CH Lab

Designed and created by Claude Hanssens – Claude@Hanssensandco.be

Instructions and others modules available et www.Hanssensandco.be/MMM

English is NOT my primary language. So please accept respectfully the errors and mistakes in the text.
If you wish to correct and improve the text, don't hesitate to contact me.

General Description

Introduction

CH Lab has been created as an add-on for the Major Matt Mason (by Mattel). The scale is about 1/12.

CH Lab is a set of PDF files. Each file contains a module (see below). All the parts needed to build a module are in one file. The selected file must be printed. The part must be cut, folded and glued.

Three main possibilities

CH Lab can be built in 3 different ways:

1. Included in the MMM Space Station, at the ground level.
2. Included in the MMM Space Station, at the first level.
3. As a separate construction.

Following your choice, you can only build some modules. Other modules are not adapted.

Following your choice, you will have to build and add some parts (or not).

Description of the modules

Wall - Base 1

It is a basic wall for general purpose. It is decorated with 4 squares on each side (outer and inner).

Wall - Base 2

It is a basic wall for general purpose. It is decorated with 2 big rectangles on each side (outer and inner).

Wall - Window

It is a basic wall with a window for general purpose.

Wall - Door

It is a basic wall with a door. The door opens and closes.

Wall - Base - Column - Panel Right

It is a part designed only to be included in the Space Station. It leaves space for the red column that support the upper floor.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Base 1*** or ***Wall – Base 2***.

It contains a panel on the right side of the wall, the red column being on the left side.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Wall - Base - Column - Panel Left

It is a part designed only to be included in the Space Station. It leaves space for the red column that support the upper floor.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Base 1*** or ***Wall – Base 2***.

It contains a panel on the left side of the wall, the red column being on the right side.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Wall - Base – No Column - Panel

It is a part designed for a separate construction only.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Base 1*** or ***Wall – Base 2***.

It contains a panel.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Wall - Window - Column - Panel Right

It is a part designed only to be included in the Space Station. It leaves space for the red column that support the upper floor.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Window***.

It contains a panel on the right side of the wall, the red column being on the left side. The upper part of the wall is a window.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Wall - Window - Column - Panel Left

It is a part designed only to be included in the Space Station. It leaves space for the red column that support the upper floor.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Window***.

It contains a panel on the left side of the wall, the red column being on the right side. The upper part of the wall is a window.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Wall - Base – No Column - Panel

It is a part designed for a separate construction only.

This module contains only the inner part of the wall. You must use the outer part from the module ***Wall – Window***.

It contains a panel. The upper part of the wall is a window.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

Panel - Gauges

It contains gauges, displays, …

You can add those gauges to the panels from the file that contains a Panel.

Floor - Column - Left

It is a part designed only to be included in the Space Station at the first level. It leaves space for the red column that support the upper floor.

It contains a floor for the **CH Lab**, the red column being on the right side.

This module contains one slice (1/6) of the floor.

Floor - Column - Right

It is a part designed only to be included in the Space Station at the first level. It leaves space for the red column that support the upper floor.

It contains a floor for the **CH Lab**, the red column being on the left side.

This module contains one slice (1/6) of the floor.

Floor – No Column

It is a part designed to be included in the Space Station at the ground level or for a separate construction.

It contains a floor for the **CH Lab**.

This module contains one slice (1/6) of the floor.

Ceiling

It is a part designed for a separate construction only.

It contains a ceiling for the **CH Lab**.

This module contains one slice (1/6) of the Ceiling.

Divider - Base

This part can be used in the Space Station or on a separate construction. It must be used with a floor.

It contains a divider for the **CH Lab**, dividing from the external wall till the center.

This module contains one divider.

Divider - Window

This part can be used in the Space Station or on a separate construction. It must be used with a floor.

It contains a divider for the **CH Lab** with a window, dividing from the external wall till the center.

This module contains one divider.

Divider - Door

This part can be used in the Space Station or on a separate construction. It must be used with a floor.

It contains a divider for the **CH Lab** with a door, dividing from the external wall till the center.

This module contains one divider.

Required parts or modules

For a build in the Space Station, at the ground level

For each wall, you need to build also the corresponding ***Floor***.

For each wall, you need to build and glue the tenons.

For a build in the Space Station, at the first level

For each wall, you need to build and glue the tenons.

In each wall, you need to cut out the mortises.

For a separate construction

For a separate construction, you need at least 2 (better 3) ***Floor***, ***Wall*** and ***Ceiling*** so that the construction stay upright.

You don't need nor to build the tenon, nor to cut out the mortise.

Technical Instructions

This section gives some technical instructions for building Paperart. You can easily find more detailed instructions on the Internet.

Preparation

Read all the instructions beforehand!

Printing

Print on ***200 g/m² normal white A4 paper*** (or similar).

When printing, check that you print on ***Actual Size***.

Before printing, read the specific instructions and select the pages to print. Print only the needed/required pages (avoid wasting paper).

Printing specific pages (e.g.: the gauges) on photo paper will produce a more dramatic effect.

Cutting

Use a sharp precision cutter or a surgical scalpel. Results are better with brand new tools. It is also possible to use sharp scissors.

Use a good metal ruler. If possible, use one with anti-slid material.

Cut all the pieces needed. See detailed instructions to select the pieces to cut.

Cut away the light grey parts if needed. See detailed instructions for more details.

Marking the folds

Folding is better and easier when the folds are marked. You can mark the folds by:

- Slightly and partially cutting the paper.
- Using an empty pencil.

Folding

All folds are "Mountain Fold": fold the pieces "backward".

Enforce the fold by pressing with a finger.

Some parts are rounded. Prepare the shape by sliding the paper around a small cylinder (pencil, …).

Testing and checking

Before gluing, test and check the build.

Gluing

Use white paper glue.

The glue must be apply on the dotted areas.

Apply the glue with a small brush.

Wait enough time before going to the next step. Clamps can be very useful.

Specific Instructions

Wall - Base - 1

Description

It is a basic wall for general purpose. It is decorated with 4 squares on each side (outer and inner).

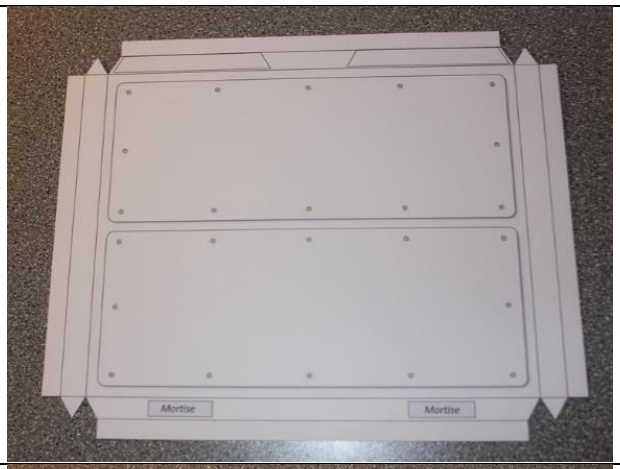
For a build in the Space Station, at the ground level, you need to build and glue the tenons. You need to glue the wall to a slice of floor (see ***Floor – No Column***).

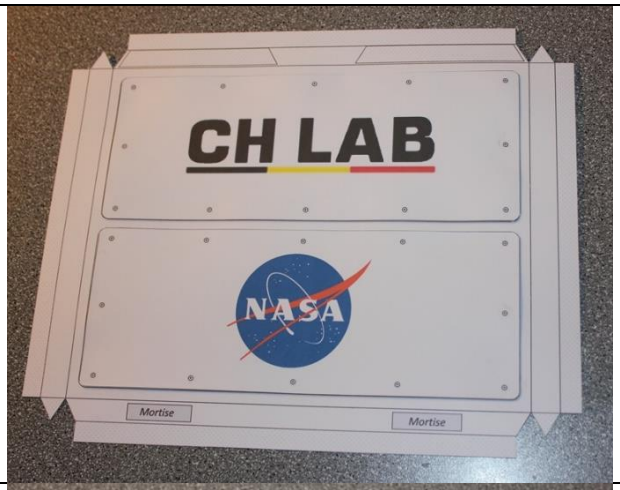
For a build in the Space Station, at the first level, you need to build and glue the tenons and to cut out the mortises.

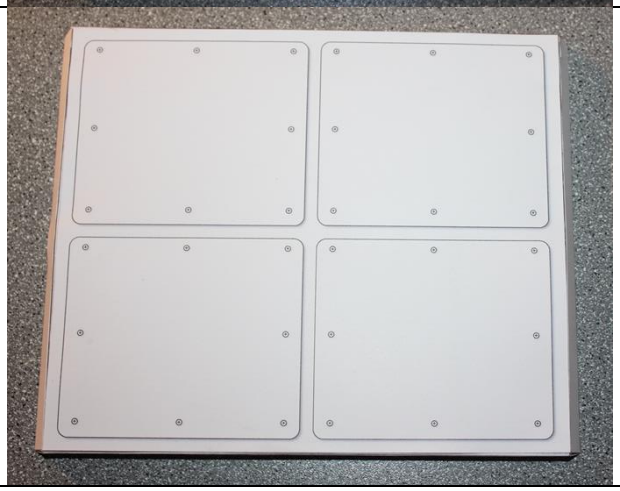
For a separate construction, you don't need nor to build the tenon, nor to cut out the mortise. You need to glue the wall to a slice of floor and glue a slice of ceiling on the wall (see ***Floor – No Column*** and ***Ceiling***).

<u>The same building steps are used for all walls.</u>

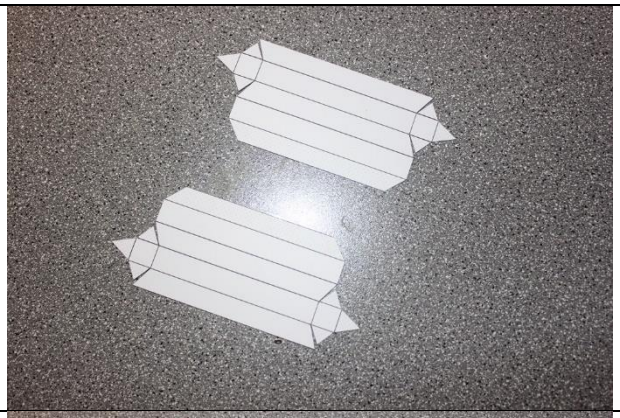
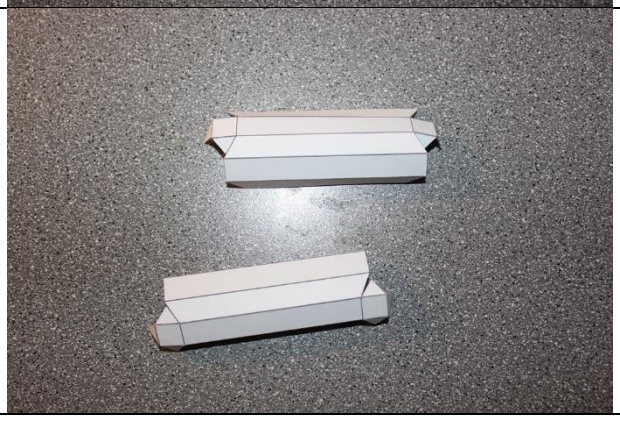
Steps to build the wall

1	Cut out all the pieces you need.		
2	Mark the folds on every pieces and make a first fold of each.		

3	If you want to add reliefs, glue it on the inner or outer part (see Steps to add relief).		
4	Build the 3 beams.		
5	Glue the beams on the outer part: One beam at the top, one at the bottom and one in the middle.		
6	Fold and glue the side of the outer part.		

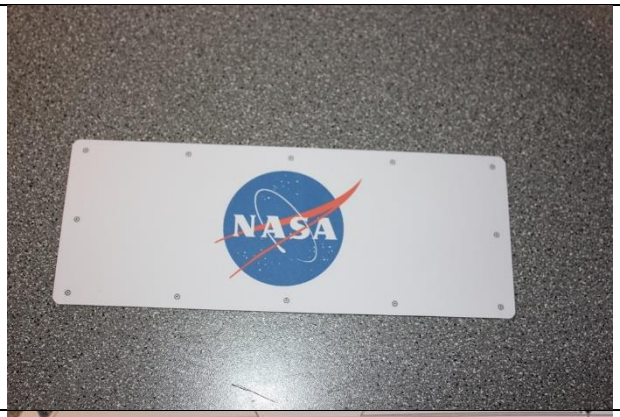
7	Fold and glue the top and the bottom of the outer part.		
8	Glue the inner part. Look out the shadows are in the same direction on the inner and the outer parts.		

Steps to build the tenons

1	Cut out all the pieces you need.		
2	Mark the folds on every pieces and make a first fold of each.		

3	Build the 2 tenons.	
4	Place the tenons in the platform of the Space Station to test fit.	
5	Glue the tenons on the top of the wall at the designed places.	
6	Place the wall in the Space Station and eventually adjust the wall before the glue dries.	

Steps to add relief

1	Cut out all the pieces you need.	
2	Glue it on the desired place.	
3	If you want, cut out the screws and glue them on the panel.	

Wall – Base - 2

Description

It is a basic wall for general purpose. It is decorated with 4 squares on each side (outer and inner).

For a build in the Space Station, at the ground level, you need to build and glue the tenons. You need to glue the wall to a slice of floor (see ***Floor – No Column***).

For a build in the Space Station, at the first level, you need to build and glue the tenons and to cut out the mortises.

For a separate construction, you don't need nor to build the tenon, nor to cut out the mortise. You need to glue the wall to a slice of floor and glue a slice of ceiling on the wall (see ***Floor – No Column*** and ***Ceiling***).

Build it using the steps described in ***Wall – Base 1***.

Wall - Window

Description

It is a basic wall with a window for general purpose.

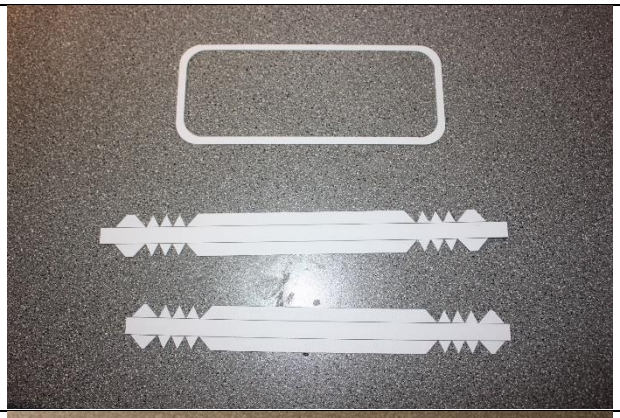
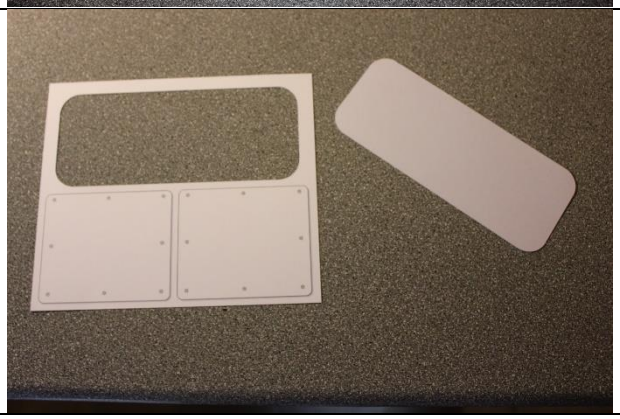
For a build in the Space Station, at the ground level, you need to build and glue the tenons. You need to glue the wall to a slice of floor (see ***Floor – No Column***).

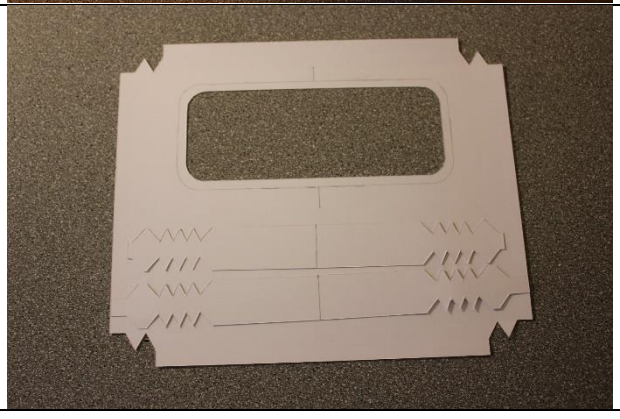
For a build in the Space Station, at the first level, you need to build and glue the tenons and to cut out the mortises.

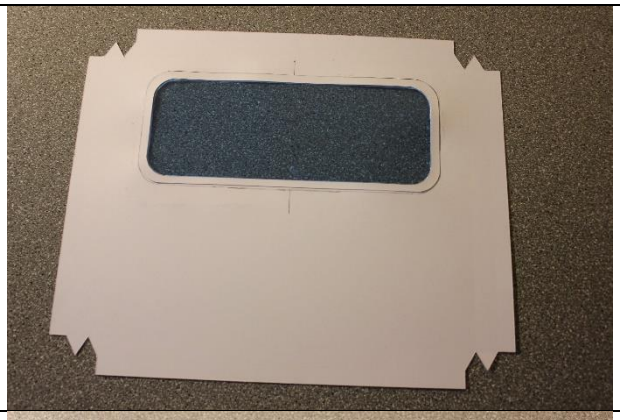
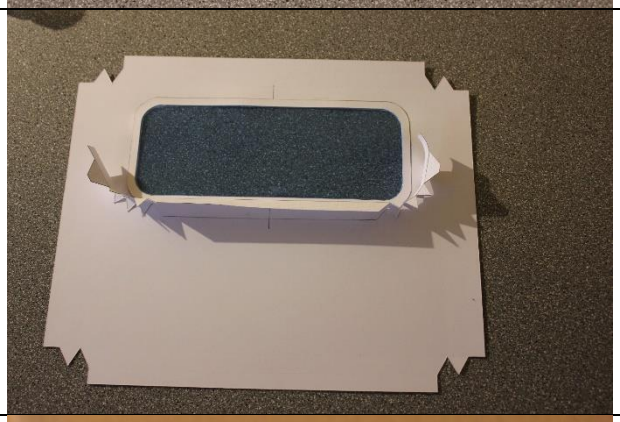
For a separate construction, you don't need nor to build the tenon, nor to cut out the mortise. You need to glue the wall to a slice of floor and glue a slice of ceiling on the wall (see ***Floor – No Column*** and ***Ceiling***).

Build it using the steps described in ***Wall – Base 1***.

Steps to build the window

1	Cut out all the pieces you need.	
2	Cut out the window from the panel.	

3	Use the Cut out from the *inner part* to cut out a transparent sheet (Plastic Jacket sleeve, …).	
4	Mark the middle of the window on the inside of the outer part of the wall and on the border parts of the window.	

5	Glue the plastic on the inside of the outer part of the wall. Glue on it the border of the window		
6	Mark the fold on the parts for the border of the window.		
7	Glue the central part of the border of the window, aligning the center marks.		
8	Glue the sides of the border of the window.		

9	Repeat for the other part of the border of the window.	
10	Build 2 beams (see ***Wall – Base 1***) and place them at middle and the bottom off the wall.	
11	Glue the Inner part. Look out the shadows are in the same direction on the Inner and the outer parts.	

Wall - Door

Description

It is a basic wall with a door for general purpose.

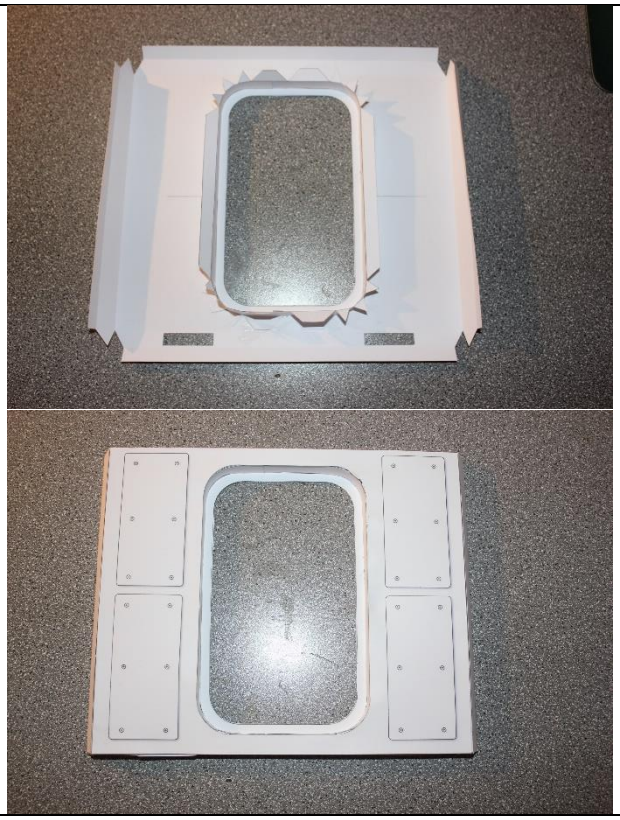
For a build in the Space Station, at the ground level, you need to build and glue the tenons. You need to glue the wall to a slice of floor (see ***Floor – No Column***).

For a build in the Space Station, at the first level, you need to build and glue the tenons and to cut out the mortises.

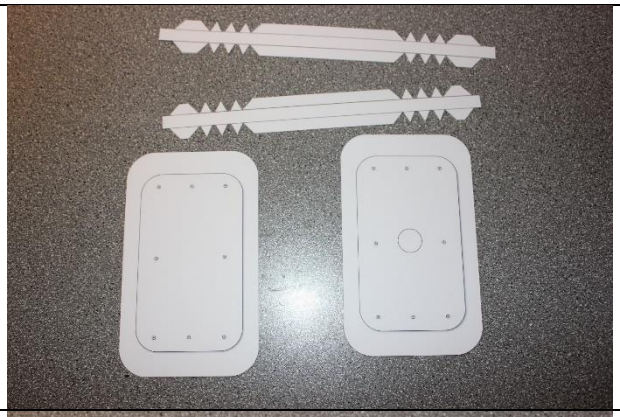
For a separate construction, you don't need nor to build the tenon, nor to cut out the mortise. You need to glue the wall to a slice of floor and glue a slice of ceiling on the wall (see ***Floor – No Column*** and ***Ceiling***).

Build it using the steps described in ***Wall – Base 1***.

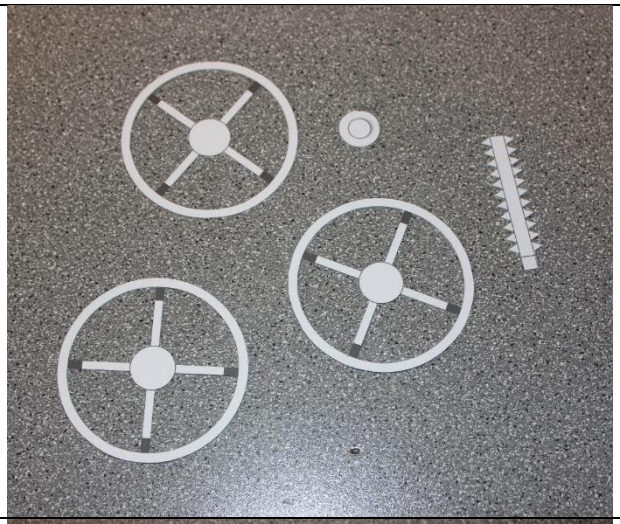
Steps to build the door opening

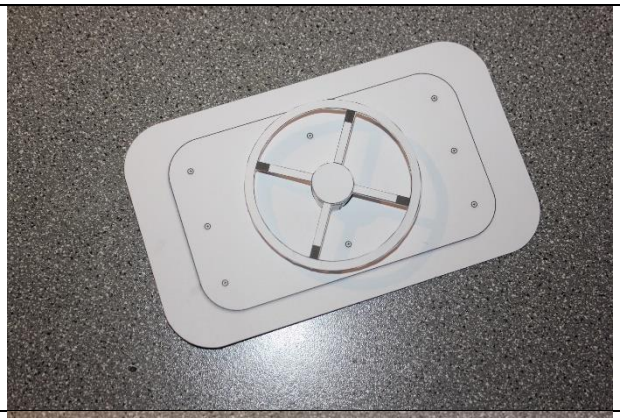
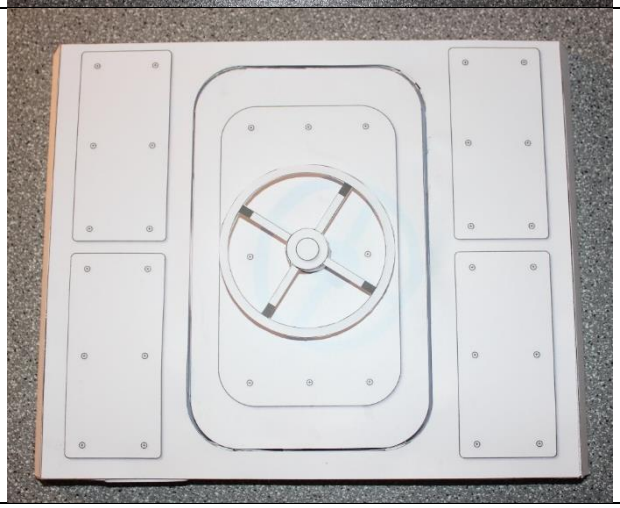
1	Build the door opening using the same steps described in ***Wall – Window***.	

Steps to build the door

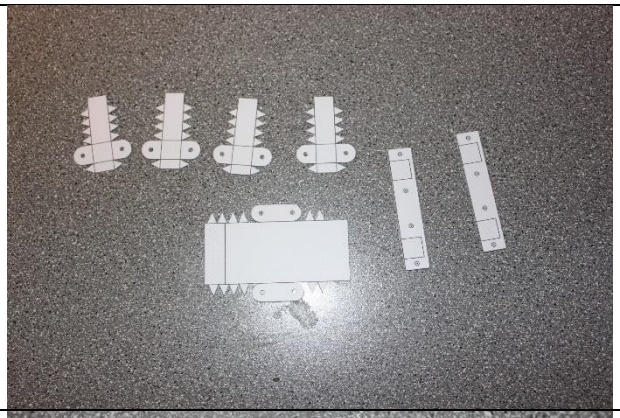
1	Cut out all the pieces you need.		
2	Mark the middle of the door on the inside of the door and on the border parts of the door. Glue the central part of the border of the door, aligning the center marks. Glue the sides of the border of the door.		
3	Glue the other side of the door.	 	

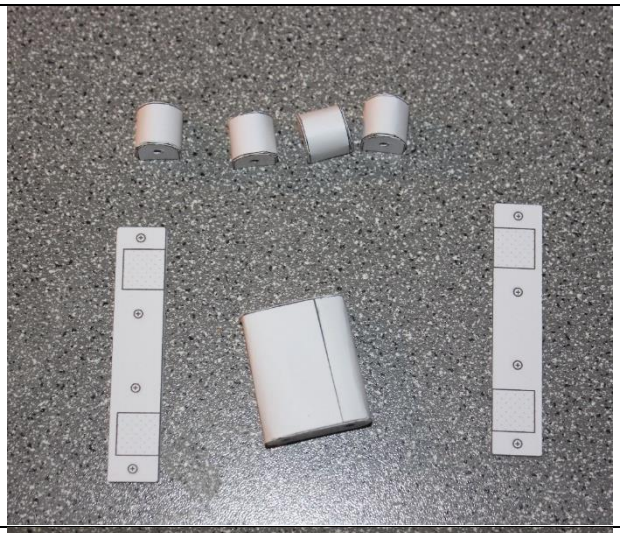
Steps to build the door handle

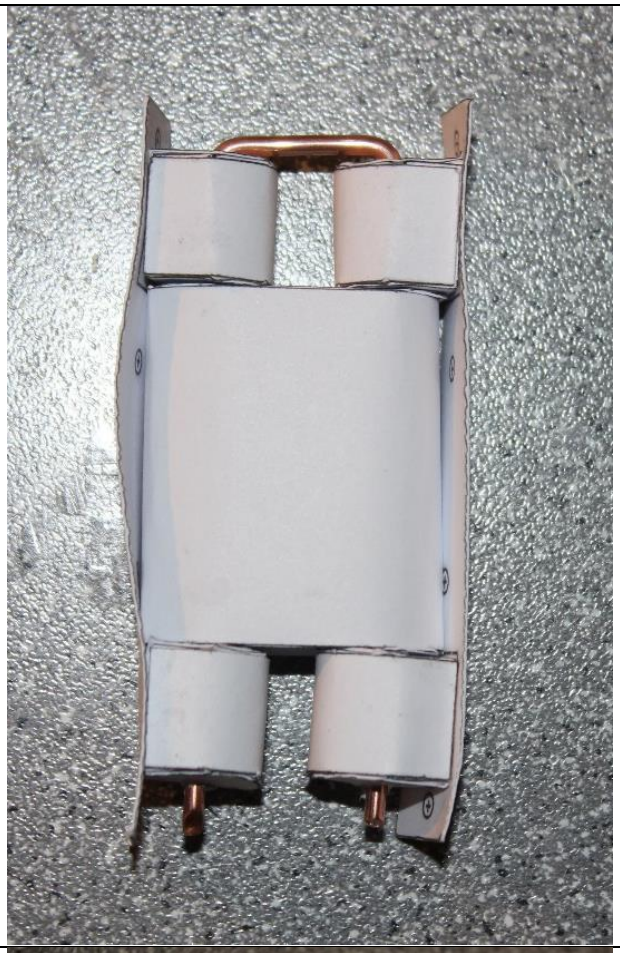
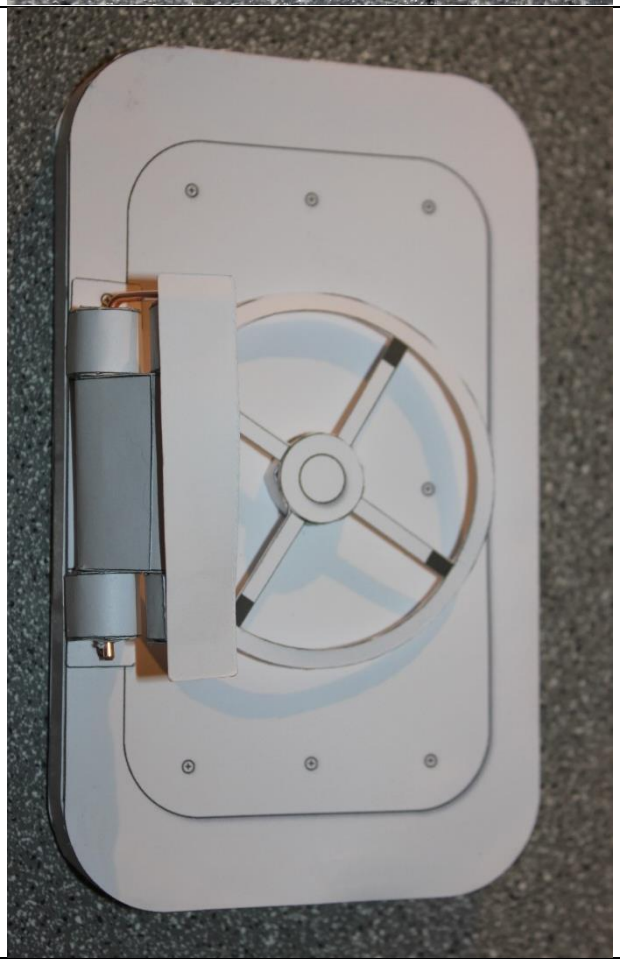
1	Cut out all the pieces you need.	
2	Glue the side of the door handle, step by step.	 
3	Glue the 3 parts of the door handle on each other, the bottom one upside down.	

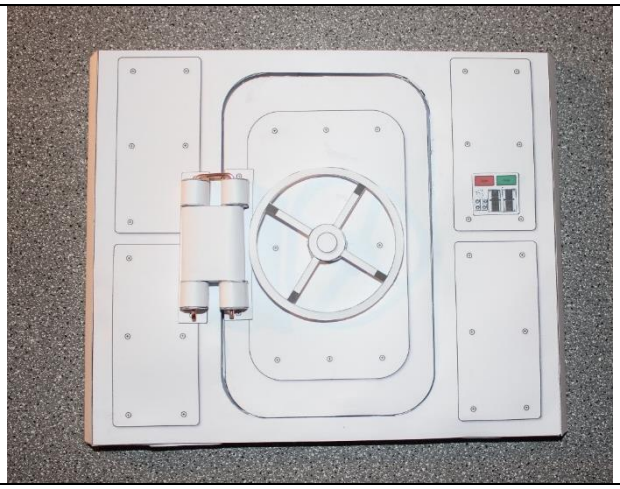
4	Glue the door handle on the door.		
5	Glue the central part of the door handle. Look out the shadows are in the same direction on the door handle and on the wall.		

Steps to build the door hinge

1	Cut out all the pieces you need.		
2	Mark the fold on the 4 side parts and on the central part of the door hinge. Glue the central part of the 4 side parts and of the center part.		

3	Glue the side of the 4 parts and of the central part.	
4	Glue the 2 upper side parts on each tab. Place temporarily the central part to have the correct spacing for the side parts. Glue the 2 lower side parts on each tab.	
5	Fold a plastic or metal rod (diameter about 1.5 mm). Here I used a coper electric wire.	

6	Build the hinge. Look out the shadows are in the same direction.	
7	Glue the door hinge on the door. Look out the shadows are in the same direction. Align the side of the door hinge and the side of the door.	

8	Place the door in the wall. Look out the shadows are in the same direction. Glue the door hinge on the wall.	

Wall – Panel

Description

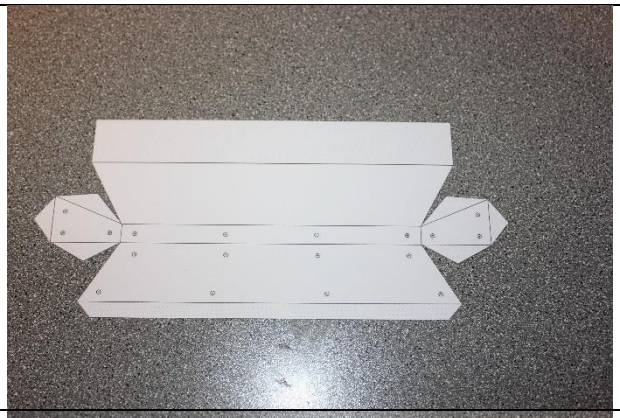
These modules contains only the inner part of the wall. You must use the outer part from the module ***Wall – Base 1***, ***Wall – Base 2*** or ***Wall-Windows***. They contain a panel.

You can add gauges from the file ***Panel - Gauges*** on the panel or on the wall.

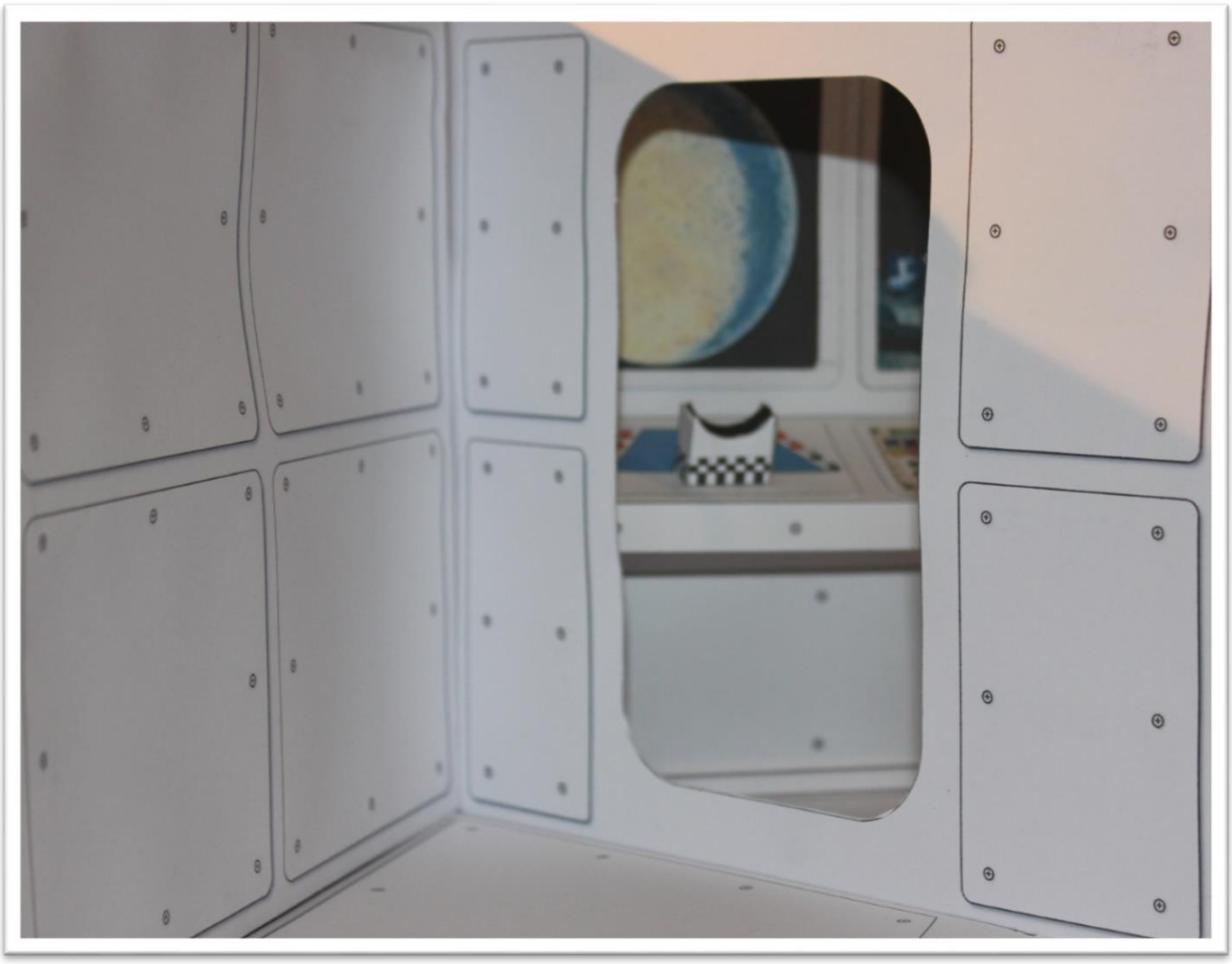
Build it using the steps described in ***Wall – Base 1***.

Build the panel corresponding to the selected wall.

Steps to build a panel

1	Cut out all the pieces you need.	
2	Glue the desired gauges.	
3	Mark the folds on every pieces and make a first fold of each.	

4	Build the panel.		
5	Glue the panel on the wall.		



Panel - Gauges

Description

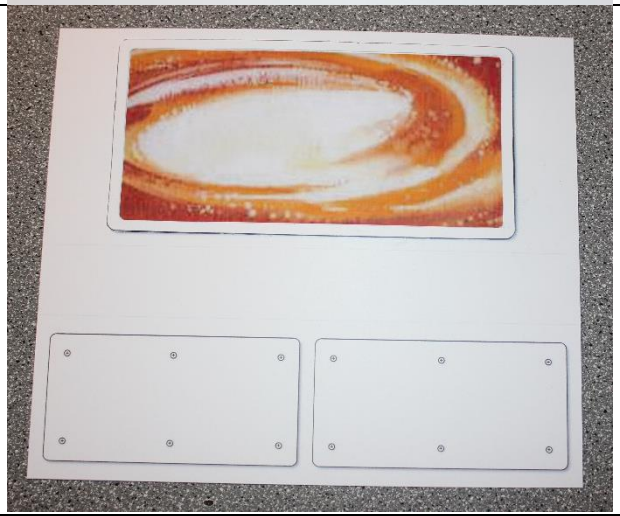
It contains gauges, displays, …

You can add those gauges to the panels from the file that contains a Panel.

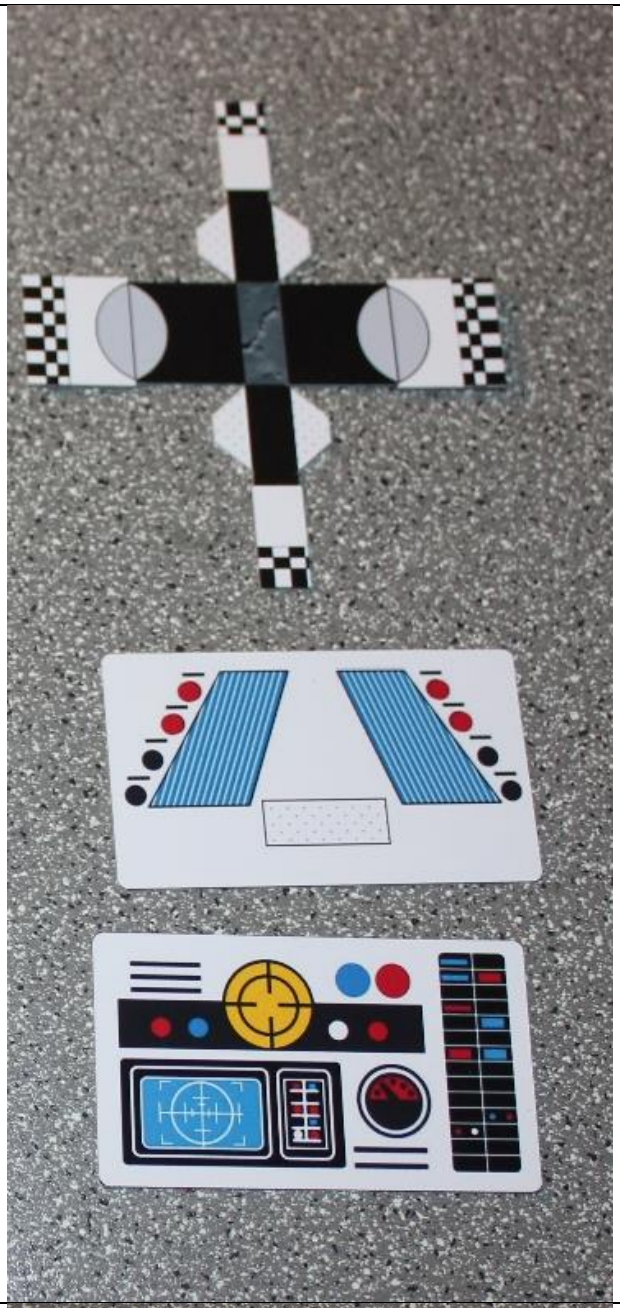
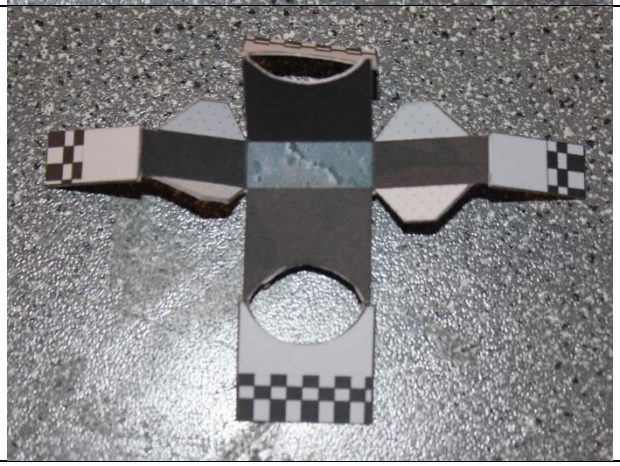
For the basic gauges, just cut them out and glue them.

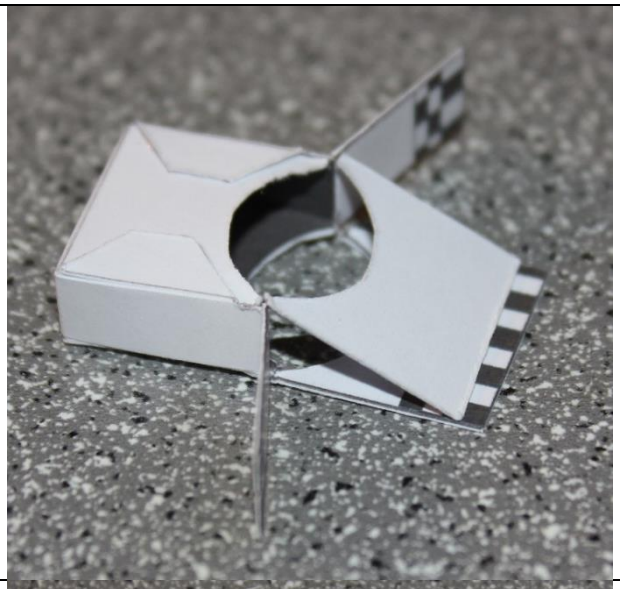
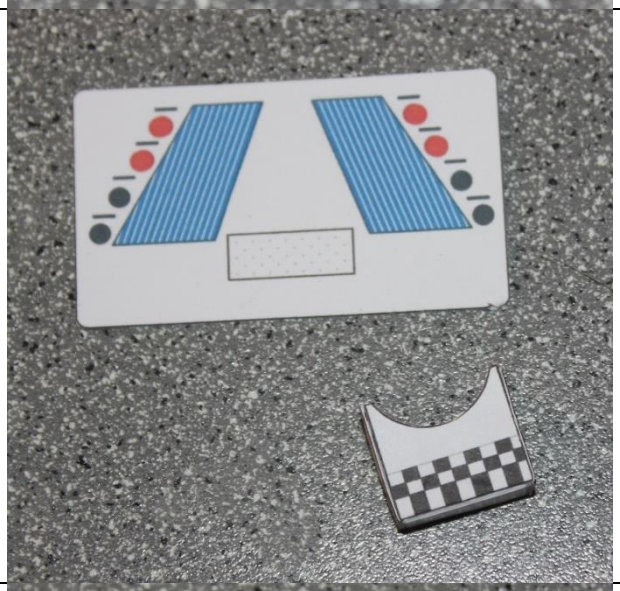
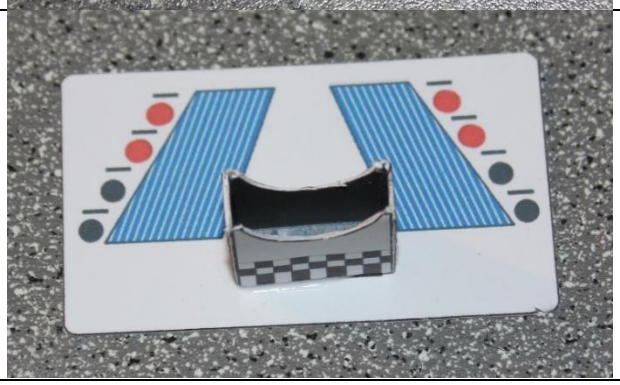
Glue the gauges on the panel before building the panel.

Steps to build the screen

1	Cut out all the pieces you need.	
2	Glue the frame on the screen.	
3	Glue the screen on the inner part of the wall before building it.	

Steps to build the scope

1	Cut out all the pieces you need.	
2	Mark the folds on every pieces and make a first fold of each. Look out for the valley and mountain folds.	

3	Glue the inner part of the scope.	
4	Glue the outer part of the scope.	
5	Glue the scope to the gauges when the panel is fully built.	

Floor

Description

These are parts can be included in the Space Station at the ground level, at the first level or in a separate construction.

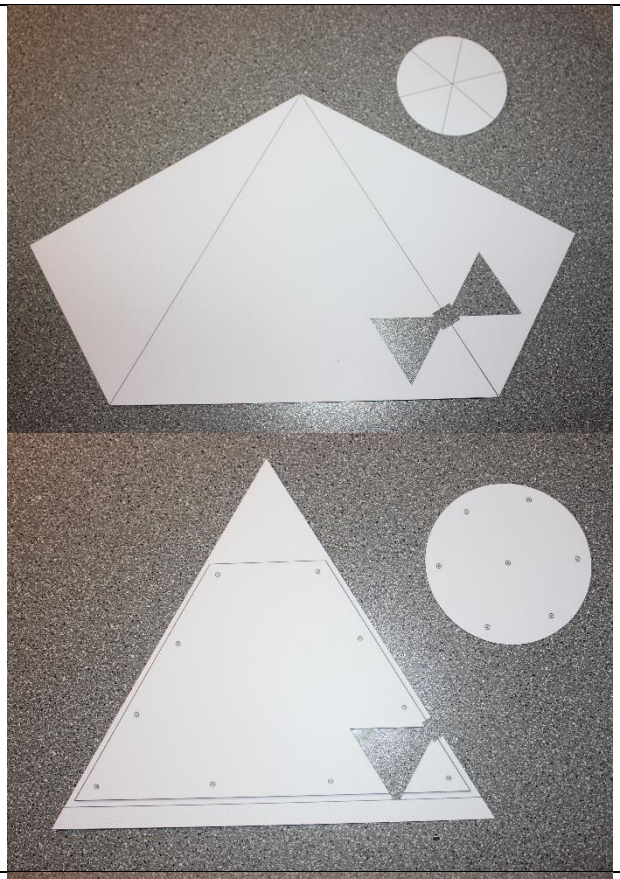
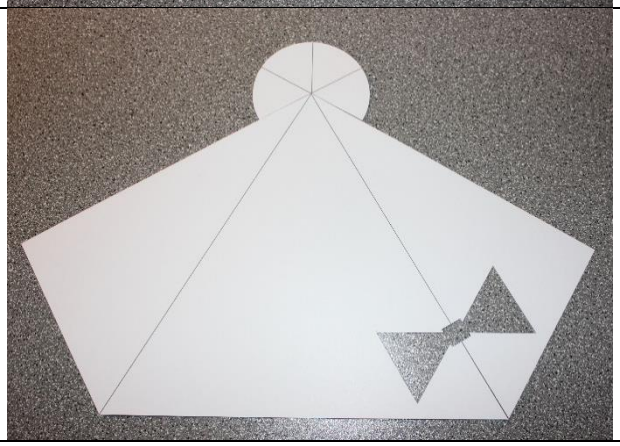
They contain a floor for the **CH Lab**.

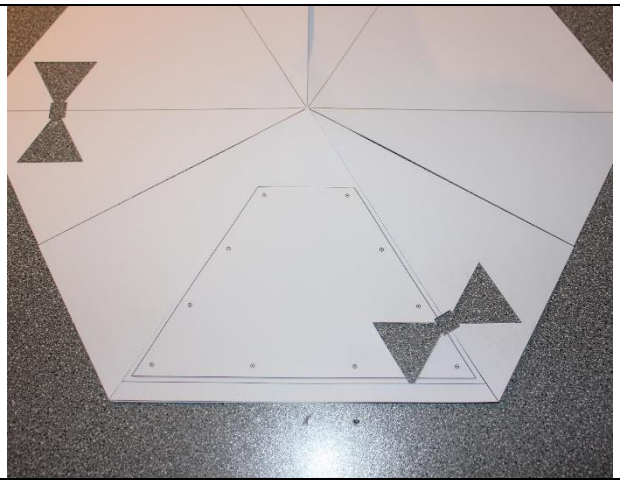
Each module contains one slice (1/6) of the floor.

You can build a full floor or only a part of it.

Build the floor corresponding to your need.

Steps to build a floor

1	Cut out all the pieces you need.	
2	Glue the bottom layer on the center circle. Add parts to have the area you want.	
3	Eventually, place the dividers at this stage.	

4	Glue the top layer on the bottom layer. You may need to slightly cut the sides of the top layer if you added dividers. Add parts to have the area you want.	
5	Eventually, cut the exceeding areas.	
6	Glue the walls on it.	

Ceiling

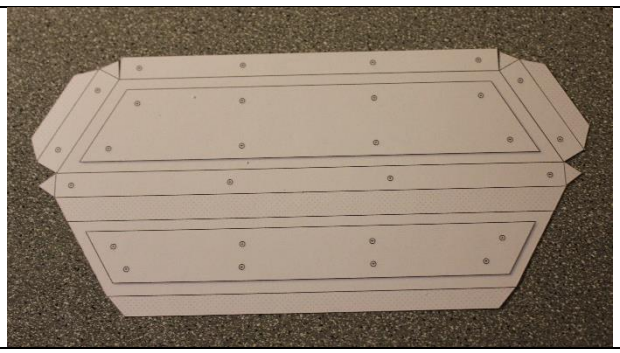
Description

It is a part designed for a separate construction only.

It contains a ceiling for the **CH Lab**.

This module contains one slice (1/6) of the Ceiling.

Steps to build a ceiling

1	Cut out all the pieces you need.	
2	Mark the folds on every pieces and make a first fold of each.	

3	Build the ceiling.	
4	Glue it on top of the wall.	

Divider

Description

This part can be used in the Space Station or on a separate construction. It must be used with a floor.

It contains a divider for the **CH Lab** dividing from the external wall till the center.

This module contains one divider.

Steps to build a divider

1	Cut out all the pieces you need. Eventually, cut out the window or the door.	
2	Mark the folds on every pieces and make a first fold of each.	
3	Glue the 2 parts back to back. Eventually glue the divider on a floor, better with the top layer of the floor above the floor tab of the divider. Eventually glue the divider to another divider, better with the side tab(s) of the divider inside the other divider.