RYS D2A Articulator Manual

RYS ADVANCED CAD/CAM SOLUTIONS
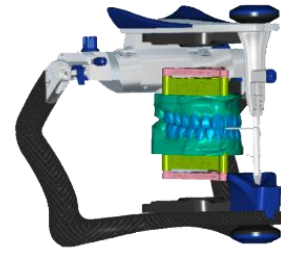
Correct articulation and planes are crucial for the success of dental rehabilitation. After the digital revolution in the sector, 3D printing of models using intraoral scanners is already a reality. However, the accuracy of the articulation in this system is quite questionable, increasing the global errors of the planes and occlusion, and not allowing complex articulation in the real world without analog work behind it (reassembly of impressions).

Our purpose
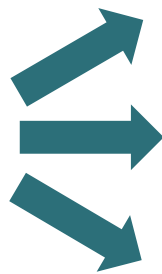
To move from virtual to real-world articulation effortlessly.

Minimizing errors to the maximum in the transition.

Eliminating errors caused by possible manual reassembly.

PROBLEMS to achieve our goal in resin printers:
1. The overall printing error, different in each 3D printer.
2. The deformations suffered, either by the compression of the first layers or by the pins adhering to the model to be printed.

THE SOLUTION

Outlet chimney

Printed model

Contact zone with tolerance margin

Deformable Zone
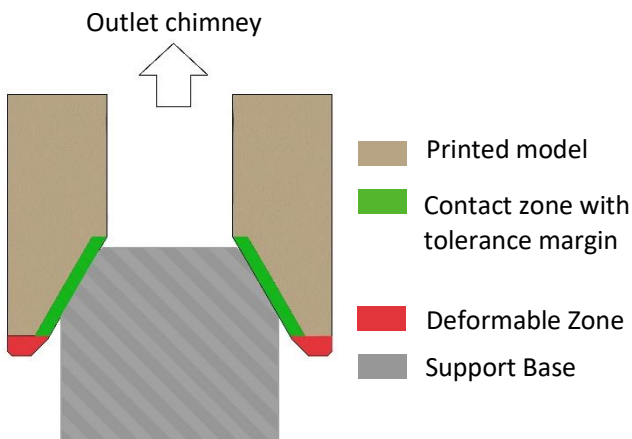
Support Base

We need to change the model's support to the articulation base to one that minimizes problems. To do this, we use a cone with a wide tolerance range and a pin-holding zone that considers deformation, adding a resin outlet chimney that avoids the possible collapse of the layers by vacuum and also facilitates cleaning, increasing model repetitiveness.

RYS ADVANCED CAD/CAM SOLUTIONS

This way, we achieve stable support, ease of printing, and most importantly, high repetitiveness.

The next step is to bring that repetitiveness to the highest possible accuracy for each printer on the market.

To achieve this, each articulation support platform change must be calibrated on each printer, obtaining an accessory for its articulator that includes and corrects the errors of its printer, the **RYS D2A ADAPTER.**
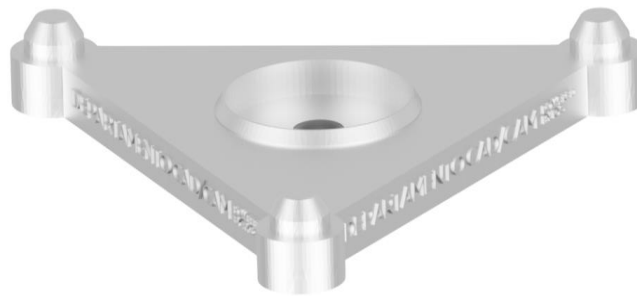
Step by step

0 Each RYS D2A Base must be mounted on the articulator **using only the RYS D2A Calibrator printed on the printer that manufactured the models**.

1 Machine or print two *RYS D2A Bases.*

2 Print the RYS D2A Calibrator A and the RYS D2A Calibrator B parallel to the print bed, supporting the pins only on the outer edge of the cones *(figure 1).*

The orientation will be parallel to the print area. The support distribution is done uniformly throughout the underside of the piece *(figure 2).*
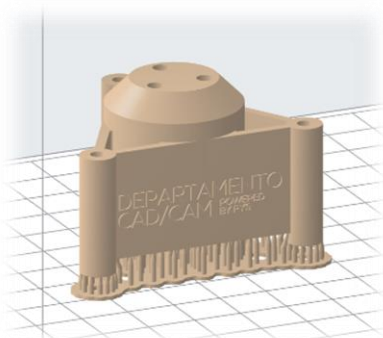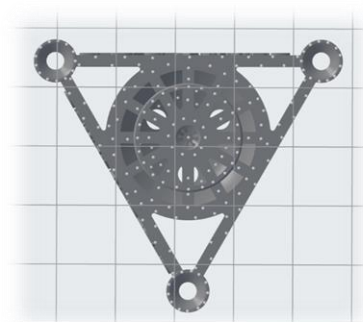
Figure 1

Figure 2

The most critical area is the one that includes the support cones. It is necessary to avoid placing supports on the inner surfaces of these cones. For this, there are perfectly horizontal flat surfaces where these supports must be placed *(figure 3)*.
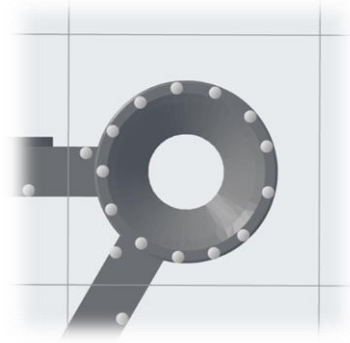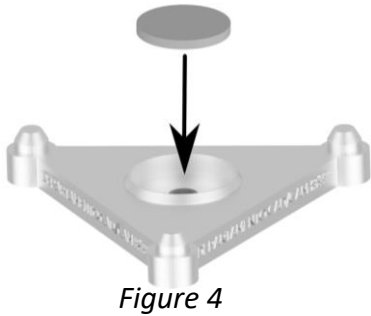

Figure 3

Figure 4

3 Cement a 15∅ * 3mm neodymium magnet on each RYS D2A Base *(figure 4)*.

4 Screw a short wood screw with a ∅3mm head in the center of each *RYS D2A Calibrator* or use glue to attach a metal ring between ∅8mm to ∅15 mm in the center *(figure 5)*.

Figure 5

Figure 6

5 Join parts A and B, obtaining the *complete RYS D2A Calibrator (figure 6)*.

6 Place the already magnetized *RYS D2A Bases* at each end of the complete *RYS D2A Calibrator (figure 7)*.

Figure 7

RYS ADVANCED CAD/CAM SOLUTIONS

7 Using glue, attach the assembly obtained in step 6 to the lower mounting plate of your articulator so that both are leveled parallelly *(figure 8)*.

Figure 8

Figure 9

8 Mount assembly 7 on your articulator and place another mounting plate at the top of your articulator *(figure 9)*.

9 Fill the space with plaster *(figure 10)*.

Figure 10

10 Get the new **RYS D2A Adapter.** Calibrated for your printer, it will allow you to move from virtual to real-world articulation effortlessly *(figures 11 and 12)*.
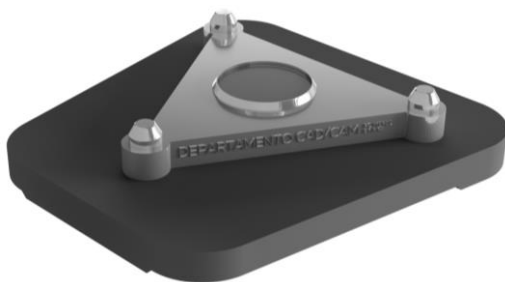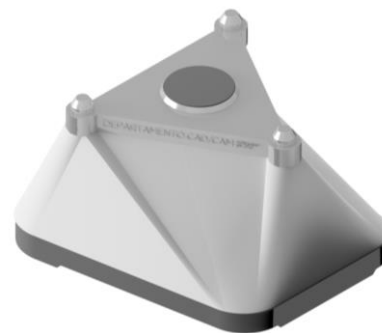

Figure 11

Figure 12

ADVANCED
CAD/CAM
SOLUTIONS

EXOCAD MODEL CREATOR PROCEDURE

Valid visual planes (the visualization views match the articulation planes).

1 In model alignment, choose the type of model you want. In the assembly height, choose a value between 60 and 40 mm, depending on the height of your models. **Do not tilt** the model at this step, or you will lose the planes.
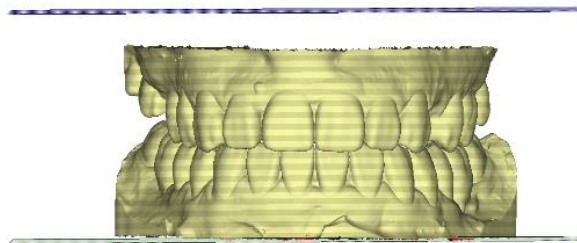
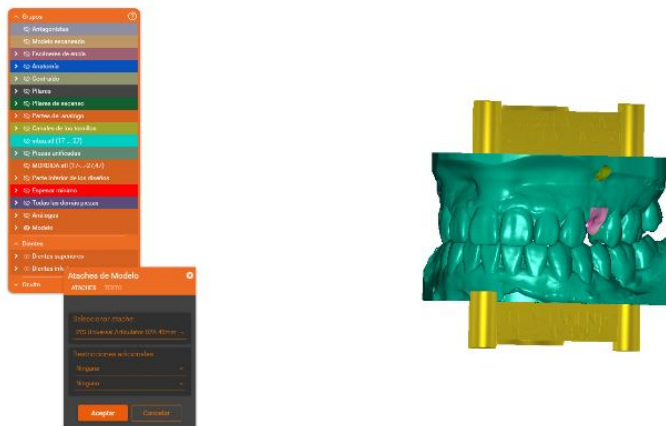DEPARTAMENTO
CAD/CAM POWERED BY RYS

2 Once the model is created, choose RYS Universal D2A articulator in the *model attachments option*, with 60 or 40mm, depending on the height of models selected previously.

DEPARTAMENTO
CAD/CAM POWERED BY RYS

RYS ADVANCED CAD/CAM SOLUTIONS

3 Raise, lower, or shift to ensure the connection to the model. If necessary, rotate the attachment to center the cylinder with the midline.

In case the visualization view is not valid, we will correct it using the virtual articulator:

Using the articulator, and using the vertical and horizontal planes, position the models manually or automatically. Once correct, accept the correction and articulate.
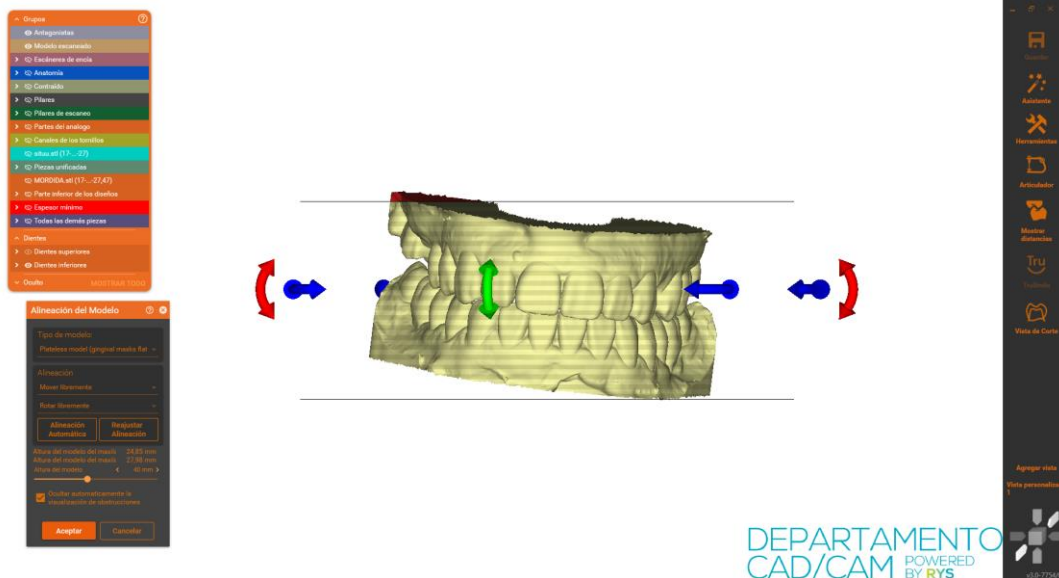
After this correction, follow the steps of the process seen in "Valid visual planes", as the visualization views already match the planes.

# Process without visual plane correction:

In model alignment, choose the type of model you want. In the assembly height, choose a value of 60 or 40 mm, depending on the height of your models.

Next, center the model between the two planes manually, for this, you must have the "Rotate freely" option accepted. Clicking on the model while holding down the "Ctrl" key will allow us to rotate the model:

Until it is centered as we consider correct:
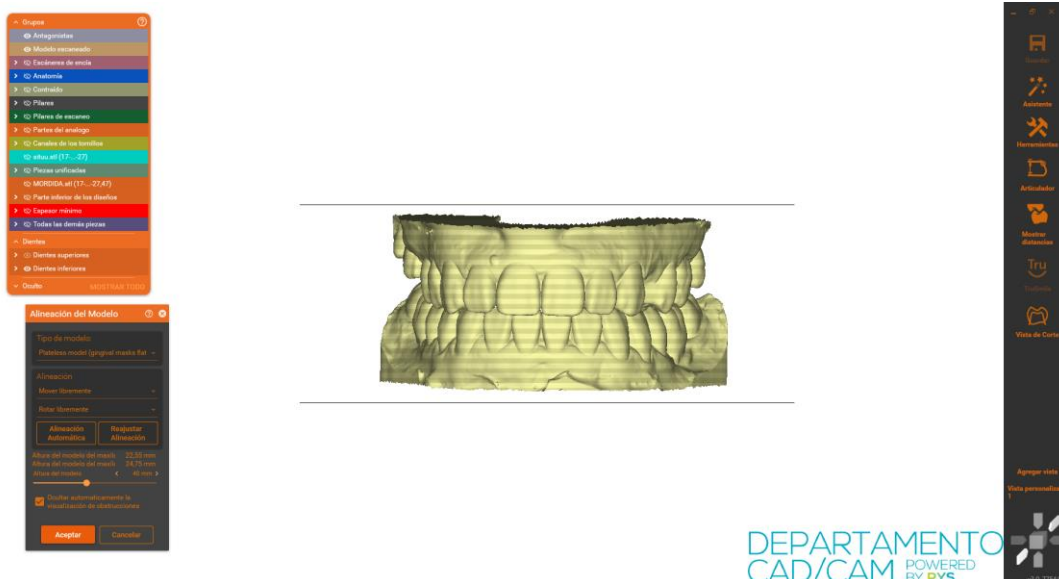
After this, even though the views still do not match the articulation planes, you can follow the steps of the process with "Valid visual planes".

MODEL PRINTING

Before printing the calibrators or models with RYS D2A on our printer, some details must be taken into account, such as orientation, size, and position of the supports used for printing.
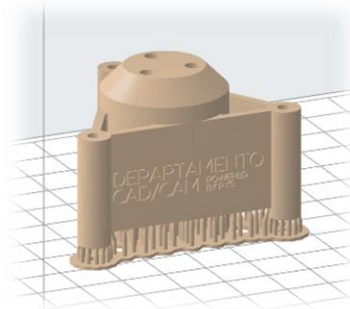
The chosen orientation is shown in *Figure 13.*

Figure 13

To achieve a correct printing of the calibrator, the following printing configuration has been used along with the placement of pins shown in *Figures 14 and 15.*
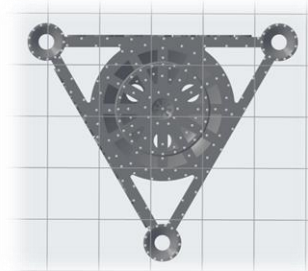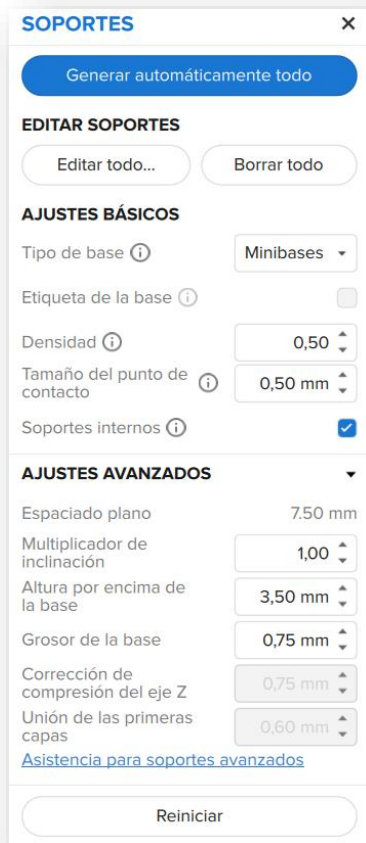

Figure 14

"Minibases" are chosen as anchoring to the print bed and a contact point with the piece of 0.50 mm.

The support distribution is carried out evenly throughout the lower surface of the piece, as seen in *Figure 14.*

Figure 15

The most critical area is the one that includes the support cones. It is necessary to avoid placing supports on the inner surfaces of these cones. For this, perfectly horizontal flat surfaces are available where these supports must be placed, thus ensuring that there are no printing errors, as can be seen in *Figure 16.*
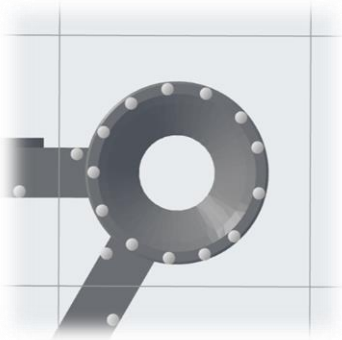

Figure 16

The importance of having maximum precision possible in these support cones lies in the fact that these cones have a support area that will make the calibrator higher or lower depending on the machine's error. In this way, it will be possible to obtain the printing error in the calibrator, to later obtain the RYS D2A adapter calibrated for your printer.

■ Base Cone

■ Calibrator Cone
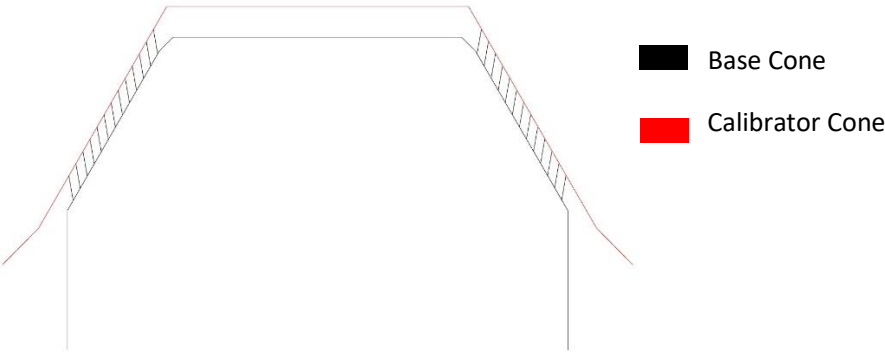
📞 **959 99 99 99**

✉ **email@ryscadcam.com**

🖱 **ryscadcam.com**