



**PLANMECA**

**ProOne**

# Calibration Manual

The manufacturer, assembler, and importer are responsible for the safety, reliability and performance of the unit only if:

- Installation, calibration, modification and repairs are carried out by qualified authorized personnel.
- Electrical installations are carried out according to the appropriate requirements such as IEC364.
- Equipment is used according to the operating instructions

Planmecca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

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# *General Information*

## **1 DISCLAIMER**

This manual contains the information required to setup and calibrate the Planmeca ProOne Panoramic unit.

**WARNING :**

Protect yourself from radiation when you are checking the beam alignment and calibrating. Since radiation safety requirements vary from state to state, country to country, it is the responsibility of the installer to ensure that the correct precautions are observed.

- 1.1 The display values shown in this guide are only examples and should be interpreted as recommended values unless otherwise specified.



## 2 REQUIRED TOOLS

### 2.1. Calibration Tools

- Ball phantom (part number 50977) used for checking the position of the Patient Positioning Mechanism and the Positioning lights. (Figure 1)



Figure 1

- Frankfort plane alignment tool (part number 50977) used with the ball phantom for checking the position of the Frankfort plane light. (Figure 2)

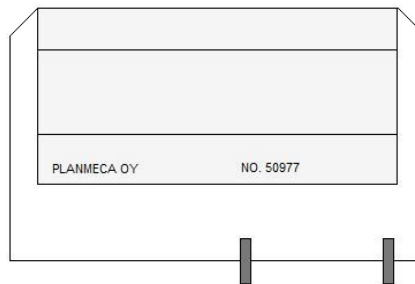


Figure 2

- Beam alignment tool, fluorescent screen, (part number 50972) used for checking the position of the x-ray beam. (Figure 3)

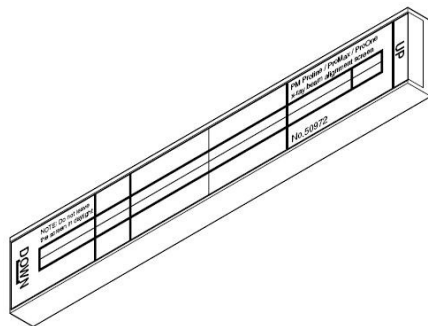


Figure 3

- Alignment Ruler (part number 50973) used for checking the alignment of the patient positioning mechanism. (Figure 4)

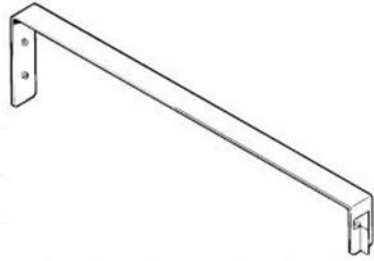


Figure 4

- Calibration block (part number 10016995) used for calibrating the sensor. (Figure 5)

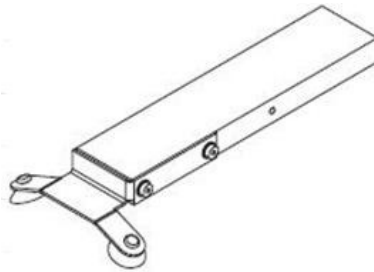


Figure 5

- Alignment Pins (part number 7100) used for locking the c-arm into positioning for checking alignment. (Figure 6)

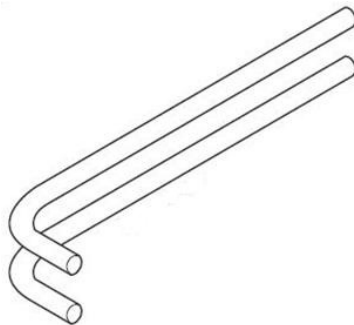


Figure 6

## 2.2 Hand Tools

- 2.5 mm allen wrench
- 4 mm allen wrench
- Needle Nose Pliers

# *Pre-Check*

## 1 Dimaxis 4.3.x

Click on Start, All Programs, Planmeca, Dimaxis 4.3.x



*NOTE: Place the ball phantom into the patient positioning mechanism.*

## 2 Ball Phantom Test

Click **OK** then click **OK** again. Select “New” from the bottom of the “Select Image” screen.

Press the exposure button then press **OK** once the image is taken to evaluate the image.



## 2.1 Measurement Tool Calibration

Click the measurement toolbar at the top. (Figure 7)



Figure 7

Click on the first icon, CAL, and calibrate the Center Ball from top to bottom. (Figure 8)



Figure 8

Enter the number 7 when asked to input a distance. (Figure 9)



Figure 9

## 2.2 Measuring Image

Click the second icon now and measure the Center Ball top to bottom and left to right. (Figure 10)



Figure 10

The ball should be 7mm top to bottom and left to right. (Figure 11)

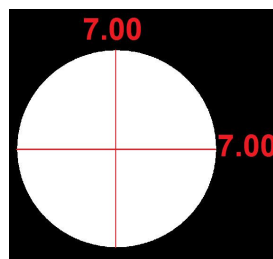
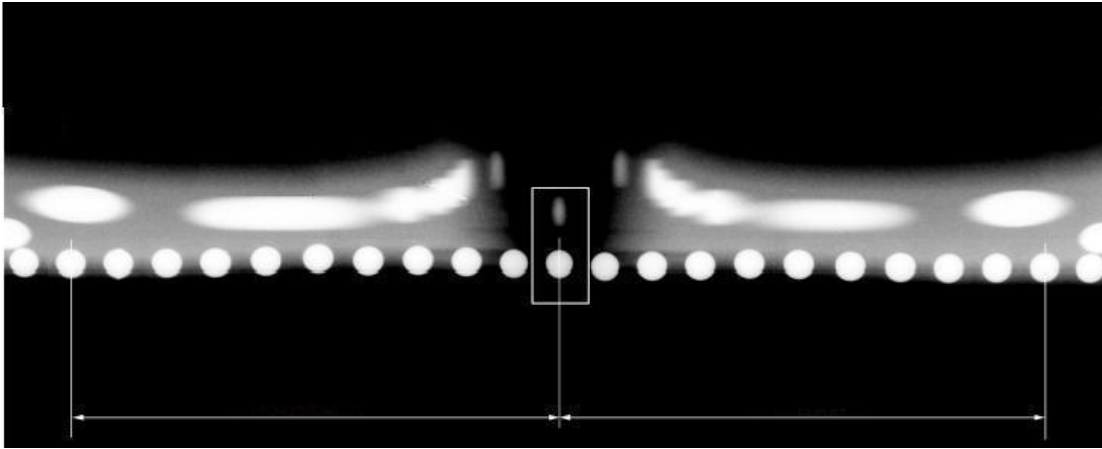


Figure 11

Measure from the center of the Center Ball to the center on the 10<sup>th</sup> Ball on the right then measure from the center of the Center Ball to the center of 10<sup>th</sup> Ball on the left.



*NOTE: The distance from the Center Ball to the 10<sup>th</sup> Ball should be the same  $\pm 1.5\text{mm}$ .*

Now check the shadow ball by clicking the Vertical Line from point icon from the measurement toolbar. (Figure 12)



Figure 12

Click the top of the shadow ball and measure the distance between the shadow ball to the Center Ball. (Figure 13)

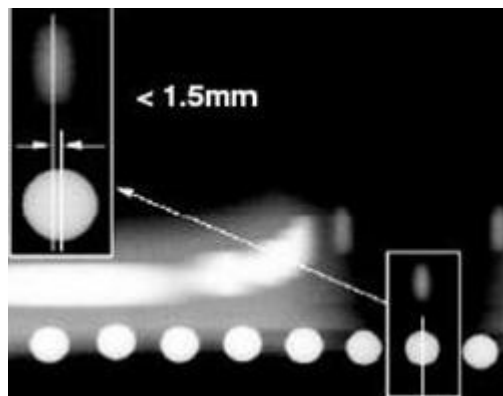


Figure 13

*NOTE: If any of these distances are off then continue on with Chapter C-F. If the measurements are within the tolerances then the ProOne is calibrated.*



# Removing Covers

## 1 Upper Arm

Take the Upper Arm cover off by pulling straight up. (Figure 14)



Figure 14

## 2 Sensor Head

Loosen the 2.5mm allen screw on the top of the Sensor Head cover then pull the cover off. (Figure 15)



Figure 15

Loosen the 2.5mm allen screw on the bottom of Sensor Head cover then pull the cover off. (Figure 16)

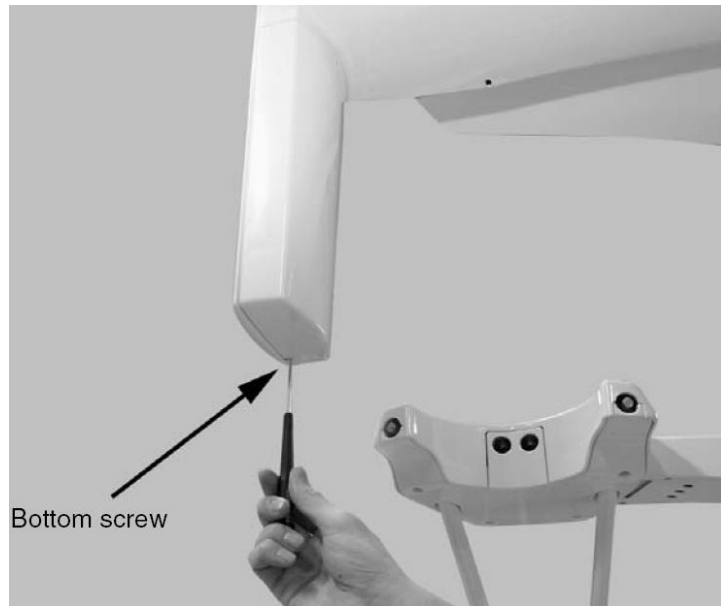


Figure 16

### 3 Inner Tubehead

Loosen the 2.5mm allen screw on the bottom of the Tubehead cover then pull the cover off. (Figure 17)



Figure 17

## 4 Inner C-Arm

Pull the C-Arm cover straight down from its position to remove it. (Figure 18)

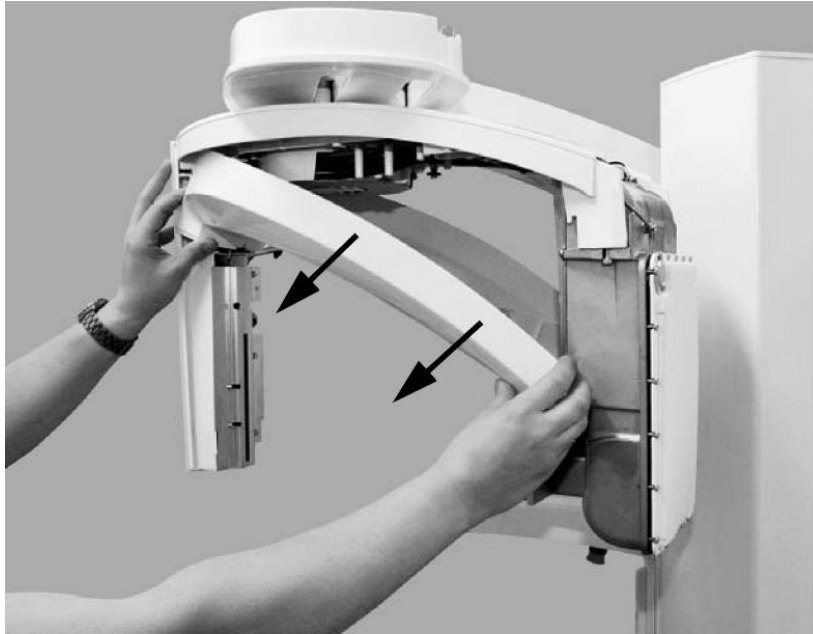


Figure 18



# Alignment

## 1 Beam Adjustment

Press the **wrench** to get to the configuration options. (Figure 19)

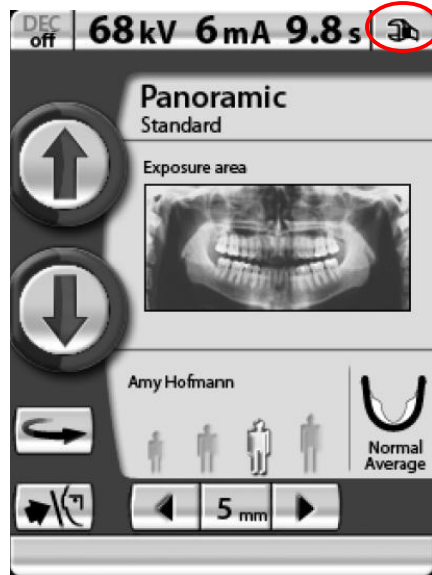


Figure 19

Press **Collimator calibration** to check the beam alignment. (Figure 20)

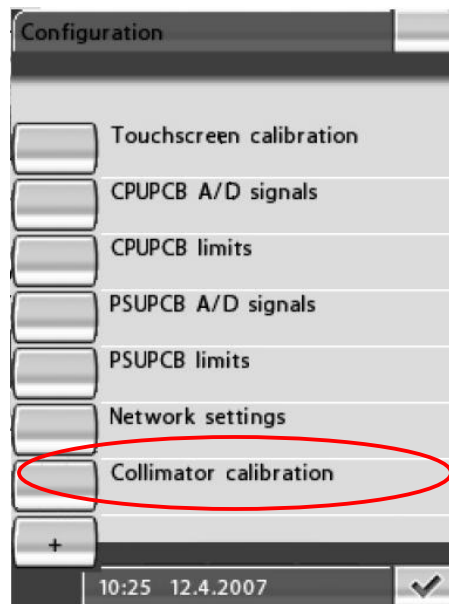


Figure 20



## 1.1 Vertical Alignment

### 1.1.a High/Low

Loosen the two 2.5mm allen screws and slide the collimator up/down accordingly. (Figure 23)

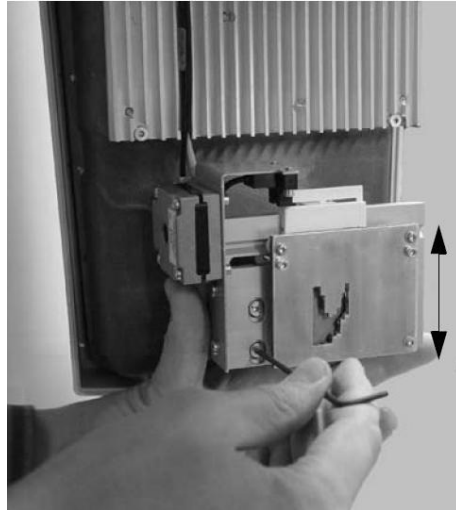


Figure 23

Press **Test** and take another exposure. If beam is aligned press the green check in the lower right corner to save the changes

### 1.1.b Angled

Loosen the bottom 2.5mm allen screws and rotate the collimator left/right accordingly to get the beam straight. (Figure 24)

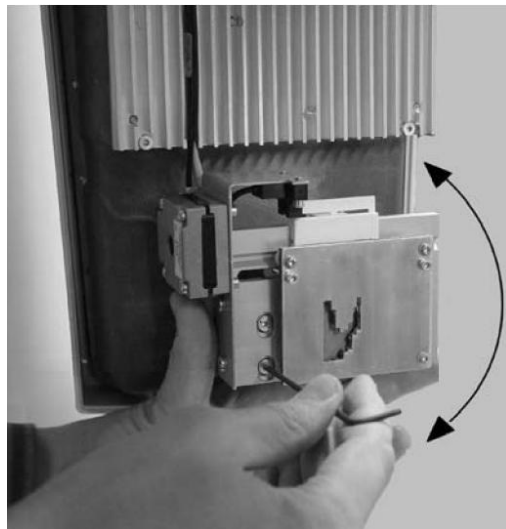


Figure 24

Press **Test** and take another exposure. If beam is aligned press the green check in the lower right corner to save the changes

*NOTE: If still unable to fix the vertical alignment, loosen the three 2.5mm allen screws on the Sensor Head and make further adjustments there. (Figure 25)*

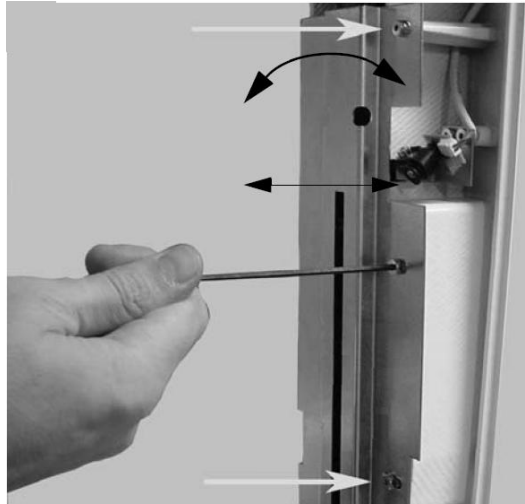


Figure 25

## 1.2 Horizontal Alignment

### 1.2.a Left/Right

Press the respective left or right button under X-collimator on the touch screen to move the collimator to the left or right. (Figure 26)

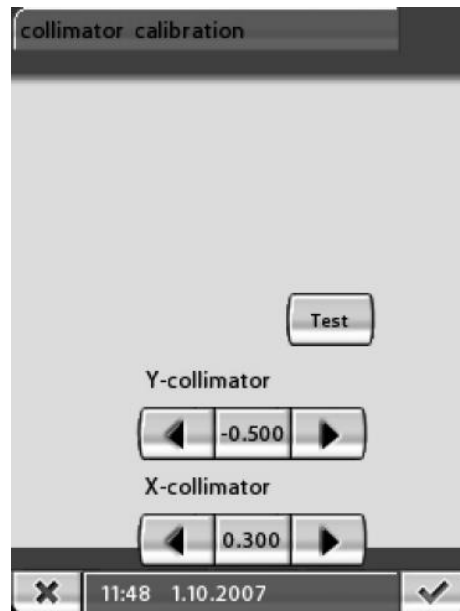


Figure 26

Press **Test** and take another exposure. If beam is aligned press the green check in the lower right corner to save the changes.

## 2 Ball Phantom y-line

Remove the fluorescent screen from the Sensor Head. Attach the alignment ruler between the collimator and the sensor. (Figure 27)

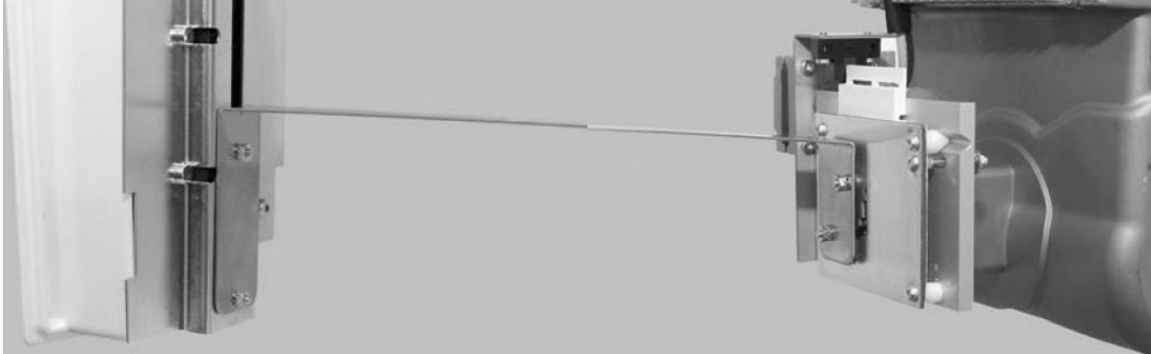


Figure 27

*NOTE: Be careful not to make cuts on the lead blades.*

Put the ball phantom into the patient positioning mechanism. (Figure 28)

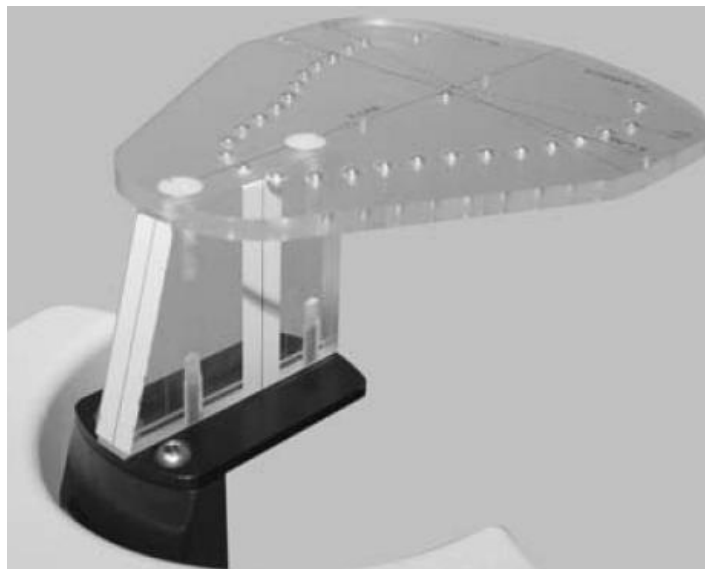


Figure 28

*NOTE: Make sure the unit is off before continuing.*

Manually position the C-arm and pin the arm with an alignment pin as shown. (Figure 29)

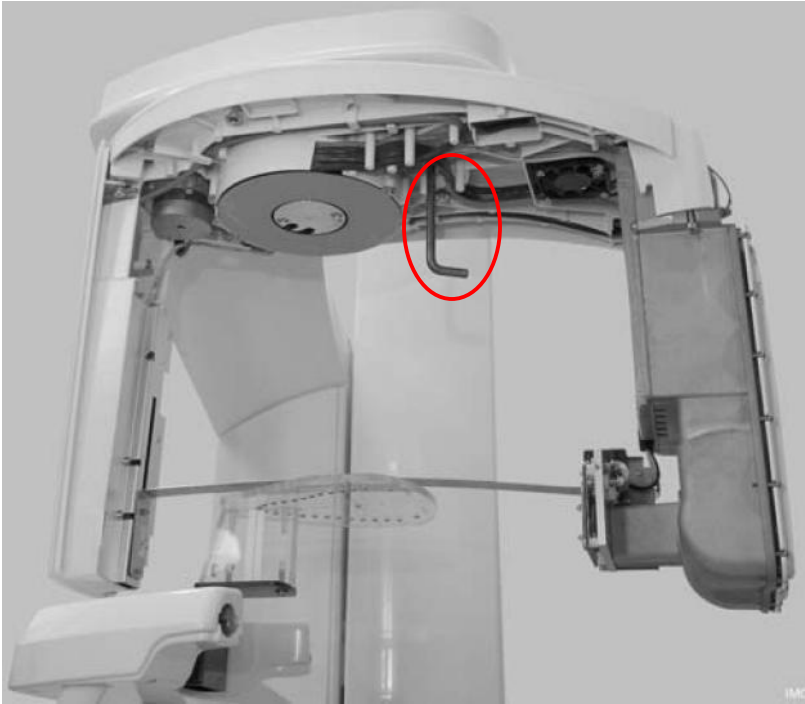


Figure 29

Check to make sure that the y-line on the ball phantom and the alignment ruler coincide. (Figure 30)

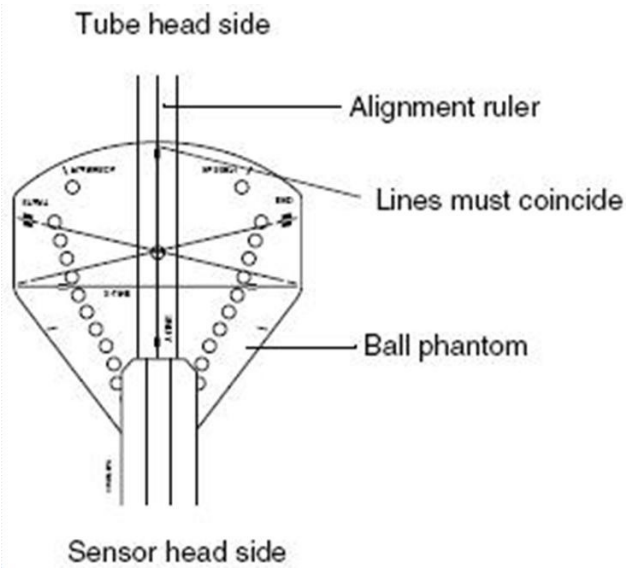


Figure 30

## 2.1 Adjusting Y-line

Loosen the three 4mm allen adjustment screws on the patient positioning arm. (Figure 31)

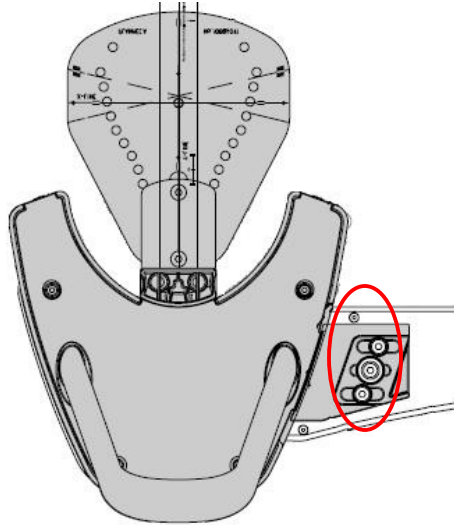


Figure 31

Slide the patient support table away from or towards the column till aligned. (Figure 32)

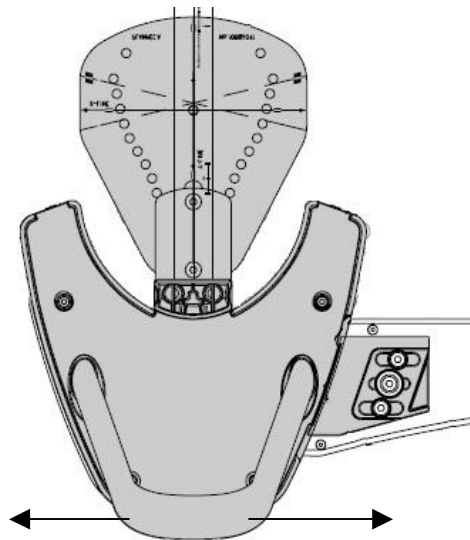


Figure 32

Re-tighten the adjustments screws and remove the alignment pin.

### 3 Ball Phantom x-line

*NOTE: Remove the alignment ruler before turning unit back on.*

Turn the unit on and press the **wrench**. (Figure 33)

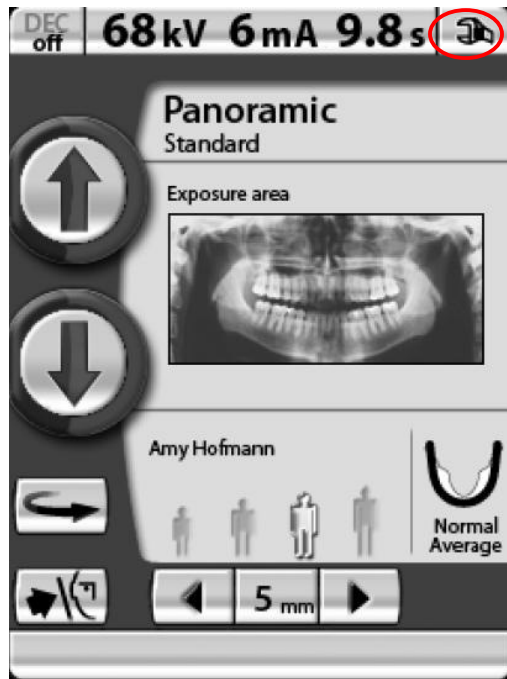


Figure 33

Press **Arm calibration**. (Figure 34)

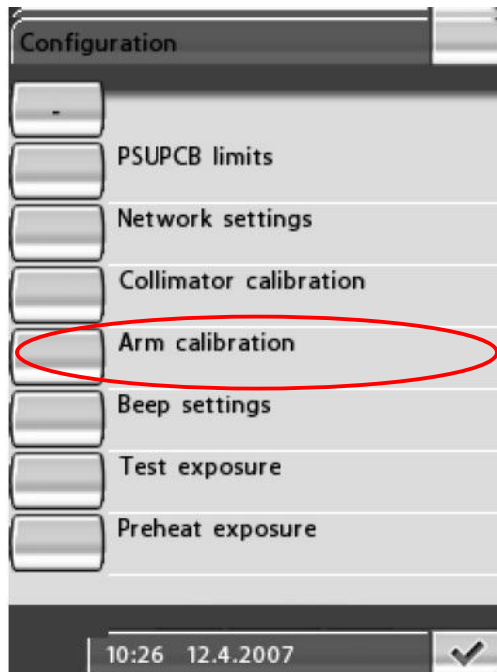


Figure 34

Press **Side** twice to get the C-arm to move into position 1. (Figure 35)



Figure 35

After the C-arm has finished moving, pin the arm as shown with the alignment pin. (Figure 36)

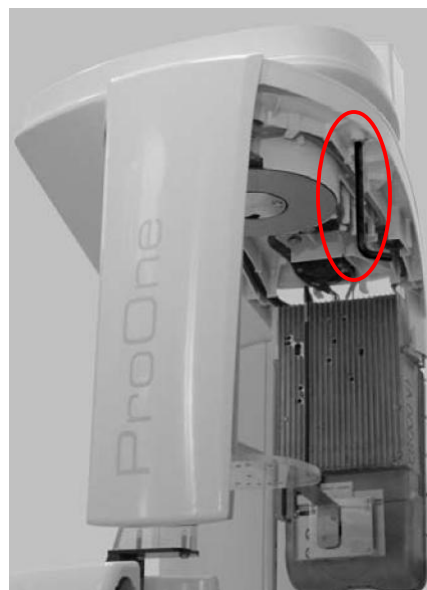


Figure 36

Check to make sure that the x-line on the ball phantom and the alignment ruler coincide. (Figure 37)

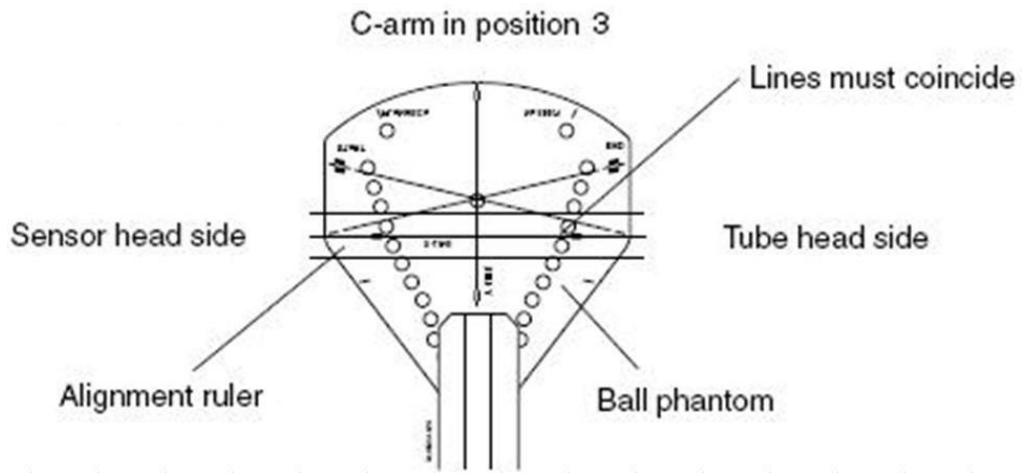


Figure 37

### 3.1 Adjusting X-line

Use the left or right arrows to adjust the C-arm position till the lines coincide. (Figure 38)

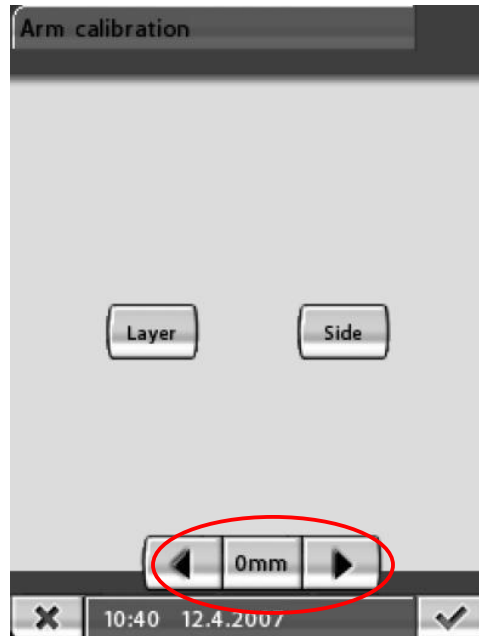


Figure 38

Remove the alignment.

*NOTE: If the X-lines are not parallel then adjust the sensor position till it is. See Figure 25 on pg.20.*

### 3.2 Checking Symmetry

Press **Side** once to rotate the C-arm 180° to position 3.

After the C-arm has finished rotating, pin the arm as shown with the alignment pin. (Figure 39)

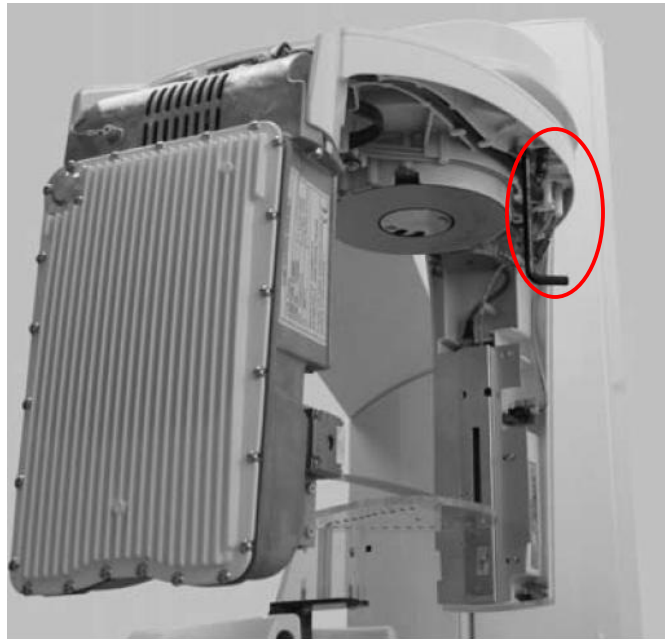


Figure 39

Check to make sure that the x-line on the ball phantom and the alignment ruler coincide. (Figure 40)

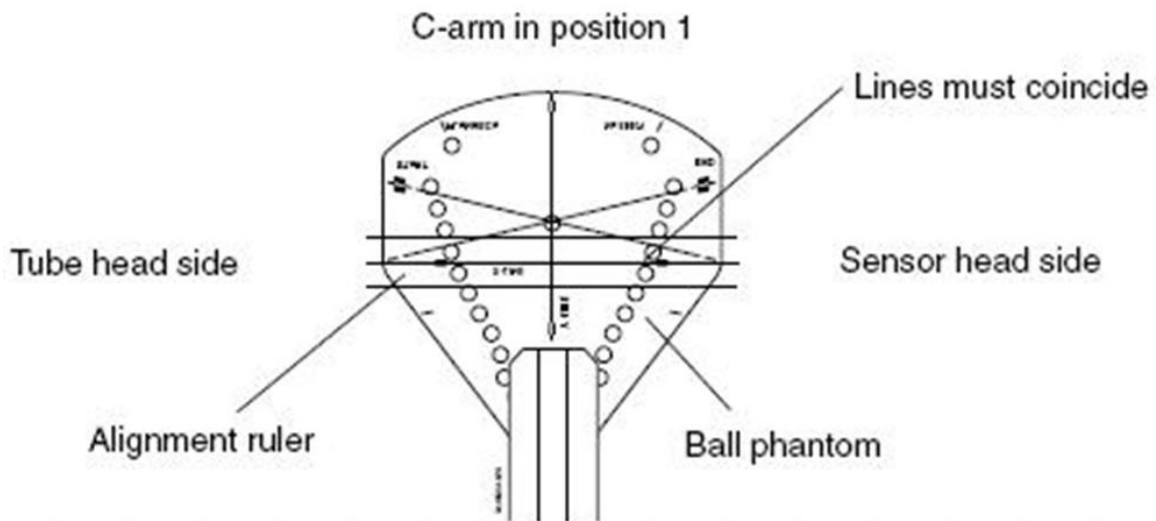


Figure 40

### 3.2.a More than 1mm deviation

Adjust the sensor position by loosening the three 2.5mm allen screws and adjust the sensor angle by moving it left or right. (Figure 42)

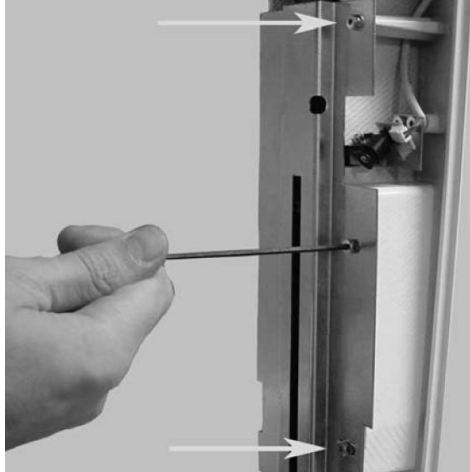


Figure 42

*NOTE: Correct the deviation by only half here and half in position 1.*

Go back to Beam adjustment, pg.17, if the sensor angle was adjusted and re-check everything again from there.

Press the green check to accept all the changes made to exit the Arm calibration mode. (Figure 43)

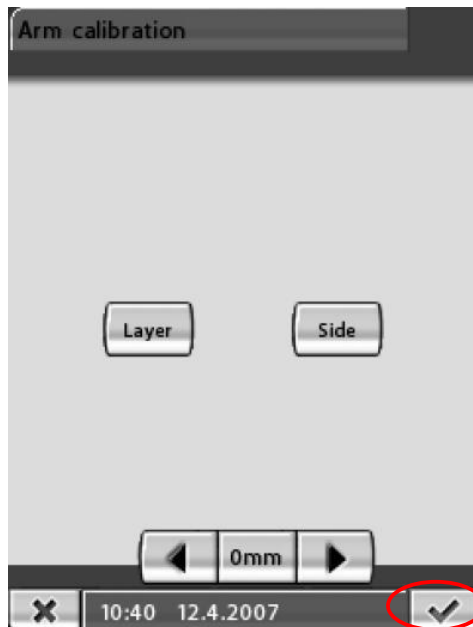


Figure 43

Remove the alignment ruler and alignment pin.

## 4 Positioning Lights

*NOTE: Make sure the ball phantom is still in the patient positioning mechanism.*

### 4.1 Layer

Press the wrench. (Figure 44)

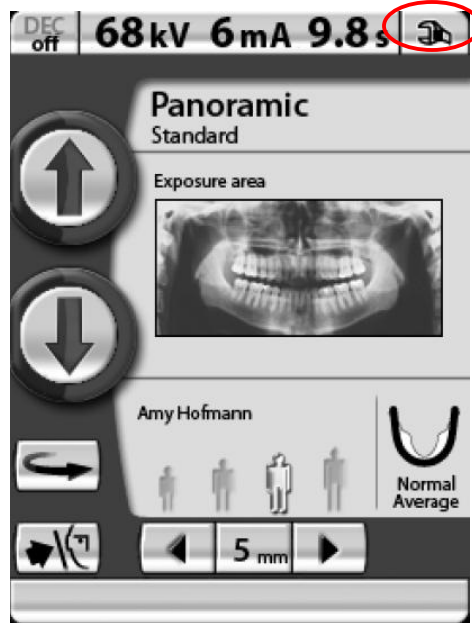


Figure 44

Press **Arm calibration**. (Figure 45)

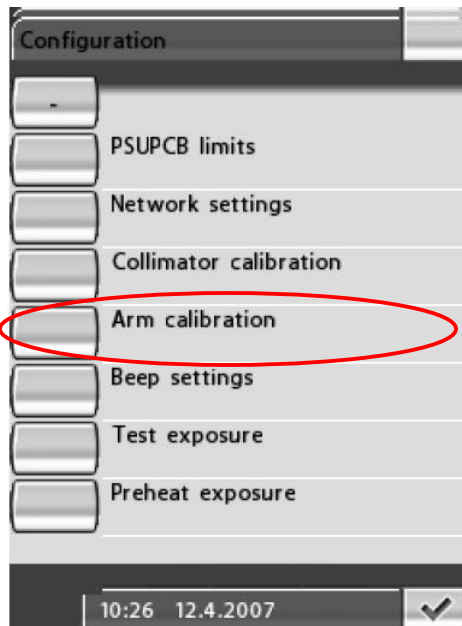


Figure 45

Press **Layer**. (Figure 46)



Figure 46

Carefully adjust the focal layer light to the reference line on the ball phantom with needle nose pliers until it lines up. (Figure 47)

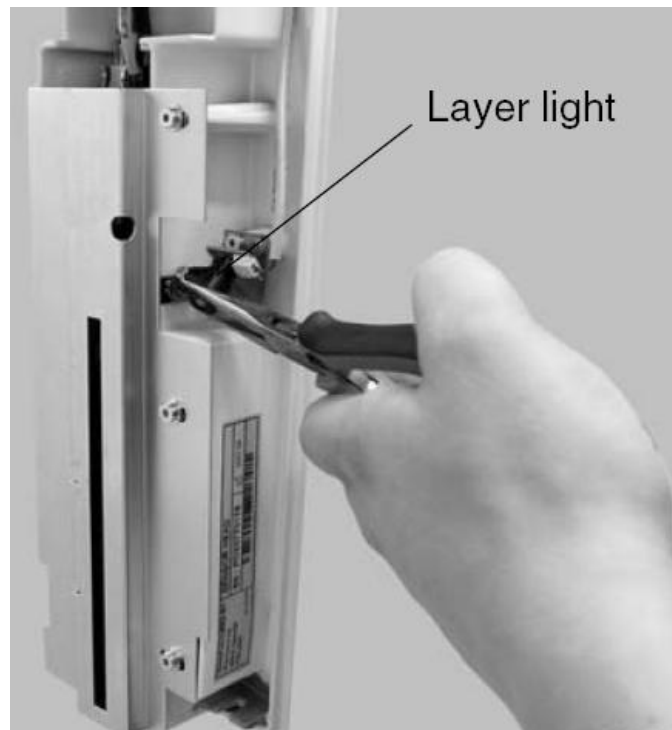


Figure 47

### 4.1.a Adjusting the light

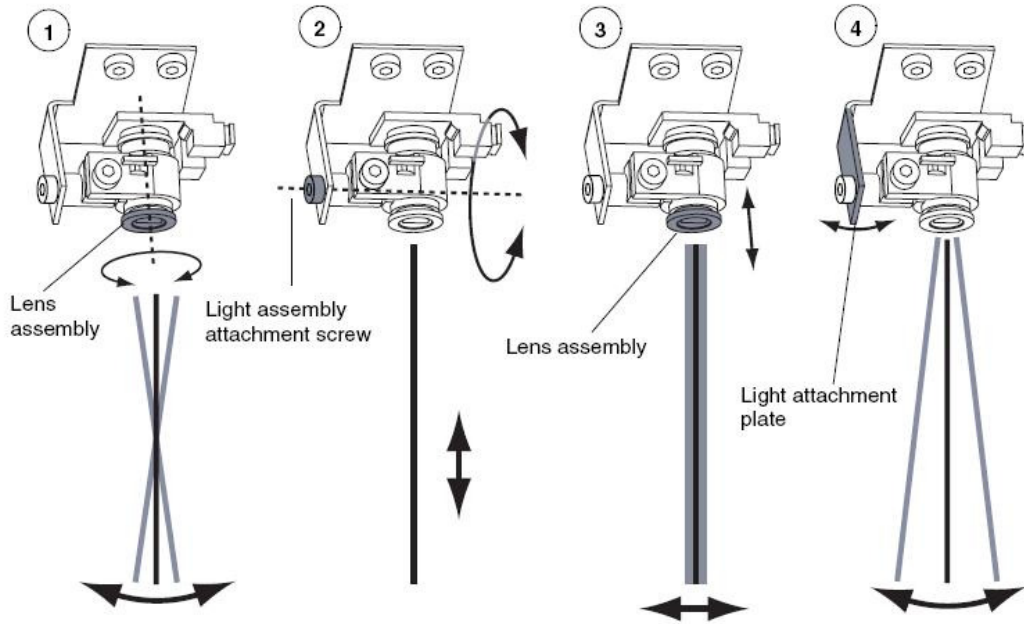


Figure 48

Once the light is adjusted, press the green check. (Figure 49)

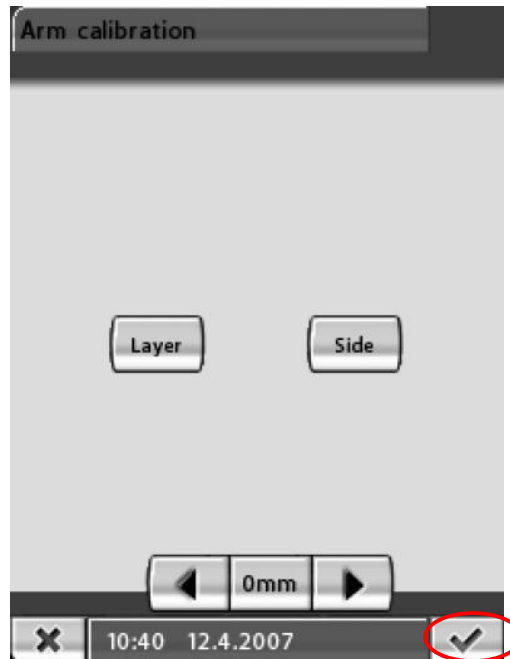
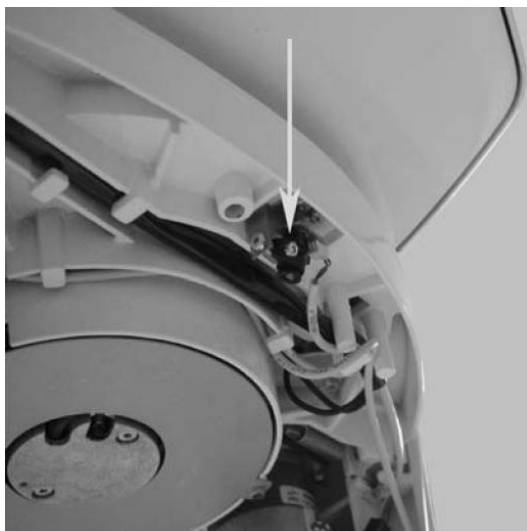


Figure 49

## 4.2 Midsagittal

Touch the touch screen to turn the positioning lights on.

*NOTE: The midsagittal light must line up with the y-line on the ball phantom*



Carefully adjust the light with needle nose pliers until the light lines up.  
(See Figure 48)

## 4.3 Frankfort

Put the Frankfort plane alignment tool onto top of the ball phantom.  
(Figure 50)

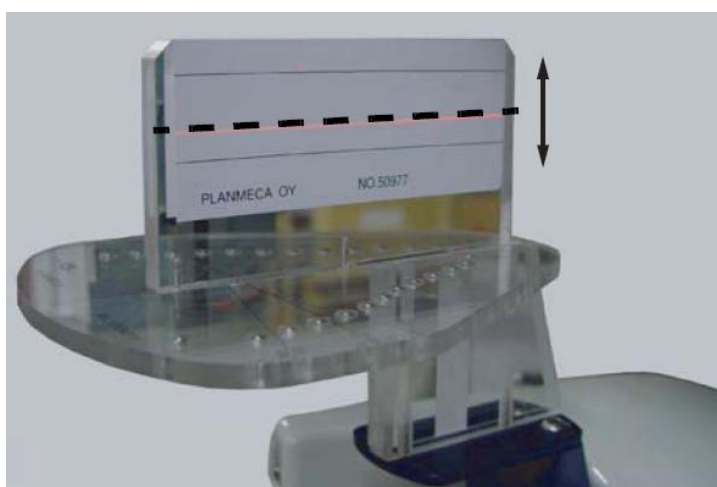


Figure 50

*NOTE: The frankfort plane light must go from the front to back of the tool, range from the top to the bottom, and be straight with the lines on the tool.*

### 4.3.a Adjusting the light

Unscrew the 2.5mm allen screw on the bottom of the column cover and unscrew the adjusting lever for the light. (Figure 51)

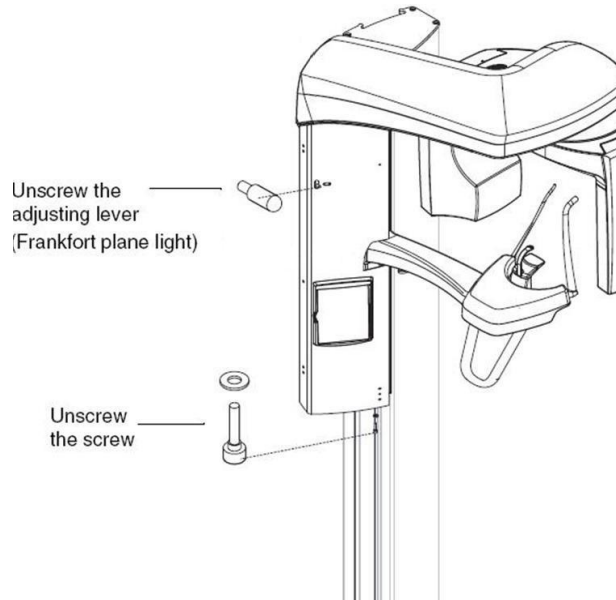


Figure 51

Open the column cover. (Figure 52)

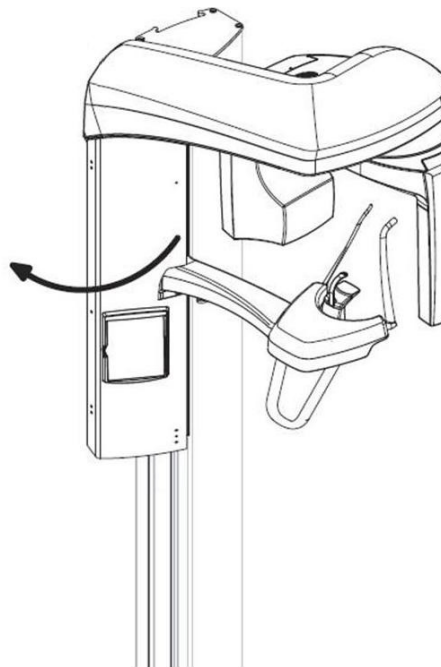


Figure 52

Carefully adjust the light with needle nose pliers until the light lines up. (See Figure 48)



# Calibrating the Sensor

## 1 ProOne setup

*NOTE: Make sure that the third person “average adult” is selected and re-attach all c-arm covers.*

Press the kV/mA at the main screen. (Figure 53)



Figure 53

Set the unit to 64kV and 5mA. (Figure 54)

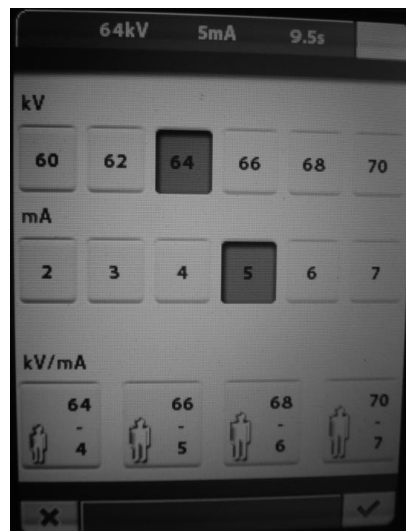


Figure 54

Place the calibration block over the sensor. (Figure 55)



Figure 55

*NOTE: The sensor is located between the two gray hash marks on the sensor head cover.*

## 2 Computer setup

Click Start, All Programs, Planmeca, Dimax3 Tool. (Figure 56)



Figure 56

Click Settings, Type, ProOne. (Figure 57)

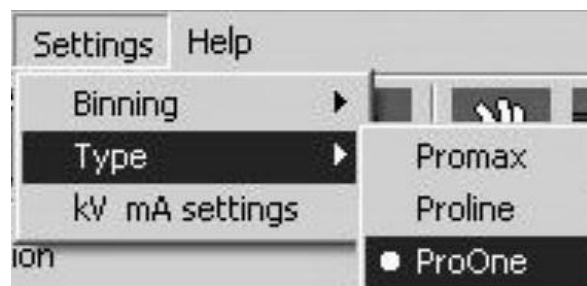


Figure 57

### 3 Calibration file creation

Click the Panoramic Exposure button. (Figure 58)

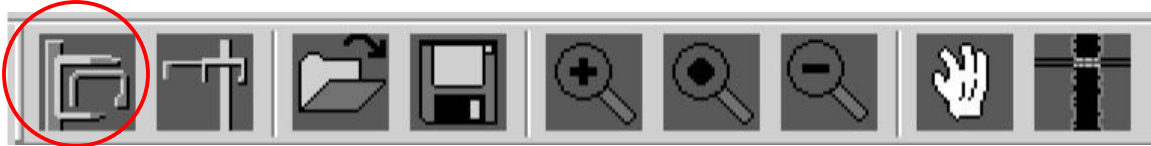


Figure 58

When prompted to turn the radiation off, click **OK**. (Figure 59)

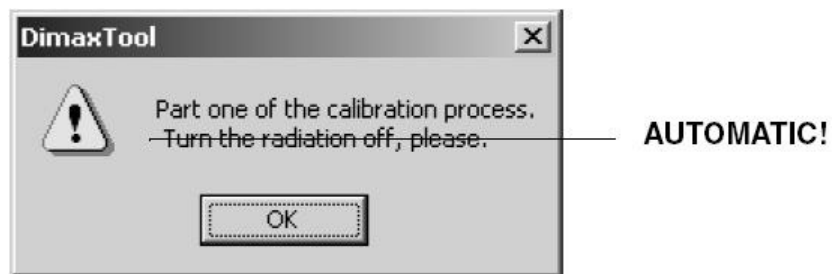


Figure 59

*NOTE: The radiation is turned off and on automatically.*

Wait until the screen displays “Waiting for Exposure.” (Figure 60)



Figure 60

Take the exposure. Again there will be a prompt to turn the radiation on, Click **OK** to continue. (Figure 61)

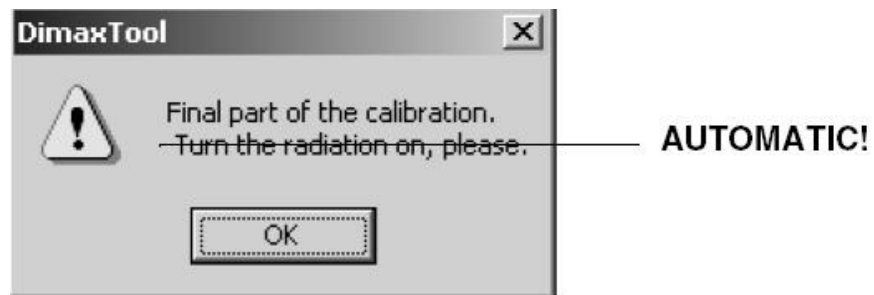


Figure 61

Wait until the screen displays “Waiting for Exposure.” (Figure 62)



Figure 62

Take another exposure and remove the calibration block.

The image created should appear like this. (Figure 63)

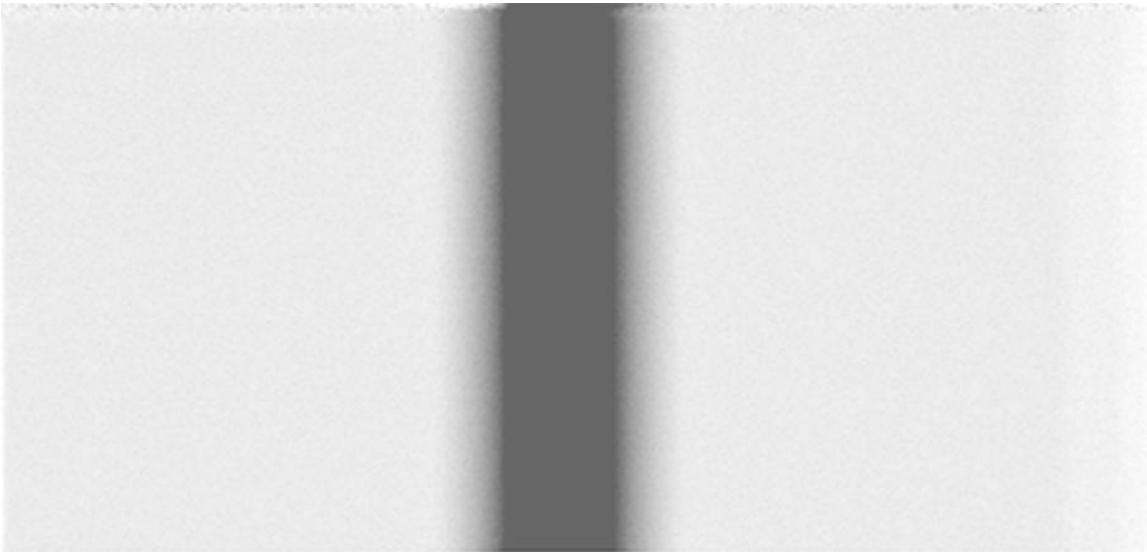


Figure 63

Close the Dimax3 Tool.

# *Ball Phantom Test*

## 1 Dimaxis 4.3.x

Click on Start, All Programs, Planmeca, Dimaxis 4.3.x



*NOTE: Place the ball phantom into the patient positioning mechanism.*

Click **OK** then click **OK** again. Select “New” from the bottom of the “Select Image” screen.

Press the exposure button then press **OK** once the image is taken to evaluate the image.



## 2 Measurement Tool Calibration

Click the measurement toolbar at the top. (Figure 64)



Figure 64

Click on the first icon, CAL, and calibrate the Center Ball from top to bottom. (Figure 65)



Figure 65

Enter the number 7 when asked to input a distance. (Figure 66)



Figure 66

## 3 Measuring the Image

Click the second icon now and measure the Center Ball top to bottom and left to right. (Figure 67)



Figure 67

The ball should be 7mm top to bottom and left to right. (Figure 68)

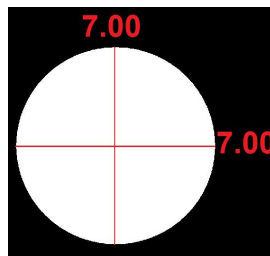


Figure 68

Measure from the center of the Center Ball to the center on the 10<sup>th</sup> Ball on the right then measure from the center of the Center Ball to the center of 10<sup>th</sup> Ball on the left. (Figure 69)

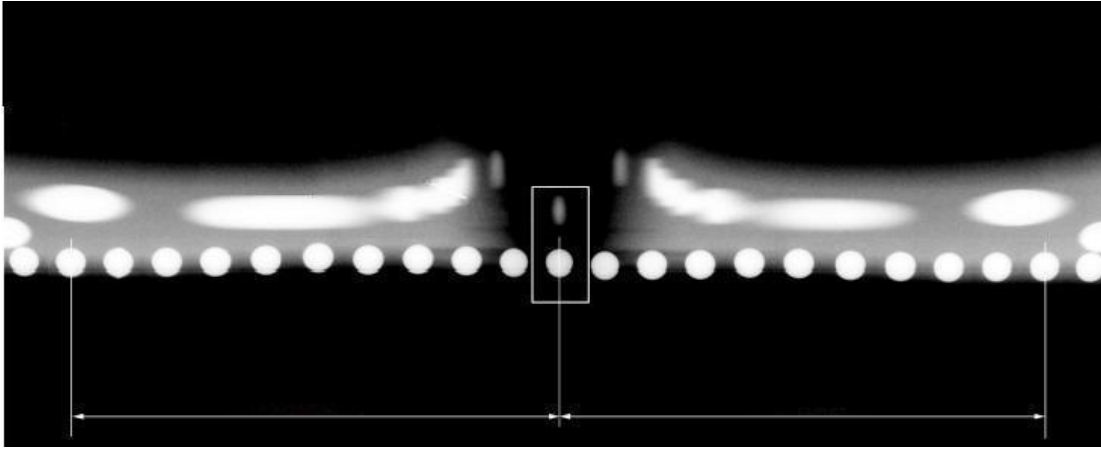


Figure 69

*NOTE: The distance from the Center Ball to the 10<sup>th</sup> Ball should be the same  $\pm 1.5$ mm.*

Now check the shadow ball by clicking the Vertical Line from point icon from the measurement toolbar. (Figure 70)



Figure 70

Click the top of the shadow ball and measure the distance between the shadow ball to the Center Ball. (Figure 71)

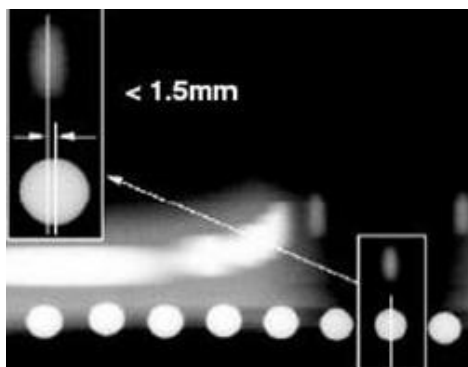


Figure 71

*NOTE: If any of these distances are off then start over with Chapter D-F at pg. 17. If the measurements are within the tolerances then the ProOne is calibrated.*



[www.planmecausa.com](http://www.planmecausa.com)