PLANMECA

Planmeca Proline EC panoramic and pan/ceph

INSTALLATION MANUAL

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1 INTRODUCTION

Planmeca manufactures two versions of the Planmeca Proline EC X-ray:
-the Planmeca Proline EC Panoramic X-ray
-the Planmeca Proline EC Pan/ Ceph X-ray.
This guide contains all the information required to set up and calibrate both versions of the Planmeca Proline EC X-ray.

Protect yourself from radiation when you are checking the radiation beam alignment.

WARNING
FAILURE TO INSTALL THE X-RAY IN AN APPROVED LOCATION MAY BE DANGEROUS TO BOTH PATIENT AND OPERATOR.

ATTENTION
IT IS VERY IMPORTANT THAT THE ROOM IN WHICH THE X-RAY IS INSTALLED AND THE POSITION FROM WHICH THE USER OPERATES THE EQUIPMENT ARE CORRECTLY SHIELDED FROM RADIATION. SINCE RADIATION SAFETY REQUIREMENTS VARY FROM COUNTRY TO COUNTRY AND STATE TO STATE IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT ALL LOCAL SAFETY REGULATIONS ARE MET.

CAUTION
The remote exposure control, Autoprint and Admark film marking systems are connected to the X-ray units Planet connectors. Do NOT connect any other devices to the Planet connectors.

All key illustrations indicate that the key should be pressed or, where indicated, pressed and held down. Pressing a key will either switch a function on or off, depending on the original setting, or change the parameter.

The display values shown in this guide are only examples and should not be interpreted as recommended values unless otherwise stated.

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

2 PRE-INSTALLATION INFORMATION

WARNING
Do not connect items which are not specified as part of the system.

NOTE
The connection of additional equipment to a multiple portable socket-outlet must only be possible by using a tool or be supplied via separating transformer.

NOTE
The multiple portable socket-outlets shall not be placed on the floor.

When using a multiple portable socket-outlet, do not connect any other equipment to this than the ones specified as part of the system.

In cases where additional equipment, in same or especially in separate locations, are connected there is always a danger of too high leakage currents in the system.

2.1 X-ray unit installation information

1. The room in which the X-ray is to be installed and the position from where the user is to operate the equipment MUST be correctly shielded from radiation. Since radiation safety requirements vary from country to country and state to state it is the responsibility of the installer to ensure that all safety regulations are met.

2. Make sure that there is enough room to install the X-ray correctly and that the wall will support the X-ray. The bracket that secures the X-ray to the wall must be able to resist a pull-out force of 160 kg (353 pounds). NOTE. If the wall will not support the X-ray the X-ray must be mounted on the free-standing base, part number 50021.

3. Make sure that the power requirements of the X-ray are the same as the power that is to be used. The X-ray is designed to operate using either 100-132, or 180-240 V~ dedicated power supply with a tolerance of ±10%. The X-ray power requirements are printed on a label which is attached to the mains cable and also printed on a label located at the base of the support column. If the voltage is likely to fluctuate by more than ±10% you will need to install a power supply regulator to ensure that the unit operates correctly.

4. Make sure that there is an earthed power outlet within 2.5 meters (8 feet) of where the X-ray is to be installed.

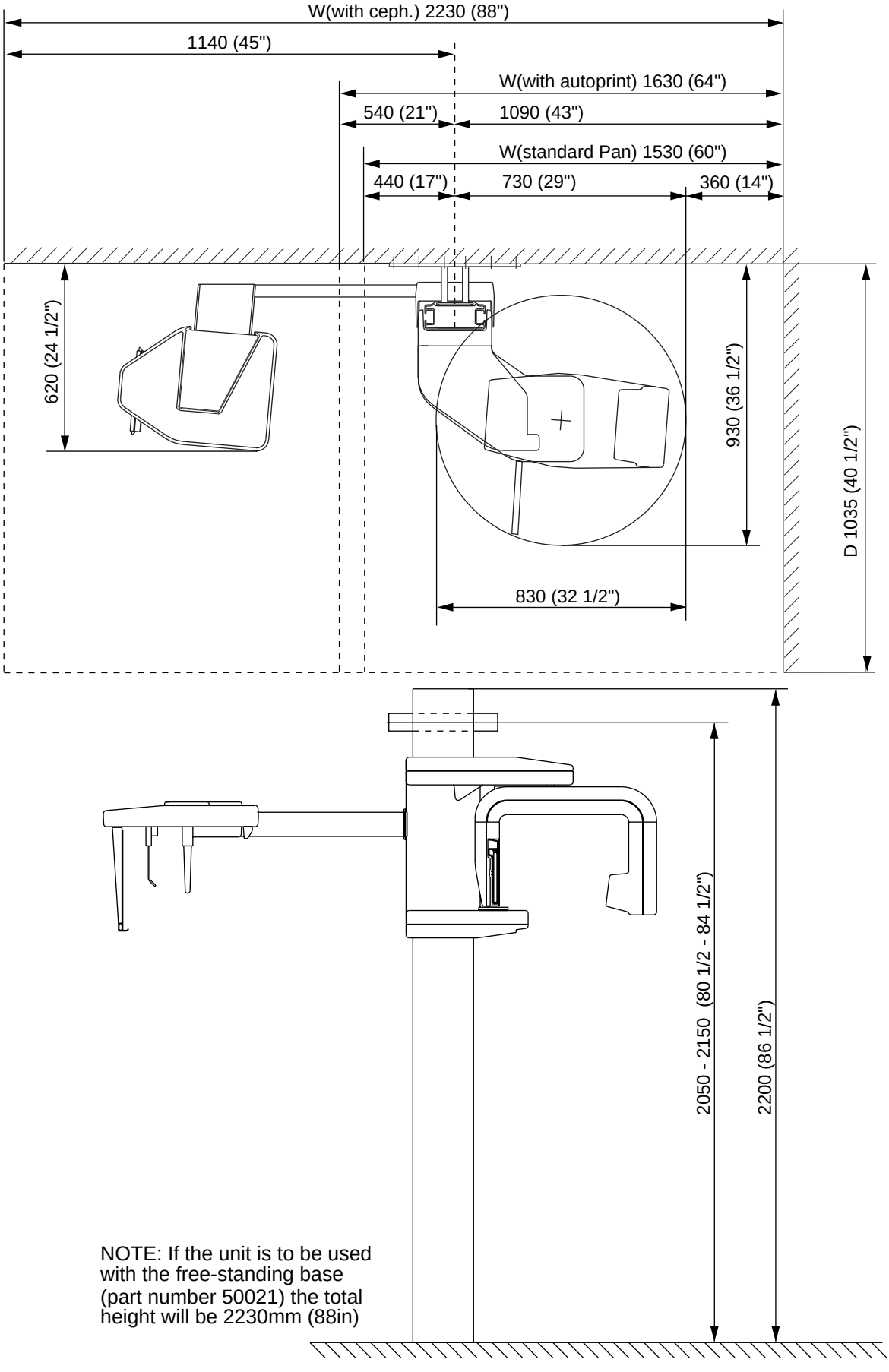
5. Make sure that you have access to an X-ray film processor that is in working order and is ready for use.

6. Make sure that you have the correct chemicals for processing the X-ray film being used. Make sure that the solutions are fresh.

7. Make sure that the darkroom is fitted with a safe light that is suitable for the X-ray film being used.

8. Make sure that the X-ray film will fit the cassette and that it can be used with the intensifying screen being used.

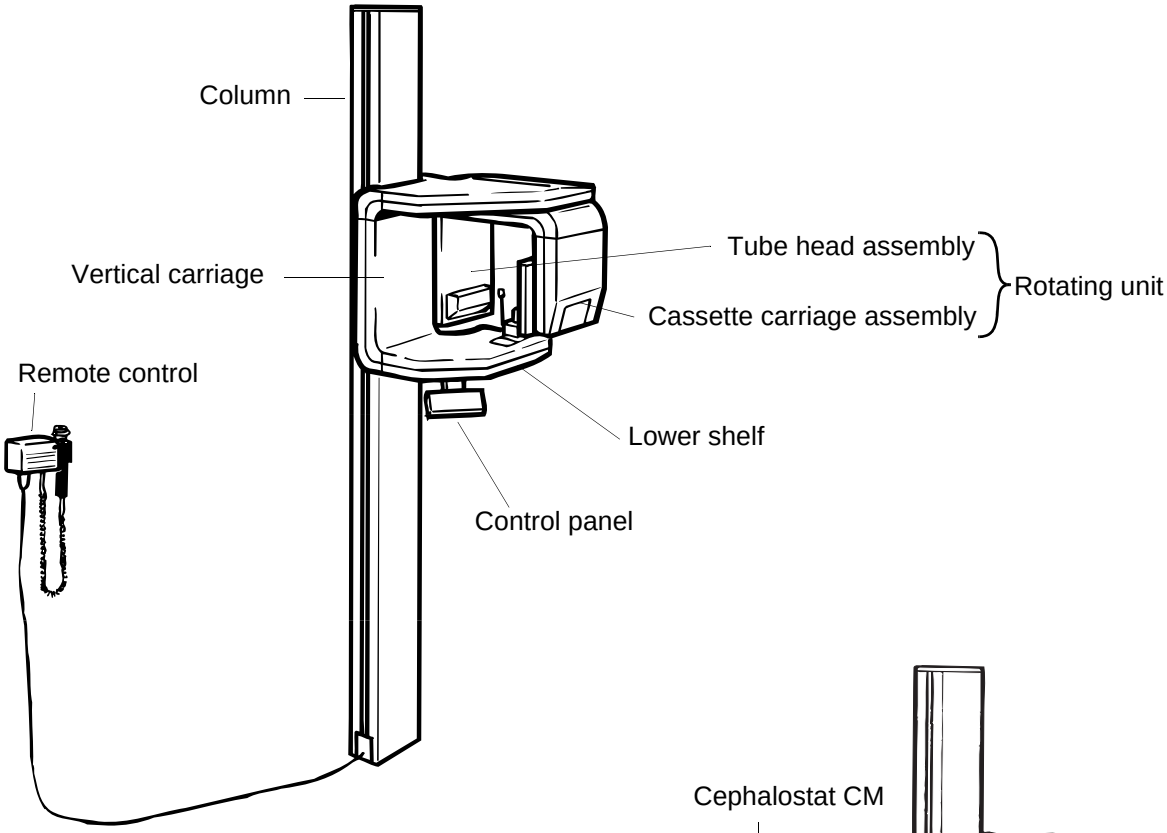
3 INSTALLATION DIMENSIONS

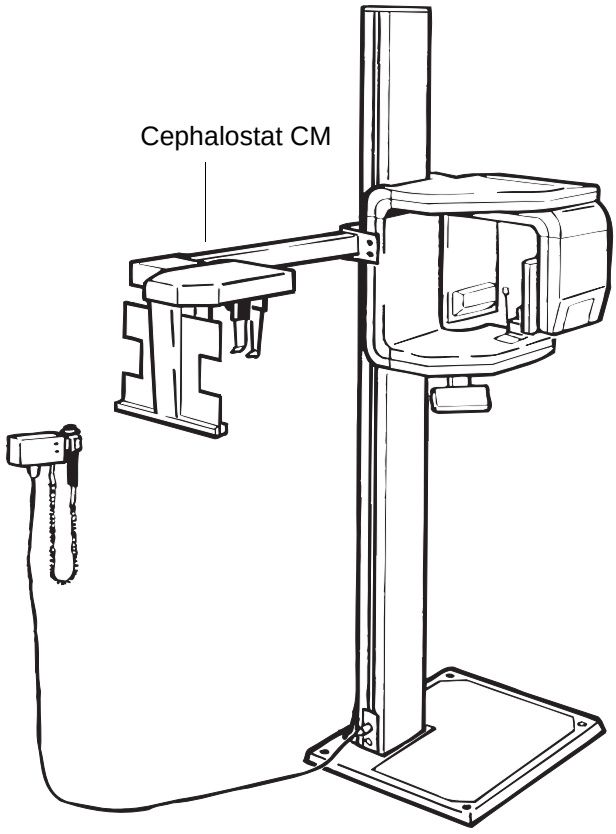


4 THE PLANMECA PROLINE EC X-RAY

4.1 Main parts

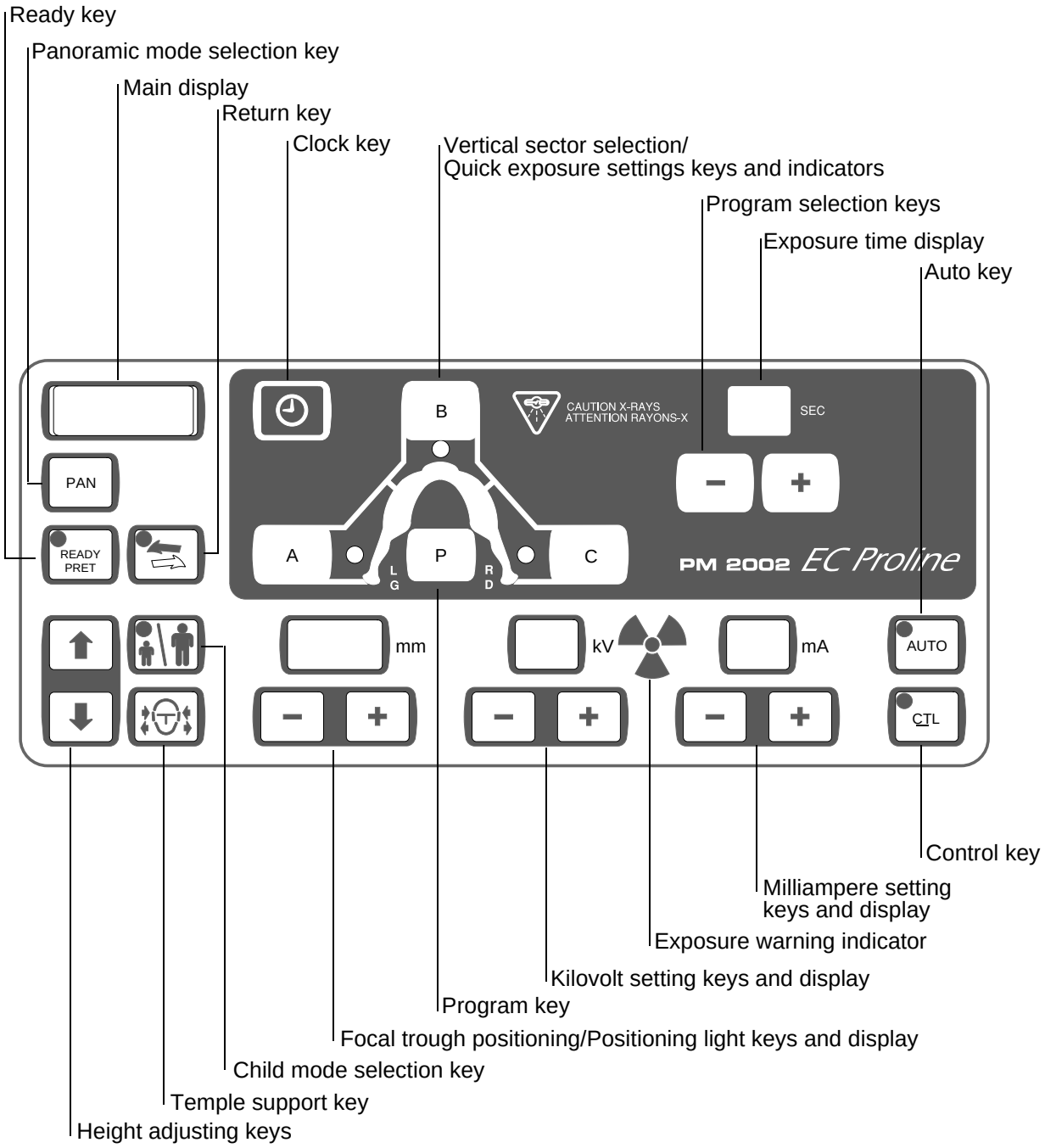
PLANMECA PROLINE EC PANORAMIC X-RAY





PLANMECA PROLINE EC PAN/CEPH X-RAY

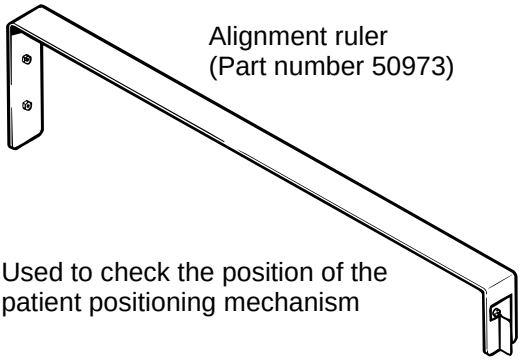
4.2 Keyboard


Ready key
Panoramic mode selection key
Main display
Return key
Clock key
Vertical sector selection/
Quick exposure settings keys and indicators
Program selection keys
Exposure time display
Auto key
PAN
READY
PRET
B
A
P
C
L
G
R
D
CAUTION X-RAYS
ATTENTION RAYONS-X
SEC
PM 2002 EC Proline
mm
kV
mA
AUTO
CTL
Control key
Milliampere setting
keys and display
Exposure warning indicator
Kilovolt setting keys and display
Program key
Focal trough positioning/Positioning light keys and display
Child mode selection key
Temple support key
Height adjusting keys

4.3 Calibration tools

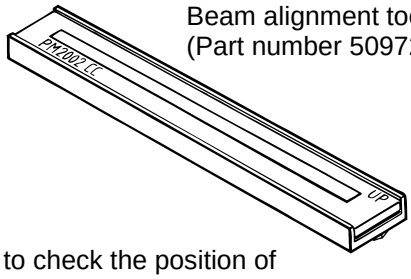
You will need the following PLANMECA calibration tools to check the alignment of the X-ray:

Alignment ruler
(Part number 50973)



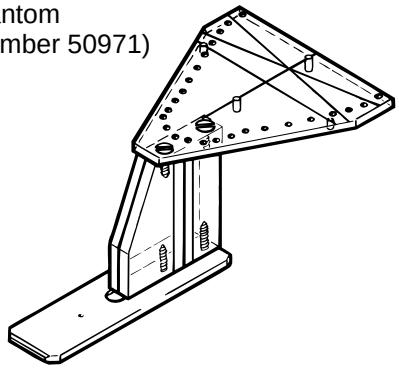
Used to check the position of the patient positioning mechanism

Beam alignment tool
(Part number 50972)



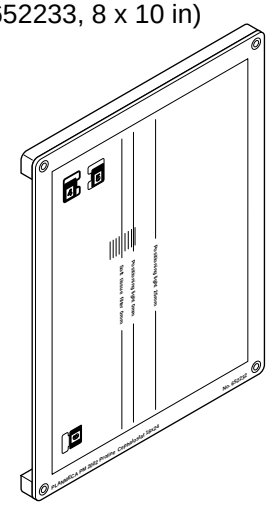
Used to check the position of the panoramic X-ray beam

Ball phantom
(Part number 50971)



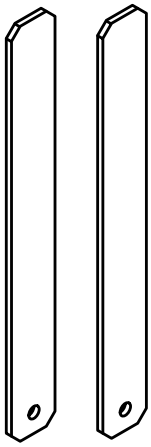
Used to check the position of the patient positioning mechanism and the positioning lights

Cephalometric beam alignment tool
(Part number 652232, 18 x 24cm
652233, 8 x 10 in)



Used to check the position of the cephalometric X-ray beam
(Only Pan/ceph x-ray unit)

Ceph head support
alignment tool
(Part number 653126)



Used to check the position of the head support
(Only Pan/ceph x-ray unit)

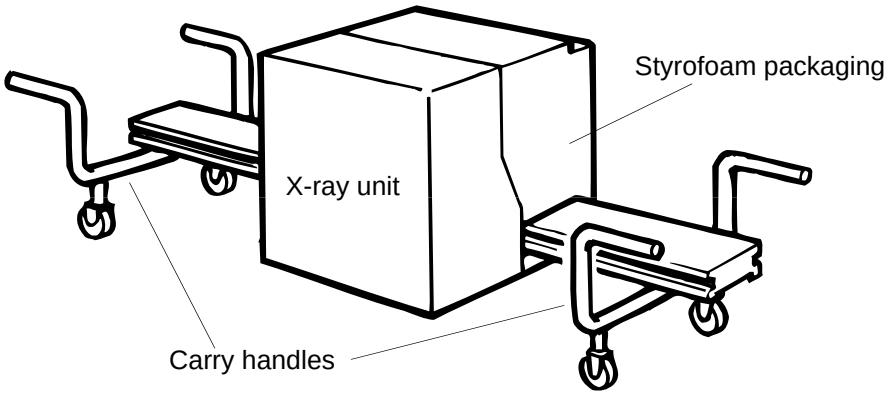
Soft tissue filter
positioning tool
(Part number 653121)

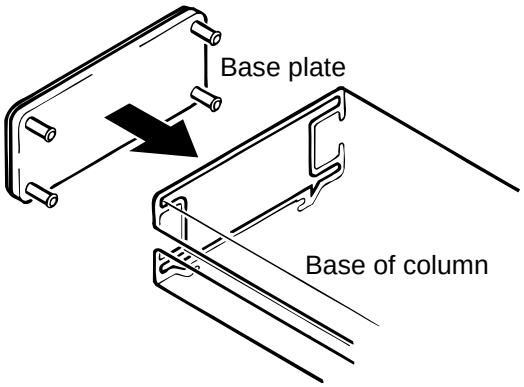
Used to check the position of the soft tissue filter
(Only Pan/ceph x-ray unit)

5 INSTALLING THE X-RAY

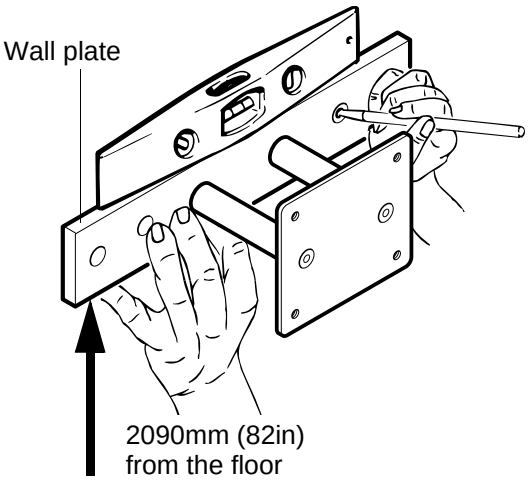
5.1 Attaching the X-ray to a wall

Unpack the unit but **DO NOT REMOVE THE PROTECTIVE STYROFOAM PACKAGING UNTIL THE UNIT HAS BEEN ATTACHED TO THE WALL AND LEVELLED**. If you have the carry handles (PLANMECA part number 50985) attach them to the support column. Transport the unit to the installation position.



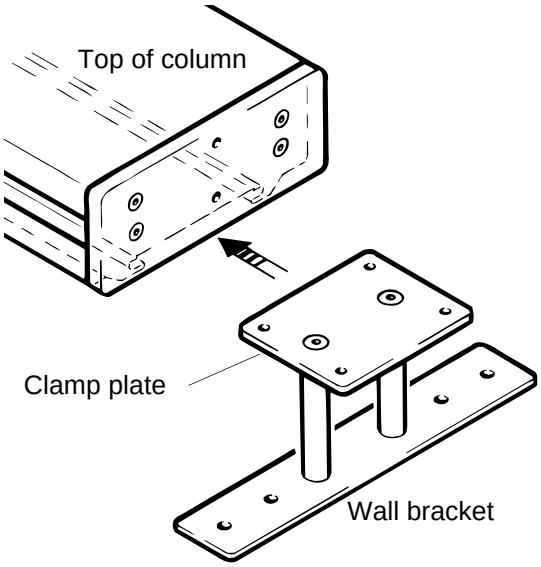


Remove the carrying handles and push the base plate into the base of the column. You may need to tap it in with a hammer.

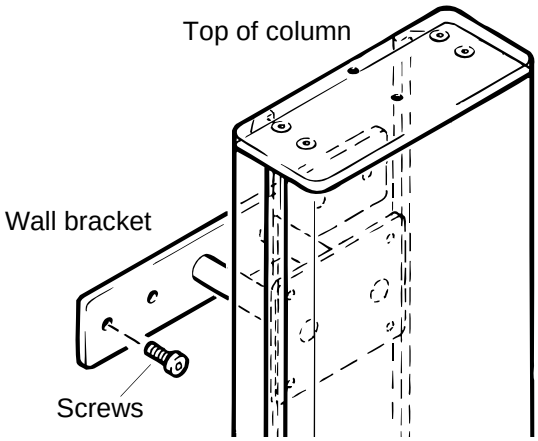


Use the wall plate to mark the position of the wall bracket that secures the X-ray to the wall. Either two or four screws can be used to secure the bracket to the wall. If the wall is thin you may have to use a backing plate and screws and nuts (not supplied).

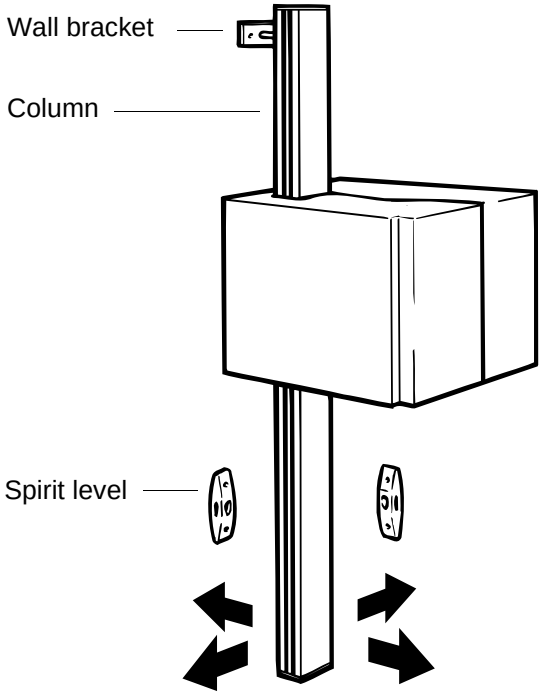
The bracket should be positioned approximately 2090mm (82in) from the floor. Use a spirit level to ensure that the wall plate is level. Decide what type and size of screws you plan to use and then drill securing holes of the appropriate size.



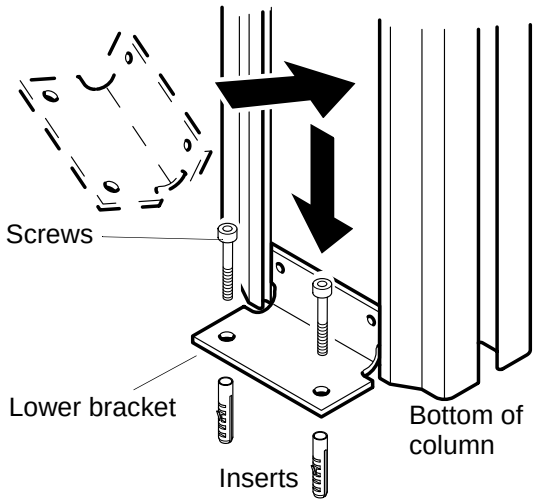
Wrap tape around the top of the X-ray column approximately one foot down from the top. This will prevent the wall bracket from sliding down the column when you stand the X-ray up. From the top of the column, slide the clamp plate part of the wall bracket into the grooves at the back of the column.



Lift the X-ray into position against the wall and secure the wall bracket to the previously drilled holes with suitable screws.



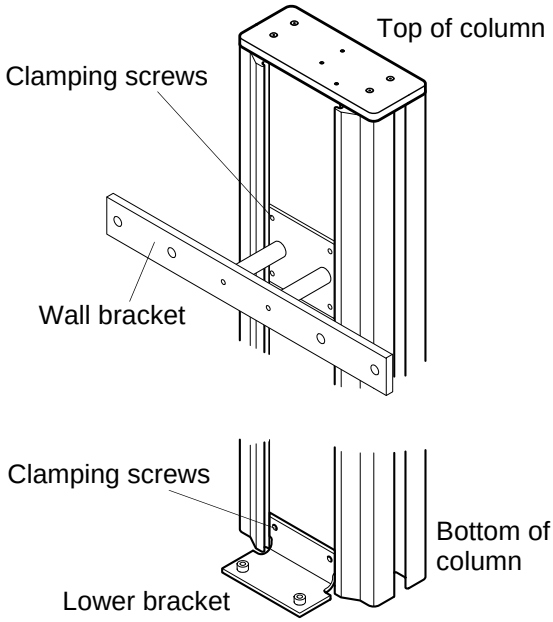
With a spirit level make sure that the column is vertical. If you have to make any adjustments move the base of the column.



NOTE

If you are installing a Pan/ceph unit you must secure the X-ray column to the floor with the lower bracket.

To slide the lower bracket into the groove at the rear of the column, you will have to turn the bracket sideways slightly to get it into the slots, and then use the bracket to mark the positions of the fixing holes. Drill two 10mm (3/8in) fixing holes and then secure the lower bracket to the floor with the screws and plastic inserts.



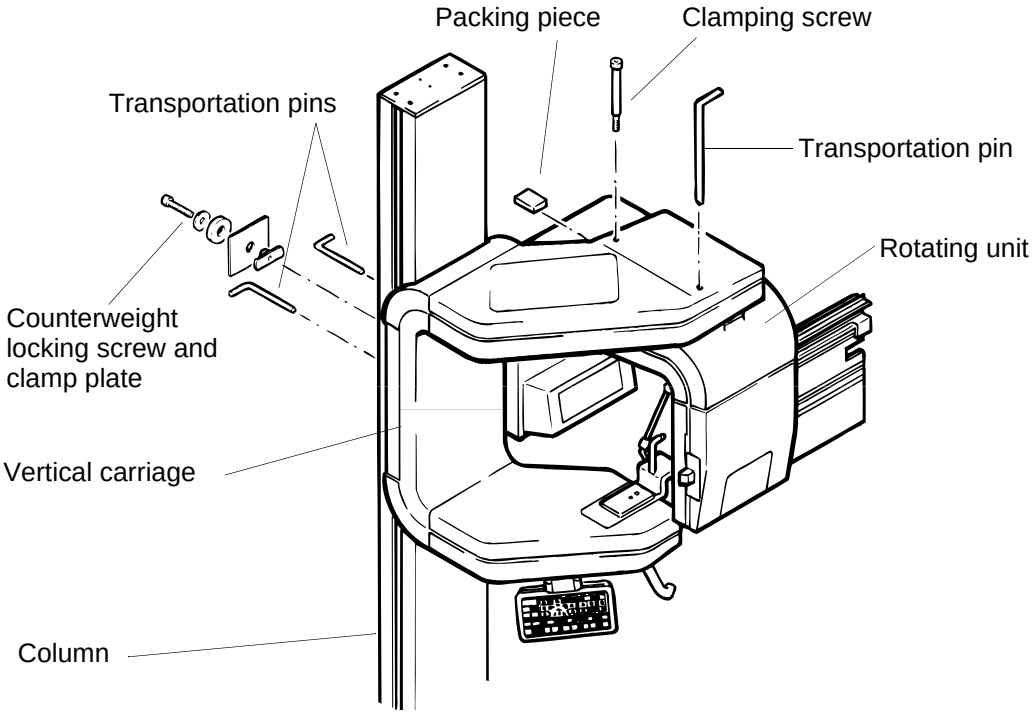
When the unit is vertical tighten the column clamping screws that hold the x-ray column to the wall bracket and, if the lower bracket is used, tighten the column clamping screws in the lower bracket.

Remove the protective styrofoam packaging and the tape that you previously wrapped round the top of the column to stop the wall bracket from sliding down.

Remove the transportation pin, clamping screw and packing piece that lock the rotating unit to the vertical carriage.

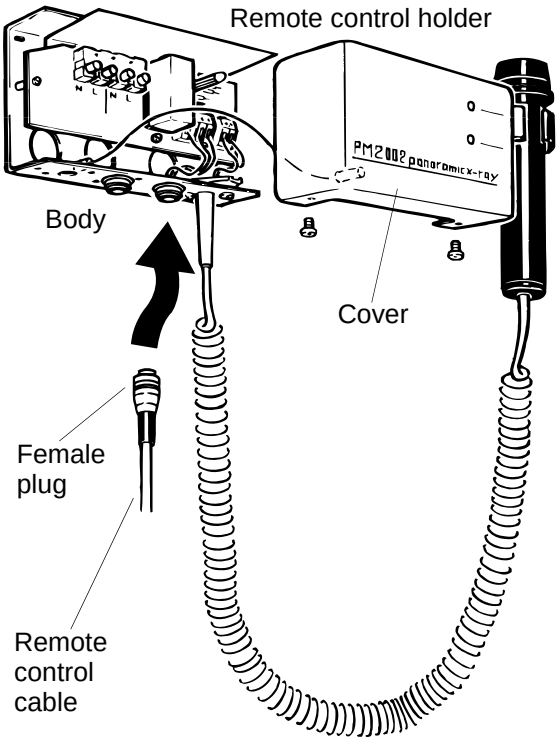
Also remove the counterweight locking screw and clamp plate from the rear of the column and the two transportation pins that hold the vertical carriage in position during shipping. These should be kept with the X-ray in case the X-ray needs to be moved at some future date.

The long transportation pin that holds the rotating unit in position is used to check that the unit is correctly aligned.



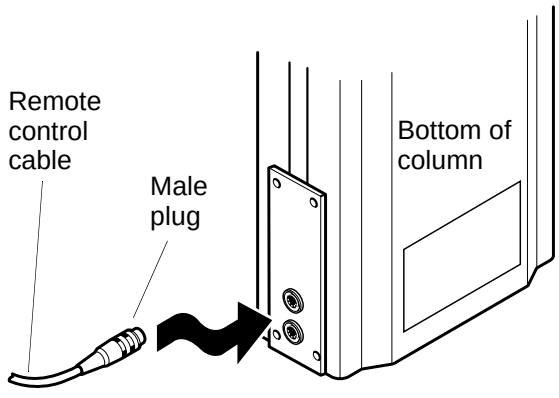
5.2 Installing the remote exposure control

The remote control holder must be located at least two meters (7 feet) from the X-ray in a position that satisfies the local radiation safety regulations regarding to operator safety and the shielding of X-ray equipment.



Remove the cover from the remote control holder, note that there is a ground lead connected to the cover, and use the body as a template to mark and drill the two securing holes. Secure the holder in position and replace the cover.

Connect the female plug at one end of the remote control cable to the socket on the underside of the remote control holder.



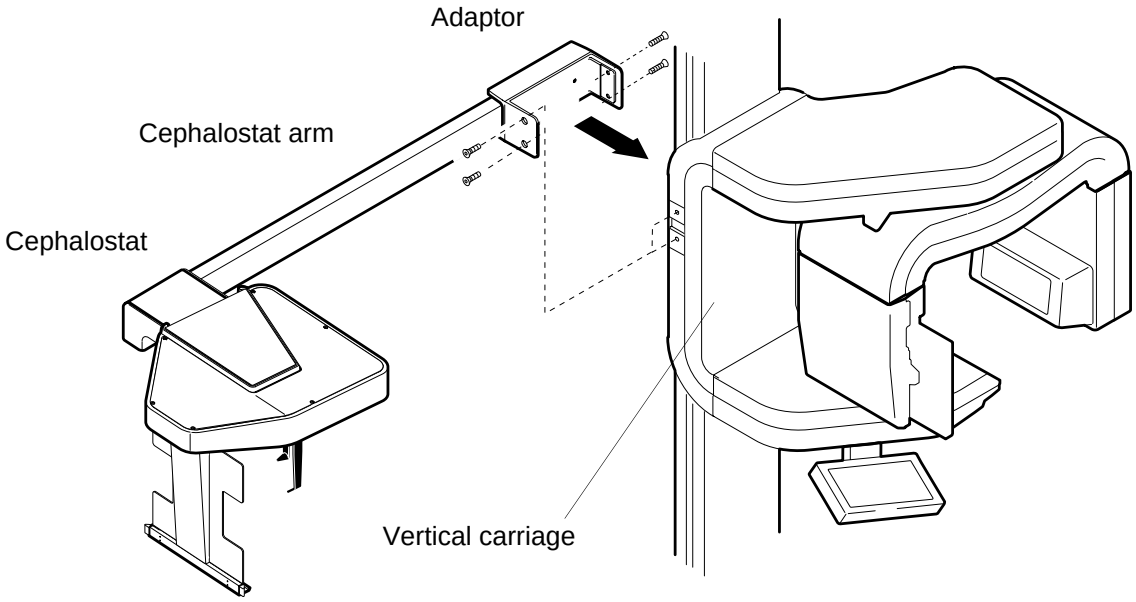
Connect the male plug at the other end of the remote control cable to one of the sockets at the bottom of the X-ray column. It does not matter which socket the cable is connected to.

5.3 Planmeca Proline EC pan/ceph X-ray - Attaching the Cephalostat CM

If you are installing a Planmeca Proline EC PAN/ CEPH unit you must attach the cephalostat to the vertical carriage.

Lift the cephalostat and carefully guide the cephalostat arm round the back of the X-ray so that the adaptor is behind the vertical carriage.

Position the adaptor so that it straddles the vertical carriage.



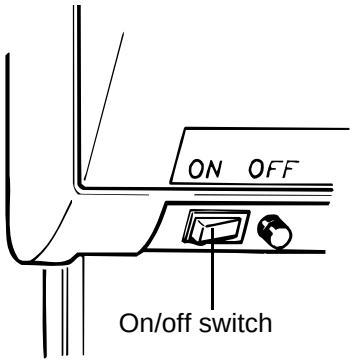
Secure the cephalostat to the vertical carriage with the four screws supplied.

6 CHECKING THE ALIGNMENT

6.1 Operating the X-ray

Switching the unit on

Connect the unit to a dedicated power supply with a voltage appropriate to the unit you are installing.



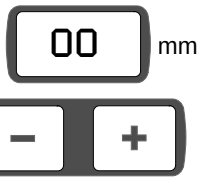
Switch the unit on. The on/off switch is located on the underside of the vertical carriage. The control panel indicator lights will come on and the X-ray will carry out a self-test during which the software version numbers of the lower and upper processor boards will appear on the display.

The same switch is used to switch the X-ray off.

When the self-test is complete a message (PASS) will appear briefly on the main display indicating that the X-ray has passed the self-test.

The time will then appear on the display which indicates that the unit is ready for use.

NOTE
If the letters Er (error) and a number (error code) appear on the display it means the X-ray did not pass the self-test. Refer to the PM 2002 EC Panoramic X-ray unit techncial manual for a list of error codes and what they mean.



If either the number on the focal trough positioning (mm) display or the time on main display starts to flash it indicates either that the patient positioning mechanism has lost its position or the clock has lost the time. This is due to CPU battery failure.

In either case recalibrate the setting, refer to the PM 2002 EC Panoramic X-ray unit techncial manual for information on how to do this, and then leave the unit switched on over night (12 hours) to recharge the battery. If, after switching the unit off and then on in the morning either indicator light starts to flash again it indicates that the CPU battery cannot be recharged and must be replaced. Refer to the PM 2002 EC Panoramic X-ray unit techncial manual.

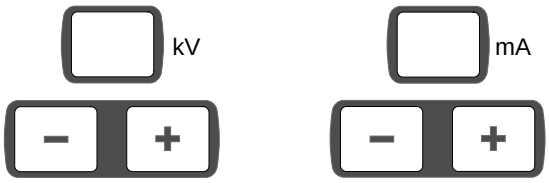
Clearing error codes

Error codes can be cleared from the display by pressing the control key. A list of the error codes and what they mean is given in the user's manual and the technical manual.

Entering and exiting the test mode

The test mode enables the X-ray to be operated without radiation being generated.

Press the control key to activate the additional function mode. The indicator light will come on.



Press any kV or mA key. The kV and mA displays will clear indicating that the X-ray tube has been switched off and that you have entered the test mode.

Repeat the above procedure to exit the test mode and switch the radiation on again. The mA and kV values will reappear on their respective displays.

Entering and exiting the service mode

Various settings and adjustments can only be made in the service mode.

CAUTION
WHEN YOU ARE IN THE SERVICE MODE IT IS POSSIBLE TO CHANGE SOME OF THE PRESET FACTORY SETTINGS. DO NOT PLAY WITH THE KEYS UNLESS YOU KNOW WHAT YOU ARE DOING.

To enter the service mode press and hold down the control (CTL) key and then, while still holding the control key down, press and hold down the hidden key (to the right of the panoramic mode selection key). After about four seconds the temperature of the tube head will appear on the main display and the READY key indicator light will start to flash. This indicates that you are in the service mode.

To exit the service mode press the hidden key. The current time will reappear on the main display

Planmeca Proline EC pan/ceph X-ray - selecting the cephalometric exposure mode

Press and hold the P key until you have heard two audible signals. The latest used exposure mode number starts to flash on the main display.

NOTE
If you are entering the exposure selection mode for the first time, the mode number CPH4 will start to flash on the main display.

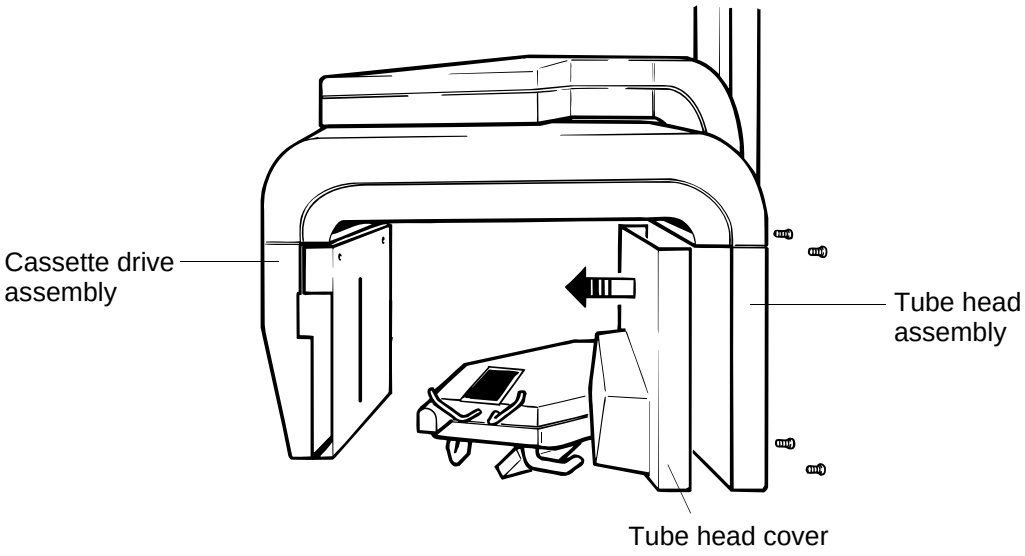
The program selection keys are used to scroll the exposure mode numbers. Press the minus (-) key to decrease the value and the plus (+) key to increase it. The menu is cyclical, after the last (first) choice the first (last) is displayed again.

NOTE
If you do not complete the exposure mode selection in 10 seconds, the unit automatically exits the selection mode and returns to the last selected mode.

The exposure mode is accepted by pressing the P key. The mode number stops flashing and the rotating unit and cassette carriage will move automatically to the correct position for taking cephalometric exposures. When it is in the correct position the ready key indicator light will come on and the number on the exposure time display will start to flash.

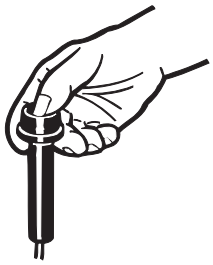
6.2 Planmeca Proline EC panoramic X-ray - checking the alignment of the radiation beam

Remove the inner cover from tube head assembly. Four screws hold the tube head cover in position, these are located at the rear of the tube head assembly. The primary slot mechanism is located under the tube head cover.



Press the ready key to drive the X-ray into the exposure position. The rotating unit and cassette carriage will move to their respective ready positions. When the X-ray is ready the indicator light on the ready key will come on.

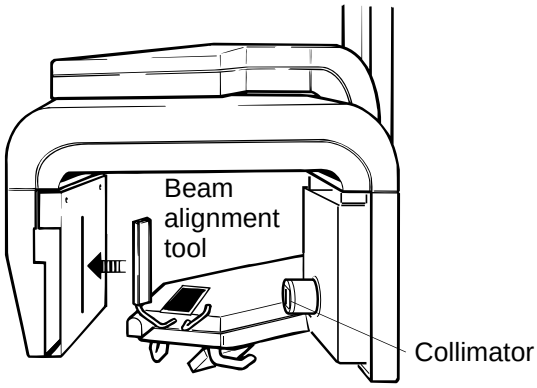
Enter the test mode (See section " Entering and exiting the test mode" on page 15) to switch the radiation off.



Press and hold down the exposure button to drive the rotating unit to a position where you can safely view the secondary slot when standing behind the tube head. Stop pressing the exposure button when the rotating unit is in a convenient position.

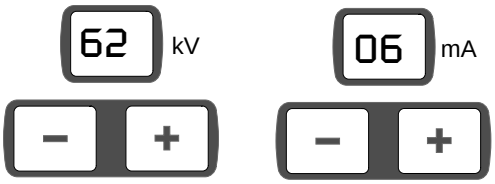
An error code will appear on the display and start to flash.

Clear the error code from the display (See section "Clearing error codes" on page 15).



Place the beam alignment tool into the secondary slot, it is magnetic so it will stay in position. Leave the cassette in position as it will reduce the amount of scattered radiation.

Enter the service mode (See section " Entering and exiting the service mode" on page 15).



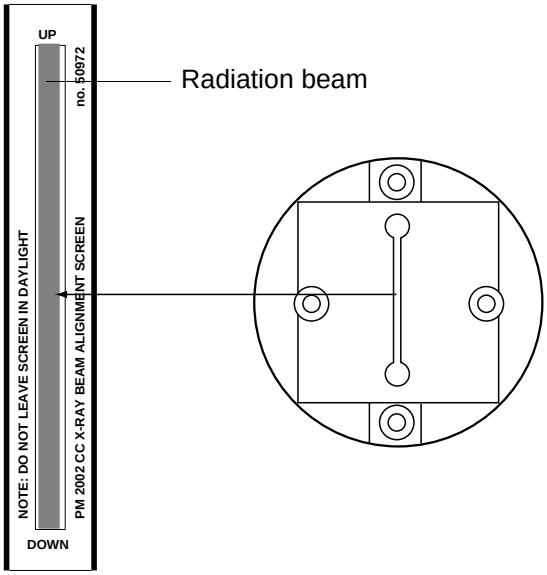
Select a kilovolt and a milliampere value high enough to enable the radiation beam to be seen in a darkened room for example 62kV and 6mA. The actual values will depend on how dark the room is.

Darken the room sufficiently so that you will be able to see the image of the radiation beam on the alignment tool (it is fluorescent and will glow when the radiation beam strikes it), but not so dark that you cannot see the borders of the alignment rectangle.

WARNING
RADIATION

Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam will appear on the alignment tool.

The radiation beam must appear within the borders of the rectangle marked on the alignment tool. If it does not refer to the Planmeca Proline EC panoramic X-ray technical manual for information on how to align it.

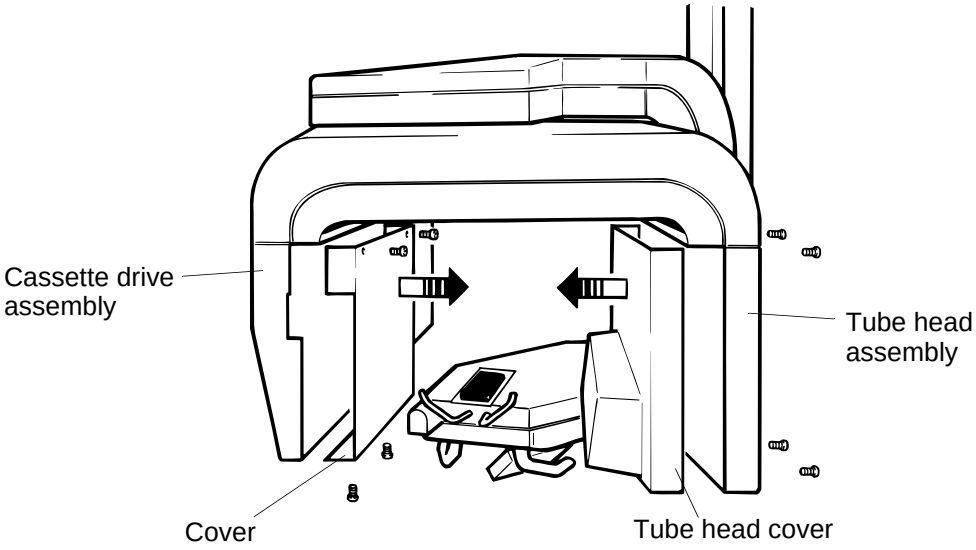


When the slot has been checked, and if necessary adjusted, exit the service mode, see section " Entering and exiting the service mode" on page 15.

You must now take an exposure to check that the patient positioning mechanism is correctly aligned, turn to section "6.6 Checking the alignment of the patient positioning mechanism" on page 29.

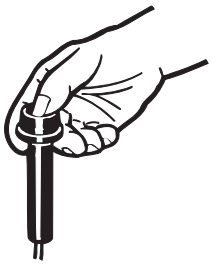
6.3 Planmeca Proline EC pan/ceph X-ray - checking the alignment of the radiation beam

Remove the inner covers from tube head assembly and the cassette drive assembly. Four screws hold the tube head cover in position, these are located at the rear of the tube head assembly. The screws that hold the cassette drive cover in place are located at the front and lower side of the cover. The primary slot mechanism is located under the tube head cover.



Press the ready key to drive the X-ray into the exposure position. The rotating unit and cassette carriage will move to their respective ready positions. When the X-ray is ready the indicator light will come on.

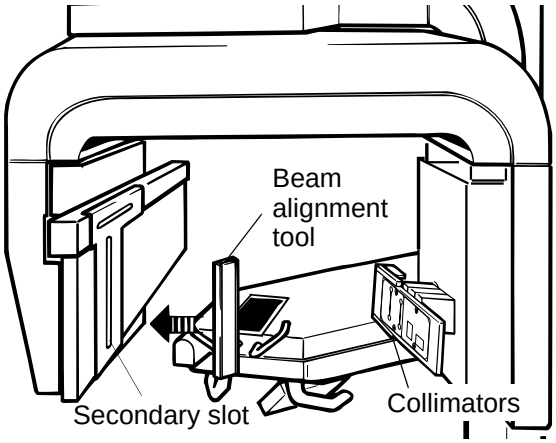
Enter the test mode (See section " Entering and exiting the test mode" on page 15) to switch off the radiation.



Press and hold down the exposure button to drive the rotating unit to a position where you can safely view the secondary slot when standing behind the tube head. Stop pressing the exposure button when the rotating unit is in a convenient position.

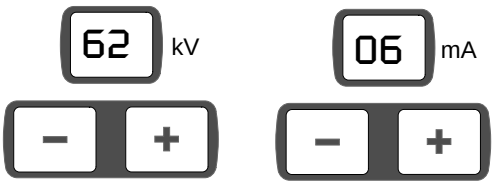
An error code will appear on the display and start to flash.

Clear the error code from the display (See section " Clearing error codes" on page 15).



Place the beam alignment tool into the secondary slot, it is magnetic so it will stay in position. Note which way round it goes. Leave the cassette in position as it will reduce the amount of scattered radiation.

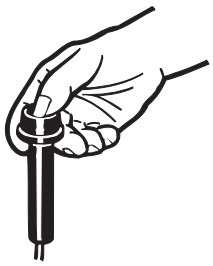
Enter the service mode (See section "Entering and exiting the service mode" on page 15). The panoramic collimator slot has been automatically selected.



Select a kilovolt and a milliampere value high enough to enable the radiation beam to be seen in a darkened room for example 62kV and 6mA. The actual values will depend on how dark the room is.

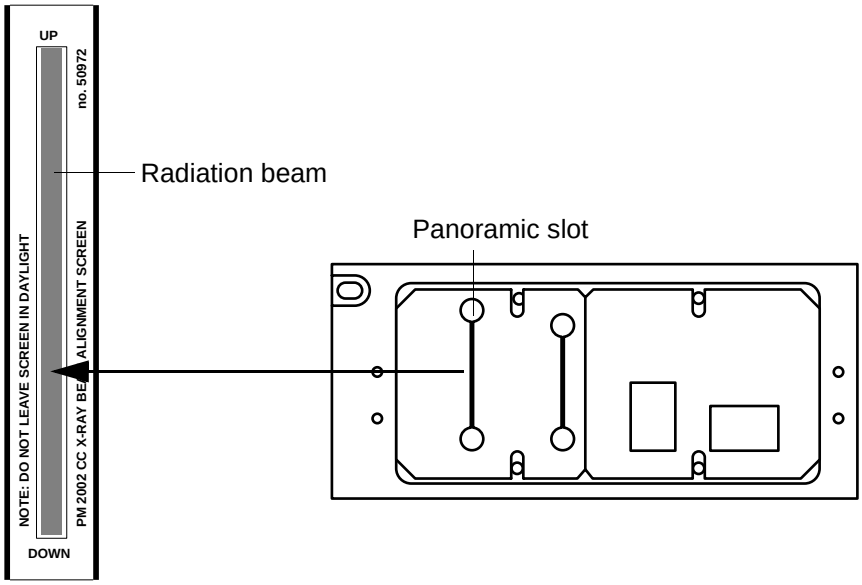
Darken the room sufficiently so that you will be able to see the image of the radiation beam on the alignment tool (it is fluorescent and will glow when the radiation beam strikes it), but not so dark that you cannot see the borders of the alignment rectangle.

WARNING
RADIATION



Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam from the panoramic slot will appear on the alignment tool.

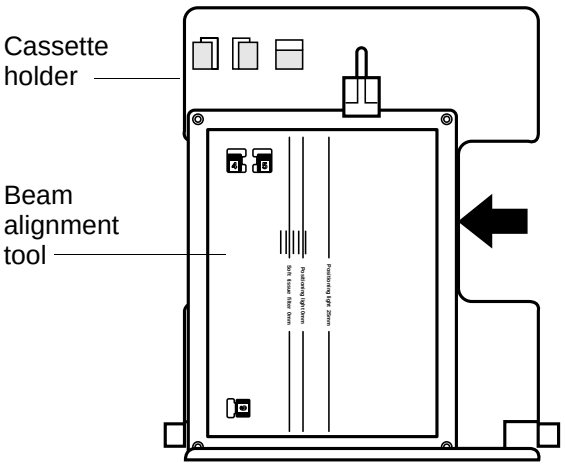
The radiation beam must appear within the borders of the rectangle marked on the alignment tool. If it does not refer to the PLANMECA X-ray service manual for information on how to align it.



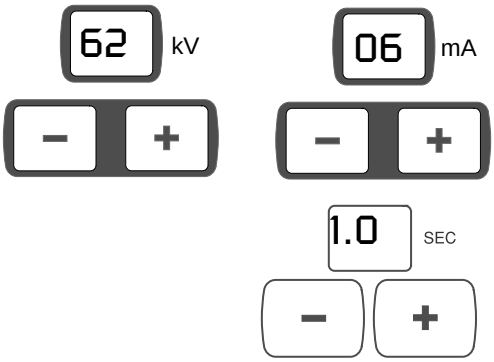
If the slot is misaligned refer to the Planmeca Proline EC Pan/Ceph X-ray technical manual for information how to align it.

Exit the service mode, see "Entering and exiting the service mode" on page 15.

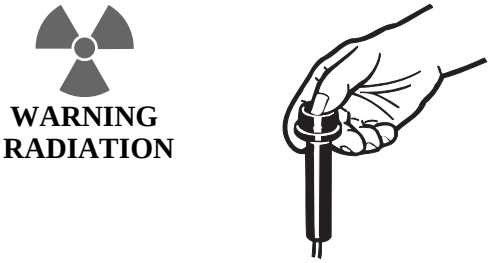
Orientate the cephalometric beam alignment tool so that it is vertical and then place it in the cephalometric cassette holder. Position it so that it is on the left of the cassette holder.



Select the cephalometric exposure mode number 4 (third collimator slot) with the program selection keys, see section "Planmeca Proline EC pan/ceph X-ray - selecting the cephalometric exposure mode" on page 16. The text CPH4 will appear on the main display.

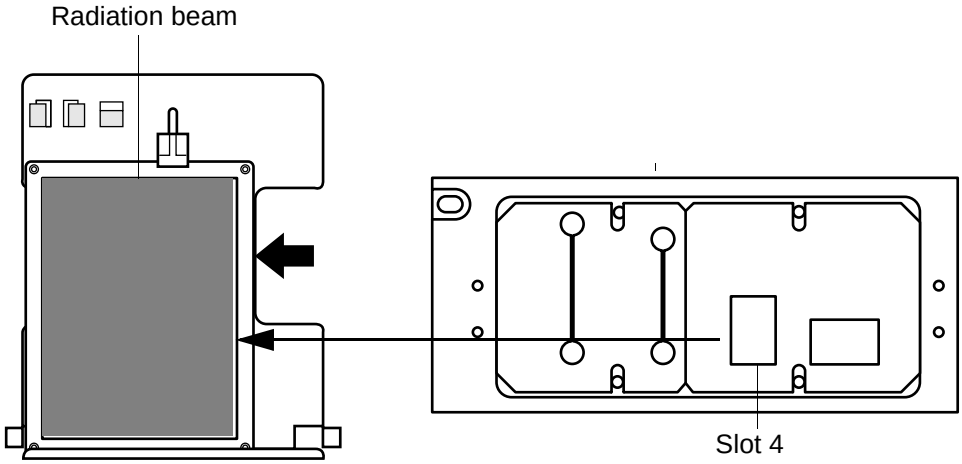


Select exposure values of approximately 62kV, a milliampere value of 6 and an exposure time of about one second. The actual values will depend on how dark the room is.

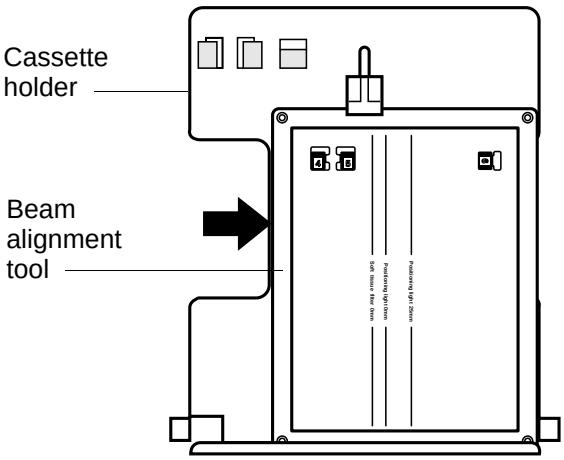


Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam from slot number 4 will appear on the alignment tool.

The radiation beam must appear within the borders of the rectangle marked on the alignment tool. If it does not refer to the Planmeca Proline EC Pan/Ceph X-ray unit technical manual for information on how to align it.



NOTE
The soft tissue filter will filter a narrow area of the left side of the radiation beam.



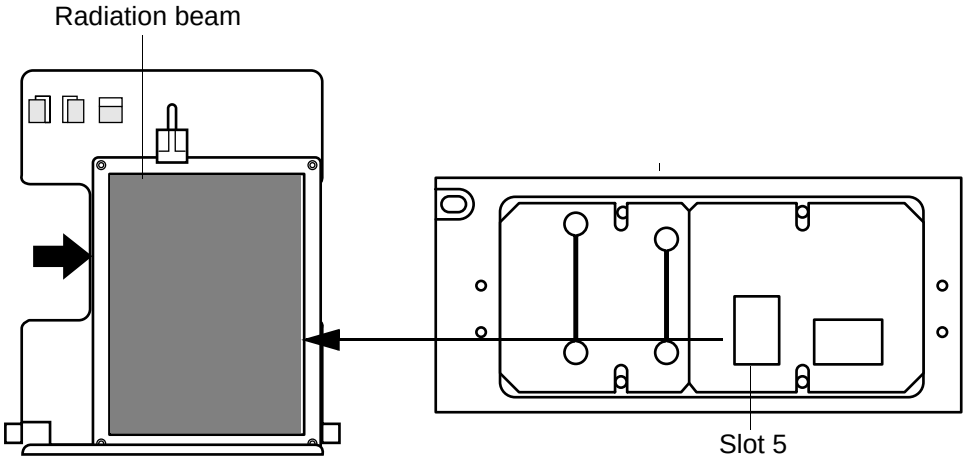
Slide the beam alignment tool to the right of the cassette holder.

Select the cephalometric exposure mode number 5 (third collimator slot) with the program selection keys, see section "Planmeca Proline EC pan/ceph X-ray - selecting the cephalometric exposure mode" on page 16. The text CPH5 will appear on the main display.

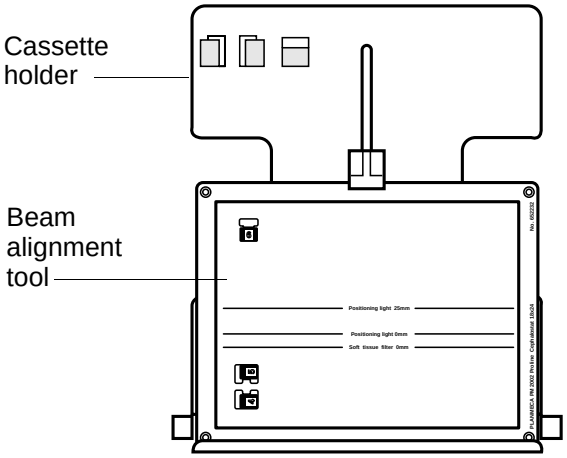
WARNING
RADIATION

Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam from slot number 5 will appear on the alignment tool.

The radiation beam must appear within the borders of the rectangle marked on the alignment tool. If it does not refer to the Planmeca Proline EC Pan/Ceph X-ray unit technical manual for information on how to align it.

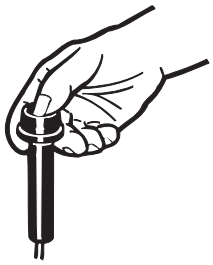


Turn the beam alignment tool so that it is horizontal.



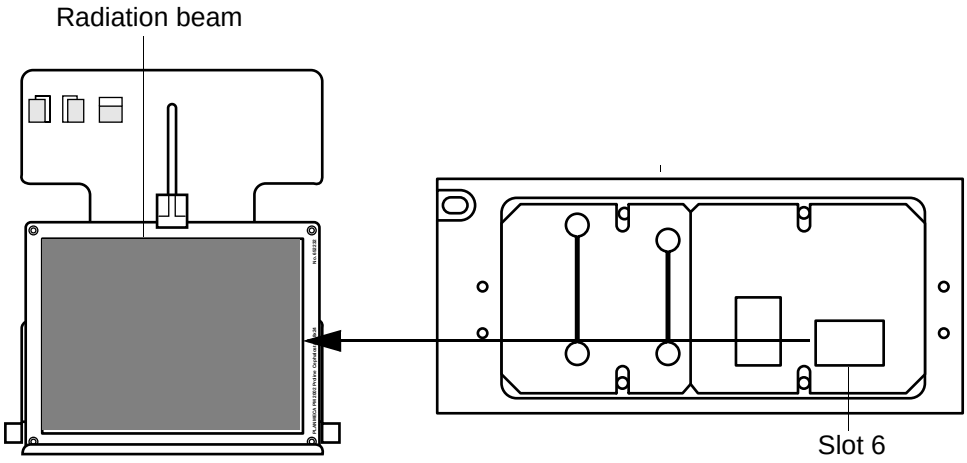
Select the cephalometric exposure mode number 6 (third collimator slot) with the program selection keys, see section "Planmeca Proline EC pan/ceph X-ray - selecting the cephalometric exposure mode" on page 16. The text CPH6 will appear on the main display.

WARNING
RADIATION



Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam from slot number 6 will appear on the alignment tool.

The radiation beam must appear within the borders of the rectangle marked on the alignment tool. If it does not refer to the Planmeca Proline EC Pan/Ceph X-ray unit technical manual for information on how to align it.

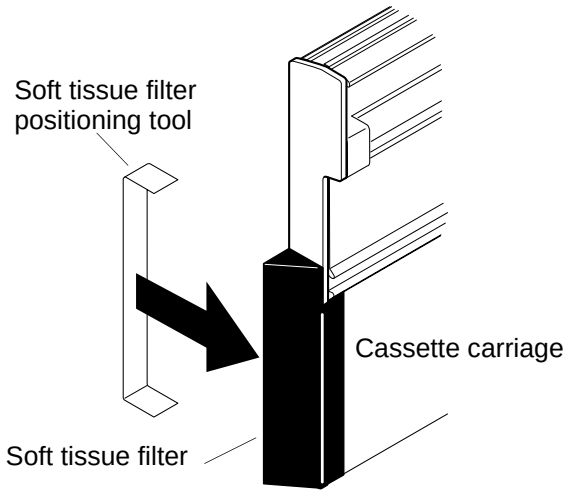


NOTE
The soft tissue filter will filter a narrow area of the left side of the radiation beam.

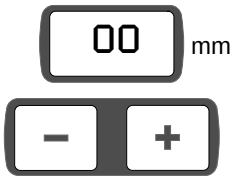
When all the slots have been checked, and if necessary adjusted, exit the service mode, see section " Entering and exiting the service mode" on page 15.

You must now check the position of the soft tissue filter. Turn to section "6.4 Planmeca Proline EC pan/ceph X-ray - checking the position of the soft tissue filter" on page 26.

6.4 Planmeca Proline EC pan/ceph X-ray - checking the position of the soft tissue filter

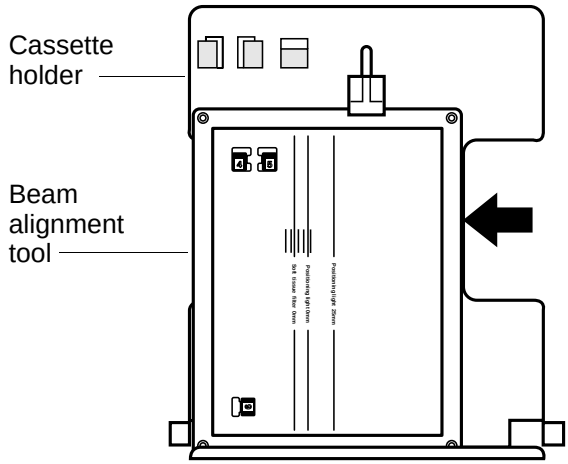


Clip the soft tissue filter positioning tool to the soft tissue filter which is at the end of the cassette carriage. This will enable you to see the soft tissue filter when you check its position.



Drive the soft tissue filter to the zero position by pressing the focal trough positioning keys.

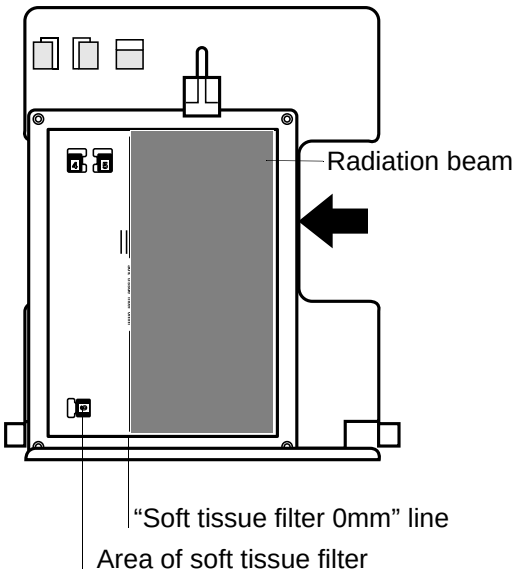
Select the cephalometric exposure mode number 4 (third collimator slot) with the program selection keys, see section "Planmeca Proline EC pan/ceph X-ray - selecting the cephalometric exposure mode" on page 16. The text CPH4 will appear on the main display.



Orientate the Cephalometric beam alignment tool so that it is vertical and then place it in the cephalometric cassette holder. Position it so that it is on the left of the cassette holder.

Select exposure values of approximately 62kV, a milli-ampere value of 6 and an exposure time of about one second. The actual values will depend on how dark the room is.

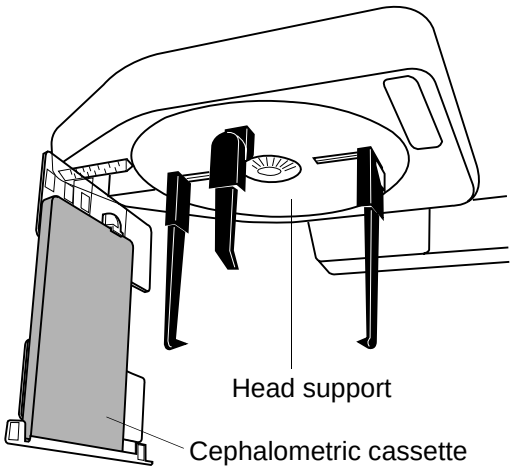
Stand behind the tube head and protect yourself from radiation. Press and hold down the exposure button. The image of the radiation beam from slot number 4 will appear on the alignment tool.



The radiation beam must appear within borders of the rectangle marked on the beam alignment tool and to the right of the line marked “Soft tissue filter 0mm”.

If the left-hand side of the radiation beam does not reach the line marked “Soft tissue filter 0mm” or extends passed the line the soft tissue filter is in the wrong position it must be repositioned. Refer to the Planmeca Proline EC Pan/Ceph X-ray unit technical manual for information on how to carry out this task.

6.5 Planmeca Proline EC pan/ceph X-ray - checking the alignment of the head support

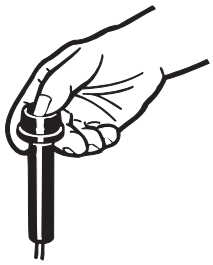


Rotate the head support to the 90° position and place the two ear posts into their holders if they are not already installed.

Embedded in the end of the left (V or L) ear post there is a metal ball and embedded in the end of the right ear post (O or R) is a metal ring. The images of these that appear on an exposed film are used to check the alignment of the ear posts.

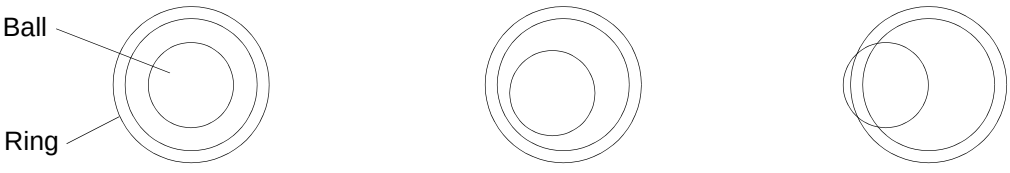
Place a film in the cephalometric cassette and slide the cassette into the cassette holder.

Select exposure values of approximately 70, a milliampere value of 10 and an exposure time of about half a second.



Protect yourself from radiation and take an exposure. Remove the film and process the film

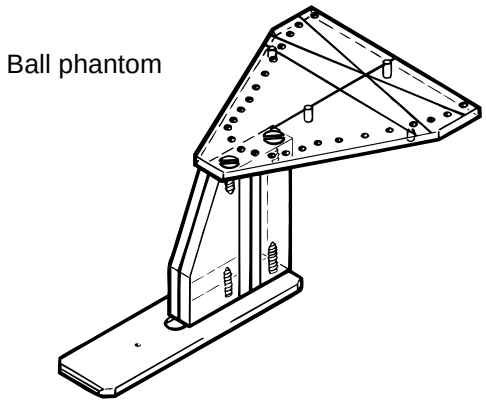
On the film you will see the images of a metal ball and a metal ring. They must be concentric, of if not exactly concentric there must be a small gap between the edge of the ball and the inner edge of the circle.



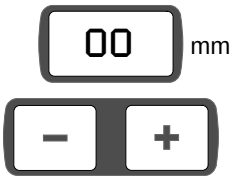
If the ball touches the ring the head support must be adjusted. Refer to the PM 2002 EC Pan/Ceph X-ray unit techncial manual.

6.6 Checking the alignment of the patient positioning mechanism

NOTE
If the PLANMECA AUTOPRINT film marking system is to be used with the X-ray you can check the operation of the AUTOPRINT at the same time as you check the position of the patient positioning mechanism. To do this enter suitable information into the AUTOPRINT system using the AUTOPRINT keyboard and then check that this information appears correctly on the ball phantom exposure. Refer to the user's manual supplied with the AUTOPRINT for information on how to use the system.

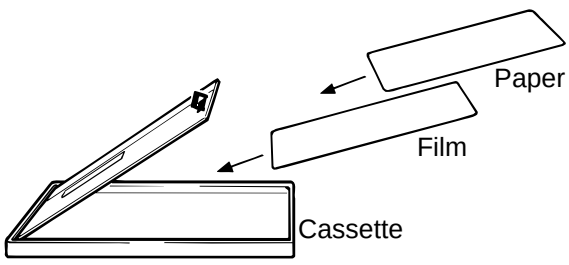


Slide the ball phantom into the patient positioning mechanism.



Set the position of the patient positioning mechanism to 00 with the patient positioning keys.

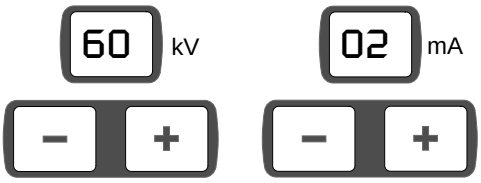
Press the return key to move the cassette carriage to the loading position.



In the darkroom open the cassette and place a film inside the cassette and then place a piece of paper the same size on top, the paper will reduce the radiation that reaches the film. Close the cassette.

Slide the cassette into the cassette holder. Make sure that you push it all the way in.

Enter the service mode.



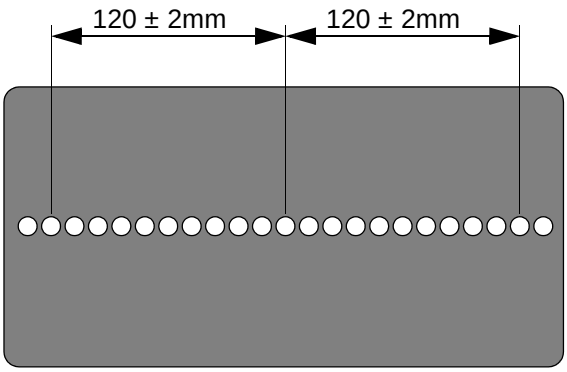
Select a kilovolt value of 60 and a milliampere value of 2. Note that these values must be selected to produce a clear ball phantom exposure and it is only possible to select these values in the service mode.

Exit the service mode.

Press the ready key to drive the X-ray to the exposure position. The rotating unit will move to the start position and the indicator light will come on.

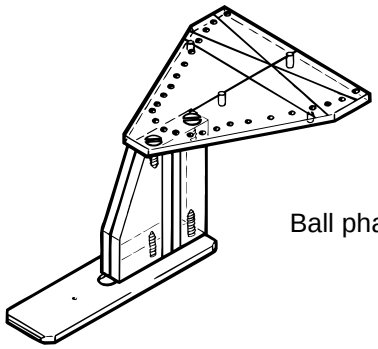
Take an exposure. Hold the exposure button down for the duration of the exposure.

Press the return key to return the cassette to the loading position, remove the cassette and process the film.

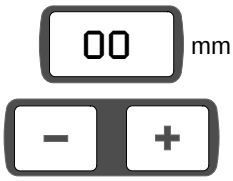


The images of 23 balls should appear on the film. They should be round, all the same size, and evenly spaced. Note that they will not necessarily be at the same vertical height. The distance from the center of the middle ball to the center of the tenth ball to the left and the tenth ball to the right should be 120mm ± 2mm. If this distance is not correct the patient positioning mechanism must be adjusted. Refer to PM 2002 EC Panoramic X-ray unit techncial manual for information on how to do this.

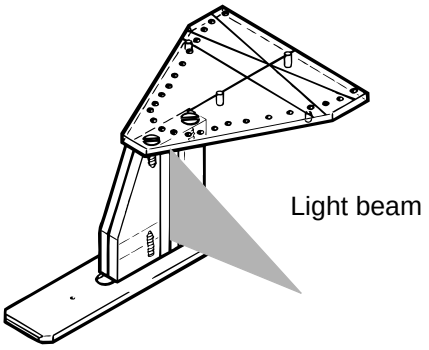
6.7 Checking the alignment of the focal trough positioning light



Use the ball phantom for checking the focal trough positioning light.



Press either of the focal trough positioning keys to switch the positioning light on and then a second time to drive the patient positioning mechanism to 00 if it is not already there.



The focal trough positioning light beam should be positioned so that it is on the black reference line on the side of the ball phantom.

If the light beam does not coincide with the black lines or it is not in focus, it should be adjusted. Refer to the PM 2002 EC Panoramic X-ray unit techncial manual.

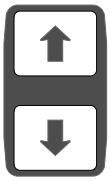
7 SETTING CUSTOMER PREFERENCES

7.1 Setting the clock

If the time that appears on the main display is not correct it must be reset.

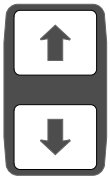
Press control key to activate the additional function mode. The indicator light will come on.

Press the clock key to enter the clock setting mode. The display digit indicating minutes will start to flash.



Press either of the height adjusting keys to set the correct minutes (0 - 9). The “up” key will increase the number and the “down” key will decrease it.

Each time you press the clock key different clock digits will start to flash:
- firstly minutes
- secondly hours
- thirdly days
- fourthly months
- and finally years.



Press either of the height adjusting keys to change any of the time settings that are incorrect.

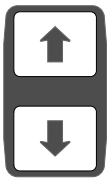
Press the ready key to exit the clock setting mode when you have finished setting the time.

7.2 Checking and changing the tone of the exposure warning signal

When an X-ray exposure is taken you will hear a warning tone indicating that radiation is being generated. The pitch of the tone can be altered if required.

Press the control key to activate the additional function mode. The indicator light will come on.

Press program key and the warning tone will come on.



Press either of the height adjusting keys to increase or decrease the pitch of the tone if required.

Press the ready key to accept the new or existing tone and exit the function mode.

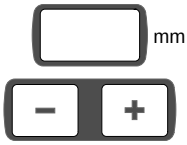
7.3 Adjusting the starting speed of the vertical carriage

The user may wish to change the speed at which the vertical carriage starts to move up and down.

Enter the service mode.

Press the control key to select the additional function mode. The indicator light will come on.

Press the “up” height adjusting key and the current upward starting speed of the vertical carriage as a percentage of the maximum speed will appear on the display.



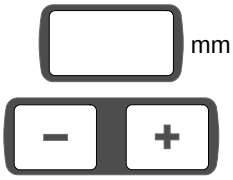
Press either of focal trough positioning keys to increase or decrease the speed. The new value will appear on the display.

Press the “up” height adjusting key to check the speed. The vertical carriage will move up at the new speed.

Press the ready key to accept the new speed. The temperature will reappear on the display.

Press the control key to select the additional function mode. The indicator light will come on.

Press the “down” height adjusting key and the current downward starting speed of the vertical carriage as a percentage of the maximum speed will appear on the display.



Press either of patient positioning keys to increase or decrease the speed. The new value will appear on the display.

Press the “down” height adjusting key to check the speed. The vertical carriage will move down at the new speed.

Press the ready key to accept the new speed. The temperature will reappear on the display.

Exit the service mode.

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