

# Using MLCad

Digital LEGO Building with MLCad

Presented by: Jeff Van Winden



# Introduction

- MLCad was written by Michael Lachmann
- Used to design LEGO models using the LDRAW parts library.
- Created in 1999, MLCad quickly gained popularity in the LEGO Community and is still the editor of choice for the LEGO fan community.



# Where do I find MLCad?

- Go to Ldraw.org
- Click on the Get Started Link

[Home](#)[Forums](#)[Downloads](#)[Parts](#)[Community](#)[Documentation](#)[The LDraw Organization](#)[Help](#)You are here: **Home**

Sea

## Home



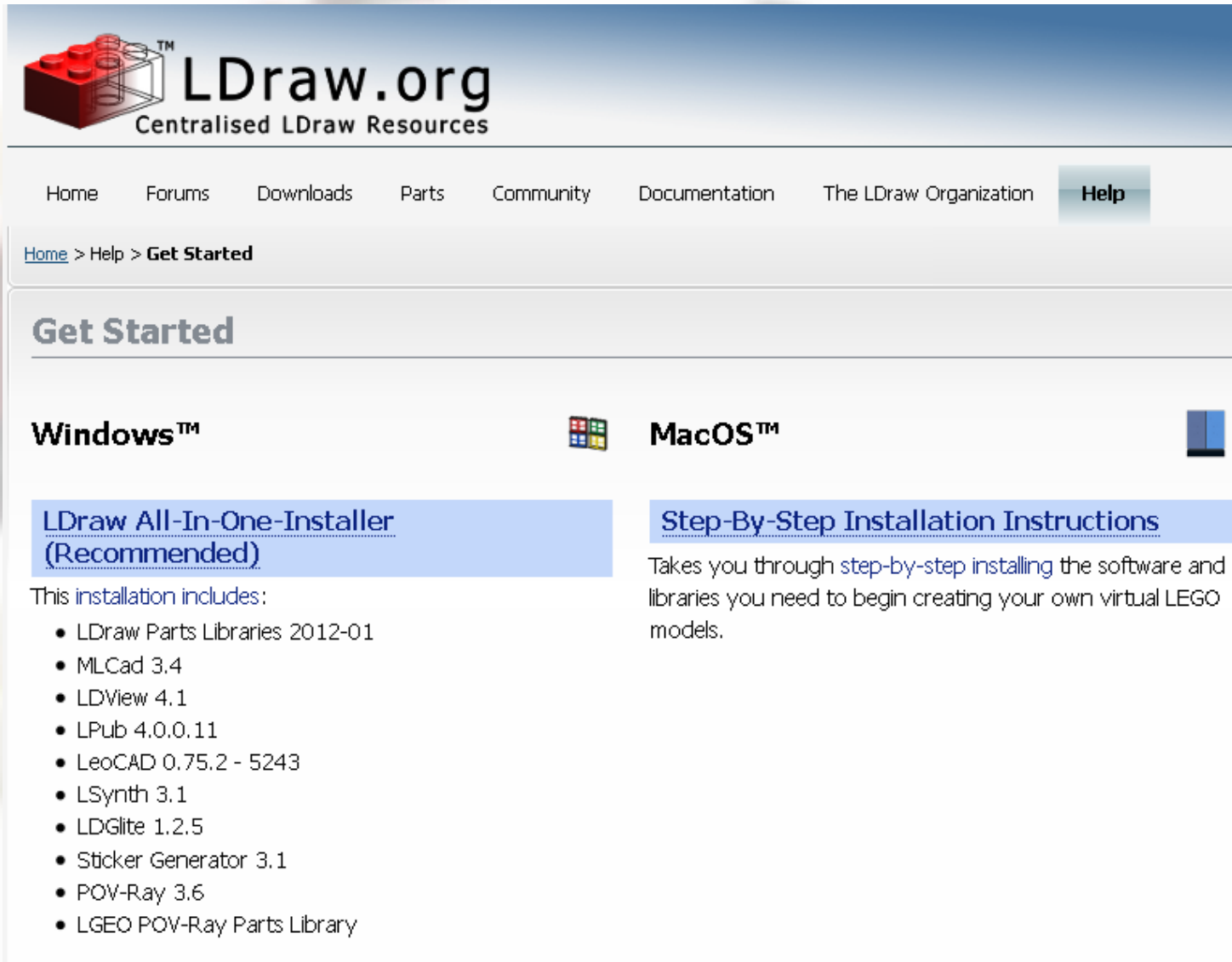
### What is LDraw?



LDraw™ is an open standard for LEGO CAD programs that allow the user to create virtual LEGO models and scenes. You can use it to document models you have physically built, create building instructions just like LEGO, render 3D photo realistic images of your virtual models and even make animations. The possibilities are endless. Unlike real LEGO bricks where you are limited by the number of parts and colors, in LDraw nothing is impossible.



- Click the all in One installer link (for Windows)





The screenshot shows the LDraw.org website. At the top left is the logo, which consists of a red LEGO brick with a transparent window and the text 'LDraw.org' and 'Centralised LDraw Resources'. Below the logo is a navigation menu with links for Home, Forums, Downloads, Parts, Community, Documentation, The LDraw Organization, and Help. The 'Help' link is highlighted. Below the navigation menu is a breadcrumb trail: Home > Help > Get Started. The main heading is 'Get Started'. There are two columns for operating systems: Windows™ and MacOS™. The Windows column has a blue background and contains a link for 'LDraw All-In-One-Installer (Recommended)'. Below this link is a list of software included in the installation. The MacOS column has a blue background and contains a link for 'Step-By-Step Installation Instructions' and a paragraph of text describing the instructions.

**LDraw.org**  
Centralised LDraw Resources

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[Home](#) > [Help](#) > **Get Started**

## Get Started

**Windows™**  **MacOS™** 

**[LDraw All-In-One-Installer \(Recommended\)](#)**

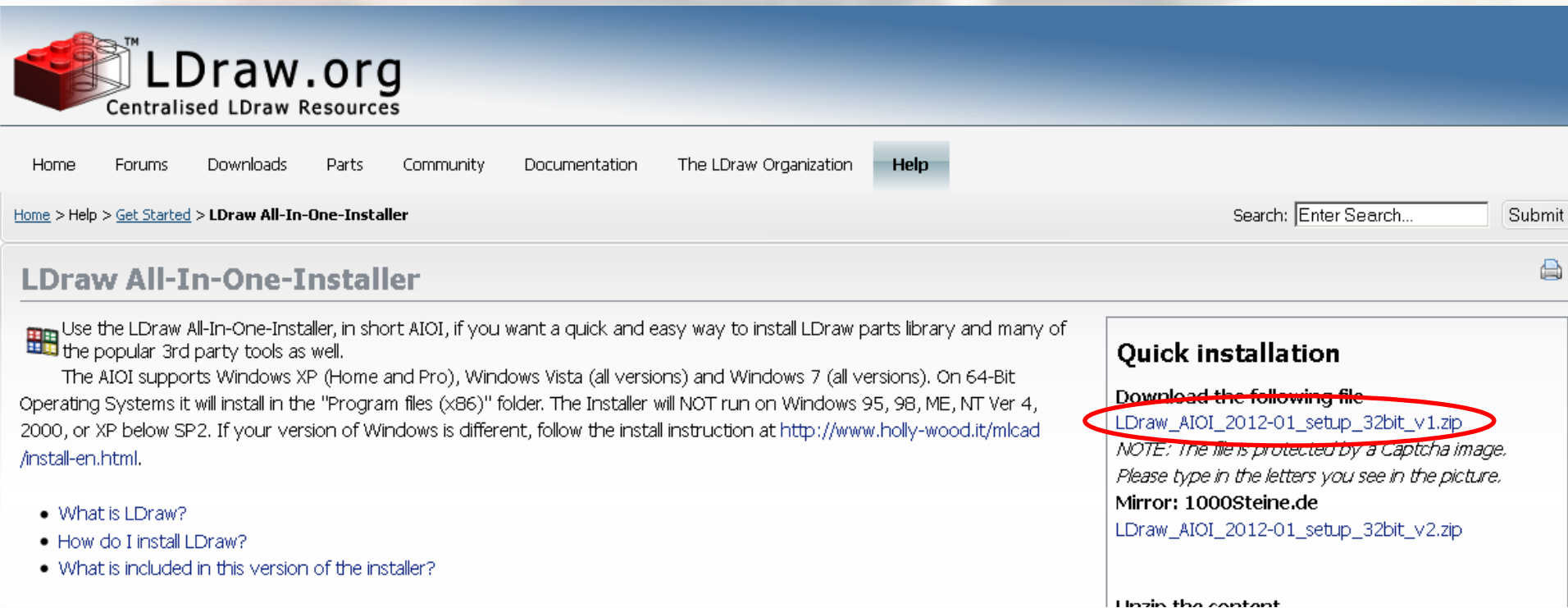
This installation includes:

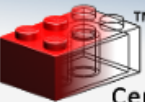
- LDraw Parts Libraries 2012-01
- MLCad 3.4
- LDView 4.1
- LPub 4.0.0.11
- LeoCAD 0.75.2 - 5243
- LSynth 3.1
- LDGlite 1.2.5
- Sticker Generator 3.1
- POV-Ray 3.6
- LGEO POV-Ray Parts Library

**[Step-By-Step Installation Instructions](#)**

Takes you through [step-by-step](#) installing the software and libraries you need to begin creating your own virtual LEGO models.

- Download and open the zip file, then click the .exe file and follow the prompts.
- this will install everything that you need.




 **LDRAW.org**  
Centralised LDraw Resources

Home Forums Downloads Parts Community Documentation The LDraw Organization **Help**

Home > Help > [Get Started](#) > **LDRAW All-In-One-Installer** Search:

## LDRAW All-In-One-Installer

 Use the LDraw All-In-One-Installer, in short AIOI, if you want a quick and easy way to install LDraw parts library and many of the popular 3rd party tools as well.

The AIOI supports Windows XP (Home and Pro), Windows Vista (all versions) and Windows 7 (all versions). On 64-Bit Operating Systems it will install in the "Program files (x86)" folder. The Installer will NOT run on Windows 95, 98, ME, NT Ver 4, 2000, or XP below SP2. If your version of Windows is different, follow the install instruction at <http://www.holly-wood.it/mlcad/install-en.html>.

- What is LDraw?
- How do I install LDraw?
- What is included in this version of the installer?

### Quick installation

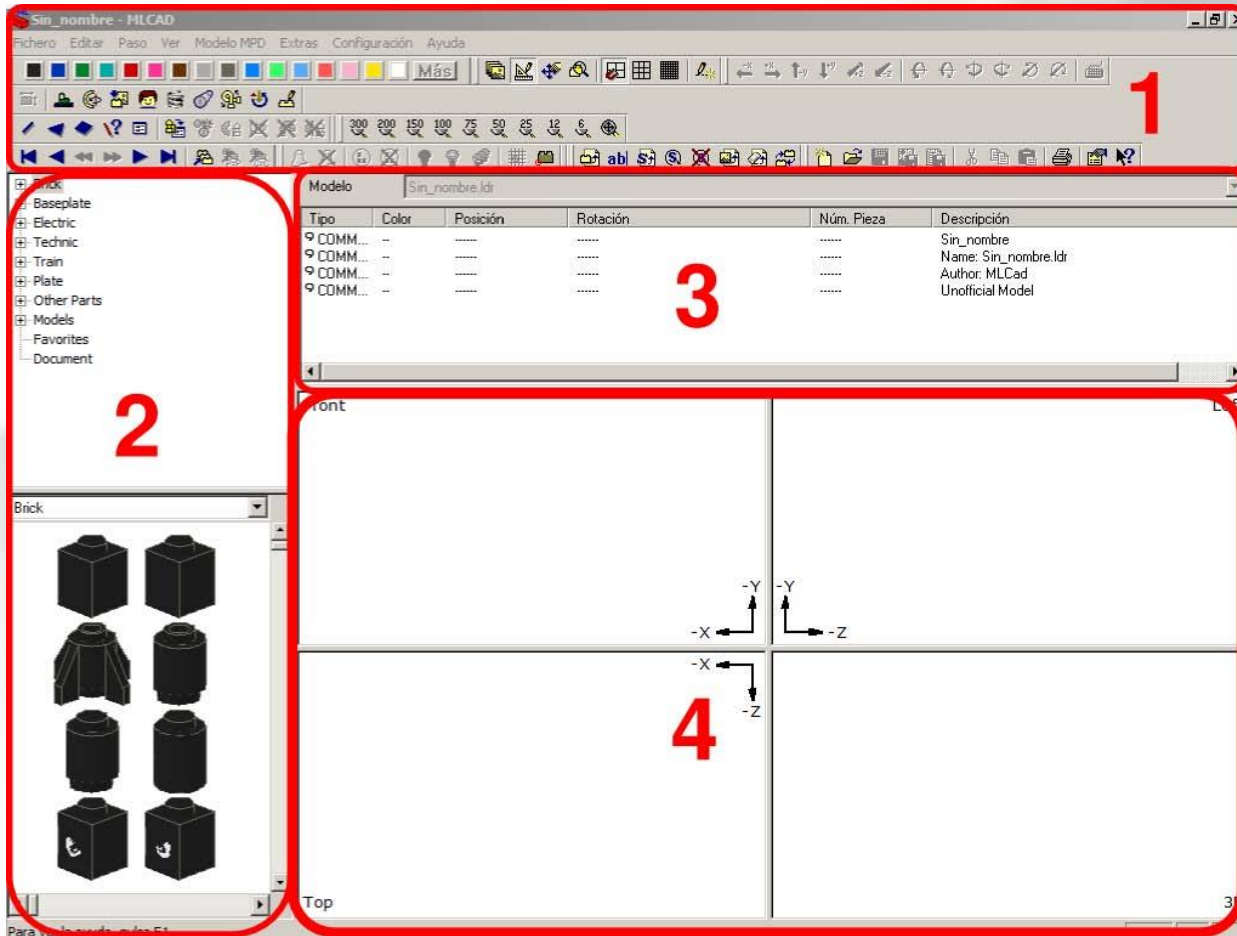
**Download the following file**  
[LDRAW\\_AIOI\\_2012-01\\_setup\\_32bit\\_v1.zip](#)

*NOTE: The file is protected by a Captcha image. Please type in the letters you see in the picture.*

**Mirror: 1000Steine.de**  
[LDRAW\\_AIOI\\_2012-01\\_setup\\_32bit\\_v2.zip](#)

Unzip the content

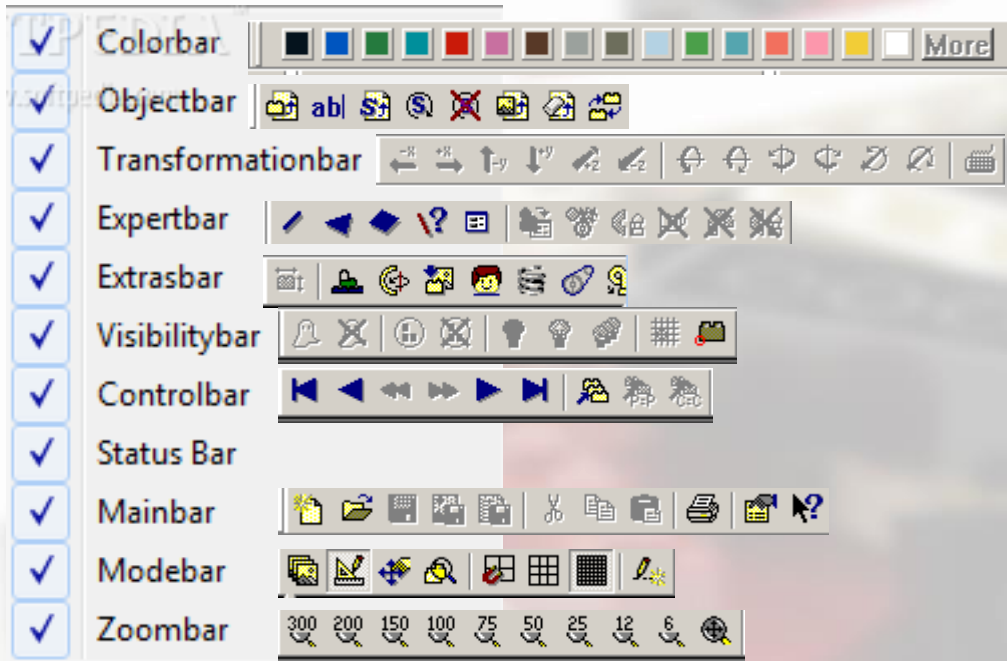
# MLCad look and feel



- 1 - Toolbars
- 2 - Parts tree
- 3 - Inventory
- 4 - Build area



# Toolbars



Today's demo will use tools from the Color, Object, Transformation, Control, Main, Model and Zoom Bars.

Color – Change a parts colour

Object – Add comments, parts, steps.

Transformation – Move and rotate a part

Control – Move through steps and select same parts or colors

Main – Open, Close, Save

Model – control different view mode, the grid granularity and draw to step.

Zoom – Change the Zoom percentage and zoom to fit



# Parts Tree

- The basic Parts tree is ok to start with, However you may find that you are using a lot of parts that are under the “Other Parts” Category. Don’t worry you can customize this and I will show you how later. We will also use the Documents and favorites lists.





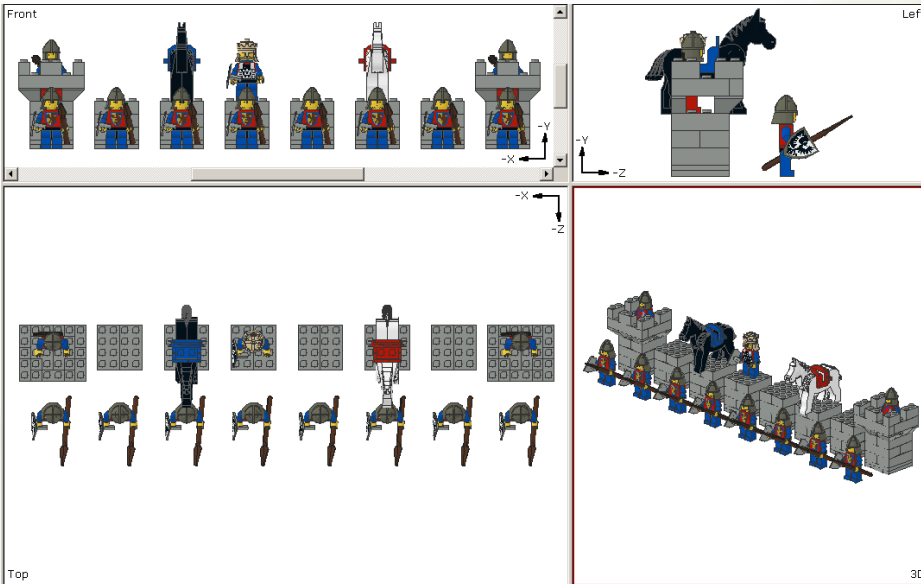
# Inventory

Active Model: cnTower.ldr

Type	Color	Position	Rotation	Part no./Model ...	Part name/Description
COMM...	--	-----	-----	-----	WRITE CN Tower
COMM...	--	-----	-----	-----	WRITE Name: cnTower.ldr
COMM...	--	-----	-----	-----	WRITE Author: Jason Allemann
COMM...	--	-----	-----	-----	WRITE www.truedimensions.com
PART	Black	0.000,24.000,10...	-1.000,0.000,0.000 0.000,1.000,0.00...	41539.dat	Plate 8 x 8
STEP	--	-----	-----	-----	-----
PART	Black	0.000,16.000,10...	-1.000,0.000,0.000 0.000,1.000,0.00...	3958.dat	Plate 6 x 6
STEP	--	-----	-----	-----	-----
PART	Black	-70.000,16.000,...	0.000,0.000,-1.000 0.000,1.000,0.00...	4162.dat	Tile 1 x 8
PART	Black	70.000,16.000,1...	0.000,0.000,-1.000 0.000,1.000,0.00...	4162.dat	Tile 1 x 8
PART	Black	0.000,16.000,-6...	1.000,0.000,0.000 0.000,1.000,0.000...	6636.dat	Tile 1 x 6
PART	Black	0.000,16.000,80...	1.000,0.000,0.000 0.000,1.000,0.000...	6636.dat	Tile 1 x 6
STEP	--	-----	-----	-----	-----
PART	Light_Bl...	-40.000,8.000,-3...	0.000,0.000,-1.000 0.000,1.000,0.00...	3068b.dat	Tile 2 x 2 with Groove
PART	Light_Bl...	-40.000,8.000,1...	0.000,0.000,-1.000 0.000,1.000,0.00...	3068b.dat	Tile 2 x 2 with Groove
PART	Light_Bl...	-40.000,8.000,5...	0.000,0.000,-1.000 0.000,1.000,0.00...	3068b.dat	Tile 2 x 2 with Groove

- This section contains all of the parts in your model, along with other information such as comments, Rotation points and Steps.
- Steps are used to break your model up into building steps.
- Use Page Up and Page down to move through the inventory


# Build Area



The build area shows your model from 4 different views. You can change the views to suite your building needs. You can also Add in Scroll Bars for

those really Big Models. Right Clicking on one of the Windows will allow you to change the view angle and zoom.

# The Parts Library

- The Parts library is updated about every 6 months.
  - Parts are created by Fans, Reviewed and once they pass the review process they are added to an official parts release.
  - Unofficial (parts that have not yet passed the review) can still be downloaded via the Ldraw parts tracker @ <http://www.ldraw.org/library/tracker/>
- 
- A collection of translucent red and pink LEGO Technic parts, including a 1x2 Technic brick with four holes and several individual Technic pins, scattered on a light-colored surface.

# ML Cad Basics

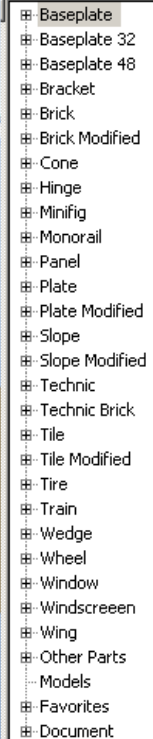
A Quick Demo

# Finding & changing parts

To add a part to your model:

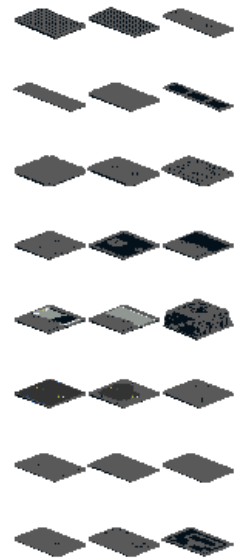
- Expand a section of your parts tree to see a text list of the parts under that category
- Click on the name in the parts tree to see a list of thumbnails for the parts in the bottom section of the parts tree.

Drag the part into your model and position it where you would like.



- Baseplate
- Baseplate 32
- Baseplate 48
- Bracket
- Brick
- Brick Modified
- Cone
- Hinge
- Minifig
- Monorail
- Panel
- Plate
- Plate Modified
- Slope
- Slope Modified
- Technic
- Technic Brick
- Tile
- Tile Modified
- Tire
- Train
- Wedge
- Wheel
- Window
- Windscreen
- Wing
- Other Parts
- Models
- Favorites
- Document

Baseplate



# Zoom & Move



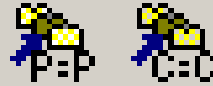
Zooming in and out in MLCad can be done in a few ways:

- Using the tool bar, the last icon is zoom to fit.
- Right clicking on the window and choosing the Zoom item (zoom in, out, zoom to fit or set)
- Using your Mouse wheel.

Moving your model can be accomplished by using one of the following techniques:

- Using the scrollbars, to activate right click and select scrollbars.
- Hold down Shift, left click and move your mouse.

# Selecting parts



There are a few ways to select parts:

1. Drawing a box around the parts this selects only the visible parts, not the parts underneath.
2. Drawing a box around the parts and hold down shift before releasing the mouse button. This will select all of the parts including the ones underneath
3. Click on the part and hold Ctrl (adds parts to your selection.)
4. Click on the part in the inventory and hold Ctrl (adds individual parts to your selection.)
5. Click on the part in the inventory and hold Shift (adds all parts between the two selected items.)
6. Click on a part and press the P=P or C=C to select all of the parts with the same Colour or Part #



# Working with your parts

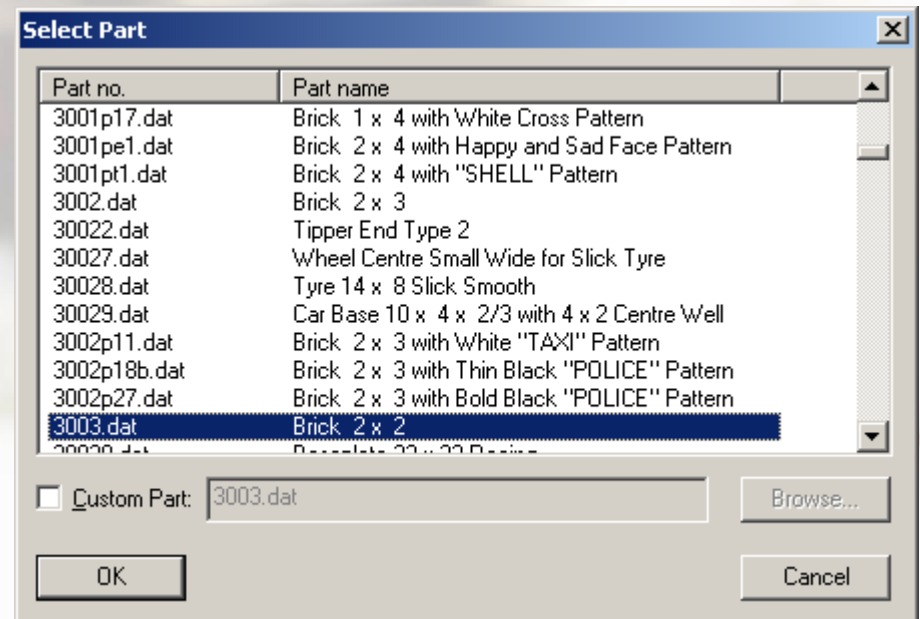
Once you have a part in your model, you can select it from the Instruction list, or Select the part on the screen. Once selected you can right click to:

- Change the part color\* – this will open the color selection window.
- Modify the Part – this will open the select part list where you can swap the part out for another one.
- Change the parts Position and Rotation\* – Move and turn the part.
- Snap the part to the grid\* – move the part to the closest grid line
- Hide the part\* – Hide the annoying part(s) that are in the way.
- \* These actions can also be done on multiple parts by ctrl Clicking them first.



# Modifying parts

- When you modify a part, it opens the Select Parts list, from here you can sort the parts by name or description by clicking the column name. You can also enter in a part number in the custom part box



# Moving & Rotating parts



Once selected parts can be moved and rotated around the screen.

Moving parts can be done in a few ways:

- Using the buttons shown above
- Using the mouse (to move the part, just hold down the left mouse button)
- Right click on a part to enter the position and rotation
- Using the keyboard



# Keyboard moving

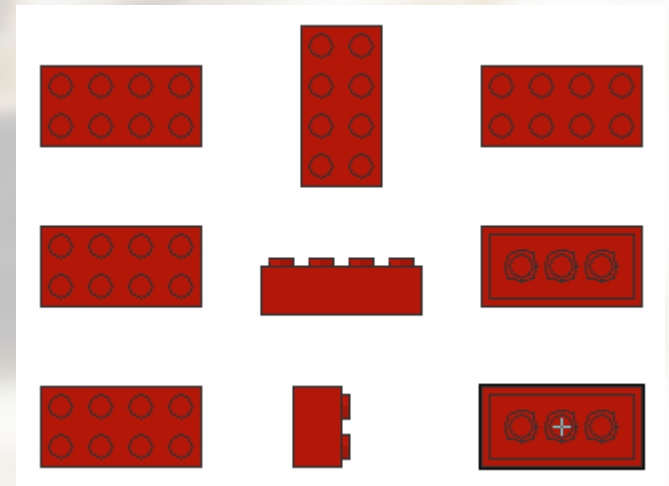
## Moving

- Left/Right arrows move in the X axis (left/right\*)
- Up/Down arrows move in the Z axis (up/down\*)
- Home/End move in the Y axis (closer/farther\*)

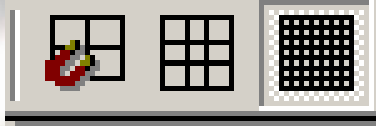
## Rotating

- Ctrl + Left/Right arrows rotate in the X axis (clockwise /counter clockwise\*)
- Ctrl + Up/Down arrows rotate in the Z axis (Places the brick on its side\*)
- Ctrl + Home/End rotates in the Y axis (places the brick on its end\*)

\* when in Top view plane. Using a Coarse Grid



# MLCad grid



MLCad has 3 Grid sizes to choose between

- Coarse is great for quick building
- Medium is used with some SNOT techniques
- Fine is used for fine adjustments, weird angles and many SNOT techniques

You can also use the enter Pos. and Rot. for finer adjustments.

	Move in X or Y axis	Move in Z axis	Rotation
Coarse	$\frac{1}{2}$ a stud	1 Plate	90 degrees
Medium	$\frac{1}{4}$ of a stud	$\frac{1}{2}$ a plate	45 degrees
Fine	$\frac{1}{20^{\text{th}}}$ of a stud	$\frac{1}{8^{\text{th}}}$ a plate	15 degrees


# Copying Parts

There are a few ways to copy parts (after they have been selected)

1. The standard ways:

- edit + Copy, edit + Paste
- or Ctrl + c, CTRL + v

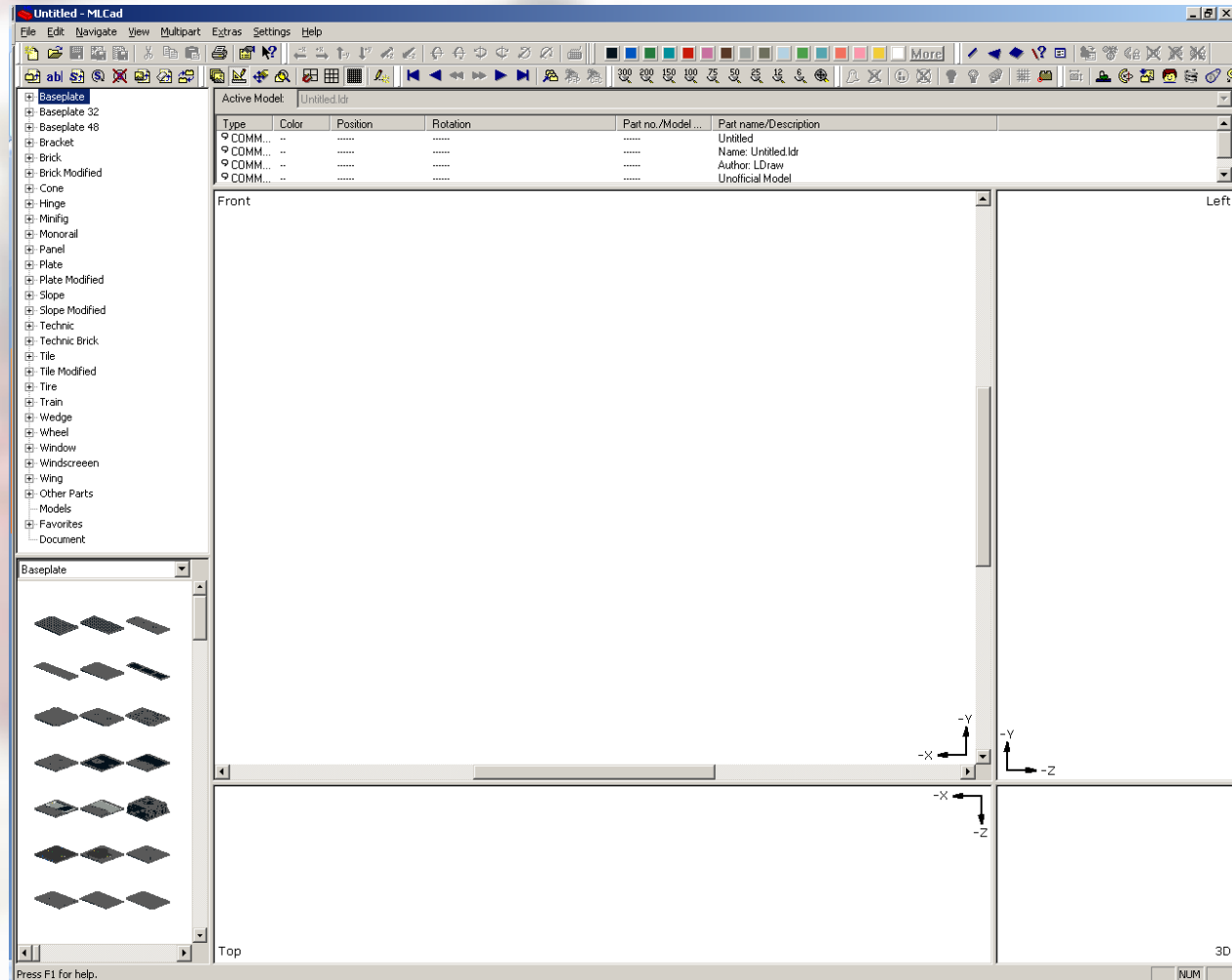
2. My favourite CTRL and Drag, allows you to copy and move the same part around the screen, allowing for quick builds.

A red LEGO Technic part, specifically a 1x2 Technic brick with two holes, is shown in the bottom right corner of the slide. It is slightly out of focus and appears to be floating or placed on a surface.

# Personalizing ML Cad

In this section we will look at:

- Changing the colour pallet
- Re-Organizing your parts
- Favorites





# Changing the colour pallet



MLCad contains most of the LEGO colours. However they are not all available on the screen. You can press the More button to see more colours, but you can also customize the bar. To do this:

- Right click on a colour, Select a new colour from the lists and press ok. Now you can have all of you castle colours grouped together, or your classic space colours, or your friends colours...

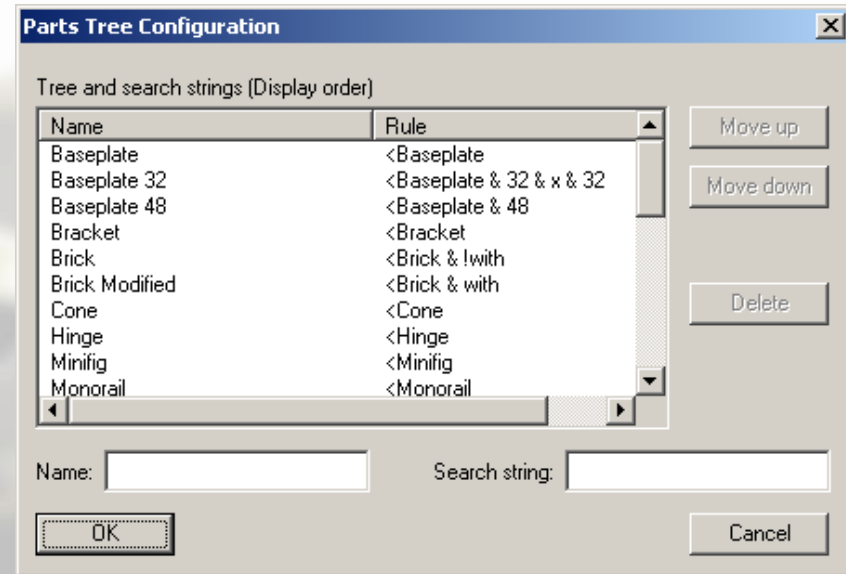


# Re-Organizing your parts

taken from Lugnet post <http://news.lugnet.com/cad/mlcad/?n=943>

MLCad allows you to sort the parts tree. To do this go to Settings -> Parts tree -> Tree Configuration and add or edit groups as you see fit.

Adding a rule of window will give you a category of any part that contains the word window.



WORD .... Adds all parts which contain <WORD> in the description

<WORD ... Adds parts which description begins with WORD

WORD> ... - "" - ends with WORD

WORD1 & WORD2 .... both WORD1 and WORD2 must be found

WORD1 | WORD2 .... either WORD1 or WORD2

!WORD ... must not contain WORD

WORD1 & !WORD2 ... has to contain word1 but not word2

- other combinations work also ... brackets () group rules
- This info is stored in a MLCad.grp file in the MLCad Directory I have this backed up to use on other PC's



# Favorites

- If there is a part that you always use, Or you are working on a model that uses a limited set of parts (5 bricks, 4 plates, 3 slopes..) then consider adding them as favorites.
- Just right click on a part in the parts tree area of the screen and choose add to favorites.
- To remove a part for your favorites, right click on the part and choose remove from favorites.
- You can also clear the list by right clicking the parts tree and selecting clear favorites.

The background of the slide is a blurred image of a brick structure, possibly a house or a large wall, with various colors of bricks (red, grey, white) and mortar. The text is overlaid on this background.

**Advance ML Cad  
where ML Cad really shines**



# Multi part Models

MLCad has a great feature called Multipart Models (the reason MLCad has a .mpd file type).

When to use Multipart files

- If you are building a model that uses the same structure numerous times
  - If you are building a section of your model that needs to be built separately. Lpub uses this feature to build subassembly in instructions
- .MPD files allow you to have one main model with many sub models within.
- If you were building a House, with 4 identical walls, you would only have to build the wall one time. Then you can use that sub assembly 4 times.

\*important for Lpub instruction creation.

# The Documents listing

- Once you create a multipart subassembly you will notice that the document section of MLCad's part tree now shows your sub assemblies
- These can be used just like regular parts, you rotate the subassembly like it is one part.
- Time for a demo



# Generators

MLCAD has a few other interesting tools that you can use.

Accessible from Extras -> Generators

- Arrow -> add an Arrow to your model to point something out
- Mosaic -> Creates a brick or plate mosaic from a small image.
- Rotation - > Build spheres in brick or plate up to 40x40
- Minifig -> allows you to select parts and build a mini figure easily.
- Spring -> create a spring
- Rubber Belt -> Create custom rubber belts
- Flex Hose -> Create custom Flex Hoses
- Baseplate -> Create custom Baseplates

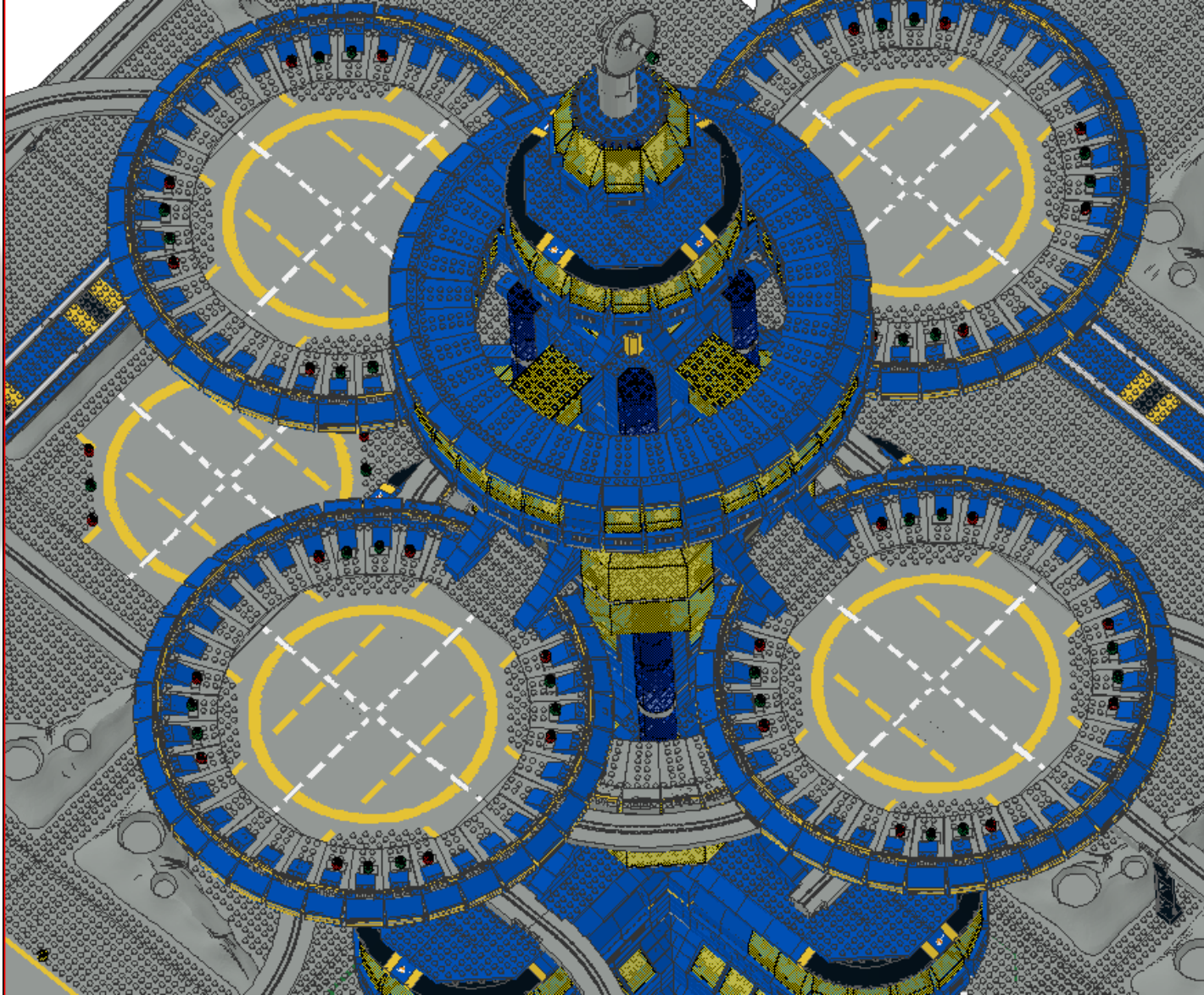


# LPub

- Lpub was created by Kevin Clauge
- A very simple yet powerful instruction creator
- Is included in the All-in-One Installer
- A good tutorial is located at:  
<https://sites.google.com/site/workingwithlpub/>
- A quick demo with our model.



# The possibilities are endless



# Questions and Answers

Did I miss something?

