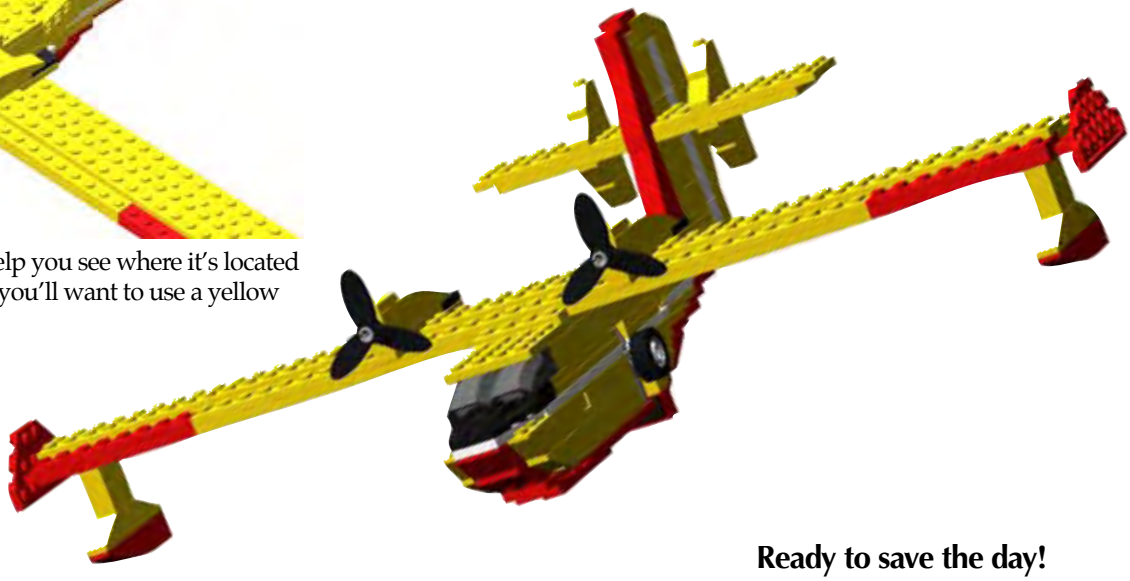
Engine and Wing Locations

Attach the wings between the 2 x 4 and 1 x 4 plates already on the top of the fuselage.



I've shown the next piece in grey to help you see where it's located on top of the fuselage. But, of course, you'll want to use a yellow 4 x 6 when you build your 415.

I've shown the last piece in grey to help you see where it's located on top of the fuselage. But, of course, you'll want to use a yellow 2_10 when you build your 415.



Ready to save the day!

To learn more about the Bombardier CL 415 visit the company's website at: http://www.bombardier.com/en/3_0/3_3/3_3_1.html

The photograph featured at the beginning of this article was used with kind permission from Pierre Landry. He is a pilot and a photographer. Please be sure to visit his photo galleries at: http://www.pbase.com/northflyboy and http://pierrelandry.photostockplus.com

Allan Bedford is from Stratford, Ontario Canada. He is the author of The Unofficial LEGO® Builder's Guide. *Information about the book can be found on his website: http://www.apotome.com*

Additional instructions created by Allan can be downloaded from: www.apotome.com/instructions.html

Minifig Decal Application

Article and photos by Jared Burks

Now that you know how to create waterslide decals from the *BrickJournal 4* the next skill to conquer is waterslide decal application. Waterslide decal application is quite easy and can be done by most anyone. There are basic application instructions, that work well for flat surfaces and advance instructions, that are needed for complex curves like helmets. In order to begin applying your decals you need to start with a clean slate or brick in this case. Don't have a torso without any printing on it? No problem. A quick trip to the grocery store, or Wal-Mart, to pick up a $3 bottle of Brasso® will solve your problem. Brasso is a micro abrasive used to polish brass that will literally sand the printing off that LEGO has applied to the element. It is also great for removing scratches on older bricks or for making cloudy transparent bricks clear again. It is a great product for any builder to have and one bottle will last practically forever.

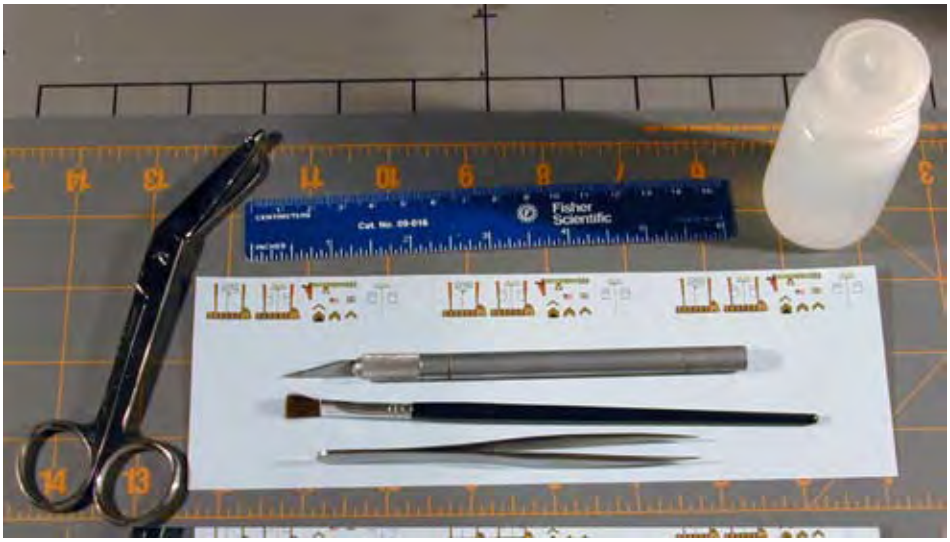
Brasso micro-abrasive cleaner

Brasso Instructions:

1. Pour a small amount of Brasso (about the size of a quarter) on paper towel or cloth.
2. Rub the LEGO element or minifig part vigorously against cloth containing the Brasso. Apply more Brasso if necessary. Removing the printing from a torso should take 15 seconds to 1 minute depending on how much elbow grease you use.
3. Once the original print has been removed, wash the piece with soap and water, making sure to remove any residual Brasso, and then allow the part to dry.

Now you have a clean LEGO element and your newly designed decal (created using the instructions in *BrickJournal 4)* and you are ready for application. This can be done by using the basic or advanced methods. The difference is the advanced method helps the decal to conform and adhere to the surface a bit better than the basic method, but it requires a few more components, that will be mentioned below. Before you begin, gather together the items that you will need for application, these include:

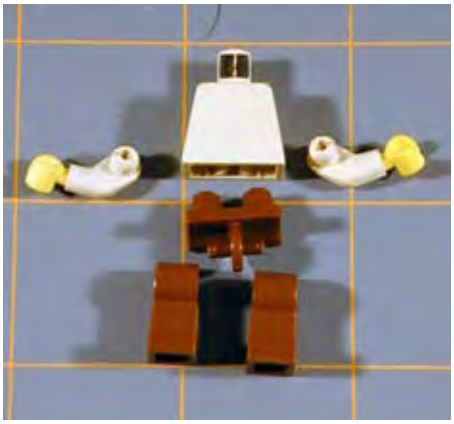
1. Pair of scissors
2. Ruler
3. X-acto® Knife
4. Small Paint brush
5. Tweezers or forceps
6. Q-tip® or cotton swab
7. Bottle of distilled water



Decal application supplies (Q-tip not pictured)

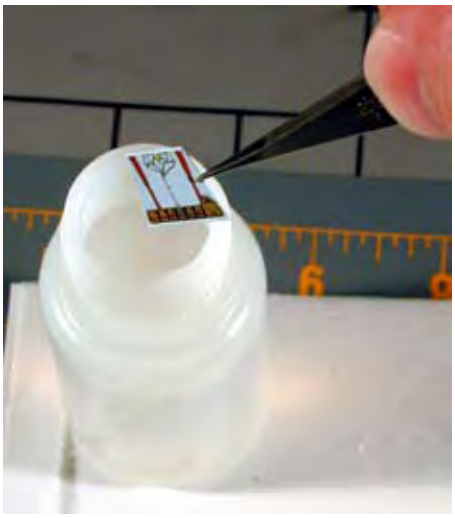
Basic Waterslide Decal Application Instructions:

1. Disassemble the minifig completely, especially if you are using the advanced decal application technique or kits.



A disassembled minifig

2. If the minifig has printing that needs to be removed use Brasso or a similar micro-abrasive polish to do so, using the instructions noted previously in this article.
3. Trim the decal with scissors or an X-Acto Knife preparing it for the distilled water.



4. Using the tweezers, dip the decal into the distilled water. DIP the decal into the water quickly and remove. Do NOT hold the decal under the distilled water for any extended period.

5. Allow the decal to sit for 1 minute giving the distilled water time to dissolve the water-soluble decal glue.

6. While the decal glue is being softened by the distilled water, apply some distilled water to the application surface with either the Q-tip or paint brush.

7. Gently slide the decal from the paper backing onto the wet application surface.

8. Position the decal into its final place with a wet cotton swab. Gently roll the cotton swab over the surface of the decal to remove any trapped air bubbles as these can detract from your finished figure. If the decal shifts slightly during this stage reposition it and allow the decal and torso to sit and dry untouched.

9. Once your decal has completely dried protect it by applying a clear coat of clear spray paint or hobby paint such as Krylon Crystal Clear or Model Master's Clear Acryl. The Model Master's will have to be applied with a brush or airbrush. More on this in the advance method instructions on the next page.
10. Reassemble your custom minifig.

The advanced decal application varies from the basic by using a chemical kit that improves the adhesion and contouring of these types of decals. These kits help make the decal backing disappear when applied properly, thus making the design appear painted on rather than applied. The kits can be found at many hobby stores or online (Micromark www.micromark.com). The kit components can be ordered individually as well (Internet Trains www.internettrains.com/bamopa.html). These application kits contain a mild acid solution that can not be shipped internationally. Therefore you will need to locate supplies in your own country. As for chemical kits the information on Micromark's Website is accurate: http://www.ares-server.com/Ares/Ares.asp?MerchantID=RET01229&Action=Catalog&Type=Product&ID=82400. It displays the same application with and without the use of the kit for comparison purposes. The two kits I recommend are from Badger and Microscale, both of which contain the two key solutions: decal setting solution and decal softening solution.

Advanced Waterslide Decal Application Instructions:

Step One: Apply the decal

Apply the decal as described in the basic instructions in the previous pages. In brief: cut the decal out of the sheet as close to the printing as possible so as to reduce the size of the film on which it is printed. Dip the decal (do not soak it) into a cup of distilled water and place it on your worktable (printed side up) for one minute. This should be sufficient time for the decal to loosen from the backing paper without dissolving too much of the adhesive on the back of the decal film. Using a soft brush, apply distilled water to the surface of the model where the decal will be applied. Next, gently slide the decal off the backing paper and into position on the model. Use a wet cotton swab (wet with distilled water) to gently move the decal into exact position, working out any large air bubbles that may have been trapped. Do not exert much force or the decal may wrinkle or tear. Apply decal setting solution with a paint brush to the decal surface and let it dry. Application of the decal setting solution strengthens the bond between the decal and the surface.

Step Two: Soften the decal

To make it look as though the decal has been printed directly on the surface of the model, the decal must be softened so it will conform to the surface of the brick. Using a soft brush, gently apply decal softening (Solvent) solution to the surface of the decal. Do not touch the decal until the solution has completely dried. The decal is VERY FRAGILE at this stage and care must be used. Repeat the application of the decal softening solution until the decal has fully conformed to the surface, but be sure to allow the solution to completely dry between applications. Otherwise, you may damage the decal while it is still soft.

Step Three: Protecting Your New Figure – Application of a clear top coat

Depending on the desired finish, apply a clear top coat to the decaled area...select either clear gloss, clear satin (semi-gloss) or clear flat. Clear gloss hobby paint works well. As for overcoats some things that people use include nail polish (though it yellows in sunlight and is not recommended), Future's floor wax (sworn to by many model makers for protecting decals http://www.swannysmodels.com/TheCompleteFuture.html), spray paint, airbrush paint, and liquid overcoats. I like Badger brand of overcoats and apply it with a slightly damp (with distilled water) paint brush. I find a using a hair dryer helps to dry the overcoat quickly and gives a smooth finish, removing any air bubbles that occur. The only critical point is that you have to remove any overcoat excess before using the hair drier. Apply a second coat after the first coat has dried. I **strongly** recommend the use of a clear sealant over the top of the decal to protect your new figure.

Advanced Application: Helmets, shoulders, and domes are examples of surfaces that are aided by the use of the application kits. These complex curves make application difficult.

You can get a nice application on many of the LEGO elements without these kits (the Q-tip really helps), and if you are only making one or two customs, I would skip them. If you are planning on making this a hobby, I would get the decal setting, decal softening, and satin overcoat from Micromark's kit. The components can all be ordered independently to save a few dollars and will last a very long time. I have yet to use up my first kit and I have made many figures so it is a good investment.

Now you know how to design, print, and apply decals. See how creative you can be!

Next Time:
Minifig Customization 101 – Digital Photography

Jared Burks is a regular contributor to BrickJournal *and can be contacted at: fineclonier@gmail.com*

Designing and Creating a Custom Minifig

Article and Photos by Norbert Black, art courtesy of Sean Esty

This short article is a step-by-step look at how I go about producing one of my custom minifigs. This particular project recreates a redesign by artist Sean Esty of DC Comics' Batgirl character.

This custom requires painting new decorative patterns on LEGO elements, doing a bit of carving and also some work with fabric. At each stage, I've tried to show both what I do, and also why I do it.

Figure 1

Choosing your pieces:

The first stage in any custom project is to choose the appropriate LEGO pieces as a starting point. I choose arms, legs, etc. to get a close match in colour for whatever design I'm trying to reproduce. Figure 1 shows what I came up with in this case.

Sometimes, there will be several possible colours for one element. For instance, in Esty's drawing, the legs show bare skin, grey socks and black boots. Why did I go with yellow?

The key concern is what I call "clearance factor". Some parts of a minifig fit very closely to their neighbours: the curved surface of legs, the gripping surfaces of hands, the inside face of an arm and the sides of the torso. Any paint, stickers or decals on such surfaces are more vulnerable to scratching. Since our Batgirl has bare upper legs, I chose "skin tone" yellow leg elements.

Preparing for Paint:

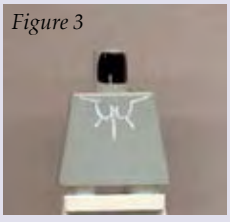
Most custom figures need to have at least some of LEGO's decorations removed from their donor elements. I use fine (500 grade) wet & dry sandpaper for this, used with lots of water. Some customizers use Brasso metal polish. This leaves a very smooth and shiny finish, but I prefer the slightly scuffed finish I get with fine wet & dry - this fine "tooth" helps paint to stick properly.

Figure 2 shows our figure disassembled, with almost all the LEGO paint removed. Note that the original lips are still there, to be used in my design. Each surface that will be painted has been given a brief rubdown with the wet & dry. All printed decorations are gently rubbed until the last of the design vanishes.

Now, I scrub everything with dishwashing detergent using an old toothbrush. Rinse with warm water, and then avoid handling things directly - oily fingerprints make it hard for paint to stick. To avoid touching them, I attach my pieces to other LEGO elements, and use these as handles while painting.

Figure 2

Figure 3



First Steps in Painting:

I use acrylic paints, mostly the relatively inexpensive "craft" brands. Feel free to use enamel paints if you choose, but they're toxic and require special thinners and solvents for cleaning. Whatever type you use, make sure you apply your paint in thin coats. Dilute the paint until you don't see brush marks as you apply it. This is the only real secret (besides patience and practice!) to painting fine detail. Be prepared to use several coats to get a smooth, evenly coloured surface.

The most eye-catching part of Batgirl's costume is the emblem on her chest, so we start our custom figure there, as shown in Figure 3. Note that I'm using a white LEGO leg assembly as a handle while painting the torso.

I begin by blocking in part of the bat - its head and wings - in white paint. I'm using white because some colours of paint (especially yellows and reds) are translucent - they show what's underneath them. To get a bright yellow bat symbol over my light grey LEGO plastic, I need a white bat to sit under the final layer of yellow paint.

I focus on getting the "skeleton" of the symbol correct - the ears, the line of the wing tops, the tip of the tail and the points on the bottom of the wings. If all of these are in the right place relative to each other, I can join them up with curves and/or straight lines and get the overall shape correct. Figure 3 shows that skeleton finished, while Figure 4 gives us a bat with some meat on its bones!


Figure 4

If you make a mistake, freshly-applied acrylic paint can be scraped off without fuss. Use a toothpick or something similar to remove any wobbly or out-of-place lines, and try again. For accurate work, it always helps to support the hand you use to hold your LEGO element against a desk or something. That way, you only have to control one shaky hand, not two!

Adding Detail:


Figure 5

It's often the smaller details of a design that make a custom minifig look good. The trick is to blend your original inspiration with a "LEGO-like" appearance. As a creator, think carefully about what shapes and colours you use. Take time to study how LEGO does things.

As an example of the importance of colour and shape, look at Figure 5. I've added a pair of "shadows" to suggest Batgirl's breasts (as well as a coat of yellow on her bat symbol). Esty's original figure is quite curvy, but still fairly subtle. Rather than bold black lines, I use small arcs in two shades of grey - a narrower dark one in the centre of each arc of medium grey.

Figure 6 shows another useful technique: blacklining.

I've painted a very fine black line around the yellow bat symbol. This division line helps make the symbol stand out from its background. We're used to seeing such lines in cartoons and comic characters, and they work well on custom LEGO figures for the same reason: they sharpen the boundaries between colours.


Figure 6

Going Around Corners:

Now that we've seen the torso completed, we'll turn our attention to the minifig's hips. Because Esty's Batgirl wears her belt very low, I chose to paint it on the hips element rather than along the bottom edge of the torso. Figures 7 through 10 show how this was done.


Figure 7


Figure 8


Figure 9


Figure 10

The steps here should look familiar. I start with the key part of a design (the buckle, Figure 7), add in the rest (Figure 8) and then cover a white undercoat in yellow (Figure 10). Note that I'm using once again a handle piece - in this case a white torso element.

Note that Figure 9 shows something rather unusual on a minifig: decoration on the sides of a hip element. In fact, the "belt" is painted all the way around the element - around its corners, so to speak. It takes a bit of extra care to get things to match up at the corners, but not much.

Complex Painting, Step by Step

Here's another run of images, this time of our figure's legs, mounted on streetlight elements for ease of handling:
What I want to show you here is the way I build up multi-part decoration on a LEGO element. Our Batgirl needs boots, stockings, bows

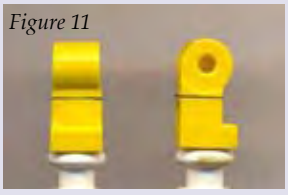


Figure 11

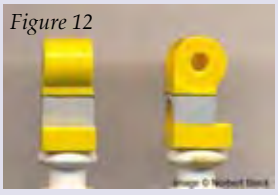


Figure 12

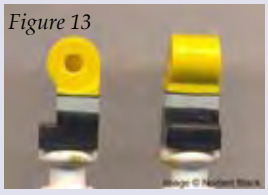


Figure 13


Figure 14

and a belt pouch painted on her leg elements. That's a lot of painting, but by choosing the order in which it's done, I can make things easier for myself and get a better-looking result. It's worth noting that minifigs have very short legs proportionately, so most costume designs get rather compressed in this area. I will need to think about both adapting Esty's drawing AND applying paint - tricky!

I start by painting a fine black line to mark the top of Batgirl's stockings (Figure 11). There's leg showing in the drawing between the bottom of the black trunks and the top of the stockings, so I make sure there's a bit of space between my painted line and the bottom of the curved area of the leg element. All the other design decisions for the figure's legs depend on where this crucial line is placed. That's why it gets done first.

Once I know where the top of the stockings is, I can paint them in with a grey paint which matches LEGO light grey (Figure 12). I use a custom mix of black and white paints with just a touch of yellow added. After the stockings, I paint the boots in black (Figure 13). They're high boots in the drawing, so I don't leave much grey stocking showing.

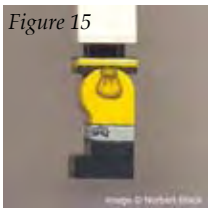


Figure 15

Figure 14 shows some final detail added to the legs. I've painted a narrow very light grey line at the top of the stockings as a highlight. I also touch up the black "stocking top" line anywhere it's been accidentally overpainted with grey. Finally, a bit of black and dark grey paint adds those ultra-stylish bows! I paint them in black first, and then add the dark grey almost up to the edge of the black, leaving black division lines and shadows showing. Finally, our leg elements are reunited with the hips element to form a finished leg assembly (Figure 15). Note that the left leg element has a pouch painted on it, using ochre, brown and black. It's a different shape than the bows, but the same technique is used - black first, then brown, then ochre. I leave the yellow part in the pouch centre unpainted plastic.

Final Painting Steps:


Figure 16


Figure 17

If our custom figure has complex legs, its arms are really pretty easy!

The only thing noteworthy here is that I've used light grey arm elements and painted the black gloves, rather than choosing black elements and painting grey sleeves. Why? Black paint covers better than light grey does, so I need fewer coats. This means there's less paint on the inner surface of the arms - one of those "clearance factor" areas mentioned above.

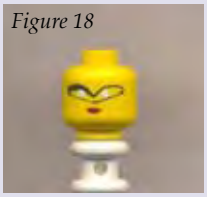


Figure 18


Figure 19

There's more tricky work in the head and mask, but the techniques are the same as we used for the torso. I start by adding white dots in the correct places for the eyes. Note that the original LEGO lips are still in place. I chose this particular head element to get that style of small, dark red lips.

Once I know where the eyes will be, I can sketch in the outline of Batgirl's mask (Figure 18). This time, I place one side better than the other, so you can see I have to work through several attempts to get both sides of the mask outline matching in shape! Don't anyone ever believe I get everything right the first time...

Finally, though, I have the outline correct. Black lines are added to give me the shape of the mask's eye holes (around my original white dots). Now I fill colour inside the lines (Figure 19) in black for the mask and in white for the eyes. And that's our painting complete!


Figure 20

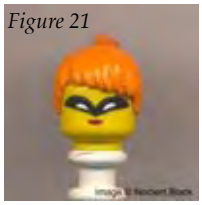


Figure 21

Changing the Shape of a LEGO Element - a Mild Customization:

The Batgirl drawing shows her with orange hair in a ponytail. Easy, right? Add a ponytail hair element (Figure 20), and we're done!

Well, not quite... The Esty design shows that Batgirl parts her hair on the right side, so I take a sharp modelling knife and gently carve away a bit of the hairline on one side. Using a fine rat-tail file, I recreate a scalloped profile on the new hairline (Figure 21). This made my customized element look a little more LEGO-like, since the original piece had this kind of edge. This is another one of those touches that don't take a lot of work or time, but which make your custom minifigs look more impressive.

Varnish For Protection:

To protect my work, I always add a couple of thin coats of satin acrylic polyurethane floor varnish. Acrylic paint is fairly soft, even when dry, and custom pieces should be able to take some handling. The varnish will protect your work. Remember, use only thin coats of varnish (thinned slightly with water if necessary) and let them dry thoroughly (at least 24 hours) before handling.

Here's our custom after varnishing (Figure 22 and 23).

Notice that it's slightly shiny now. I think "satin" varnish looks more LEGO-like than the high-gloss type, but feel free to use whichever you think looks best.

I generally varnish an element once it's had the last bit of paint added. So, for instance, I varnish arms and torsos before joining them back together. Ditto with legs and hips. Before adding a varnish coat, give your paint a few hours to dry, and remember, LET EVERYTHING DRY before you touch it again! If you rush, you can ruin your work by scratching something that would have eventually been strong and safe.

Figure 22

Figure 23

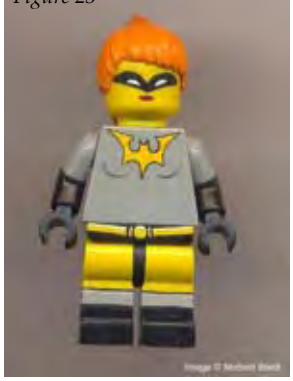


Figure 24

A Custom Fabric Cape:

Our Batgirl needs only one thing to complete her outfit - a cape. Fortunately, it's quite easy to create capes, skirts and other cloth elements for your minifigs. Go to a fabric store and find the bolts of polyester "broadcloth". It's a thin, inexpensive, finely-woven fabric that comes in a rainbow of colours. Properly treated, it looks just like the cloth LEGO uses for making capes.

To treat the cloth, you take some acrylic matte medium and dilute it 50% with water. Take a good-sized brush and paint the mixture onto a small swatch of broadcloth, working it well in to the fabric. You want the cloth wet but not dripping. Leave a strip along one edge dry, and hang the fabric somewhere to dry. Use clothes pegs to hold the dry strip.

Once the treated cloth is dry, you can cut it with sharp scissors and it won't unravel. You can even paint designs on treated fabric, if necessary. For our Batgirl project, no painting is needed. Her cape is a very light grey, and I was able to buy broadcloth in that shade. The Esty drawing shows Batgirl's cape covering her shoulders, so I used a custom "3-hole" cape template of my own to cut out a piece of fabric (Figure 24) with cuticle scissors.

The cape's centre hole is placed over the torso's neck, and then the left and right holes placed in their turn. The figure's head is then added. The effect is that the custom cape cover's the minifig's shoulders

A Final Fashion Show:

And there we have it - a custom minifig which I think duplicates the look of Sean Esty's original drawing but also appears quite LEGO-like. Here's a trio of shots of the completed figure:

Although the final product looks quite elaborate, I hope I've convinced you that the steps along the way are a lot less frightening. With some practice, some patience, and a willingness to try, almost anyone can do custom work that they'd be proud of. Remember, the biggest (and scariest) step in any creative process is the first one. Make that, and you're already ahead of all those people who say they can't!

I've tried to show you the techniques I find easy to use, and which give good results. There are certainly other approaches, however. For anyone interested in the topic, I'd recommend a look around Isaac "Redbean" Yue's fine site at http://www.minifigcustomizationnetwork.com.

Sources for Materials:

acrylic craft paints: craft supplies stores, artist supplies stores, some large department stores; hobby and gaming shops have a more expensive version that's essentially the same thing

artist's acrylic matte medium: craft supplies stores, artist supplies stores

cuticle scissors: drug stores, department stores

polyester broadcloth: fabric stores, some large department stores

modelling knife: hobby shops

rat-tail file: hobby shops

satin polyurethane floor varnish: hardware stores, some large department stores

wet and dry sandpaper: hardware stores, some large department stores

Norbert Black (born 1961), is a proud (although occasionally bemused...) Canadian who lives in Ottawa. In the past few years, he has earned a living as a military historian, an artist, a teacher, a software developer and a senior technical writer. Mostly, though, he putters along making Small Nifty Things and occasionally writing immensely long emails to his friends. Some of his other Lego work can be seen at http://www.brickshelf.com/cgi-bin/gallery.cgi?m=nhblack Anyone who'd like to chat about minifig customization is welcome to contact him at norbert_howard_black@hotmail.com

Building: Mindstorms

Railroad Crossing

Article, Art, Design and Programming by Geoff Gray

This article describes a fairly simple Mindstorms RCX project you can build for use with a train layout. The project walks you through the design and programming of a railroad crossing gate that automatically detects a train coming by and lowers itself until the train has passed. The project is designed to work regardless of which direction the train is coming, and accounts for possible gaps in the train cars. I use a freeware programming language called NQC, and connect to the RCX using a program called BricxCC (see the "Programs" sidebar for more information on these).

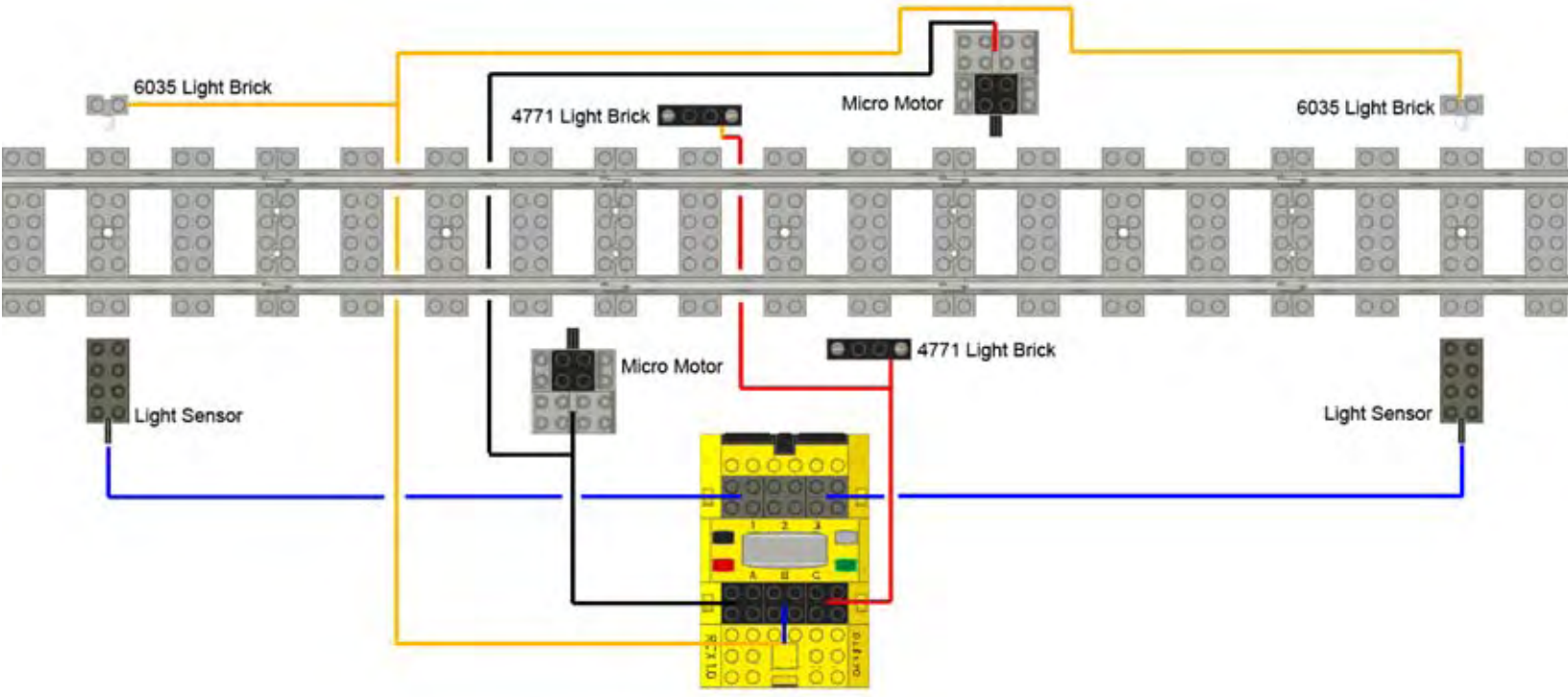
When designing a project, the first thing is to layout the scope of the project. Outline (on paper or in your head) exactly what you want the project to do, and at what time). For my project, we had the following scope:

- *There should be 2 sensors for detecting the train; one on either side of the crossing, and each about 6-12 inches down the track (see figure 1).*
- *When a train crosses in front of one sensor, the RCX should lower the gates and turn on the flashers. They should stay on until the train has passed the second sensor.*
- *After the train has passed the other sensor, the gates should go up, and the flashers stop.*

This seemed like a simple design, so I decided to move on. The next step was to determine what sensors to use. I chose to use light sensors because we do not know exactly how wide each train car coming by might be. Using the BricxCC, I tested the readings a sensor gave and determined that ambient light was making the sensor fairly useless since the range of readings was too wide. To compensate for this, I added a light brick on the far side of the track for each sensor. This caused the readings from the sensors to be much more stable.

I needed to determine what readings would be used to signal the train's passing. Since the train would pass between the sensor and the light, I would look for a reading of "dark" to indicate that a train was coming. Once my program read either sensor going dark, I would go into a routine to read the other sensor. As soon as that sensor went dark, I knew that the train was passing by it. I would then wait until that second sensor went back to "light," which would indicate that the train had passed completely by, and we could raise the gates and turn off the lights.

The only other part of the design I needed to consider was how to deal with gaps in train cars (see figure 2). These gaps would create false readings for the end of the train. The best way to handle these was to create a routine similar to a "contact bounce" routine



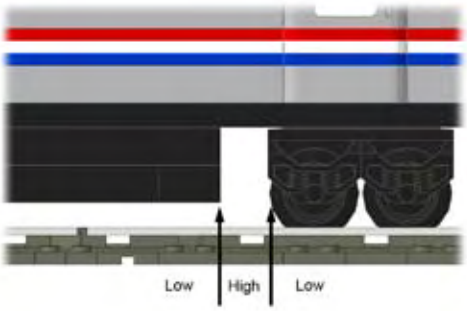


Figure 2

used in electronic inputs that read external switches (such as the circuits in computer keyboards). The idea is that as soon as you detect a reading change, you take a series of readings, waiting for the input to settle down. That way you can tell if the reading is truly a change or just a "blip" in the system.

Let's look into the actual program itself. I will break down the analysis by the different routines. Notice that there are a lot of comment lines. I always put extra lines in to help me remember what I am doing and to help break the code into readable chunks. The first part of the code is setting up a bunch of definable labels that will allow me to "tweak" the performance of the application quickly.

These five entries define what is attached to the various ports of the RCX.

```
#define INPUT1    SENSOR_1
#define INPUT3    SENSOR_3
#define MOTOR     OUT_A
#define CROSSING_LIGHTS OUT_B
#define SENSOR_HELPER_LIGHTS OUT_C
```

These three entries define sensor threshold, the length of time the motor needs to run to raise and lower the gate, and the length of time used between sensor polls during the bounce back routine.

```
// 20 =~ 2 seconds
#define BOUNCE_TIME 20
// 100 = 1 second
#define MOTOR_TIME 100
#define LIGHT_CHANGE_VALUE 46
```

The next part of the program I will cover is the main routine. It appears at the end of the program because of the way the compiler for NQC works, but logically it is where the program begins execution.

This part of the program is required for any program that will run on an RCX unit. The NQC program can be used for any of the LEGO robotics units, but when programming the RCX, it must know what type of sensor is used on any port. Here we define that input ports 1 and 3 will both have light sensors attached.

```
#ifdef __RCX
     // RCX needs to be told what kind of sensor is used
     SetSensor(INPUT1, SENSOR_LIGHT);
     SetSensor(INPUT3, SENSOR_LIGHT);
#endif
```

Next is the main routine. The first line turns on the light bricks across from the sensors. After that we wait for 0.4 seconds. This is to allow the lights to turn on and for the sensors to adjust to the light.

```
On(SENSOR_HELPER_LIGHTS);
Wait(40);
```

Now we enter an endless loop (we will let the program run forever. We can turn it off at anytime by stopping the RCX). The first statement inside the endless loop is another 0.4 second wait that exists to allow the system to settle after every pass of a train. Then we use the "until" keyword to wait until either sensor changes to dark, indicating that a train is passing. As soon as we detect a change, we then look to see if sensor 1 or sensor 3 saw the change. This will tell us which control routine we need to run. We call the routine, and then when it is done and we start the whole process over.

Programs

There are a number of freeware programming languages available for the LEGO Mindstorms computers.The key to choosing which one to use is deciding what style of programming you are used to. The following is a list of some languages available:

The Official LEGO Mindstorms SDK web site:
http://mindstorms.LEGO.com/sdk2/?domainredir=www.LEGO-mindstorms.com

NQC ("Not Quite C"):
http://bricxcc.sourceforge.net/nqc/

Bricx Command Center (an interface for communicating with all manners of Mindstorms computers):
http://bricxcc.sourceforge.net/

leJOS (Java for the RCX):
http://lejos.sourceforge.net/

Visual C++ Interface:
http://www.kyb.tuebingen.mpg.de/bu/people/berger/mindstorms.html

Web Portal to dozens of other sites and languages:
http://www.crynwr.com/LEGO-robotics/

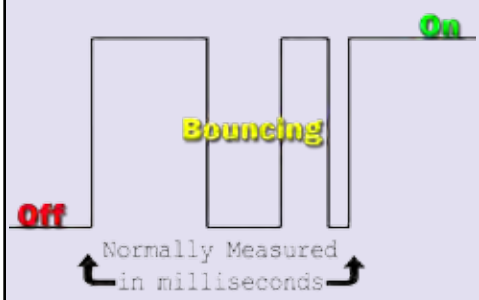
Web Site to purchase custom Mindstorms sensors and controls:
http://www.hitechnic.com/

Contact Bouncing Explained

Most mechanical input devices for electronics involve some sort of a switch that contains a piece of metal that is pushed down to touch another piece of metal, thereby closing the circuit and turning "on" the switch. However, there is an inherent problem with such a switch. The metal piece that moves to make contact is flexible, and will therefore "bounce" against the second piece, causing the contact to be made and broken several times before the switch piece finally comes to rest. The time for this is usually measured in milliseconds, so for light switches, this bouncing really doesn't matter. However, if the switch is used to signal electronics, the bouncing time looks like the switch is flipped on and off several times.

It is possible to work around this either with physical hardware, or with software routines. In a robotics lab I worked on in college, I simply looked at the input for the switch to signal that it had changed, and then waited 10 milliseconds for the switch to "settle" into the new position. That way, false readings were ignored.

I did the exact same thing for the Railroad Crossing, except I measured the contact bounce in terms of seconds instead of milliseconds.



The full source code for this project can be found at http://www.brickjournal.com

```
while(1)
{
Wait(40);
until((INPUT1 < LIGHT_CHANGE_VALUE) || (INPUT3 < LIGHT_
CHANGE_VALUE));
if(INPUT1 < LIGHT_CHANGE_VALUE) Button1Routine(); else
Button3Routine();
}
```

The following is the follow up routine for Sensor 1 detecting the train. The routine for Sensor 3 is identical except that you reverse the sensors listed in the routine. The first 4 lines setup the bounce back variable, turn on the blinking lights, set the direction for the gate motor, and turn it on long enough to lower the gate.

```
// -- Button1 follow-up routine
void Button1Routine()
{
      int x = 0;
      On(CROSSING_LIGHTS);
      SetDirection(MOTOR, OUT_FWD);
      OnFor (MOTOR, MOTOR_TIME);
```

Now that we have the gate down, we need to wait for the other sensor to detect the train. We wait until the sensor goes dark. The very next line waits for the sensor to go light (the train reached the sensor, then the train passed the sensor).

```
      until(INPUT3 < LIGHT_CHANGE_VALUE);
      until(INPUT3 > LIGHT_CHANGE_VALUE);
```

Now we enter our bounce back routine. The heart of the routine is the "if" statement. We check the status of the second sensor. If it is still bright, we increase the value of x by 1, wait 0.1 seconds, and then loop through again. If, however, the sensor goes dark again (indicating we had a "bounce back") we reset the value of x, forcing the count to start over. This routine will keep running until we keep the sensor bright for 20 passes consecutively.

```
      while (x < BOUNCE_TIME)
      {
            if(INPUT3 < LIGHT_CHANGE_VALUE) x=0; else
x=x+1;
            Wait(10);
      }
```

Once the "while" loop exits, we know the train has passed and we raise the gate and turn off the blinkers.

```
      SetDirection(MOTOR, OUT_REV);
      OnFor (MOTOR, MOTOR_TIME);
      Off(CROSSING_LIGHTS);
```

This ends the follow up routine, and our program goes back to the main loop and waits for the next train to pass.

Stikfas are a toy line from Singapore; a toy line that is an interesting combination between action figures and model kits. 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). 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 lightsabre hilt, or the popular megaphone). The figures are also very poseable, due to their unique ball-joint design. This makes them easy to put together (and take apart) without the need for glue.

But the popularity of the Stikfas figure design took hold, and a lot of Stikfas fans (or "Stik-fans," as the Stickfas website calls them!) leave their figures "as is," using only the pieces and parts provided, as well as the included sticker sheets. The Stikfas company surely realized this, because they released figure sets of all sorts of characters and themes beyond the original soldier sets. Some kinds of characters they produced have also been made by LEGO, such as samurai, ninjas, spacemen, pirates, knights, police, fire fighters, and now even vikings. But Stikfas made some even more innovative sets which many AFOLs would love to see in LEGO sets, like Romans, generic superheroes and villains, fairies, angels, devils, bikers, gangsters and even rock stars! The sets come with a large number of props, weapons and tools (some AFOLS would certainly like it if LEGO made similar items). There is always a sense of humour with the extra items; for example, the nurse figure comes with saws and oversized syringes, the robot comes with a teddy bear, and the fairy comes with a giant mallet. The sticker sheets continue the humourous appeal, as they come 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!

One set allows you to make dozens, if not hundreds, of figure combinations. You could easily buy an army of samurai and make sure no two look the same. You can even buy single figure blister packs with no accessories, because, with the amount of items included in the regular packs, you'll have enough left over to give to the lone figures.

Putting a Stikfas figure together is relatively easy, albeit time consuming. The parts are on a spur, like a typical model kit. You will want to cut the pieces off the spurs, rather than simply twisting them off. I also then sand down any remaining parts on the pieces >>

This new column plans to take a look at some of the toys out there that are "Not Quite LEGO." No, we're not talking about MegaBloks, but the toys that are sometimes similar to LEGO, or may be of interest to LEGO fans in general!

This issue: Stikfas®

Article and photos by Greg Hyland

left over from the spur. The assembly instructions (provided on a postcard in older packs, on a poster in newer packs) are pretty straightforward, starting with the torso, and adding the head, arms and legs. There are three main male body designs, the "Alpha Male," the "G2 Alpha Male," and the "Omega Male" (which is slightly larger and more 'muscular'). However, the "G2 Alpha Male" has elbow and knee joints that allow more realistic flexibility; these figures, I find, take more time to assemble.

Once the body is assembled, you can decide which accessories you want to use. There is always an assortment of items for the figures to hold, but some figures come with things that will clip on their bodies, like armor or head gear, while others have soft plastic "clothing" items like cloaks, capes, skirts and even a trench coat. Next, you can decide which, if any, stickers you want to apply. Some people like the look of the figures without any of the stickers, and I actually only use the eye stickers on the heads... unless there is a sticker that is just too cool to ignore! The one problem with the stickers is that sometimes they don't stick very well, especially on the cylindrical parts.

Some packs give you a choice of different coloured body parts. Certain packs also come with other whole figures that will need assembly –a dog, an octopus, etc.! Larger Deluxe Packs come with horses, dragons and motorcycles.

All in all, a Stikfas figure is a cool toy to put together. Whether you pick up just one or two, or end up with an army of them, you will find they are fun to collect and play with.

Stikfas can be found at most good comic shops or specialty toy stores, and can be easily ordered on-line through the Stickfas website (http://www.stikfas.com). A search on eBay will also come up with dozens of results. The Packs can range from $7-$20.

TOP FIVE STIKFAS SETS YOU NEED!

Beta Female Warrior with Dragon
This pack was the first appearance of a female Stikfa figure, 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 wing span, 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.

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 (I did!).

Alpha Male Spaceman

The Stikfas designers seem to have a real love of "retro" design with robot and spacemen (something I sometimes wish for in LEGO), which is why I love the Spaceman. 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!

Alpha Male Samurai Warrior

I think this has to be my favorite figure. I'm not even a big fan of Samurai, 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.

Mechana Segmented Robot

Possibly the most poseable figure in the line, if not ever! Again, the "retro space" design continues, with a nod to the robot in Hayao Miyazaki's 'Castle in the Sky,' and even a little bit of the Iron Giant. 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). This allows him to hold the cool retro space gun. Plus, for some reason, the robot comes with a teddy bear, which, to me, conjures images of unseen Miyazaki-esque films!

HONOURABLE MENTION

Beta Female Fairy

Give her a machine gun from one of your other army sets, and how can you resist her?

Alpha Male with Motorcycle

With the provided stickers, you can make him into Paul Sr. from American Chopper!

Original Alpha Male Phantom

Made with clear plastic! Who wouldn't want an all-clear plastic mini-figure? The problem was that the plastic was sort of fragile and the parts broke easily. It was re-released with a glow-in-the-dark body.

Alpha Male Pirate with Skeleton

I'm not too thrilled with the pirate (besides, how can you beat a LEGO mini-fig pirate?), but the skeleton is awesome!

**Actually, there are three male body designs—the "Omega Male" which is slightly larger and more 'muscular.'*

Greg Hyland is an illustrator that had worked for LEGO for over four years, and is the co-creator of the AFOLs comic book. His most recent work can be seen in the comics on the boxes of the LEGO Batman line. His weekly on-line comic, Lethargic Lad, can be seen at http://www.lethargiclad.com

Last Word

And another issue is done!

This was a fun issue to do (even if it took a bit longer to do than I thought)!

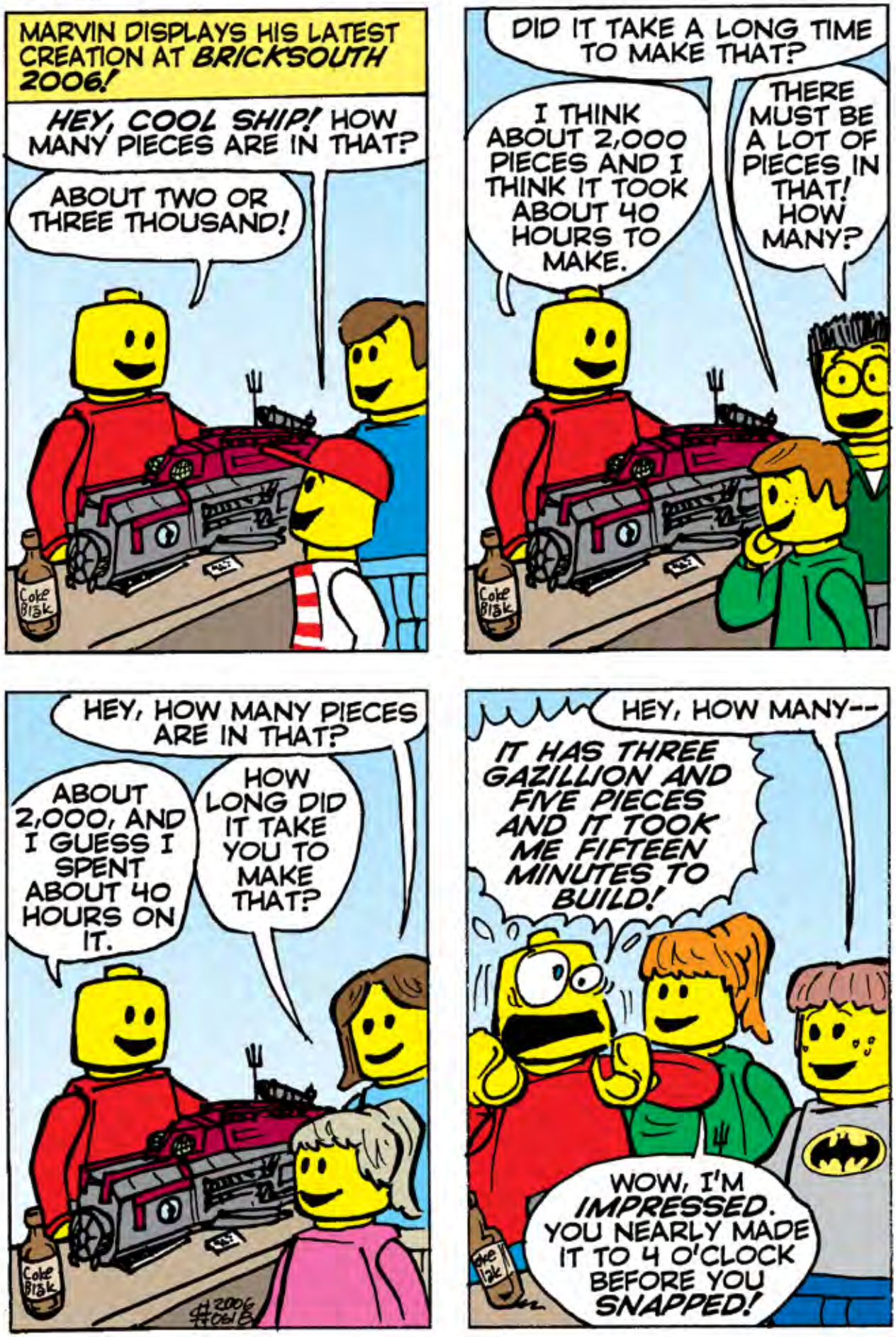
The next issue looks to be even better - it will be the events and year-end issue! Expect reports from BrickFest and many other events, and many other building articles!

And be ready for a couple of surprises and announcements!

See you then,

Joe

by **Greg Hyland**



NOT YOUR TYPICAL BRICKS.

If you have seen THE engraved Brick Badges at BrickFest™ and other LEGO conventions, you have seen the work of Tommy Armstrong, the Brick Engraver. He can engrave names and line art directly to a brick, making it a unique item for things like keychains, badges, and models.

A new innovation from Tommy is WoodStitches®, where a wood veneer is bonded to LEGO® elements. These elements can be used with other LEGO bricks and also to create beautiful mosaics (such as the one at left) and desk nameplates.

If you're interested in seeing the wide assortment of brick engravings and finishes that Tommy offers, you can go to **www.brickengraver.com** and browse through his catalog.

You'll see that his work is not typical.

And neither are his bricks.