The Eyetracker

FOR DUMMIES

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EYETRACKER

- The Eyetracker is at the end of the MRI room behind the machine.
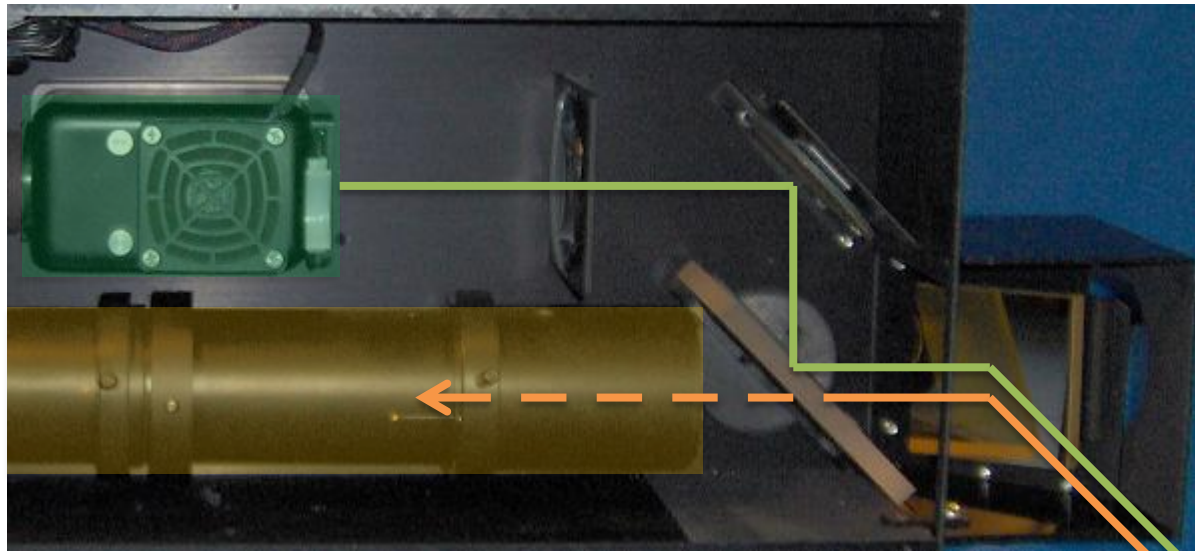
⚠️ <u>Do NOT move the Eyetracker</u>

EYETRACKER

- A bulb can light the pupil through mirrors and the reflected signal is recorded

Emission

Reception

SUMMARY

- 1) Machine Part
- 2) Software Part
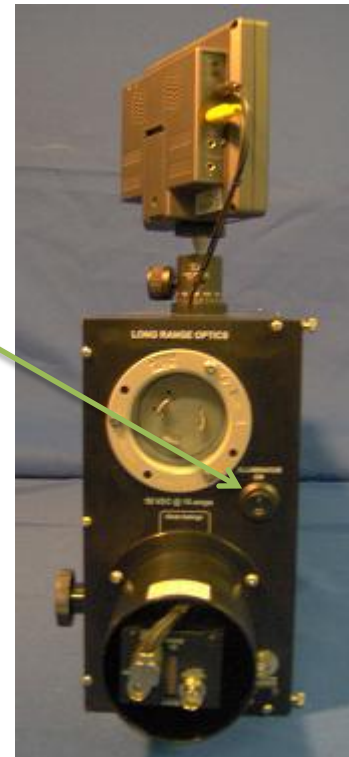- 3) Change the bulb
- 4) Tips and tricks

1) MACHINE PART

- First press the switch "Eyetracker" behind the phone between computer screens green and blue.
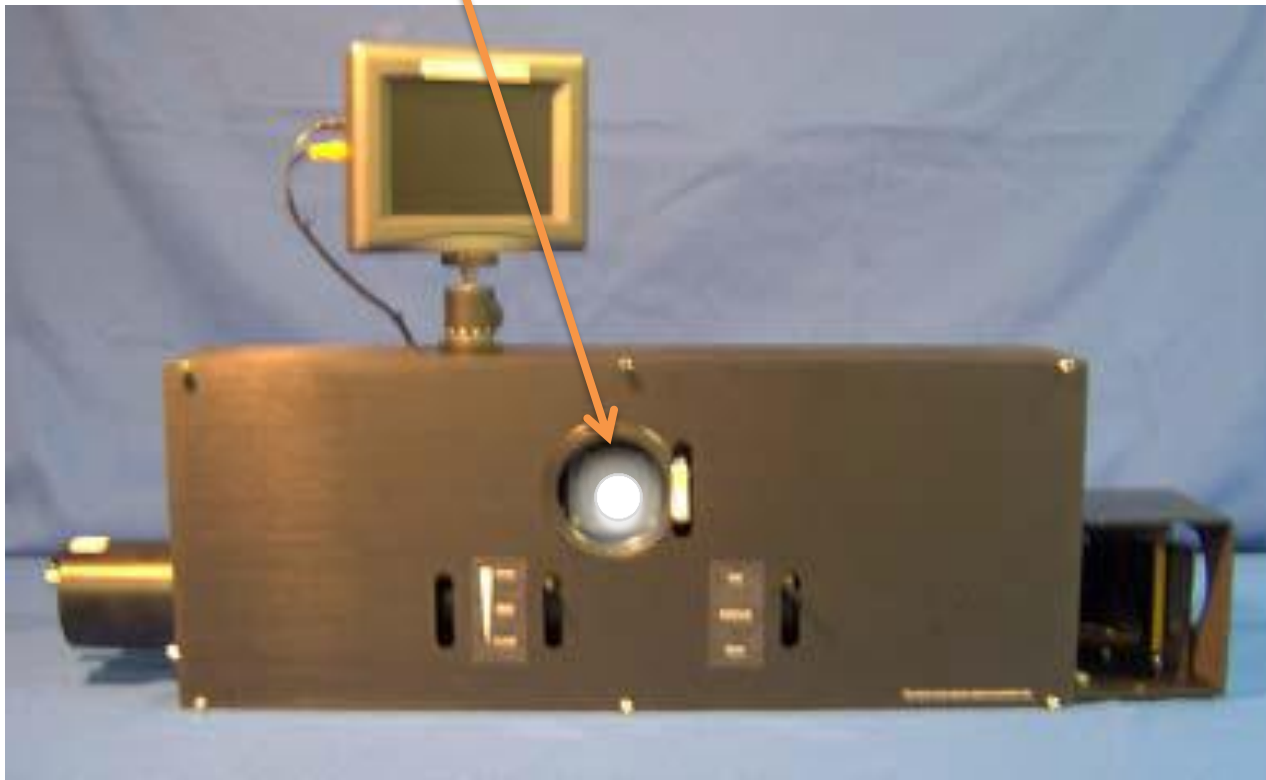
1) MACHINE PART

- Enter the MRI room, go near the Eyetracker and light the bulb with the button on the side of the unit.

1) MACHINE PART

- Check if the bulb is still operational (the light must be visible from the outside HERE).
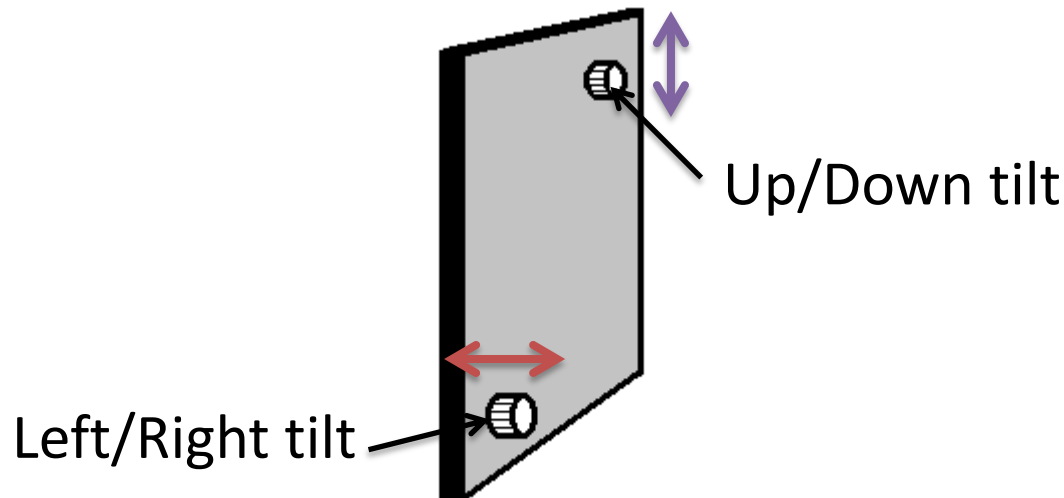
1) MACHINE PART

- Turn on the screen above the Eyetracker. The pupil must be visible, if it is not the case, adjust the mirror to focus the eye.

1) MACHINE PART

- If the pupil is not visible from the start, you need to adjust the tilt of the mirror to move the field of view and see the eye at the center of the screen. To do this, turn the screws located behind the mirror.
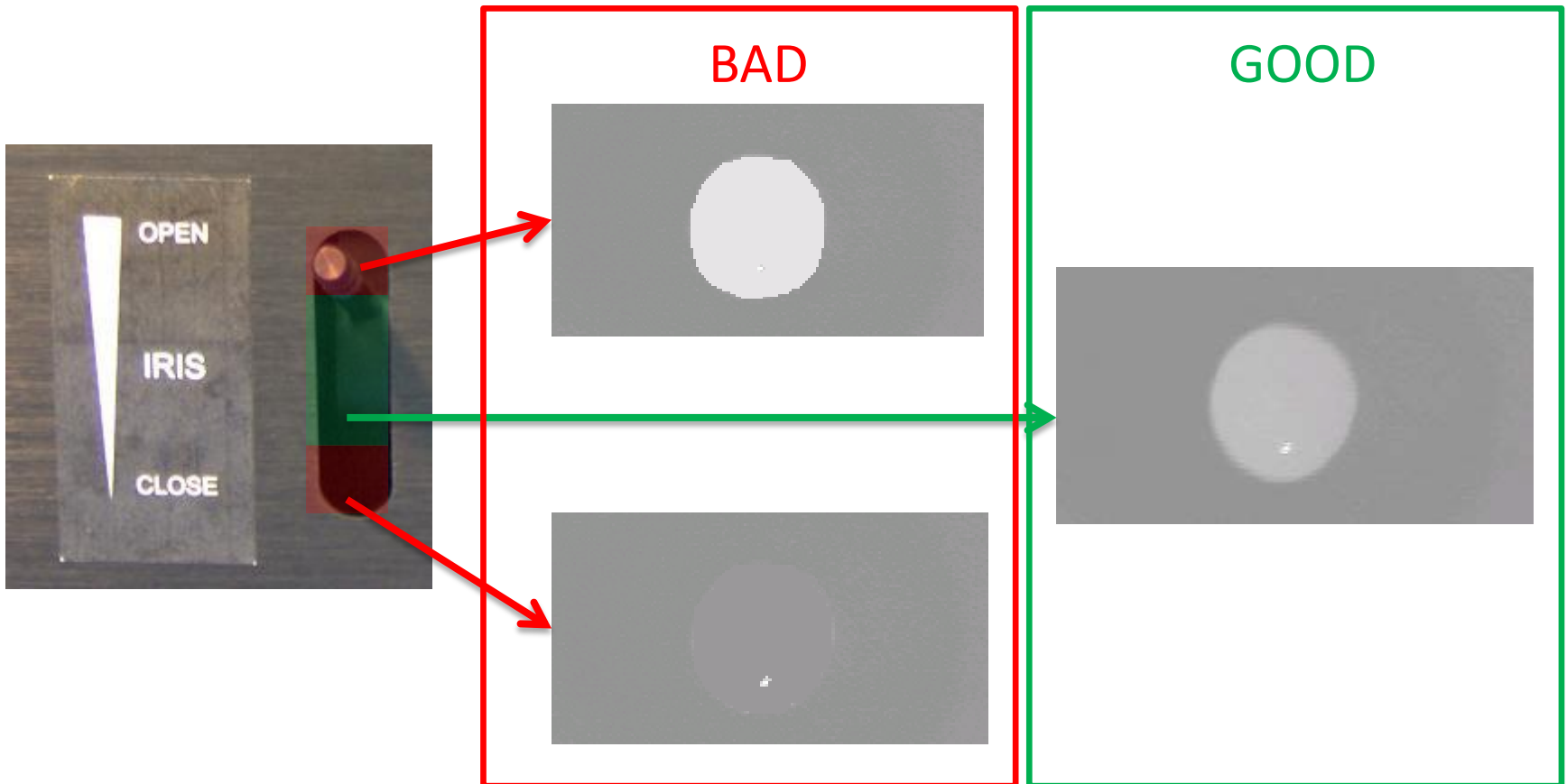
Up/Down tilt

Left/Right tilt

1) MACHINE PART

- If the pupil is visible, it is necessary to adjust the brightness and sharpness of the image using the levers on the front of the Eyetracker.

Brightness   Sharpness

1) MACHINE PART

- The pupil must not be too dark or too bright

BAD

GOOD

1) MACHINE PART

- When the eye is visible and clear, <u>turn off the screen</u> before leaving the room.
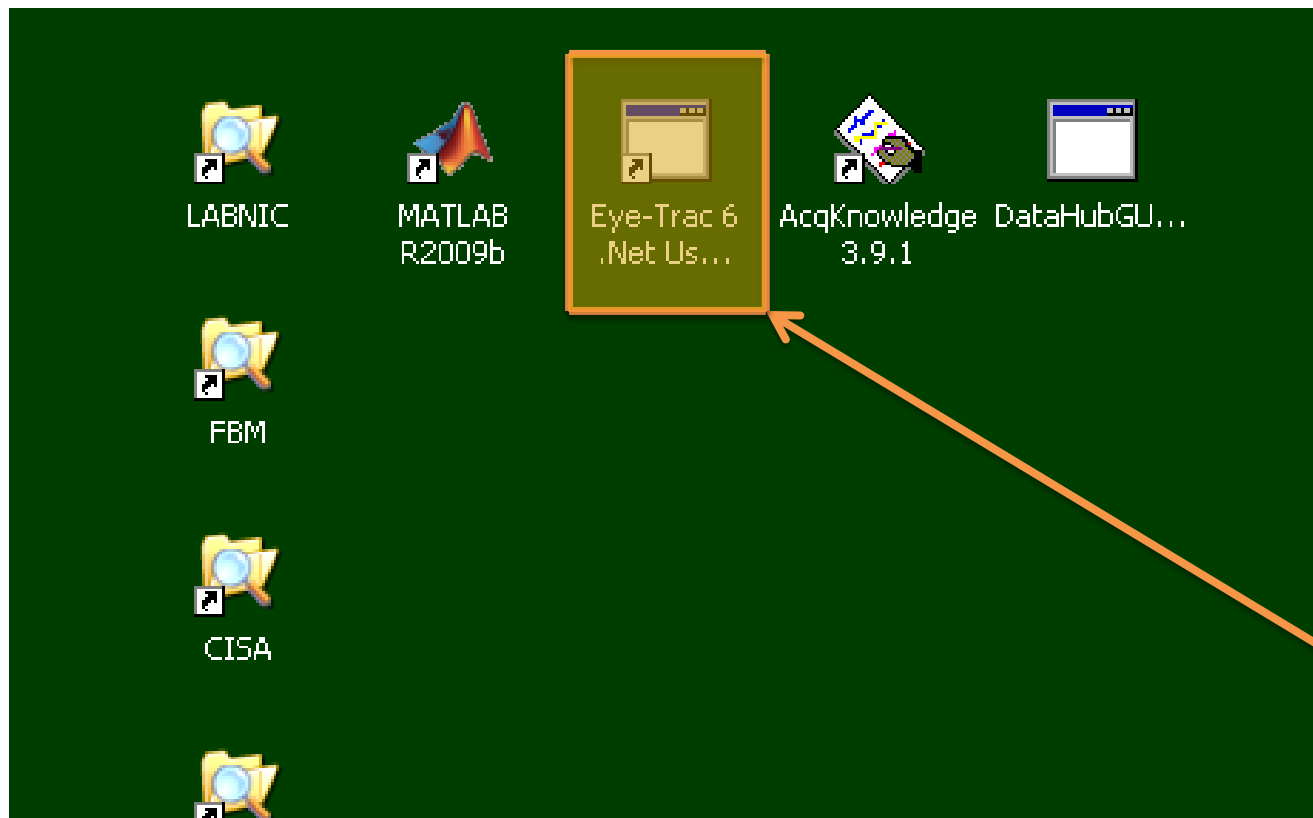
2) SOFTWARE PART

- Start by turning on the control unit of the Eyetracker and then the two screens located above.

ON

2) SOFTWARE PART

- Launch the application Eye-Trac from the « Physiological Measurement PC » (green computer).
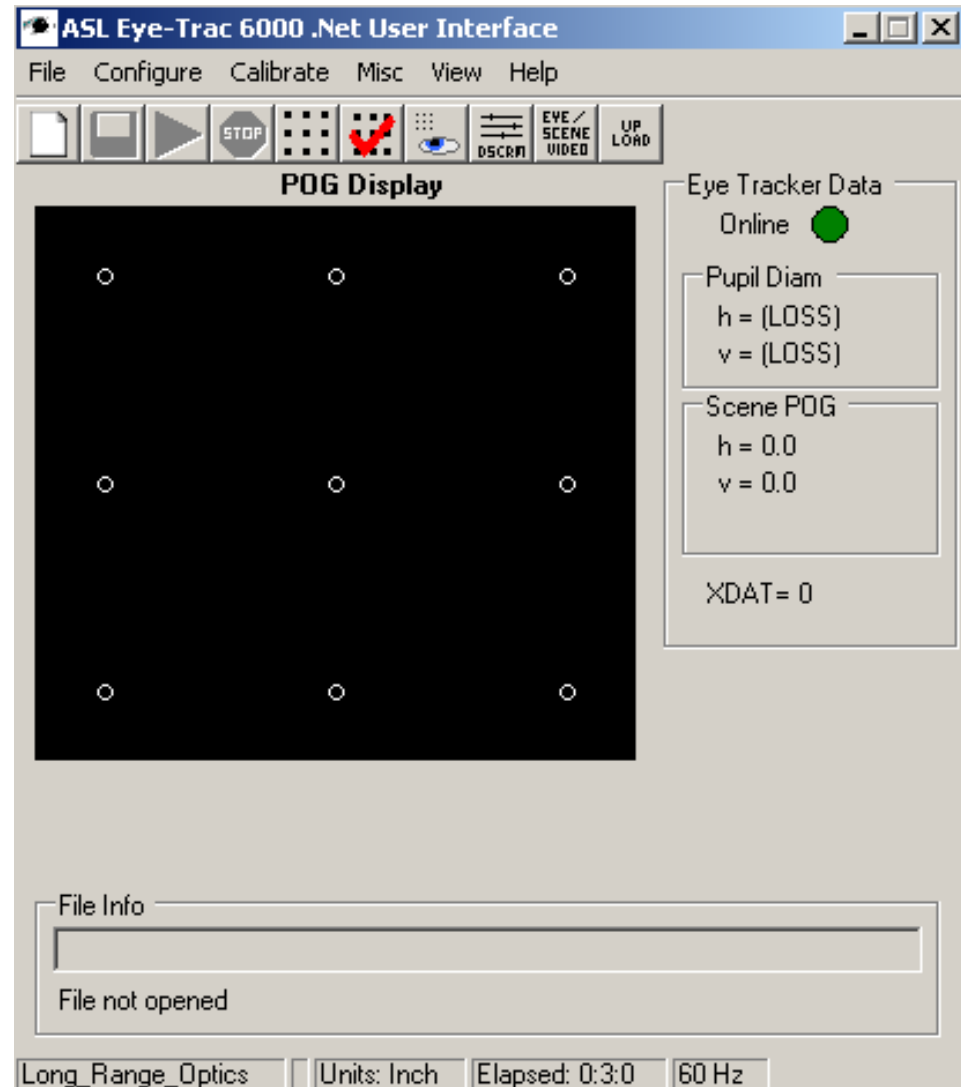
2) SOFTWARE PART

- The program starts and needs an **upload** that links it to the control unit
  This upload must be done only once after the control unit is switched on.

- If the upload is needed,
  this window appears.
  Then click on "Upload".

- As you the central unit isn't
  switched off after the upload,
  it is not nessessary to do this
  upload again even if you closed
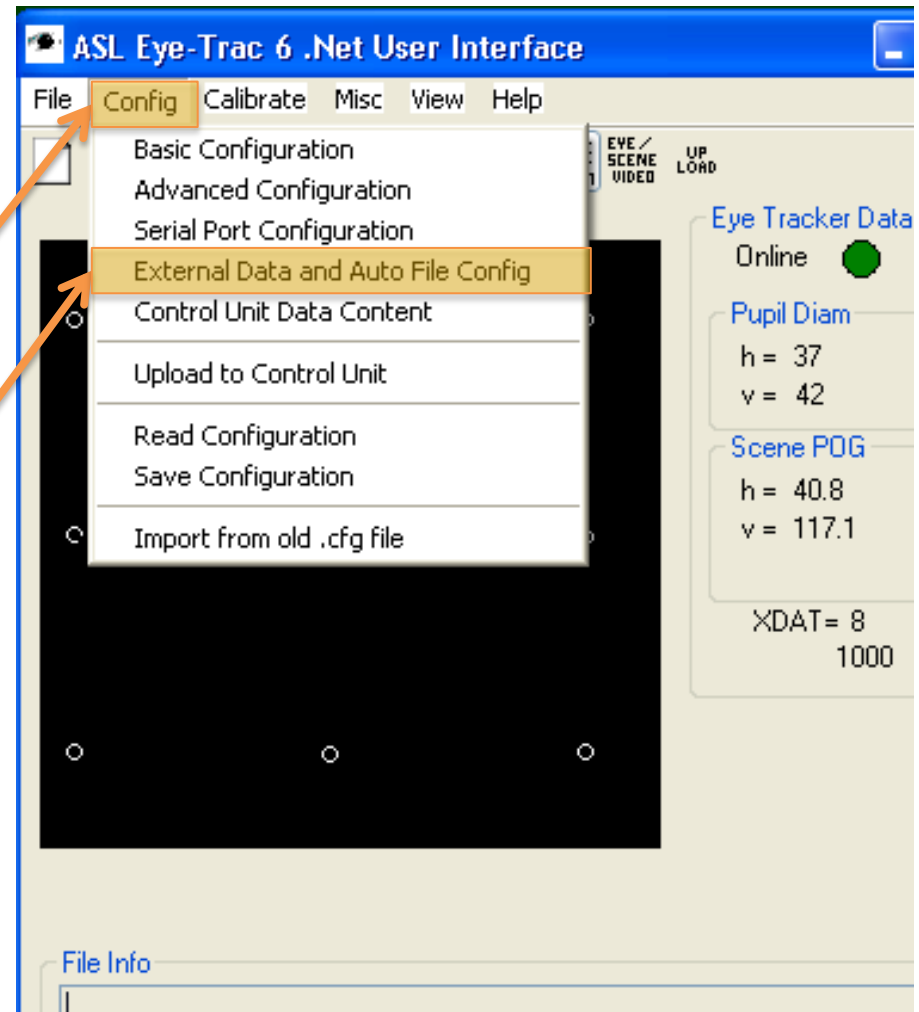 the Eyetracker software.
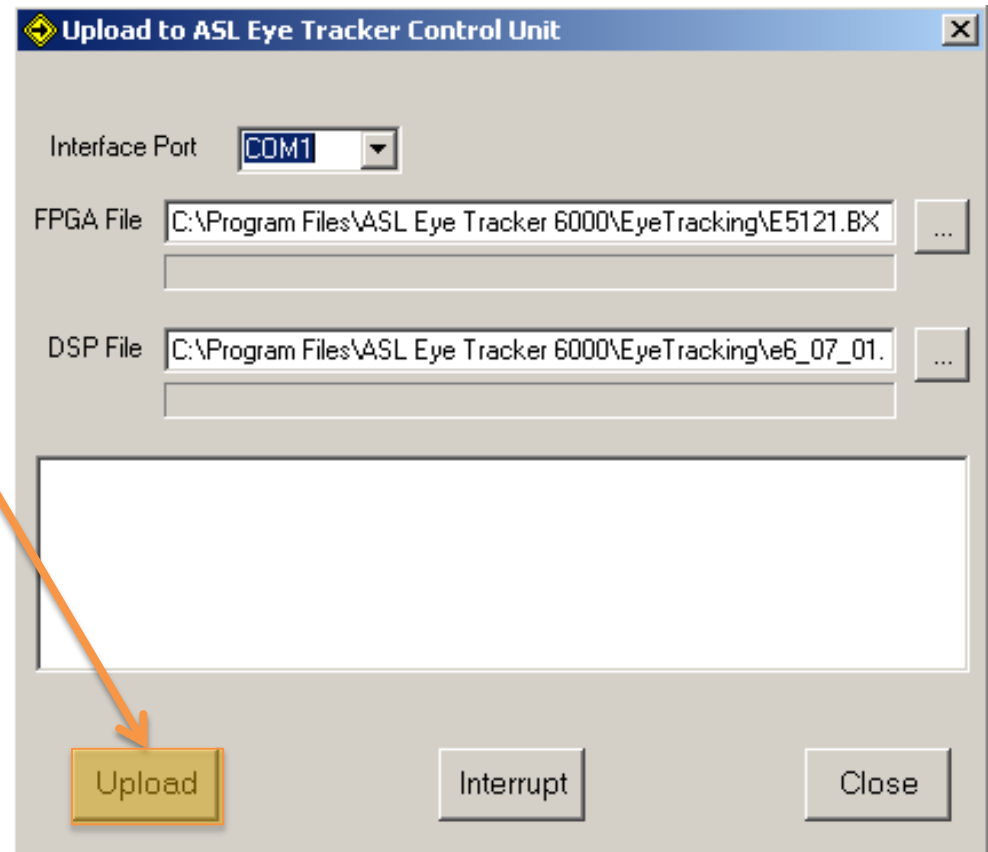
2) SOFTWARE PART

- Once the program is started and the upload is done, it is possible to set up the program before using it (calibration, file creation, manual or automatic recording mode)
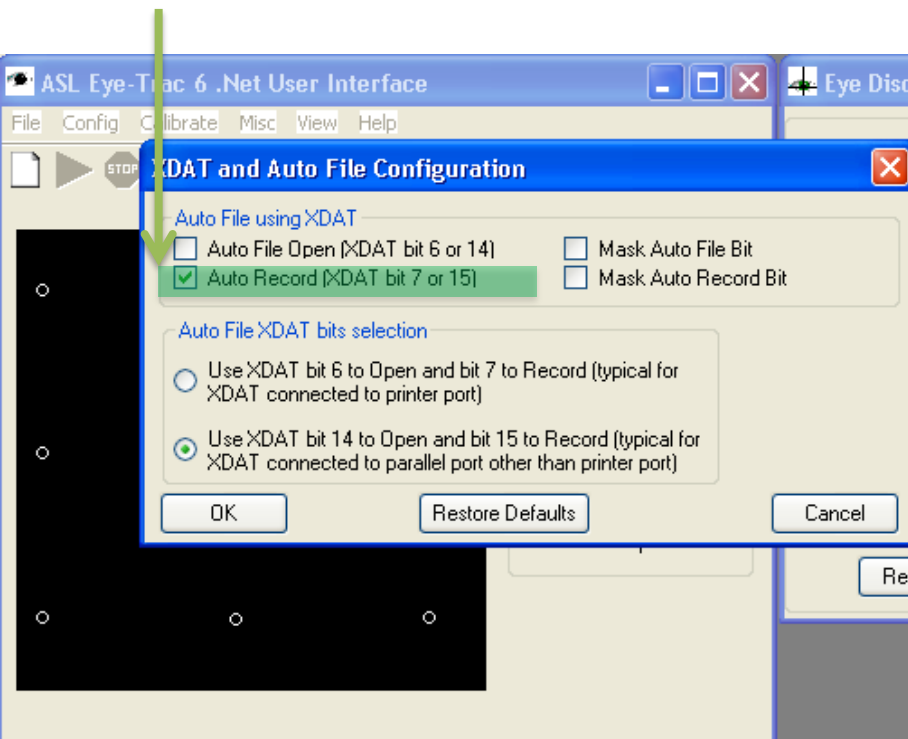
2) SOFTWARE PART

- At this point, you must check if the program is set up to start recording manually or when the script gives the instruction.

- So click on « **Config** » and then « **External Data and Auto File Config** »
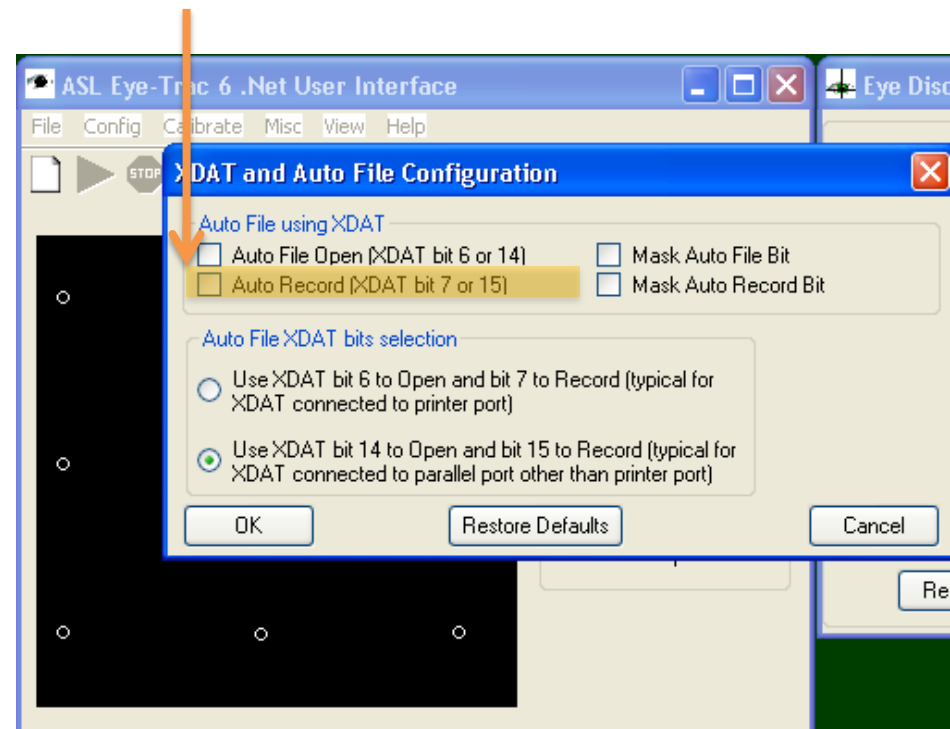
2) SOFTWARE PART

- « Auto Record » enabled: automatic acquisition by the script
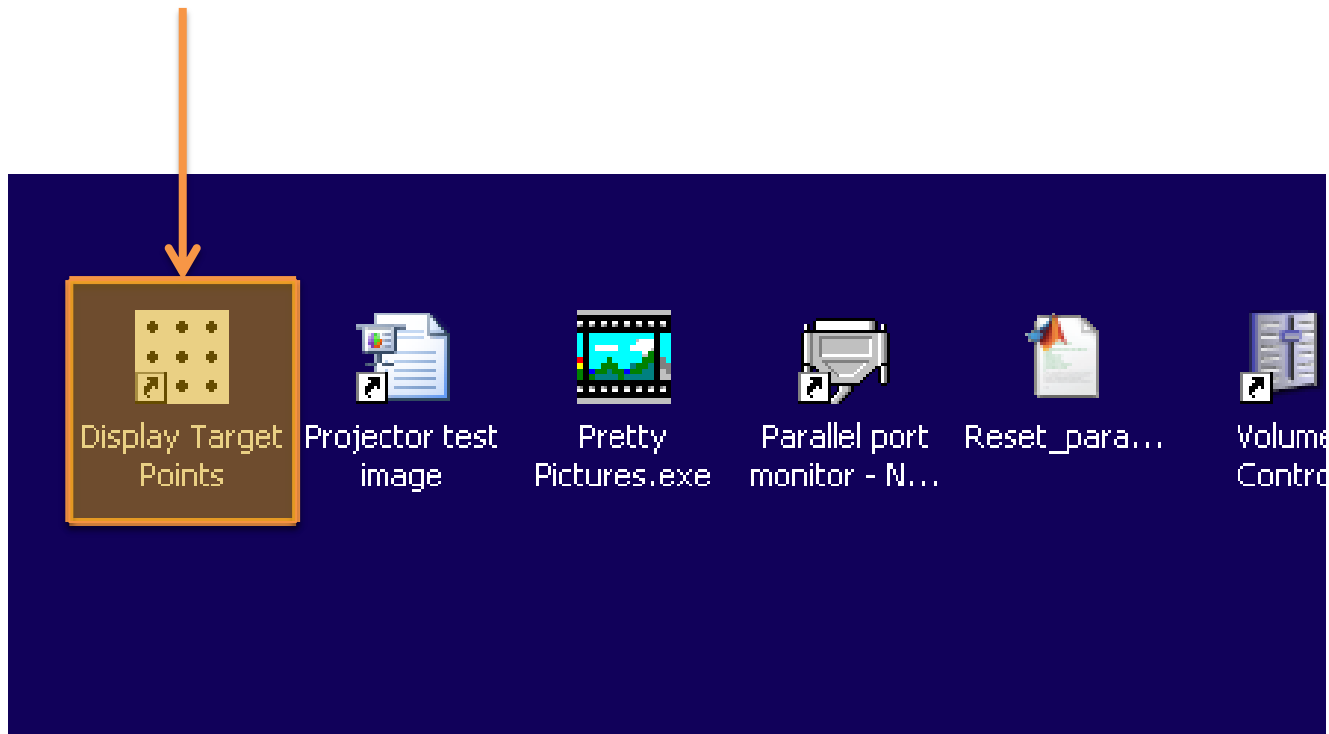
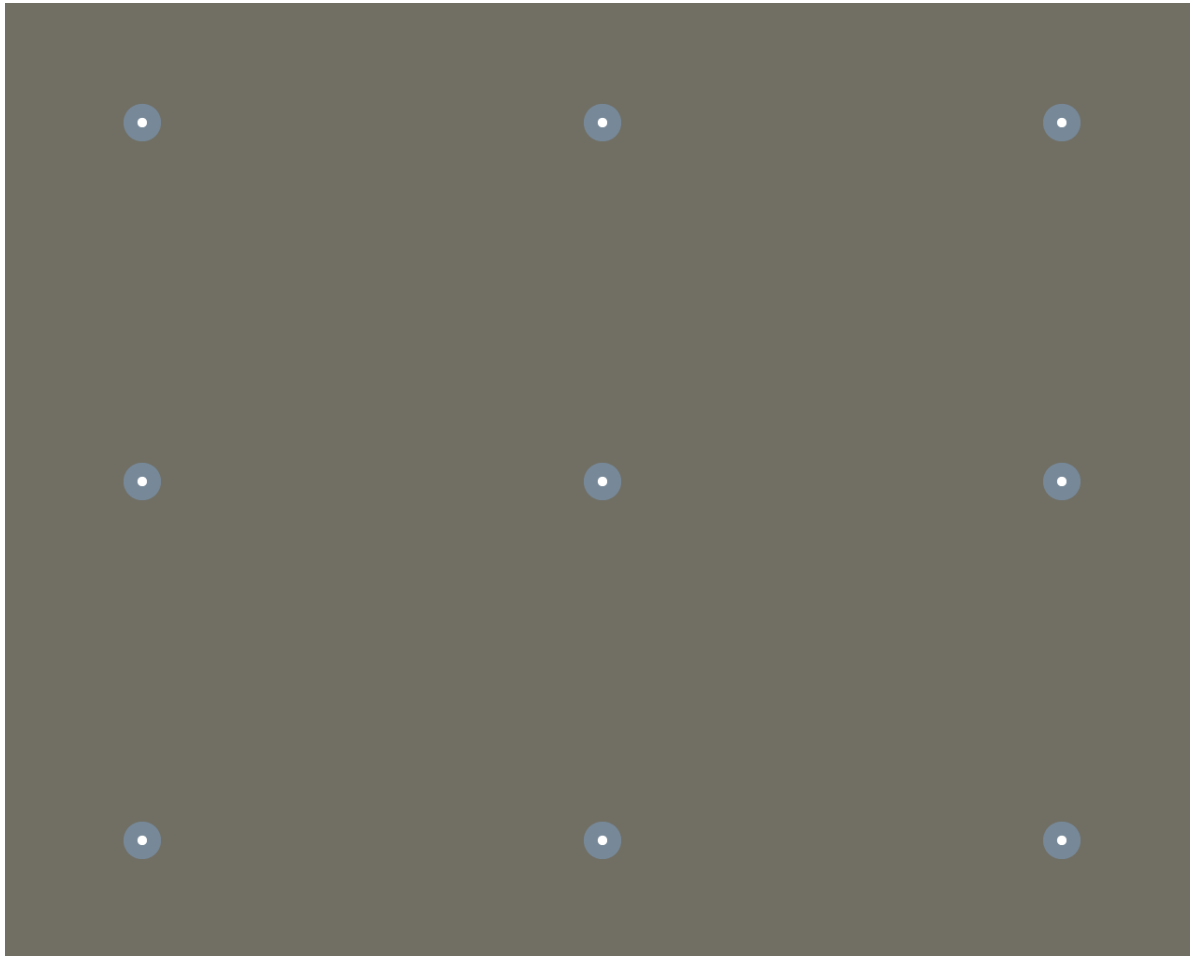« Auto Record » disabled: manual acquisition controlled by the user

2) SOFTWARE PART

- To calibrate the Eyetracker you also need to use the « Experiment Control PC » (blue computer). Execute the application « Display Target Points »

2) SOFTWARE PART

- This picture appears in full screen displaying 9 dots.

2) SOFTWARE PART

- Display the picture of the blue screen on the projector to show it to the participant. Then give these instructions:

- « The dots on the screen are going to appear one after another. Your goal is to look at the dot on the screen with your eyes wide open. You shall not anticipate the emergence of the next dot but wait it appears. »

- Then it's possible to calibrate the Eyetracker in automatically or manually.
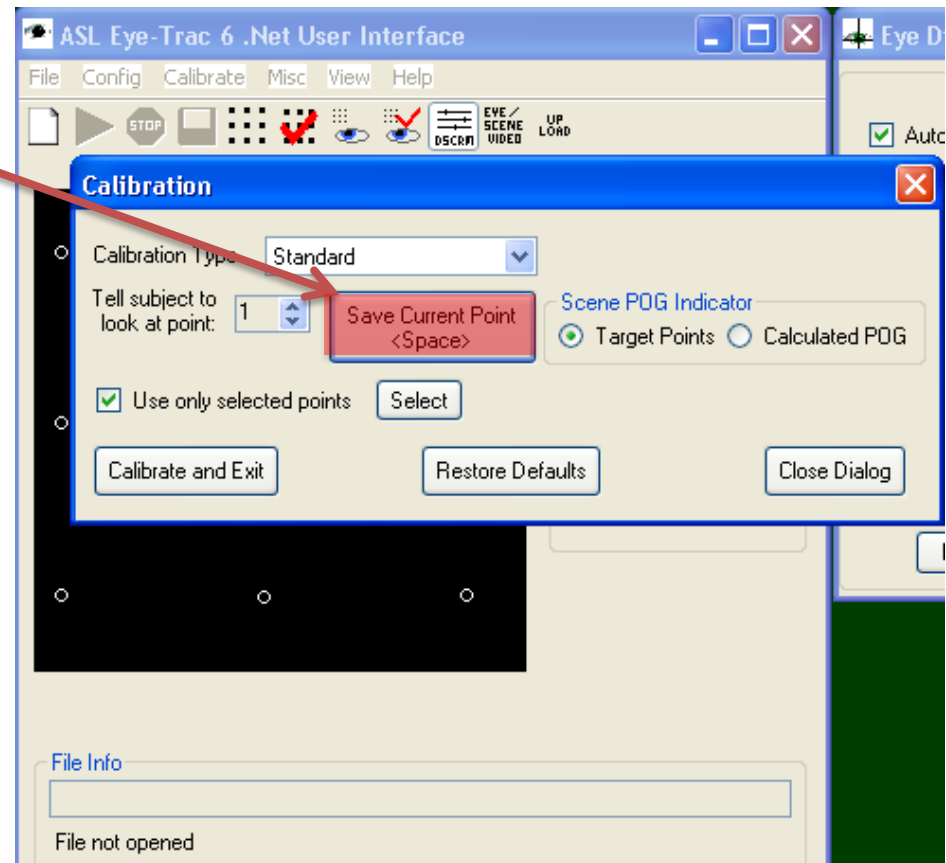
2) SOFTWARE PART

- <u>Manual calibration</u> is useful when the participant blinks too much or when the signal is not stable (it is stable when the black AND white crosses are stable on the picture). To do this, click on "Calibrate" then "Standard Calibration". The dots will not appear automatically but manually.
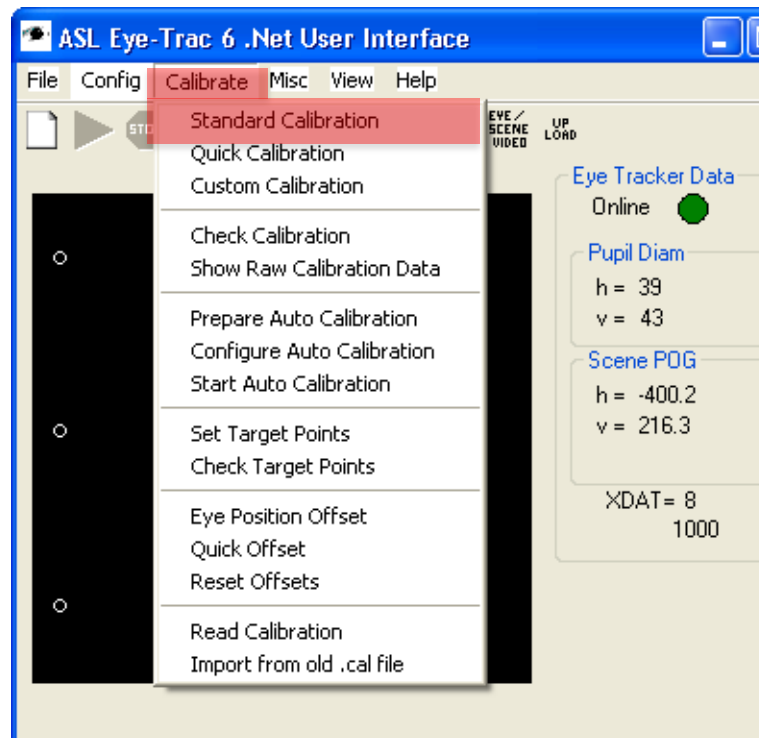
2) SOFTWARE PART

- Manual calibration: Look at the screens above the control unit and wait until the signal is stable for the 1st dot and then click on « Save Current Point <Space> ».
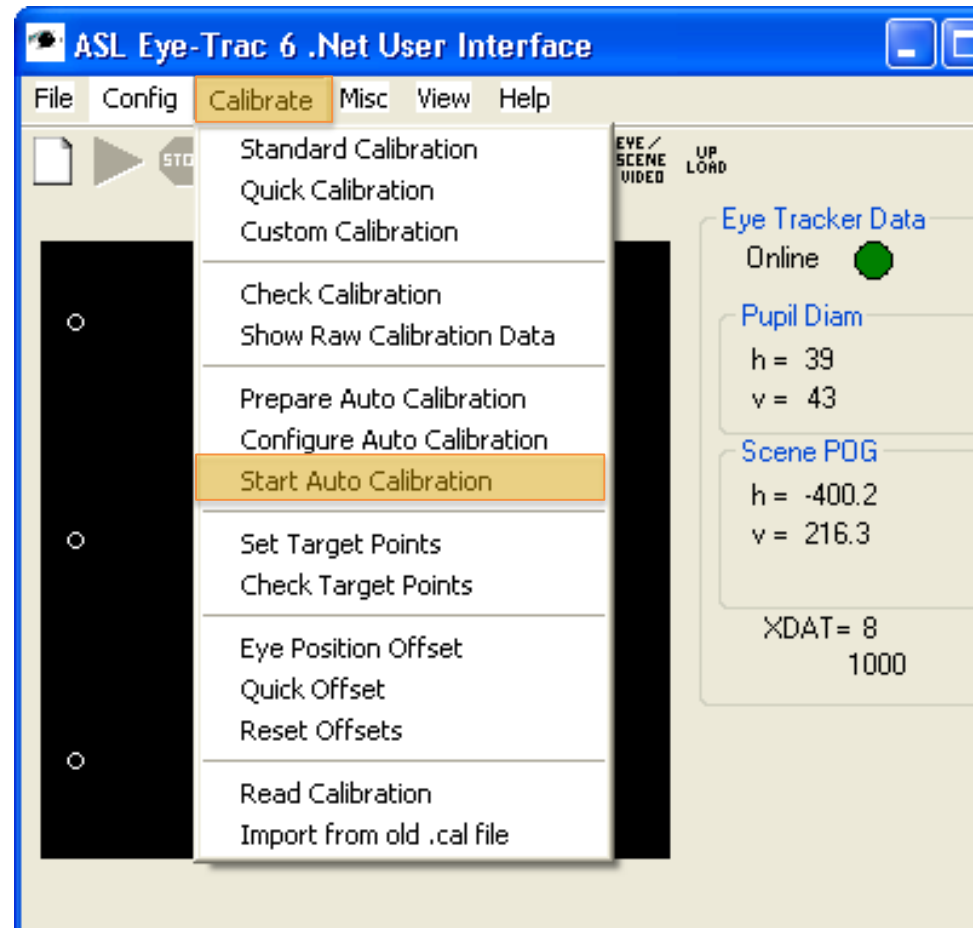
  Repeat this procedure for the 9 dots.

2) SOFTWARE PART

- In the other cases, the automatic calibration is recommended. Click on « Calibrate » then « Start Auto Calibration ».
  The program will calibrate automatically the 9 dots and tell if there are missing dots.
  To check if the calibration has been successfully done, ask the participant to look at some dots.
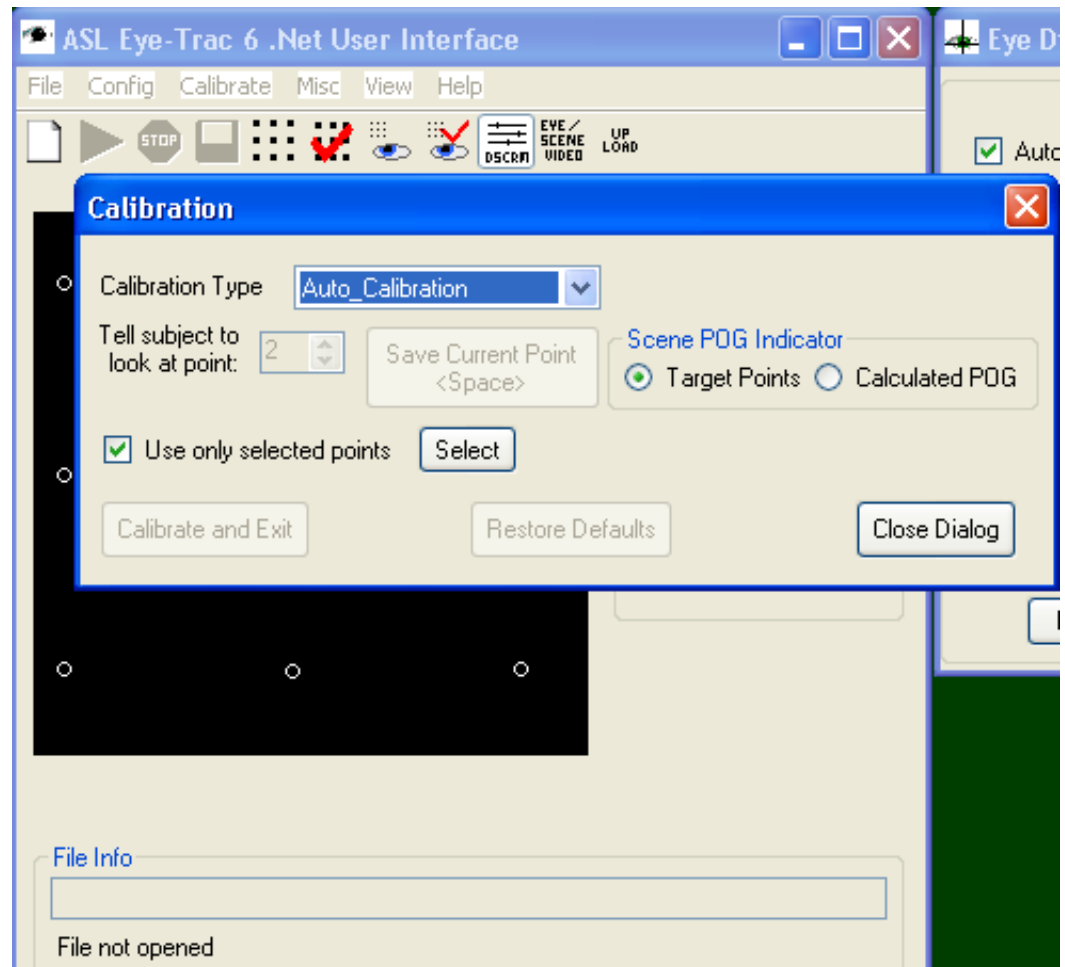
2) SOFTWARE PART

- Auto calibration:
  The window « Calibration » appears and displays the dots one after another on the blue computer screen.
  Just wait until the 9 dots are identified.

 ⚠️ Don't click on anything during this operation.

2) SOFTWARE PART

- If Eyetracker cannot accurately calibrate one or more dots, a message will appear showing the missing dots. If too many dots are missing, it is wise to check the previous settings (contrast, bulb in good condition, targeting the eye, eye blinking) and do another calibration (automatic or manual). However, there is often 1 or 2 missing dots but this doesn't make the data unusable.

While this message remains on the screen, the 9th dot will remain displayed and the participant will look at it. So don't wait too much before clicking on "OK".

Auto Calibration Warning

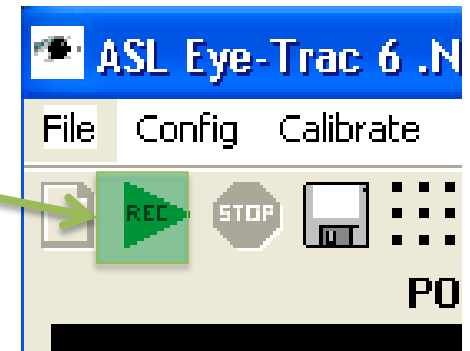Questionable data at point(s) 1, 2, 3, 4, 5, 6, 7, 8, 9

OK
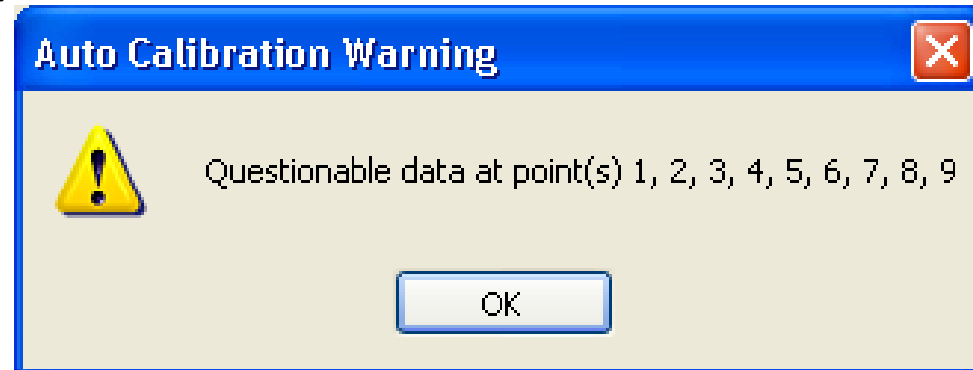
2) SOFTWARE PART

- Create a file to save the data. For this click on « File » then « New Data File ».

- Choose a folder and name your file.

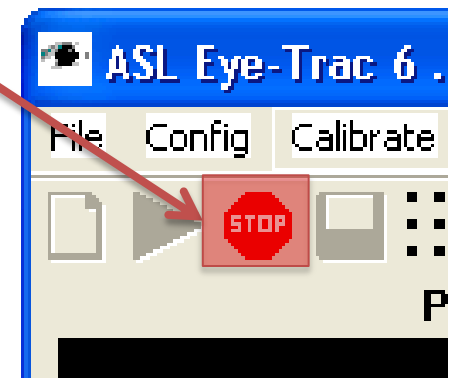- Just click on « OK » in the window « Enter File Description ».
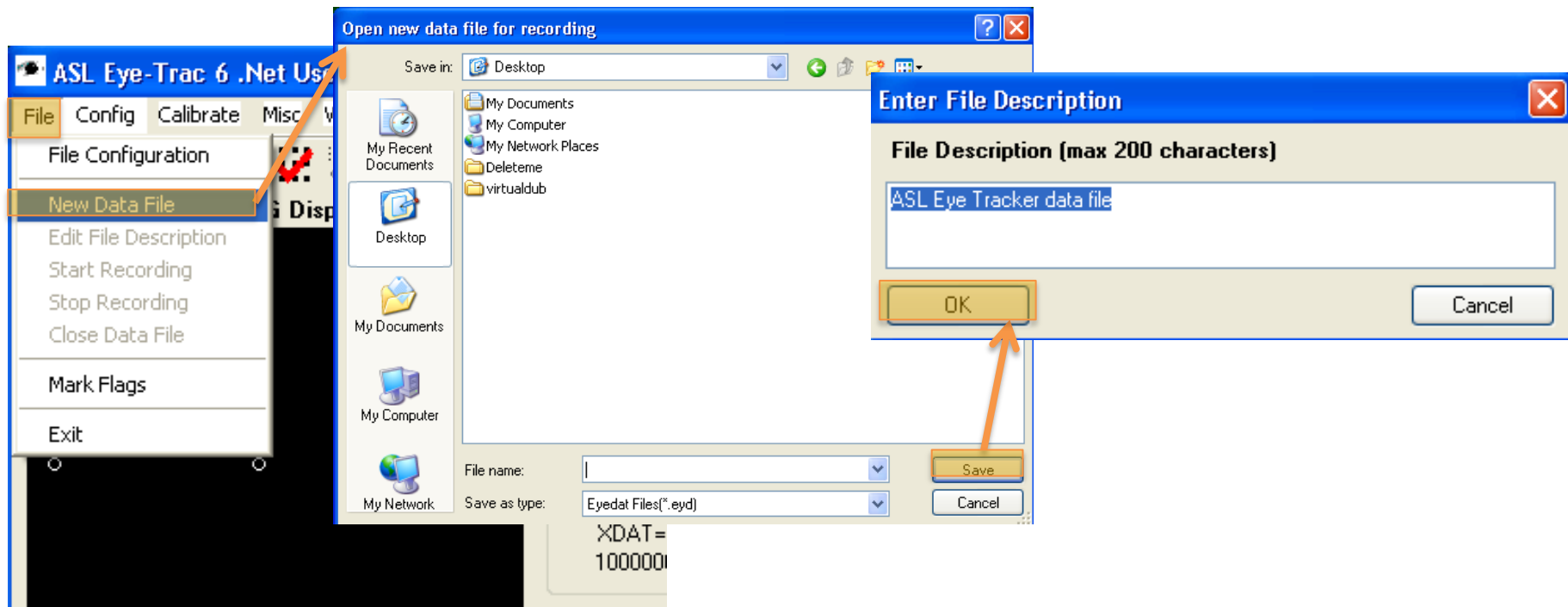
2) SOFTWARE PART

- If you chose the manual recording mode, don't forget to click on « Record » before starting your script.

  To stop recording, click on « Stop ».

- If you chose the automatic recording mode, your script will control everything.
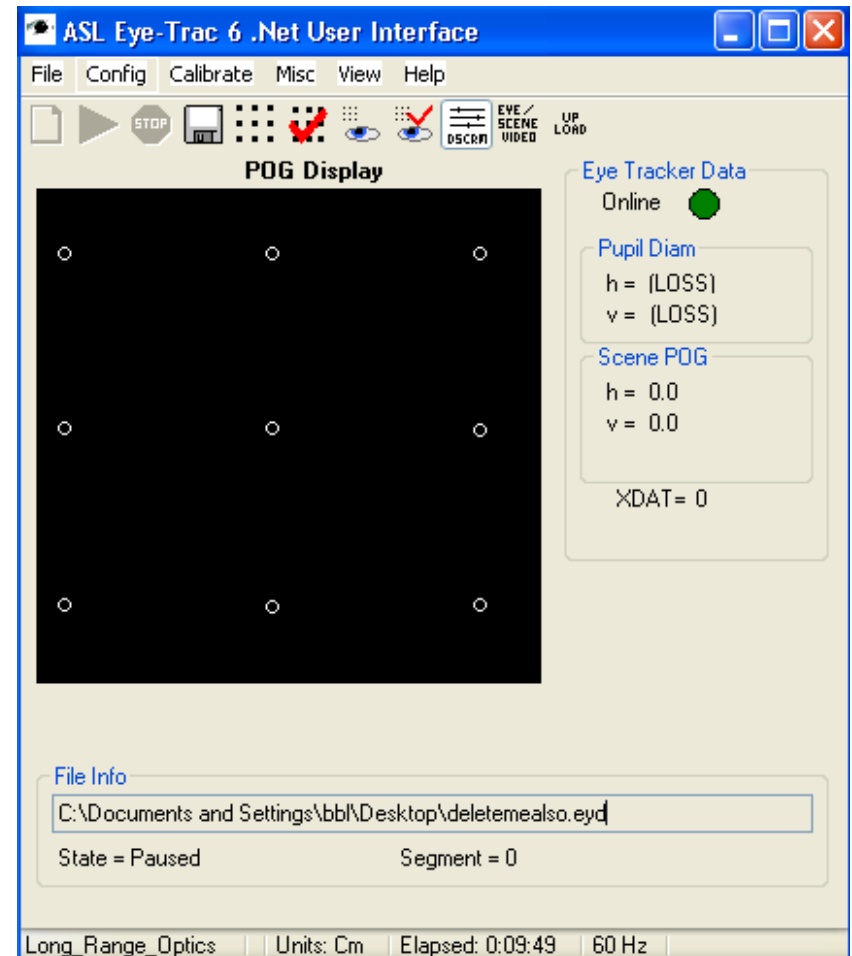
2) SOFTWARE PART

⚠️ **Tip:** If the option "Record" is grayed out and therefore
unusable, it means that
the program is configured to
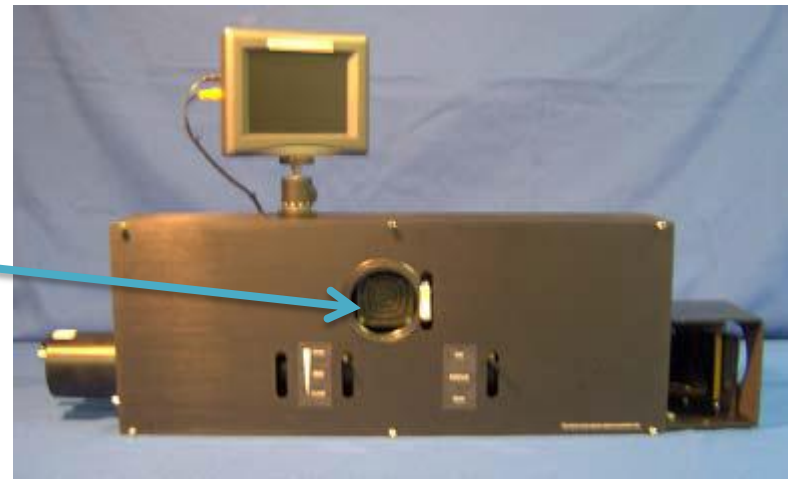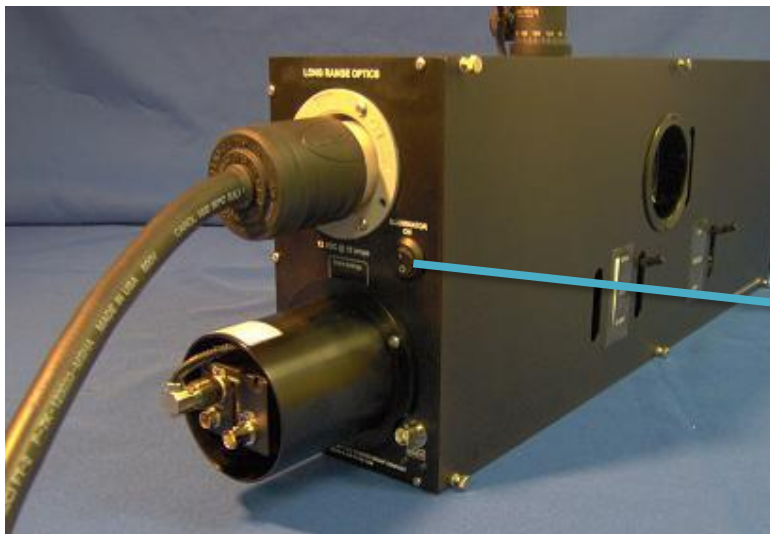start automatically.

- It is not possible to
  change this setting as
  a file is opened.

3) CHANGE THE BULB

- The bulb in the Eyetracker is a consumable that is changed regularly because of his short life.

  You need to change the bulb if the light does not appear when you turn on the lamp.

3) CHANGE THE BULB

- For safety reasons, it is recommended to turn off the Eyetracker before changing the bulb (so the fan is not running).
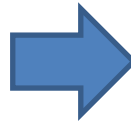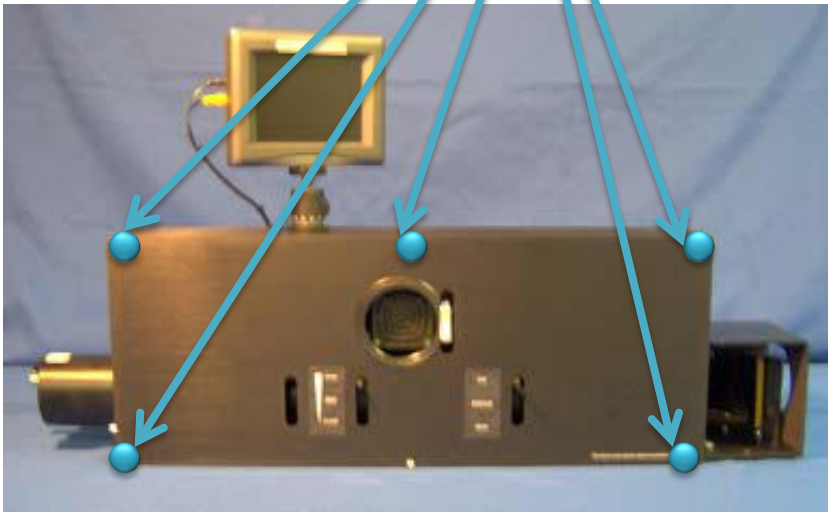
3) CHANGE THE BULB

- Take a new bulb in the cabinet in front of the door of the MRI control room.

3) CHANGE THE BULB

- Enter the room and remove the 5 screws that hold the front of the Eyetracker to remove. The front of the Eyetracker and the screws are not magnetic and can be handled safely. The 5 screws
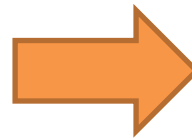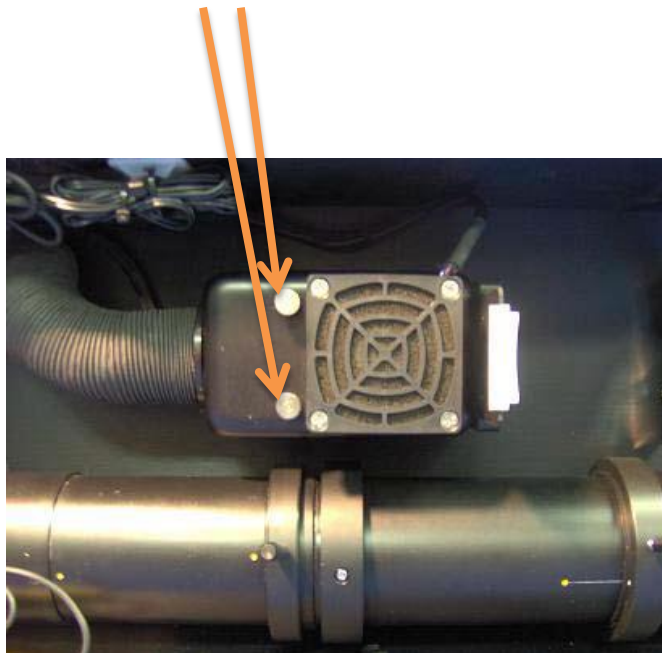
3) CHANGE THE BULB

- Then remove the two screws that hold the fan housing to remove it also. The fan is not completely non-magnetic, so place it above the Eyetracker.
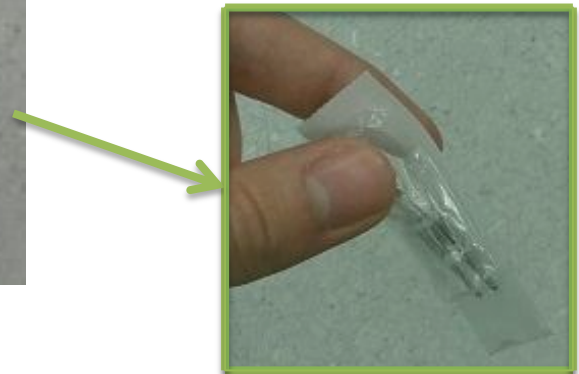
The 2 screws

3) CHANGE THE BULB

⚠️ It is important <u>not to touch the new bulb with your fingers</u> to avoid leaving a trace that would interfere with the signal and the life of the bulb. To avoid this, handle the bulb with its packaging without touching it directly.
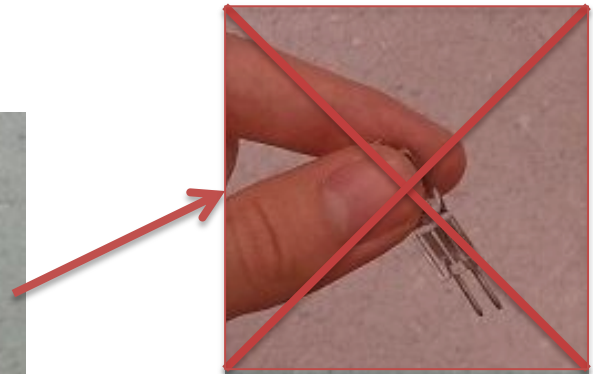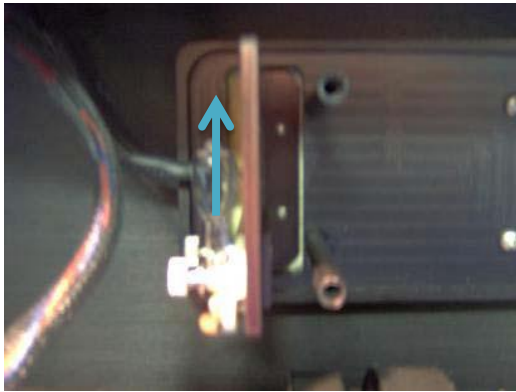
3) CHANGE THE BULB

- Remove the defective bulb by pulling it up and put the new one.

WARNING : If the bulb has been used in the day and it should then be changed, it may still be hot. Then take care to remove it (catch it with paper, for example)

3) CHANGE THE BULB

- Place the bulb so that the <u>filament</u> is in front of the <u>orifice</u> in the plate.
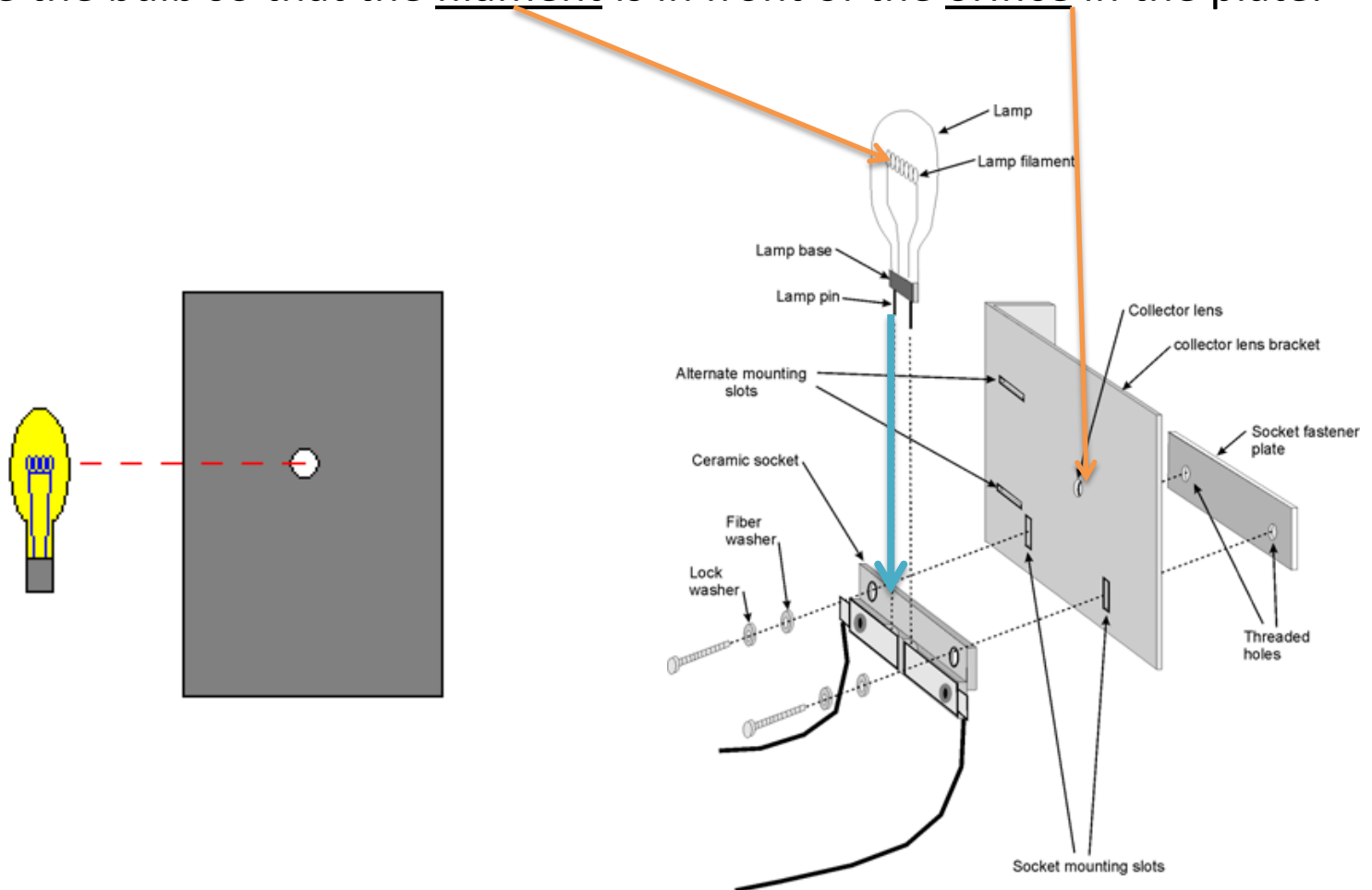
3) CHANGE THE BULB

- To verify that the bulb is well centered, look in the mirror of the Eyetracker. The filament must be visible and centered in the middle of the orifice of the plate.
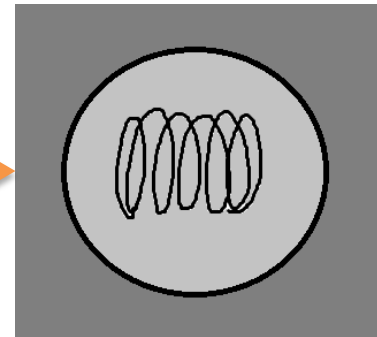
3) CHANGE THE BULB

- Replace and screw the fan housing then replace the front and screw it. If this is not done, turn on the Eyetracker (with the switch near the phone) to light the bulb and check that the light works.

- The filament is even more visible now because it is glowing. This confirms that the bulb is correctly positioned, ensuring a good quality signal.

3) CHANGE THE BULB

- Hold (> 1 second) the button « Reset » on the left side of the device to reset the counter of the bulb to zero (the Eyetracker must be supplied with electricity for it to work).

« Reset » Button
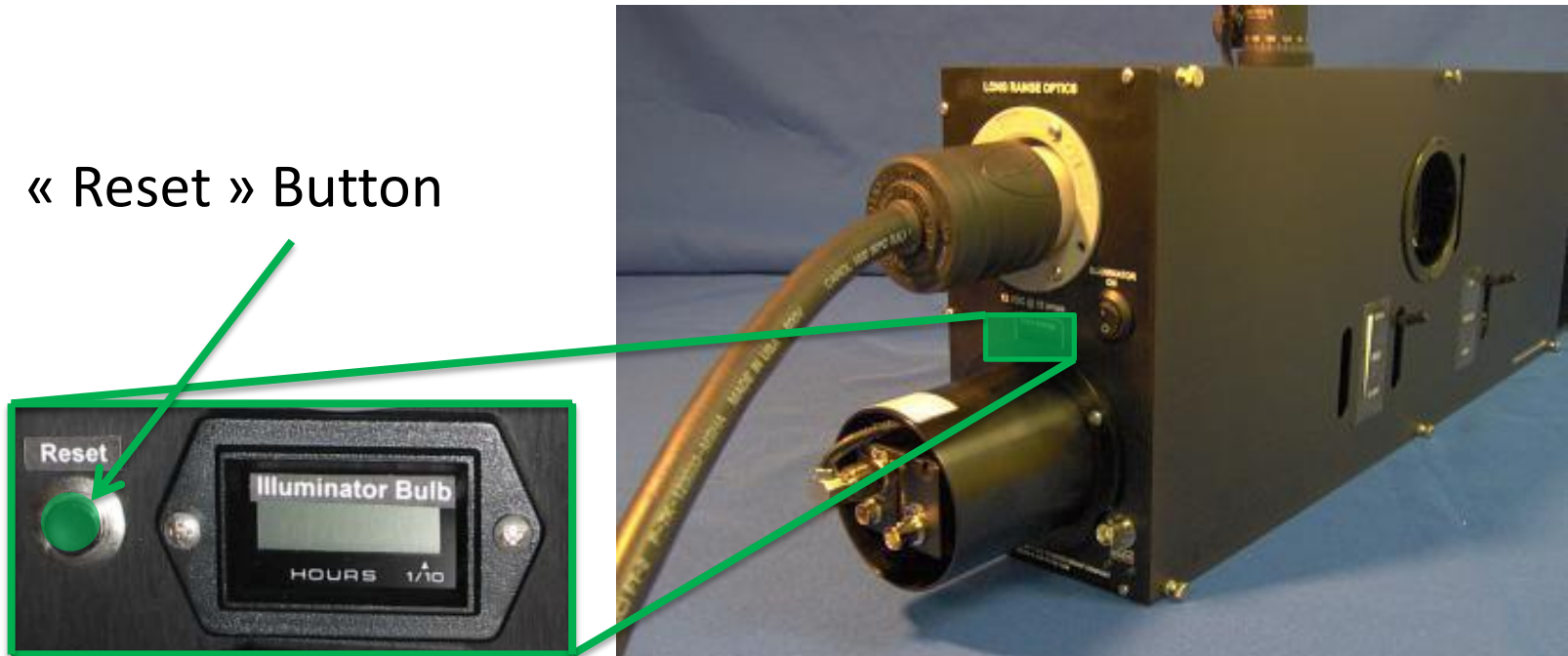
4) TIPS AND TRICKS

- The **placement of the head** of the participant in the antenna and the **position of the mirror** are 2 points absolutely essential that care must be taken to successfully visualize correctly the pupil with Eyetracker.

- For an ideal position of the head in the antenna, the eyebrows of the participant must be aligned with the line that marks the middle of the antenna:
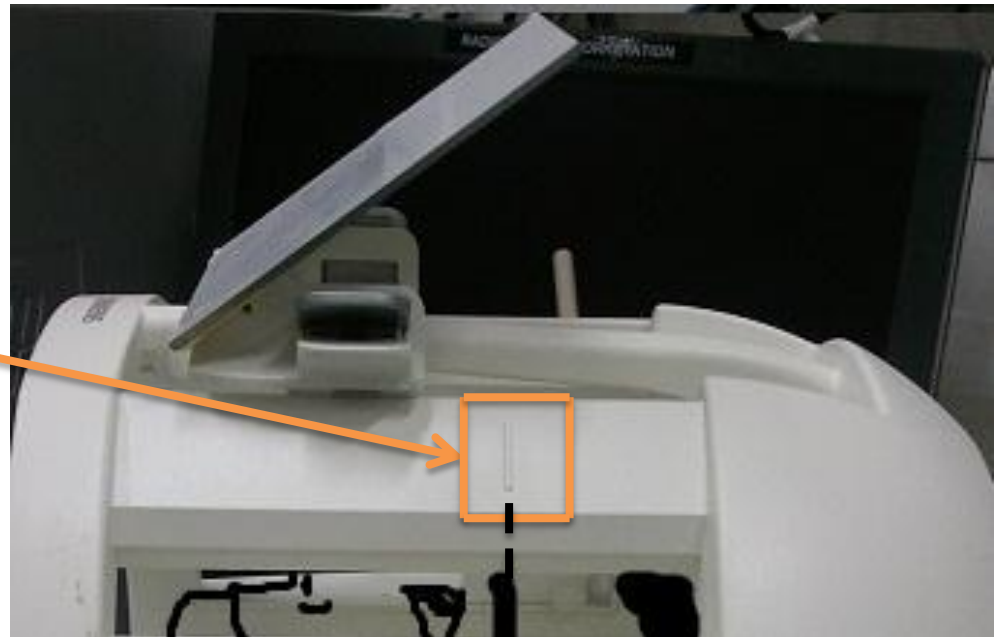
4) TIPS AND TRICKS

- A mark is visible on the antenna 12 channels to show the lower limit to which the eyes must lie.
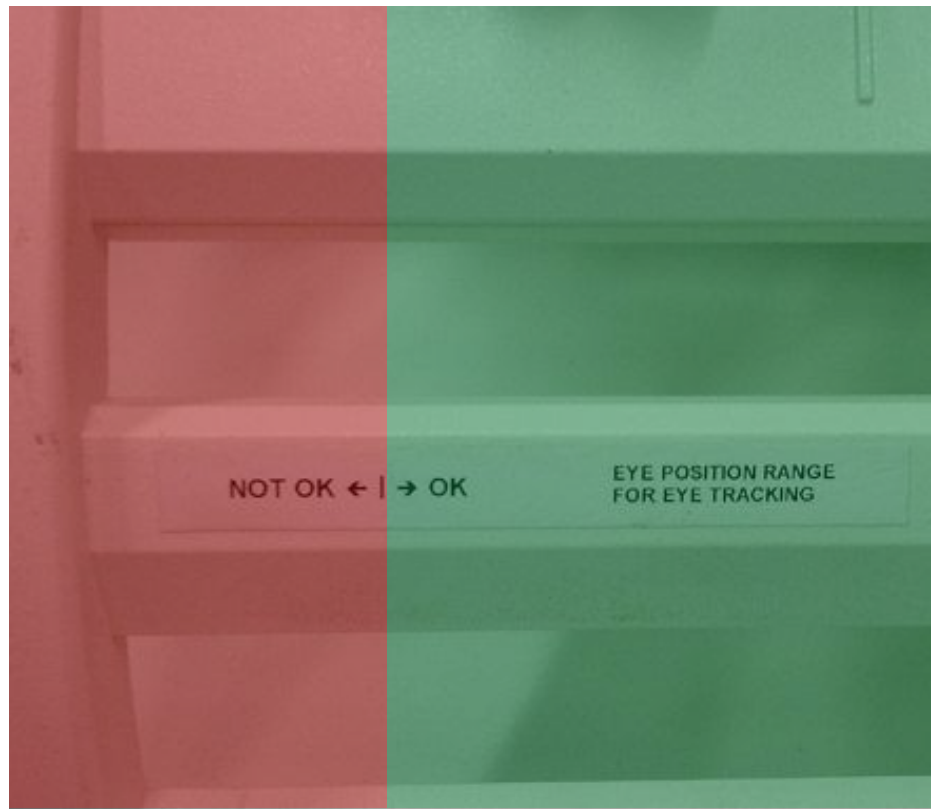
4) TIPS AND TRICKS

- For an <u>ideal position or the mirror</u>, place it at the lowest position and then to advance progressively until the participant can view the entire screen at the top of the mirror.
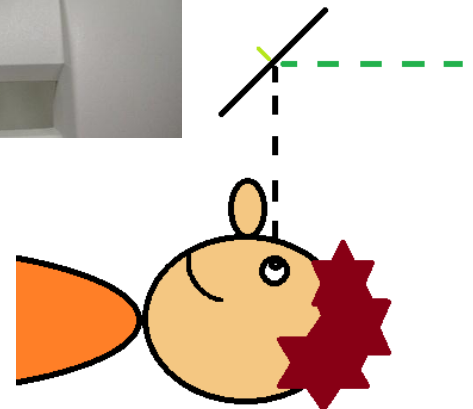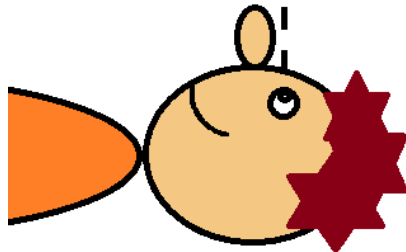
4) TIPS AND TRICKS

- When handling the mirror on the antenna, use the handles on the sides to move it (do not touch the reflective surface of the mirror or the back)
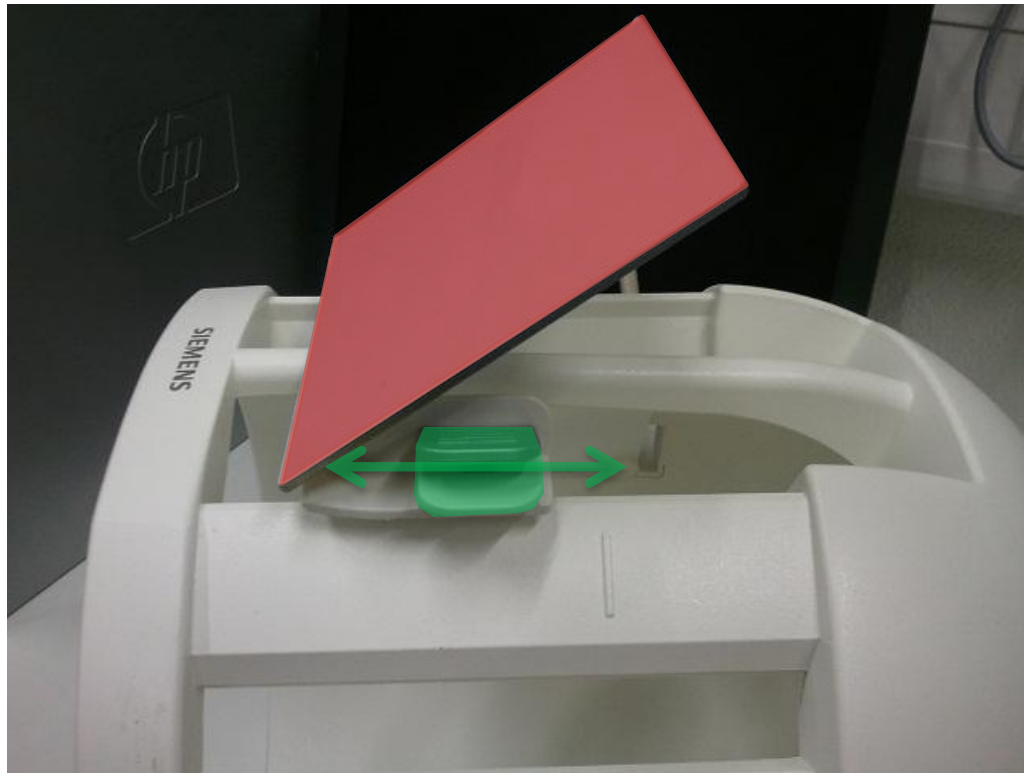
4) CONSEILS ET ASTUCES

- The ideal position is often reached when the eyes of the participant are exactly opposite the middle of the mirror:
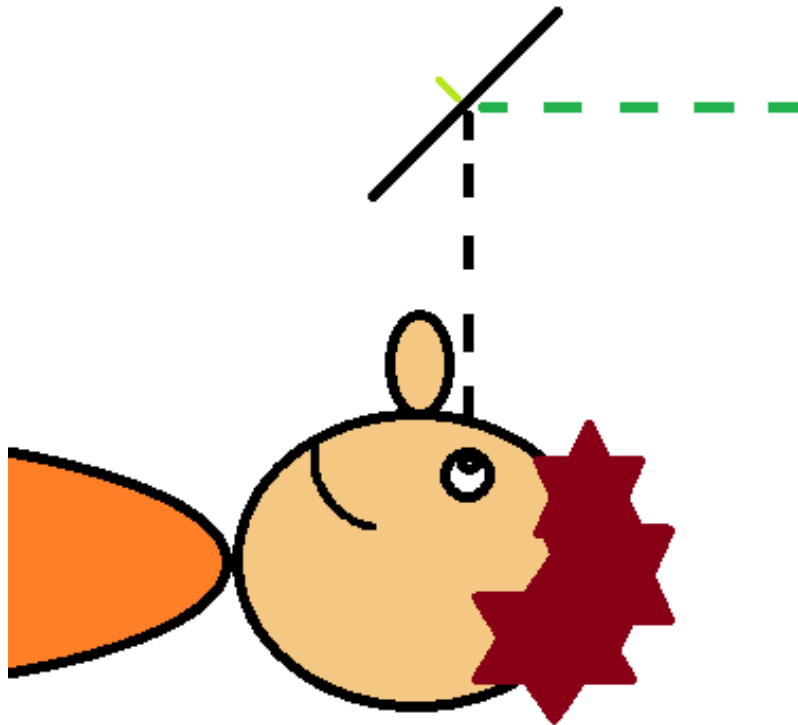
4) TIPS AND TRICKS

- To check the correct placement of the mirror and the head of the participant, just look at the mirror from the other end of the MRI (Eyetracker side). If the eyes are visible in the upper part of the mirror, so the position is correct.
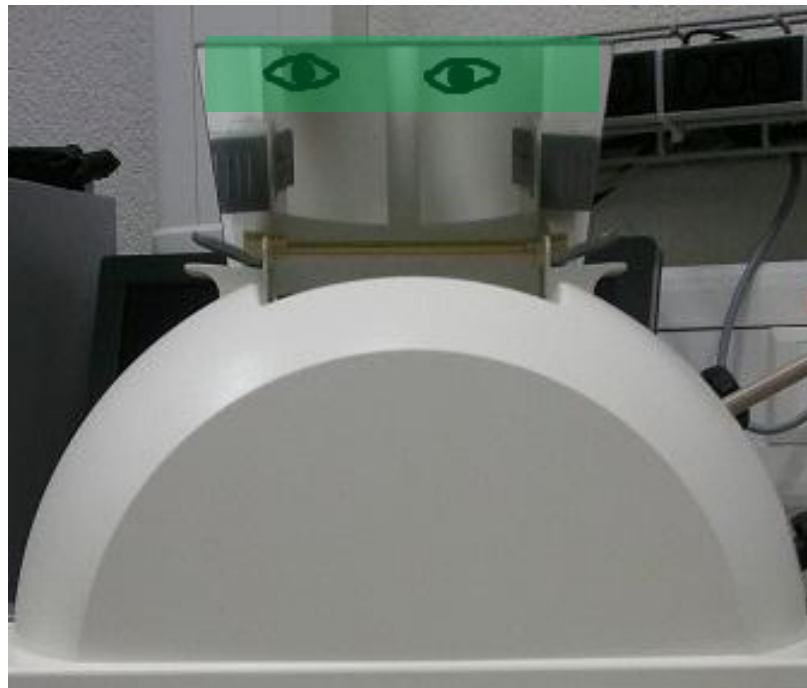
4) TIPS AND TRICKS

- If the eyes are the center of the mirror, it will be difficult or impossible to calibrate the Eyetracker. This means that the mirror is too high, although this does not necessarily prevent the participant from visualize the entire screen.
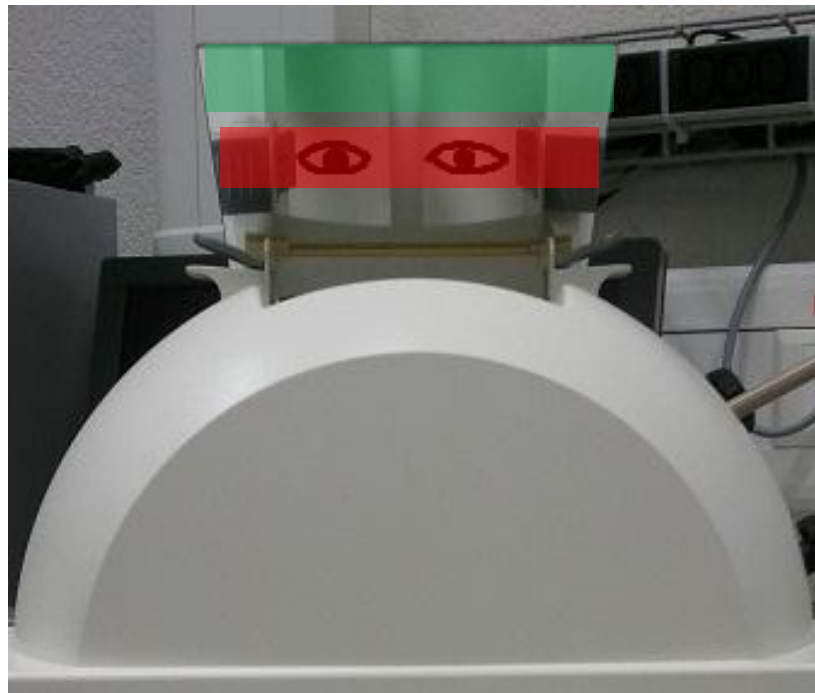
4) TIPS AND TRICKS

- Another way to verify that the mirror is in the correct position on the antenna is to stand up to the mirror and check the Eyetracker from that point of view if the participant's eyes are still visible.

- If this is not the case, the Eyetracker cannot see the pupil, it is necessary to readjust the position of the mirror on the antenna or the position of the head of the participant.

4) TIPS AND TRICKS

- What to verify when there is a problem?

  – If the pupil is not visible   =>   - State of the bulb?

                                                                          - Pupil well targeted?

                                                                          - Eyes open?

                                                                          - Did the head move?

                                                                          - Screens turned on?

  – If the signal is unstable   =>   - Good contrast and neatness?

                                                                          - Eye blinking?

                                                                          - Old bulb?

                                                                          - glasses or contact lences?

4) TIPS AND TRICKS

- Wear <u>glasses</u> or <u>contact lenses</u> can make it a little more difficult to calibrate the Eyetracker. It is therefore possible that there are more missing dots than usual but this is not always the case and it will not ruin the data completely.