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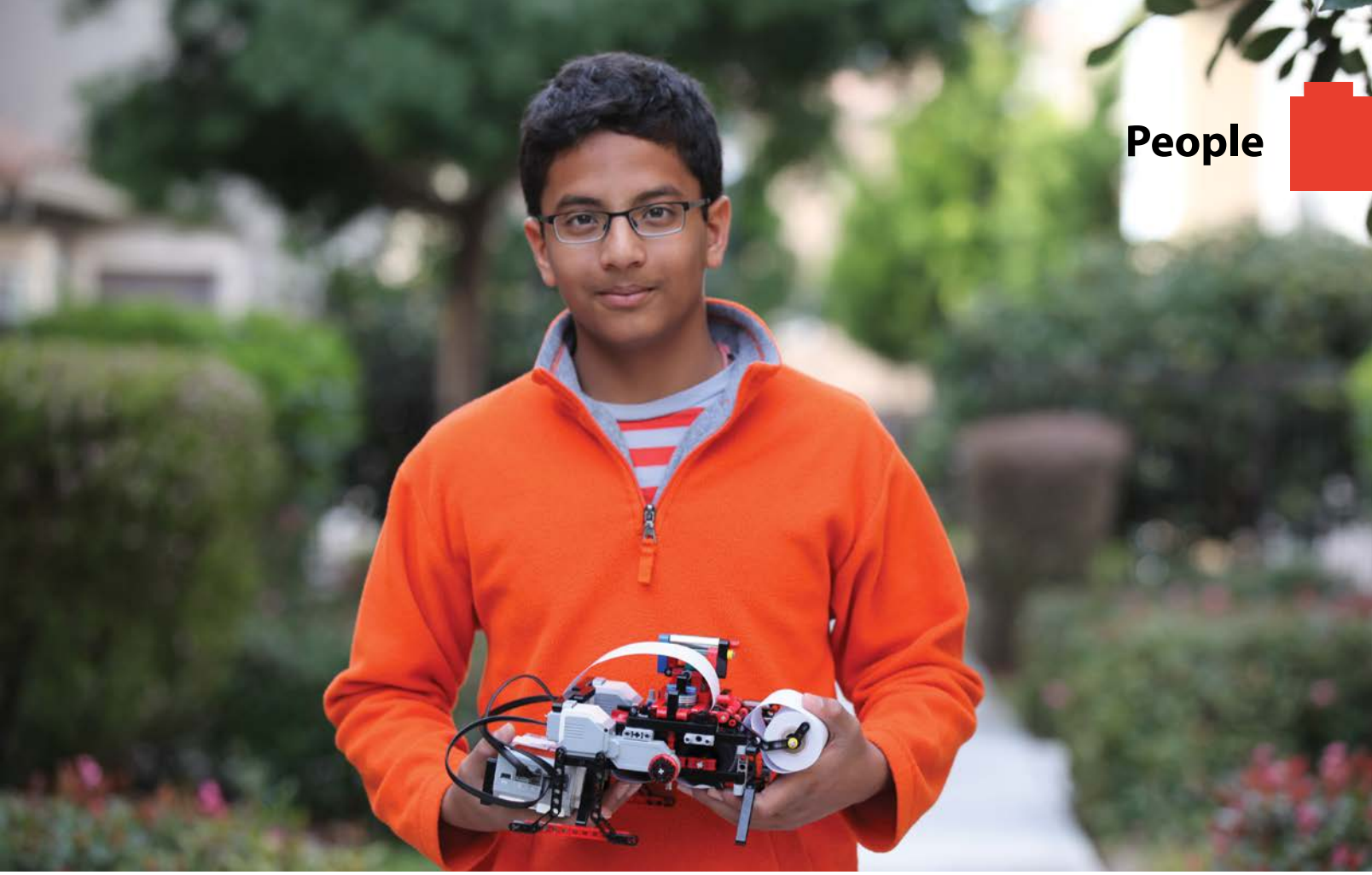


Shubham Banerjee with his printer.

Braigo: A LEGO Printer for the Blind!

Article by Joe Meno
Photography provided by the LEGO Group

Shubham Banerjee, a 7th-grade student from Santa Clara, California is not an ordinary student. Using a retail MINDSTORMS set, he made a printer for the blind that he named Braigo, which is far less expensive than commercial Braille printers. This achievement gained him attention from people and groups around the world, including the LEGO Group, who sent him supplies and also were inspired to hold a competition challenging Seattle, Washington's most innovative companies to build a MINDSTORMS robot that could improve everyday life. The competition's name was Build for Good, and there is no doubt that Shubham has done exactly that. *BrickJournal* was able to chat with Shubham briefly about his work and upcoming plans.

BrickJournal: ***So the first question that I have to ask is how long have you been building with LEGO, and when did you start building MINDSTORMS models?***
Shubham Banerjee: I have been playing with LEGO since I was 2 years old. I have previously built with the NXT version of LEGO. But the first MINDSTORMS set I got was this year in January when I wanted to build Braigo.

What inspired you to pursue a braille printer? In an abstract, you mention that you were looking for a low-cost printer solution, but this doesn't explain why you started thinking about the blind to begin with. What inspired you to look at such a challenging problem?
In the mail that came to our house in December 2013, I noticed those posts that said, 'Help the blind people with donations.' I had no idea about Braille, so I asked my parents how blind people read and they said "Google it!" Upon further research, I discovered that typical Braille printers cost about $2,000 or even more, and I felt that was unnecessarily expensive for someone already at a disadvantage. Thus, I put my brain to work, and the first thing that came to mind was to create an alternative using my favorite toy. I took the LEGO MINDSTORMS EV3 and devised a new kind of Braille printer!

You went through seven prototypes before you were happy with the Briago. Were you confident that you were going to be successful? What were the issues that you encountered in the initial versions of the printer?
To give access to easily assemble and build a braille printer for the masses, the basic

From left: Jernej Krmelj (online name: Zblj), Vimal Patel, and Peer Kreuger (online name: Mahj) with their MOCs below.

Technic Builder: Vimal Patel

Article by Joe Meno
Photography provided by Vimal Patel

One of the challenges with Technic building is discovering new and smaller ways to steer a vehicle. One builder that has been pushing the envelope, or rather, shrinking the envelope in Technic building, is Vimal Patel. Currently in college studying Industrial Design, he has built some cars and vans that use distinctly different ways to steer. **BrickJournal** ***was able to chat with him about his building.***

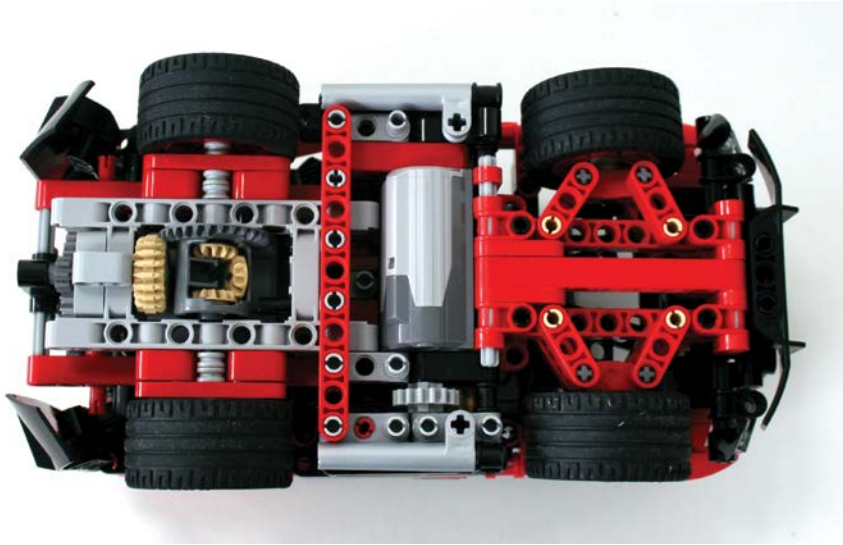
BrickJournal: ***When did you start LEGO building and did you start in Technic, or transition to Technic from System?***
Vimal Patel: I've been building with LEGO since the age of two or three. It started with System; set 565 (Build-N-Store Chest) usefully included a storage container (and baseplates for lids) that housed most of my childhood collection. I combined LEGO with so-called Better Blocks (a competing brand); their rounded end profiles created hinged connections that allowed for dynamic models, like flowing ship sails and flexible tank treads. Technic came to me as a three-year-old when, with my dad, I 'built' 8856 Whirlwind Rescue. In due course, the rotors were motorized—it was great fun to lie beneath the turbulence, and to see how close you could inch your face to the spinning blades without injury. Three years later I built 8880 (Technic Super Car), which I knew as The Supercar. It took me four days to finish; the first three were spent doing it incorrectly. On the last day I identified my mistakes, dismantled it, and put it all back together. I was bought a lot of LEGO throughout my childhood, and by the age of eleven I had a large collection of mostly Model Team and Technic sets.

Vimal in 1992.

What I find interesting now is that as a child, I barely deviated from the instructions LEGO provided. I might've modified things like Whirlwind Rescue or built simple contraptions like a motorized shaver (completely unnecessary at the time, obviously), but generally, I treated LEGO as individual construction sets rather than as a system of interchangeable modular parts. Its creative potential eluded me; it never even occurred that there were people out there designing these toys from scratch. This perspective stuck throughout my teenage years, and like many others, LEGO became just another little kid's toy.

Patel's model of the A-Team's van, which is remote-controlled.

Another view of the A-Team's van, which shows the rounded IR control sensor. The large gear is attached to the drive motor, which is an XL motor.



A look at the bottom of the van showing the differential gear for the drive. The M motor is actually the steering motor.

Fortunately, the Internet showed me that there were people unbound by the prescription of LEGO's instruction manuals and used their imagination to snap bricks together however they pleased. In 2007 I bought my first set in a long time (the motorized and remote-controlled (!) 4958 Monster Dino), cracked open my collection, and looked at LEGO in a new way. I now am addicted to the feeling of being able to create seemingly anything from a modest pile of bricks.

What inspires you to build?

I think that anything can be inspiring, it just depends how you look at it. When it comes to design, I might be inspired by something as tangible as an object or as fleeting as an emotion. Everything's interconnected and constantly dynamic; to me at least to an indefinable extent, which makes it difficult to say what inspires me beyond to say I build what I like to build. Nevertheless, as a subset of design that makes you work within a fixed system, my inspirations for LEGO builds are generally more tangible and iterative—things like vehicles and animals, rather than for 'pure' design, where there are really no limits and there is a greater focus on raw innovation.

There are many LEGO builders in the online community that inspire me. Peer Kreuger (online name: Mahj - *www.mahjqa.com)* constantly surprises me with the way he uses the bricks; the ingenuity, clarity and efficiency in his constructions is really wonderful. I also particularly love zblj's (Youtube account: *https://www.youtube.com/user/Zblj1987*) prolificacy and brute force engineering, along with akiyuki's (*http://legokarakuri.blog91.fc2.com*) super clever mechanisms.

How do you build?

My process is very much trial and error; very little is planned apart from what I would actually like to build—and even that sometimes changes. If I'm building a LEGO version of something that exists in real life, I don't print out blueprints or anything, because I often build using generous amounts of creative license. When it comes to functional, studless Technic models, I first focus on the functions (starting with the most difficult) and worry about holding it all together later. I find that doing it the other way around—for instance, building an open car chassis and trying to fit your functions in afterwards—can be unnecessarily frustrating.

Technic Junkie

Article and Photography by Paul Boratko

Two young boys walk up to my table where I have my models displayed, and one of them says, "My friend doesn't think that these are real LEGO." I reply, "Really? So do *you* think they are real LEGO?" He shrugs his shoulders and says, "I don't know, they don't look like real LEGO."

Top: Lamborghini Gallardo with custom plated LEGO wheels designed in 2009.
Above: Paul Boratko.

Ah... The life of a Technic builder. Sometimes it just seems so hard to be accepted. Casual fans of LEGO are confused, and many System builders don't view the building on the same level. I guess you can't really blame them though, as it does take a much different approach when building a straight Technic model compared to something with traditional bricks, especially in the newer studless era. It is really nice to see so many new 2014 non-Technic sets incorporating Technic into them to add some cool playability.

Beginnings

I got my first LEGO set back in the late '70s. It was the LEGO "Technical" 853 Car Chassis set. When I had seen the cutaway view of the inline 4-cylinder engine in the upper left hand corner of the box, I was in awe: this is what makes cars work. I don't remember a whole lot from when I was 4 years old, but I can remember building that awesome car and then building the alternate buggy model and then the car and then the buggy, back and forth to the point that I could build them both from memory.

I think that the Technic building experience gave me an edge when I started school in 1980. If there is one thing that Technic building does is that it improves your problem-solving skills as well as your creative talents. I continued building with Technic throughout the early-to-mid-'80s and then the infamous "Dark Ages" began... you know, the time in a youngster's life when it isn't cool to build with LEGO anymore and you have to hide it from your friends.

I still tinkered with various LEGO mechanisms throughout the next 5 or 6 years. In 1992, I was a senior in high school and I had to build a mousetrap car for a drafting class project. Of course, I pulled out my Technic parts to get the job done. The goal was to get the contraption to travel 10 feet. Of course since I had the mechanical

A Lamborghini Murcielago built by Boratko in 2010.

advantage and knowledge of how gears work, I got an "A" when mine went 25 feet. None of my friends thought that LEGO wasn't cool that day.

Two years after I graduated, the 8880 Supercar released. This was the model that had it all: New elements that made for a more realistic car including a more natural way to shift gears, new engine blocks with round pistons, all-wheel drive, 4-wheel steering, even a mechanism that made the headlights flip up and down. It was an absolute beast.

Chopped Hot Rod built in 2012 with moving pistons and convertible top.

I didn't buy my next set until 1999, which was the 8448 Super Street Sensation. It was absolutely fantastic. While it didn't boast as many features as the 8880, it did have a unique sleeker look to it and also had a transmission with two more gears than the 8880, one of which was a reverse gear, something that never existed in a LEGO model. It also gave you the ability to mount the engine in the front or rear and had a cool convertible or gull-wing door option. It also introduced some new studless parts that in time would change the way that Technic models would be designed in the future.

In 2002, I had discovered Brickshelf and was amazed and inspired by the custom car models built by a man named Nathanaël Kuipers. Nathanaël's skills were far beyond anything that I had ever built and when pics of his GT Car hit the Internet, I was completely floored by the design. Could I actually build something like this and at this level? I was determined to hopefully construct something someday that might

"Open Sesame!"

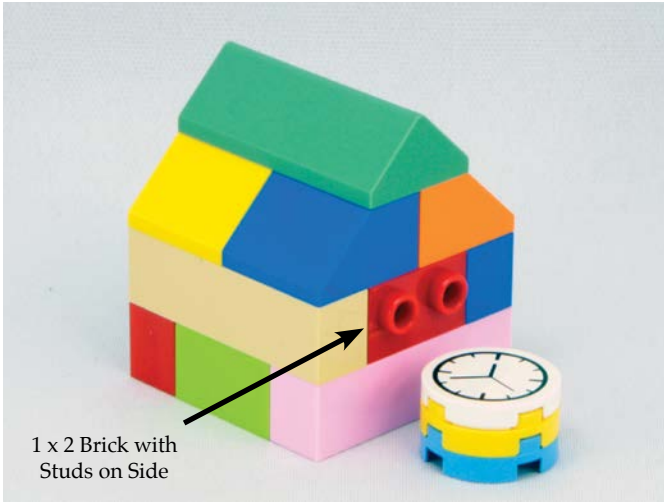
Adding Movement in Your MOCs

Article by Yoshihito Isogawa

In this article I want to introduce how LEGO Technic and MINDSTORMS parts and techniques can be incorporated into static System models. The examples that I show are just simple models. I hope you can start with these examples and expand on them to create your own incredible models.

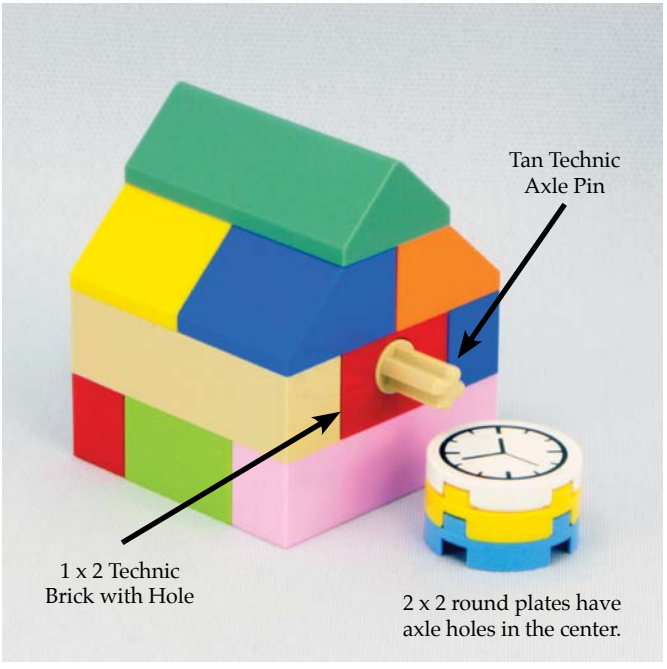
Let's Rotate

Rotation Movement is the most basic movement. Everything starts from here. I will use an example of a building with a clock attached to it.



Of course, in its current state, the clock will not rotate. You could detach it, rotate it 90 degrees at a time and reattach it, but this is not a very smooth movement.

In order to get it to rotate smoothly here is one way we could do it.



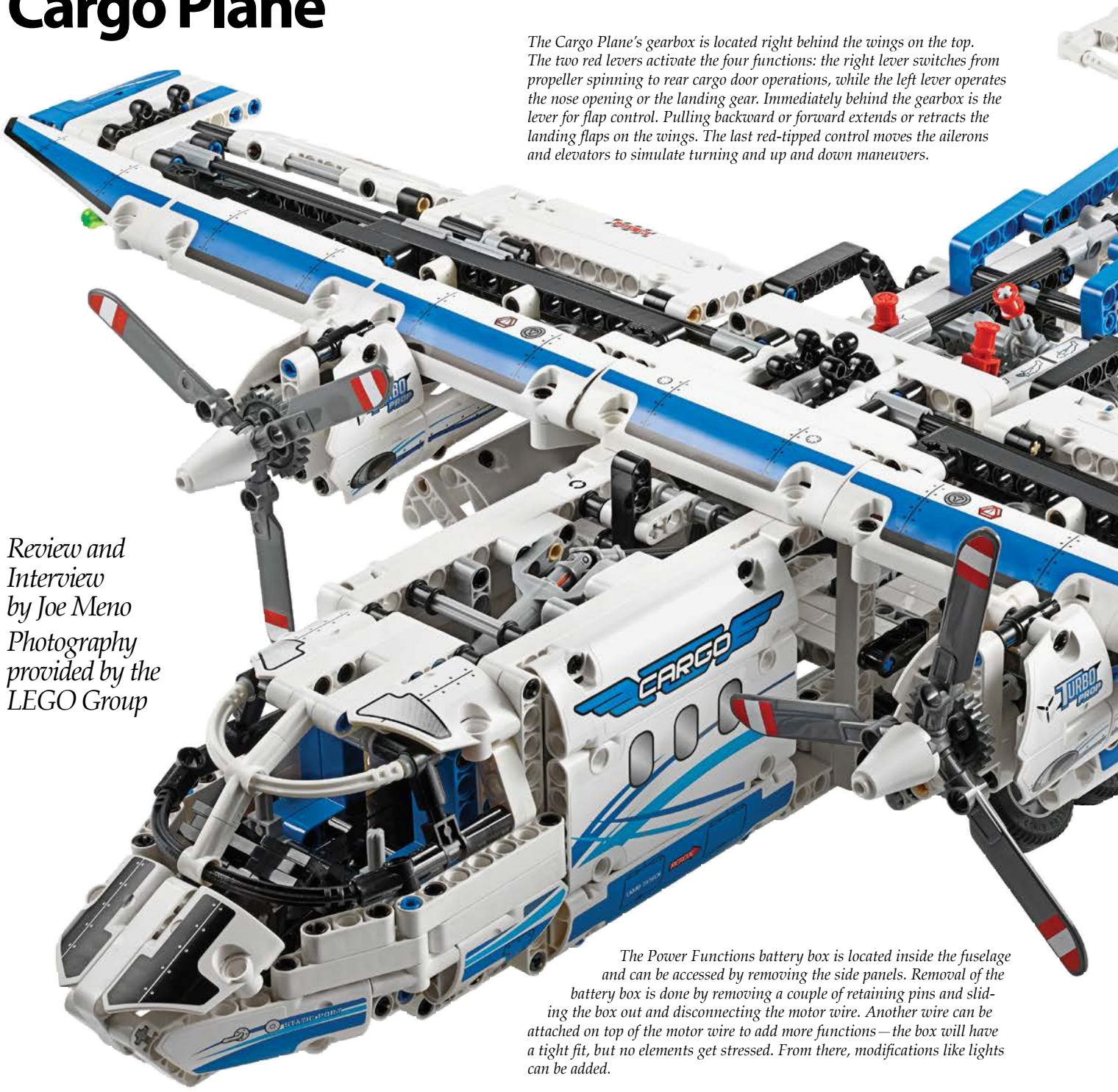
(If it is rotating too freely, instead of the tan color Axle Pin, use a blue color Axle Pin,)

But with this, you cannot create a "Clock Rotating Scene." This is because your fingers will block the scene each time you want to rotate the clock. A way to avoid this is simple.

On the Runway: The TECHNIC Cargo Plane

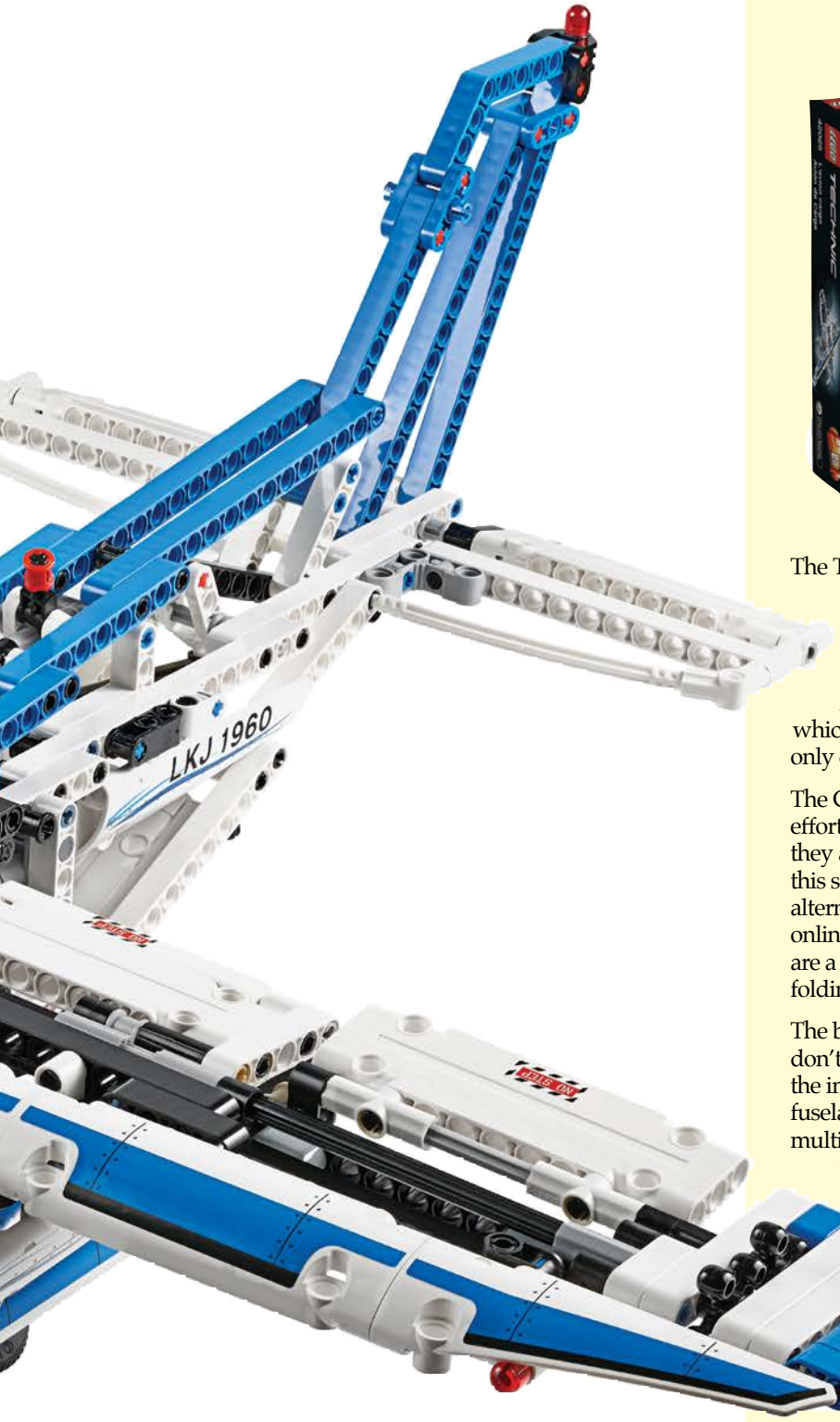
Review and Interview by Joe Meno

Photography provided by the LEGO Group



The Cargo Plane's gearbox is located right behind the wings on the top. The two red levers activate the four functions: the right lever switches from propeller spinning to rear cargo door operations, while the left lever operates the nose opening or the landing gear. Immediately behind the gearbox is the lever for flap control. Pulling backward or forward extends or retracts the landing flaps on the wings. The last red-tipped control moves the ailerons and elevators to simulate turning and up and down maneuvers.

The Power Functions battery box is located inside the fuselage and can be accessed by removing the side panels. Removal of the battery box is done by removing a couple of retaining pins and sliding the box out and disconnecting the motor wire. Another wire can be attached on top of the motor wire to add more functions—the box will have a tight fit, but no elements get stressed. From there, modifications like lights can be added.



Cargo Plane (42075)
1297 parts, $139.99 USD

The TECHNIC Cargo plane is the first large scale plane model in the TECHNIC theme since—well, a really long time. The last Technic plane was a smaller craft (the Jet Plane, 9394) with only a third of the parts of this set. Before that, there was the (VTOL) Aircraft (8434), released in 2004, the Black Hawk (8425), and the Space Shuttle (8480) which were both released in 1996(!). After building this set, the only question I have is, "Why did it take so long?"

The Cargo Plane is a good weekend's build and well worth the effort. With over 1200 parts, there's more than few bags—and they are unnumbered. Sorting would be a good way to start this set. The instructions for the plane are 225 pages long, so alternate instructions are not included, but can be downloaded online. The instructions come with a decal sheet (and there are a lot of decals) in a bag with a cardboard insert to prevent folding or creasing either, which is a nice touch.

The building experience is a long one, where the assemblies don't seem to look like anything until about the last third of the instructions. The first assembly is the gearbox and the fuselage around it, and is pretty enlightening in showing how multiple functions can be operated with only *one* motor. From there, the other sections are added, but it's only when the wings are added that the set starts looking like a plane.

Some of the assemblies by themselves are worth noting—the two propellers are geared as separate units that attach to the wing. What is neat about the props is that they have a built-in clutch if a prop is stopped, so the gears don't break. The other assembly that is impressive is the landing gears. All of them are linked together to simultaneously raise or lower, and the side wheels have doors that are synchronized to open for the gear.

Completed, the set is heavy, but with the motor on, can open the rear cargo door, landing gear, nose door, and props. The only complaint I have is that the props cannot run when opening the rear cargo door—I can see the props not running when the nose is open, but not the back. However, that is a small complaint. This set is a worthy addition to any Technic builder's collection!

This set is already available in Europe and will be coming to the US in August!

very cool! And it would have been a fun feature if you could control the steering with the stick in the cockpit. Maybe next time.

Favorite part of the set?
Can I choose three? The retractable landing gear, the propellers, and I'm really happy with the opening front cargo door.

Hardest part of the set to design?
Making the nose and cockpit look as authentic as possible was a fun challenge. It took a few tries, and I like how it turned out. And here's a little fun fact: The dash board displays show the frequency for Billund Airport Tower (119.0) because Billund is where the LEGO headquarters is based, and Herning Radio (121.0) because I'm a member of Herning Flying Club (http://www.herningmotorflyveklub.dk/).

LEGO Set Design Step 2: Preliminary Builds

After research is done and the functions of the set are defined, a preliminary model is made. From here, decisions on building methods and parts are made as ideas are tried for the plane, from the nose design to color solutions. The model shown is one of a few models built to tighten the design of the final model.

The Buffalo Airways DC-3 model submitted to LEGO Cuusoo, now LEGO Ideas.

Mikey McBryan with his namesake sculpture at Polar Land in LEGOLand Billund. The Ice Pilots School is modeled after the Buffalo Airway s hangar in Yellowknife, NWT.

An Ice Pilot and a LEGO Idea

Article by Joe Meno

Photography provided by Buffalo Airways

Ice Pilots NWT, a documentary series on History TV, begins its sixth season this year. The show is about a small family-run airline (Buffalo Airways) that runs routes in the Canadian Northwest Territories. Buffalo Airways uses vintage prop-driven planes, such as the DC-3 to run their operations, and the general manager to the airline is Mikey McBryan. It also turns out that he's a LEGO fan, and he has had a few adventures with the brick. He's a friendly, outgoing guy that *BrickJournal* chatted with about his LEGO adventures.

When asked about how long he has been a builder, he explains, "I've been a LEGO fan as long as I can remember. I had a pirate ship, and still have all my sets from childhood. I loved the LEGO sets with the metal—the lights and sound sets with the battery box and 2 lights. I also loved the Classic Space stuff."

Getting LEGO sets in the Northwest Territories, though, was a challenge. At Hay River, where Mikey grew up, there was only one general store. Mikey explained, "It had a limited selection, and there were no Toys 'R' Us stores then. The nearest toy store was Toys 'n' Wheels, and it was a 12-hour drive." It turns out that quite a few years later, the toy would find him.

When Polar Land (a new area that was opened in LEGOLand Billund in 2012) was in its design phase, a group of LEGO designers went to the Arctic to research and used Buffalo Airways. As Mikey puts it, "They fell in love with the airline," and were inspired to include the airline and the Ice Pilots show in the new themed land. Buffalo Airways donated DC-3 parts to LEGOLand to decorate the restaurant that was built for Polar Land. Mikey also got a DC-3 LEGO model in gratitude. "It's one of only two made. The other one was kept by the designer," Mikey explained, continuing, "The designer's was stolen, so I guess it's in the non-black market!"

From that adventure, it was only a matter of time before Mikey would again work with the bricks. This time, it was a smaller, but no less complex project. He wanted to build his airplanes, namely the DC-3 that is the workhorse of Buffalo Airways. He searched online for models that he could reverse engineer in MLCAD, a digital LEGO building tool, when he stumbled on a silver DC-3 model that was submitted on LEGO CUUSOO.

BrickNerd DO IT YOURSELF FAN ART!

Ghostbusters Proton Pack

Design and Instructions by Tommy Williamson

About this issue's model:

It's hard to articulate the effect *Ghostbusters* had on me as a teen. Not only was it a visual effects extravaganza, it starred some of my favorite comedians, and if you spend any time with me you'll probably get just a hint of Bill Murray or Rick Moranis in my sense of humor. It wasn't until years later I realized how much I tend to mimic those boys in grey. With the coming of the latest Cuusoo set, the Ecto1, and the passing of the great Harold Ramis, *Ghostbusters* has been on my mind a lot recently. So I designed this issue's model as a tribute to a movie I love, and to the influential comedians in my life. I hope you like it.

I'd like to dedicate this model to Harold Ramis; thanks for all the laughs, you are missed.

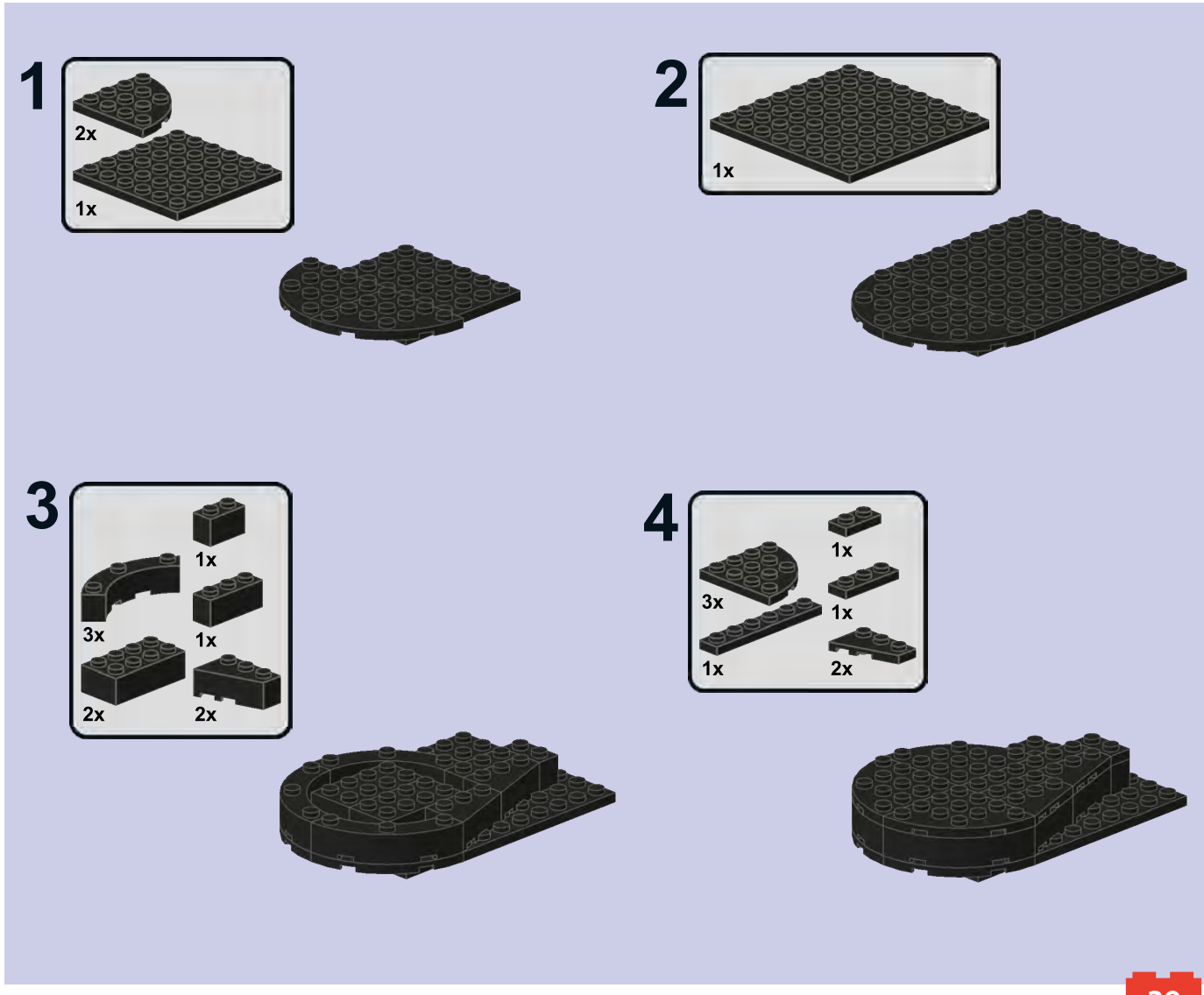
Tommy Williamson is no stranger to *BrickJournal*, having been featured previously for his Jack Sparrow miniland scale figure. Since then, he has gone farther into building, making some remarkable *Star Trek* props and other models. He's now doing a column for *BrickJournal:* DIY Fan Art. Here, Tommy takes a little time out from his busy schedule at BrickNerd.com to make a model of his choosing for the magazine.

Parts List *(Parts can be ordered through Bricklink.com by searching by part number and color)*

Qty	Part	Color	Description
1	50746.dat	Black	Slope Brick 31 1 x 1 x 0.667
2	30039.dat	Black	Tile 1 x 1 with Groove
2	87618.dat	Black	Bar 4.5L with Handle
1	30374.dat	Black	Bar 4L Light Sabre Blade
2	63965.dat	Black	Bar 6L with Thick Stop
2	44728.dat	Black	Bracket 1 x 2 - 2 x 2
7	3956.dat	Black	Bracket 2 x 2 - 2 x 2 Up
1	3005.dat	Red	Brick 1 x 1
2	3005.dat	Black	Brick 1 x 1
1	3062b.dat	Trans Clear	Brick 1 x 1 Round with Hollow Stud
4	3062b.dat	Black	Brick 1 x 1 Round with Hollow Stud
1	4070.dat	Light Bluish Gray	Brick 1 x 1 with Headlight
10	87087.dat	Black	Brick 1 x 1 with Stud on 1 Side
1	3004.dat	Black	Brick 1 x 2
1	2877.dat	Black	Brick 1 x 2 with Grille
1	52107.dat	Black	Brick 1 x 2 with Studs on Sides
2	3245a.dat	Black	Brick 1 x 2 x 2
2	3622.dat	Black	Brick 1 x 3
2	6091.dat	Black	Brick 2 x 1 x 1 & 1/3 with Curved Top
4	6143.dat	Black	Brick 2 x 2 Round Type 2
2	3001.dat	Black	Brick 2 x 4
3	48092.dat	Black	Brick 4 x 4 Round Corner
1	4589.dat	Black	Cone 1 x 1
1	2654.dat	Black	Dish 2 x 2
2	57539.dat	Black	Hose Flexible 19M
1	3024.dat	Red	Plate 1 x 1
11	3024.dat	Black	Plate 1 x 1
1	4073.dat	Trans Clear	Plate 1 x 1 Round
4	4073.dat	Metallic Dark Gray	Plate 1 x 1 Round
4	4073.dat	Light Bluish Gray	Plate 1 x 1 Round
10	4081b.dat	Black	Plate 1 x 1 with Clip Light Type 2
1	3023.dat	Blue	Plate 1 x 2
18	3023.dat	Olive Green	Plate 1 x 2
19	3023.dat	Black	Plate 1 x 2
2	32028.dat	Black	Plate 1 x 2 with Door Rail
3	4175.dat	Black	Plate 1 x 2 with Ladder
2	3794a.dat	Black	Plate 1 x 2 without Groove with 1 Centre Stud
2	3623.dat	Black	Plate 1 x 3

Qty	Part	Color	Description
2	3710.dat	Olive Green	Plate 1 x 4
1	3666.dat	Black	Plate 1 x 6
3	3022.dat	Black	Plate 2 x 2
2	2420.dat	Black	Plate 2 x 2 Corner
1	4032a.dat	Red	Plate 2 x 2 Round with Axlehole Type 1
7	4032a.dat	Black	Plate 2 x 2 Round with Axlehole Type 1
1	87580.dat	Black	Plate 2 x 2 with Groove with 1 Center Stud
2	3021.dat	Black	Plate 2 x 3
1	3020.dat	Olive Green	Plate 2 x 4
1	3020.dat	Black	Plate 2 x 4
5	30565.dat	Black	Plate 4 x 4 Corner Round
1	3035.dat	Black	Plate 4 x 8
2	3958.dat	Black	Plate 6 x 6
1	41539.dat	Black	Plate 8 x 8
1	11477.dat	Black	Slope Brick Curved 2 x 1
3	93273.dat	Black	Slope Brick Curved 4 x 1 Double
4	13547.dat	Olive Green	Slope Brick Curved 4 x 1 Inverted

Qty	Part	Color	Description
1	76384.dat	Black	String Braided 11L with End Studs (Complete)
1	32199.dat	Dark Bluish Gray	Technic Axle Flexible 11
1	32199.dat	Black	Technic Axle Flexible 11
1	6538a.dat	Black	Technic Axle Joiner
2	59443.dat	Black	Technic Axle Joiner Inline Smooth
2	6541.dat	Black	Technic Brick 1 x 1 with Hole
1	32000.dat	Black	Technic Brick 1 x 2 with Holes
1	4274.dat	Light Bluish Gray	Technic Pin 1/2
1	61184.dat	Light Bluish Gray	Technic Pin 1/2 with Bar 2L
6	75535.dat	Black	Technic Pin Joiner Round
2	2780.dat	Black	Technic Pin with Friction and Slots
3	98138.dat	Light Bluish Gray	Tile 1 x 1 Round with Groove
6	2412b.dat	Black	Tile 1 x 2 Grille with Groove
3	3069b.dat	Black	Tile 1 x 2 with Groove
6	4150.dat	Black	Tile 2 x 2 Round
2	6564.dat	Black	Wedge 3 x 2 Right
2	43722.dat	Black	Wing 2 x 3 Right
1	78c02	Black	Ribbed Hose, 7mm D

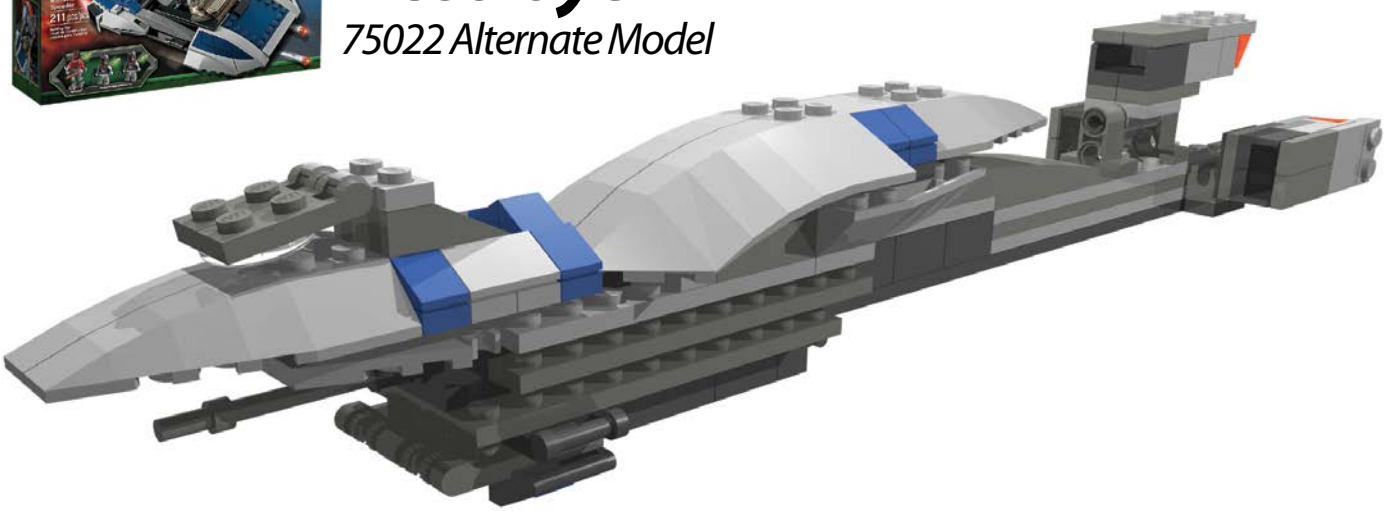


You Can Build It

MINI Model

Recusant Destroyer

75022 Alternate Model



Design and Instructions by Christopher Deck

Hello everybody! Welcome back to our mini model building series! This issue's model is a little larger than usual, and would most probably be called a midi model. It's the *Recusant*-class light destroyer as seen in the opening battle of Star Wars III: *Revenge of the Sith*. The very special thing about this model is that it is (like the pirate ship model in last issue) an alternate model of an official LEGO® set. You only need pieces from set 75022: *Mandalorian Speeder* to build this model. The piece variety of this set is almost perfect to build this particular alternate starship model. It employs 85% of all pieces of the original set and is quite detailed for an alternate model. You can also apply all stickers as intended for the speeder model. They will in the same way also benefit the typical color scheme of the Separatist fleet. Happy building!

You can view Christopher's webpage by going to www.deckdesigns.de or scanning this QR code!

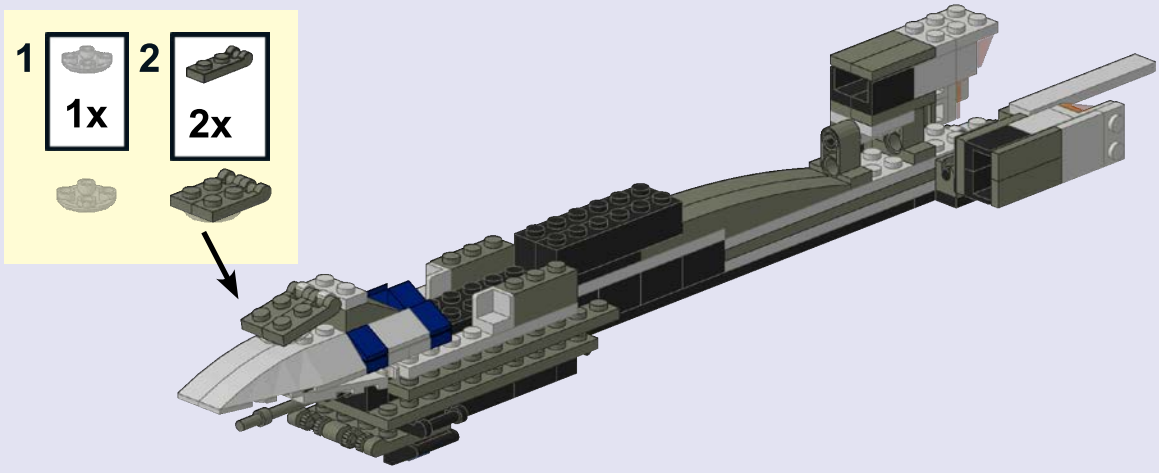
Parts List

(Parts can be ordered from Bricklink.com by searching by part number and color)

Main Hull

Qty	Color	Part	Description
1	Dark-Bluish-Gray	63965.dat	Bar 6L with Thick Stop
1	Black	30236.dat	Brick 1 x 2 with Handle
2	Dark-Bluish-Gray	3622.dat	Brick 1 x 3
2	Black	3010.dat	Brick 1 x 4
2	Black	3009.dat	Brick 1 x 6
4	Black	3003.dat	Brick 2 x 2
2	Dark-Bluish-Gray	3937.dat	Hinge 1 x 2 Base
2	Black	6134.dat	Hinge 2 x 2 Top
2	Light-Bluish-Gray	6231.dat	Panel 1 x 1 x 1 Corner with Rounded Corners
2	Light-Bluish-Gray	60897.dat	Plate 1 x 1 with Clip Vertical (Thick C-Clip)
5	Black	3023.dat	Plate 1 x 2
4	Light-Bluish-Gray	3023.dat	Plate 1 x 2
1	Light-Bluish-Gray	60470b.dat	Plate 1 x 2 with 2 Clips Horizontal (Thick C-Clips)
2	Dark-Bluish-Gray	60478.dat	Plate 1 x 2 with Handle on End
4	Dark-Blue	3710.dat	Plate 1 x 4
2	Black	3666.dat	Plate 1 x 6
1	Black	3795.dat	Plate 2 x 6
1	Light-Bluish-Gray	3034.dat	Plate 2 x 8
1	Dark-Bluish-Gray	3832.dat	Plate 2 x 10

14



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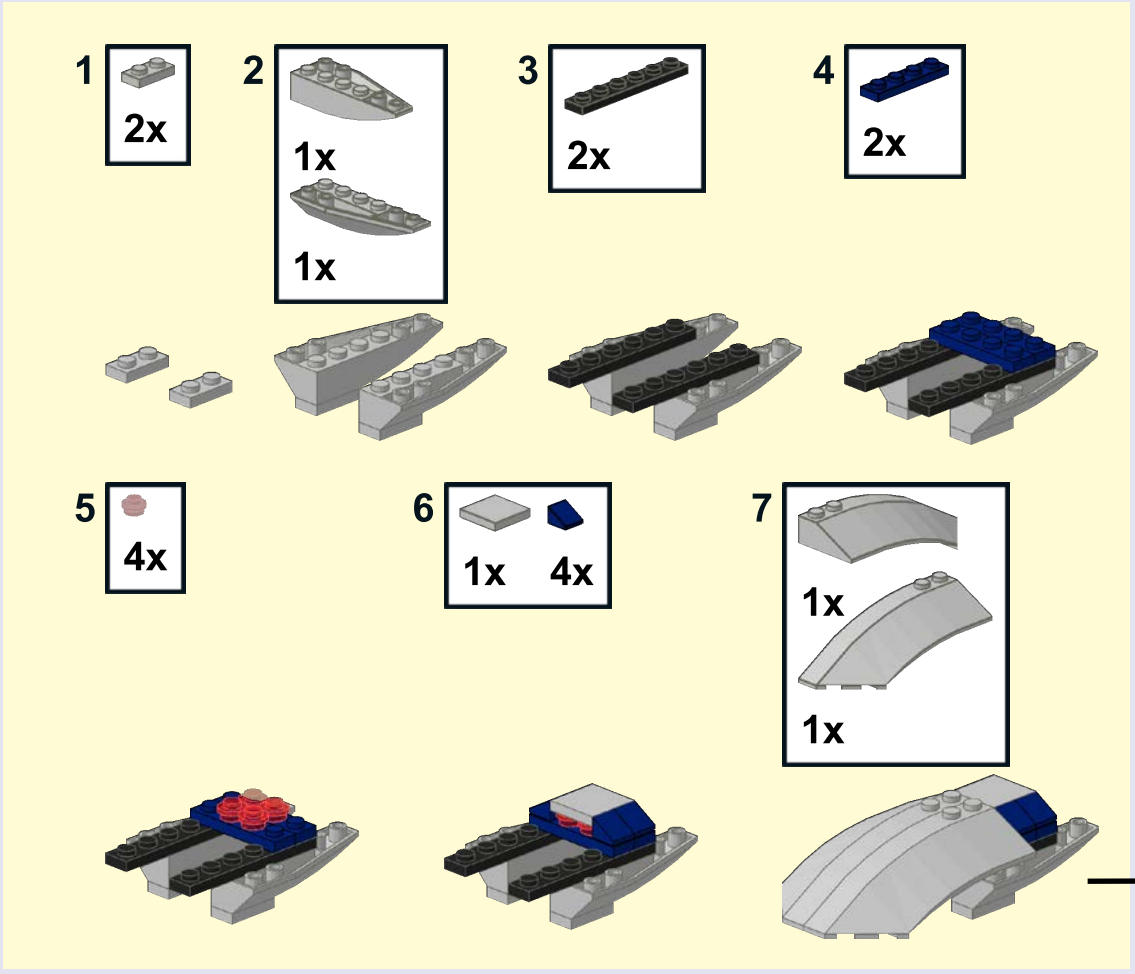


Minifigure Customization 101: Resolving Limited Range of Motion Issues

by Andrew Vu and Jared K. Burks

Don't miss Minifigure Customization: Populate Your World! *and its sequel* Minifigure Customization: Why Live In The Box? *(both are available now at www.twomorrows.com)*

What is the single most limiting detail of a LEGO minifigure? The size, the proportions, the scale—no, all these issues are manageable. The most limiting detail of a LEGO minifigure is its range of motion. Arms and legs can go up and down, hands and heads can rotate, but in reality every joint in the minifigure is single axis, meaning that these joints only rotate around one axis. This is also the detail that gives the figure some of its signature look. So the biggest customization challenge is how one addresses the limitation without losing the signature look of the figure. A few solutions are out there and some new ones have presented themselves, and I think they are worth a closer look.

Many have tried to address the limited range of motion before to various degrees of success. This article will present several methods, but will not serve as the final word on the subject because none of these solutions are perfect. Like every aspect of customizing, there are always alternative ways, each specific for their own purpose, but I digress.

In this article we will discuss minifigure articulation using three major methods; the dislocation approach, limb replacement, and advanced articulation customization. As mentioned each serves a purpose and thus are relevant. Some are quite easy and others much more time consuming. The first two methods, dislocation and limb replacement, will be discussed, but much of the focus will be on the advanced articulation method.

Dislocation

The first method to discuss is dislocation. The minifigure arm or leg is removed from the joint and attached using a foreign object, typically a rubber band. This is then concealed by either the angle of the photo or by a piece of fabric the minifigure is wearing.

Examples of dislocation.
Photos by (from left to right) Jordan Schwartz, Aidan Flynn, and Mark Parker.

Using LEGO Ideas

Article by Glen Wadleigh (Glen Bricker)

Photography provided by Jared Burks

Recently, LEGO CUUSOO opened up submissions to include the BBC *Doctor Who* series. After only a few weeks, one project gathered enough support (10,000 votes!) to qualify for LEGO review. One of the creators talks here about the challenges and effort that went behind making this project successful!

I was asked if I would be interested in doing a quick write-up about how Jared Burks and I got *Doctor Who* to 10,000 supporters on LEGO Cuusoo. I enjoy sharing what I have learned, so I took up the offer and thus, you are reading this now.

I will start with a quick disclaimer that I can't, of course, account for the personal reasoning for every vote our project got, nor do I have access to the data required to absolutely confirm the direct return on any of these activities. This is, however, my observation of events, honed by my experience promoting LEGO Cuusoo projects over the last two years.

Project Creation

Collaborating

With a few possible exceptions, pushing a project on what is now LEGO Ideas is actually a very daunting task. There is a lot of work involved if you really want to get to 10,000, so I can't suggest enough that you partner up for the long ride.

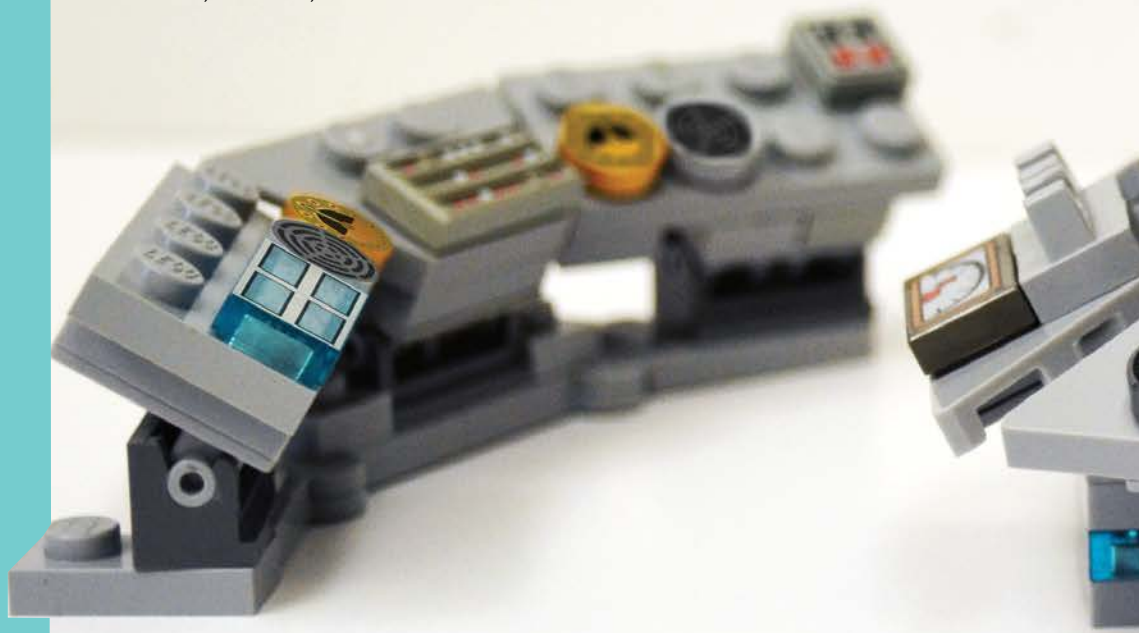
It is invaluable to have someone else, equally invested in the project, to share the highs and the lows, to bounce ideas off of, to distribute the load, and expand the available skill sets and resources.

Creating Project Content

A hard concept for a lot of people to grasp is that the project is not a product, but a pitch. The purpose of a project is to come up with a concept, and then prove to LEGO that your idea deserves further investigation by getting 10,000 people to support it.

With this in mind, Jared and I, in developing the project, concentrated on the intersection of what we wanted, what we thought the market would want, and what best fit our skill sets.

It is hard to really come up with the singular set to summarize an entire franchise, sometimes to the point of impracticality. But in the case of *Doctor Who*, the critical element is, of course, The Doctor.



In order for our project to succeed we had to convince Whovians that this squat, angular, generic piece of plastic with a cylinder for a head that we built, could trigger the memories and emotions that people have for The Doctor. Everything else is secondary to this. It was no accident I contacted Jared as soon as I found out that *Doctor Who* was allowed back on LEGO Ideas. Not only is he a master craftsman at customizing LEGO figures, but he has also spent years recreating The Doctor specifically.

Did we succeed at convincing Whovians that The Doctor is brickable? In my opinion the results speak for themselves.

The TARDIS, Eleventh Doctor and Amy Pond.

Two of the Doctor's companions: Sarah Jane Smith and K-9.

Before I list these, I want to reiterate that Jared and I have no formal training in marketing or social engineering. We are just some AFOLs who have applied some critical thinking on the subject of promotion.

Creating Engaging and Informative Images (You know… Ads)
In this world of 140 character limits, the power of an image is greater than ever. We made several images on the fly showcasing the features we thought would have the best chance of grabbing the recipient's attention. Often the image would have embedded dialog indicating the project.

Balance is key here. We didn't want to turn people off by sending them an obnoxious flyer, but there is nothing more frustrating than seeing one of our promos going viral with no mention of our project.

Contacting Your Friends, Fans, and Personal Contacts and Shamelessly Asking for Their Support
Yes, neither of us have any official training in social media but both of us have been putting ourselves out there on the Internet for years. Jared has been putting out LEGO *Doctor Who* figures for a long time so he posted to his fans on Flickr and his own site. I posted to my LEGO Ideas blog and we both reached out to our LUG and other AFOL contacts for support.

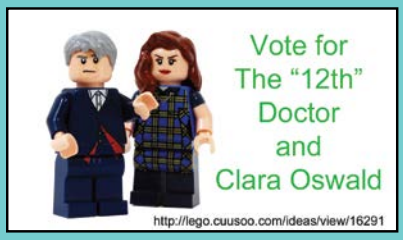
Contacting Official Channels for the IP
The idea here is to contact the Franchise and ask for a posting, somewhere. In my experience this rarely works with big franchises, due to any number of factors, but you have to try because nothing brings in fan support like a posting on an official site. While we did attempt this daily, we never got a response.

Contacting Associated Celebrities
This is another "great idea" with very low chances but great potential for returns. The concept is simple: Contact the actors associated with your subject and they tell their fans and boom, job done.

It is always a blast to get one of your favorite actors to comment on your project, but this is extremely rare. Celebrities tend to get a lot of spam from fans so first off, you are one voice drowned out in a crowd. The second issue is that the type of celebrity with enough pull to get you to 10,000 also needs to be very shrewd about how they use their image and influence.

Of the actors we contacted directly, only one, Sylvester McCoy (the seventh Doctor) posted on our project. John Barrowman (from the BBC show Torchwood) also posted on it, but more on that later.

Contacting General Geek Sites and LEGO Fan Sites
I don't usually throw these categories together but they had a very similar result for us in this case.



A few of the ads used to promote the Doctor Who project.

Making *Beyond the Brick: A LEGO Brickumentary*

Interview by Joe Meno
Photography provided by Helo

While The LEGO Movie *was being produced, another movie about the brick was being made—not an adventure/comedy film, but a documentary about the LEGO fan community.* Beyond the Brick: A LEGO Brickumentary *premiered at the 2014 Tribeca Film Festival in New York City on Sunday, April 20. Until then, final work was being done on the film, with narration being done by Jason Bateman and stop-motion animation being done in California with a crew helmed by AFOL and visual effects maker Tommy Williamson. It was during the final phases of production that* BrickJournal *talked about the documentary on a conference call with its producer Brendan Kiernan and co-directors Daniel Junge and Kief Davidson.*

BrickJournal: ***As you guys are wrapping up on editing now, how long have you been working on the movie?***

Daniel Junge: Brendan, do you have the exact date?

Brendan Kiernan: It depends on how you look at that. Daniel and I were talking about this with our executive producer over a year-and-a-half ago. The germination of the idea was from the executive producer. He went with his son to Brickcon and found it was an incredible experience and an incredible bonding experience, and really felt there was a story there. He's in the movie business and so brought this idea to me and I mentioned it to Daniel, and Daniel did a little bit of digging and realized that there was no really definitive or wide-reaching LEGO documentary. So we expanded on the original idea to be much more encompassing, and then Daniel and Kief worked on creating the design and the direction of the film, and went from there.

We officially started shooting it in June 2013, but there was a long genesis before that.

What was the original direction of the movie?
DJ: In the grand scheme of things, it wasn't different than it is now, and that is a film looking both inside and outside of LEGO. At its genesis, the film is about the LEGO community. That was always going to be the heart of the film, if you will, in all ways. I don't think our approach changed. I think it just—I just got off the phone with [builder] Sid [Dinsay] and he asked about research on the project. And you can research LEGO, and you can research LEGO, and you can research LEGO, and you can spend a year just researching—and you know this as well as anyone. What we had to do was just start shooting, and as we started doing that, certain storylines came to us. We always wanted to see a fan-based creation make it through to production, and then we learned about CUUSOO and brought their thing in—there's the user-generated story that we wanted.

So you ended up spotlighting Stephen Pakbaz for that and his Curiosity Rover set.

DJ: Yeah, actually we followed the three CUUSOO finalists in that round. When Stephen was chosen, we followed his set through production.

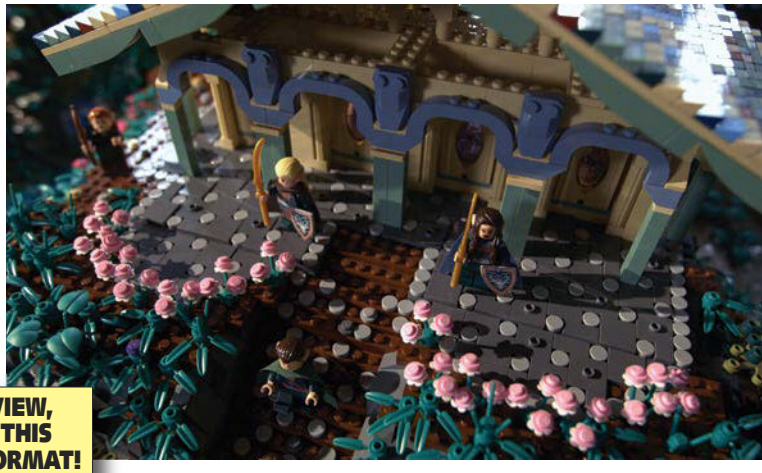
Great! In terms of looking at all the people, there were stories coming out and presenting themselves. What were some of the themes that you noticed between all the builders? What ultimately were they all doing? My perception is that an AFOL is actually a craftsman, an artist/craftsman, but ultimately there's a certain amount of control that is playing in that…

DJ: Right…

…a person being able to control his environment. So we end up building and creating. Did you see any things like that rising from your talks or just watching and making footage?

Kief Davidson: I noticed, at least with the time I spent at a couple of the conventions, the commonality really was community. I think that was a big one. I think a lot of the people that I met tended to work alone and clearly enjoy the process in building great work. At the end of the day, though, they really all looked forward to coming together and enjoying this experience with others. Then we started finding people that actually did group builds. That was a nice discovery for us, to see that you can have people in different parts of the

In the film, Alice Finch talks about her models, including Hogwarts (above) and Rivendell (seen at right).



country or the world coming together on a display. It's a real communal thing I didn't expect and it was neat to see some of these big builds like the Great Ball Contraption build.

Which events did you guys go to?

DJ: We filmed at Brickworld, Brickfair and Brickcon. We don't really distinguish too much between all of them—they are all talked about but I think it's fair enough to say that we tried not to give too much preference to one over the other, although there was more in Brickcon due to our stories converging there.

The one convention that has the most character and is most distinctive is Brickcon in Seattle. *of the people who go to Brickcon* *AFOLs on the east of the Mississi* *events, so you'll see their models* *if you go to Brickcon, that's an is* *MOCs are unique.*

DJ: We are indebted to you Joe, fo direction in that regard.

For me, that was just one of those *them, you're kinda missing out. T* *of events. They are their own com* *their own, and they are completel* *cool to see.*

In terms of community, the idea o *more recent development, within* *Before then everyone did build in* *then brought their stuff to one poi* *everybody, and then go back and*

Did the LEGO Group give you fre
DJ: As about unfettered access as major international company. I thi

nk what LEGO was most concerned about was really wanted to make sure the film was about ommunity and fan culture and that it was really an ion of the way the community had taken the LEGO d gone in so many amazing and interesting directions They were very concerned to make sure that was the the film. Other than that, it was just making sure that there was an intellectual property, that we were it and respected it. But I would say otherwise that us tell the stories wanted to tell.

d they allow you in terms of access?
ot access to their designers, which was great, and to their on facilities. We got to follow the creation of the X-Wing ay from design to finished product. We had access to ives for our LEGO history section—what else, Kief?

factories where they are making bricks. ster Builders in the Czech Republic…