

Mobaco & LeoCAD

MOBACO



-
- Tips & Tricks
 - August 2021
 - Koos Welling
 - Version 0.3

Installation LeoCAD

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- Why LeoCAD?
 - Under the hood

Windows:

- Installation LeoCAD
- Unzip Mobaco library parts
- Set preferences & check

MacOS:

- Installation LeoCAD

All platforms:

- Set other preferences

Why LeoCAD? (1-2)

Do you know other platforms? Let us know

Software:	LeoCAD	AnkerPlan	???
Availability:	Download for free	Download, need to ask for credentials.	
Does it run online?	No, need to install	No, need to install	
On which platform does it run?	Win/Mac/Linux	Win/Mac/Linux	
Is software maintained?	Yes, by >1 users	Yes, by ? users	
Opensource?	Yes (github) (C++)	No	
Online help available?	Limited on website	Extensive(?) on youtube	
Easiness importing library	Moderate	No clue...	

Why LeoCAD:

- I could access it, w/o any issue's, so everyone could access this!
- LeoCAD runs on 3 different platforms.
- The geometry data used (in the library), is also used by some other CAD packages. (LDraw format)
- I like the features from AnkerCAD more, but:
 - I'm not able to test the software: there is no free test version available.

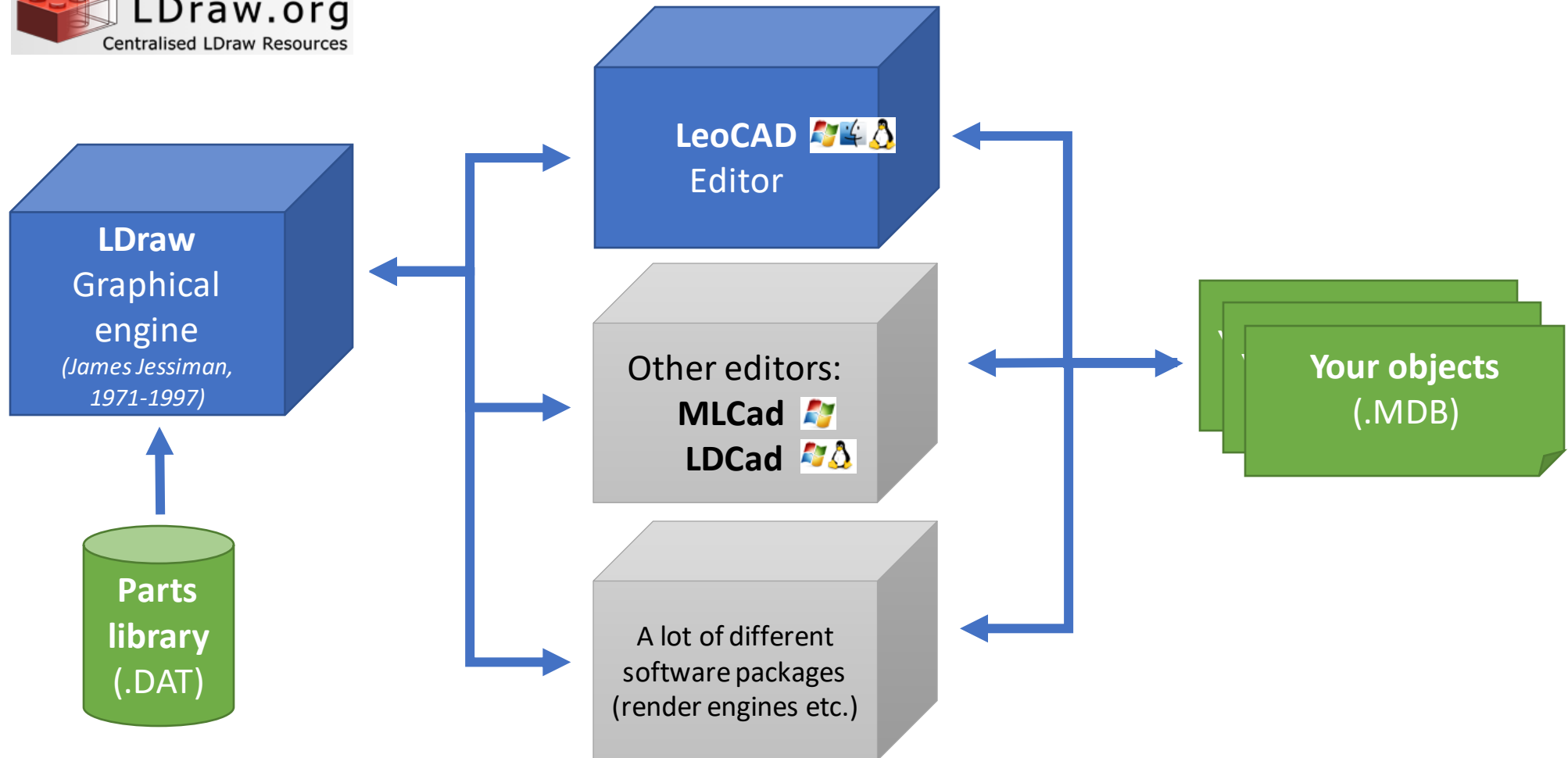
Why LeoCAD? (2-2)

What are the differences

Software features:	LeoCAD	AnkerPlan	???
• Parts library + info	Yes, incl. categories	Extensive information	
• Build multiple buildings	Yes (via submodel)	Yes	
• Generate part lists	Limited (on screen/open ascii mdb-file)	Extensive, incl. box content information	
• Slice the model	No	Yes	
• Create building plans	Limited (via steps)	Yes...	

Under the Hood

How does the software works



Installation LeoCAD

(For windows)

1. Download these files:

- Download installation from: www.leocad.org/download.html
(For Windows: LeoCAD-Windows-35ba24fb.exe (v21.06))
- Have ready latest library: Mobaco_export20210812.zip
- Have ready a test file, for example: Mobaco_City.ldr

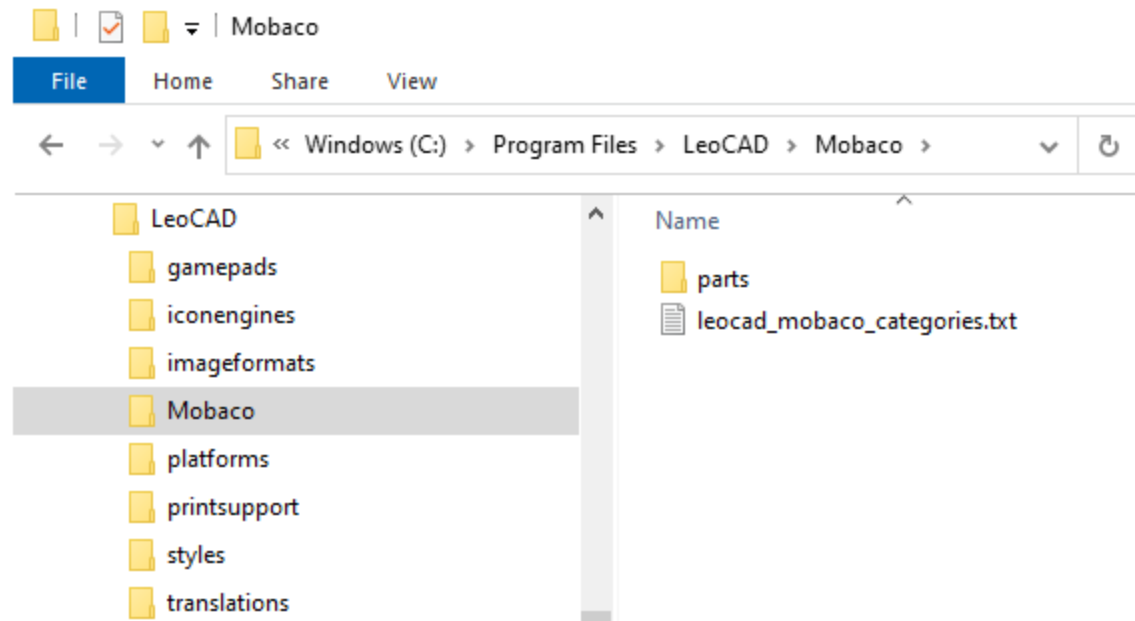
2. Install LeoCAD

- Default on windows: C:\Program Files\LeoCAD
- And run it directly

3. Try to add some bricks, does the program works?

Unzip Mobaco library parts

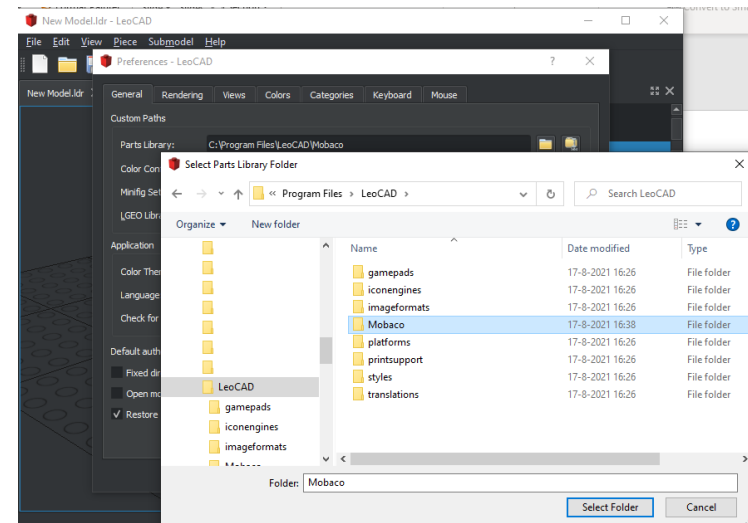
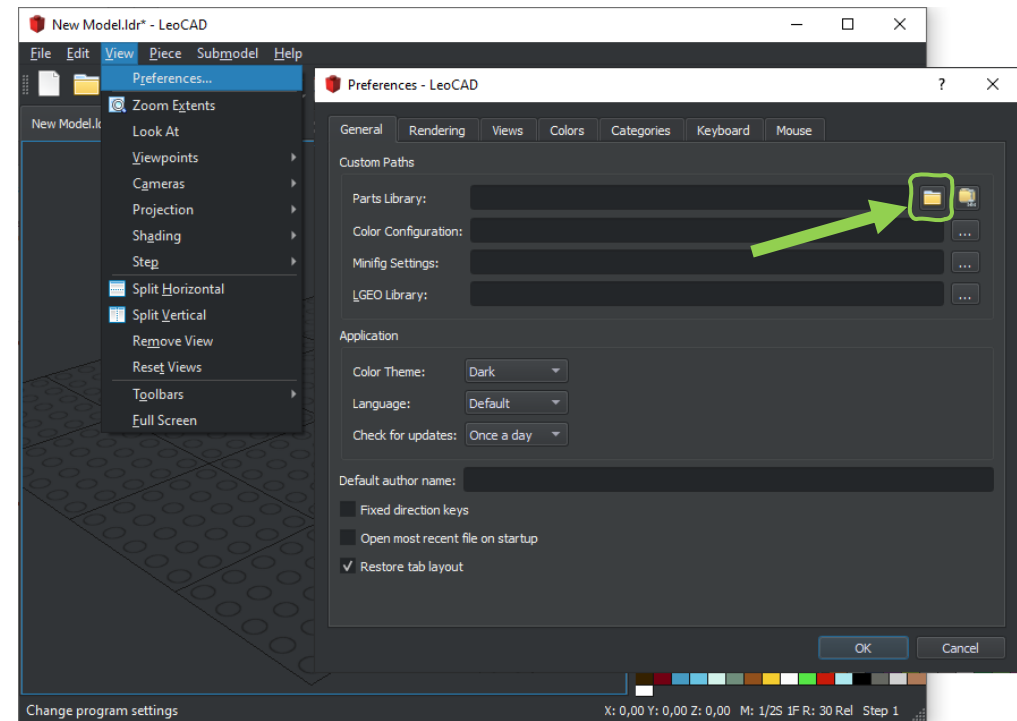
- Unzip the 'Mobaco_export20210812.zip' to your harddrive (for instance to: C:\Program Files\LeoCAD)
- Make sure, both the 'Mobaco' & 'parts' folder exist:



Set preferences:

Parts Library

- Open LeoCAD
- Select: View – Preferences
- A new window opens, with tab: General
- Select the ‘parts library’, by clicking on the folder button.
- Select the unzipped ‘Mobaco’ folder.
- Press ‘Ok’.
LeoCAD tells you, the next time this change will have effect.
- Close LeoCAD



Installation LeoCAD

(For Mac)

See installation instructions here:

- <https://www.ldraw.org/help/getting-started/mac.html>

See for library instructions here:

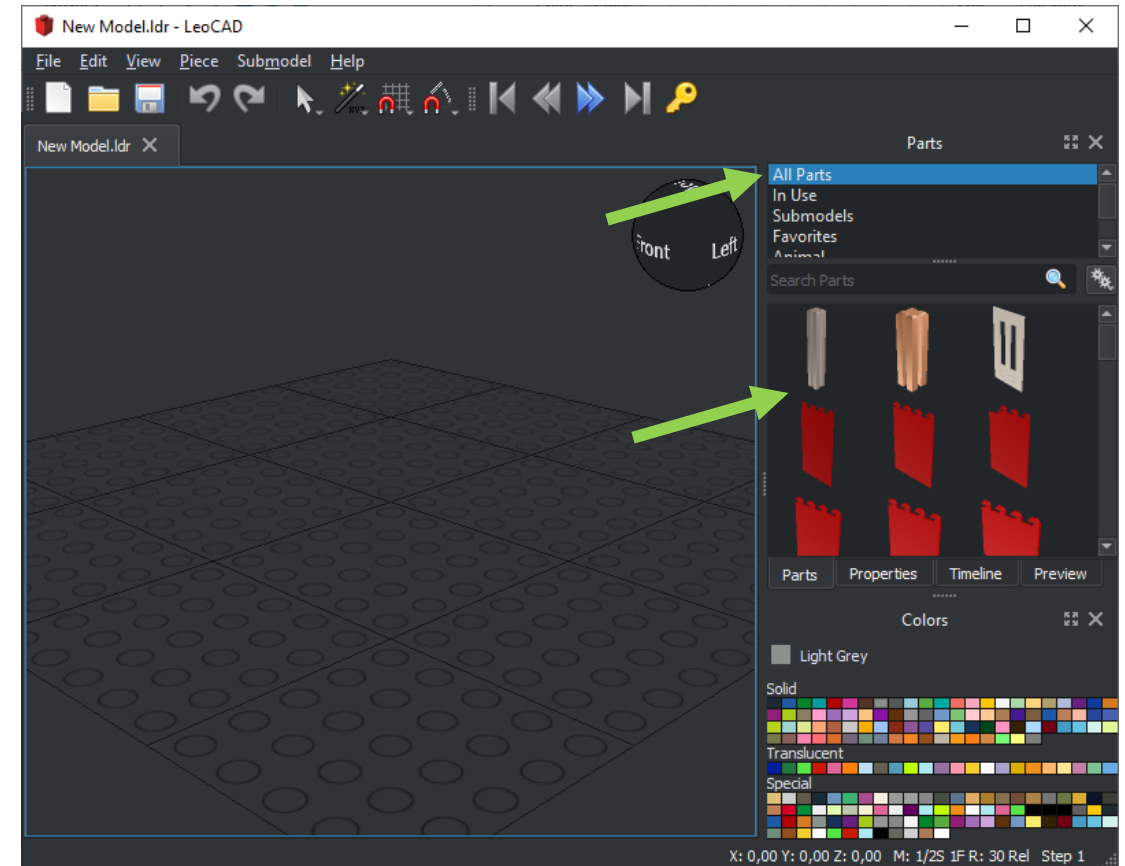
- <https://www.leocad.org/docs/library.html>

Check library parts

- Re-open LeoCAD
- On the top right, click on 'All Parts'
- Now all available Mobaco parts should be visible.

If this is not the case, something went wrong.
Try to fix this first.

(See also more information here:
www.leocad.org/docs/library.html)

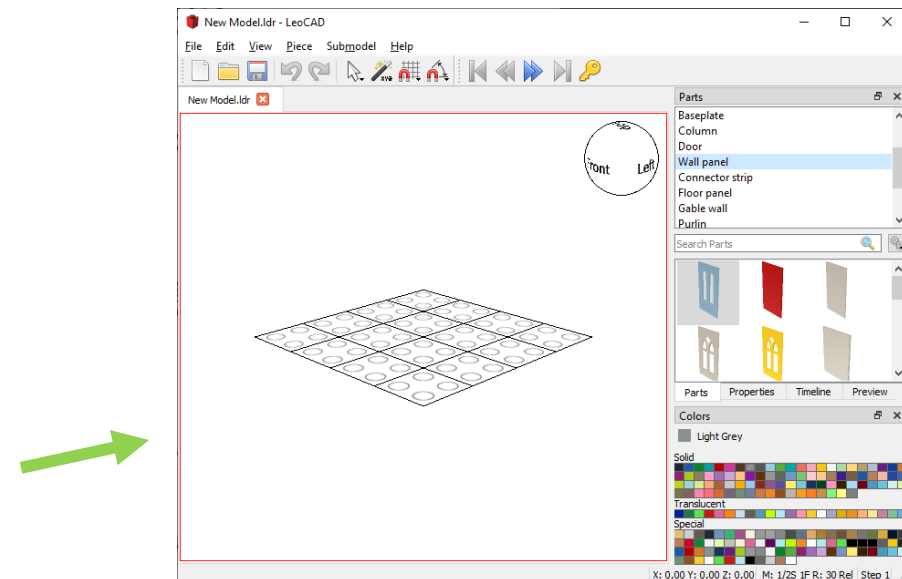
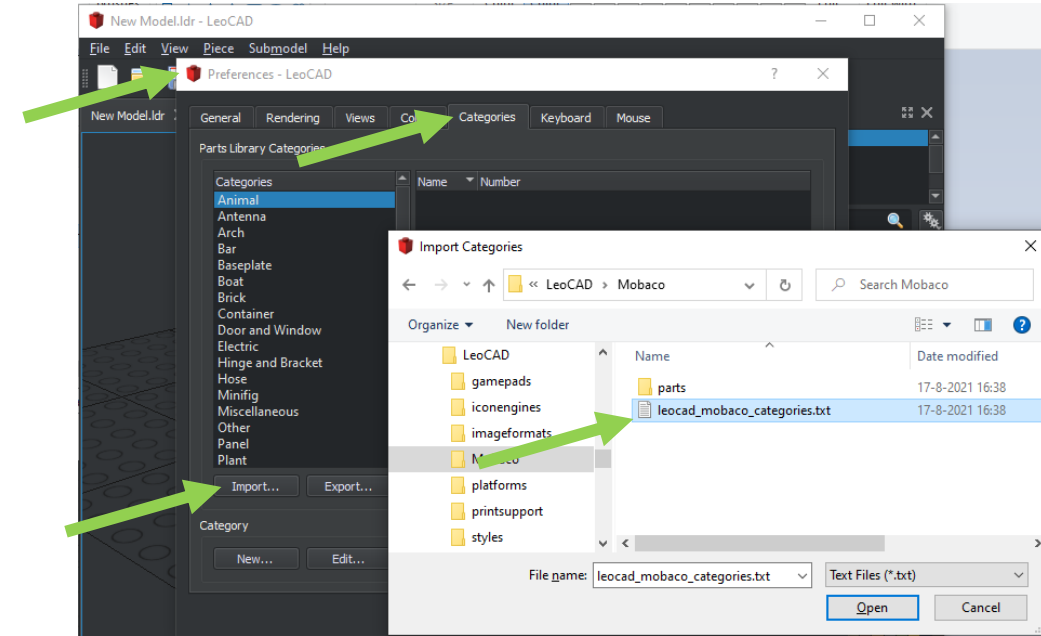


Set other preferences:

Other (optional) parameters

- Open LeoCAD, go back to: view – preferences
- Click tab: 'Categories':
 - Press: 'Import'
 - Select the file: 'leocad_mobaco_categories.txt'
(Could be found in the same 'Mobaco' folder)
 - Press: 'Open'
- Click tab: 'General':
 - Color theme: 'System'
 - Check for updates: 'Once a week'
- Click tab: 'Views':
 - Draw studs: unchecked.
 - Draw lines every '2' studs.
 - Draw origin lines: checked.
 - Press: 'OK'
 - Close LeoCAD.

Re-open LeoCAD, now the screen should look like this:
(Also try the 'Parts' categories.)

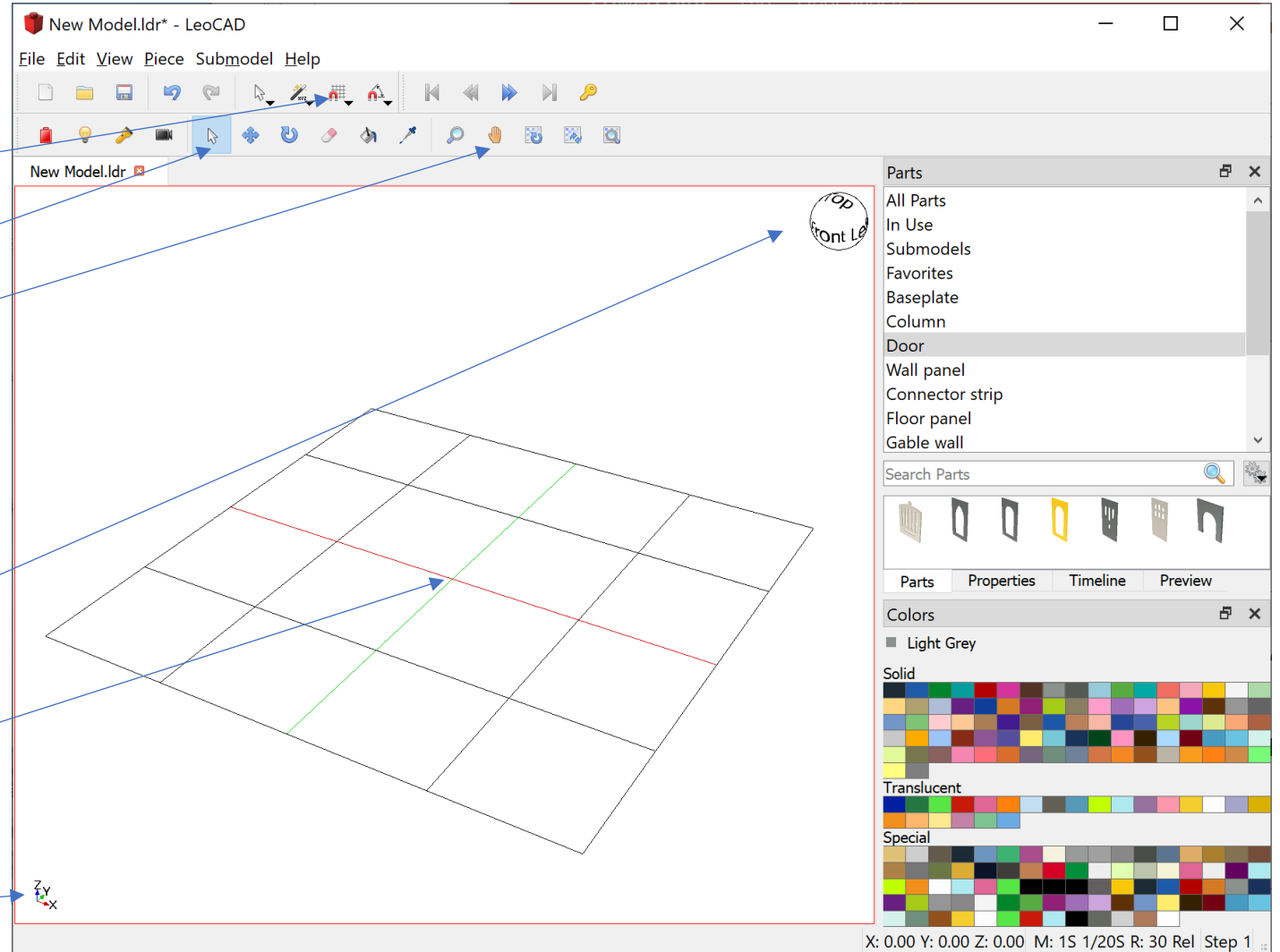


How does LeoCAD work

-
- LeoCAD screen
 - Parts – Drag & Rotate
 - Lego versus Mobaco
 - Grid size & Snap function
 - Snap function – Height issue
 - Snap function & orientating roofs
 - Selecting parts...
 - Using 'Duplicate'
 - ~~• Groups~~
 - Size, Rotate & Pan screen
-

LeoCAD - Screen

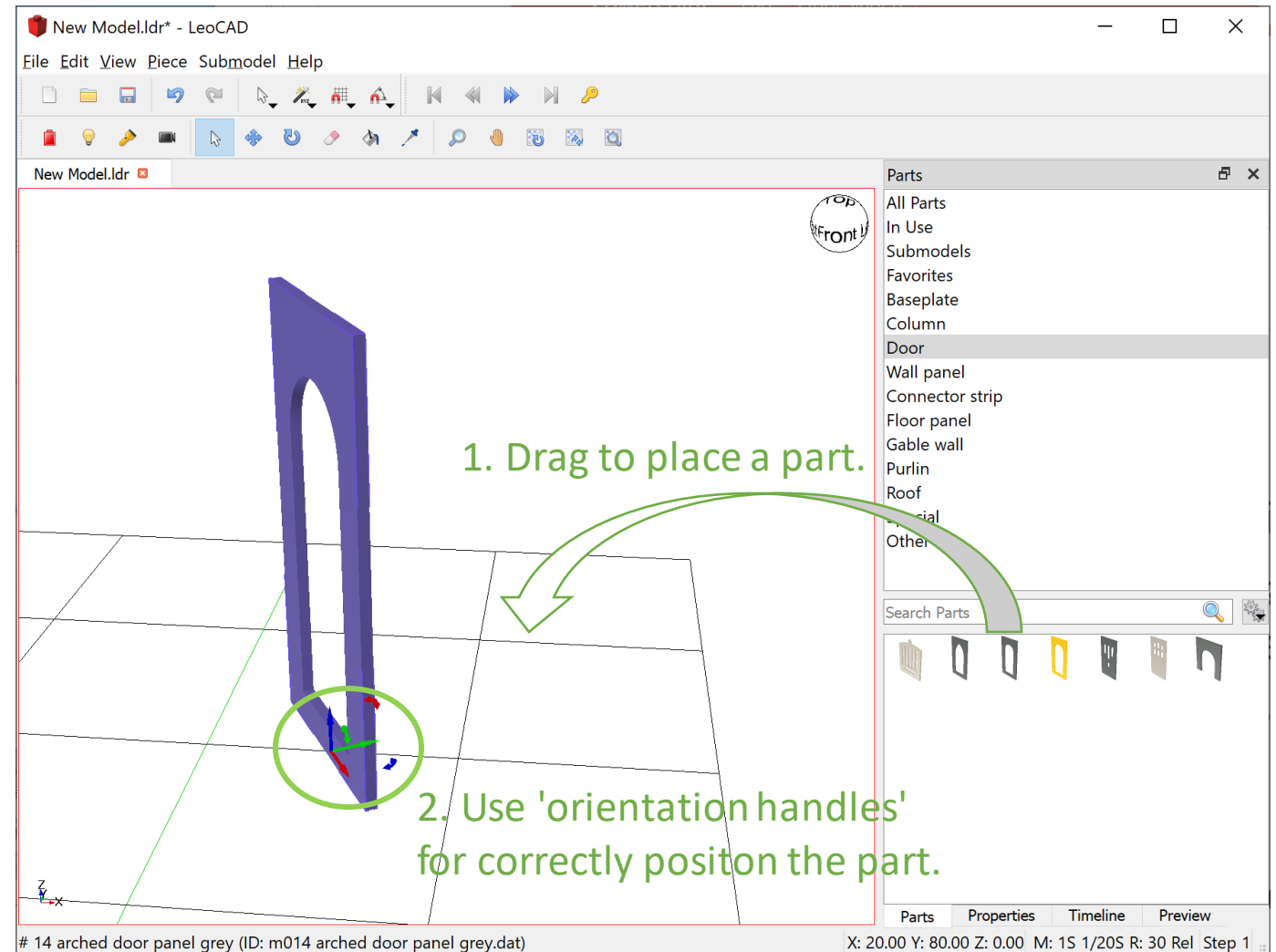
- Menubar:
 - "Snap"
 - "Selection arrow"
 - "Pan"
- Parts → Categories
- Parts
- ~~Colors~~ (turn off)
- 'View sphere'
- Grid:
 - Origin
 - Orientation



Parts – Drag & Rotate

Every part has it's own 'origin':

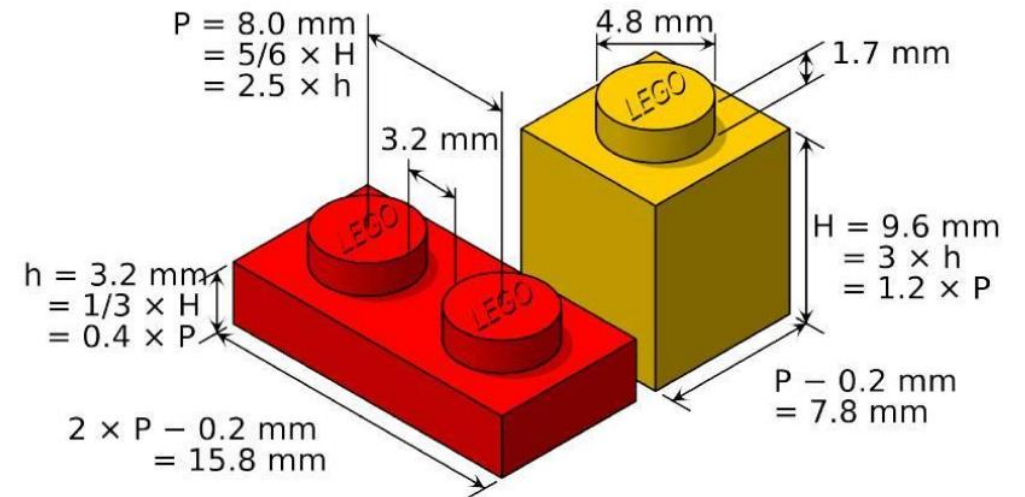
- Usual this will be a bottom center of a part.
- Move the part in horizontal directions, with green & red arrow.
- Rotate the part with the blue round arrow.
(And watch how the part-origin changes.)



Lego versus Mobaco

Dimensions, differences in dimensions

- Lego size: 7.8 x 7.8 x 9.6 [mm]
- Lego pitch: 8 [mm]
- Mobaco size: varies
- Mobaco pitch: 57.5 [mm]



→ Scaled all Mobaco parts with:
 $40/57.5 = \sim 66\%$

→ Using '2 studs' for 1x Mobaco pitch distance.

→ Dimension in LeoCAD, should be multiplied with: x1.4375, for understanding real dimensions.

Lego	LeoCAD	Distance
P	Stud	8.0 mm
H	Brick	9.6 mm
h	Flat	3.2 mm

Grid size & Snap function

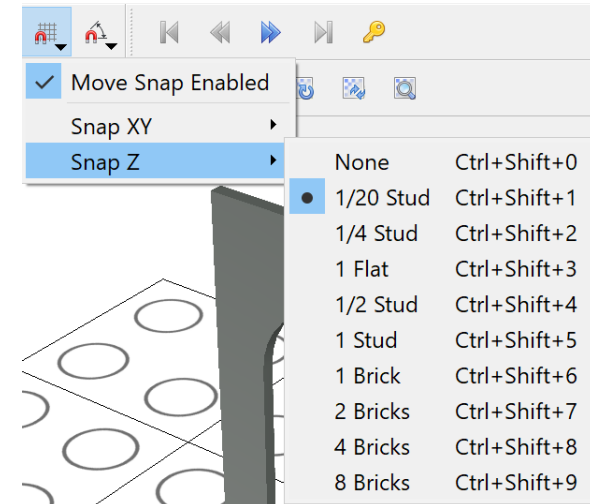
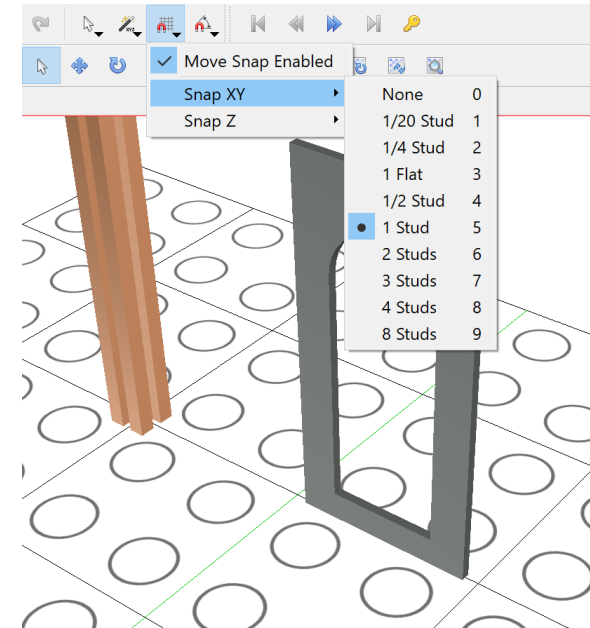
Difference Lego & Mobaco

So:

- 2 'Studs' = 1 panel width.
- On each corner (crossing of 2 lines), we place pillars.

We use:

- 'Snap enabled', for easy placement.
- 'Snap XY' = 1 Stud
- 'Snap Z' = 1/20 Stud
- 'Rotation' = 90 degrees (for walls/doors)



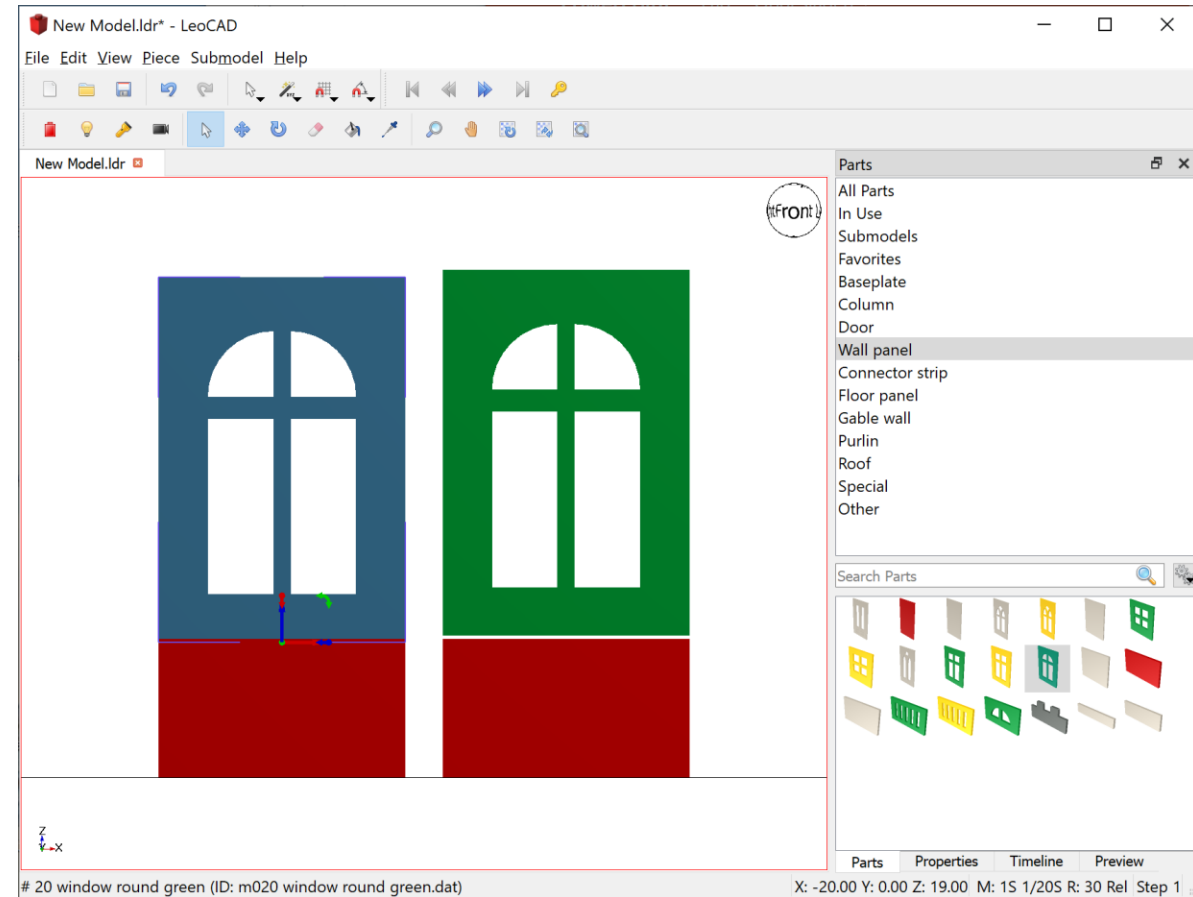
Snap function - Height issue

'Snap Z' = 1/20 Stud does not match Mobaco heights.

So either choose to:

- Overlap a little or
- except a slit.

(Just drag a part on top of an other. When the previous part is rotated, the new part will be rotated too.)



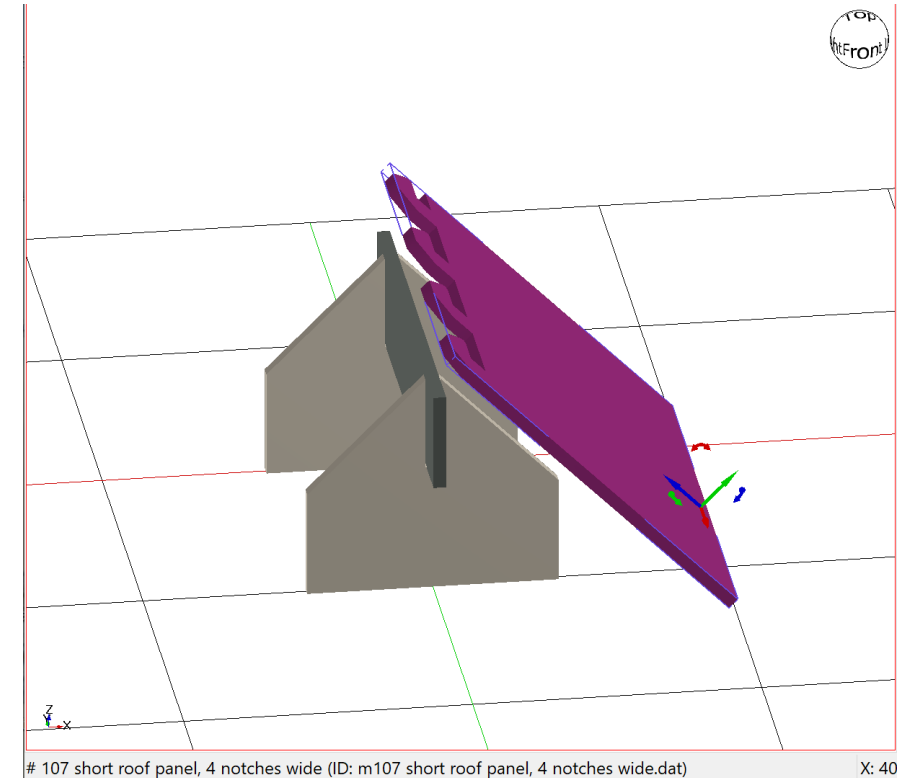
Snap function & orientating roofs

For placing roofs:

- Both Snap XY & Z = 1/20 stud.
- Don't forget to change rotation too: 45 degrees or smaller.

(Use short cuts '1' & '5', for quickly changing Snap XY.)

(Again, watch how the part origin is orientated! If XY is still snapping on 1 stud, it's impossible to place the roof right.)



Selecting parts... (1-4)

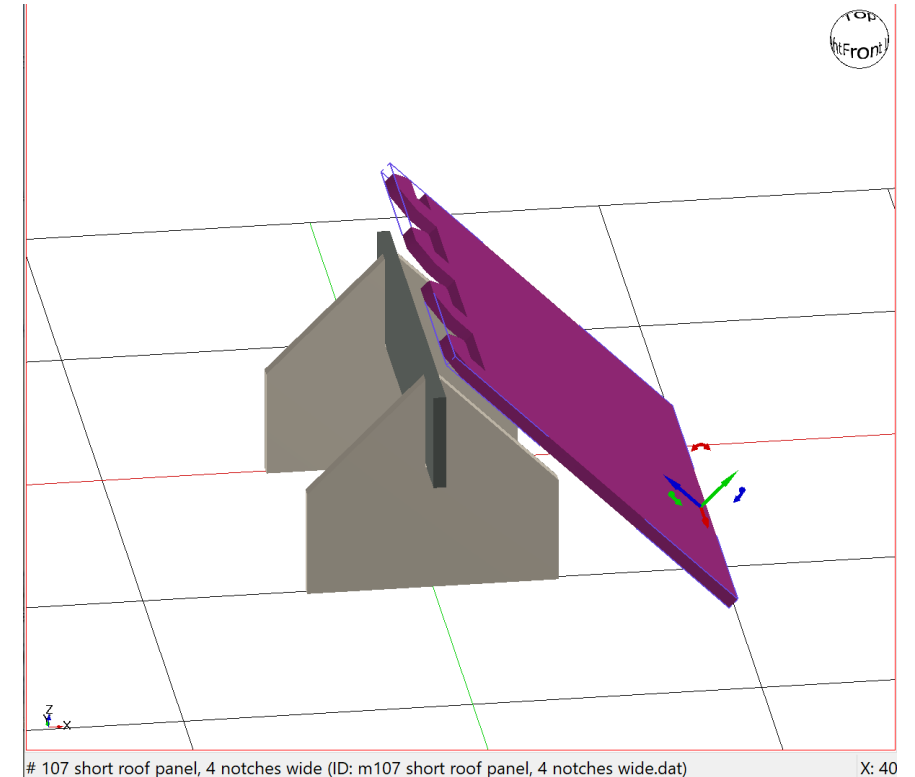
Till now, we only selected 1 part a time (with left mouse button (LMB)).

The origin is always depending on current orientation of the part.

There are 2 ways of selecting multiple parts:

- Draw square box, or
- Use Cntr+LMB, for adding a part, and Shift+LMB, for removing selected part.

→ This has big impact on the orientation handles.



Selecting parts... (2-4)

Draw square box

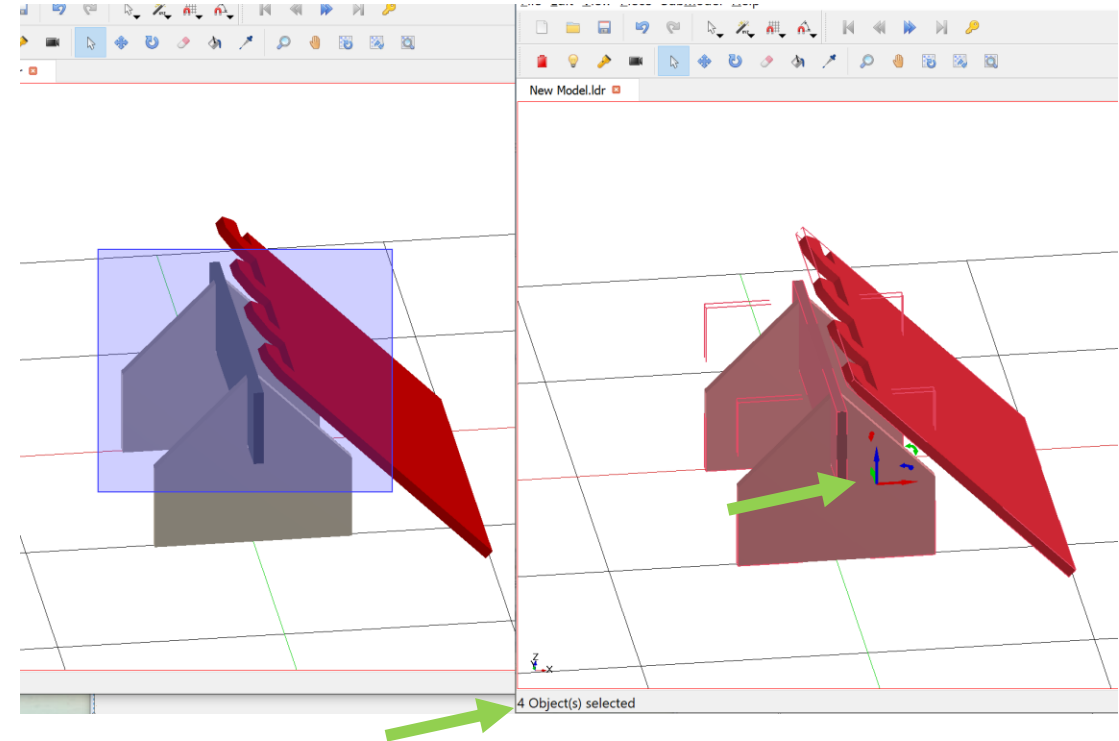
Selecting multiple parts:

- Click with LMB somewhere on the screen to start the selection box.
- Release the LMB where the selection stops.

→ Now all parts, 'touching' this selection window, will be selected.

→ The *orientation handles* are pointing in same direction, like *grid origin*!
And is centered in geometrical mid point.

→ In the status bar, the number of selected parts are shown.



Selecting parts... (3-4)

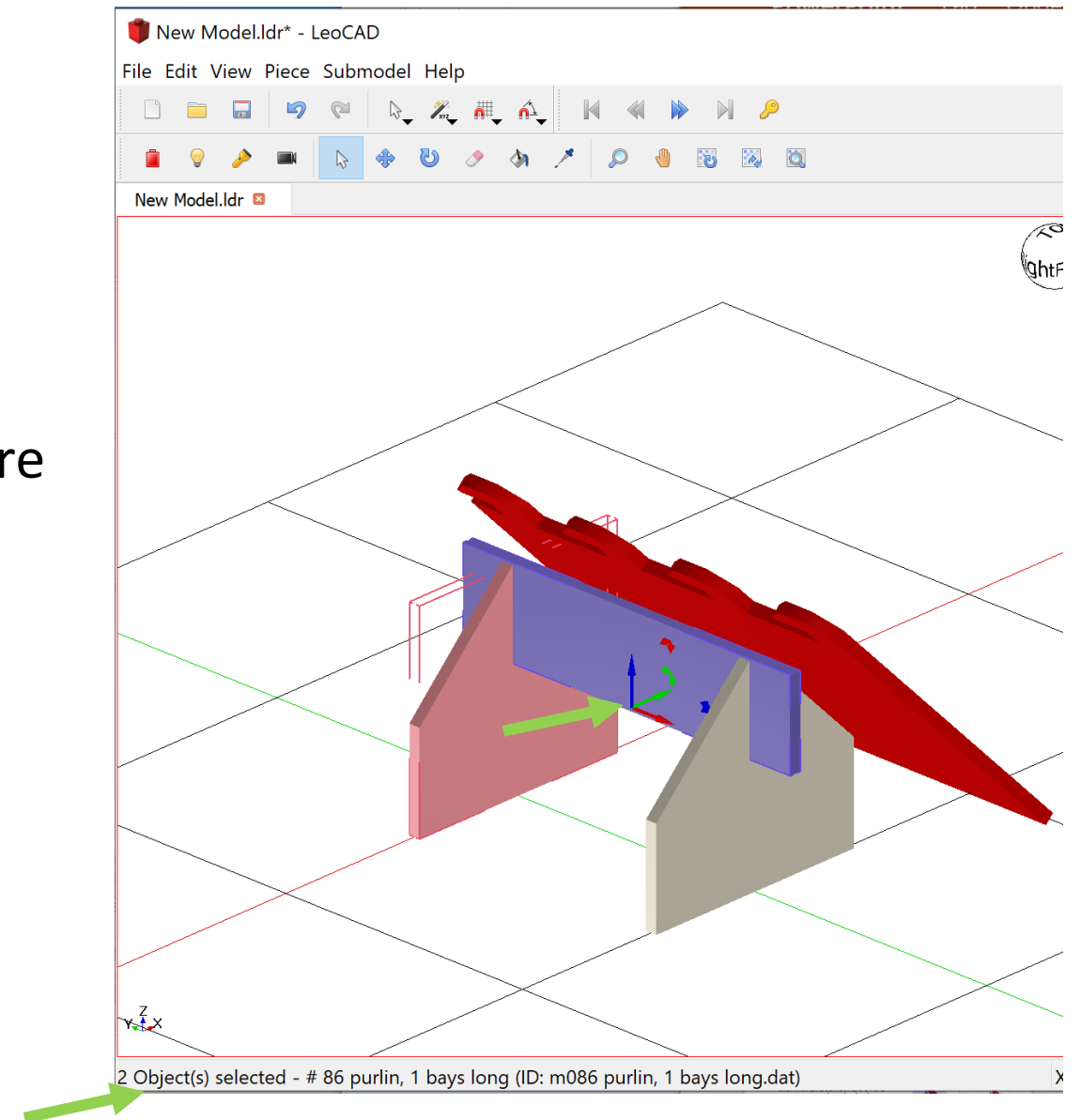
Select with: Cntr+LMB

Selecting multiple parts:

- Click with LMB first part.
- Click including Cntrl button pressed, more parts.
- Click including Shift button presses, for

→ The *orientation handles* are pointing in same direction, like *the last selected part*! And uses origin of this part.

→ In the status bar, the number of selected parts are shown.



Selecting parts... (4-4)

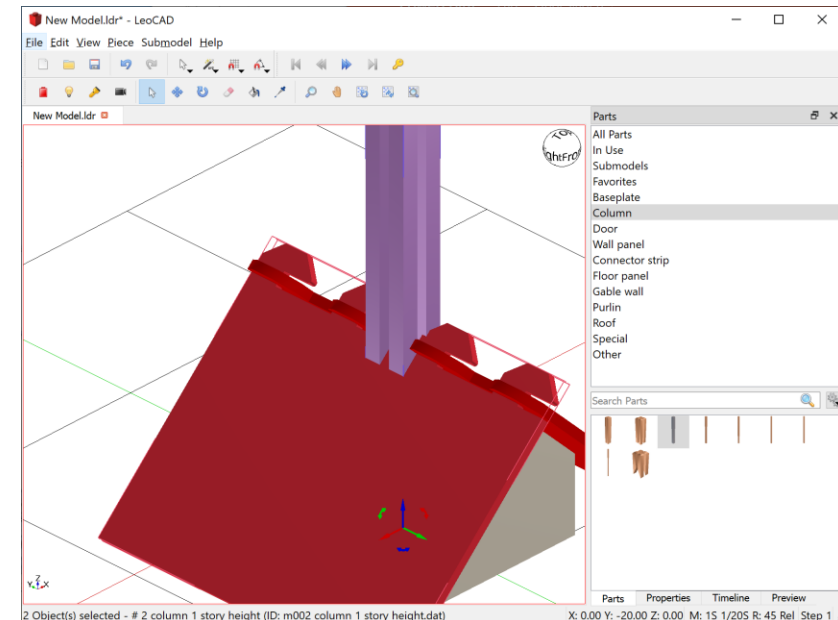
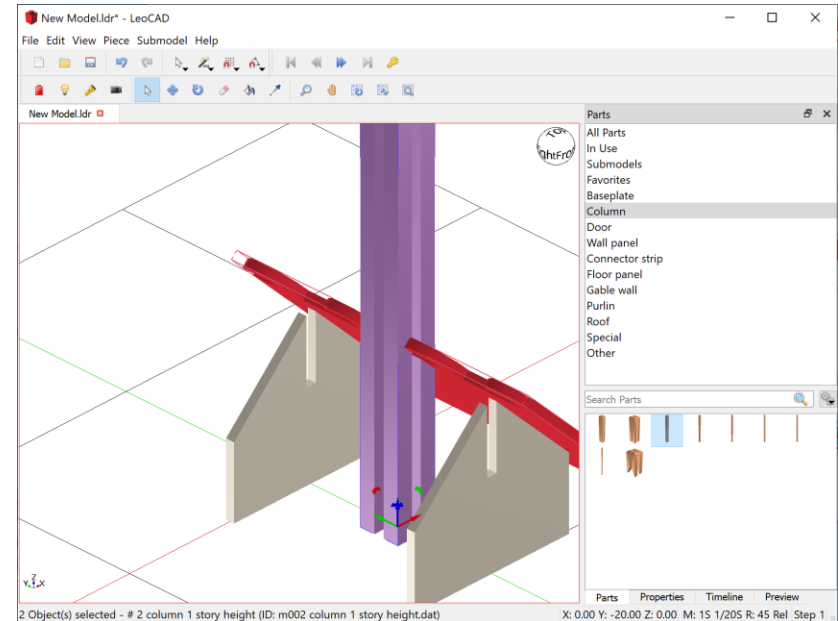
Trick rotating parts

So the ***Cntr+LMB method*** is quite handy, for copying group of parts, which needs to be rotated.

We use a 'dummy' part (this case column) and rotate around the origin of the column.

- First select all parts you want to rotate (either with square box or Cntr-method)
- As the last part, select the 'dummy' part.
- Press Cntr+D (duplicate selection)
- Rotate with round blue arrow.
- Only select the 'dummy' parts (with box method) and press 'Del'.

→ Since we rotate the selected roof, the hooks do fit directly.



Using 'Duplicate'

as often as possible!

The duplicate (Cntr-D) option is very powerfull.

Many Mobaco plans, have duplicated walls, groups of pillars etc.

So only draw one side and duplicate the rest.

This will decrease building time a lot!

Way of working:

- Select the object to copy (#22+#20 for instance)
- Press 'Cntr-D'
- Drag with 'orientation handles' to new position.

→ Sometimes, dragging goes wrong, so the selection is gone, but the duplicates are not!
Now use Cntr-LMB to select again and drag those items.

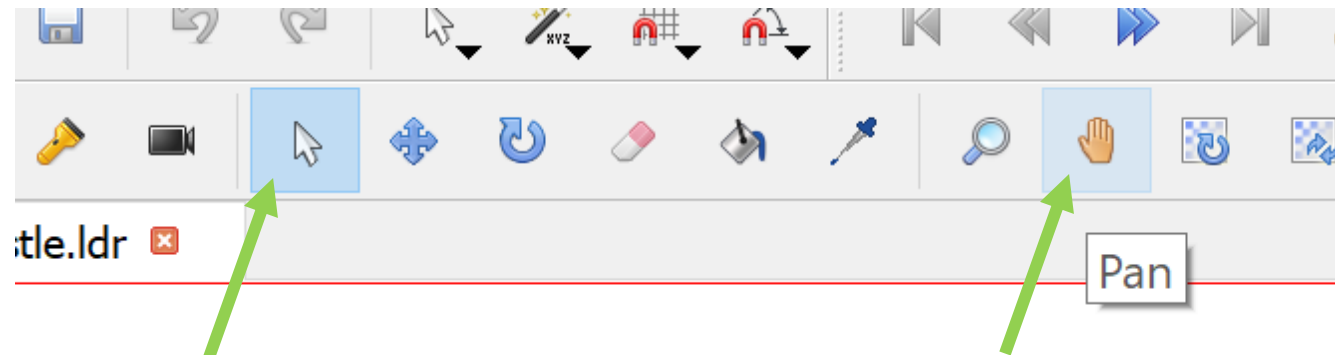
Size, Rotate & Pan screen

As often as possible

While building, the screen will very quickly become too small.

Use:

- Mouse scroll wheel to *zoom in & out*
- Use mouse right button to *rotate*
- Use 'Pan' icon to *move* te screen.
But do not forget to select the 'Select' icon again, after panning!



Best practises

-
- Tutorials
 - Building order
 - Opening LeoCAD
 - ~~Submodels~~

Tutorials

By LeoCAD

There are 2 'official' tutorials.

Just follow them!

Basics:

- <https://www.leocad.org/docs/tutorial1.html>

Rotation center:

- <https://www.leocad.org/docs/rotation.html>

Building order

- Have a printed copy in front of your computer (or use 2nd screen).
- First press 'Top' on the 'view sphere', so this orientation is same like your floor plan.
- Start with vertical panels (walls & doors) and build **ground level**
- Start at new location on grid ($z=0$), build **first floor**
- Start at new location on grid ($z=$), build **second floor**
- Now move second floor on top of first floor
- Now move both floors on top of ground level.
- Start at new location on grid ($z=0$), build **next level & repeat**.
- For place roofs, use short cuts for snapping XY. (So press '1' or '5'.)
- Start at new location on grid ($z=0$), place '**base plate**'
- Move all parts up and push 'base plate' underneath.
- Start at new location on grid ($z=0$), place all **columns** and then move them to right position.
(Leaving the columns out at early stage, makes it easier to select other parts of the building.)
- **Safe your work (Cntr-S)**, at least after each bullet in this list.

Opening LeoCAD (1-2)

(every time)

Although a bit annoying, not all 'view' options are saved, when closing LeoCAD. So everytime you want to build something, do this:

- Set **Snap-XY** at 1 stud. (shortcut '5')
- Set **Snap-Z** at 1/20 stud. (shortcut 'Cntr-Shift-1')
- Set **rotation** at 90 degrees. (short cut 'Shift-8')

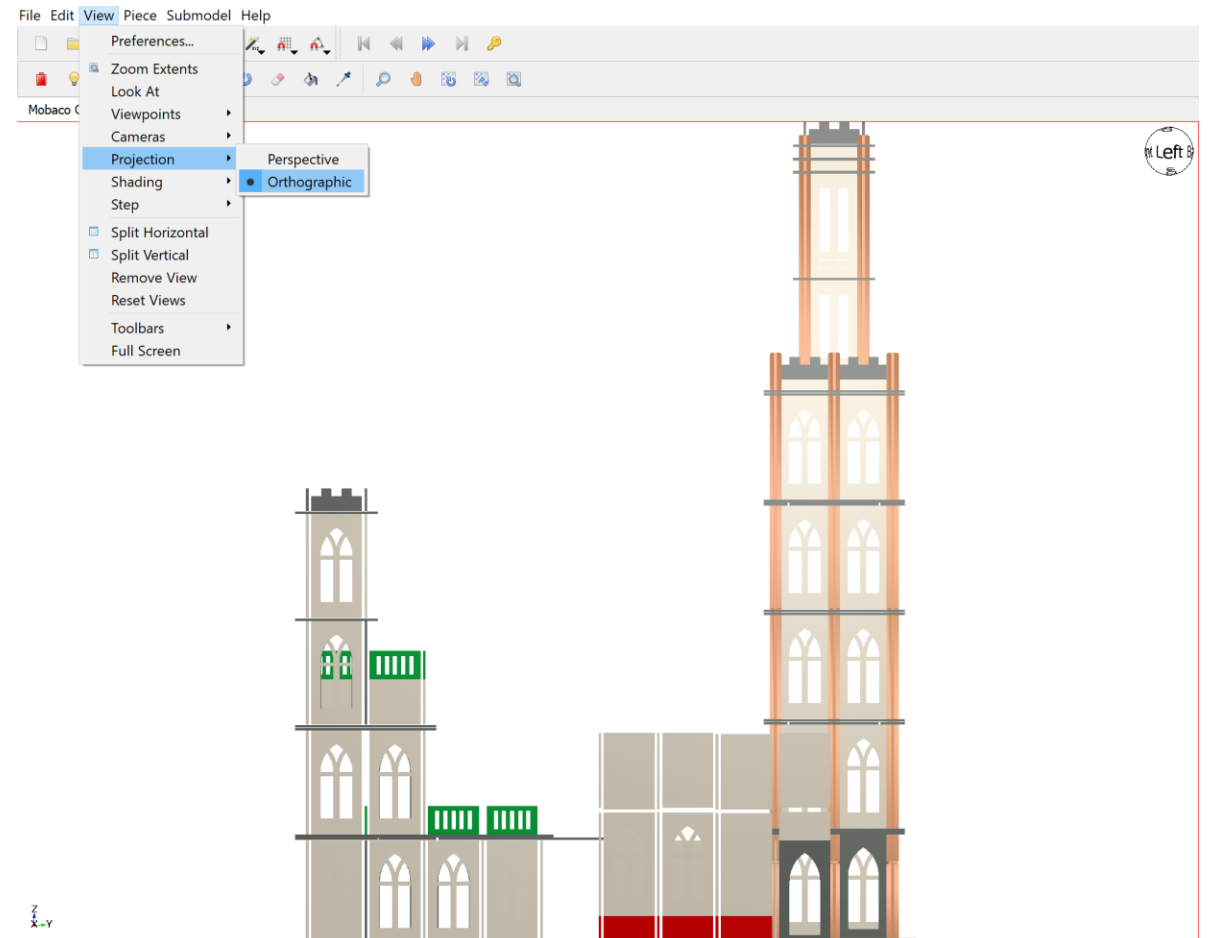
Opening LeoCAD (2-2)

(every time)

And set: 'View' - 'Projection' = '**Orthographic**'

This is very handy, for placing objects at right height.

Also use the 'view sphere',
for quick orientation.



Mobaco Library

-
- Numbering
 - Missing parts
 - Issue's & updates

Numbering

filenames

Since the odd numbering of Mobaco, including double or no numbering etc, we need to create unique filenames.

- Also a 'set' identifier is used:
 - M = Moubal parts (most items)
 - J = Jumbo parts (not used, but should be used for: #70, #71, #73, #19)
 - Gx = Garage + version
 - Wx = Windmill + version
 - Z = Model Z
 - SP = Special (for authentic parts, like: 2 window panels)
 - U = User (maybe adding a user section, for newer designs??)
- In other cases, with identical geometry, like #20 window, the color is included in the filename.

Missing parts

Missing in current library

- Parts, exceptions:
 - Both clocks (#29, #73) are grey versions of panels (#18, #23).
 - Z008 is same like Z005
 - We don't need Z014, for virtual models, we can place chimnies on all roofs.
- Folded parts:
For easy use, create your own 'group' from seperate parts:
 - Stairs (Z015+Z016+Z017)
 - #160
- 3D parts:
 - Flag pole (#161)
 - Wooden roof caps for windmills. (W_010)
 - Chimney (Z012+Z013)

Issue's & updates

No updates planned.

Current buildings might need adjustments:

- Change 'center of parts'. Some parts don't have right rotation center, like #40, #43 etc.
- Solving the height issue? No, too much work.
- Check all content for completeness, who will help?

'Silent' updates, not effecting current buildings:

- All parts have missing edges (still needs to be programmed).
- New parts in the library.

Categories in LeoCAD: don't work like expected...

- Category filters are base on "name", instead of "category meta" command.
So, some parts are in multiple categories.

Ohter topic: Who will own this library?

Best
practises:
Just try
yourself!

-
- End of presentation