ISSUE 13 - Fall 2013

RAILBRICKS™

BRICK RAILROADING MAGAZINE

Modular Modeling in L-Gauge - Modular Layout Design

Remote Controlled Decoupling - An Onboard Solution

RAILBRICKS

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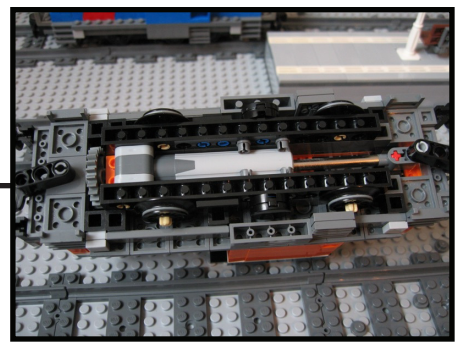

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ALL ABOARD!

As I write this, the trees in my part of the world are beginning to change colors. Their brittle leaves snap off and float to the ground with each small breeze. There's a chill in the air, and we're beginning the process of bundling up our houses in preparation for even colder temperatures. Days are getting shorter and nights are getting longer. Fall is officially here.

The coming of Fall means that we here at RAILBRICKS have taken an unfortunately long amount of time to get a magazine out to our readers; over a year, in fact. As editor and chief layout guy for the magazine, I take full credit for the delay. Though the magazine has been behind, rest assured that RAILBRICKS as a group is alive and well. In the past few months members of the volunteer team have been working on the website, organizing a new and improved container swap, and discussing items related to the LEGO® Train community.

Community is really what RAILBRICKS is about. The goal of our volunteers is to collect and share stories and information about you, me, and us. We want (and need) to hear from folks in the community so that we can share our stories, techniques and builds with each other.

As editor of RAILBRICKS, here's what I'd like to see for 2014: Increased community participation in our magazine. I'd like to put out four issues a year instead of one. I'd like to see more interaction on the RAILBRICKS forums. I'd love to have RAILBRICKS be THE place to go for the LEGO Train community.

How do we make this happen? First, we need your stories, articles, tips & tricks. Send them to me at *editor@railbricks.com* , and we'll work together to get them published. The more you send me, the more motivated I get, and the more issues we can produce together.

Visit the RAILBRICKS forum online at *http://railbricks.com/forums/* and get involved. If there's not a conversation there that interests you, go ahead and start one! We'd love to see you visit. The more visitors we have, the more conversations we can have, and the more information we can share.

Let's get together at regional events, whether it is Brickvention or Fana'briques, the National Train Show here in the U.S. or the Internationale Modellbahnausstellung erweitern in Germany. Let's show both the LEGO and train hobbies that we're here, we're healthy, and most of all, that we're an awesome community of creative people.

-Elroy

Instructions, Challenges, and Tips & Tricks have been categorized into the following levels:

Beginner

Intermediate

Advanced

Have an idea for RAILBRICKS?

Submit by January 6th, 2014 for inclusion in the next issue!

Who may submit an article?

You!

People submitting articles do not need to be professional level writers. RAILBRICKS is a magazine for fans, by fans. We welcome articles from enthusiasts who build, collect, and play with LEGO® trains.

What sort of articles may be submitted?

We welcome How-to articles, event reports, building instructions and more. if you're not sure if your article or story would be a good fit, email the idea to *editor@railbricks.com* for input.

How long should articles be?

In general articles should be between 750 to 3,000 words in length, and include any photographs or images that will accompany the text. Longer articles may be published in parts in following issues.

How should articles be prepared?

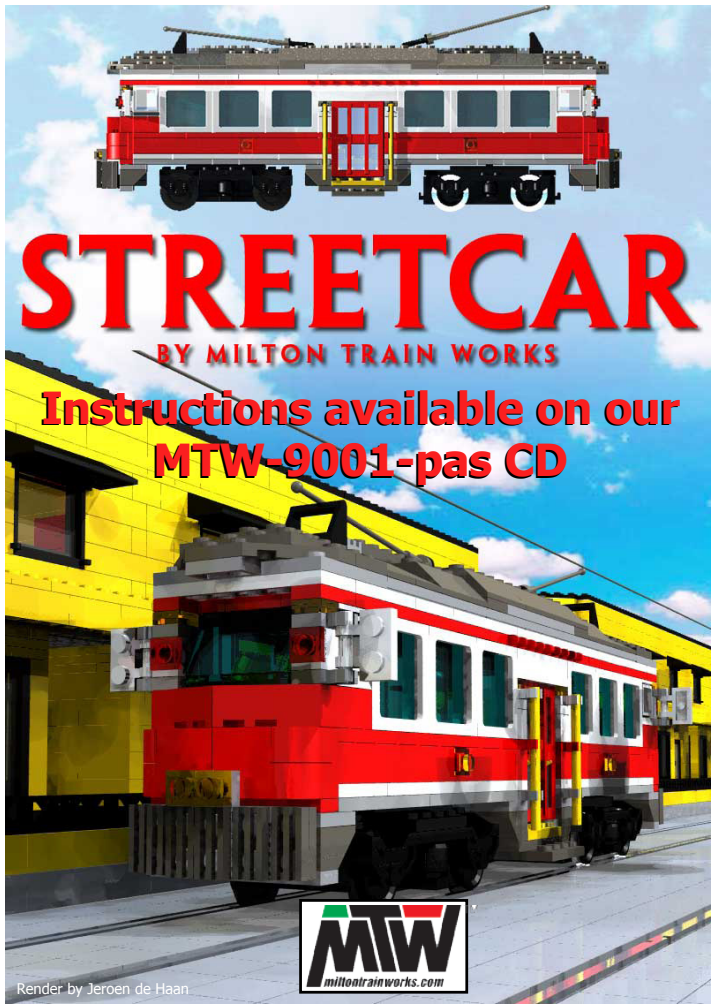
Articles should be typed in either a text document or e-mail, and should use proper grammar, punctuation, and spelling.

How should images be prepared?

Images should be submitted as separate attachments. High resolution images of 300 DPI are preferred as they will reproduce better than lower resolution images.

How are articles submitted?

Completed articles may be e-mailed to *editor@railbricks.com*. The text of the article may either be in the body of the e-mail, or added as a file attachment.



NATIONAL TRAIN SHOW 2013

- Article and Photos by Anthony Sava

I started this whole AFOL journey of mine in July of 2000. Back then I was building other things; Castle things; Fantasy things. I liked trains, I always have, but the idea of building LEGO® trains had never really entered my mind. It took me six years, in 2006, before I built my first train MOC.

How fitting is it that in July 2013, near exactly 13 years since I began this whole crazy AFOL journey, and marking the year I had been building LEGO Trains for longer than I had not, that I attend my very first National Model Railroad Association (NMRA) National Train Show® (NTS)?

Scott Lyttle of the North Georgia LEGO Train Club (NGLTC) had a dream. Back in 2005, Scott had helped contribute a huge model of the Cincinnati Union Terminal (CUT) to a gigantic NTS layout. Being a member of the host club for the 2013 Atlanta show, Scott decided to recreate NTS LEGO displays of old and gather as many LUGs and LTCs as possible together to form one giant, interconnected layout.

Being a member of the newly formed Texas Brick Railroad (TBRR), Scott invited me and TBRR to add to the layout. While it would be a good 12 hour drive from our part of the world, we just couldn't say no.

All told, we had five clubs in attendance – NGLTC (Host), TBRR, NCLTC (North Carolina LEGO Train Club), GFLUG (Greater Florida LEGO Users Group), and the Mississippi Brick Railroad. Adding to that were Scott and his newly redesigned, albeit unfinished, version of the CUT, and Matt Sailor's massive 95-stud Power Functions turntable and roundhouse. Each group's display was interconnected by a single, massive, circumnavigating 9v mainline. GFLUG installed a bypass to most of their layout for us 8-wide builders, as much of their layout is only 6-wide friendly. All told, there was a whopping 50'x90' layout.

NGLTC fittingly displayed sections and landmark buildings from the city of Atlanta, which attracted much attention from the crowd. Local eatery "The Varsity", recreated in little plastic bricks, spawned the most comments.

TBRR provided a dual PF/9v layout offering, featuring our prototype wide curve (Grand Curve as we call it) and lush forest.

NCLTC supplied a small but worthy addition to the layout, rife with tongue in cheek cultural references.

Mississippi Brick Railroad's huge modular town featured a newly finished pair of MOCs – a gigantic Shell station and a Wal-Mart® complete with packed parking lot.

Last, but certainly not least, GFLUG provided nearly one third of the entire layout, including their fantastic version of downtown Tampa, FL.

Setup began Wednesday afternoon, continuing in earnest on Thursday morning. Friday morning, the first day of the show, was met with the furious activity of adding details all over the layout. That was not the only fury to be seen that weekend…

Mother Nature brought down a deluge onto the Atlanta area on Saturday. The venue's roof could no longer hold back the driving gales and steady downpour, and began leaking in half a dozen places. One such place was behind our layout. Saturday afternoon we lost nearly 20% of our viewing area due to the venue staff taping off the area. On Sunday they created a ring of chairs around the leak, which we dubbed Chairhenge, allowing visitors to once again see all points on our layout.

We were one of the largest scales in operation – most of the displays were in classic HO and N. Our layout was also one of the largest in area of the entire venue, which did spark off some debate on classic model railroad forums. None can deny our popularity, though. We were swamped by gawkers, rubber-neckers, and looky-loos all weekend long. Children gazed wide-eyed for hours, forcing parents and guardians to drag them away so as they could enjoy the rest of the show. Several traditional modelers even argued with us that our trains were not made of bricks.

Though it was a five day event, it all ended far too quickly. In what seemed like no time at all we had to pack it all up and head for home. But just as it had begun, we all pitched in and got everyone out the door before they kicked us out (which they kept warning us about over the loudspeaker).

NTS 2014 will be in Cleveland, OH, and hopefully a local LEGO club will take the reins and continue the tradition of LEGO at the NTS. Will I be attending? I don't know. With as much fun as I had this year, I know this won't be my last National Train Show.

Redesigning New Manchester

-Article & Images by Elroy Davis

Recently I decided to build a new home layout. My old layout, which I called New Manchester, has been dismantled to make room for other projects. While I enjoyed the original, with its full switching yard and bridge features, I decided that the new New Manchester needed to be more compact, allowing space in my basement for both LEGO and non-LEGO projects.

Layout design is one of my favorite parts of the hobby, whether it be large club layouts or small home layouts. No matter the size, I generally approach the task with the same general steps: inventory, idea, function, and aesthetics.

Inventory

Inventorying your building assets may be the simplest step. For club layouts, it's a matter of asking each person what they have available for track, buildings, trains, etc. For a home layout, the process is the same. Ask yourself what you have available to build with. In my case, I was able to make the following list:

Buildings:

- Two-bay train shed (1x2 baseplates, entrance on short end)
- Yard Office (1x1 baseplate)
- Small Switching Tower (1/4 baseplate)
- Shed (1/4 baseplate)
- Covered Bridge (1x2 baseplates, track centered on short end)
- Truss Bridge (1x4 baseplates, two tracks)
- Coaling tower (1 x 1.5 baseplates, track under front)
- Sanding House (1 baseplate x ¾ baseplate, track on long side)
- Corner Barbershop (1x1 baseplate)
- Pizza Shop (1x1 baseplate)
- Firehouse (1/2 x 1 baseplate)

Baseplates:

- Green 32x32: 30
- Blue 32x32: 16
- Gray 48 x 48: 10
- Straight Road: 3

Track:

- Approx. 150 Straight 9v
- Box Curved 9v
- Cross 9v: 1
- 5 Left Swiches 9v
- 9 Right Switches 9v
- 10 Straight PF
- 8 Curved PF
- 2 Left Swtiches PF
- 2 Right Swtiches PF

Tables:

- 10 30"x30", 42" high

Electric:

- 5 speed regulators with wires
- 3 PF Controlers/Receivers

For this design, I didn't list out all of my trains, as it's unlikely that I'll ever display them all at once while at home. For club layouts and public shows, it's nice to have a general idea of how many locomotives and pieces of rolling stock will be available, to allow for enough track to display as much as possible.

Idea

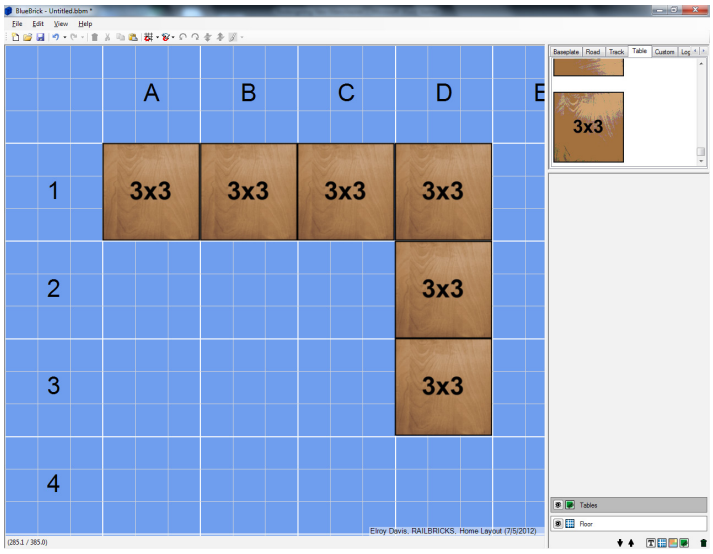
The next step is the idea phase. This is the step that allows me to take a high-level look at what I want to accomplish with a layout. For a public display, I may want to show off as many MOCs as possible. For a club layout, I may be interested in seeing how many trains can be run at one time. My original New Manchester layout focused on yard operations, and also had a large loop for continuous running. For this layout, since I still have a decent number of yard-type buildings, and not many town buildings, I decided to once again design a yard layout. This time, however, I wanted to take up less space in my basement. I decided to eliminate the loop, and compress the layout. My collection of track is still mainly 9v, as well, so electrical considerations need to be accounted for. I'd also like to display my covered bridge, so a small river section would be nice to work into the plan.

Function and Aesthetics

The next two steps, functionality and aesthetics of the layout, are something that I bounce back and forth between while designing. While a layout must look nice, it also needs to work. In the case of my home layout, the functional aspects are the 9v track, which must be electrified throughout, and a working railyard with switch points that I can either reach easily or trigger remotely. Aesthetically I'd like to balance my few town buildings with the main yard, but keep the focus on the yard itself.

For design, BlueBrick is my software of choice. I find the ability to use multiple levels useful for segmenting areas of track and types of buildings. This is especially true when I'm designing club layouts, where I can give each person contributing their own layer.

Opening up BlueBrick, my first step is to create a new Brick Layer by clicking the green Baseplate & Track icon in the lower right of the screen. I name this layer "Tables", then add tables in an arrangement that fits in the space that I have allocated for the layout. In this case, I am



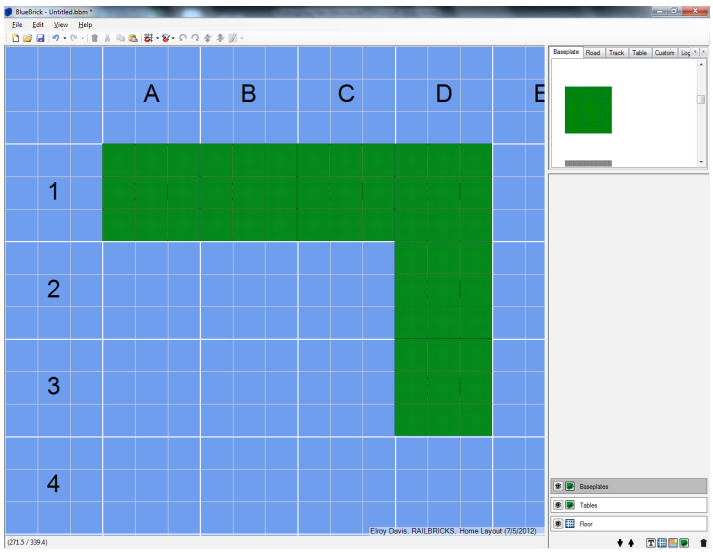
using tables that are 3 baseplates square, and my layout will sit in one corner of my basement. My initial idea is to create an L-shaped layout, with the town buildings on the short end, and the yard in the main area.

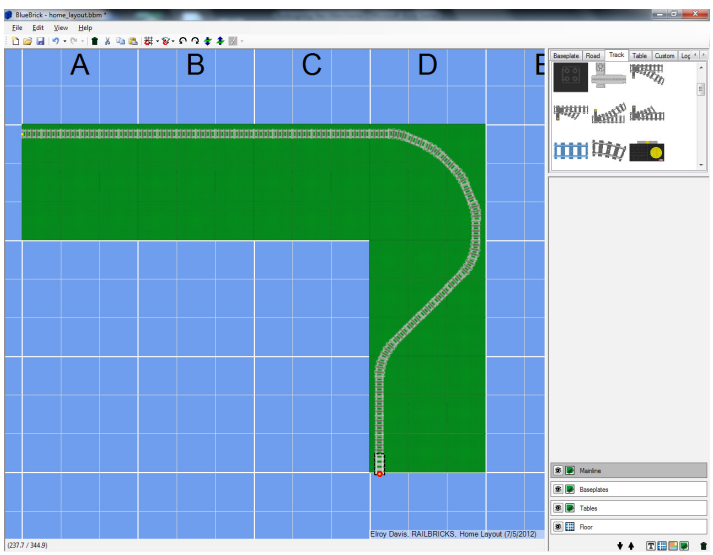
The next layer that I create is another Brick Layer named "Baseplates". I usually start out by covering this layer with standard 32x32 stud green baseplates. As I design, the types and colors of baseplates on this layer may change. Keeping the baseplates on their own layers allows me to make these changes without affecting the tables, track and buildings that I will add to other layers.

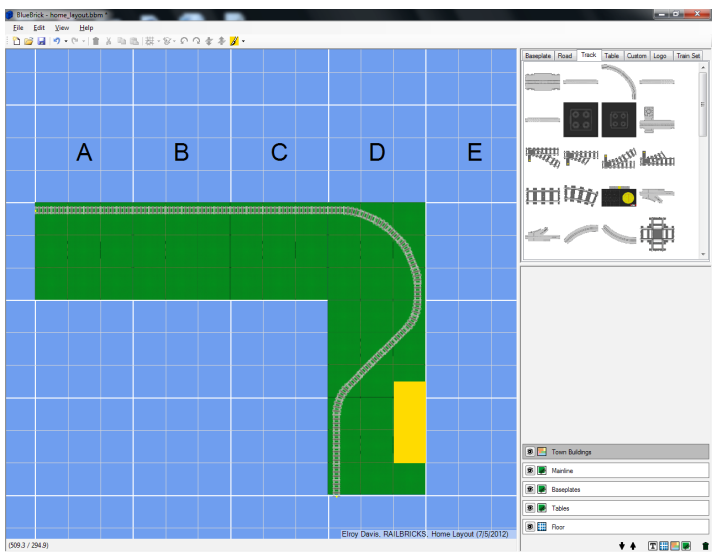
The third new layer that I create is also a Brick Layer. This is usually where I lay out my mainline track. For a club layout, this may be one or more full loops around a set of tables. For this layout, I'll run it along the back of the yard tables, create a wide curve down to where I'd like to put the town buildings, then cut to the front of the layout, allowing the trains to run in front of the street scene that I have in mind.

With my basics down, it's time to start playing with different ideas.

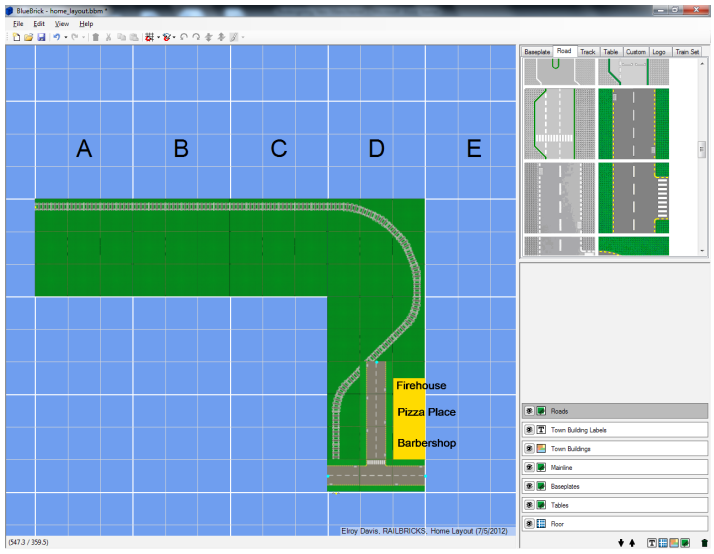
I only have a few town buildings, so I start by laying out the short section of the layout. To do this, I create a new Area Layer. Set to 100% opacity, the Area Layer allows me to paint over the sections of the layout where I would like to put my buildings. By setting the Cell Size of the layer to 16, I can paint in quarter-baseplate sections. I decide that I'll put my corner barbershop furthest down, my pizza shop in the middle, and my half-baseplate firehouse next to that. I paint the two





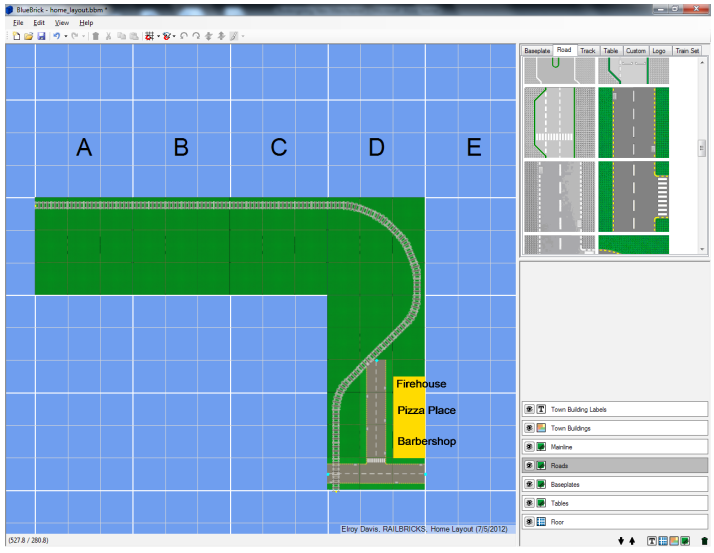


and a half baseplates worth of space in yellow to create a town zone. To keep track of which buildings will be in which spots, I create text layer, and add labels.

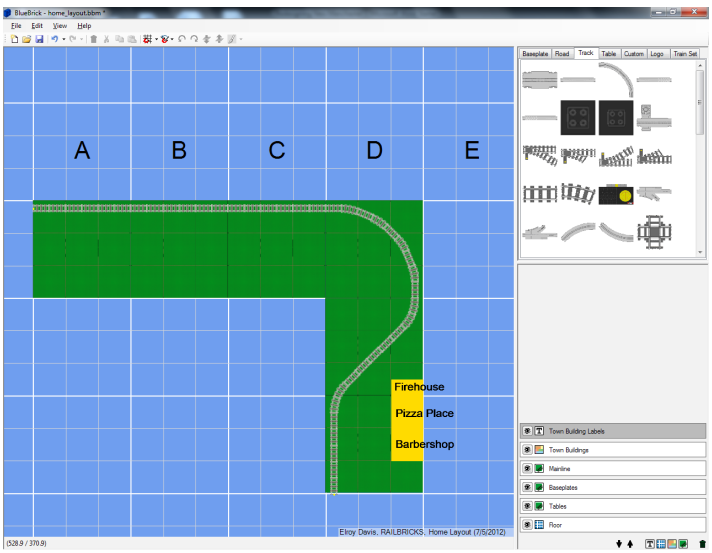


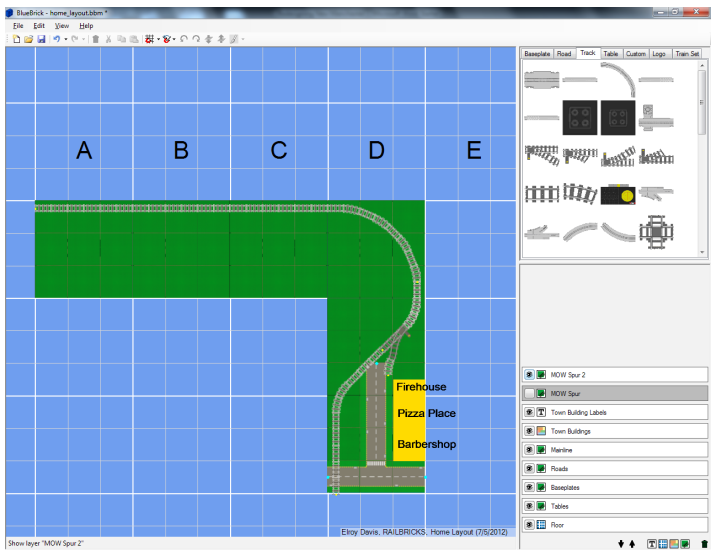
There are a number of ways that I could have placed these buildings. One of the advantages of BlueBrick is the ability to create custom objects. Instead of an Area Layer, I could have created images of each of my buildings, created assets out of them, then placed the buildings on a Brick Layer. This is actually a good approach if you design a lot of layouts that routinely use the same assets. Another way I could have placed the buildings is by changing the color of the baseplates. I tend to use Area Layers for initial design, as they are easy to add, remove, and change.

With my buildings in place, I add a couple of roads to another new Brick Layer. The layer initially displays above the Mainline layer. Using the down arrow on the toolbar, I move the Roads layer down the stack until it displays just above the Baseplates layer. At this point I don't own any road baseplates. Adding them to the plan lets me see what I need to purchase, or, if I decide to use brick-build roads (see RAILBRICKS Issue #4), how much space I need to cover.



Now that the town is in place, I can start looking at other areas. The blank space just above the firehouse looks like it might be a good spot for a short Maintenance-of-Way spur track. There are a couple of ways that I could add that track. BlueBrick makes it easy to decide. By adding two new Brick Layers, I can lay out both of my ideas for a spur, one coming off the Mainline on the curve, and one coming off the Mainline along the diagonal. By turning



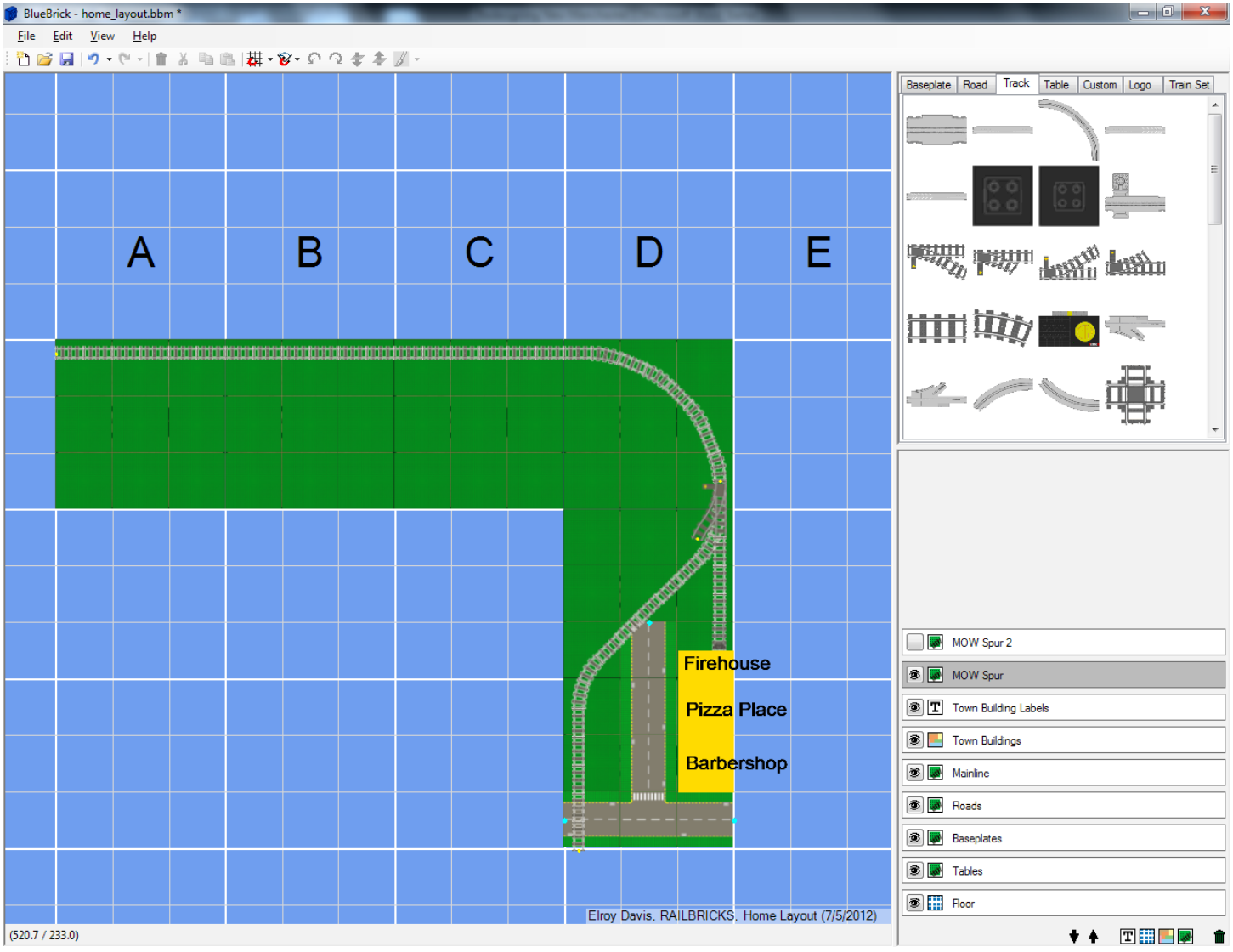


the visibility of these layers on and off, I can see which track design I like best.

The first spur option aligns nicely with the baseplates and the buildings, and provides track space long enough for at least one piece of equipment. The drawback to this solution is that the mainline track through town will need to be adjusted slightly. The second spur option allows me to keep the mainline in place, but is very short, doesn't align well with the rest of the layout, and would cut in front of the town buildings.

In this case, the choice of option one is best for my purposes. I'll need to realign the main track, but I can easily do that on the Mainline layer, without affecting anything else that I've put into place.

In the next issue, I'll explain how I adjusted the mainline track and began work on the railyard section of the new layout.



Onboard Remote Controlled Decoupling –

Two Steps Towards an Optimized Solution

Article and Photos by Thomas Selander

I'd like to share some of my findings, trials and errors on the path towards an optimized onboard remote-controlled decoupling system for LEGO® engines. As you will see from this article, there is certainly room for further development. I hope this article can inspire you to come up with new and fresh ideas.

First, a brief background to start:

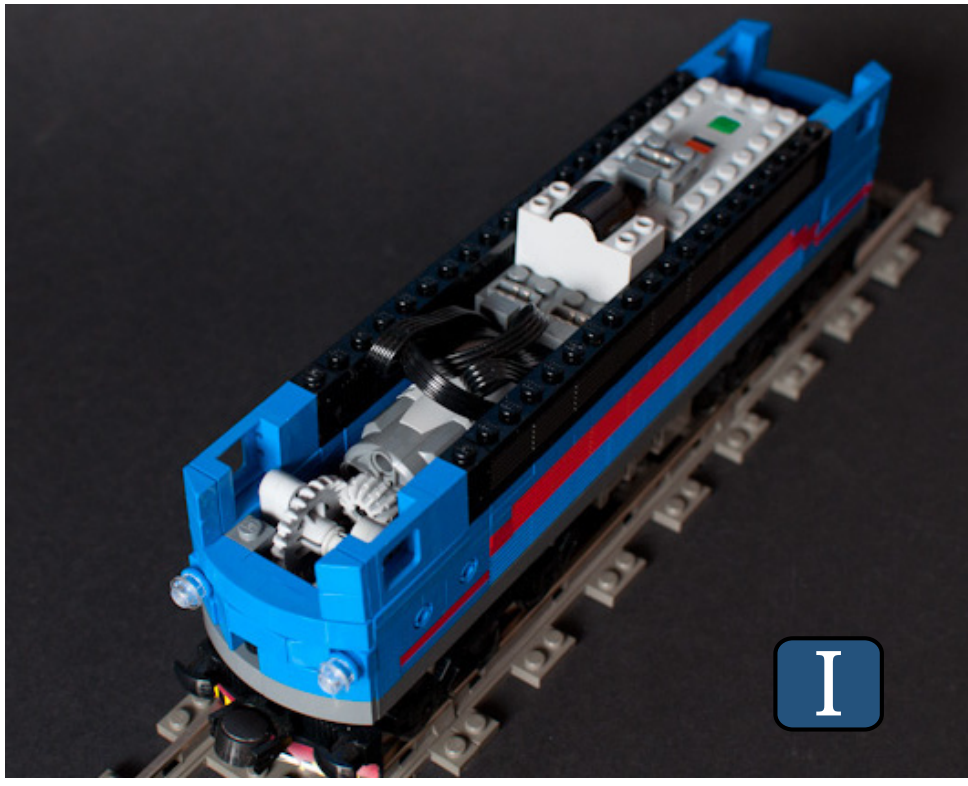
I used to be a 9V train fan with a special interest in Swedish and German prototypes. I certainly didn't appreciate when TLG first announced the discontinuation for 9V and a turn towards a Power Function (PF) based system. The mere thought of a battery operated train, like in the old 4.5V era from my childhood, felt like turning back the clock. After gradually seeing interesting MOC designs from others, I started to appreciate some of the PF-system benefits, such as the possibility to choose from several motors, to optimize torque vs. speed with different gearing, to build 3-axle bogies and custom design power-trains which weren't possible to realize in the 9V days; not to mention the small PF-LED lights which are so much more flexible compared to former lights. New ideas started to come. In particular I began to see the potential of using PF to build a remote-controlled decoupling system. But, how to get started? Having almost no Technic elements, and absolutely zero PF-stuff, I picked up an excavator 8043 on sale to get some basic materials to play around with.

Push or Pull?
My basic idea was to keep the normal magnet coupling so that any standard TLG rolling stock could couple without modifications. Decoupling would then mean that in order to physically separate the engine magnet from the wagon magnet, the two would need to be either pushed or pulled apart. Since magnets are strong, a relatively high force is needed, and moreover, a distance of approximately four studs is needed to really overcome the magnetic force. If the separation distance is too short, there is a risk that they would automatically join again.

The First Concept - Push!
After some sketching and thinking I tried my first concept on one of my 6-wide Swedish RC-class Bo-Bo engines. Inside the body I fitted a battery box + IR-receiver + a medium size PF-motor + gears that could drive a gear rack, 1 x 10, in and out through a small opening in the front of the engine. The concept proved to work. It had enough force and stroke to separate the magnets, but it had some flaws:

A hole in the engine front didn't satisfy my normal esthetical demands. Rolling stock needed to have a flat surface at the correct height to meet the gear rack. Time wise, a very precise operation was needed, because if the motor ran too long, the gear rack would fall out of the engine. It was easy to re-insert but….

Nonetheless the concept was presented on some forums, with hopes that the community would quickly invent something better.

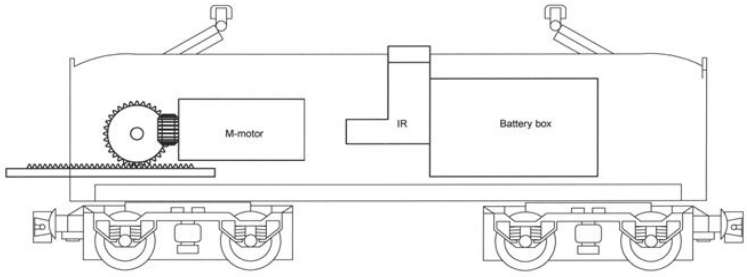


axles and bogies, it also meant an articulated engine was not possible - it had to be an engine with a static chassis. My previous experience with engines having a "static" chassis was that a maximum of 20-22 studs of length is possible. The engine would have to be relatively short and compact, so I started my integration work in an 8-wide Swedish class V5 shunter.

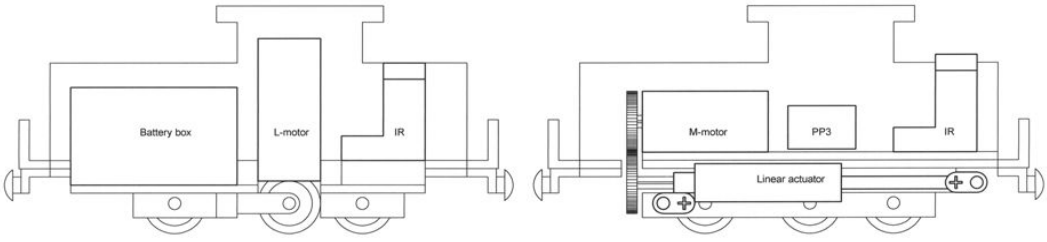
By attaching the actuator to two long Technic bricks a 2-wide channel in the chassis was created where the end of actuator could travel back and forth. To prevent the end from rotating, which is necessary to create the movement, I attached a Technic brick 1x2, and, at the very end, the magnet. Power comes from a medium PF-motor placed above the actuator, which saves a lot of space lengthwise. Despite my efforts of making a compact installation it became quickly clear that a regular TLG battery box wouldn't fit, so I had to use a PP3 battery instead. Another major drawback was that the engine couldn't be motorized for propulsion. Consequently, I chose to make a master and slave configuration, so that two very similar looking engines work in a pair. The slave engine contains the decoupling system, and the master has a large PF-motor which powers axles 1 and 3.

The Second Concept - Pull!

From day one of picking up set 8043 I'd been thinking that using a linear actuator could be a way to get the magnetic separation job done. It has a defined movement (stroke) and enough strength to separate two magnets. However, when I lined up an actuator + motor + battery box + IR-receiver, those components required a length that my RC-engine couldn't accommodate. After some consideration I decided to go for a completely different strategy. Instead of placing the actuator above the bogies (on a train base plate), I put it directly into the chassis, getting all the action at the same height as the magnet itself. Unfortunately, by occupying the space for wheel



First concept, 6-wide Swedish class RC-engine.

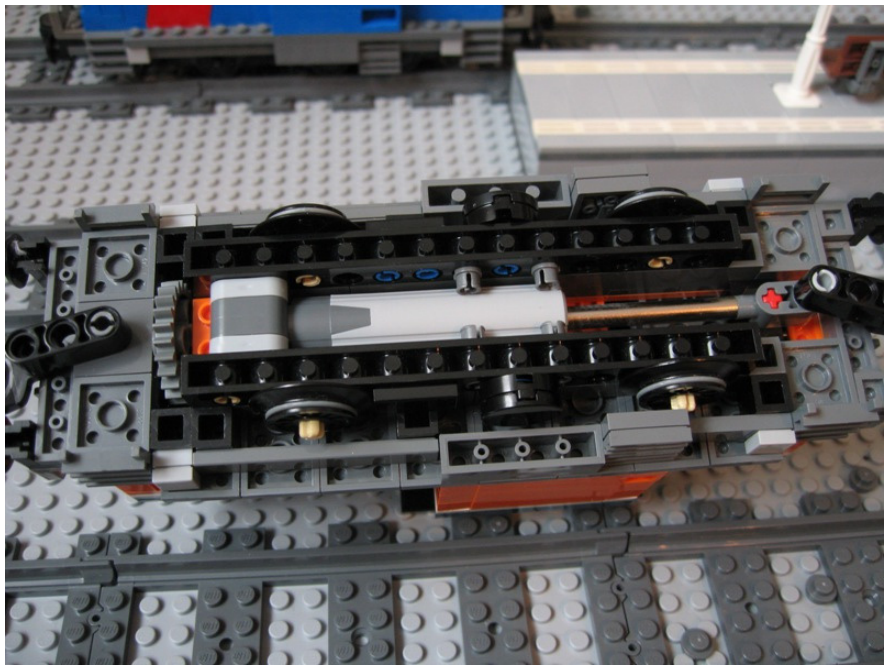


Second concept, 8-wide Swedish class V5 shunters, as "master & slave"

Summary
The second concept solved a lot of the flaws from the first, such as:

- The Engine looks esthetically quite good.
- Any rolling stock can be attached, as long as they have standard magnet couplings with buffers.
- Operation is simple; just drive the actuator to each end position where it automatically stops.

What if it were possible to keep all those good aspects achieved, and ALSO have powered wheels to create a fully autonomous engine with remote controlled decoupling? I am sure we'll soon see that become a reality... Good luck and hope you'll also discover the versatile usage of Power Functions.



Modular Model Railroading in L-Gauge: An Introduction

By Mike Pianta

Modular model railroading is a movement within the model railroading community that is growing in importance and popularity[1]. It involves the construction of modules, which are sections of model railroads built to a standard. The standard ensures that each module can be connected with other modules built to the same standard to form a large layout. Modules are typically uniform in size and feature mainlines that run from one end to the other, parallel to the longest edges. A key difference between a modular layout and a typical home layout is that modular layouts are built to be moved, which has significant implications for how the benchwork is constructed, and how scenery and structures are designed.

This series of articles will examine modular L-gauge (LEGO®) railways. This first article will provide an introduction to modular model railroading, discuss the key issues that need to be considered when defining a standard, and provide a sample standard that could be adapted for use by a LEGO train club. In subsequent articles I'll describe how to make lightweight benchwork for a module, and provide module design ideas and track plans to get you started. By the end of the series I hope you will be willing to embrace modular model railroading and in the future I hope to see more and more LEGO fans combining L-gauge modules into large, high-quality modular layouts.

Advantages of Modular Model Railroading

Modular model railroading has many advantages over traditional model railroading. Modules are designed and constructed to be portable from the outset so transport is far easier. Modules provide an ideal entry level for new club members. Their comparatively small size makes modules relatively inexpensive to build, and the time commitment required to complete a module is modest. For experienced builders, modules provide an opportunity to add a level of detail above and beyond what is possible on a larger layout. Depending on a club's rules, modules can be built to represent different time periods and geographical regions. Individual ownership of modules helps avoid issues with club members not pulling their weight, and with strong personalities trying to impose their ideas on the rest of the club. Modular layouts are less affected by changes in club membership. If a member leaves, their module(s) may leave with them, but a layout can still be assembled from the remaining members' modules. While constructing a module can be an individual activity, modular railroading is also inherently collaborative, providing opportunities to meet with fellow enthusiasts, show off works-in-progress, and display completed modules as part of a large layout.

Modular Model Railroading and LEGO

The concept of building modules to a standard is not new to the LEGO fan community. There are many examples of module standards. The most familiar is perhaps the modular buildings by the LEGO Group, but there are also standards for Moonbase, Micro-moonbase, Micropolis, and the Great Ball Contraption, to name a few. Several LEGO train clubs also use modular standards. Note that this article is concerned with modular standards, as opposed to the modular tables used by some clubs. Table designs will be covered in a later article.

Pennsylvania LEGO Users Group[2] (PennLUG) uses a modular system for their train layouts that is based on 32x32-stud baseplates, and so works interchangeably with TLG's modular buildings. Kenosha LEGO User Group[3] (KLUG) uses a similar approach. Some of PennLUG's buildings deviate from the 32x32-stud standard, but only in 16-stud increments, which makes it easy to build small modules to fill in the gaps. They also use prebuilt track in 16x16, 16x32, 32x32 and 32x48-stud (for points/switches) sections, and even provide instructions for building some of these[4].

Northern Illinois LEGO Train Club[5] (NILTC) also uses a modular standard. Their standard includes a track specification section that stipulates track position, structure gauge (i.e. the minimum height and width of tunnels and bridges, but also the minimum distance to platforms, buildings, signals, etc.), and how ballasting and the associated track height transition issues between modules should be managed. Diagrams that define a straight track section on a 32x32-stud baseplate, and the structure gauge for a corner module, are available. The train specifications section of the standard stipulates train width, length and height limitations (for both 6- and 8-wide trains). The NILTC standard does not specify a standard theme; members are free to build in any theme they like, as long as it is family friendly.

Standards

Standards are critical to enabling modules to be used interchangeably to make a functioning layout. There are many modular model railroading standards available that cover all scales of model railways (e.g. the many NMRA standards, Free-mo, Ntrack, oNeTRAK, etc.). While these standards contain elements that are specific to their particular scale, there is some commonality. As a

http://www.flickr.com/photos/34338074@N06/5494849915/

minimum, a standard must specify the number of main lines (one or more), the main line track position and rail head height (the height of the upper surface of the rail), size restrictions, and the required electrical connections. The track specification ensures that the tracks on separate modules can be connected together. The railhead height should be set high enough to provide space underneath a module for storage during a show and to allow members to crawl underneath to access the middle of the layout, and yet low enough so children can see what's happening without having to stand on a chair.

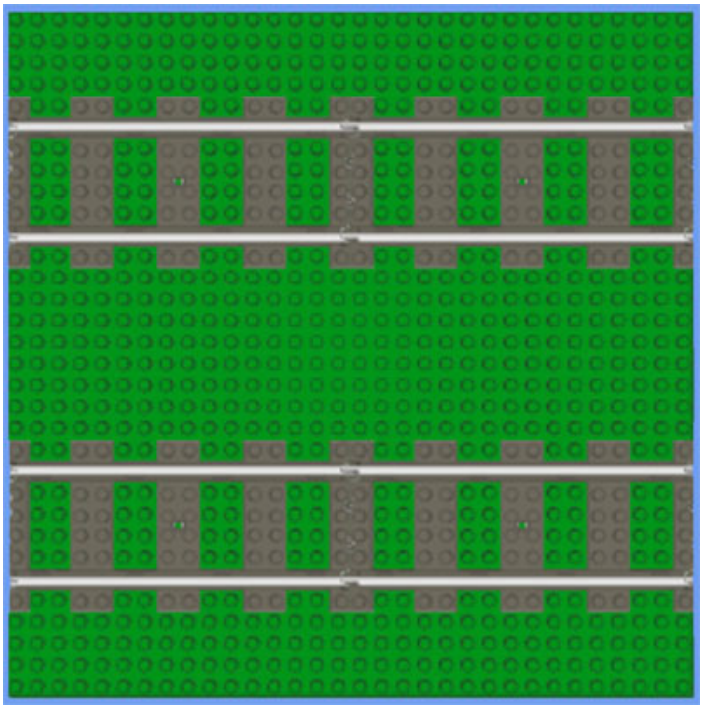
Module size is usually specified as the minimum module size, and modules may be made in integer multiples of this minimum. The standard may permit module sets. These sets are groups of modules that conform to the standard when assembled, but internal connections do not obey the standard. The key issue when considering the size of a module is transportation. A single person may be able to move a small module, whereas a large module may require two or more people to move it. Another size-related factor that is specific to modules constructed from LEGO bricks is that the amount the module can be tilted (e.g. to pass through a doorway) is limited.

When specifying size, height must also be considered. Adding height increases a module's volume, and can have a dramatic impact on the weight of modules and on the number of modules that can be transported in a given space.

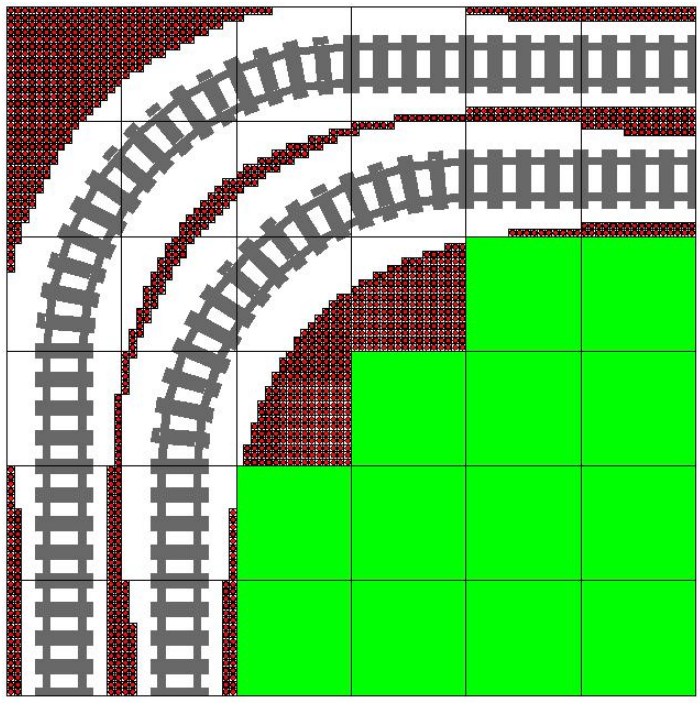
Electrical connectivity may not be an issue if the standard specifies the main lines are to be constructed from plastic track, and only remote control trains can run on the module. However, if 9V track is specified for a main line, then the standards should also cover how electricity should be supplied to the rails. This may be via a normal connection between 9V track pieces between modules or, more reliably, by standard LEGO train track contacts (BrickLink Item No. 5306c01) built into each module.

Since modular layouts are a group effort, there is the potential for a wide variety of rolling stock to be run on the layout. This can be managed by specifying the loading gauge (the maximum height and width for rolling stock and their loads to ensure safe passage through bridges, tunnels and other structures) and/or the structure gauge. Rolling stock that does not conform to the loading gauge should only be permitted to run on the layout after careful testing.

http://niltc.org/wp-content/uploads/2011/01/NILTC_2011_Track_Standard.jpg



http://niltc.org/wp-content/uploads/2011/01/Curve-Standards-1.jpg



The module theme may also be specified in a club's standard (e.g. modules must represent a certain geographic location and/or era). The advantage is that consistency is achieved between modules in a layout. However, some members may find this too restrictive, so consistency may need to be sacrificed to remain inclusive.

It is likely that a single standard will not be to the liking of all members within a club. One solution is for a club to have different standards for different purposes. For example a club might have a large show standard with three main lines, and a different small show standard with only two main lines. Adaptor modules can be used to convert from one standard to another, and thus allow modules built to different standards to be used in a single layout.

Small or large modules?

Compared to traditional model railway modules, the PennLUG, KLUG and NILTC modules are small relative to the scale. Another difference is that modules are positioned and connected together on the top of folding tables to create the layout at a show, whereas traditional model railway modules are permanently built onto benchwork, usually with folding or detachable legs.

One advantage of small modules is that there is greater flexibility in how they are arranged for each show. For example, buildings in a city could be rearranged, or a rail yard could be reconfigured, all without rebuilding. Another advantage is that the layout can be broken down into components that can be packed into stackable boxes for easy transport. Small modules take less time to build, tend to be less expensive and require less bricks, and so are more readily accessible to new members. However, disadvantages include the need to separately transport tables, the increased set up time required to arrange the large number of small modules on the tables and to add the fiddly little details, and the difficulty in using more realistic building techniques such as building off the grid and integrating changes in elevation.

Larger, semi-permanent modules have the advantage of reducing setup times because large modules can be self-contained (i.e. scenery, benchwork and legs all in one package) and there are fewer of them to connect together to form the layout. In addition, many of the small details could be kept in place on the modules between shows. The larger area also allows for greater realism by making it easier to incorporate variation in elevation (e.g. hills, rivers, etc.), and by allowing flexibility in the placement, size and orientation of structures. The disadvantages of large modules are that they require a significant investment in time, bricks and money, and they are more difficult to move (typically requiring at least two people because of weight and size) and store. Storage issues could be minimized by the use of a custom rack that allows modules to be slotted in like drawers at different heights. The addition of wheels to the rack would make a very simple system for transferring multiple modules between the club's trailer and the show venue.

The standards for large and small modules are not necessarily mutually exclusive. For example, a club could have a large module that is built from small modules. The small modules could then be assembled into a large module, and have small details added, prior to transport to the show. This approach combines the flexibility of small modules with the decreased set up time of large modules.

Sample Standard

A sample of module standards that are currently under consideration for use by the Melbourne L-gauge Train Club (M>LTC) is included on the next page. They are based on sample HO module standards provided in Jim Spavins' excellent Modular Railroading Handbook[6]. These standards are designed for a show layout, and so include three main lines (two 9V and one RC), but could easily be modified by a club to suit any purpose.

References

1. *Modular Model Railroads, www.modular-model-railroads.com*
2. *Pennsylvania LEGO User Group, pennlug.com*
3. *Kenosha LEGO User Group, https://sites.google.com/site/kenolug/*
4. *Pennsylvania LEGO User Group, Instruction Page, http://pennlug.com/?page_id=86*
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6. *Spavins, J. (2012). Modular Railroading Handbook. 2nd ed. Create Space. http://www.modularrailroading.com/*

SAMPLE L-GAUGE MODULE STANDARDS

PREAMBLE

This standard applies to all modules used in the L-gauge M>LTC modular layouts. This standard is subdivided into definitions, train control, benchwork, track work, electrical and scenery sections. This standard is based on three fundamental principles. First, creativity in module design and construction is encouraged. Second, mainline trackage will be designed and operated to optimize the continuous running of several trains. Third, the design, construction, and operation of trackage other than the mainline trackage are at the complete discretion of the module builder.

DEFINITIONS

Module – The minimum unit into which the railroad may be disassembled.

Module Set – A collection of two or more modules that cannot be used without all the modules in the set. For example, a straight curve module set could be made up from multiple modules.

Directions – Left and right when used in this standard refer to the directions on the module when viewed from the inside of the modules. Inner refers to that side of the module closest to the operators.

Main Line Trackage – The three continuous tracks (9V outer, RC middle, 9V inner) required on each module.

Non-Main Line Trackage – All trackage other than the main line trackage.

TRAIN CONTROL

Main Line Control – Control of 9V trains on the outer and inner main line tracks will be through the use of the 9V Train Speed Regulator (BrickLink Item No. 2868b). Control of RC trains on the middle (or other) main line track will be through the use of a remote control unit

Non-Main Line Track Control – Control of trains on non-main line tracks is at the complete discretion of the module owner.

BENCHWORK

Connecting Modules – Module sets will be connected with the standard LEGO track connections and G-clamps. Connections between modules in a set will be at the discretion of the owner.

Height – The height of the track head (i.e. the top of the track) will be 76 cm from the floor.

Height Adjustment – Module height shall be adjustable from 73.5 cm to 78.5 cm.

Length – The length of a module shall be multiples of 96 studs (3 x 32-stud baseplates, or 2 x 48-stud baseplates).

Width – The width of a module shall be 96 studs (3 x 32-stud baseplates, or 2 x 48-stud baseplates).

Materials – Materials shall be selected to make modules which are sufficiently flat, strong, and stable to permit trains to run at a consistent speed without derailing or uncoupling.

Color – Benchwork shall be matt black.

TRACKWORK

Trackage – Trackage shall be standard L-gauge track (9V or RC). Grades and/or super elevation (banking) are not permitted.

Track Spacing – There shall be three main line tracks: an outer 9V track, a middle RC track, and an inner 9V track. Within 16 studs of the end of a module set, track shall be straight. The centerline of the outer 9V main line shall be set back from the front of the module by 24 studs, the centerline of the middle RC mainline shall be set back from the front of the module by 40 studs, and the centerline of the inner 9V mainline shall be set back from the front of the module by 56 studs.

Insulating Non-Main Line Trackage – The use of insulating material or a physical break between rail contacts is required to isolate main line 9V trackage from non-main line 9V trackage. All points of intersection between the 9V main lines and any 9V local tracks shall have insulating material or breaks used on each rail.

ELECTRICAL

Track Voltage Service – Each module or module set shall have train track contacts (BrickLink Item No. 5306c01) installed for the outer and inner main lines, and electric connector bricks shall be accessible from the inside face of the module or module set.

SCENERY

Scenery at Ends – All scenery at the ends of a module set shall slope down so as to create a flat profile at a level four plates below the main line track head.

Track Sleepers/Ties – All trackage on the modules shall use reddish brown tiles for sleepers/ties. Main line sleepers/ties shall be one stud wide and spaced one stud apart, starting from the leftmost stud.

Ballast – All mainline tracks shall be ballasted with dark bluish gray ballast.

LUGOCT

LEGO® USERS GROUP OF CONNECTICUT

by Jim Foulds

The LEGO® Users Group of Connecticut (LUGOCT) got its start in the fall of 2011.The idea for the group came about when I was attending BrickFair D.C. in 2010. I had met a number of people from the northeastern part of the United States that were interested in being a part of a LEGO User group (LUG). I asked about them participating with the New England LEGO User Group (NELUG). There were many reasons why people felt that was not feasible. As I was still living in Colorado at the time, I suggested forming a new club and gave ideas, suggestions, and offered to help from afar to get things rolling.

Roll the calendar forward to BrickFair D.C. 2011. The same conversation came about and this time I poked as to why no one had taken the initiative to form a new LUG. Lack of time, lack of knowledge on how to go about forming a LUG, and not wanting to ruffle feathers were all excuses given as to why nothing had happened. This time things had changed for me as I had just relocated my belongings to Connecticut in June. Speaking with another recently transplanted LEGO fan – Kevin Hinkle, we decided to form the club ourselves.

Kevin designed the club logo and set up the Yahoo® group in November. Invites were sent out and word was spread that a new club was created. It took us a little while to get momentum with the group, which is typical for any new club. In April 2012, we had our first in-person meeting. Following that, we've tried to have a meeting every month. Knowing that a display or event tends to really make the club click, we worked hard in searching out an event that the club could get behind. Fate smiled upon us, as a local fair – The 4 Town Fair – was looking for a child-focused display/activity to add to their association. The idea fit the club perfectly, as they just wanted a small display/interactive activity to entertain the kids as they walked by. Tapping into the experience of some of our more seasoned members, we quickly had a rough layout and interactive plan presented to the club. We divided the display up into sections for members to claim and build for. Everyone worked over the summer on their individual sections. In September, we all came together at the fair, some for the first time in person. Great fun was had by all, including the fair-goers, and many milkshakes were had by the attending members.

We're hard at work for 2013 activities. The club has been meeting regularly at a local library which has taken notice and has asked the club to create items to put in their entrance display cases. We've also been asked to display at a local comic convention in the spring.

If you live in Connecticut and are interested in joining us, please visit us on our Yahoo! Group (http://groups.yahoo.com/group/lugoct/). Though we are primarily an AFOL (Adult Fan of LEGO®) group, we do offer a youth membership for those 13-17 years old. All we ask of our teenaged members is that you attend meetings with a parent or guardian.

We also have a Flickr group, for our members to upload and share photos as well as providing another avenue to discuss the hobby. Please visit our Flickr group (http://www.flickr.com/groups/lugoct/) to check out what our members have built!


GUINNESS
WORLD RECORDS
CERTIFICATE
The longest plastic toy train track was assembled by Henrik Ludvigsen & Byggepladen (Denmark), in Broby, Denmark on 11 May 2013
OFFICIALLY AMAZING
Byggepladen
Denmarks LEGO® Entusiast Forening

Guinness World Record – The longest LEGO® train track - 4.00025 km

By Anne Mette Vestergård & Lasse Vestergård

It was a great moment when Henrik Ludvigsen and the Danish LUG Byggepladen received their Guinness World Record™ certificate on the 11th of May, 2013. For almost ten years it had been a goal of Byggepladen to achieve a Guinness Record and it had finally happened. The certificate was handed over by Kirsty Bennett from Guinness, who had flown to Denmark the same morning. The certificate said: "The longest plastic toy train track measured 4.00025 km. (13,124 ft. 2 in.) assembled by Henrik Ludvigsen & Byggepladen (Denmark) in Broby, Denmark on the 11th of May, 2013. This exceeded the previous record by more than 1,000 meters.

Henrik Ludvigsen got the idea about the train track after a clear out, where he'd come across his own old train track that he had spent hours playing with as a child. This is the reason the train track was built with old blue LEGO train tracks from the 60's and 70's. Unlike newer tracks, these old ones had the advantage that crosses had been produced, so the track could be placed quite compact.

The finished track produced a nice looking blue pattern. It was an enormous effort for Henrik Ludvigsen to get the more than 30,000 blue tracks necessary, which without a doubt gives him the world record in largest blue train track collection.

It took a year and a half to get hold of the required blue train tracks. However, that wasn't all that was needed. The measurements on the tracks had to be documented by the LEGO company. A place had to be found where the record could be attempted. Money had to be raised to pay the Guinness representative and people had to volunteer to help build the track. The money was raised through support actions, sale of sponsor wagons and by producing a small support-train sold to the members of Byggepladen. It wasn't a problem to find volunteers, as plenty of the members of Byggepladen were eager to show up and lend a helping a hand.

The set-up of the track itself only took 6 hours for the volunteers, however the demand that a train had to go the entire track without being lifted from the rails proved to be a much greater challenge than anticipated. The tracks were old, some broken, and it didn't take much for the track to shift. Quite a number of trains sent off derailed after 30-60 minutes. At the same time it was required that the attempt be documented, so the entire train ride had to be followed by camera. When Kirsty Bennett, arrived around noon on Saturday the 11th of May, only one train had been driving for approximately two hours and still had another two hours to go. All eyes were on Tomas Lørup, a member of Byggepladen, whose duty was to follow the last train all the way, directing it with a remote control. The anxiety amongst the audience was vivid, but all had been carefully planned. Thomas slowed down in every turn to avoid derailing. The train had new batteries, however there weren›t new batteries in the remote control and Thomas lost control over the train, which went backwards at high

speed through critical turns. Luckily nothing happened before control was restored and Thomas could continue the steady way towards the finishing line. The anxiety was remarkably greater amongst the audience. All the members of Byggepladen who had collect funds and gotten Henrik Ludvigsen the blue tracks realised what thin ice the Guinness Record was on. It all worked out though, and the attempt was approved by Kirsty Bennett.

A Guinness Record wasn't the only thing to experience in Denmark on the 11th of May 2013. The visitors, who came to see the gigantic train track, were also able to see a unique exhibit of LEGO train sets from the last eight decades, which presented an opportunity to see the LEGO train development through time. The goal was to present every LEGO train set (not including DUPLO). It turned out Danish collectors possessed them all, except one: the Minitalia train from 1971, only ever sold in Italy. Thankfully the LEGO Idea House was kind enough to lend one for the purpose.

Members of Byggepladen had impressive collections of both 9V and 12V trains. Other members brought in the old 4.5V trains and other had the newer versions. Some brought in a lot of trains, others few or just one. As Lasse (the co-writer of this article) also collects old LEGO wooden toys, these trains were also represented.

The first LEGO train was made of wood. It was a part of the selection when LEGO was founded in 1932. The oldest trains at the exhibit were two wooden trains from the 1940s. There were also three wooden trains from the 1950s.

In 1949 the sale of plastic LEGO bricks began. They were originally intended to be used for house building, but in 1953 the first box with a picture of a train, build by bricks, went on the market. It is believed to be the first time a brick built train appeared on a LEGO box. This old train was built with the original old LEGO bricks and put on display together with the box.

Set 700/3 from 1961 was also on display. This is not an actual train set, but a ground set. It was part of the exhibit due to the picture of a train on the front of the box. On the back of the box there were pictures showing things that can be created with the contents of the box, one of these is a train. This train was built and placed in front of the box. In 1961 LEGO wheels didn't exist, so the wheels of the train were regular, square bricks.

In 1962 the LEGO wheel was launched, which meant that it was finally possible to build LEGO trains with regular wheels.

In 1964 the first 323 set was produced. This was the first set specifically produced for the purpose of building a train, and can therefore be considered the first «real» LEGO train set.

In 1966 the first LEGO train track was launched. It had blue tracks and white sleepers. At the same time 4.5V motors and battery boxes were produced, so you could build LEGO trains to run on an actual train track.

In 1968 set 118 was produced. It was a train capable of starting and stopping by the sound of a whistle. It is considered one of the most attractive items amongst collectors.

In 1969 the 12V train track appeared. It consisted of power leads, placed between the blue tracks. The 12V train track had the advantage that its trains didn't require a battery box. The unfortunate part was its dependency on an outlet, which is why the LEGO company continued to produce the 4.5V trains.

1971 was the year for set 24, part of the Minitalia collection, only distributed in Italy. This set was so rare no Danish collectors could bring it to the exhibit. Some may wonder why nobody had the parts to build it. The train consists of only 77 parts, but the Minitalia is made with very specific bricks with hollow studs made with a different plastic material with crosses instead of tubes. It was therefore not possible to put together parts for the set. Fortunately the LEGO Idea House was kind enough to lend us an unopened example and this rare and valuable item was displayed in a glass showcase.

In 1975 set 148 was launched; a red station house. This was the first train set to include minifigs, though these 1975 figures lacked both arms and faces.

In 1978 the modern minifigs with face and movable arms and legs were launched. This was also the year the last LEGO sets with blue train tracks were launched.


VELKOMMEN
GUINNESS WORLD RECORDS
GWR 4.000,25 METER


Henrik Ludvigsen
LEGO World DK 2013
WR 1508,64
GUINNESS WORLD RECORDS

In 1980 the grey train track was marketed. It consisted of light grey tracks and dark grey sleepers. Just like the blue gtain track, both 4.5V and 12V trains for these tracks could be found. Apart from the trains on display in the museum, an independent layout was built, which included every 12 V set.

In 1988 the first Monorail set was launched. Overall three major Monorail sets where launched from 1988 to 1994. These three sets were obviously placed on display for the audience to see their functions.

In 1991 the 9V train track was presented. This was a new type of track, where tracks and sleepers were one part. The tracks were dark grey and the power lead was placed on the outside of the actual tracks rather than being placed in the middle.

In 1997 set 6497 was produced. This train was a part of the LEGO Time Cruisers theme, a mixture of the various LEGO themes, which is why this train contained castle elements.

In 2001 LEGO Harry Potter was launched. The Hogwarts Express was produced already in the first year as a LEGO train set and new versions were marketed in both 2004 and 2010.

2006 was another year where non-power leading tracks and trains with batteries were launched.

In 2010 LEGO Toy Story was launched, which is when the Western train set 7597 was launched as well.

In 2011 set 10219 saw the light of day. This was a Maersk train, containing three Maersk-blue hats. The Maersk-blue hat hadn't been a part of a set since 1980 and went for more than 100 euro per hat on BrickLink. Due to the production of this train, the price of a Maersk-blue hat dropped to approximately 2 euro per hat.

In 2012 LEGO Monster Fighters was launched. An extension to that theme, 9467, was launched; a ghost train.

The most recent train in the exhibit was set 79111, a part of the new Lone Ranger theme. It was so new it hadn't yet hit the shops. Still, Henrik Ludvigsen managed to find an example, which was displayed at the main entrance.

LEGO PF Trains to The Limit

- Controlling LEGO Trains

Article, photos and programming by J.A. Korten

A

In this series we will discuss ways to take LEGO® Power Functions to the next level by adding some cheap, but non-LEGO parts.

This time: Simple Train Control

Introduction

When I was about 2.5 years old I got my first LEGO train. On the 5th of December 1982, St. Nick (the original Dutch version of Santa) brought me set 7710. Thus my LEGO train adventure started. The years after my railroad imperium grew. Some wagons, a black 12V motor for the 7710 and eventually a 7750 set made things complete. I built and played with all those remotely operated things like points, a level crossing, a signal, etc. When LEGO brought the news that they would discontinue 12V I was able to get some more parts. As a child I never went for 9V, apart from buying those two nice railroad vehicles 4546 and 4525. That was the end of my LEGO train experience.

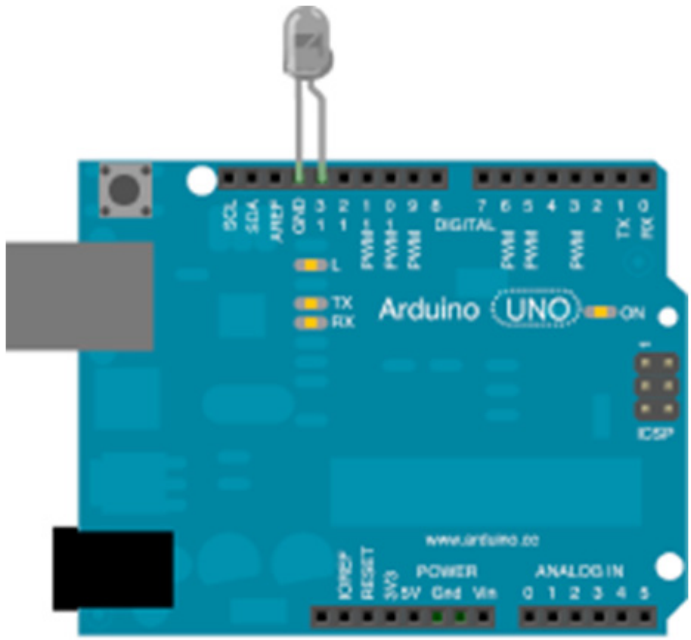
As a master student in computer science teaching, I became a Mindstorms enthusiast. That marked the end of my dark ages. The days of the eighties would never come back since LEGO decided to discontinue those side structures that we all loved, seemingly forever, but the interests in LEGO trains came back. With the recent dawn of the so-called “Maker movement” we suddenly have new opportunities to ‘just do it ourselves’. This first article will deal with the possibility of computer controlling your LEGO train without modifying any parts.

When controlling trains, one has a lot of different options. Some people have changed their 9V motors to Digital Command Control (DCC). They use model railroad systems or a modified Mindstorms system to send commands to a specific LEGO train. Experimenting with DCC convinced me that LEGO+DCC also has its drawbacks. One of the major drawbacks is that LEGO trains are too light to make good rail contact. With the coming of Power Functions we hoped again (in vain) to get remotely operated items like signals and switches.

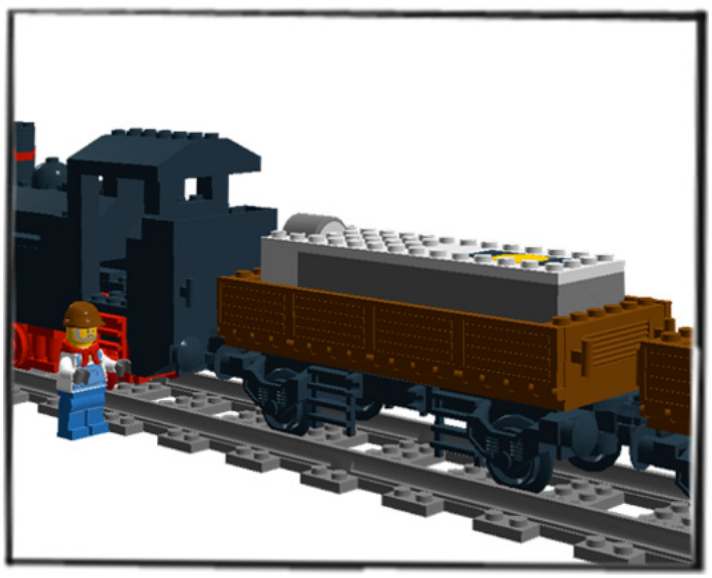
Luckily LEGO decided to release the PF protocol so we can do what LEGO did not do: automatically controlling our trains and adding more options designed by us. In my work (teacher ICT of high school and college students), I came across Arduino, and that took my train adventures to a whole new level.

Introduction to Arduino Microcontrollers

Arduino provides us with an easy to use platform for both hobbyists and (semi-) professionals. A microcontroller is a small computer in a chip that can be used for all kinds of applications. A typical Arduino costs about 20 bucks. Both Arduino hardware and software are Open Source, so we can modify it and have good support.



The Arduino UNO Rev 3 with an IR led connected to it. Long lead to pin 13, short lead to GND.



My newest version of the 7710, power functions enabled and ready to be controlled.

It is not our goal here to give an exhaustive expose of Arduino (for that, see the links at the end of this article). We will, however, give you a hands-on to start with LEGO PF + Arduino.

Roland Wiersma came up with a library to send out LEGO PF compatible infrared pulses.
Using this library we can simply create a system that controls the LEGO train.

What do we need?

- An Arduino UNO (or compatible)
- A 940nm Infrared LED
- A LEGO Power Functions receiver and a LEGO train
- Arduino software
- Arduino Library (thanks to Roland Wiersma)

We used LEGO Digital Designer, Fritzing and Arduino software to create a basic setup.

Next time we will discuss how to create a computer controlled shunter, now we will just show you some basic train control. This time we will just show how a simple program on the Arduino will make the train move.
We use this source code to make the train move. In the LEGO PF documentation we see what the SingleOutput command does. The first 0 indicates the mode, the second gives the speed (0 clear, 1 to 7 forward speed, 8 break then float, 15 to 9 backward speed). RED is a reserved word in the library that indicates the red output of the IR receiver while CH1 indicates channel 1. If you want to use the blue IR output instead, just replace RED by BLUE! Note: testing revealed that my train needed 14 as a speed instead of 2 to go forward with speed 2 (depending of course on how you mount the train motor).

We upload this example to the Arduino and see that our little train will move for a minute or 60 seconds and then stop for another 20 seconds. This will go on forever till you cut the power or point the IR led away from the receiver. After uploading the code is in the Arduino and you can disconnect Arduino from the computer. By adding a battery you can then operate your train without a computer. Next time we will add some more add to influence the train movement without the need for a computer (after initial programming).

The best way to learn using Arduino is to buy a simple board like the UNO, get yourself an IR-led and start testing! If you have questions feel free to contact us. Our website (last link) includes the source for this example, a small movie that shows the application and the library needed for the IR commands.

If you use the source from above you might notice a not so handy thing: now and then the train will not react in time and will keep running or miss the start command. This is because the signals are only sent once in a cycle of 60 + 20 seconds. Radio would be more reliable but in case of infrared the signal might be blocked just at the moment of sending. To make it at least a bit more reliable we could add a loop so that a command is repeated for let's say five or ten times. There are even better solutions like using millis() but we won't cover that here.

```
/*
   We will send some basic power functions
signals to a LEGO train.

   J.A. Korten for Railbricks
   Original library by Roland Wiersma
   August 2013

   V1.1
   We have included an extra variable
myspeed since in my train it was reversed.
 */
#include <legopowerfunctions.h> // this
imports the LEGO PF library

// The IR LED is connected to pin 13
// Long lead is connected to pin 13, short
lead to GND

LEGOPowerFunctions lego(13);

void setup() {
  // nothing to set up right now
}

void loop() {
  // myspeed = 2 one direction slow driving
and myspeed = 14 slow in reverse direction
  int myspeed = 14;
  lego.SingleOutput(0, myspeed, RED, CH1);
// run!
  delay(60000);
  lego.SingleOutput(0, 0, RED, CH1); //
pause!
  delay(20000);
}
```

We have changed the delays of running and pause also a bit in order to keep the total time the same, although this isn't really necessary.
Now the Arduino IR sender will send 10 start pulses + pauses of 100 milliseconds, wait for 59 seconds, send pause 10 pulses + pauses of 100 milliseconds and wait for another 19 seconds before repeating the cycle till 'forever'.

Relevant links:
- www.arduino.cc (Arduino software and examples)
- www.fritzing.org (to digitally draw electronic circuits)
- www.leguano.nl (all examples plus the remote library, see instructions.txt inside the zip)

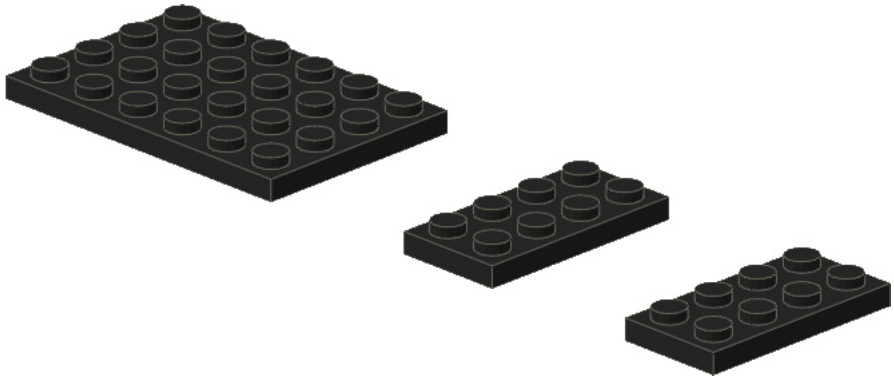
Upcoming articles in this series:
- An automated shunter with sensors.
- Your own LEGO PF compatible receiver and some turnouts.
- Connecting it all together and going beyond the standard LEGO capabilities.

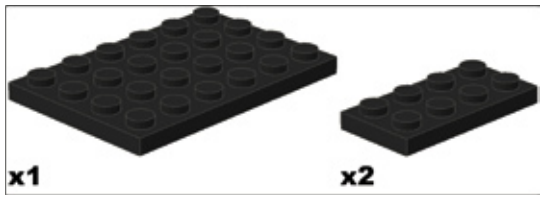
B

0-6-0 Steam Locomotive

by Pierrick “PZ” Dauny

Building Instructions by Didier Enjary





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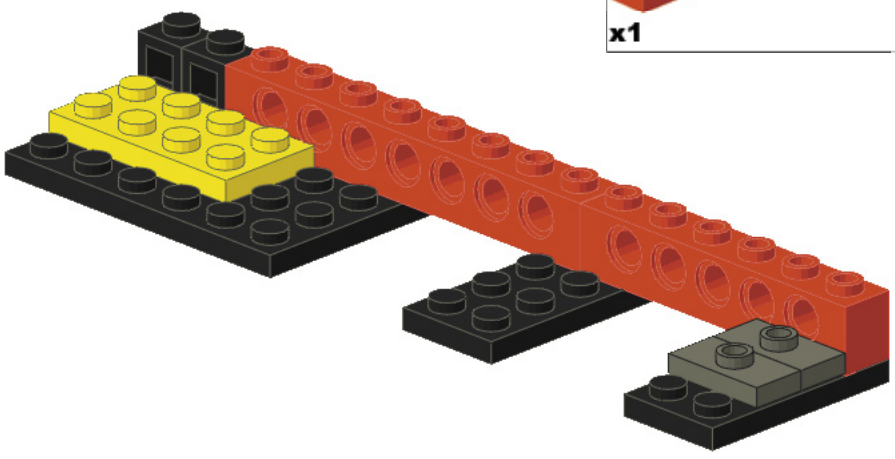

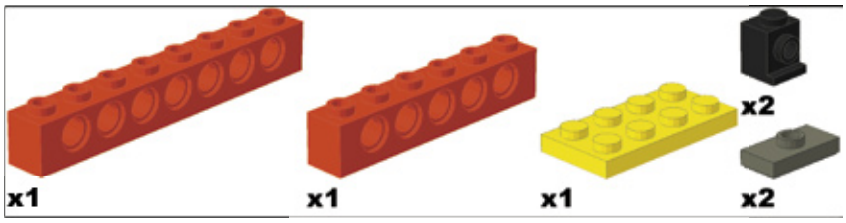

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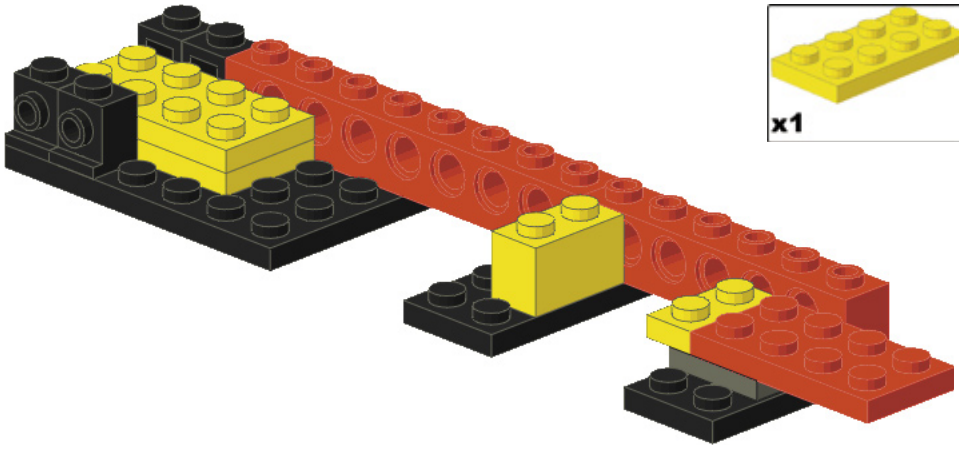

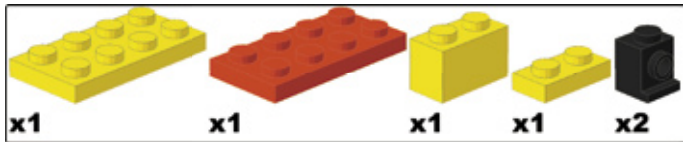

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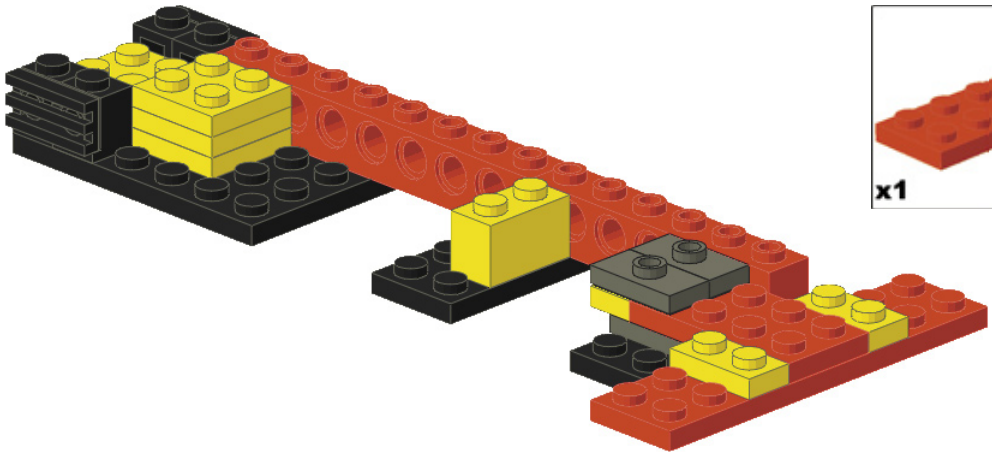

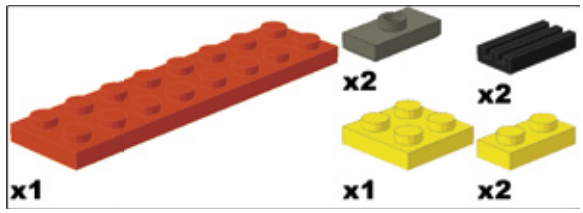

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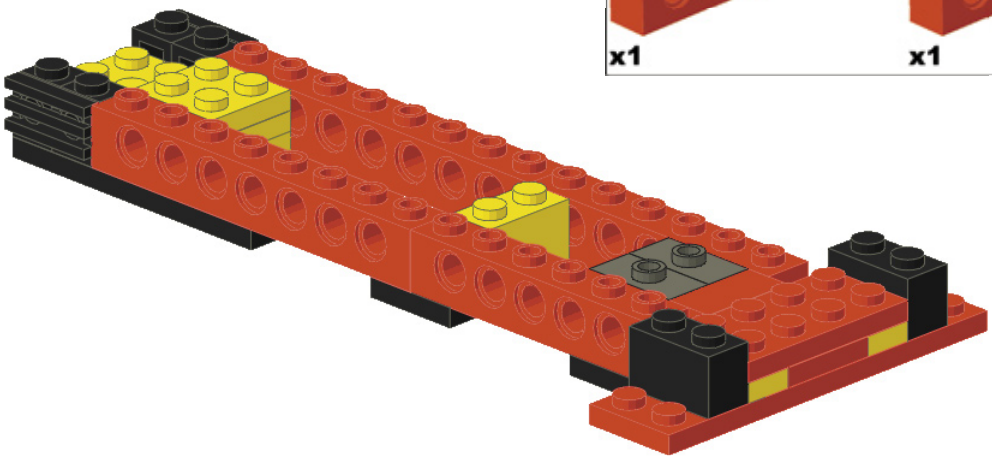

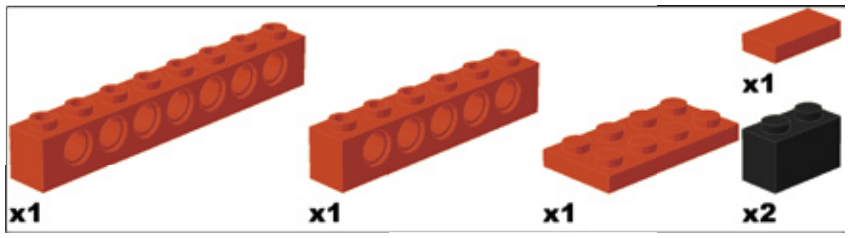

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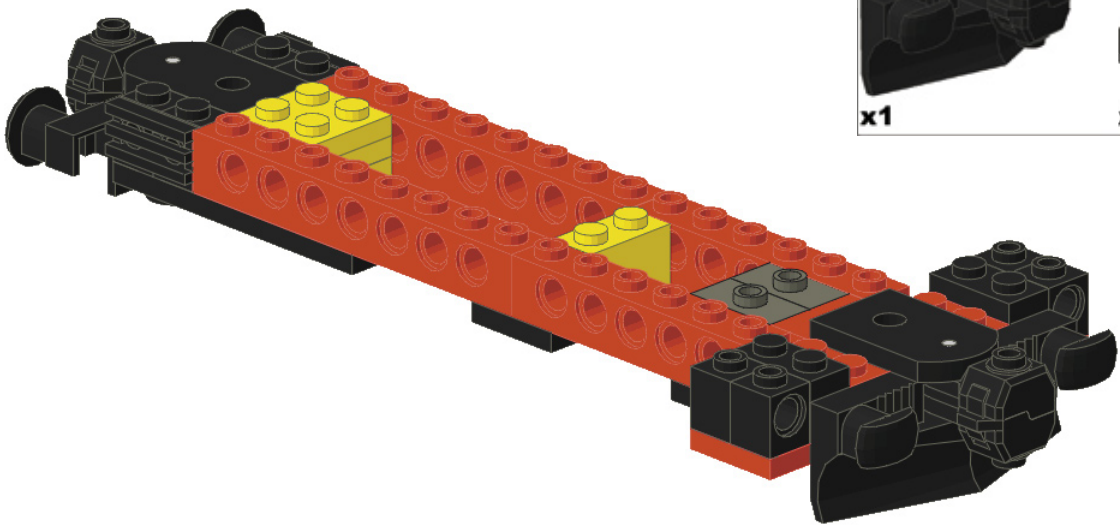

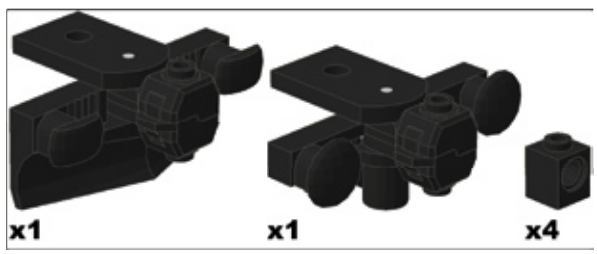

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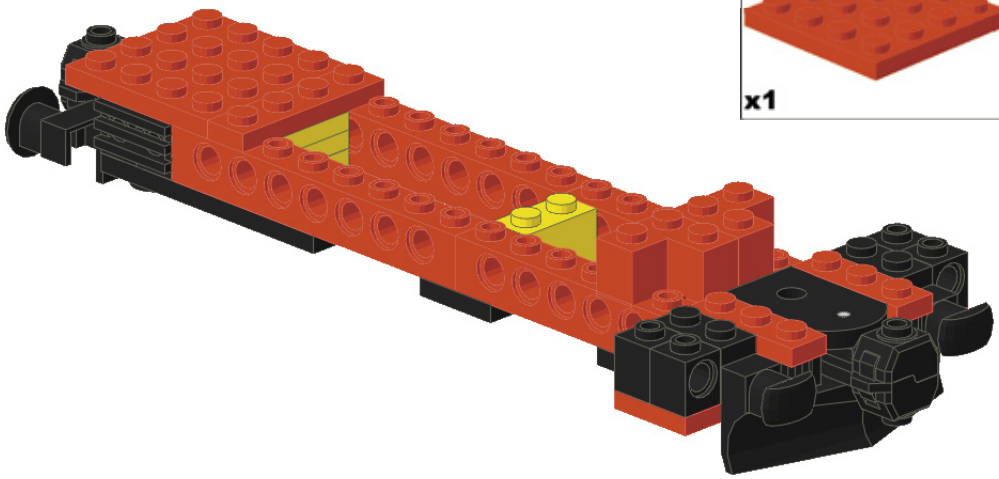

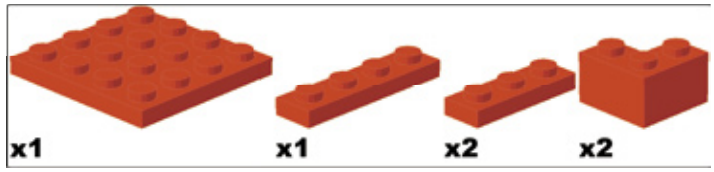

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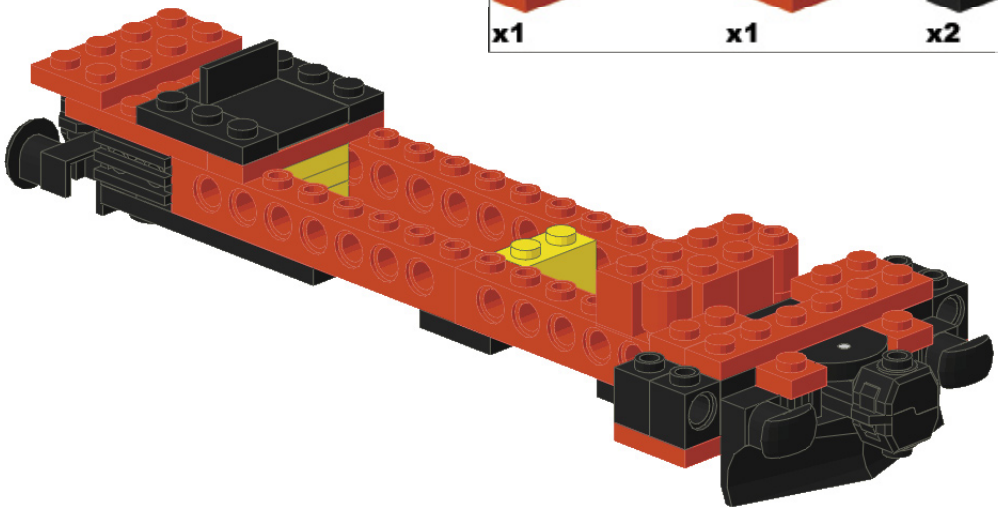

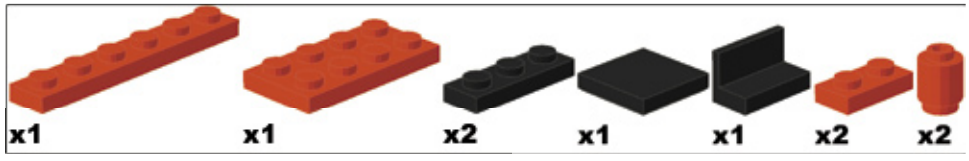

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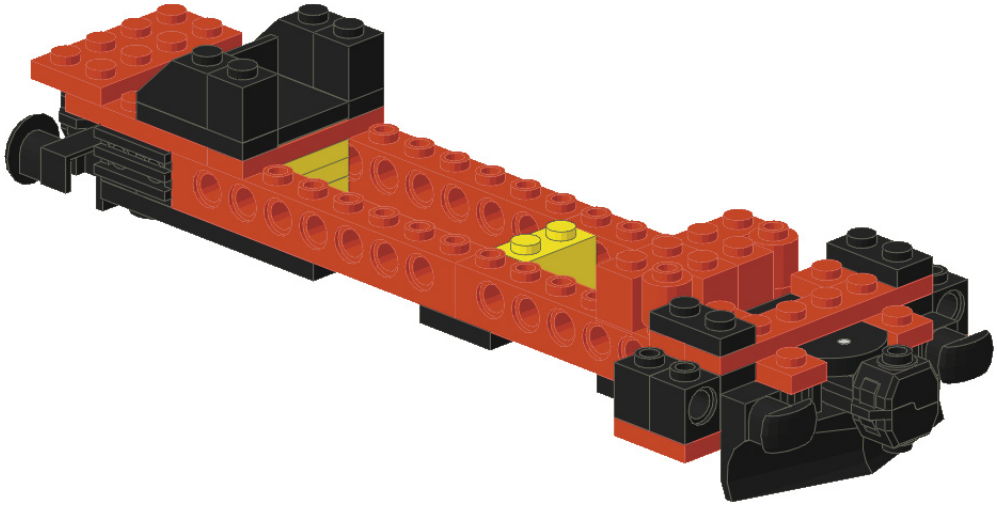

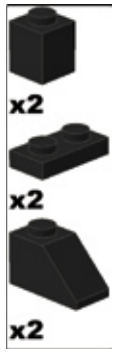

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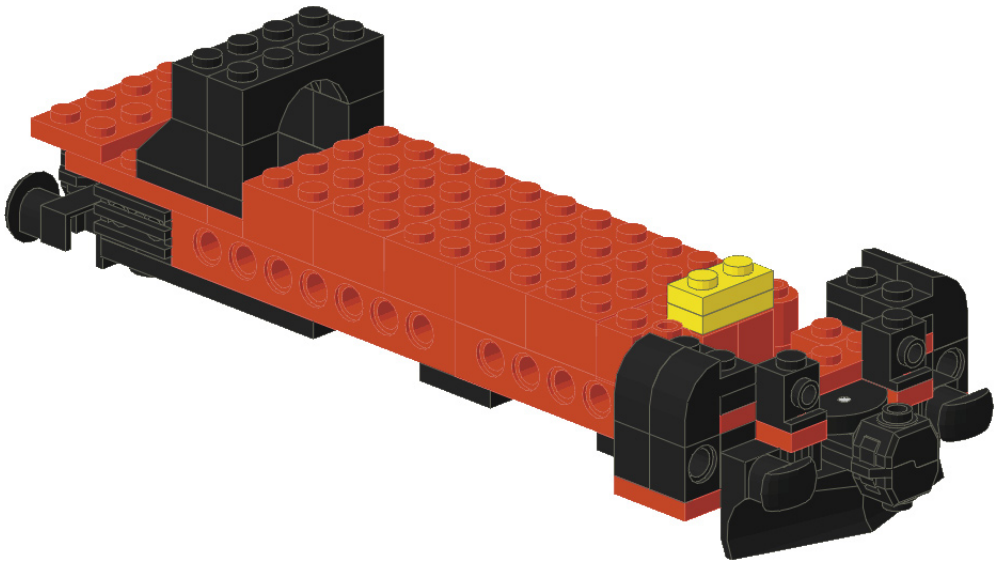

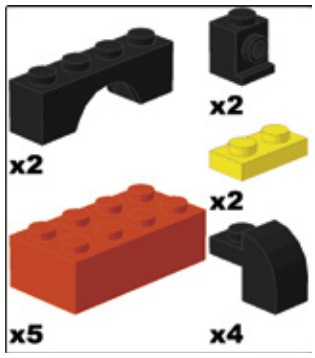

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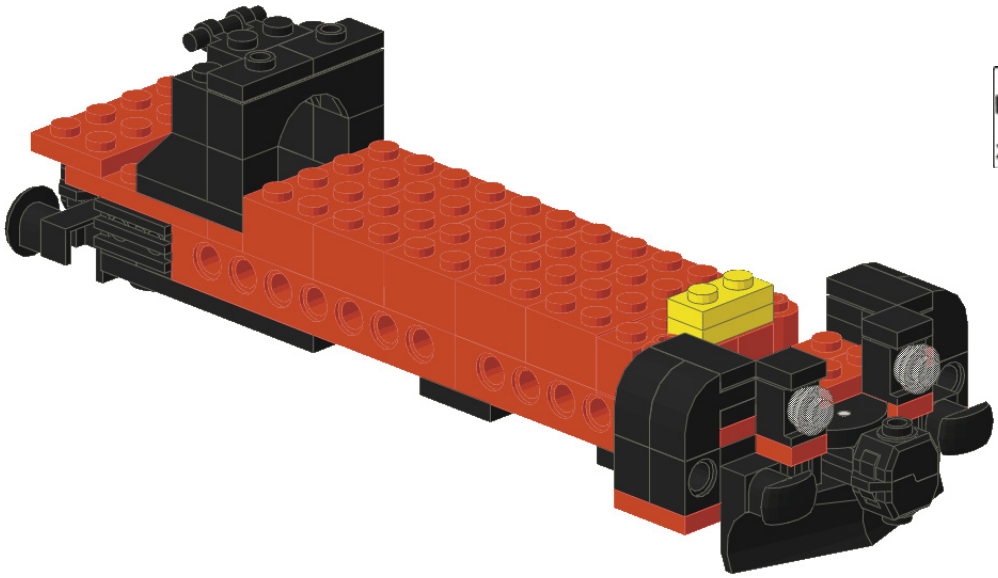

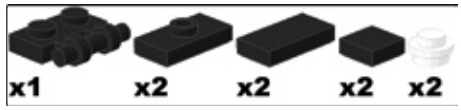

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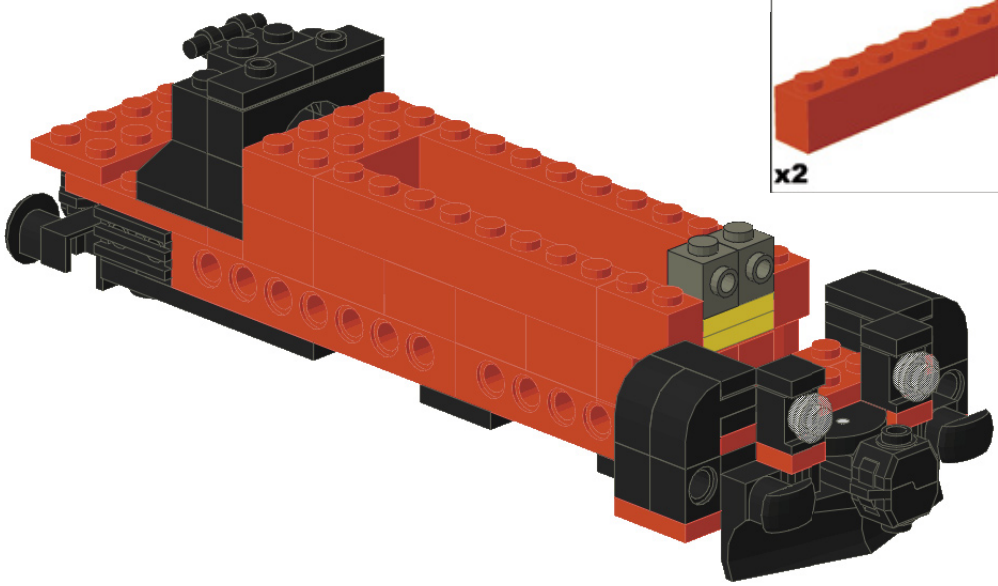

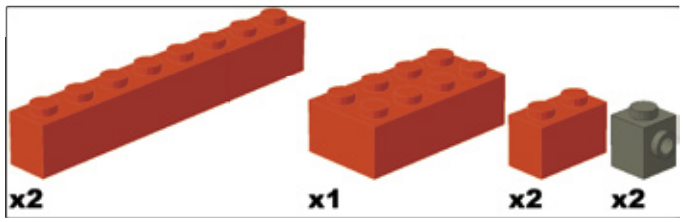

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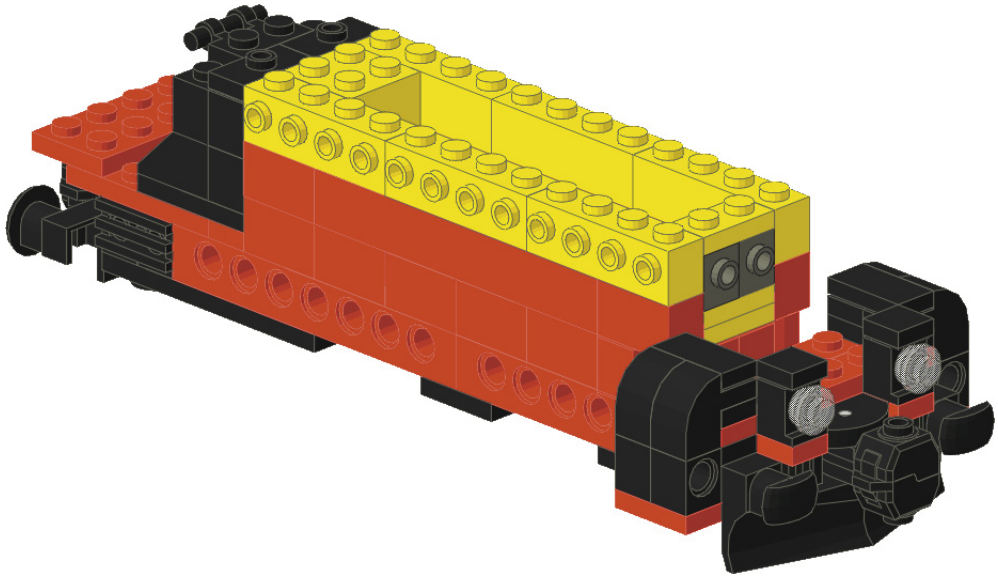

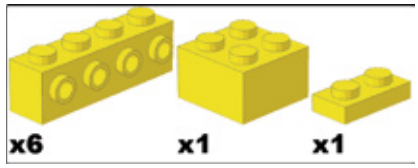

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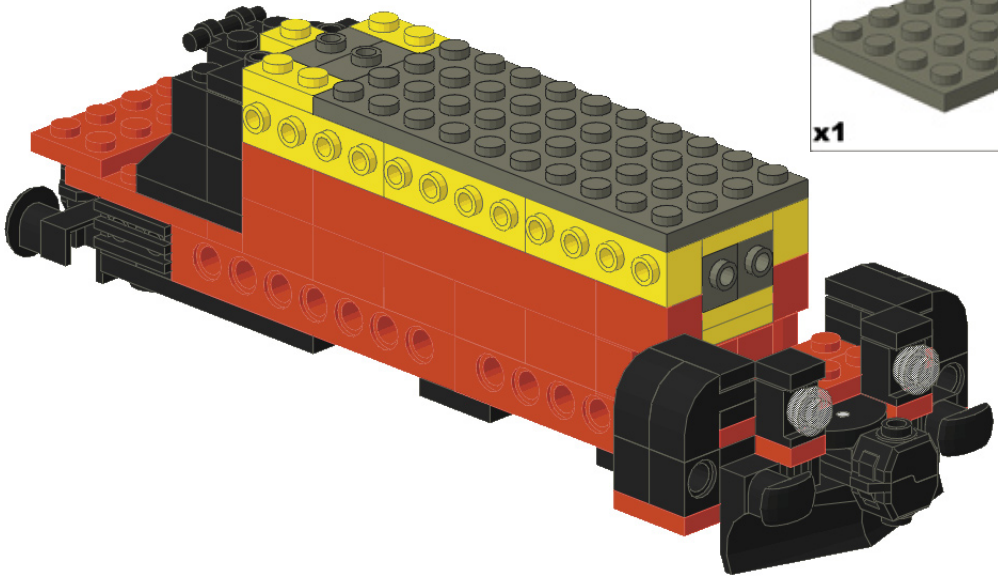

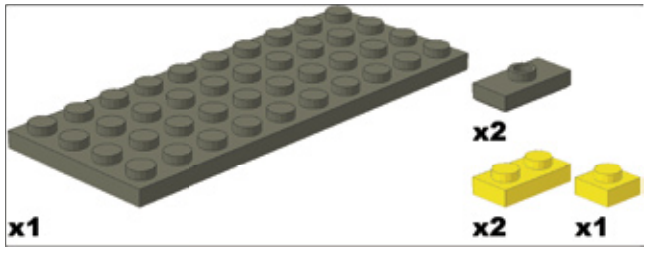

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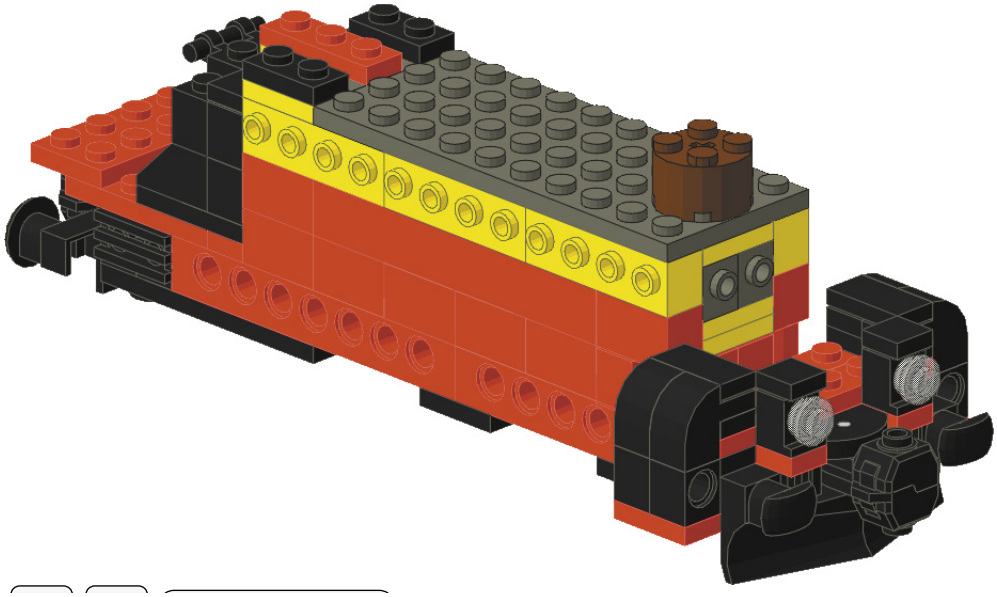

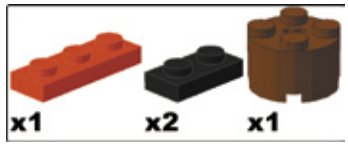

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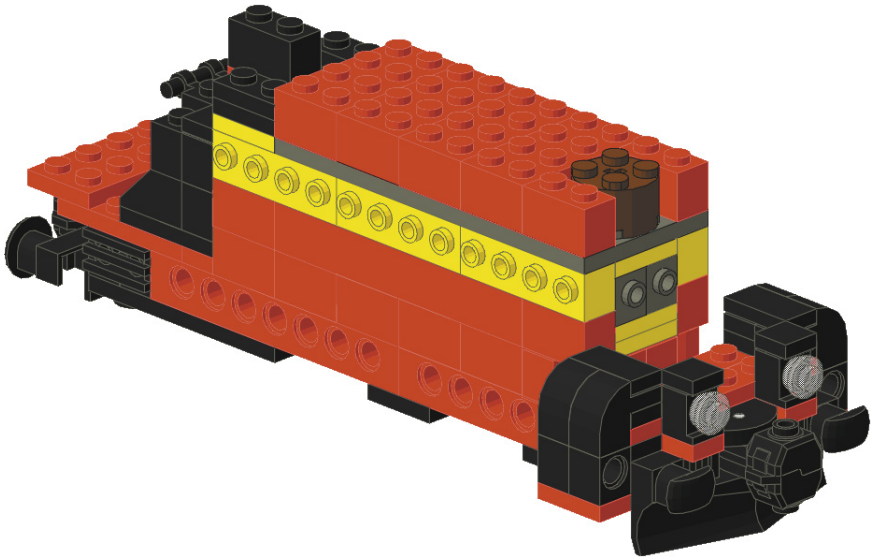

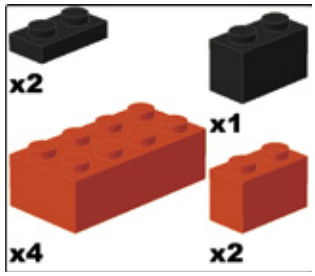

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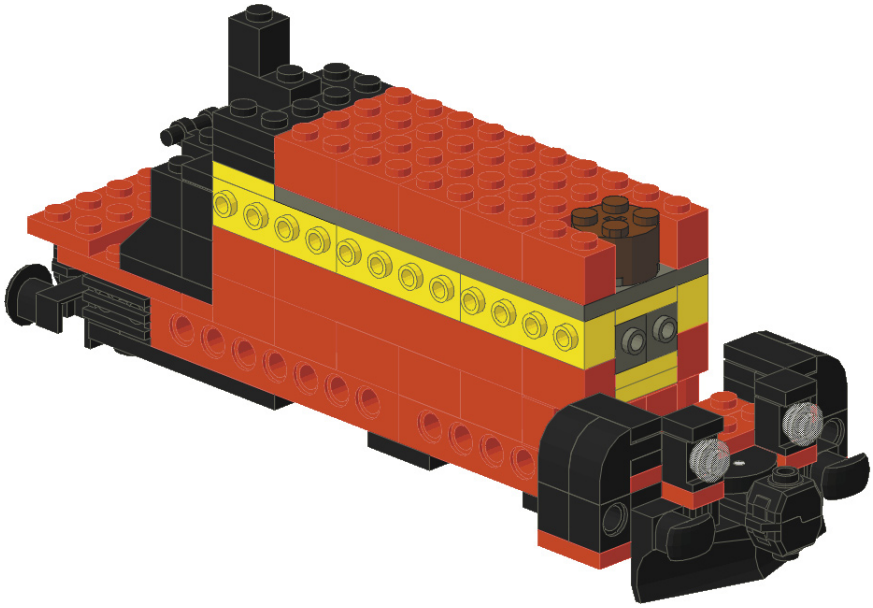

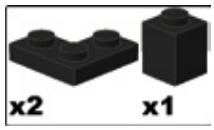

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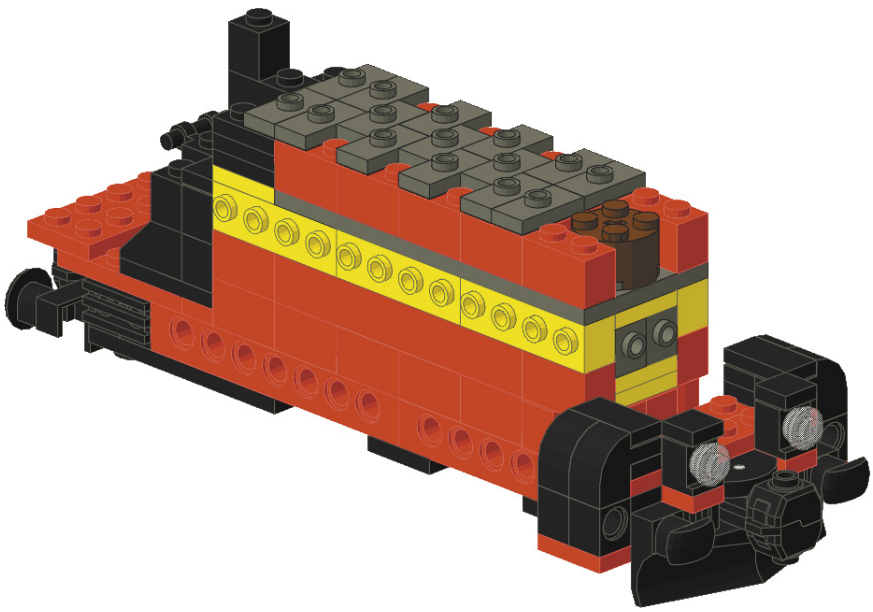

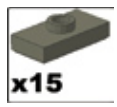

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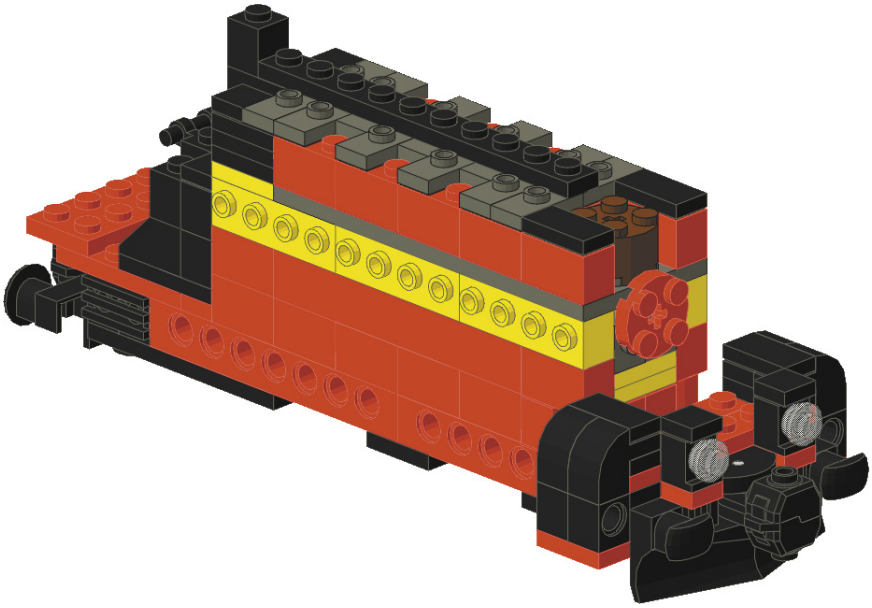

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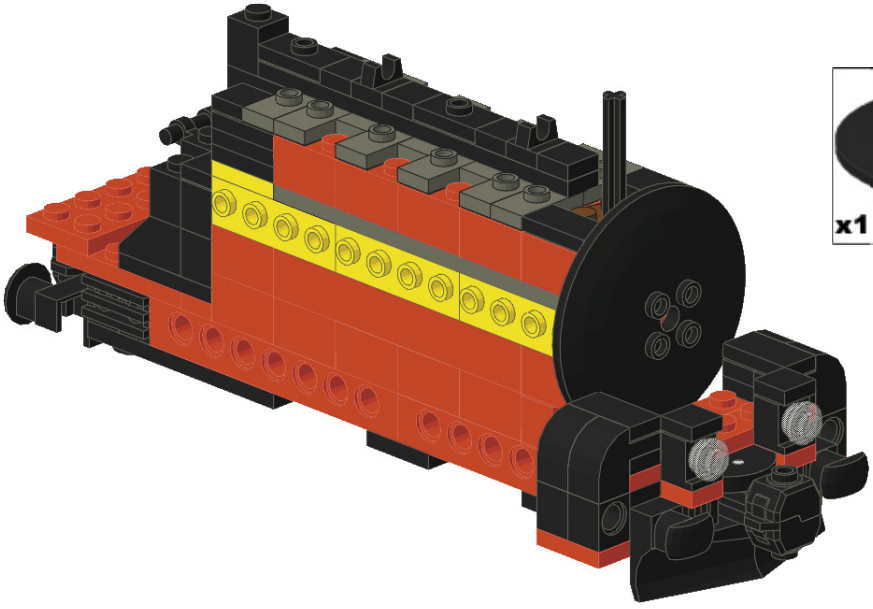

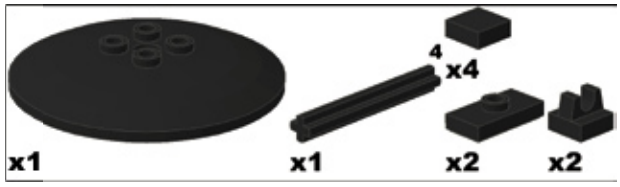

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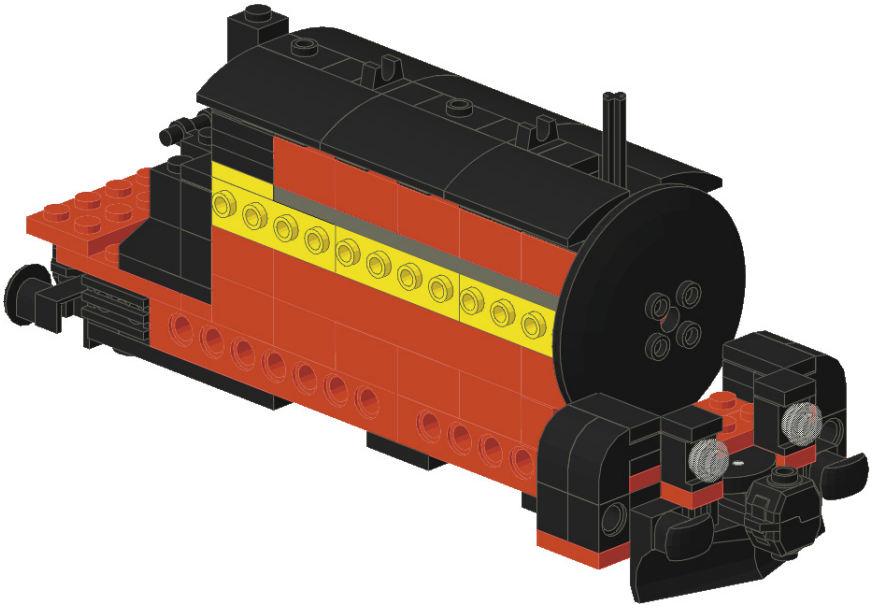

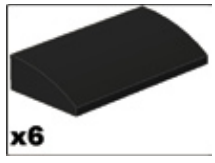

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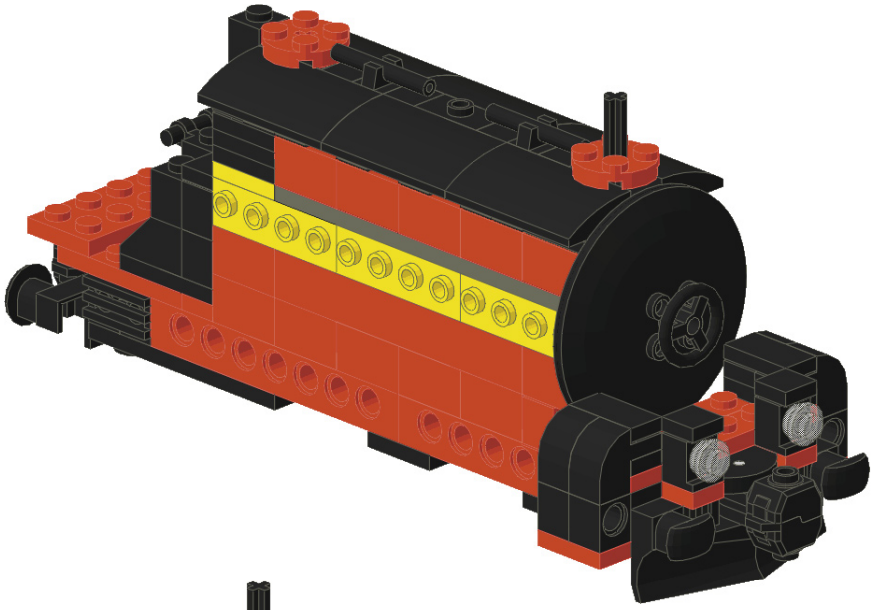

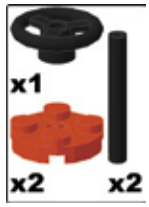

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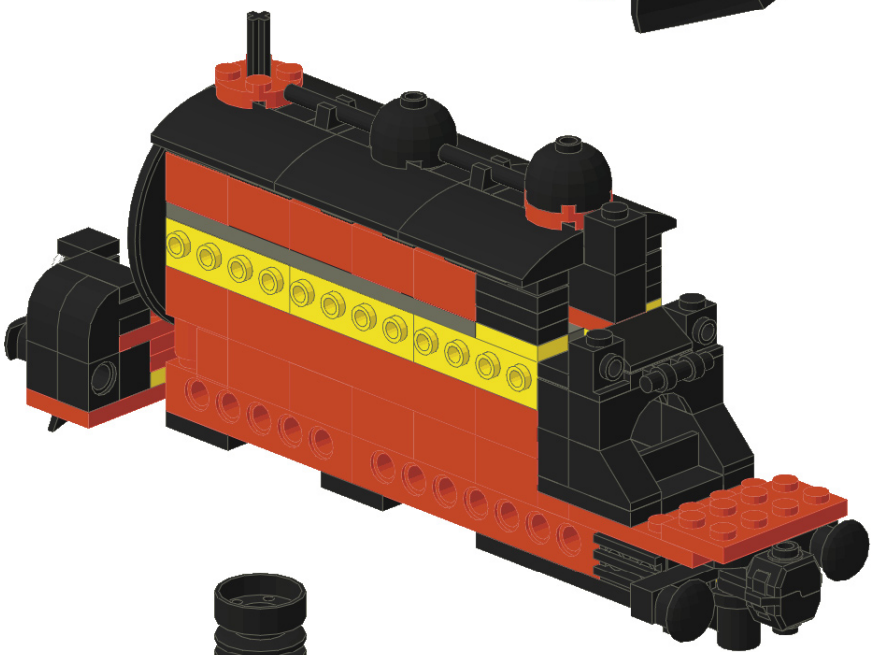

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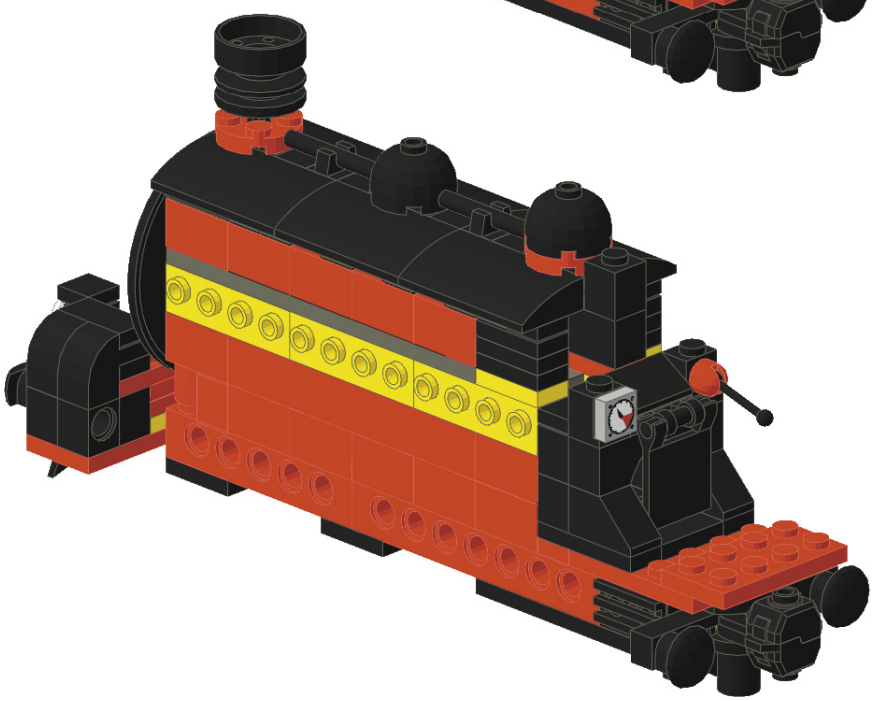

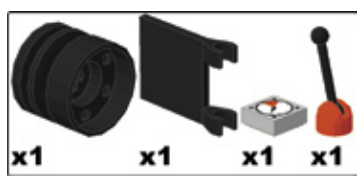

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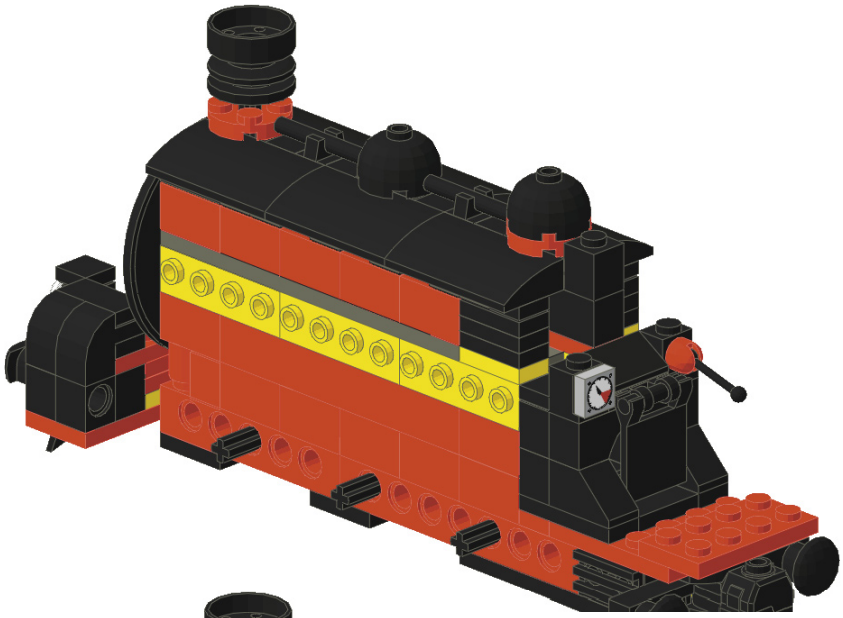

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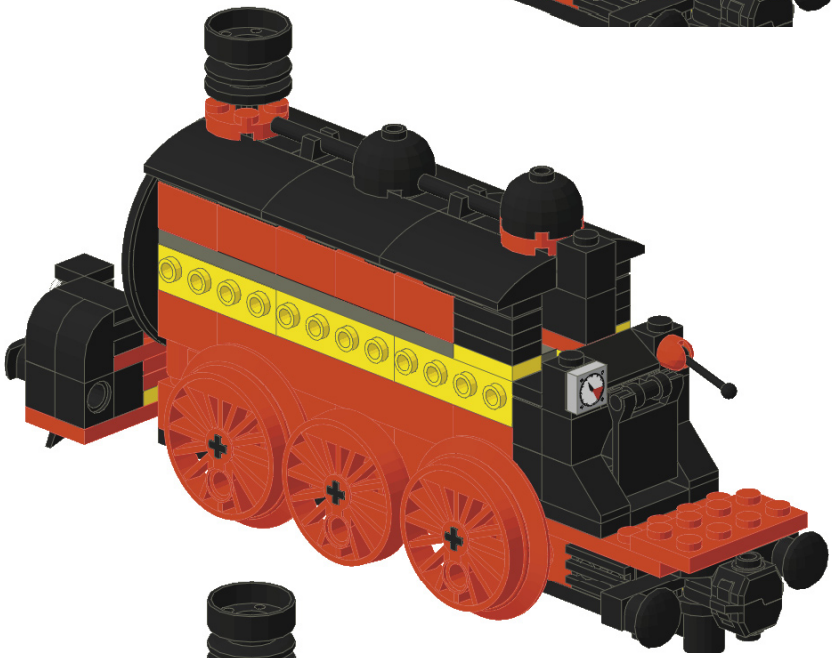

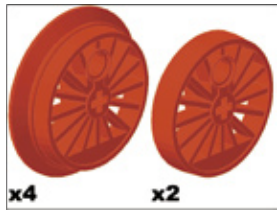

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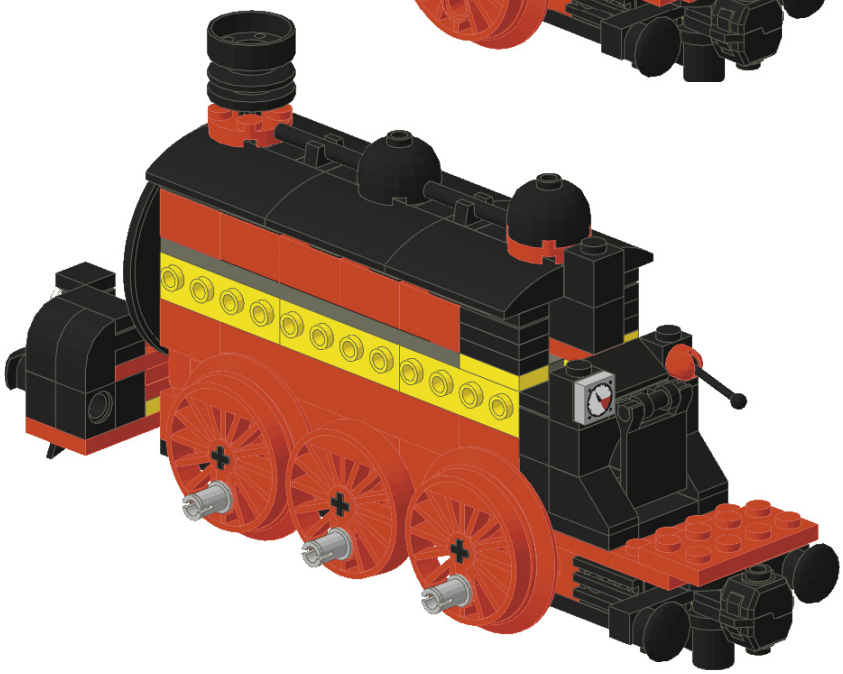

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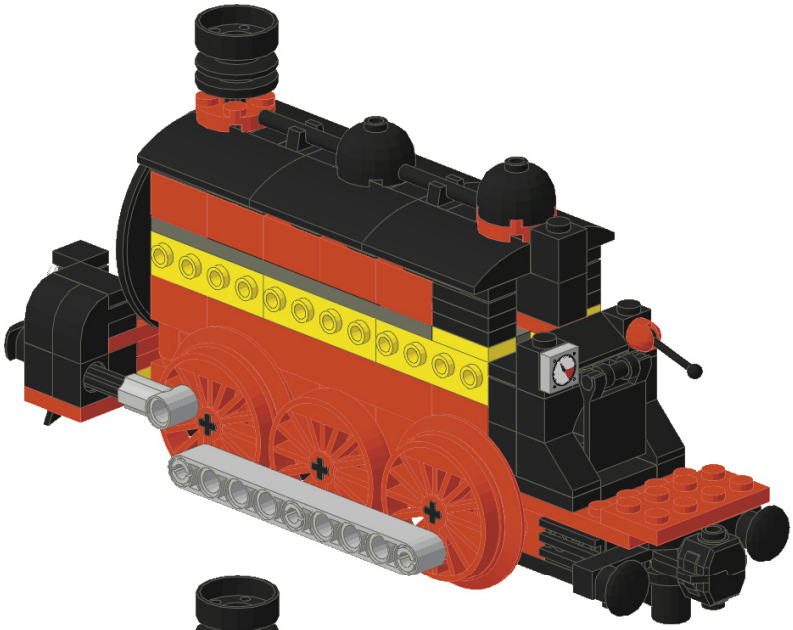

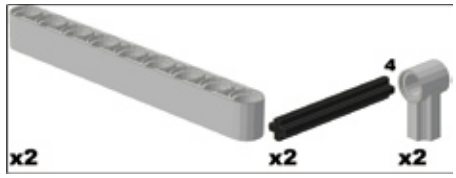

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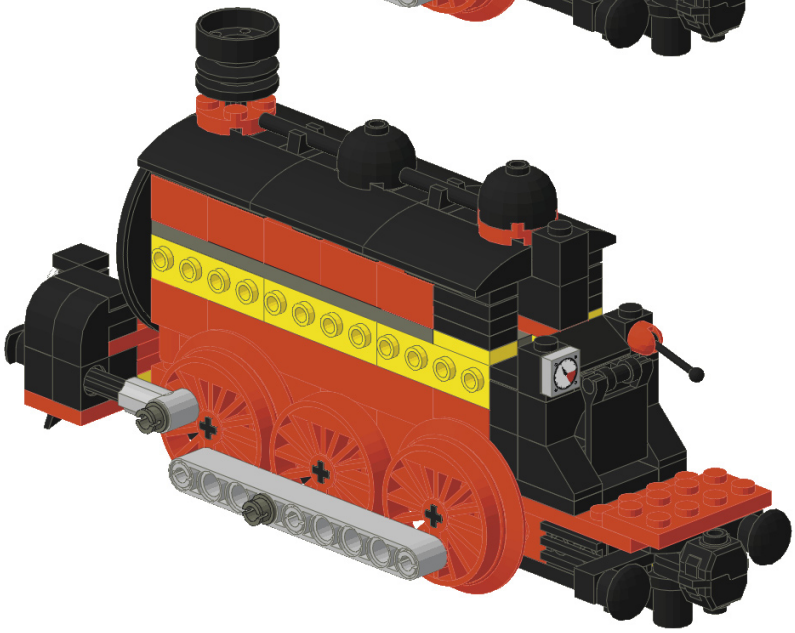

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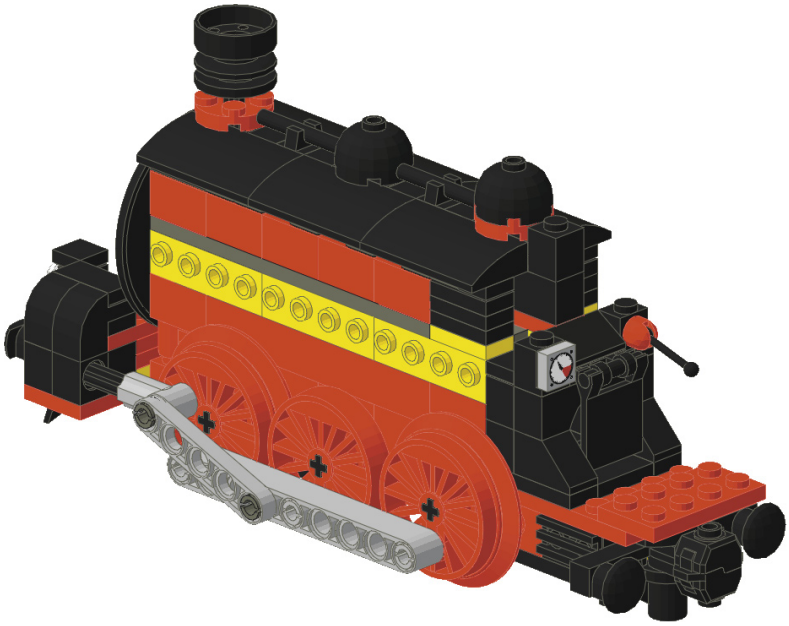

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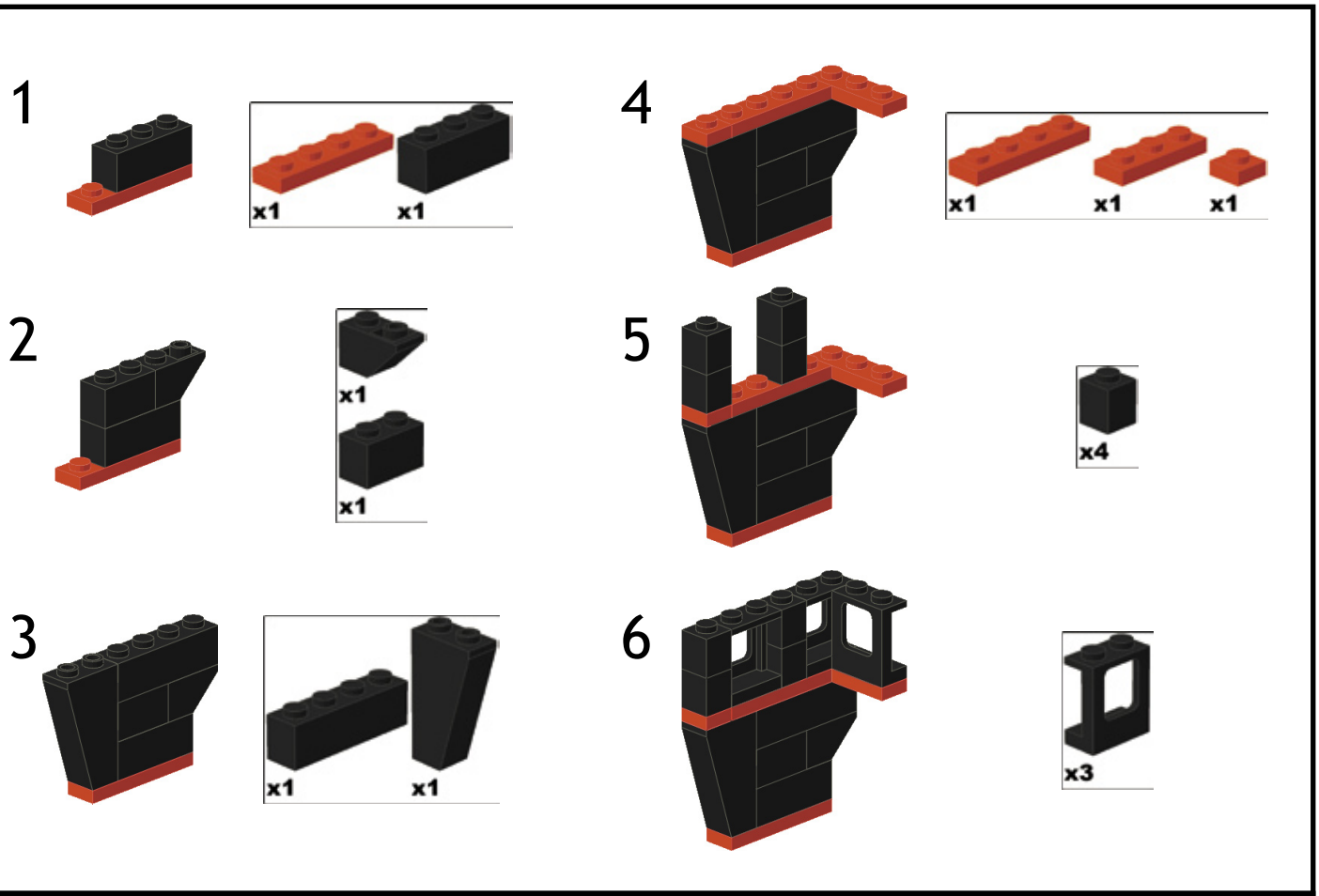
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x1
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x1
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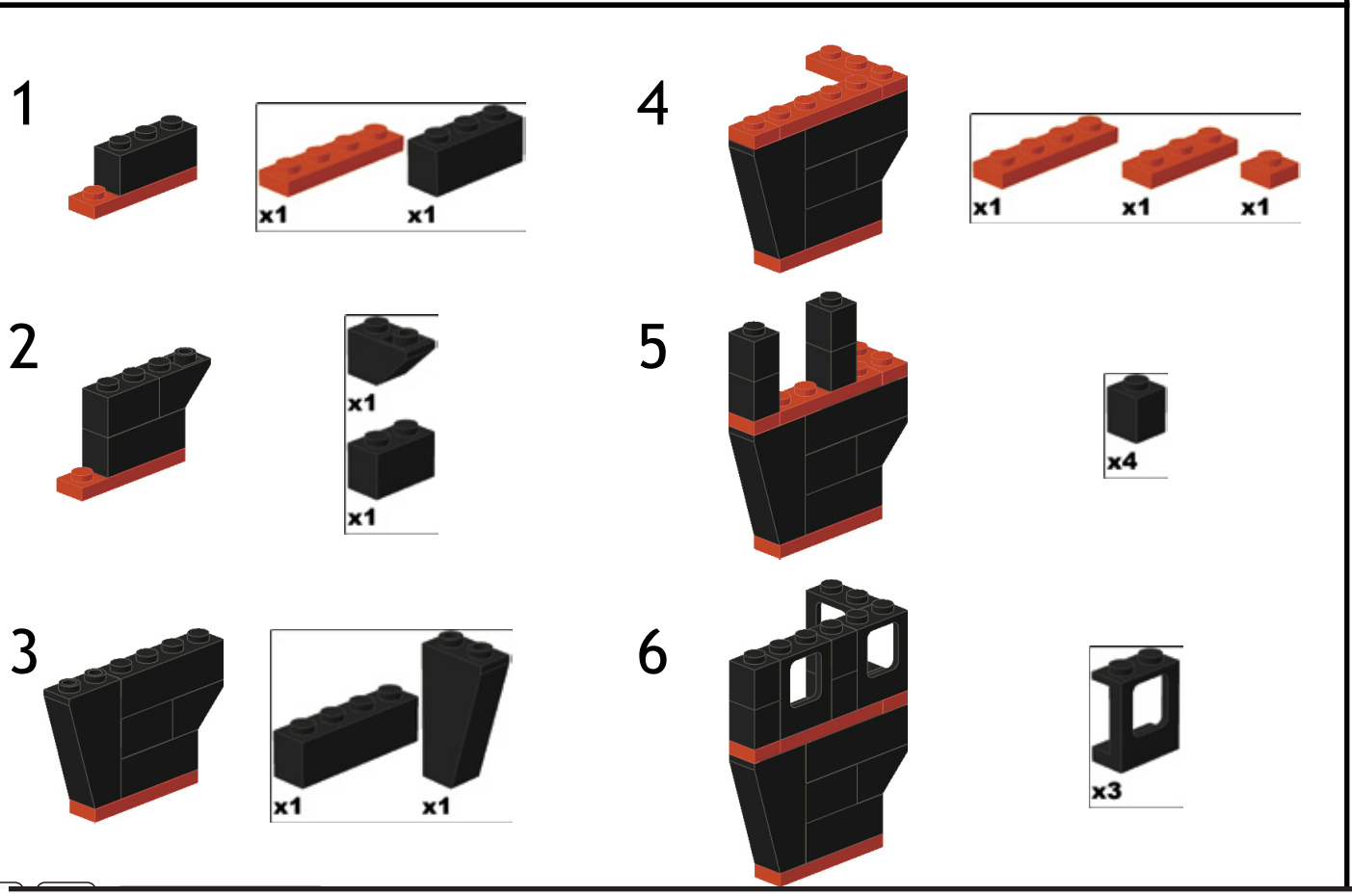
x1
x1
5
x4
6
x3


1
x1
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2
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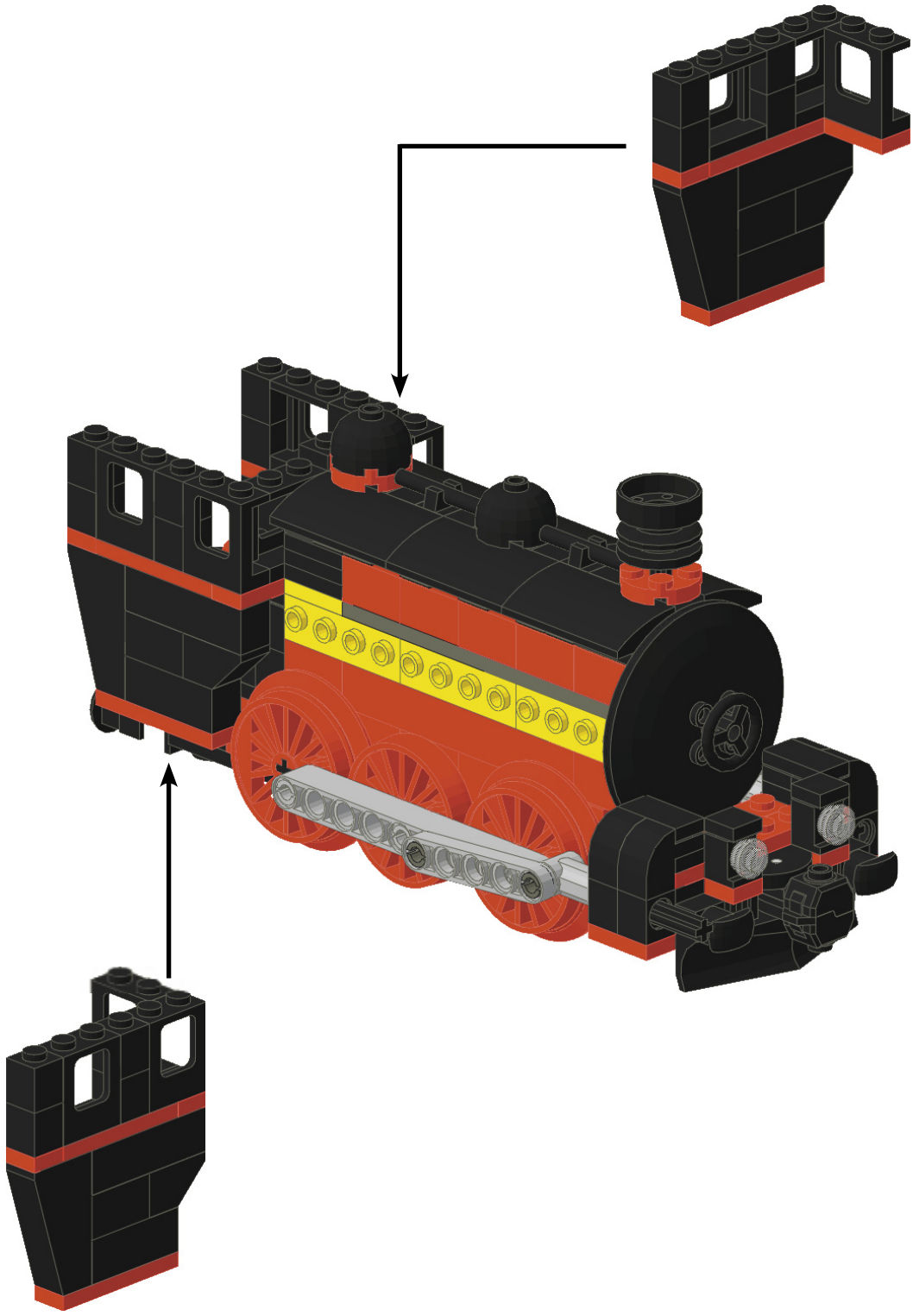

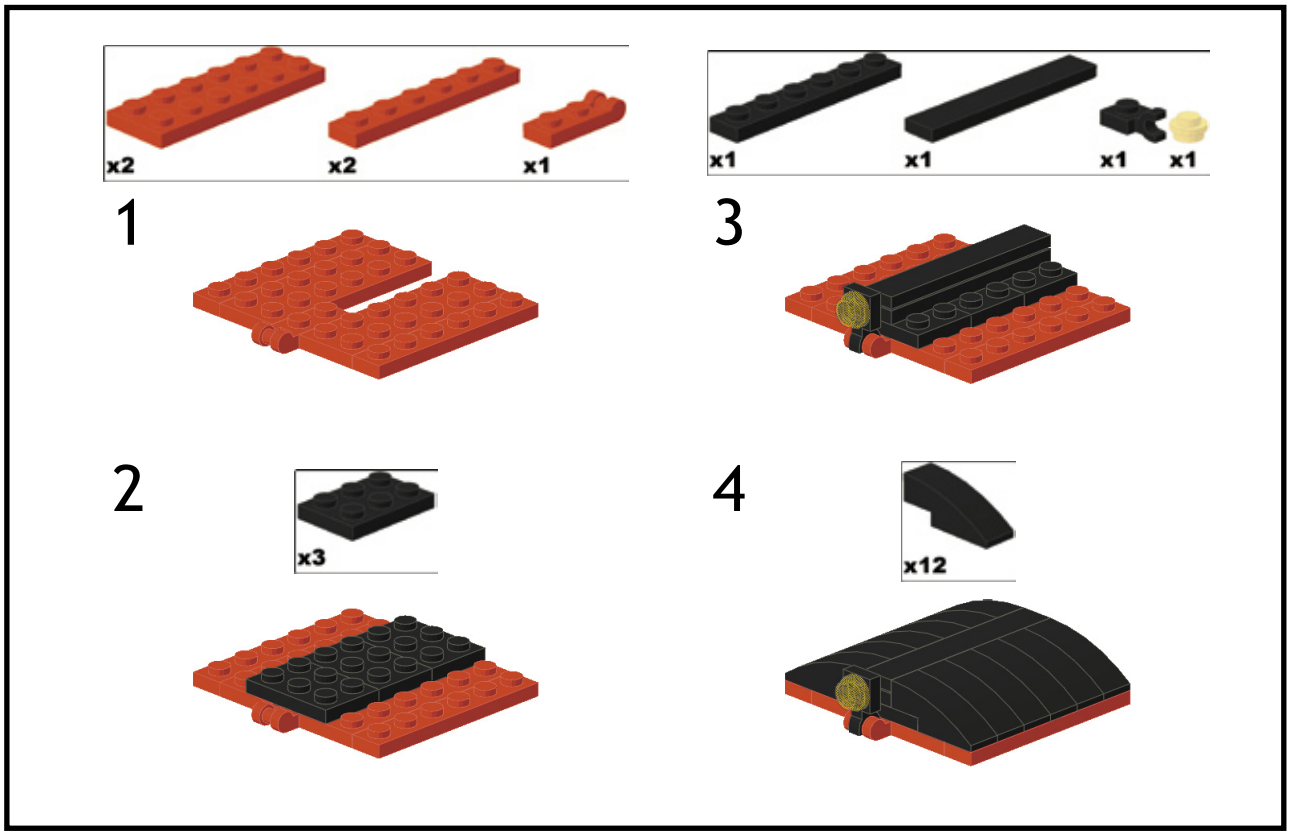

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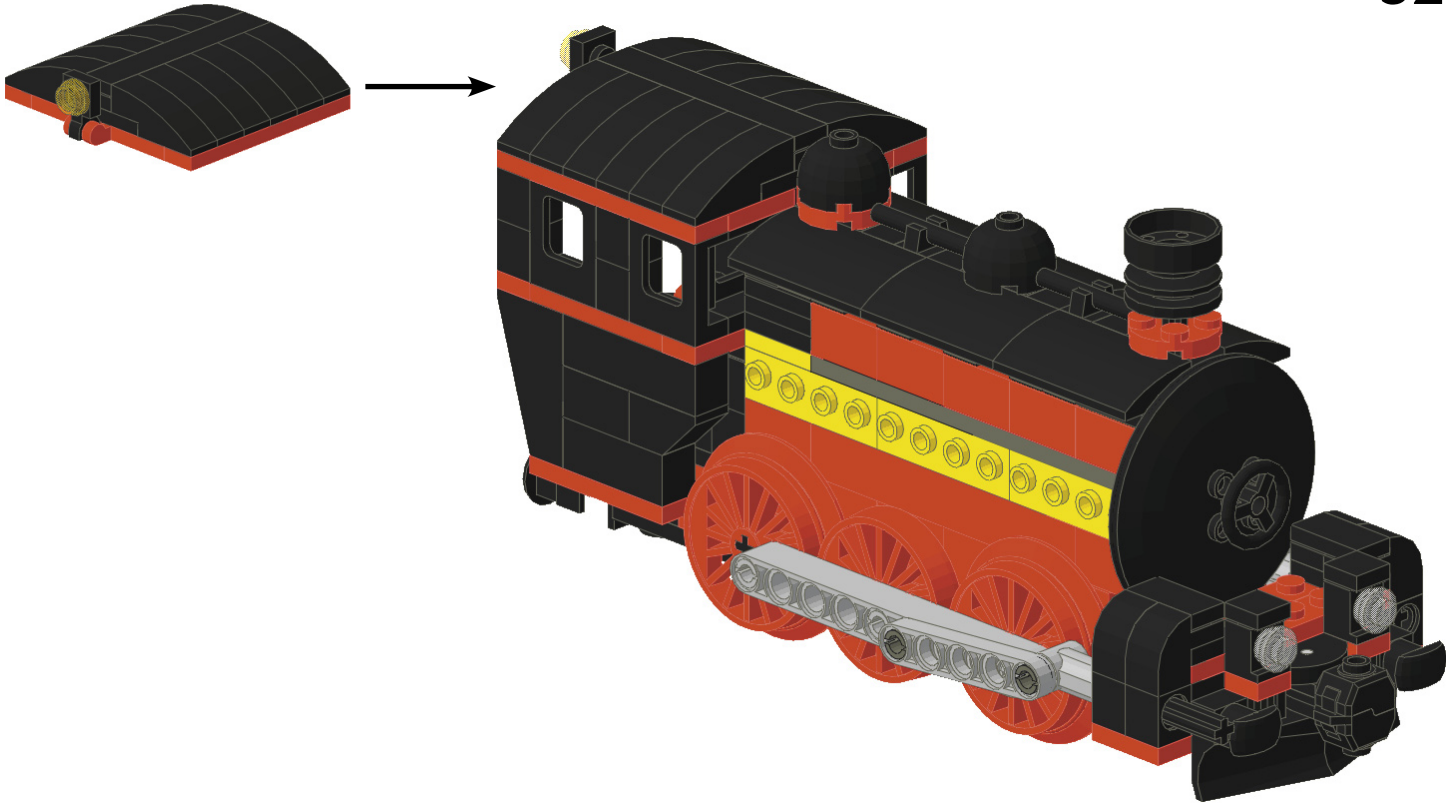

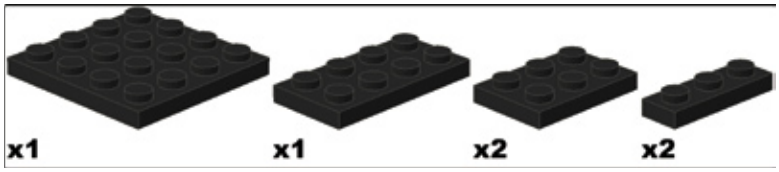

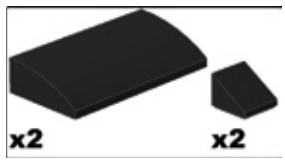

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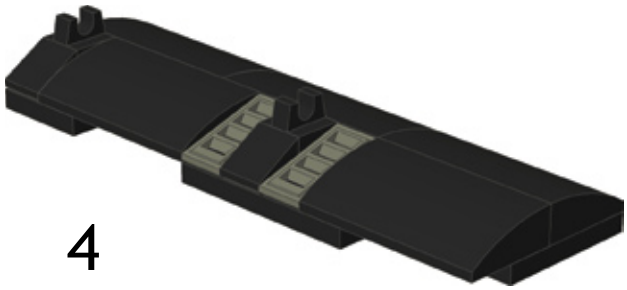

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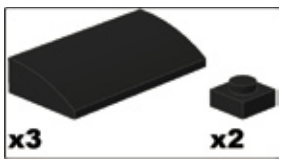

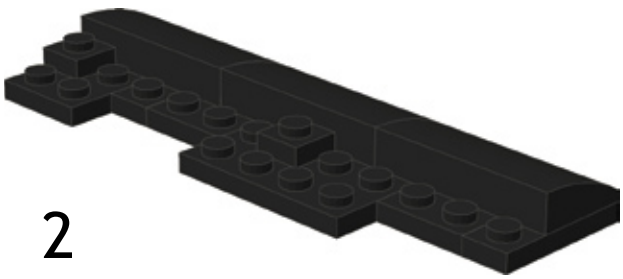

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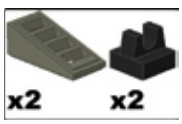

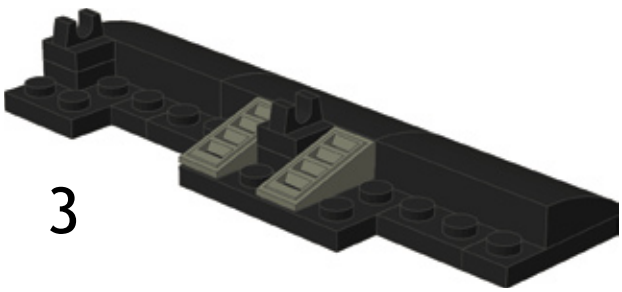

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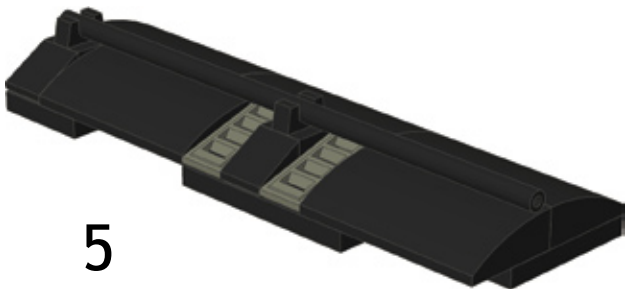

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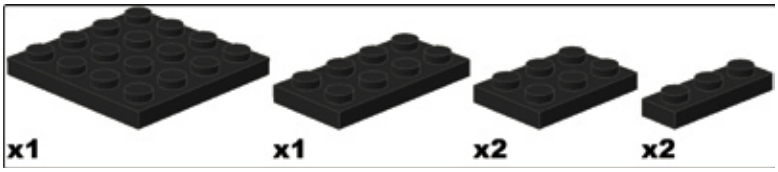

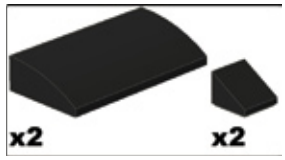

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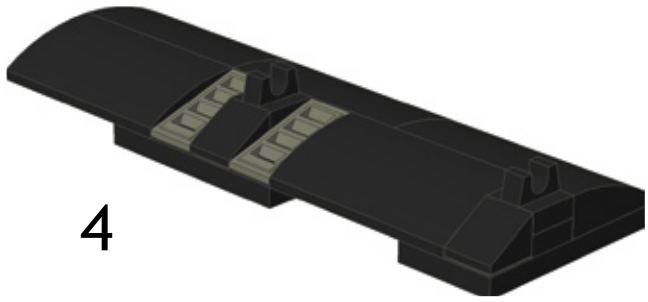

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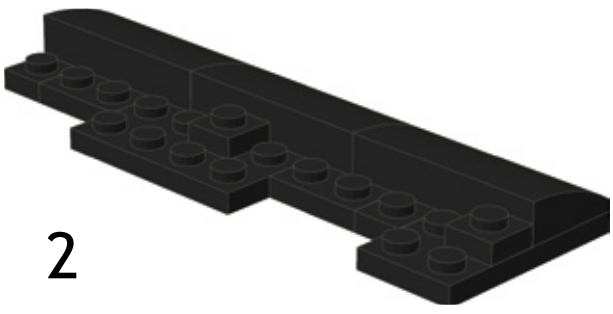

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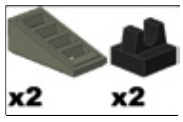

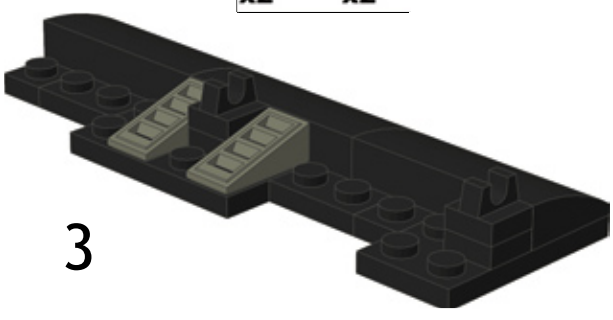

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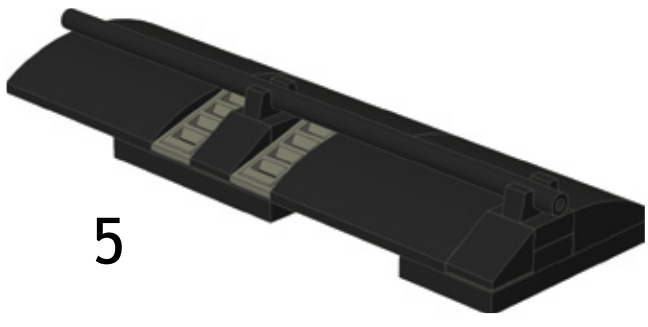

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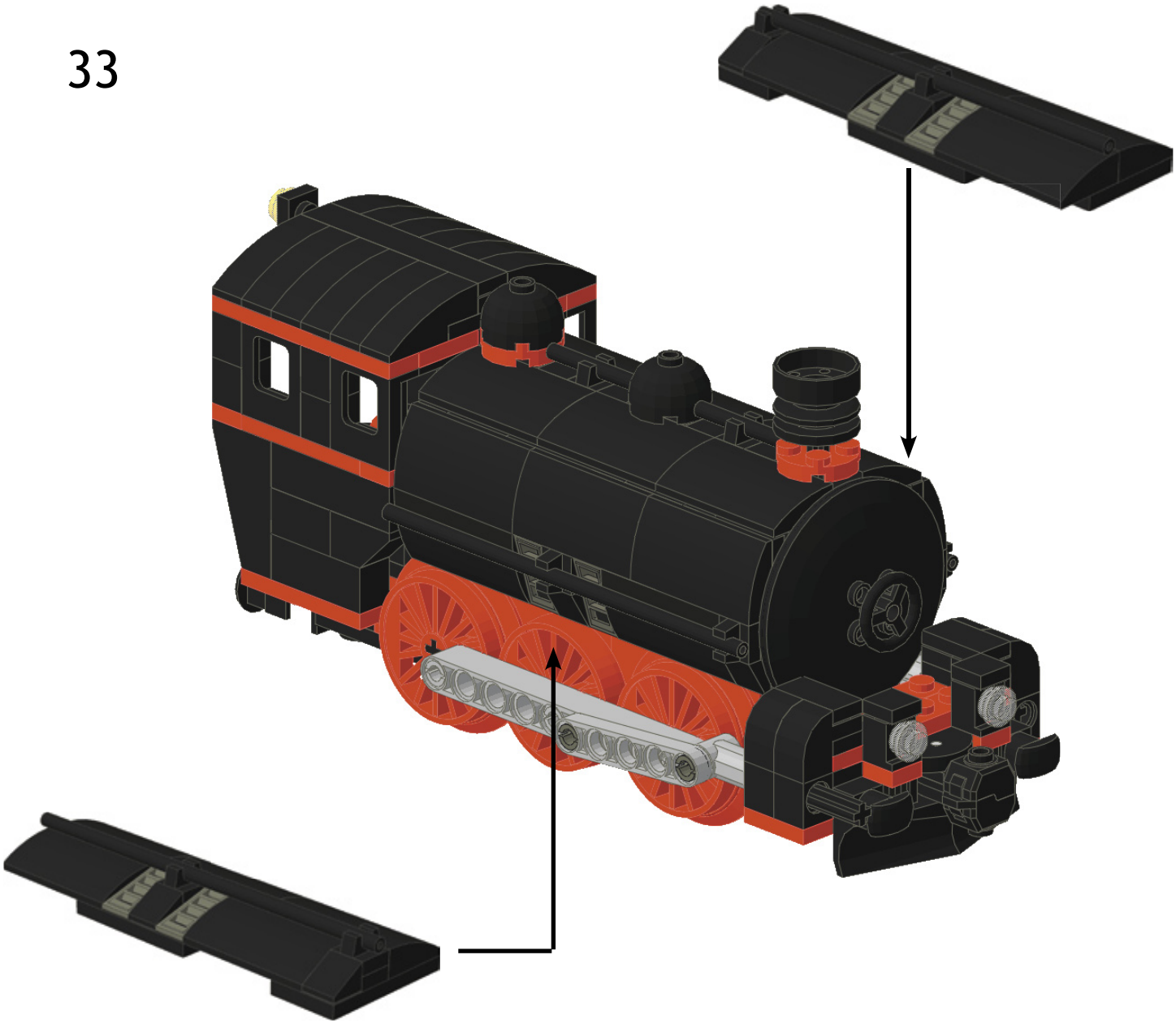

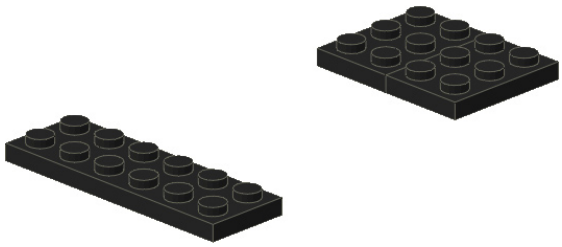

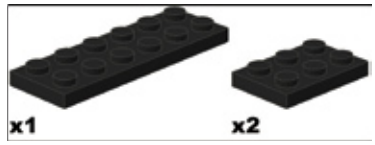

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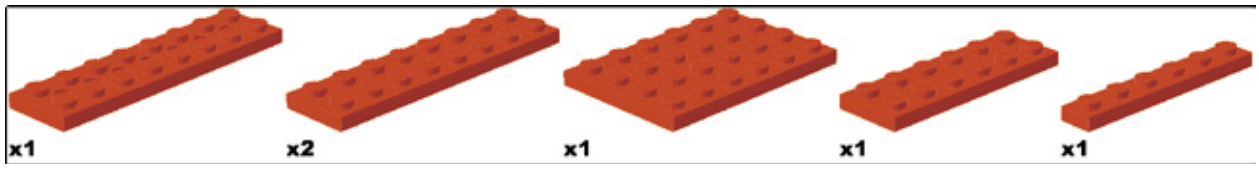

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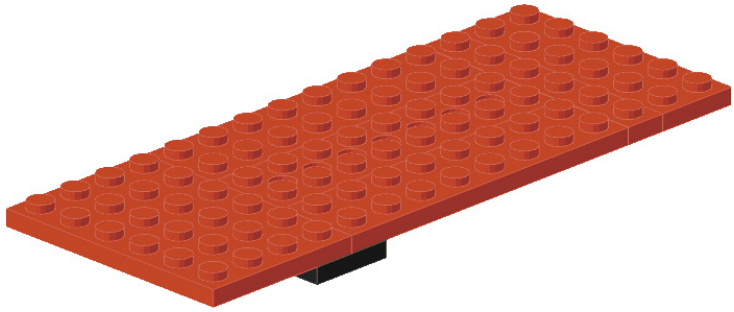

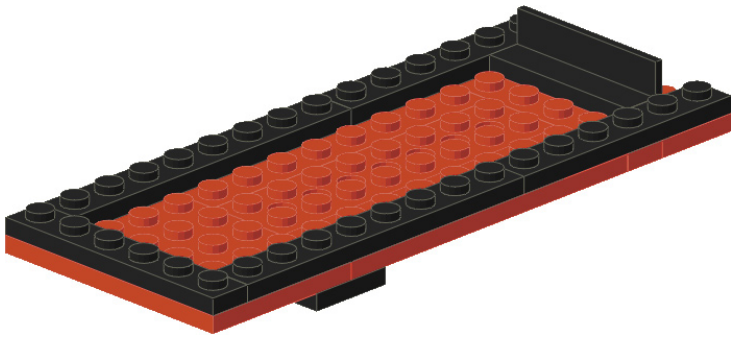

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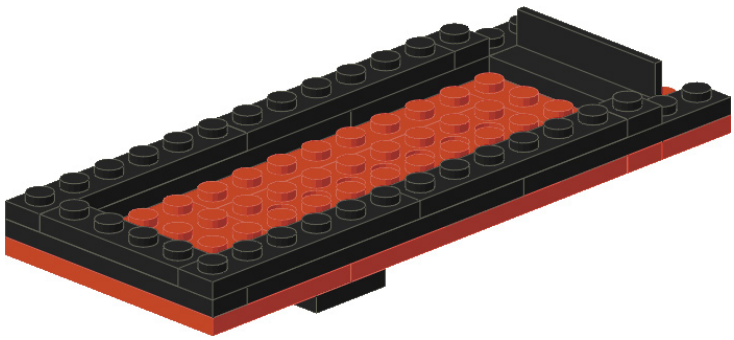

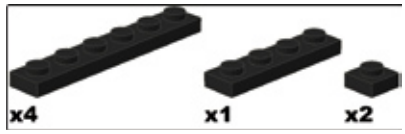

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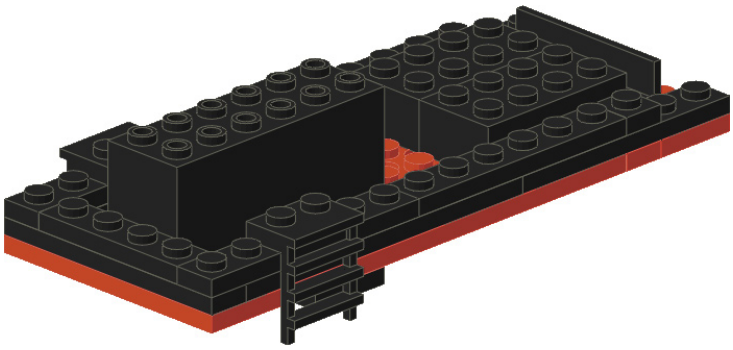

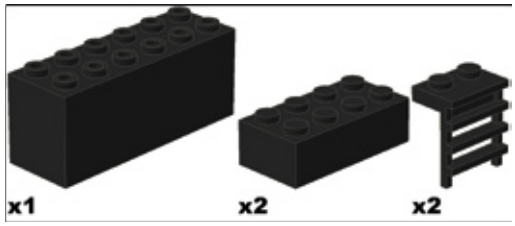

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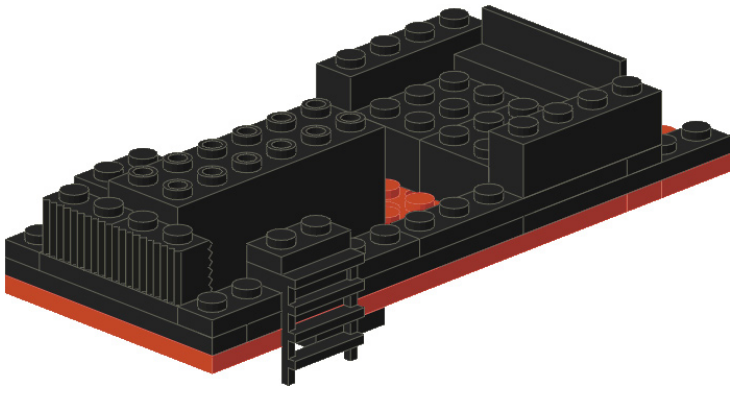

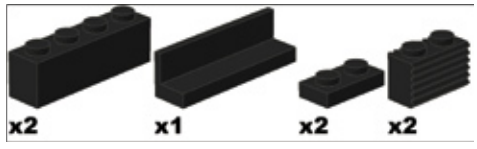

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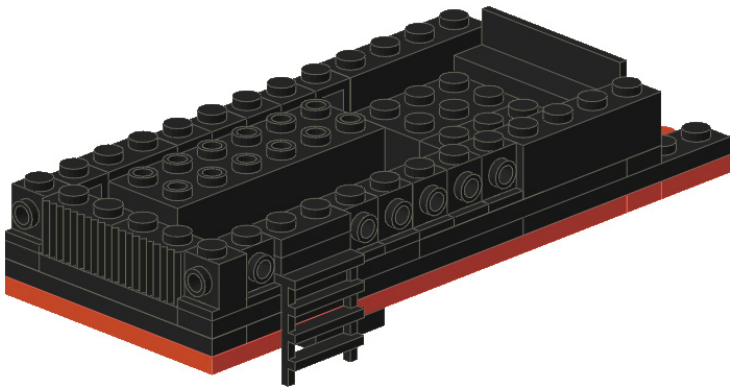

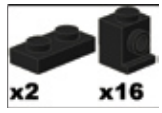

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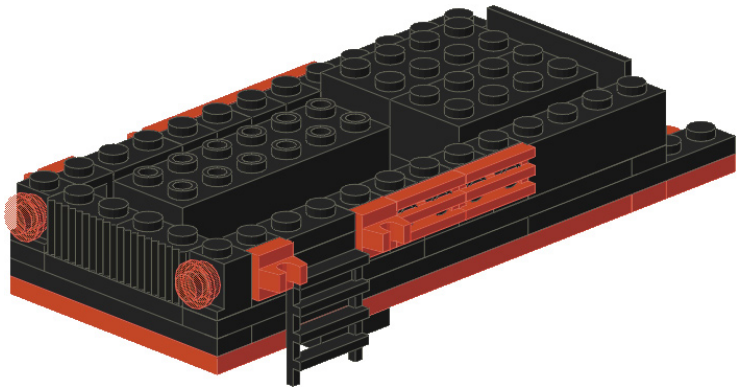

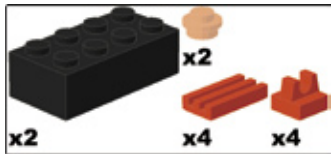

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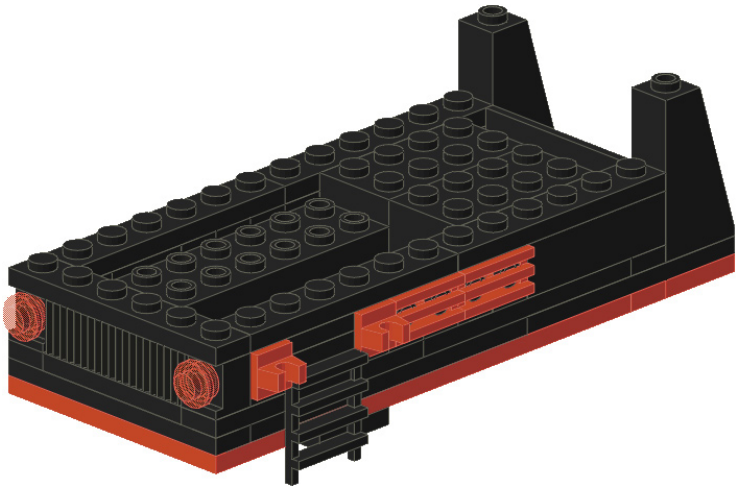

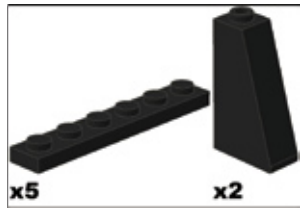

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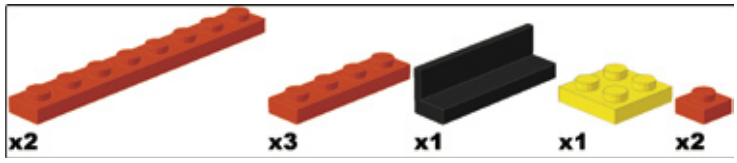

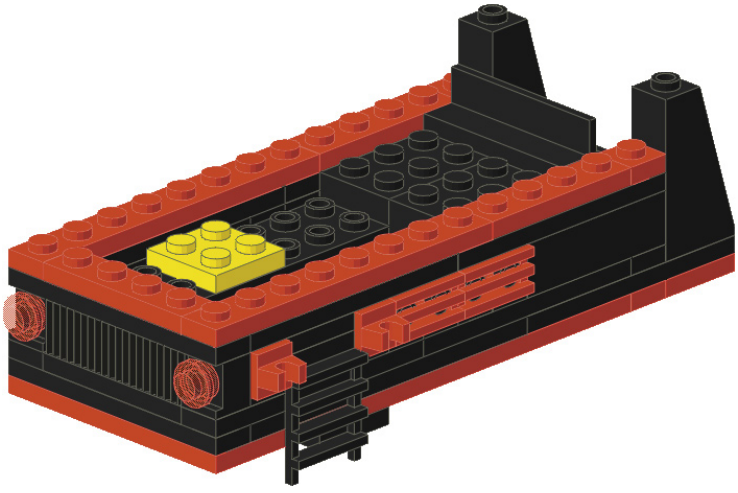

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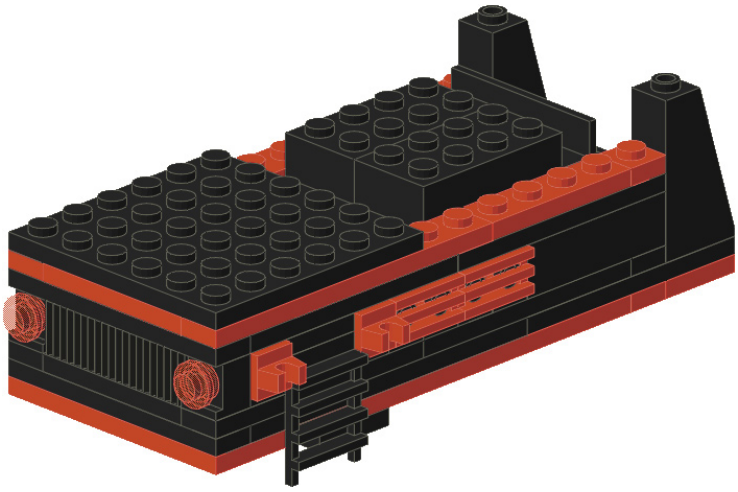

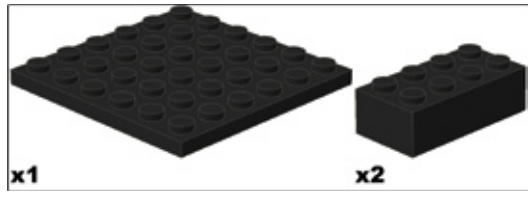

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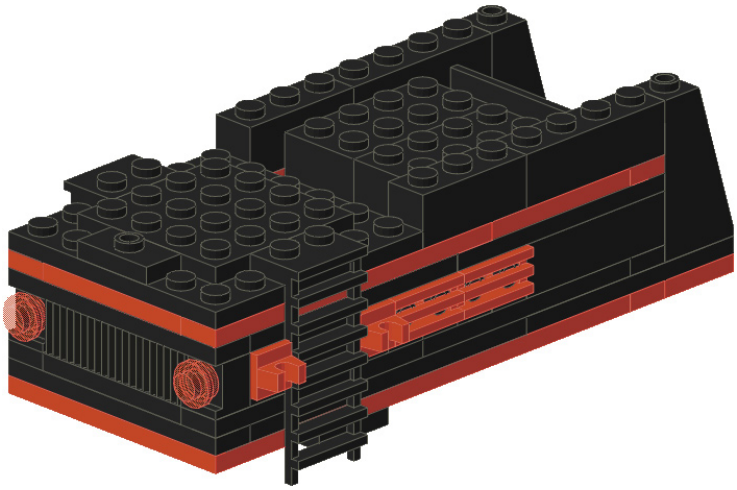

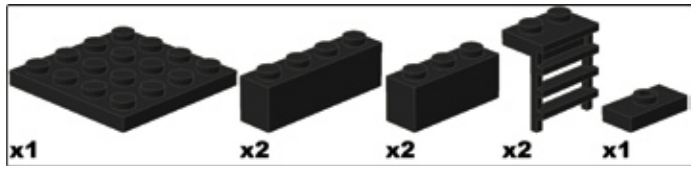

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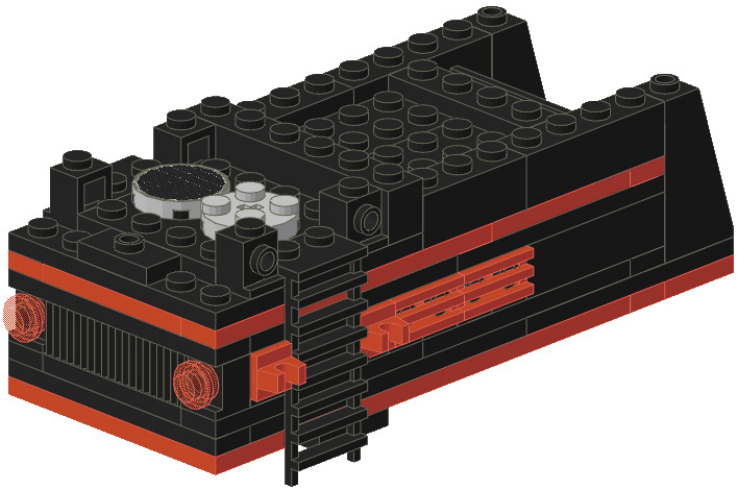

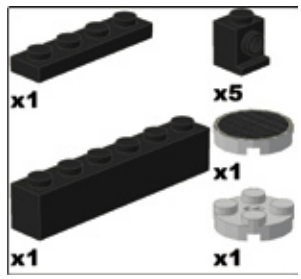

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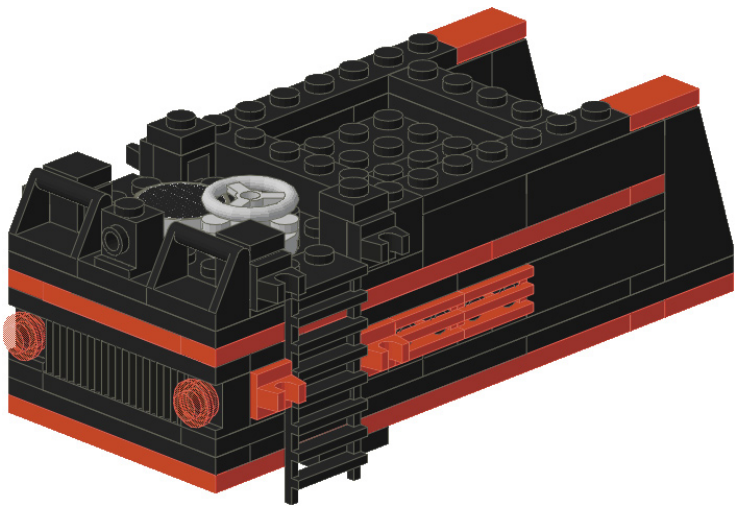

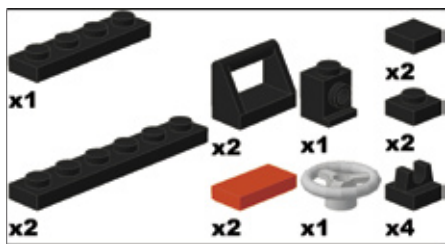

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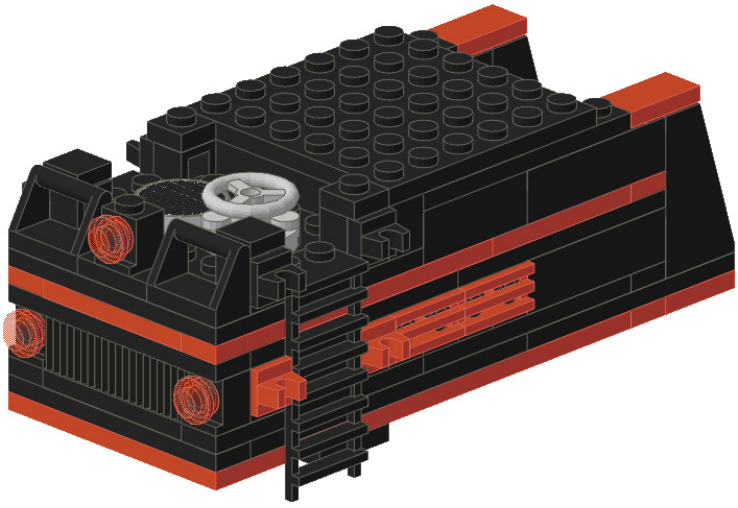

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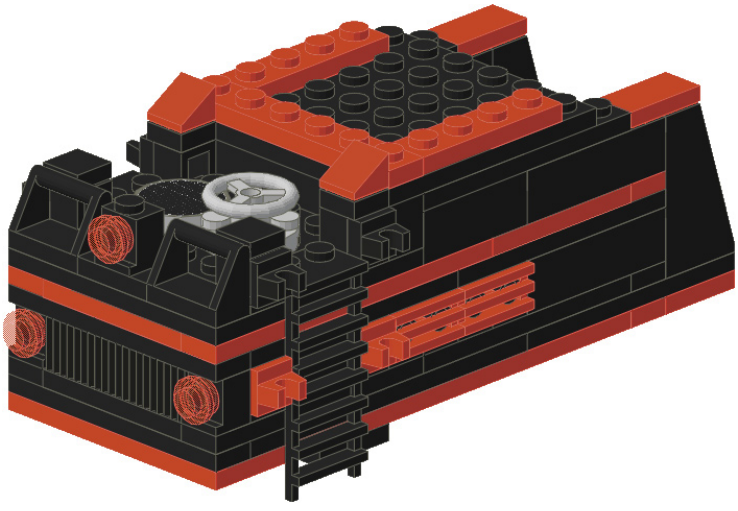

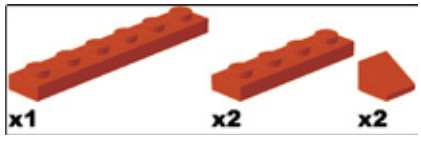

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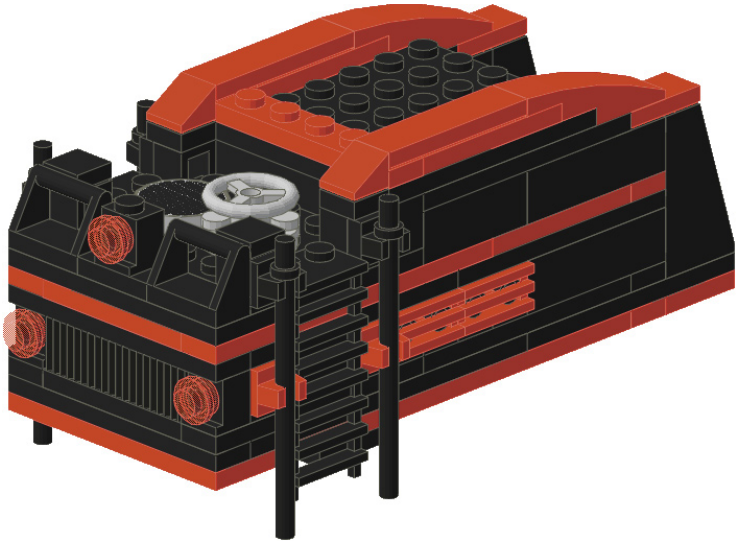

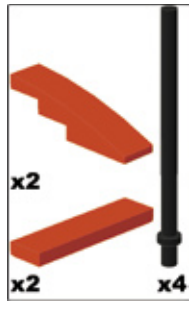

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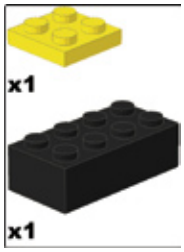

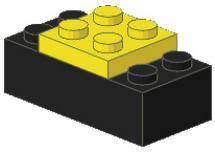

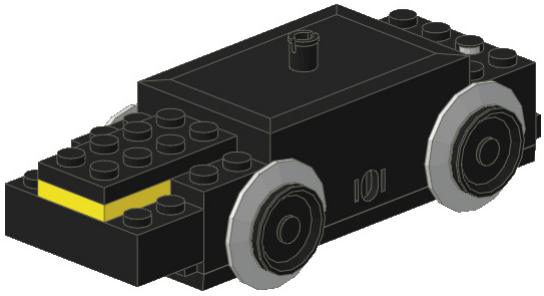

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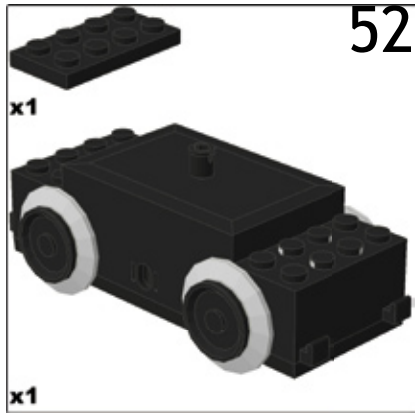

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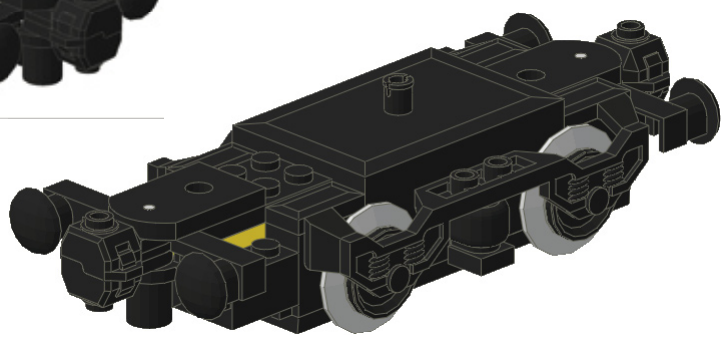

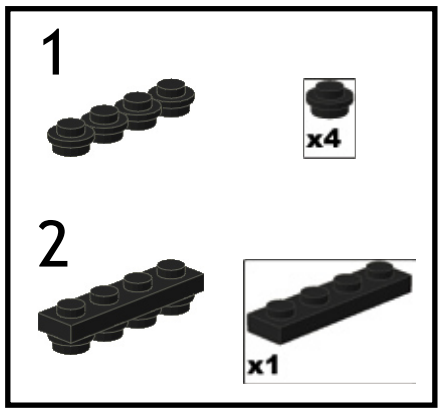

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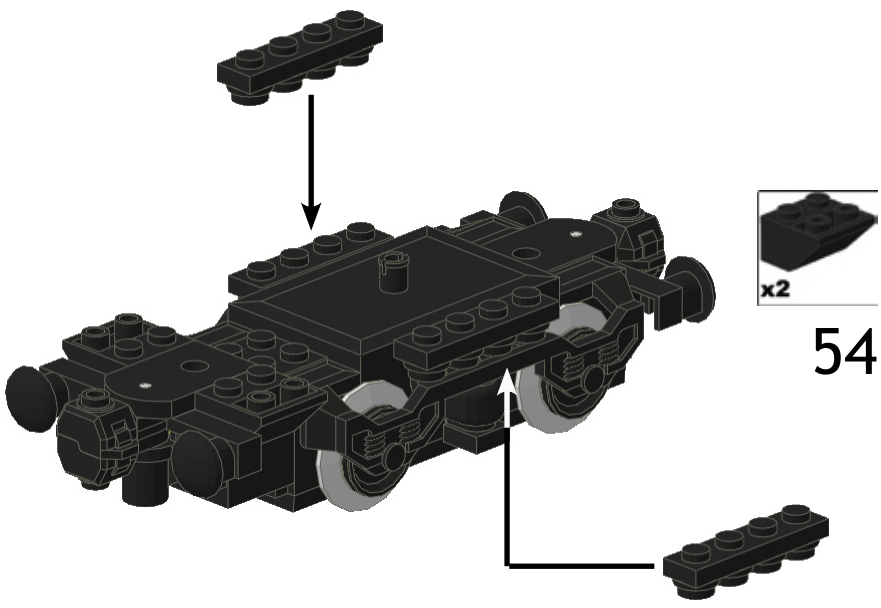

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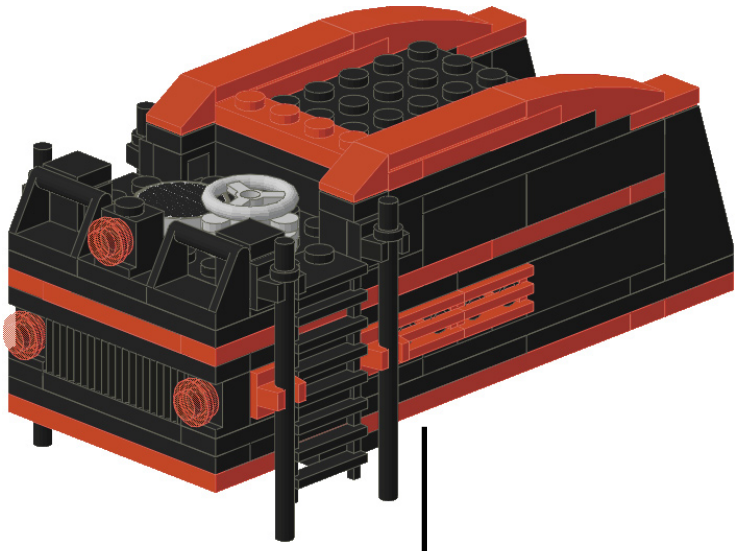

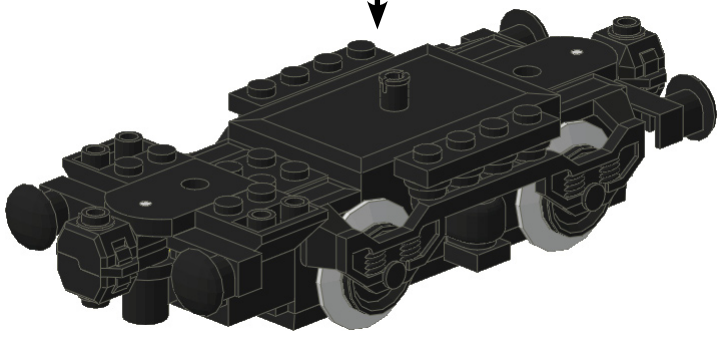

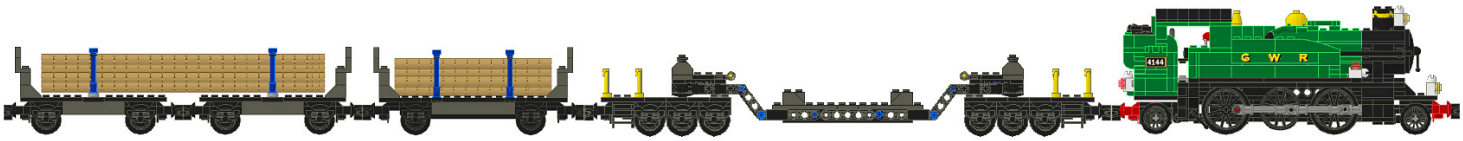

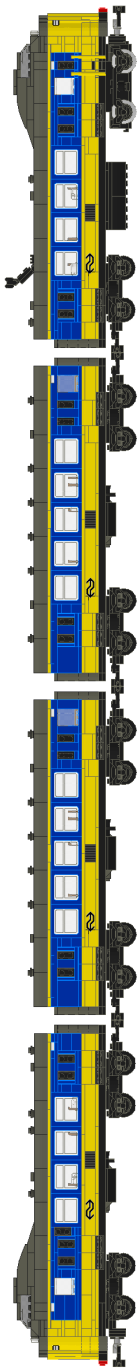

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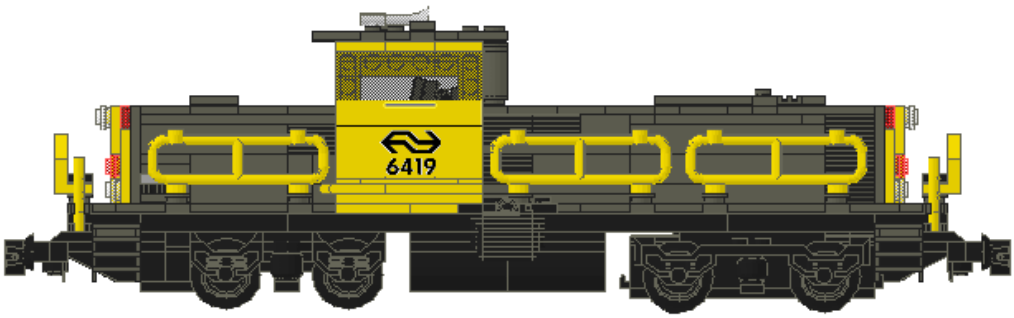
Over 30 models

All wagons and carriages for 9V, 12V or RC



Engines for 9V/12V and some for RC

RC turntable and 9V/RC pneumatic switchpoints.

Sets complete with all parts, stickered box, colourfull building instruction (mostly printed, some on CD), list of parts and stickers/decals. All models also available without parts.

For Lego © technic/pneumatic fans: e.g. high quality pneumatic hose in 13 colours and pneumatic compressors.

Most models extra economical for buyers from outside the European Community. No hidden shipping costs: they are showed before ordering. Shipping from the Netherlands.

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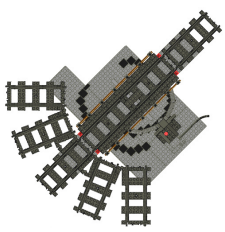

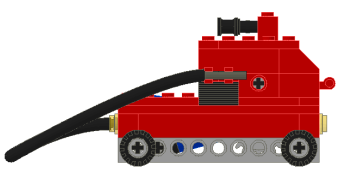

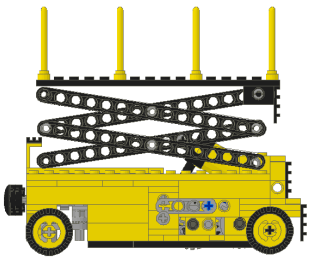

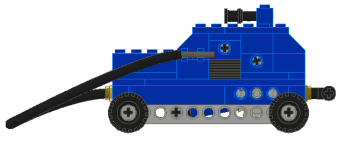

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Only genuine Lego © parts used.

Roundhouse on display at the 2013 National Train show in Atlanta, Georgia. Photo by Anthony Sava