

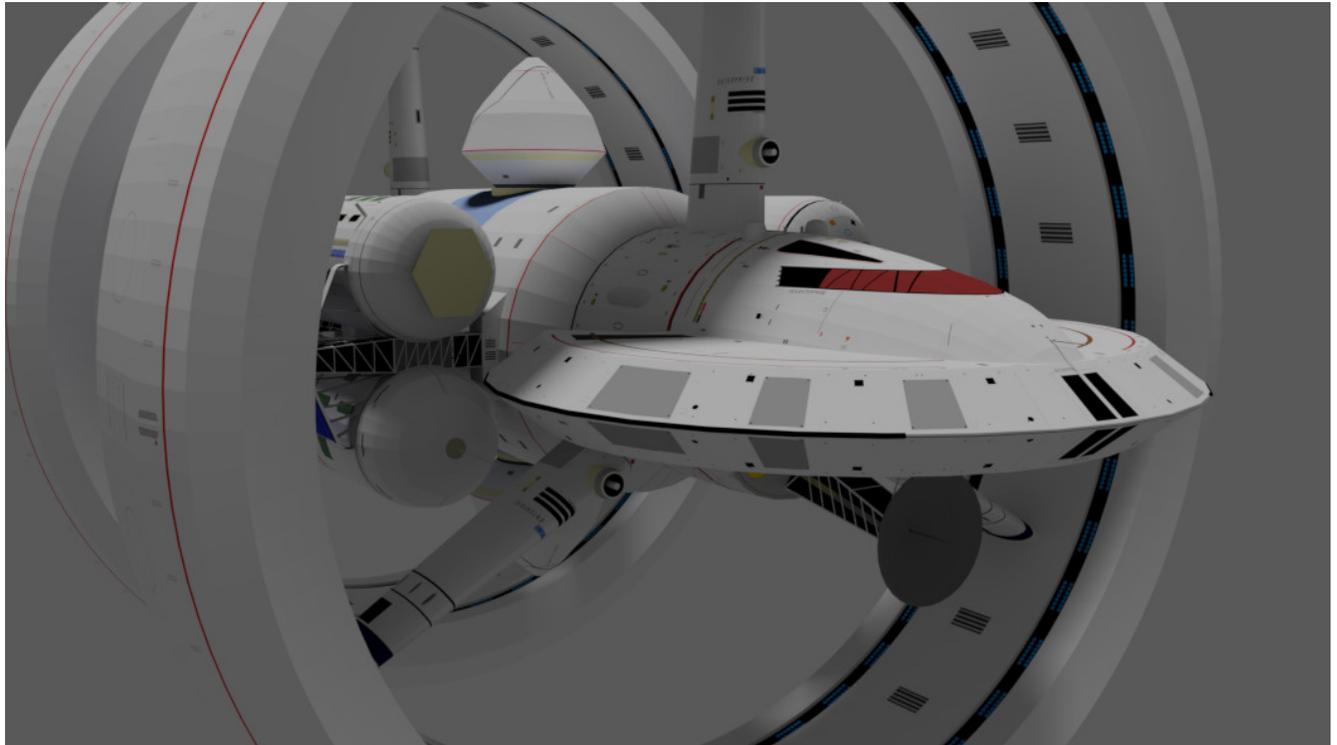
IXS Enterprise - 1/144

Version 1.3, Card Model Designed by David Lukens (C)2018

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http://insanityunlimited.com/model_plans/

Original Concept by Mark Rademaker - <http://mark-rademaker.blogspot.com>



I hope you enjoy this model. I distribute it for free so that as many as possible can build it. If you think it is worth something, please drop a few dollars in the tip jar. Knowing that people are getting something out of all the work that goes into a design such as this makes a big difference. The IXS Enterprise has easily consumed several hundred hours to design, layout, and build. Thanks.

-Dave

QR code for the tip jar:

[Paypal Link](#)



Forward

All of the photos used in this guide can be found in higher resolutions in the gallery: _

http://insanityunlimited.com/gallery/paper_models/ixs_enterprise/

Tips and Tricks

Here are a few things that have come up in testing the build that make life easier from several different angles.

- By default, print the pages on 60-70lb card stock. The exception is the page with turbine parts that should be printed on 20-40lb paper.
- The joiner strips for the rings on the warp tori should be made from thin (20lb) paper. The joiner strips that link an entire circle of parts together end up adding some thickness to each of those seams. If you use 65lb cardstock for those joiners the thickness builds up over time and you will get bulges where those seams line up with other seams on neighboring parts.
- Use the high resolution images in my gallery for reference as needed. There are both CG and photos there. http://insanityunlimited.com/gallery/paper_models/ixs_enterprise/

General Tips – These may or may not be useful to your building style

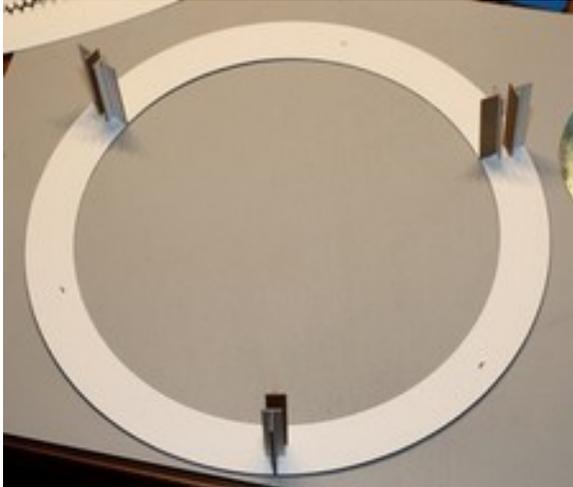
- Take your time.
- Test fit parts.
- If you don't like how a subsection of parts came out, then make another set.
- For large flat pieces, reinforce them from the inside with chipboard as desired.
- Use a metal straight edge as a guide for making scoring marks and long cuts.
- Use a chisel style blade for small cuts and corners.
- Edge color where needed with pencils/markers/paint.
- If you have a better technique for making some of these components, do it.

Warp Tori

There are two warp tori on this ship. Each have a single red stripe oriented towards the front of the ship. **These are the most complex portions of this model.**

Ring Formers

Each of the warp tori are started with a pair of ring formers. These hold the overall structure together and keep the warp ring circular. Start by assembling two sets of parts 1, 2, and 3 into rings. Then take the standoffs (parts 4) and make 'T' shaped structures from them.



Use the seams on the ring formers as register points. Put a standoff on either side of each seam between parts 1-3. Place a total of half the standoffs around the interior and exterior edge of the ring former. This picture only shows 3 pairs of standoffs, but feel free to use as many as you would like to affix the two formers solidly to each other. The finished formers should be rigid.

You will put the 2nd former ring on top of the standoffs using the seams as register marks.



Warp Tori Details

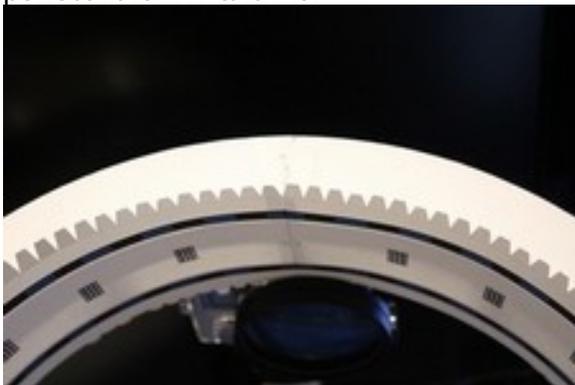
Mark one of the ring former seams. This will be the top of your torus. It doesn't matter which seam you choose, as we'll use it as the starting point for each warp ring.

Start with parts R1 and glue them together in one long strip. Do the same with R2/R3, and R4/R5. For R2-5, if you place the joint between R2 and R3 at the top (or R4 and R5), then the red marker lights should be on the bottom of each part.

We will form a long strip out of parts R7 and R9 for the inner detail of the torus. R7's should be the end of this 4 part strip with the 'T' markings at the extreme ends. Note that there is no grille type markings in the center of the strips where the T's meet. This will end up being the top of the inner face of the torus. Position R9's in the middle such that the blank areas in the grille graphic will appear every 120 degrees around the circle.



Take the strip of R7 and R9 parts (inner face) and line them up inside the formers. You will want to center the part on the formers as close as possible. I know this isn't entirely desirable as it relies upon some dead reckoning to properly align the structure. **This is the most difficult part of the model.** Don't forget to have the T's on the part match up with the reference mark you made earlier on one seam for the top of the torus. You may need to sand or shave the inside edge of the formers to get a perfect fit for R7 and R9.



Take the strip made from parts R1 and wrap that around the exterior of the formers. This one should be much easier to center on the formers. The center of the strip should align with the seam you marked for the top of

your torus. This image is of the topmost seam on the warp ring.



Take parts R6 and do the same type of thing, attaching them to parts R2-5.

Take parts R10 which will bridge the gap between all of the R6 parts and the inner strip of the torus. I found that attaching R10 to R6 first, then gluing it to R7 and R9 works the best. Your seam that will take up any slop in assembly is between R10 and the inner strip.



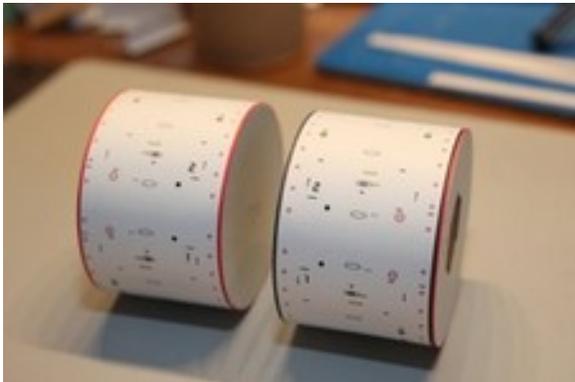
Repeat this again to make a 2nd warp torus.



Strut Collars

Collars

Take the parts for the strut collars and laminate the four disks. Roll the strips for both the forward collar (FC) and rear collar (RC) into cylinders and put the disks on either end of each. The forward face of the forward collar is the edge with the stripe of black and red.



Struts

For the struts, laminate each of the two end caps. Wrap the main strut skin and put the caps in either end.



Turbines

For the turbines cut out each of the parts. T2 and T4 are used to create a small cylinder. This is specifically sized such that you can use a piece of around toothpick instead of forming the cylinder out of paper. T5 and T6 are rolled with the color on the outside. T7 is rolled with the color on the inside.



T3 and T7 go together to form the inside of the turbine. T1 goes on T6 to form the forward shroud.



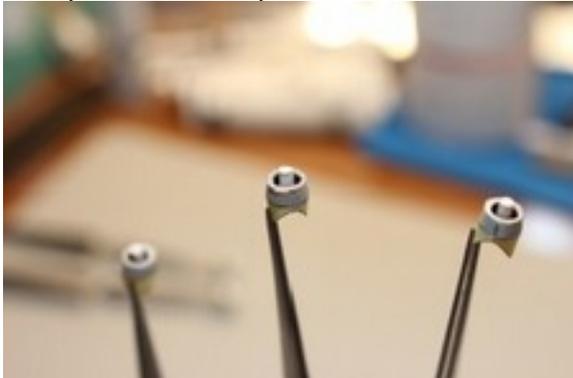
Then the group of T3&T7 goes inside T1&T6.



T5 is then put on the back of this assembly.



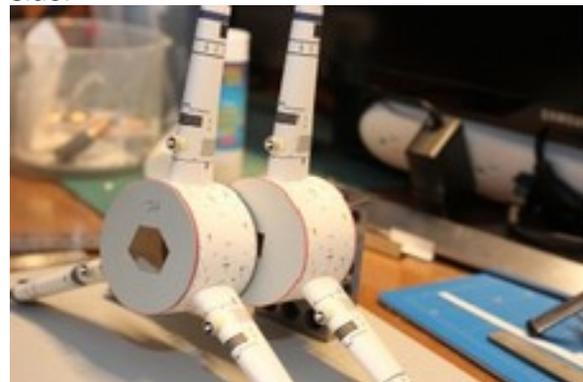
The post, made of either T2&T4 or a toothpick section is put in the center.



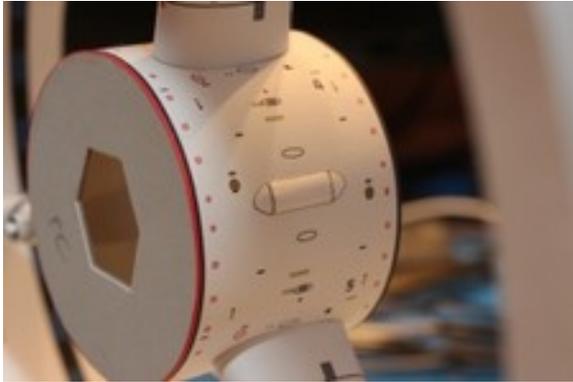
The turbines are put onto each of the six struts. They are aligned with the center of the grey rectangle that wraps around the rear edge of the strut.



The struts are put onto the collars at 120 degree intervals. Note that the seam on the collars should be on the bottom. The hex holes I have cut in the caps are solely so I can get my fingers inside to position them properly. The holes have no structural significance. The struts on the forward collar should face forward and those on the rear collar should face towards the rear. In the final placement of the two collars, both should have '2' graphic on the starboard side.



The blisters are made in a curved, tapered shape. Imagine it as a slice off the side of a cylinder with narrowing ends. These get placed on the collars 120 degrees apart, evenly spaced between the struts.



Place the collar and strut assembly inside of each warp ring with the topmost strut centered on the warp tori seam marked with the T's.



Engine

Engine Cylinder

The main engine cylinder is made up of EC2, the outer side of the cylinder. EC1 is a cap that goes on one end and a former can be placed in the center of EC2. The other end is capped by EC3 and EC4.



The interior of the engine is made up of EC8, with a cylinder made out of EC7, and a ring of EC6. EC5 links the interior to EC4.

Engine Collar Cone

The cone is made simply by turning the part into an abbreviated cone, finished by the two caps.

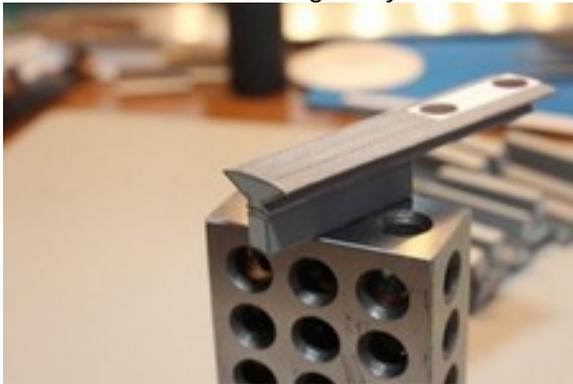


Engines

The eight engines are made up of the main body, E1, capped by E3 at the one end (without the white rectangle and black circles), E4 on the end with the circles, and E2 as the bottom of the section.



The engine standoff is made from E5 in a roughly rectangular prism type shape. Please note that the bottom of the standoff is arced in slightly to conform with the outer circumference of the engine cylinder.



The eight engines are arranged on the cylinder flush with the forward edge of it. Begin by placing the engine cylinder with the seam at the 6 o'clock position. Then place one engine at the 6 o'clock position, then 12 o'clock, then in the sequence 3, 9, 1:30, 7:30, 4:30, 10:30.



Finally, glue the engine cylinder with its engines onto the dark section of the cap on the engine collar cone.

This completes the aft section of the ship.

Nose

Cockpit

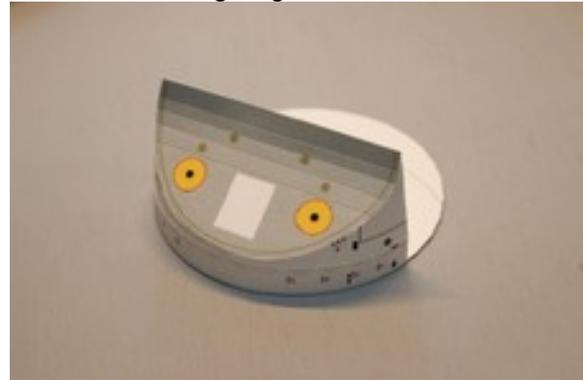
The nose of the ship is made up of several sets of parts. The first is the cockpit.

Assemble N11 through N19. Each of these should be curved to make roughly 1/3 of an arc. Use N8 to act as a base for this section. N8 should be just a hair shorter than the footprint of the cockpit with the rear edge of N11 protruding out past the rear edge of N8 slightly.



Dorsal Hull

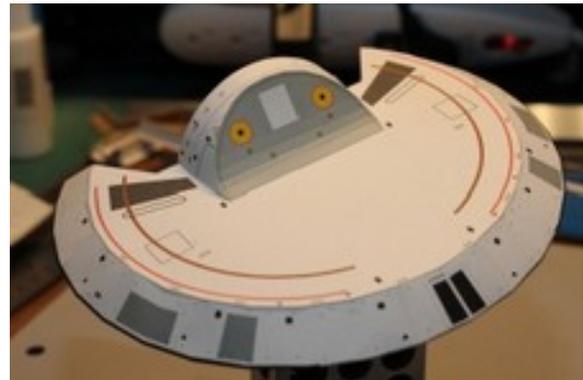
N9 and N10 are similarly curved and glued to each other. N9 is curved and glued into the leading edge of N9 and N10. N7 is doubled up on 65lb cardstock and fits flush inside the trailing edge of N10.



Saucer

The next section is the saucer itself. It is made up of N1 (the upper beveled edge), N2 (lower beveled edge), N3 and N4 (top and bottom). N3 and N4 are identical, so don't worry about mixing them up. N2 has a total of 4 gray panels on it and N1, the upper, has 6. N5 is the rear support and fills out the back end of the saucer. I found that reinforcing N5, N3, and N4 with chipboard helps with the structural rigidity of the assembly. The strips on the 3rd page of nose parts can be rolled and used to help enforce a constant separation between the upper and lower parts.

The lower nose section is glued onto the bottom of the saucer. The circular former that makes up the rear bulkhead is centered on N5.

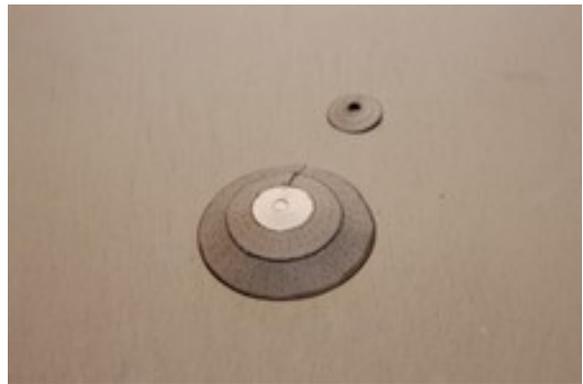
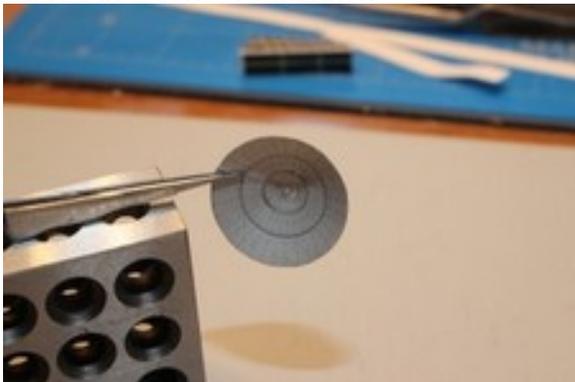


The cockpit is now glued to the top of the saucer with the rear of the cockpit flush over the curve of N7.



Dish and Details

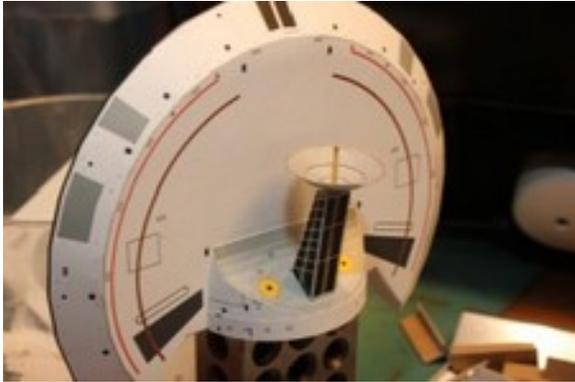
All these parts can be printed on thinner paper (20-40lb). The backside parts for the antenna dish are curved in a convex manner. The interior parts of the dish are curved in a concave manner.



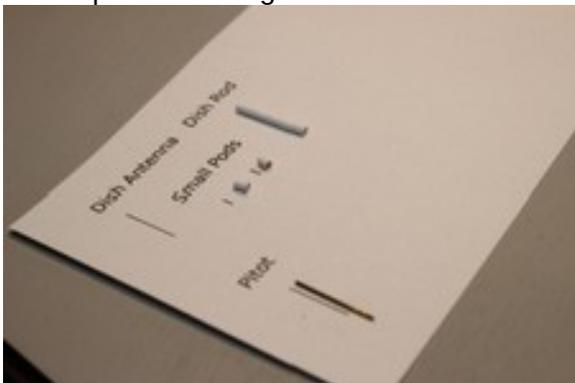
The rod labeled “dish antenna” can either be laminated to several thicknesses of cardstock and trimmed out, cut out of round toothpicks, or if you have scrap metal around use a segment cut to length (as I did here).



The dish strut is formed as a modified rectangular prism and glued to the lower saucer section with the dish centered on the end of it.



The small pods, dish rod, and pitot tube can also be laminated or made from toothpicks or scrap metal tubing.



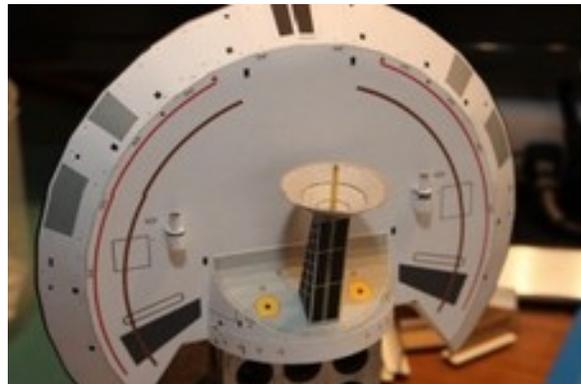
The camera bodies are made of the noted parts. The black strip is the leading edge of the outer body. The small square is the base, and the squares with 2 rounded corners are the front and back.

The lenses are simple cylinders with the black and white as the caps. The black end is the leading face of the lens. The lenses are glued to the center of the leading face of the camera body.

The pods are made up of several cylindrical parts.



The cameras are glued to the bottom of the saucer.



The small and large pods are glued to N11 in the positions indicated. The small pods are in the center with the large pods flanking each of them.

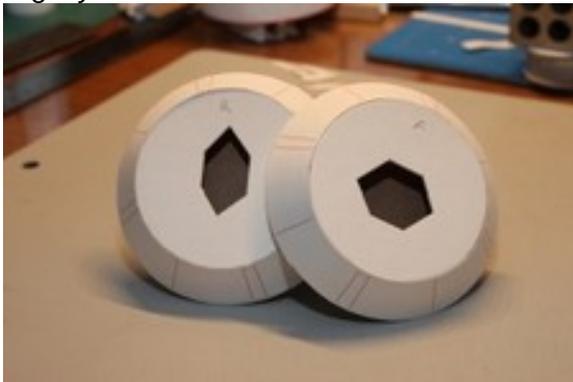


Also, the pitot tube goes into the forward-most black dot on the starboard side of the cockpit.

Main Body

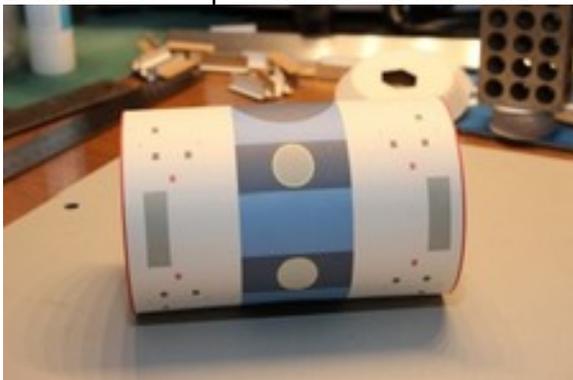
Forward and Rear Cones

The forward and rear tapers (cones) of the main body are very straight forward. The outer skin of the cone is formed with a cap put on each end. The holes I have cut in the cap is just to get my fingers in place to position things properly. Laminate the caps/formers to 1mm thick. Keep track of which is the forward and rear one, they are slightly different.



Main Body

The main body is made of a large cylinder with a cap/former put on each end. Laminate the caps/formers to 1mm thick.



Next the cones are glued to each end of the main body.



Support Arms

The support arms hold each of the science modules to the main body. They are made up of three pieces; the mount, center, and end.

Mount

The mounts are each two parts. The back of it (slightly concave) goes over the gray rectangles on the main body.



Center

The top and bottom of the center section are each slightly concave to cradle the modules.

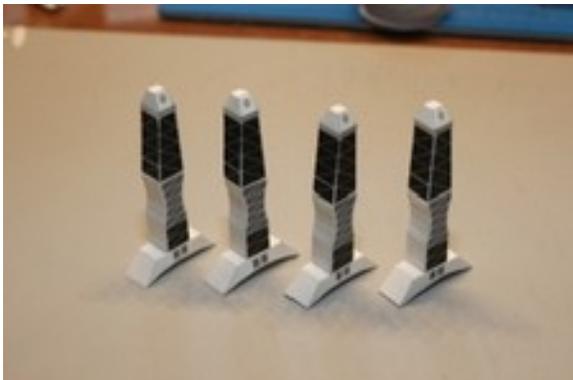


End

The ends are tapered prisms. The circles on the end of these components need to be aligned horizontally.



Each of the parts are joined together to make four arms. Note the orientation of the diagonal markings on each in the photo below.



RCS Thrusters

These thrusters are also relatively simple. They are cylinders with tapered ends. It is important to note the black circles on the parts when you apply the cap to the top and bottom of each. Parts R1-R3. Those circles on top and bottom should be in line with the circles on the sides of each thruster.



Sensor Domes

The domes are made up of a number of individual parts. Laminate S2 and S4 to .25-.5mm. S2 is the flat base that the dome sits upon. S4 is the former that fits into the widest part of the sensor dome. From bottom to top we use S1-S9. S1 is the skirt that goes around S2 so that the dome as a whole can sit evenly on the cylinder of the main body.



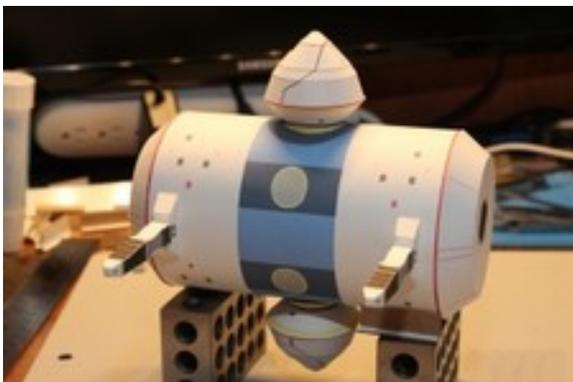
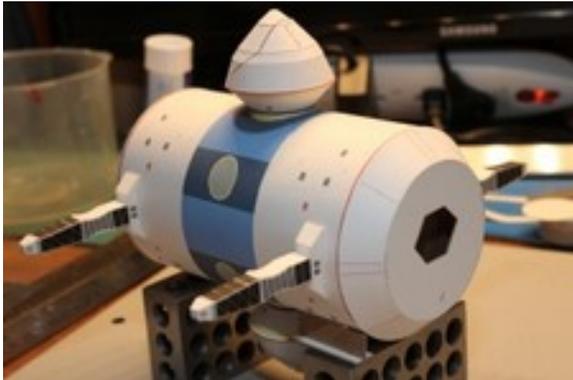
Be sure to line up the seams on the stack of parts. This should allow the texture to come

together properly at each horizontal layer.



Assembly

All these components come together on the main body. Ensure the arms are square with the body and in line with each other, both front to back and left to right. The sensor domes get placed in the center of the texture circles on the main body.



Modules

Each of the four modules (CS-110, CS-220, CS-330, CS-440) are made similarly.

CS-110 is the upper starboard module, CS-440 is the lower starboard module, CS-220 is the upper port module, and CS-330 is the lower port module.

The nose hemisphere is made up of parts 1-4. The center body consists of part 5, and the rear hemisphere comes from parts 6-10. Position the seams on each of these parts so that they are in line. I found that using a total of two formers in each module added sufficient structural integrity to the parts. Add the formers before gluing the hemispheres to either end. Note that the front and rear hemispheres are different on each module and each module has slightly different sets of antennas.

Parts 11-12 make up the porthole. The flat back plate that holds the docking tube is made from part 13. The connector to the main body is made from parts 14-17. Part 14 goes on the circle printed on part 13. Part 15 (cap) goes on 14, with 16 rolled and glued on the inner circle printed on 15. Part 17 finishes it off by acting as an end cap of part 16. On the top two modules the end of the docking tube will be angled downwards, on the bottom two modules the end of the docking tube will be angled upwards.



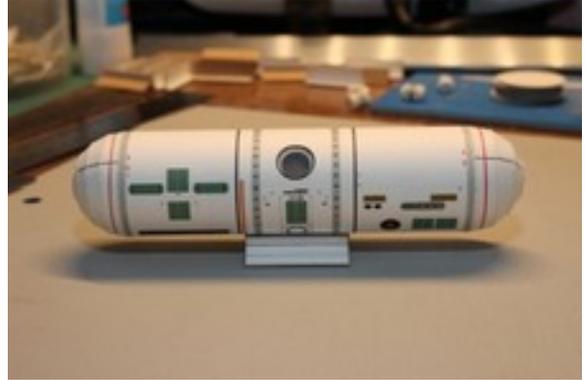
CS-110



CS-220



CS-330



...and the antenna on it.



CS-440



...and with the antenna on it.



For two of the modules (CS-110 and 220) there are a set of 4 whisker antennas. They are made of a post that is 4-5mm long (I used a toothpick sliced up) and 3 wires evenly positioned around the center. These whisker antennas are placed as shown in the images below. They are just slightly above the centerline of the black windows. Make sure one of the wires is aligned horizontally with the body of the module.



CS-110 with whisker antennas.

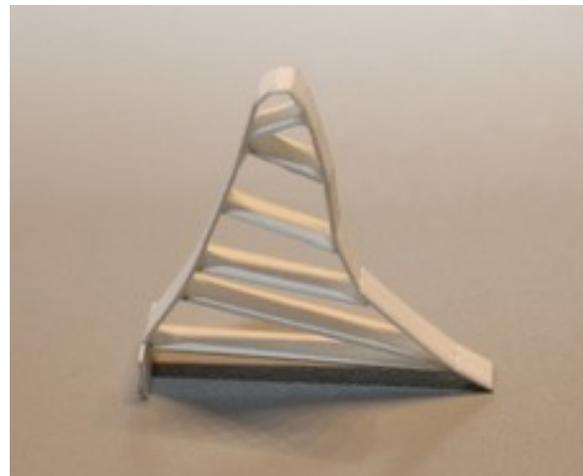


CS-220 with antennas.



Module Brackets

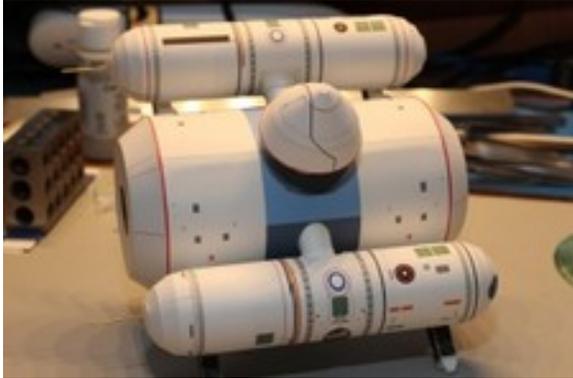
These brackets hold the modules in the arms from the main body and also give a place to mount the solar panels. The long piece forms the left and right faces of the bracket. The 2nd longest part has a fold line on it and forms the bottom two rungs of the bracket. The longer portion is on the bottom with the fold facing away from the wide point. That fold line is glued to the last fold line on the first part. The other smaller pieces are fixed as you see in the image below.



Final Assembly

Glue modules CS-440 (lower starboard

side, with the antenna facing forward) and CS-330 (lower port side, with the antenna facing forward) to the main body. The bottom of the main body is where the seam exists on the main cylinder.



Do the same with CS-110 (upper starboard with the gold hexagon facing forward) and CS-220 (upper port with the antenna pointing towards the rear).



In this image the seam at the bottom of the frame is the bottom of the main body.

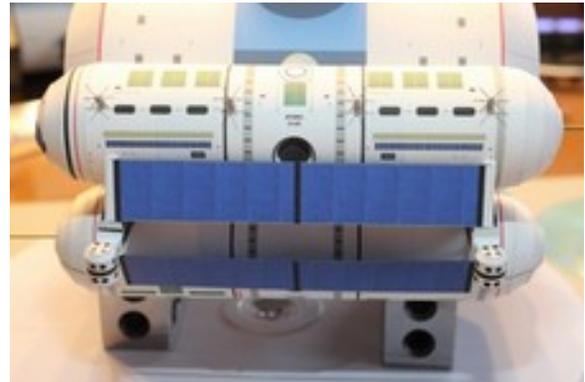


The brackets fit between the arms and each of the four modules.



Solar Panels

The solar panels are folded in half so that they are double sided. They are glued to the outside face on each pair of brackets.



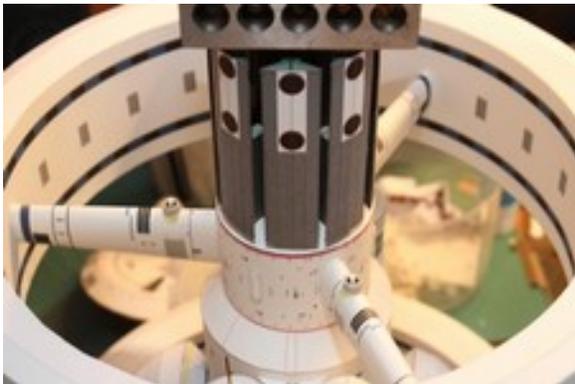
Glue the forward ring to the main body. Keep the red stripe of the ring facing forward. The seams on the main body, ring collars, and engine should all align on the bottom of the ship.



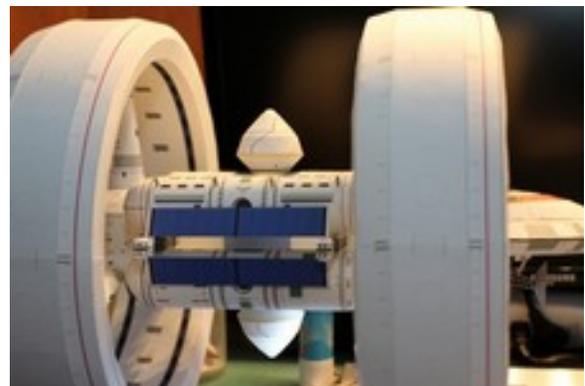
Add the rear ring. This too will have the numeral 2 on the starboard side of both collars. The red stripe on the rear ring will also face forward. The following image has the front of the ship on the left.



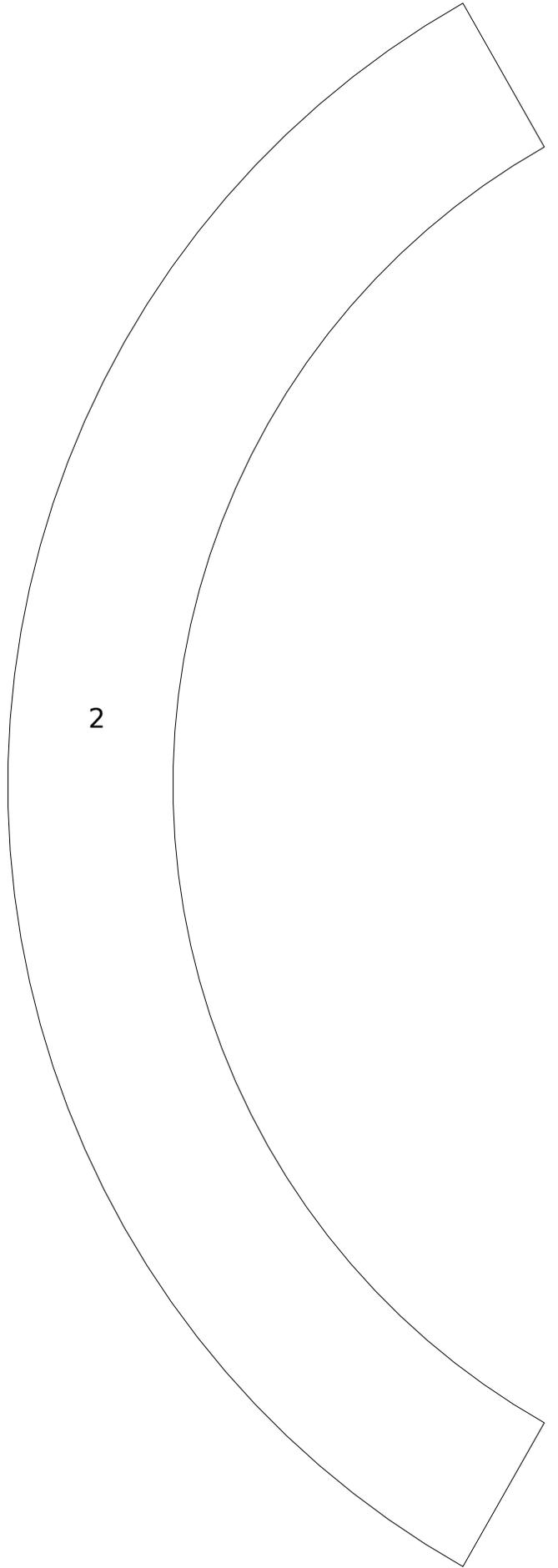
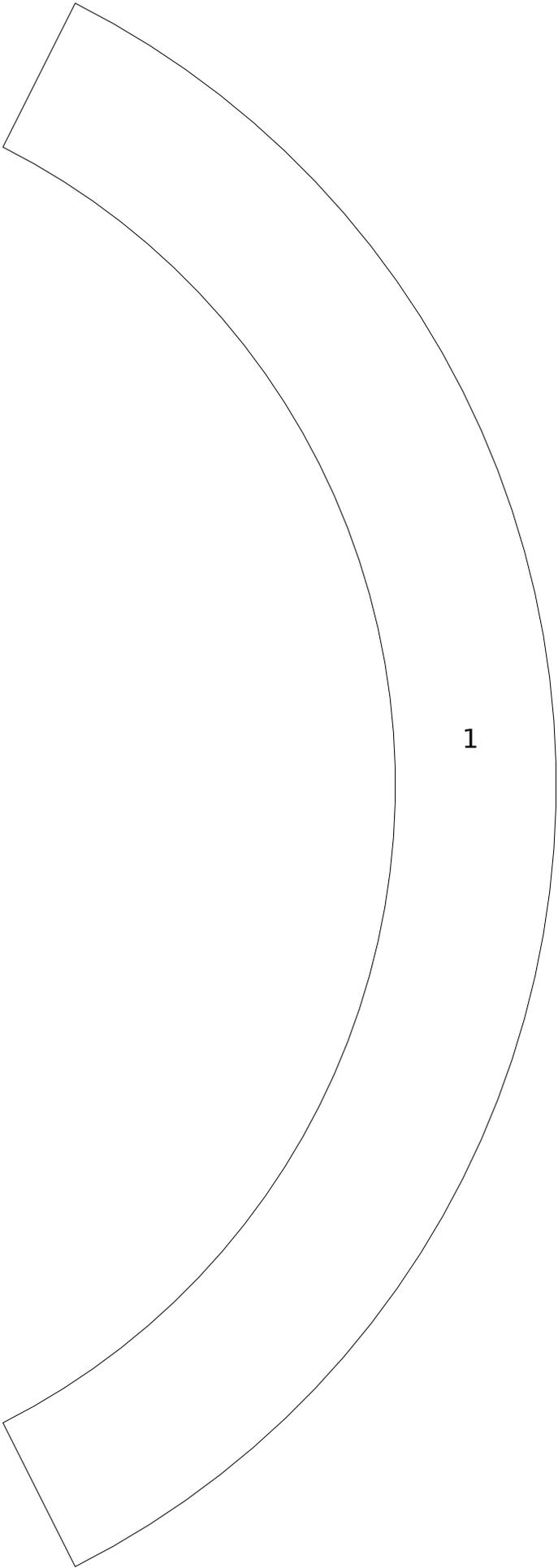
Add the engine to the rear of the ship.

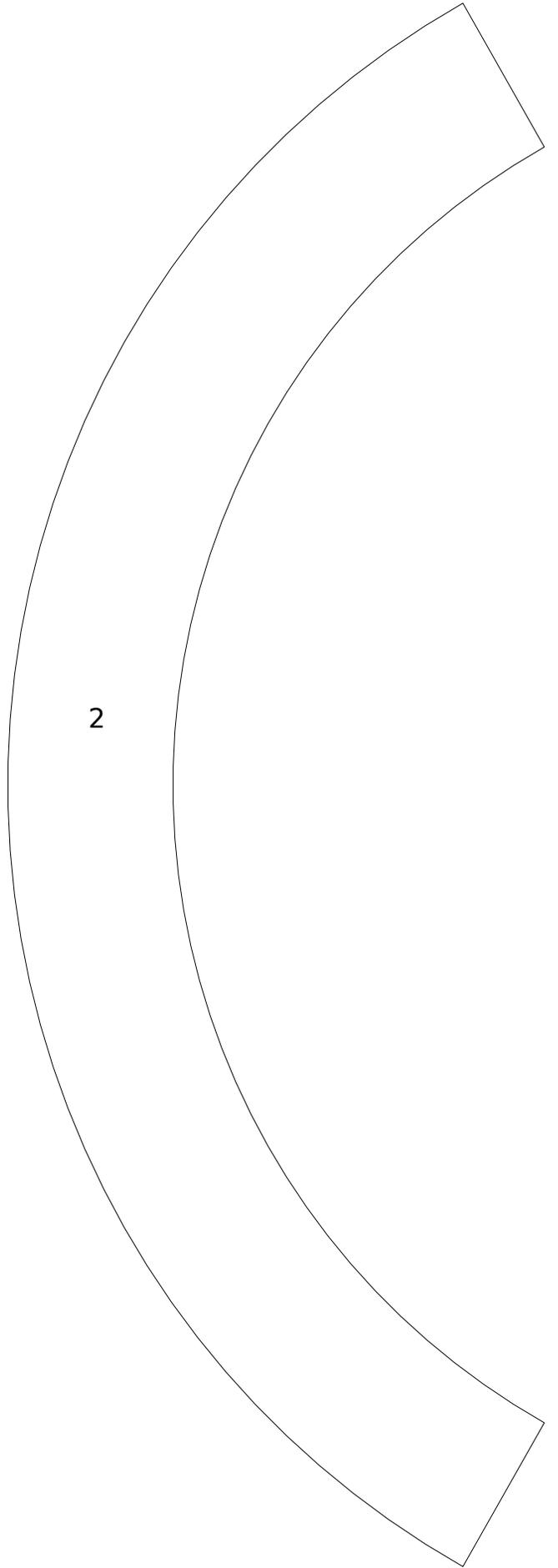
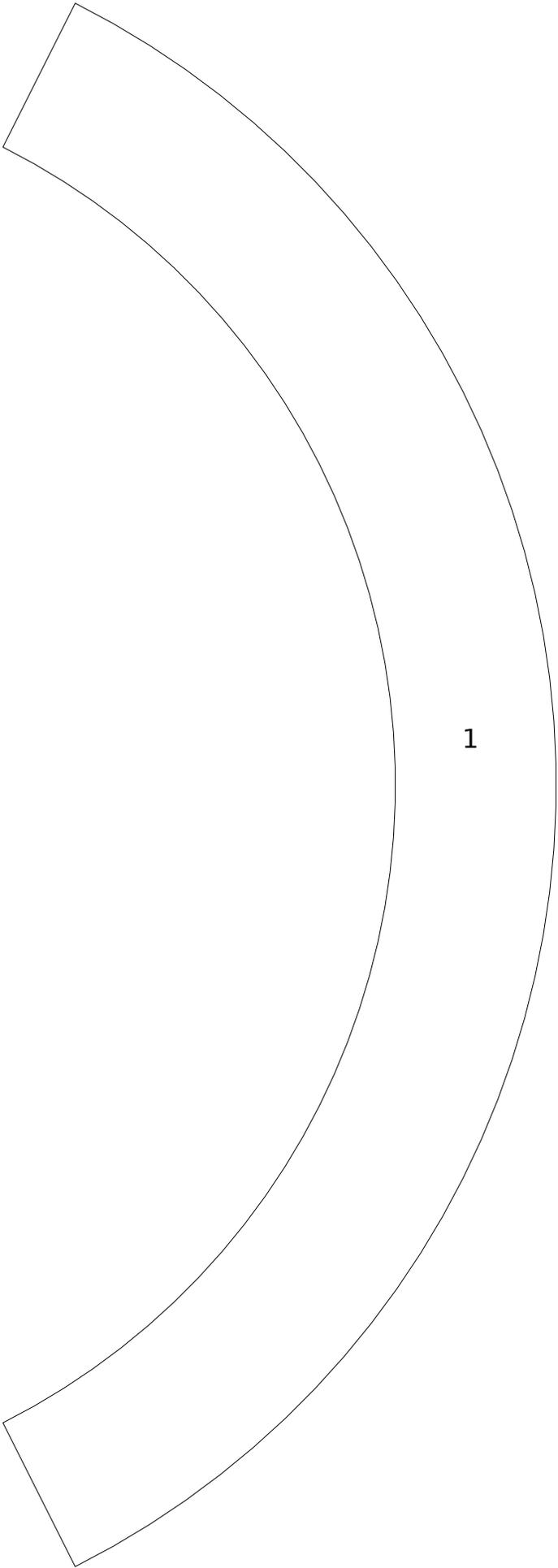


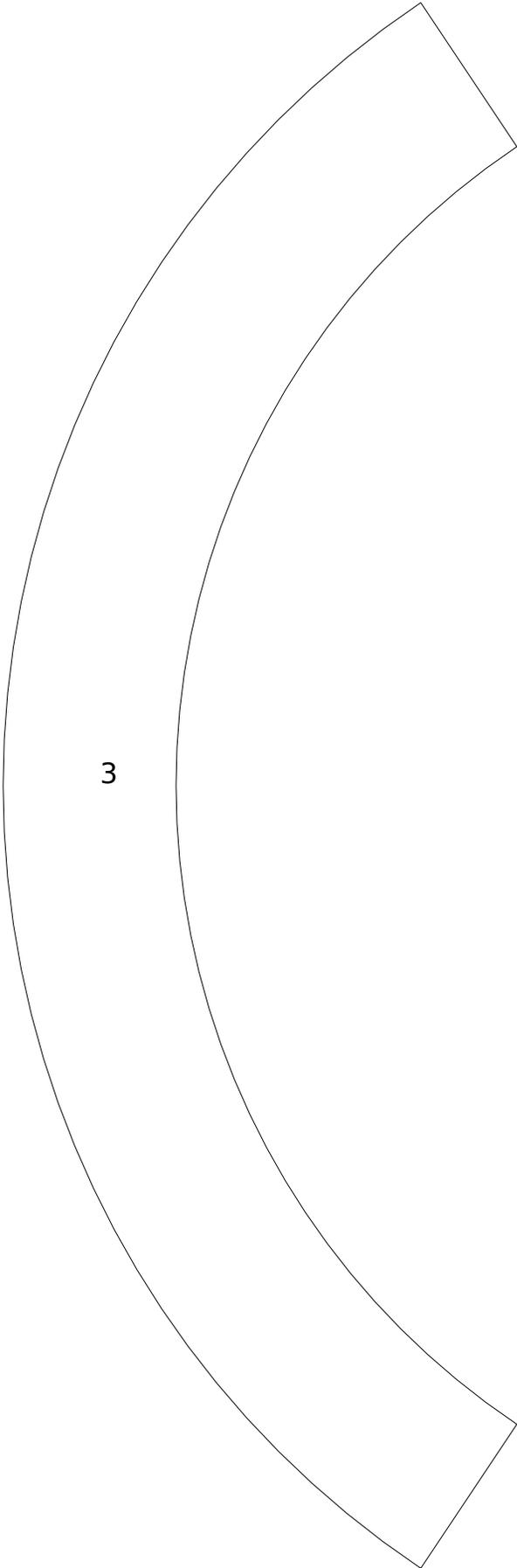
Add the bow to the string of parts and you are done.



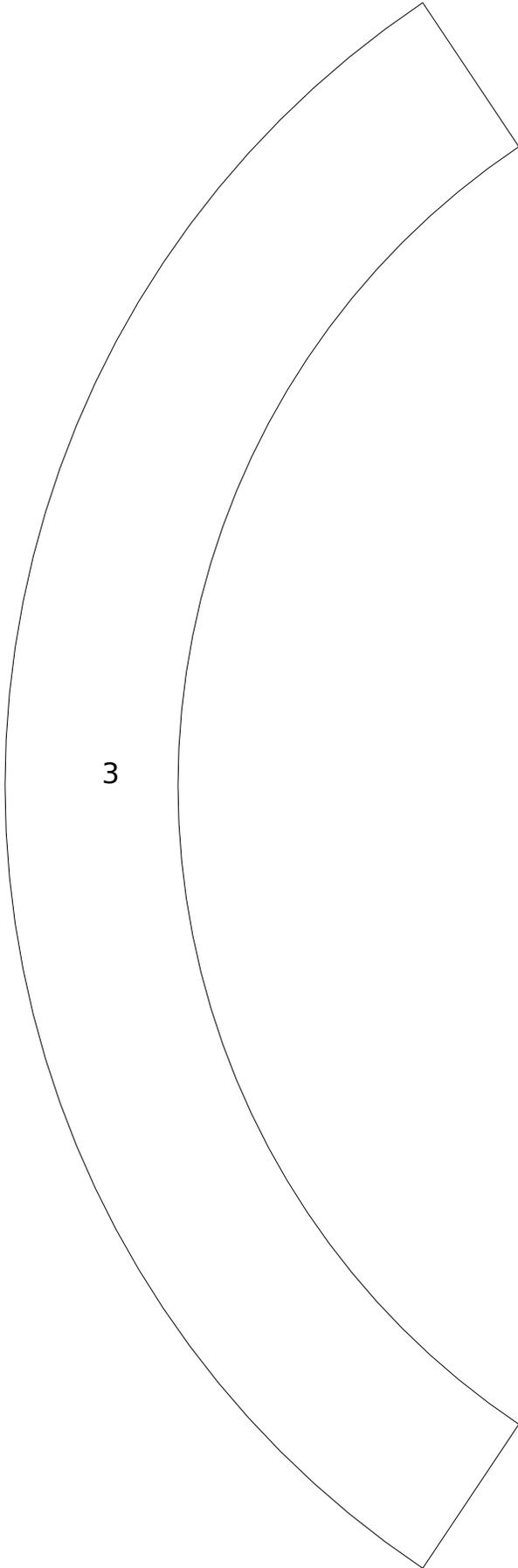








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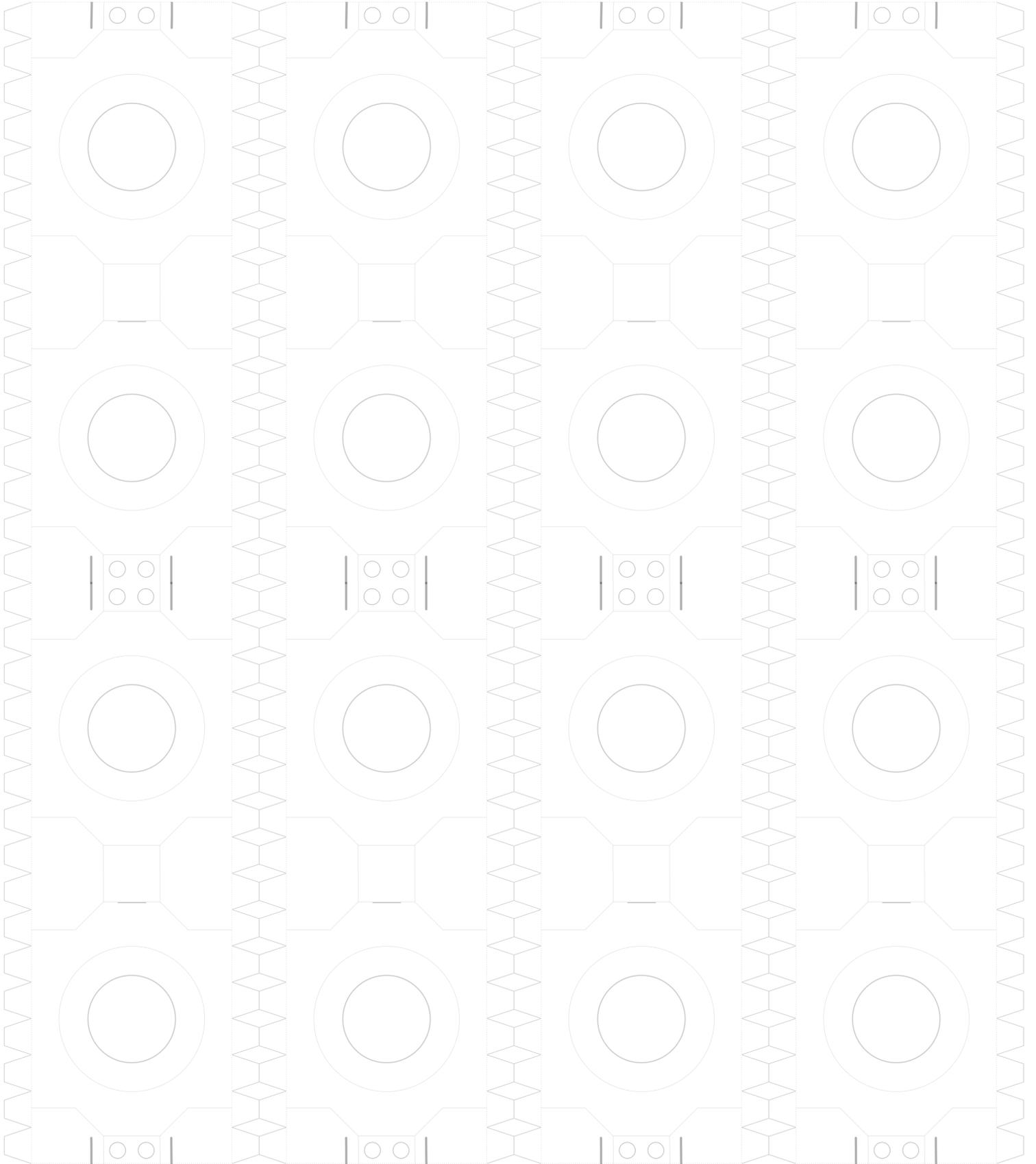


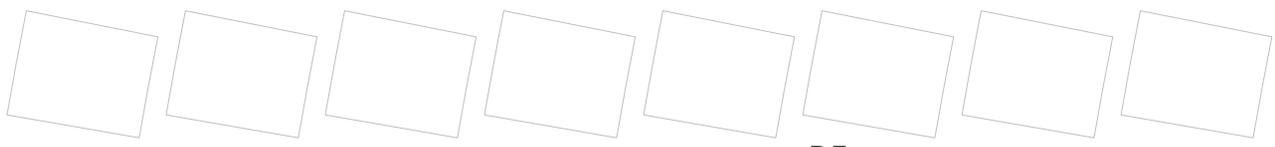
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Warp Ring Outer Strip



R1



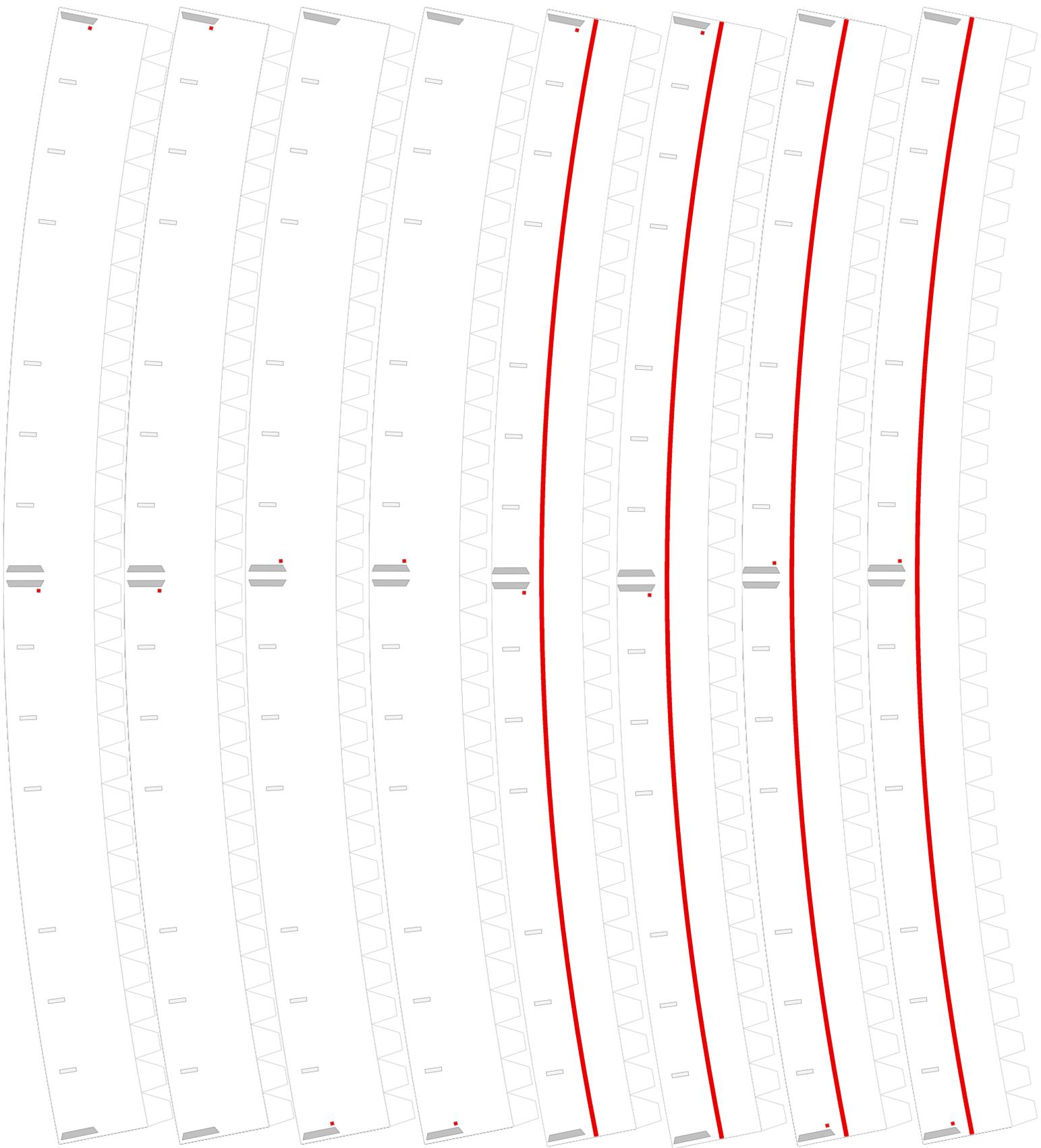


R2

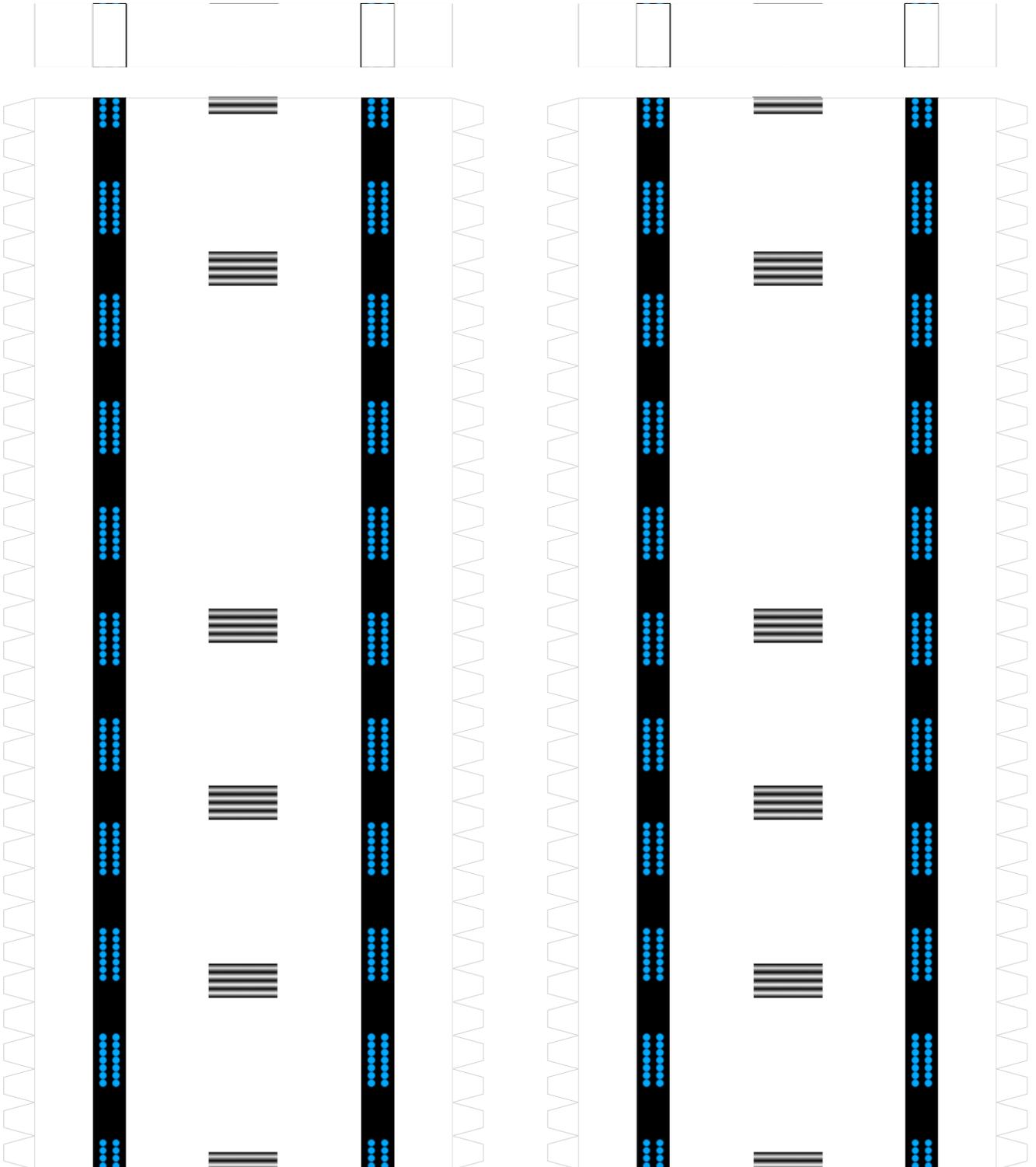
R3

R5

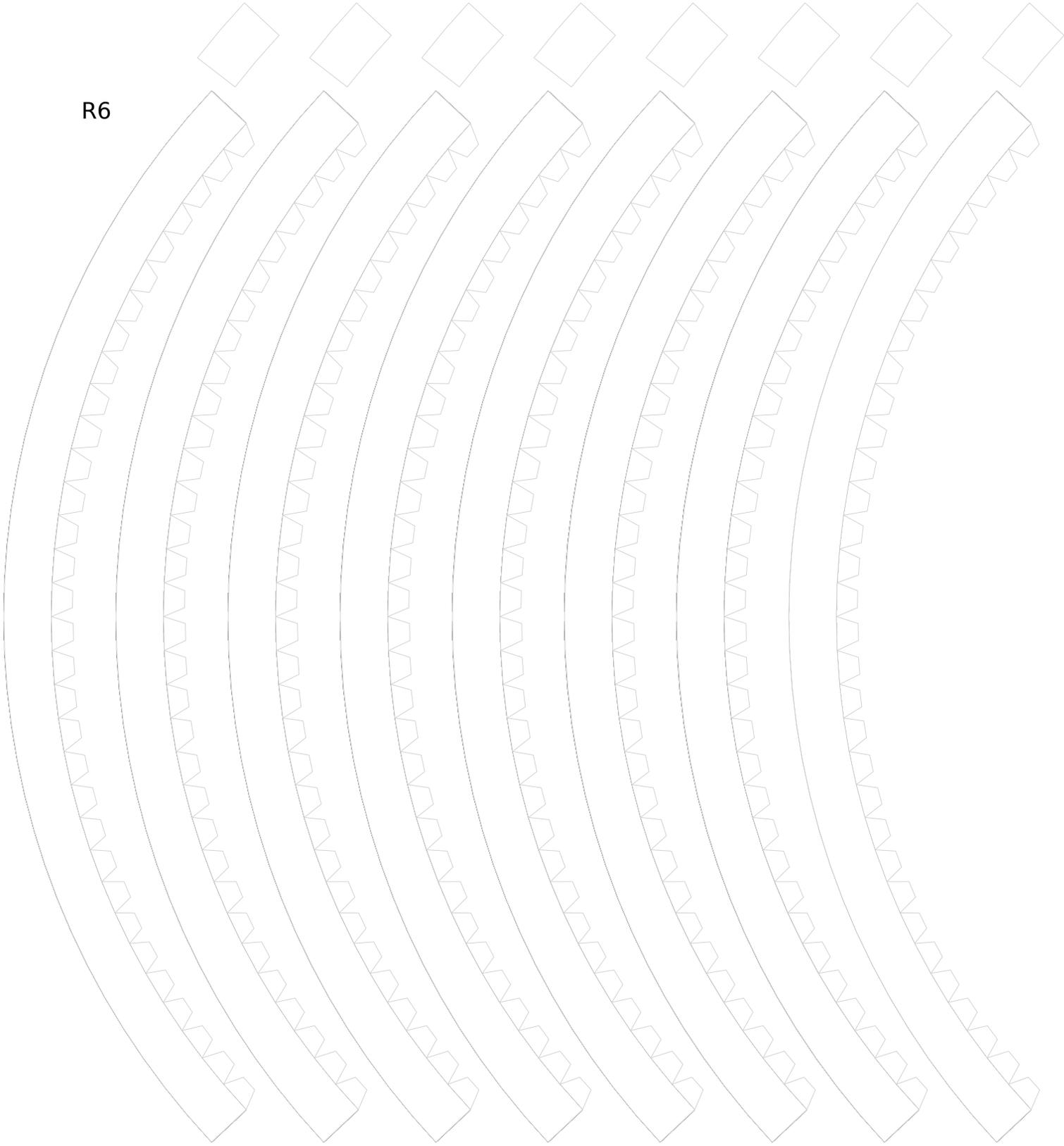
R4



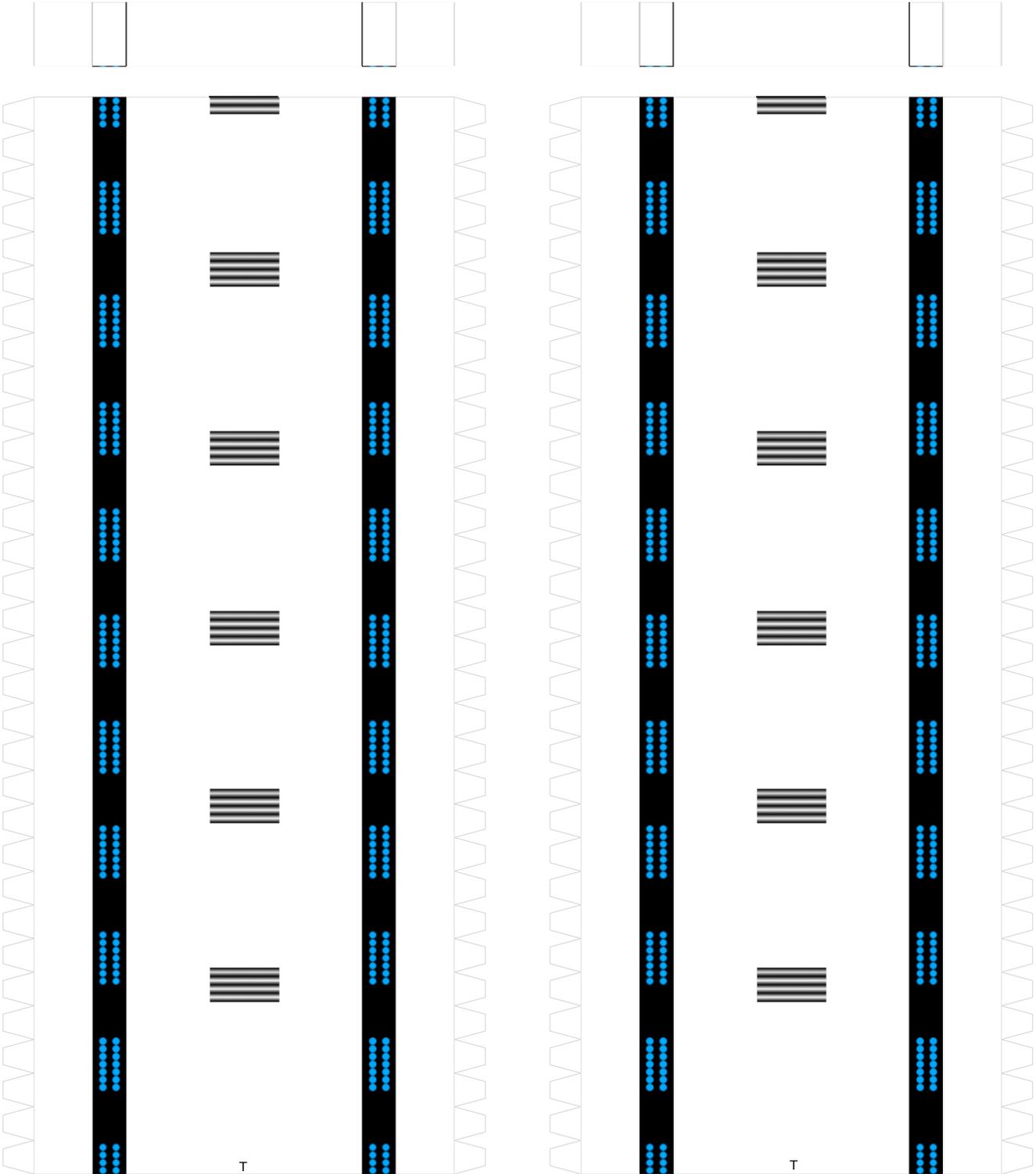
R9



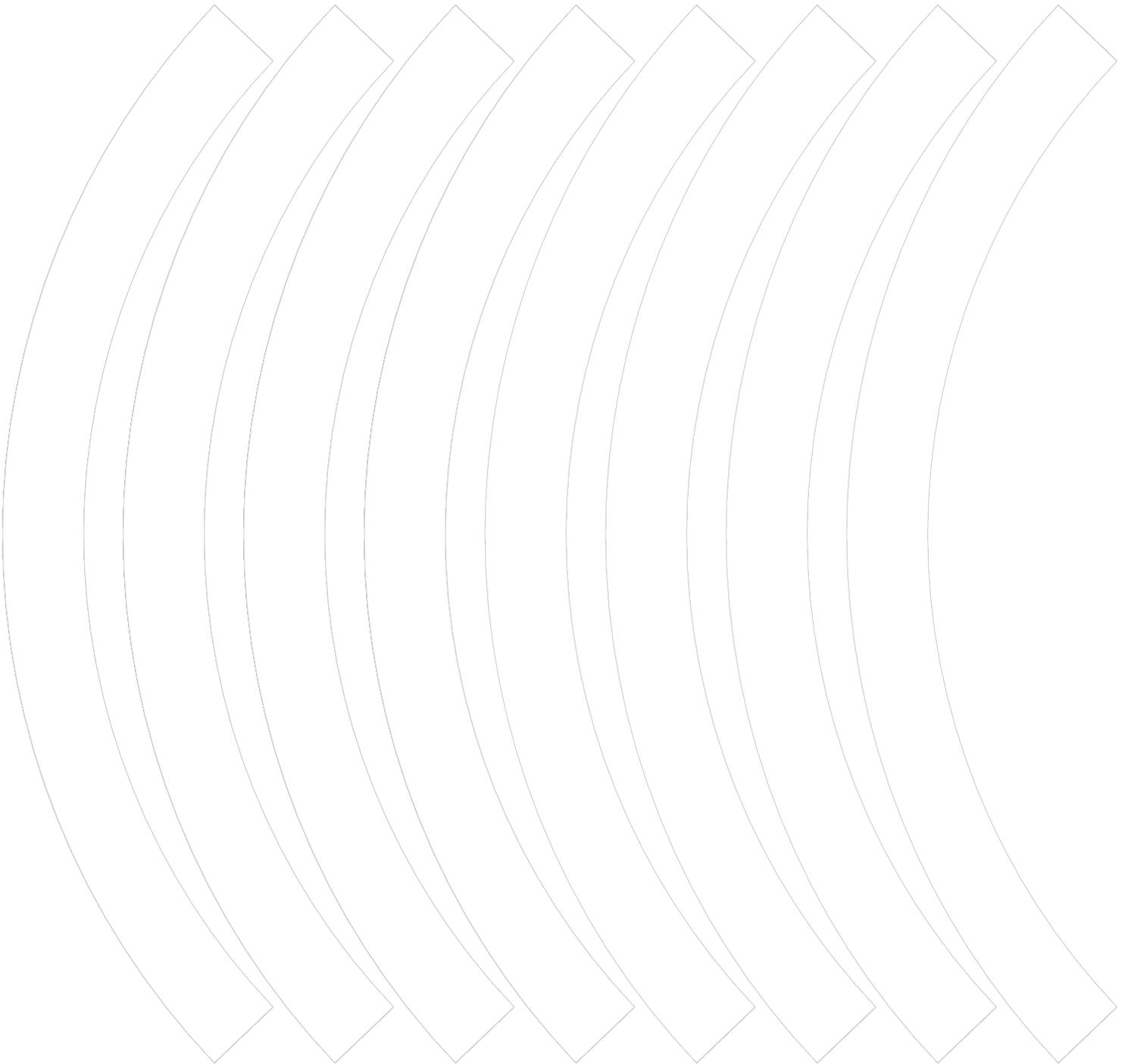
R6



R7



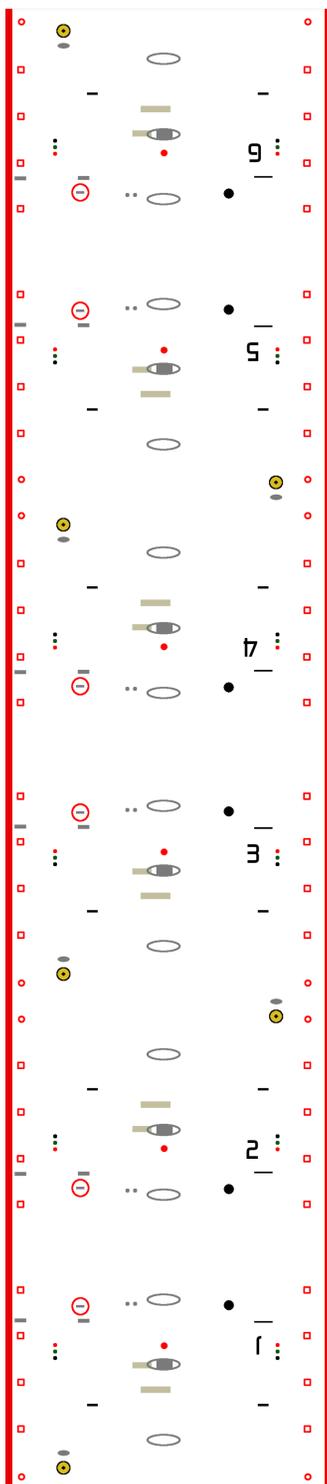
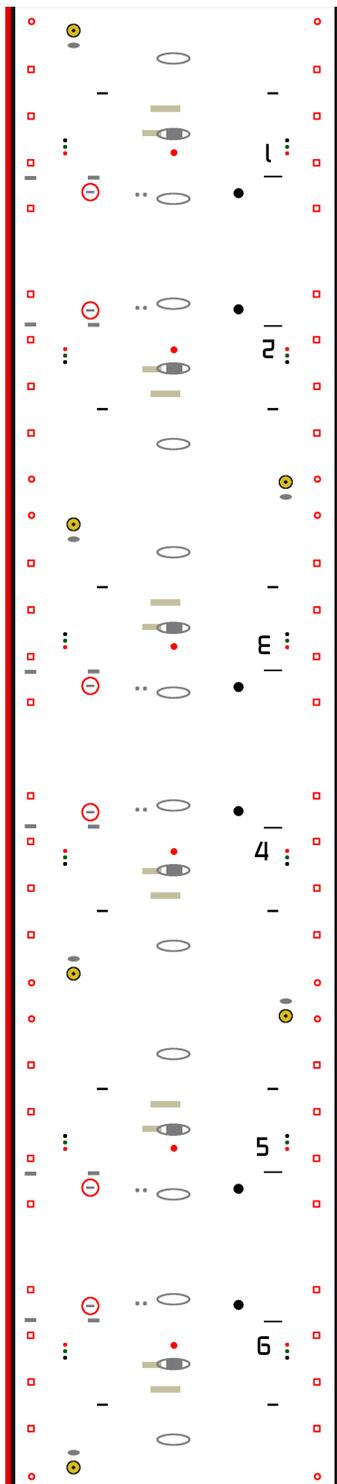
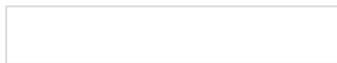
R10



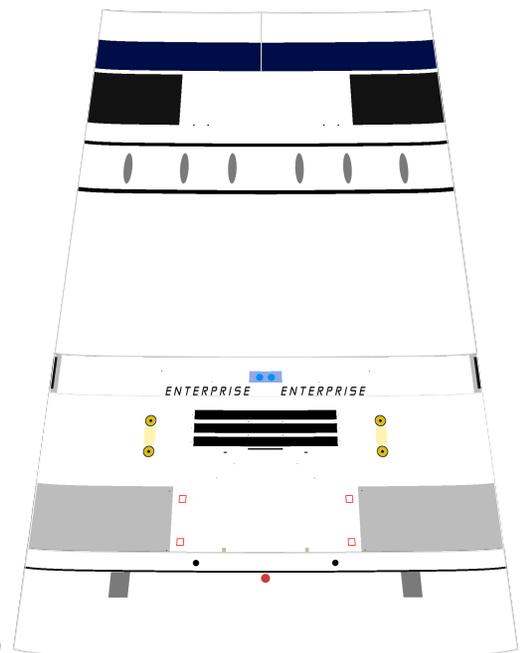
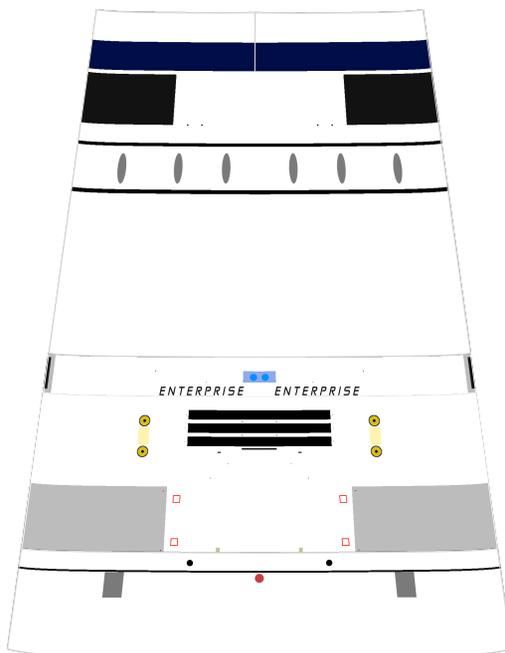
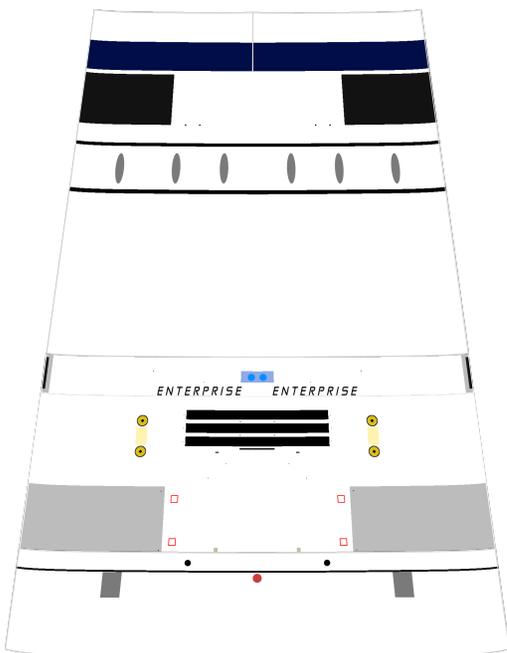
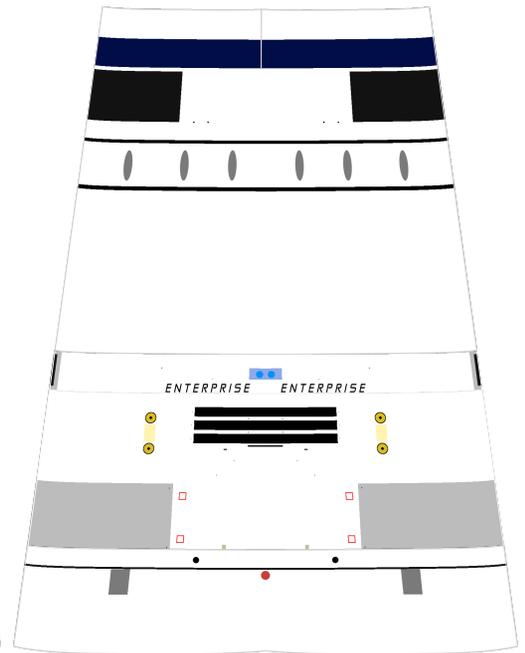
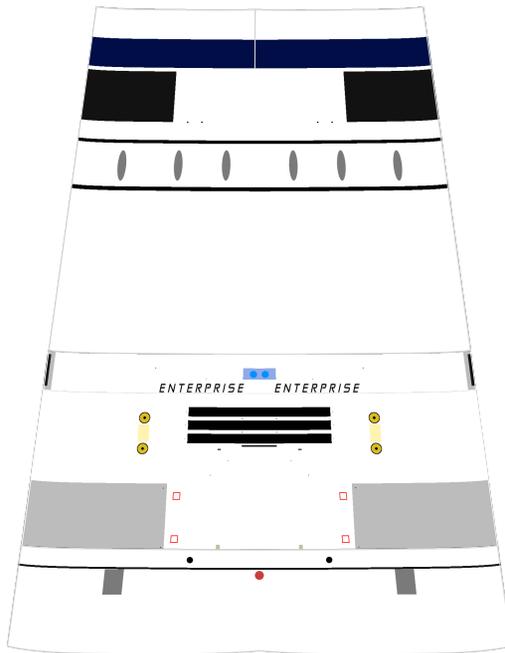
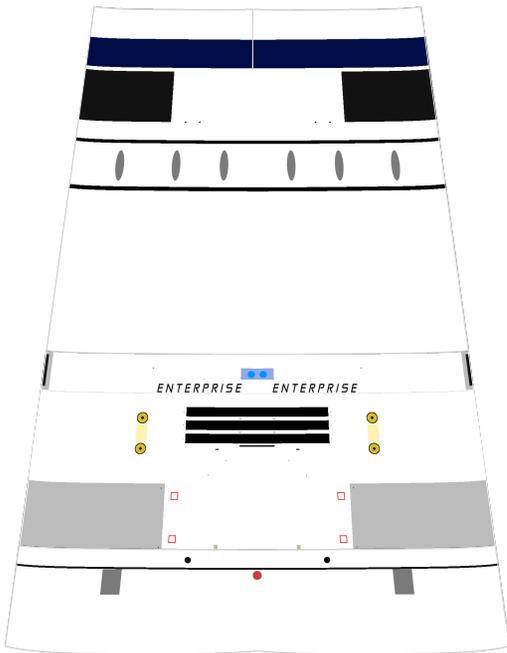
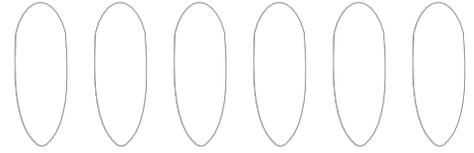
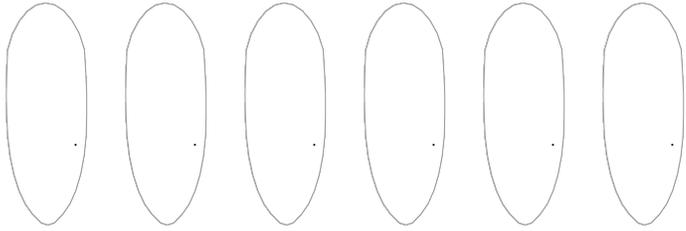
Strut Collars

FC

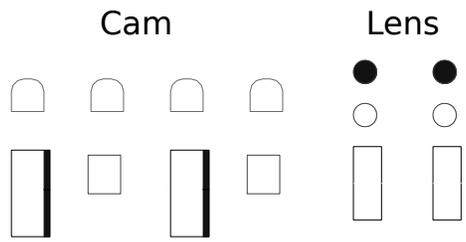
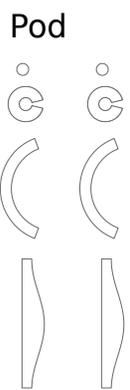
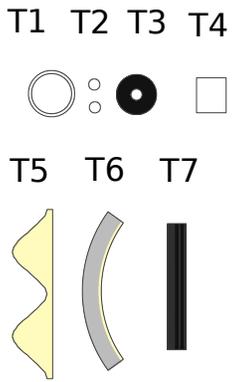
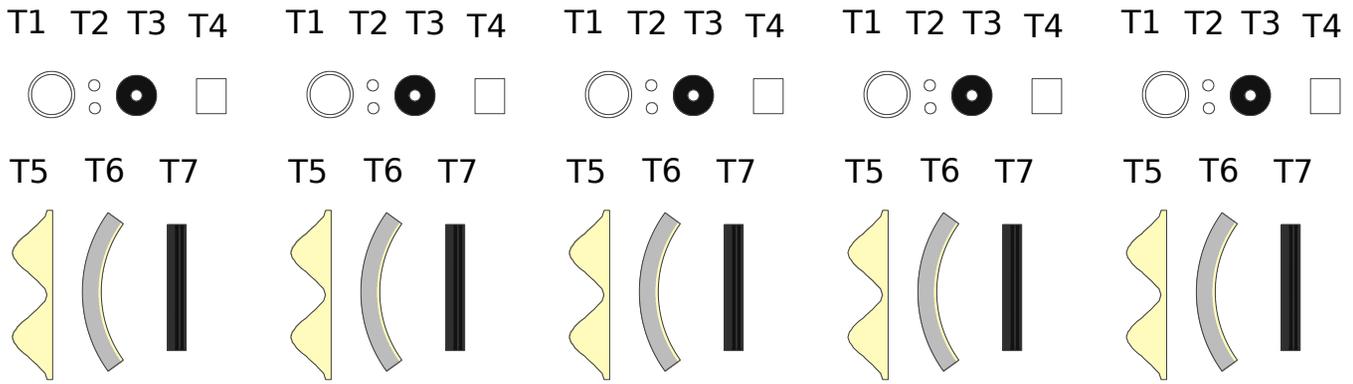
RC



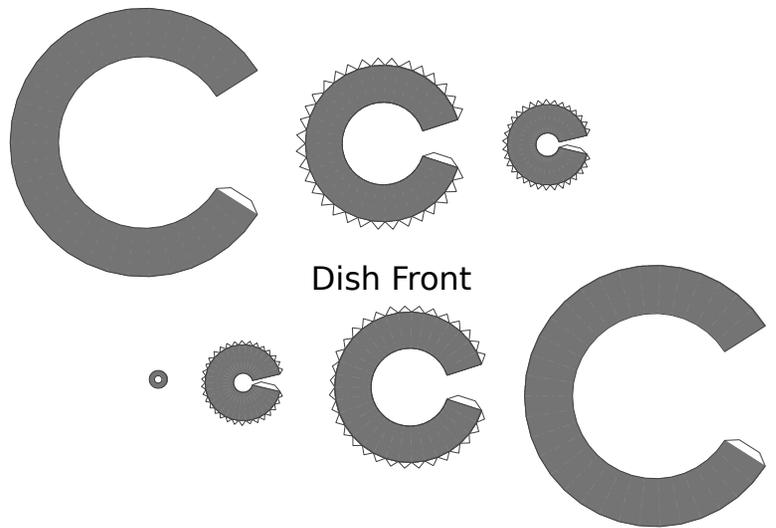
Struts



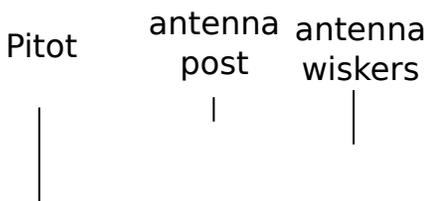
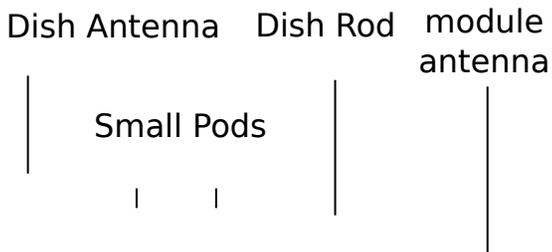
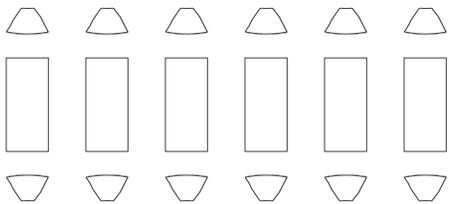
Turbines and Details - print on thin paper



Dish Backside



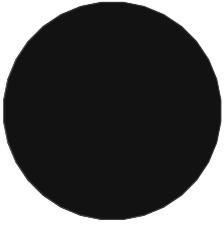
Blisters



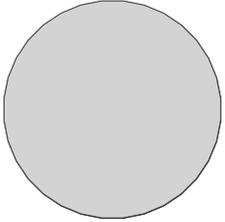
Engine Cylinder

EC2

EC1



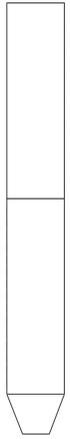
former



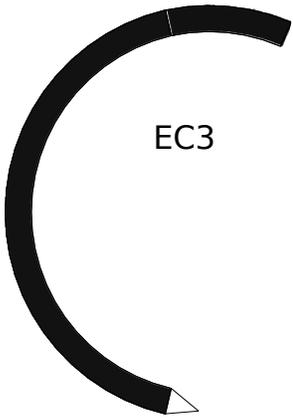
EC5



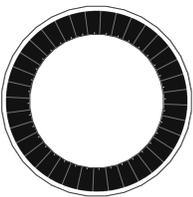
EC7



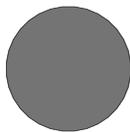
EC3



EC4



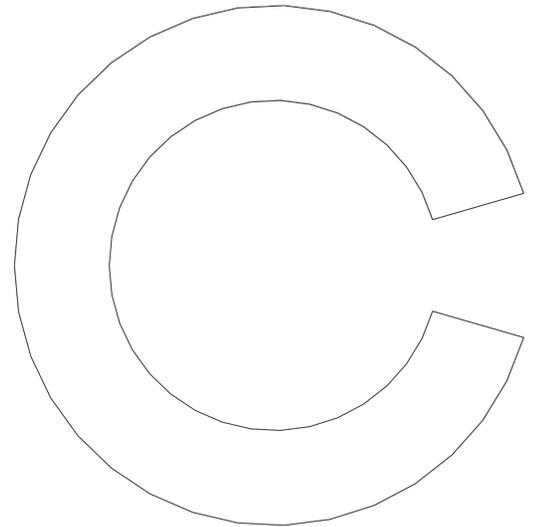
EC8



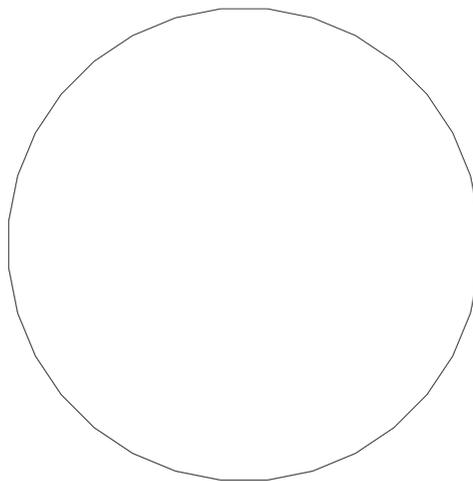
EC6



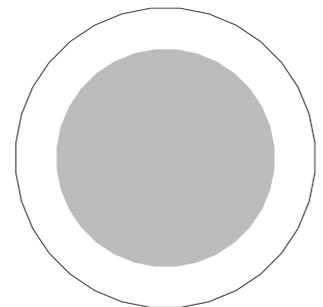
EngineCollarCone



forward cap



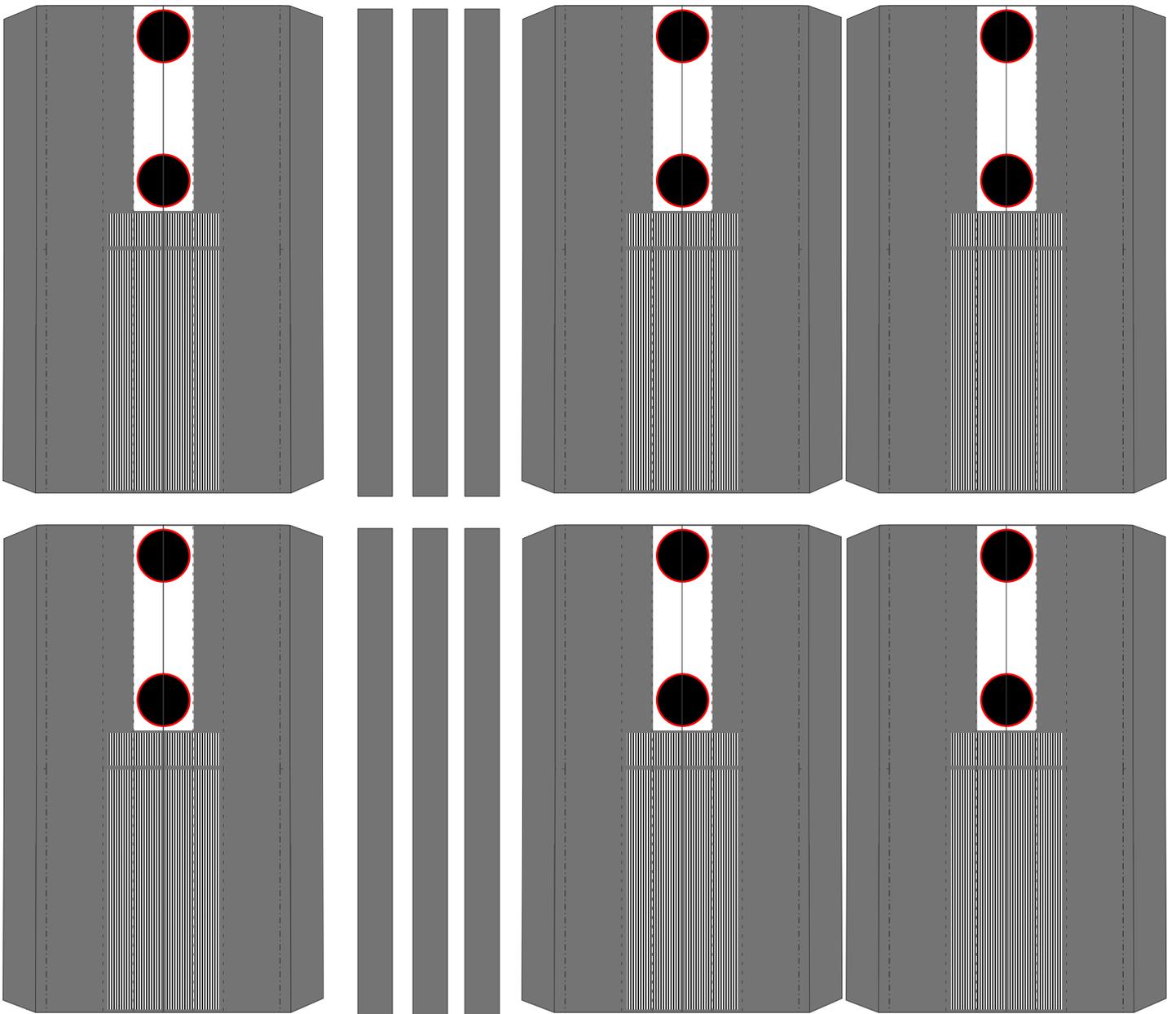
rear cap



Engines1

E2

E1



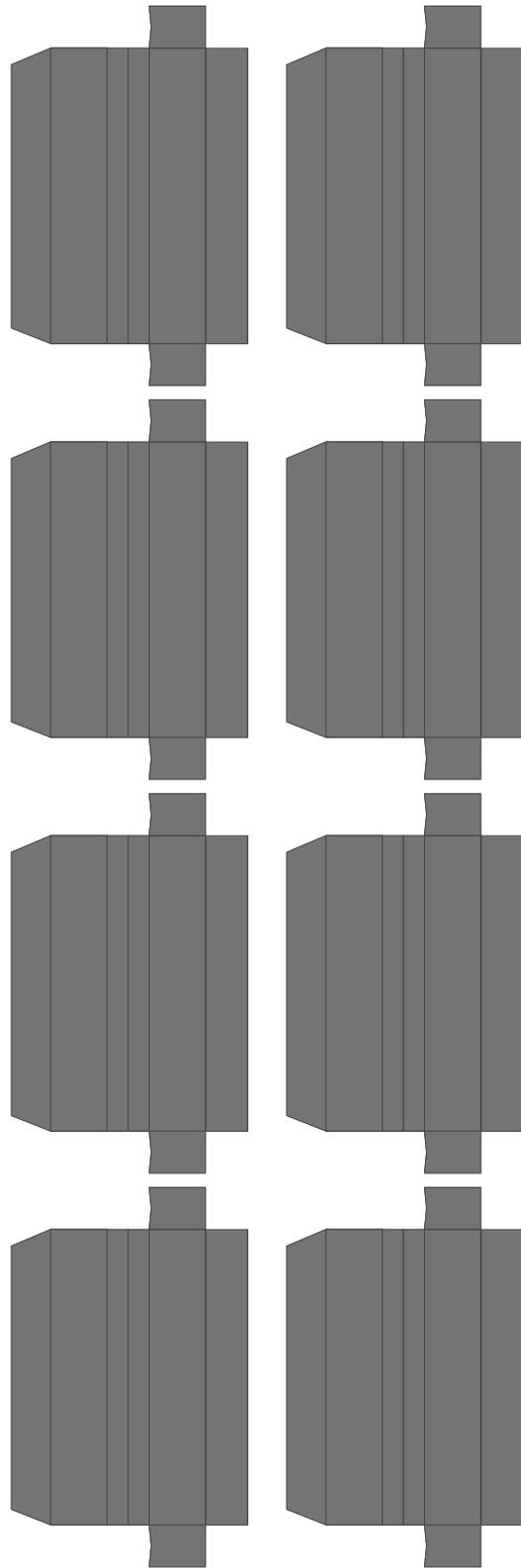
Engine2

E3

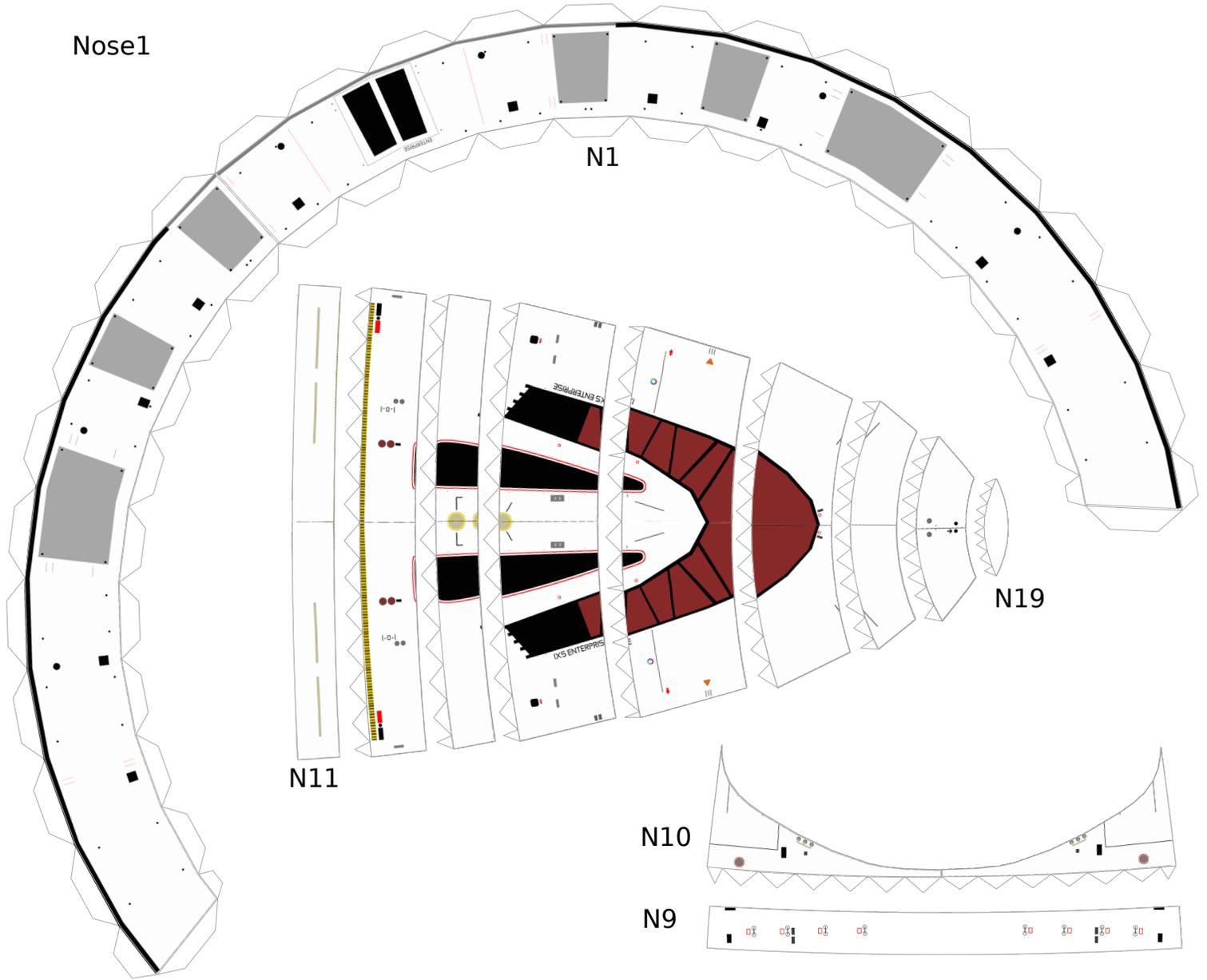
E4



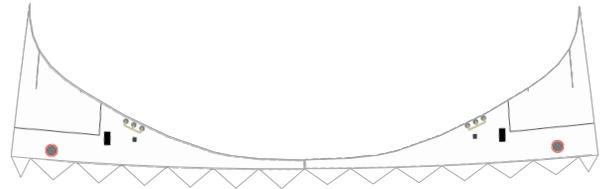
E5



Nose1



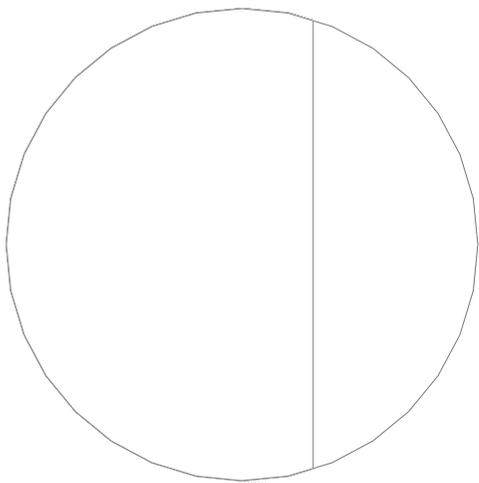
N10



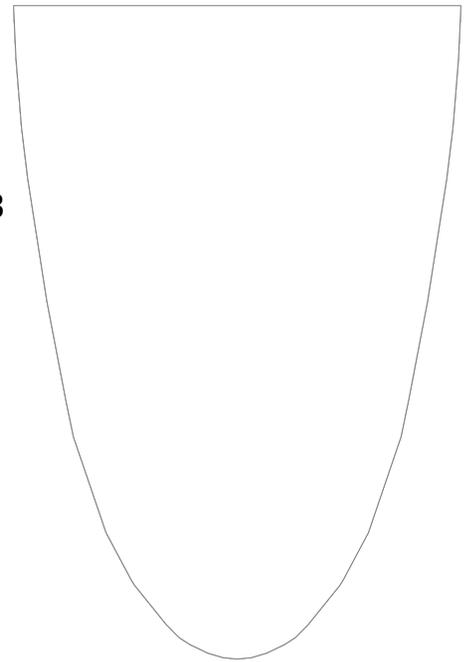
N9



N7



N8



Nose2

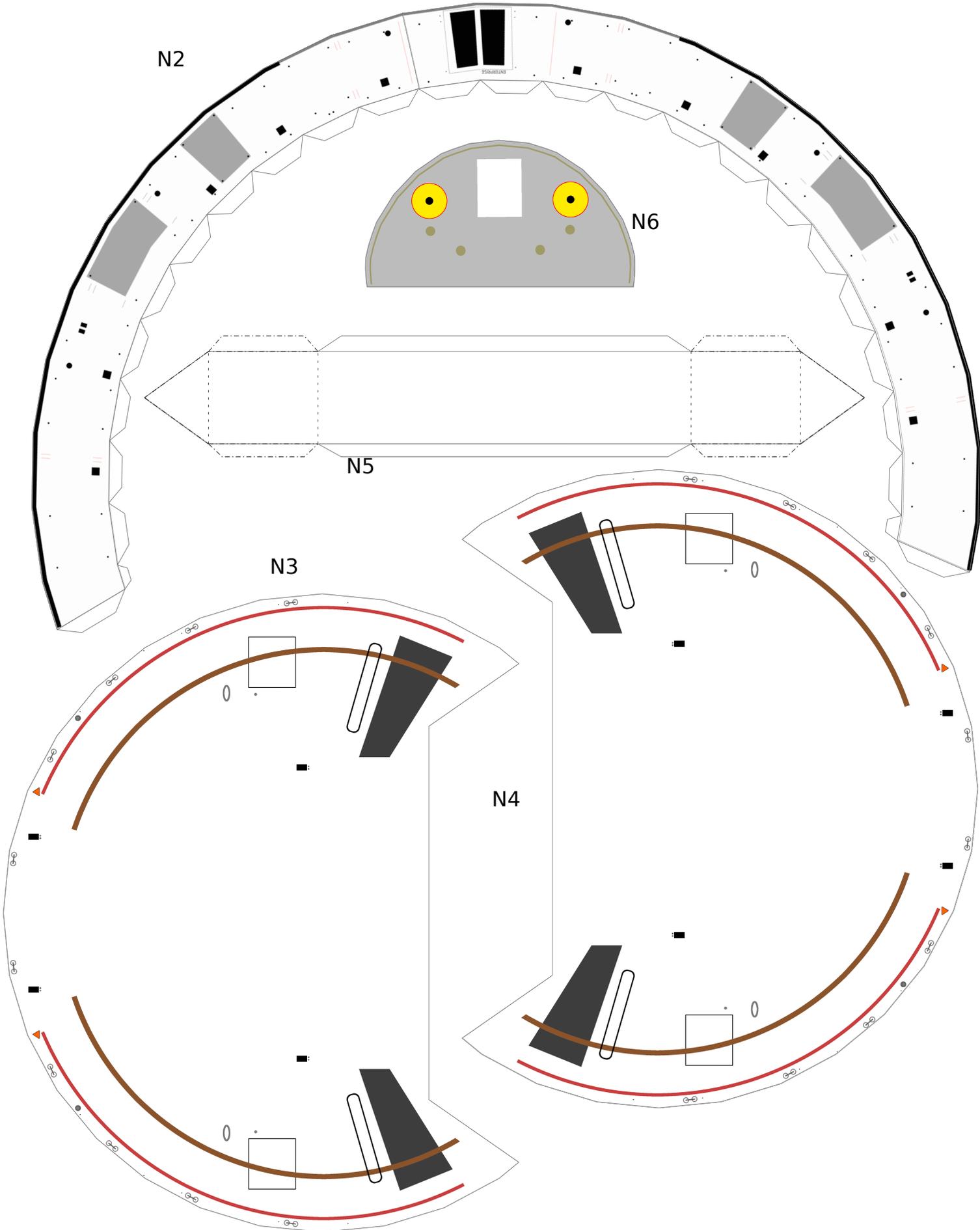
N2

N6

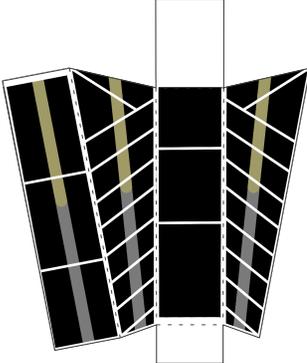
N5

N3

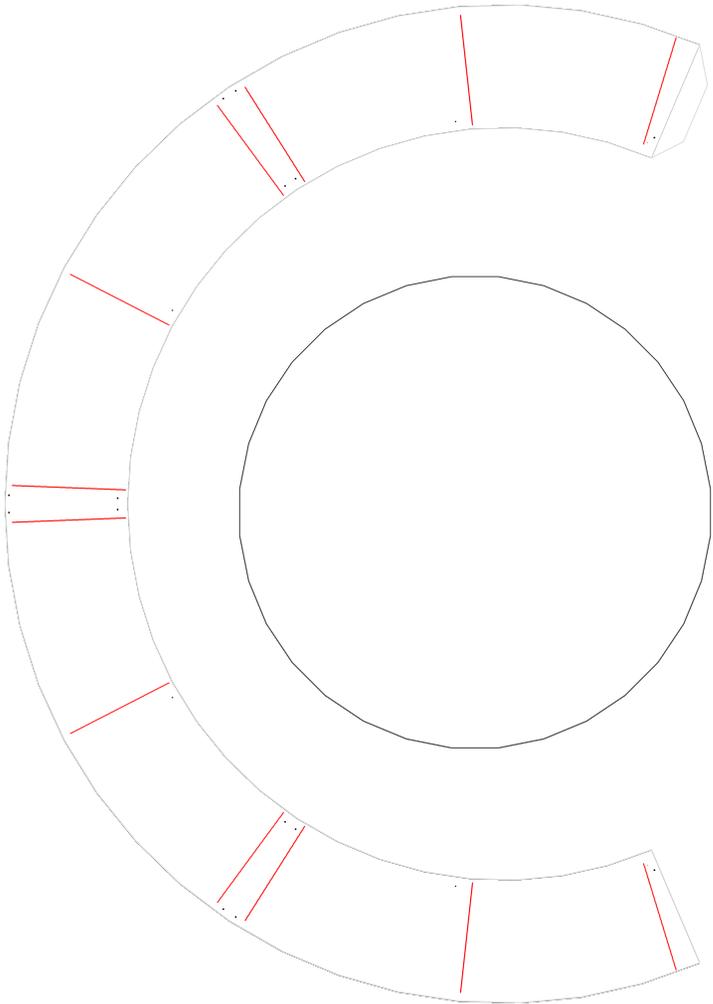
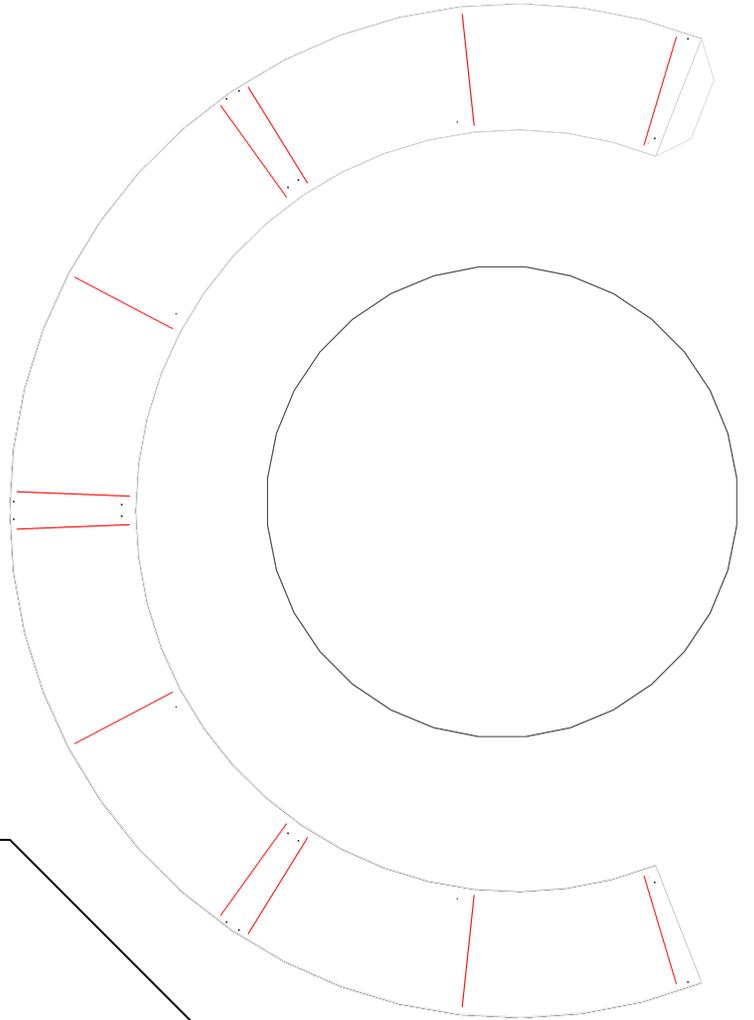
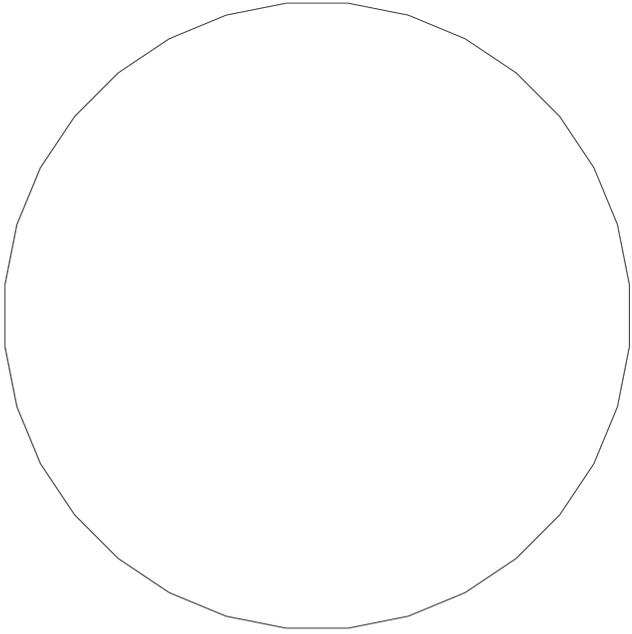
N4



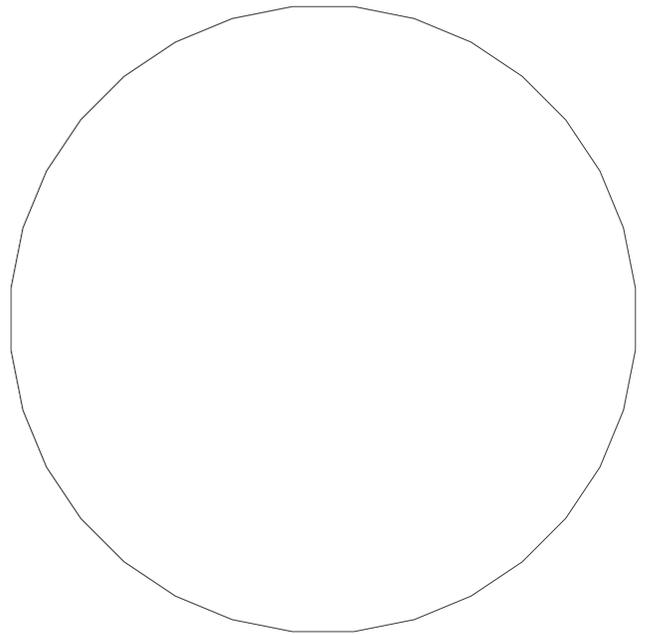
Dish Strut



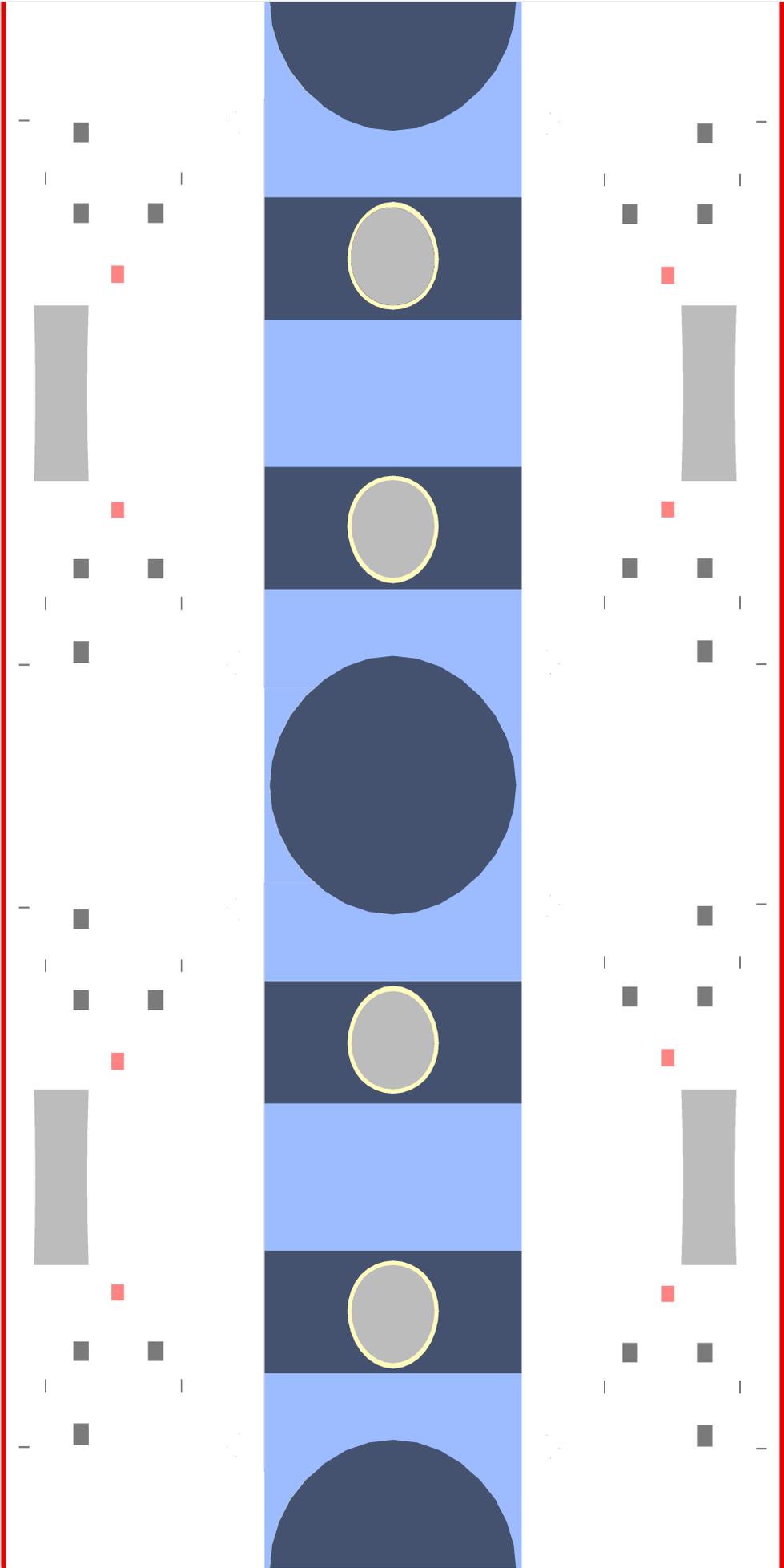
Forward Cone



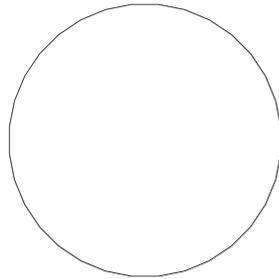
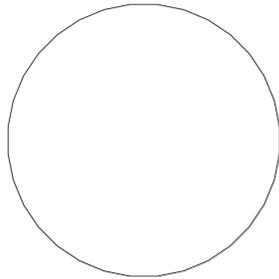
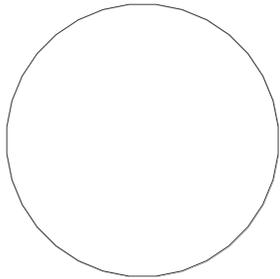
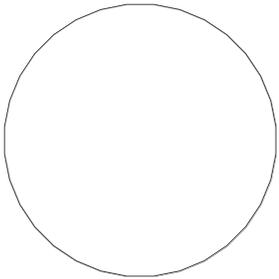
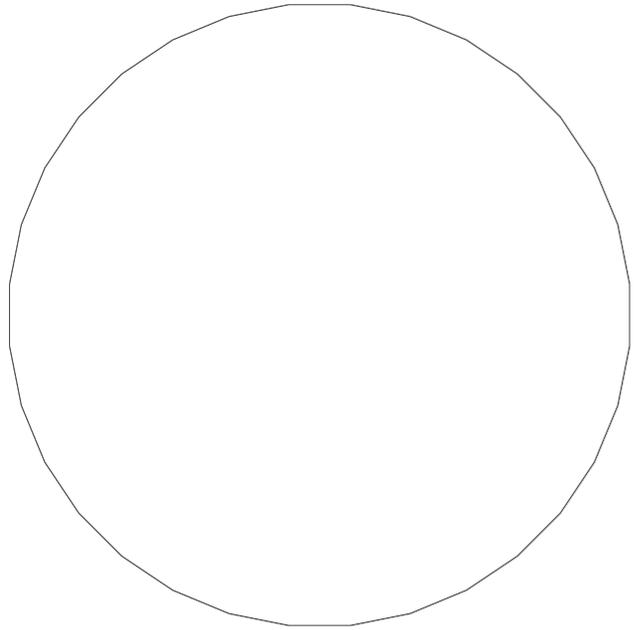
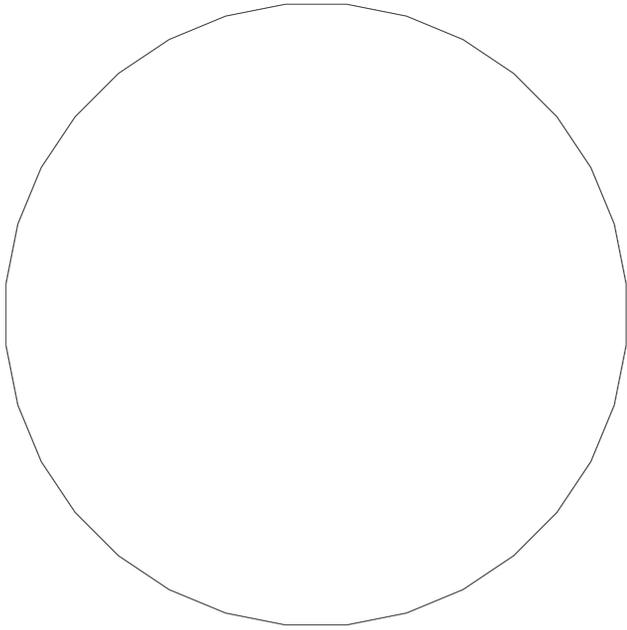
Rear Cone



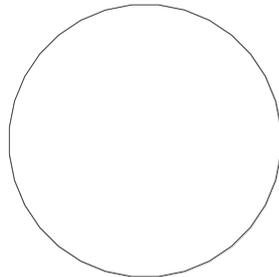
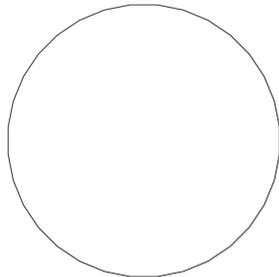
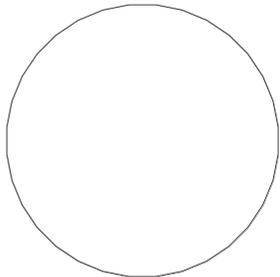
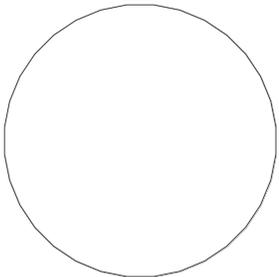
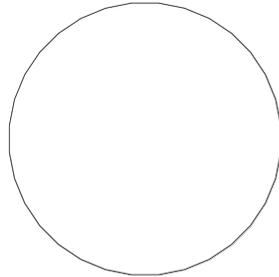
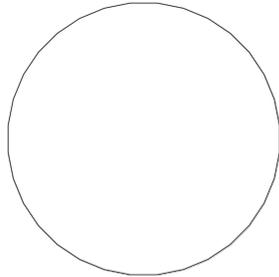
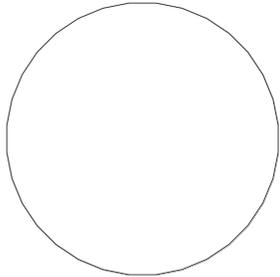
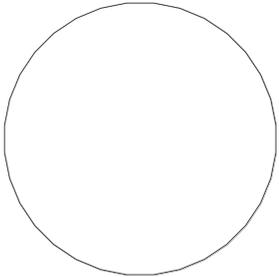
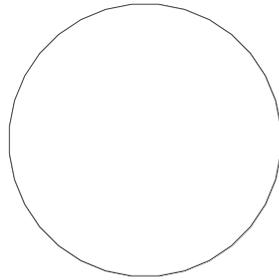
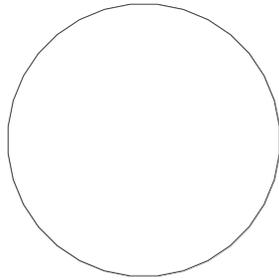
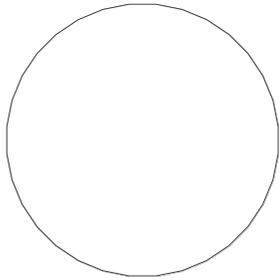
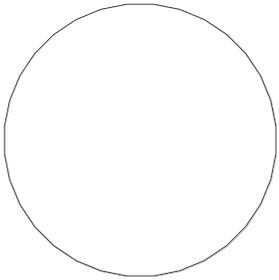
Body



Body Caps

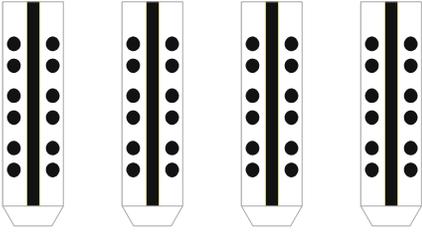


module
formers

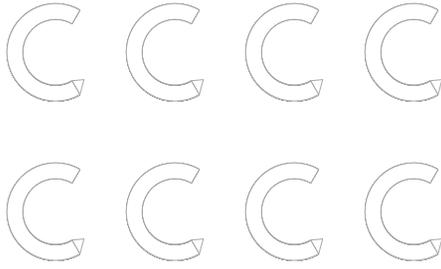


RCS - thin papper

R1



R2



R3

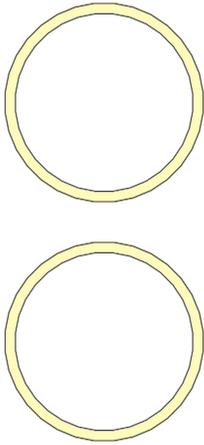


Sensor Pods

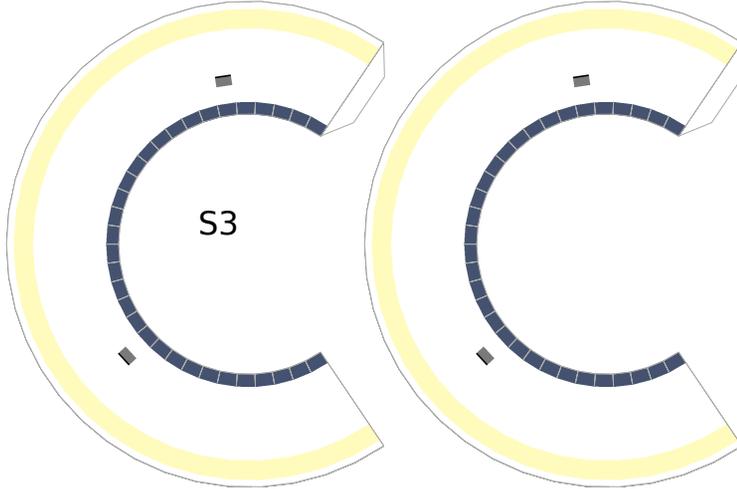
S1



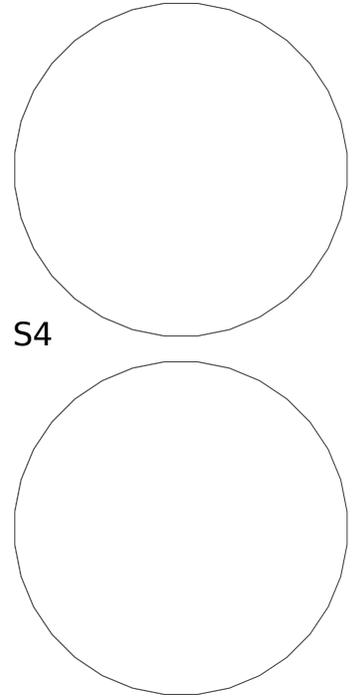
S2



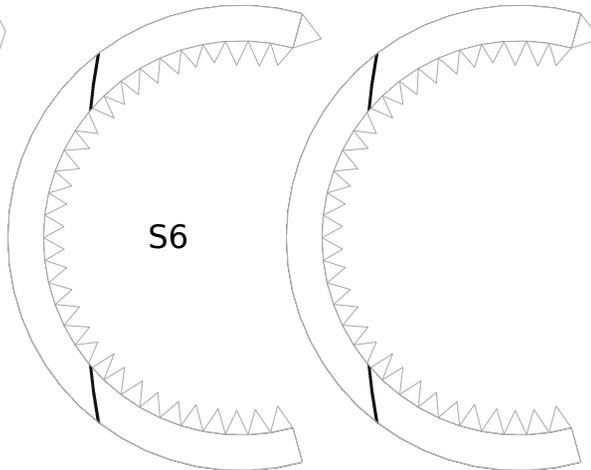
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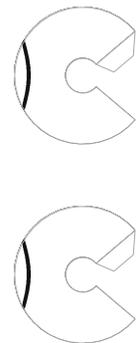
S4



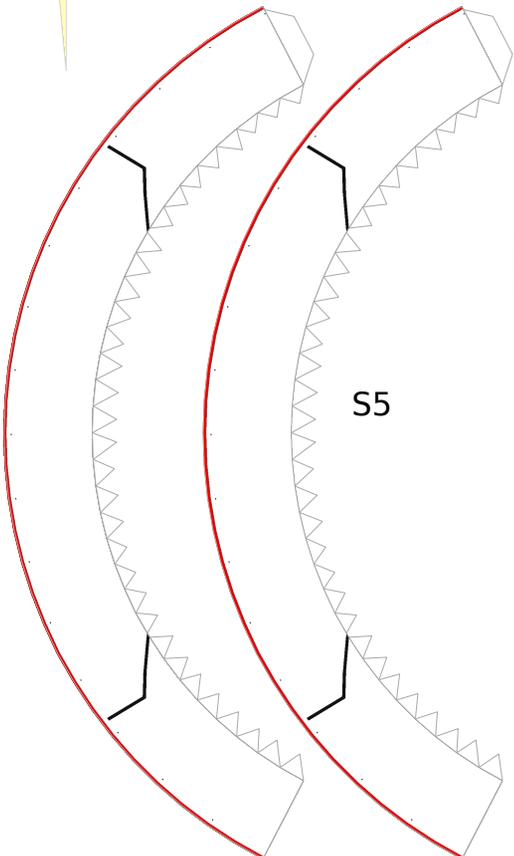
S6



S8



S5



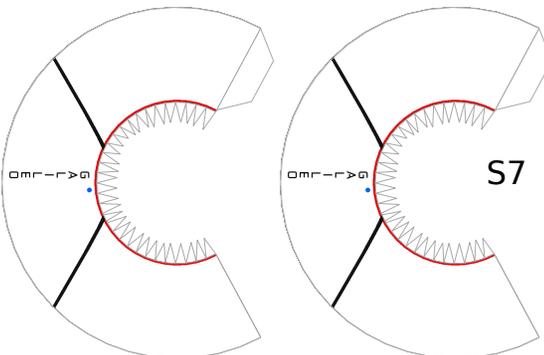
S9



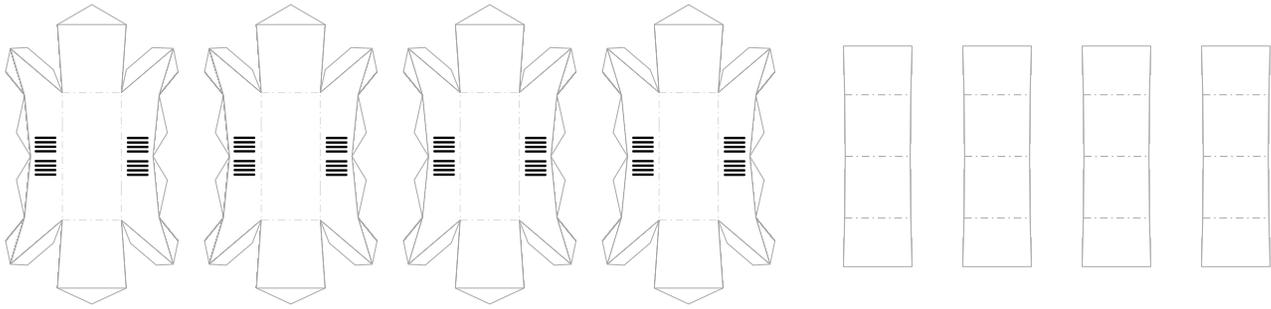
amr-r>g

amr-r>g

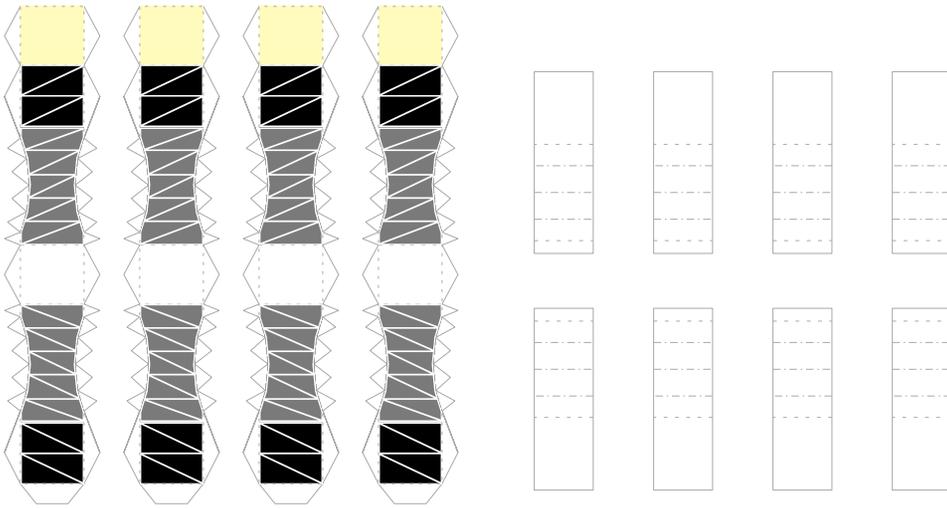
S7



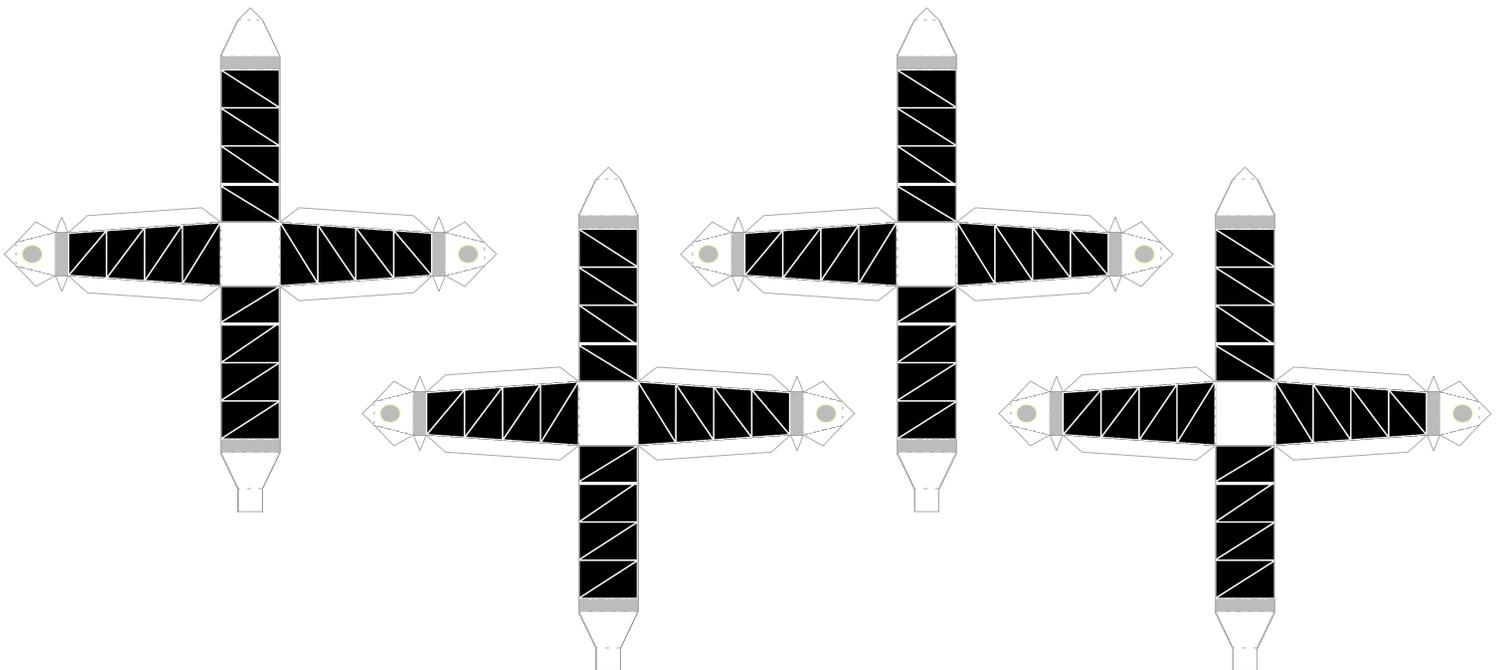
Arm Mount



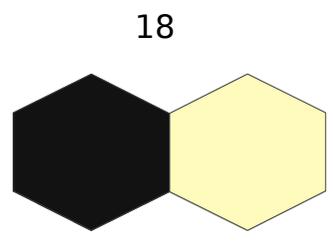
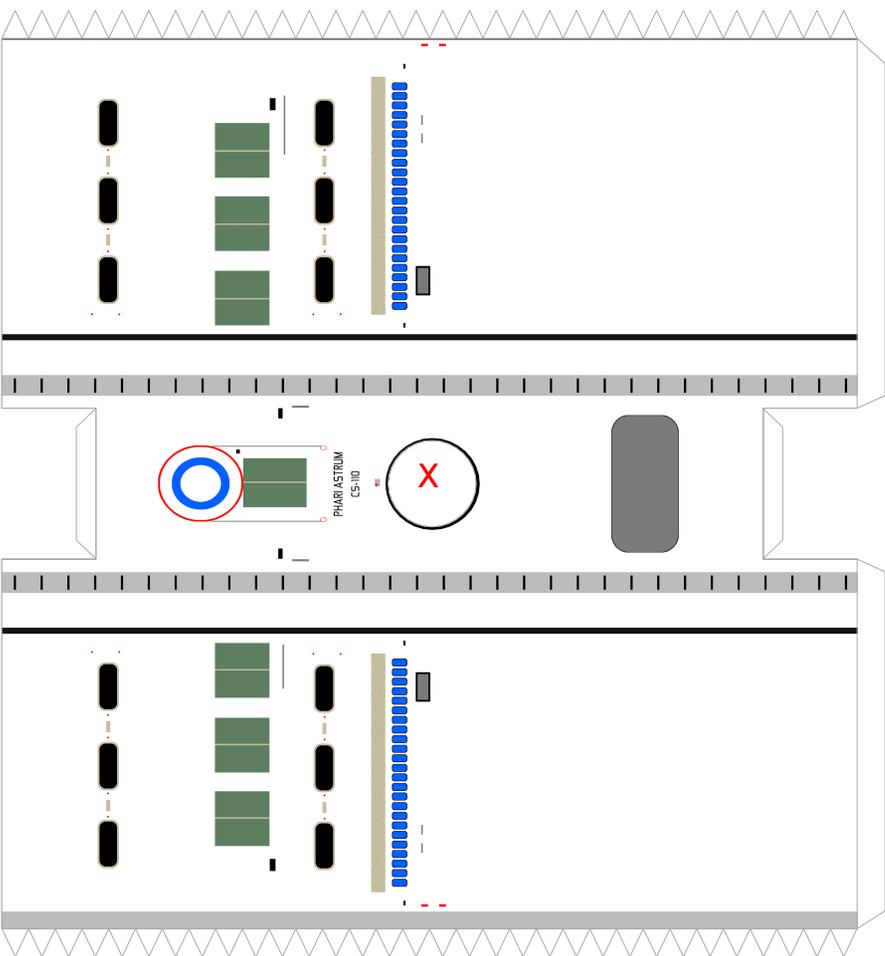
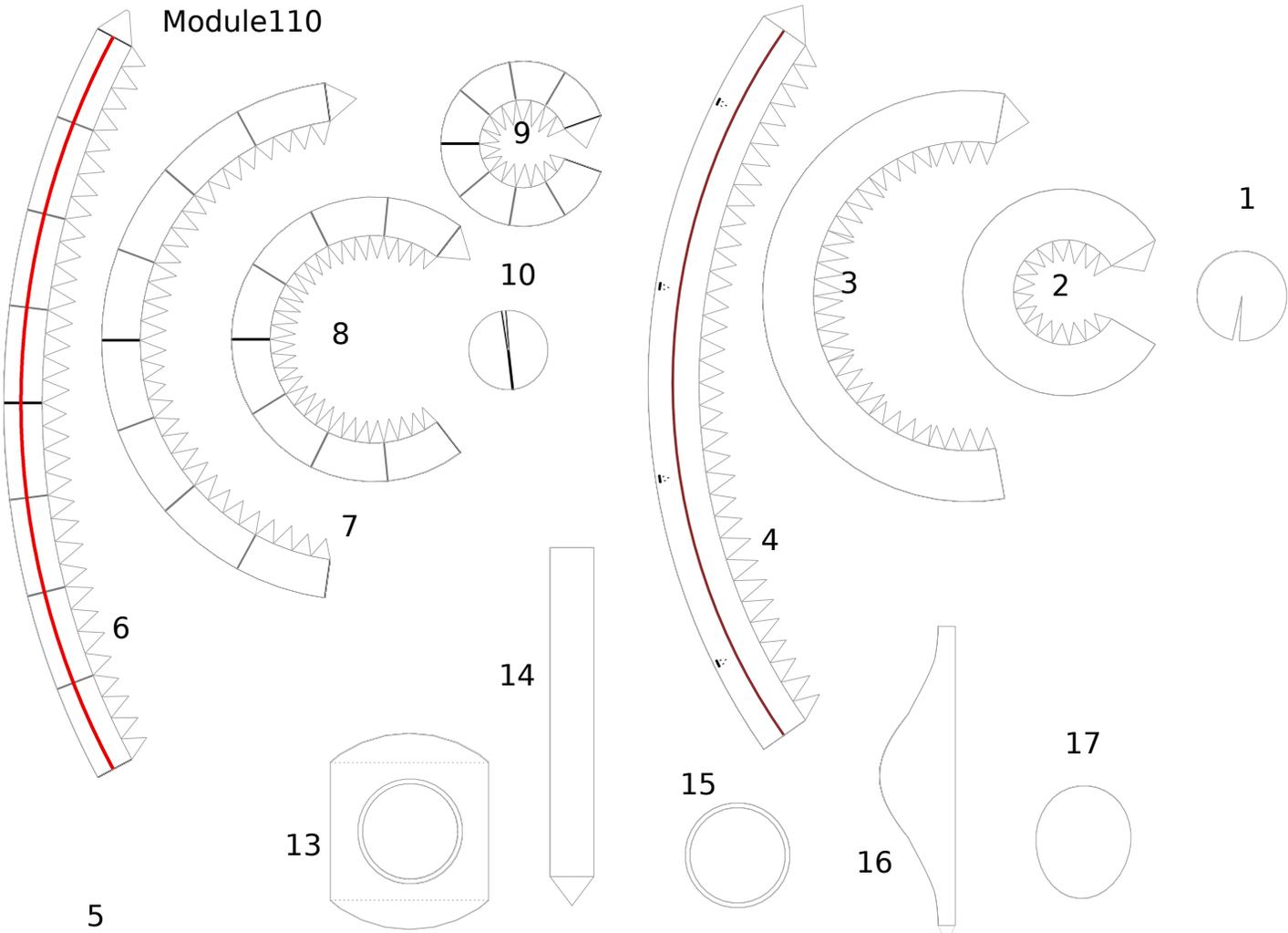
Arm Center



Arm End



Module110



220

1

15

9

10

8

7

6

4

16

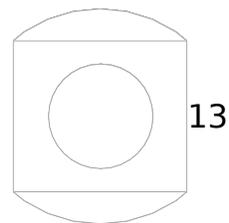
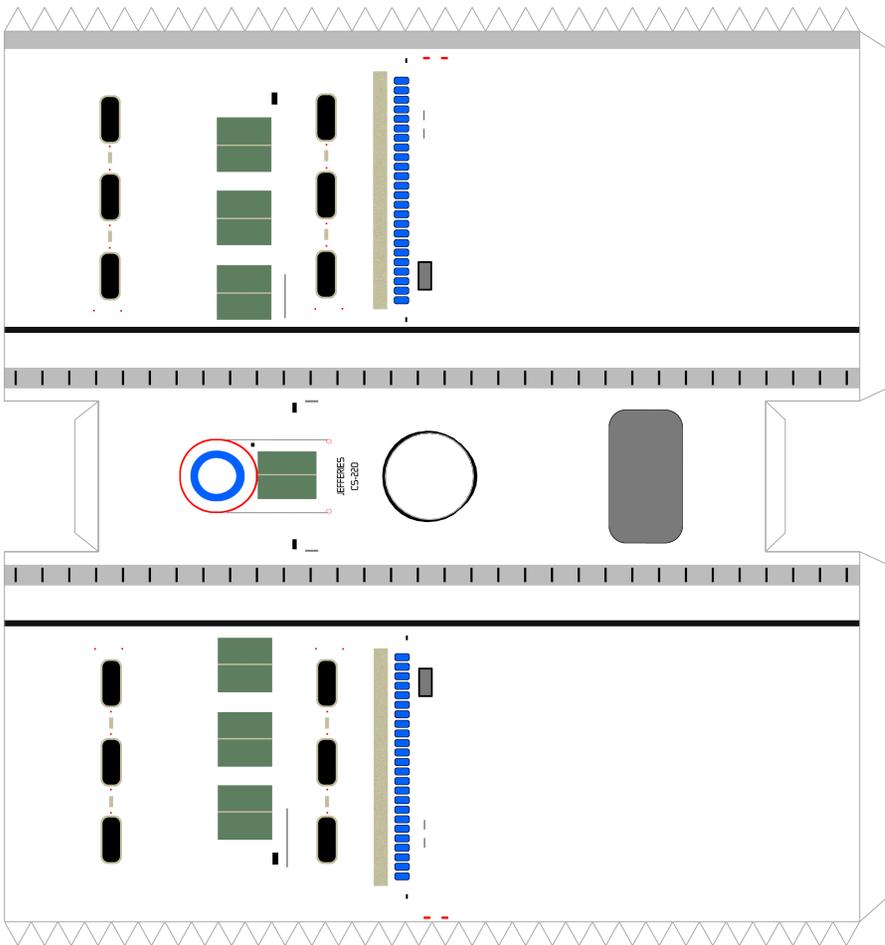
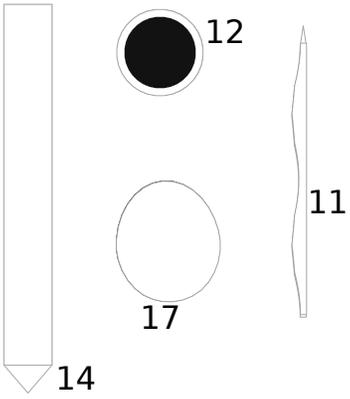
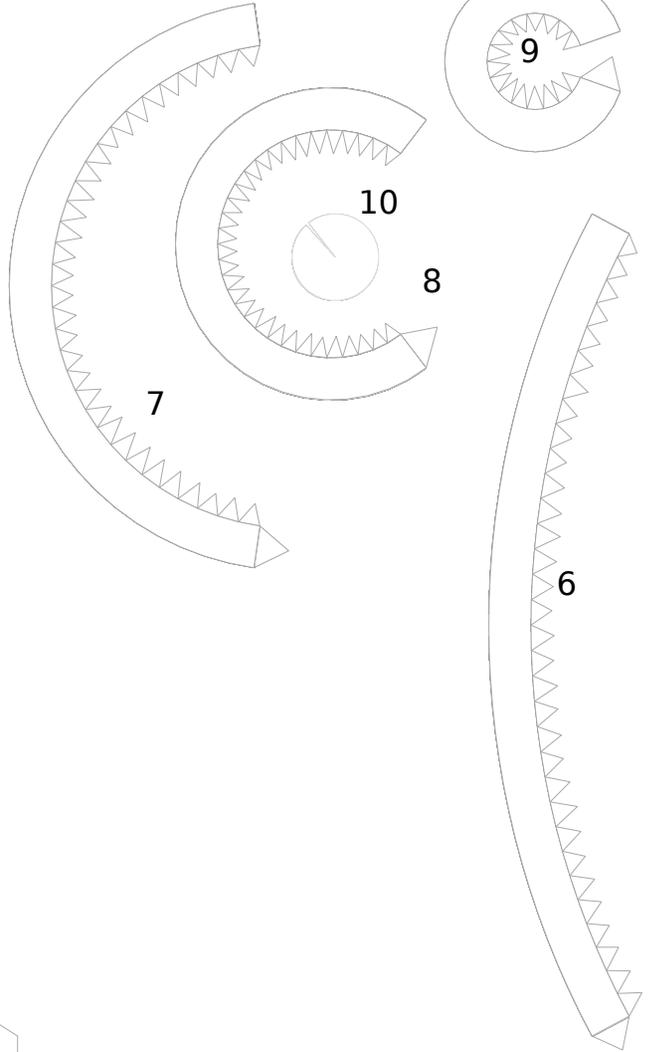
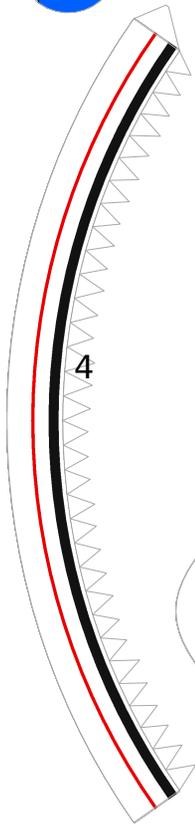
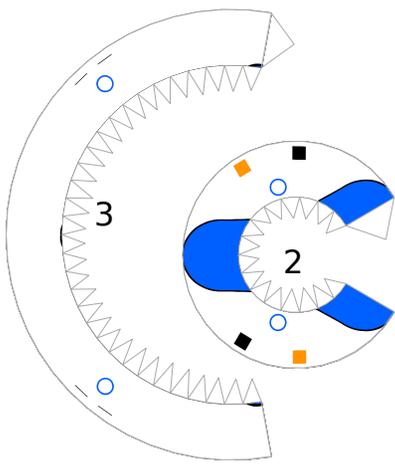
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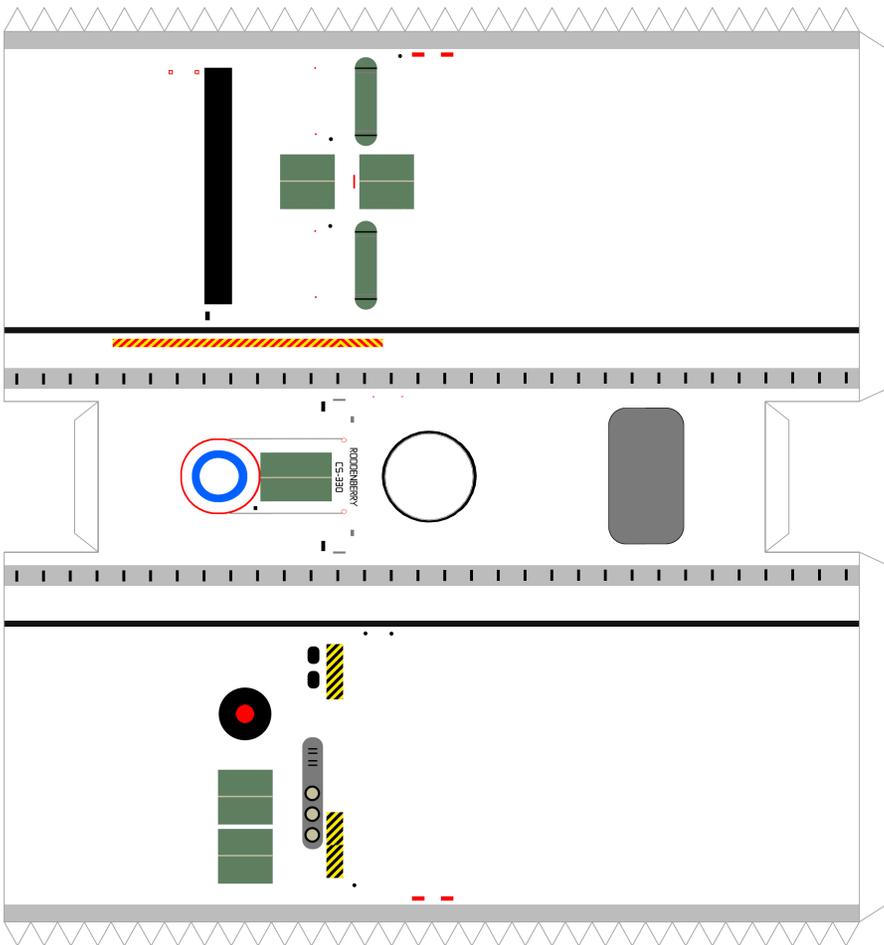
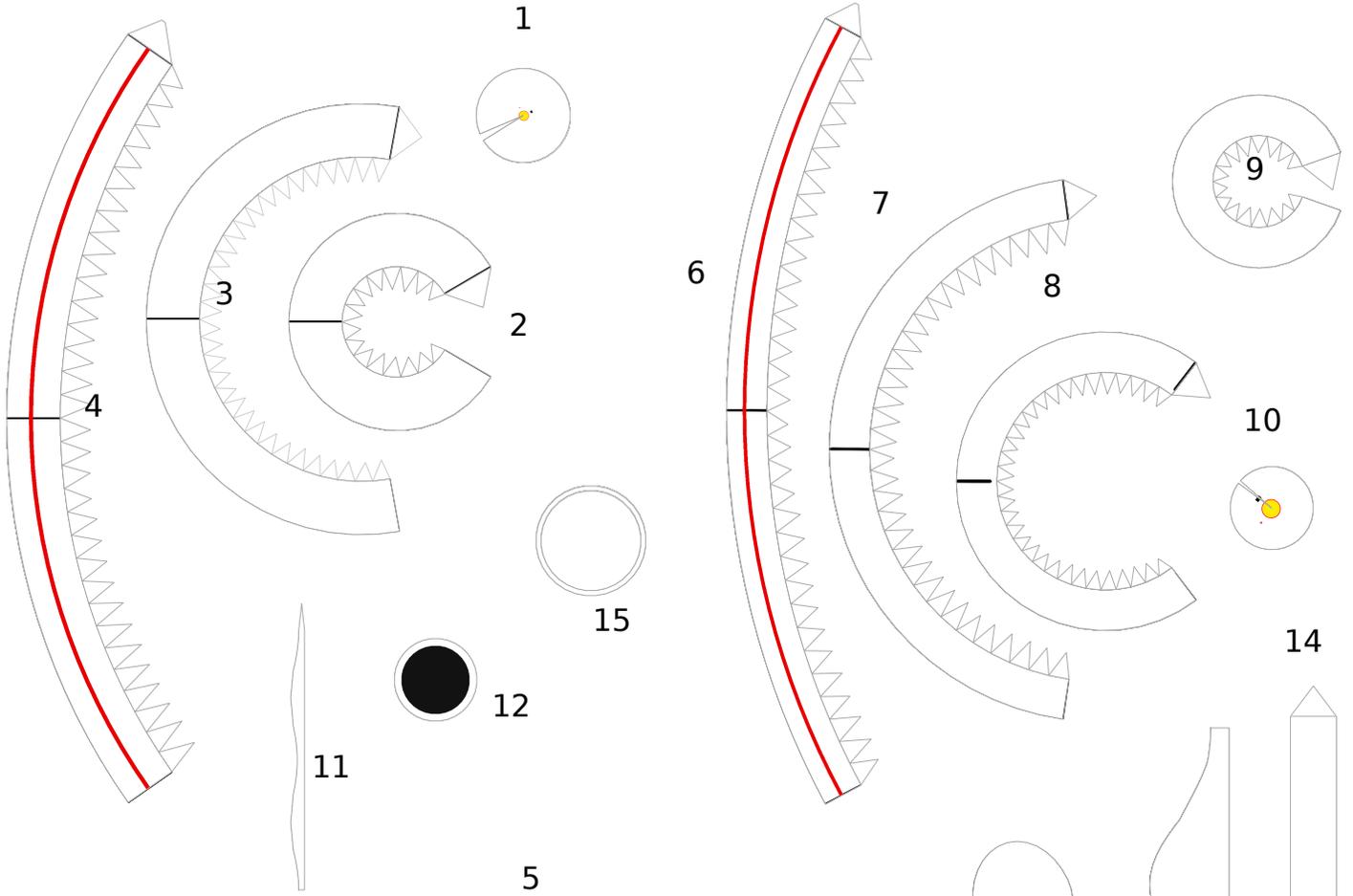
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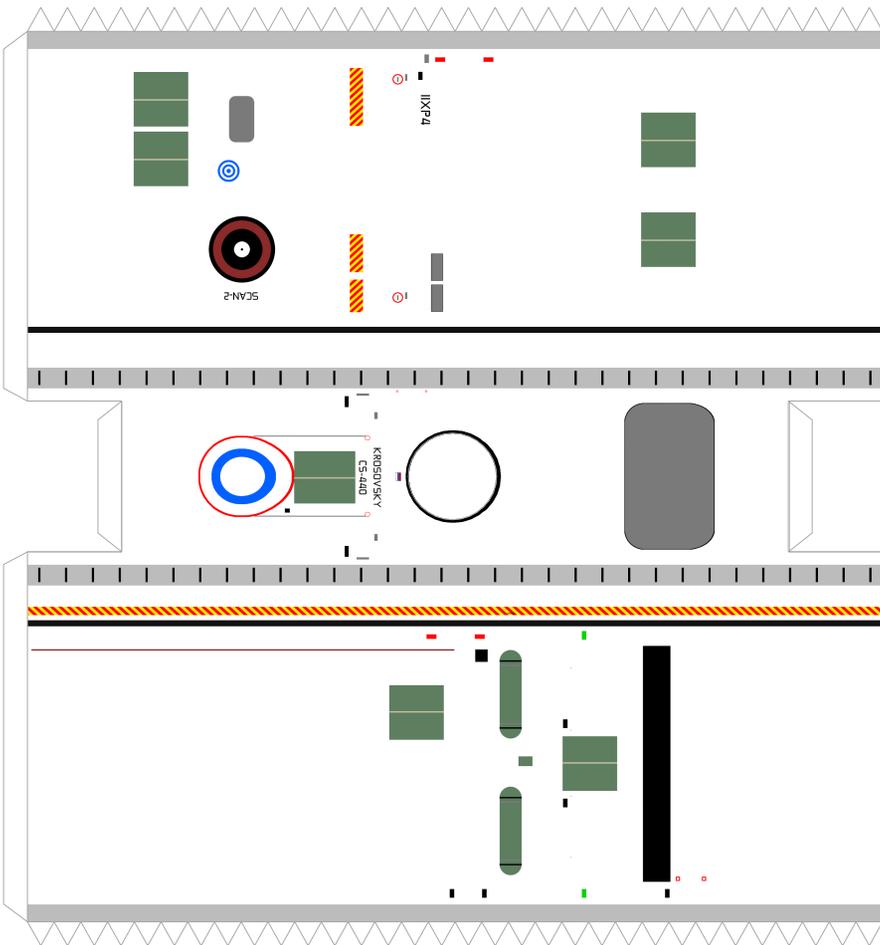
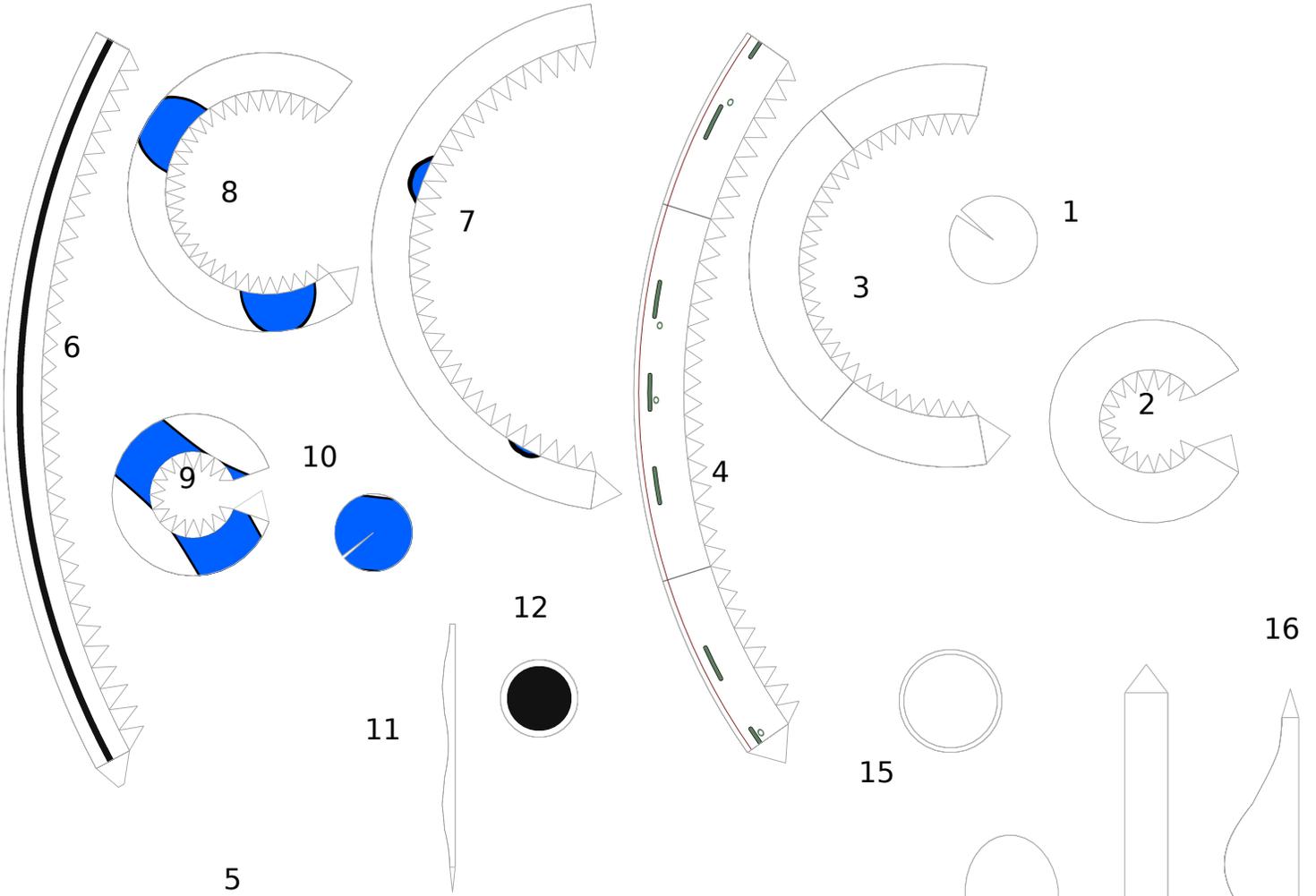
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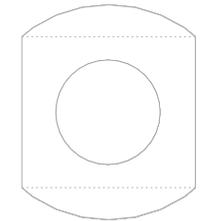
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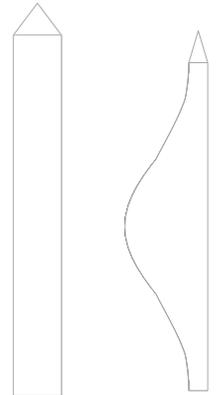
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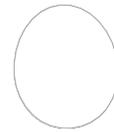
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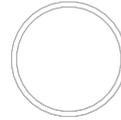
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17



15



16

11



12

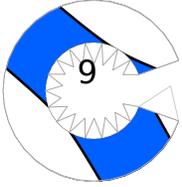


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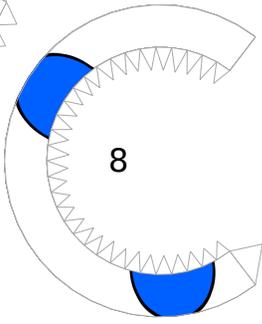
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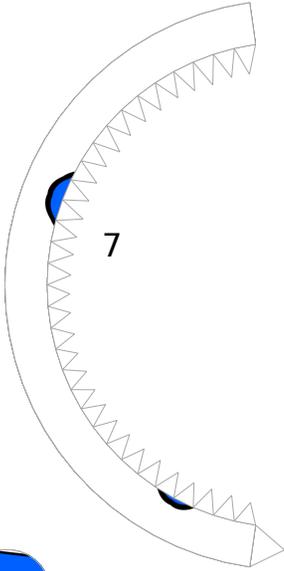
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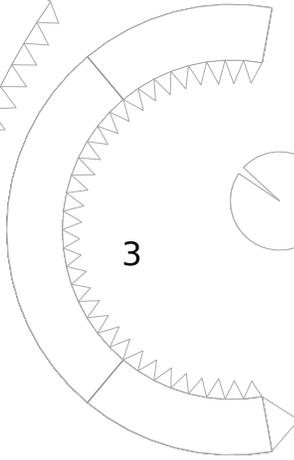
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7



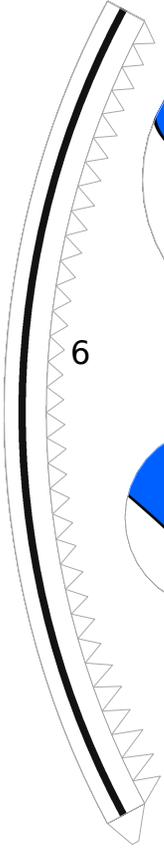
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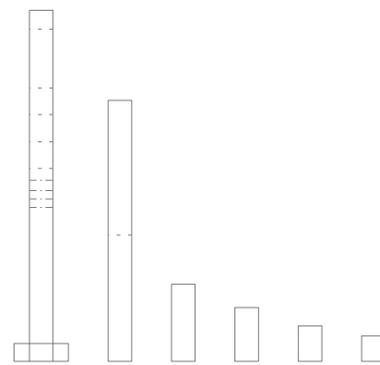
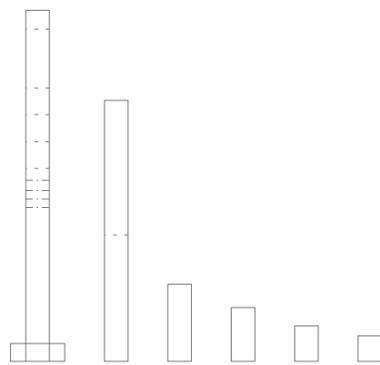
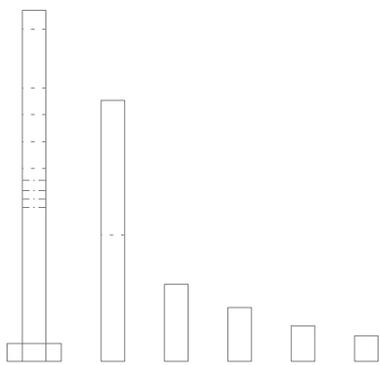
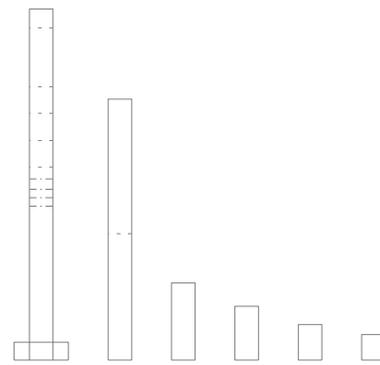
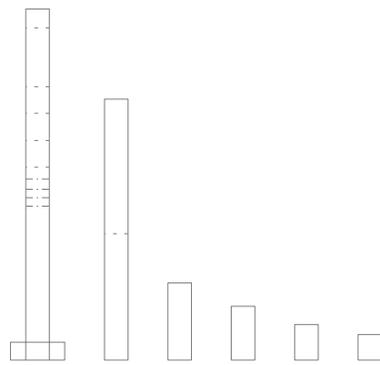
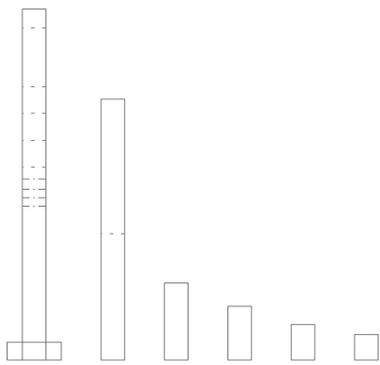
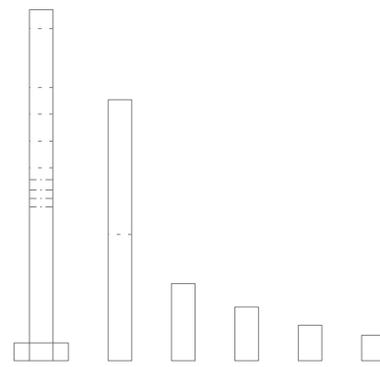
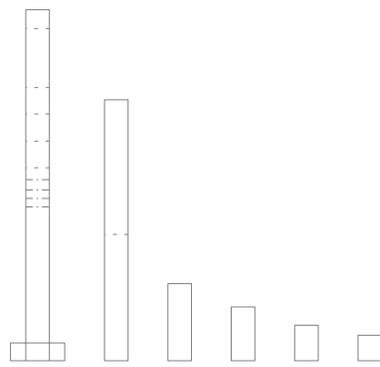
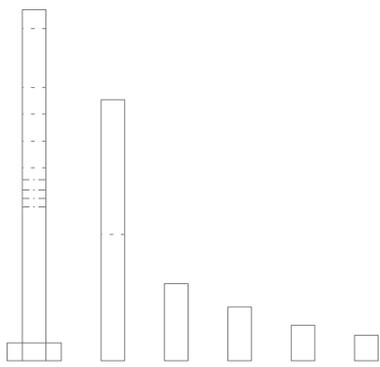
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Brackets



Solar Panels

