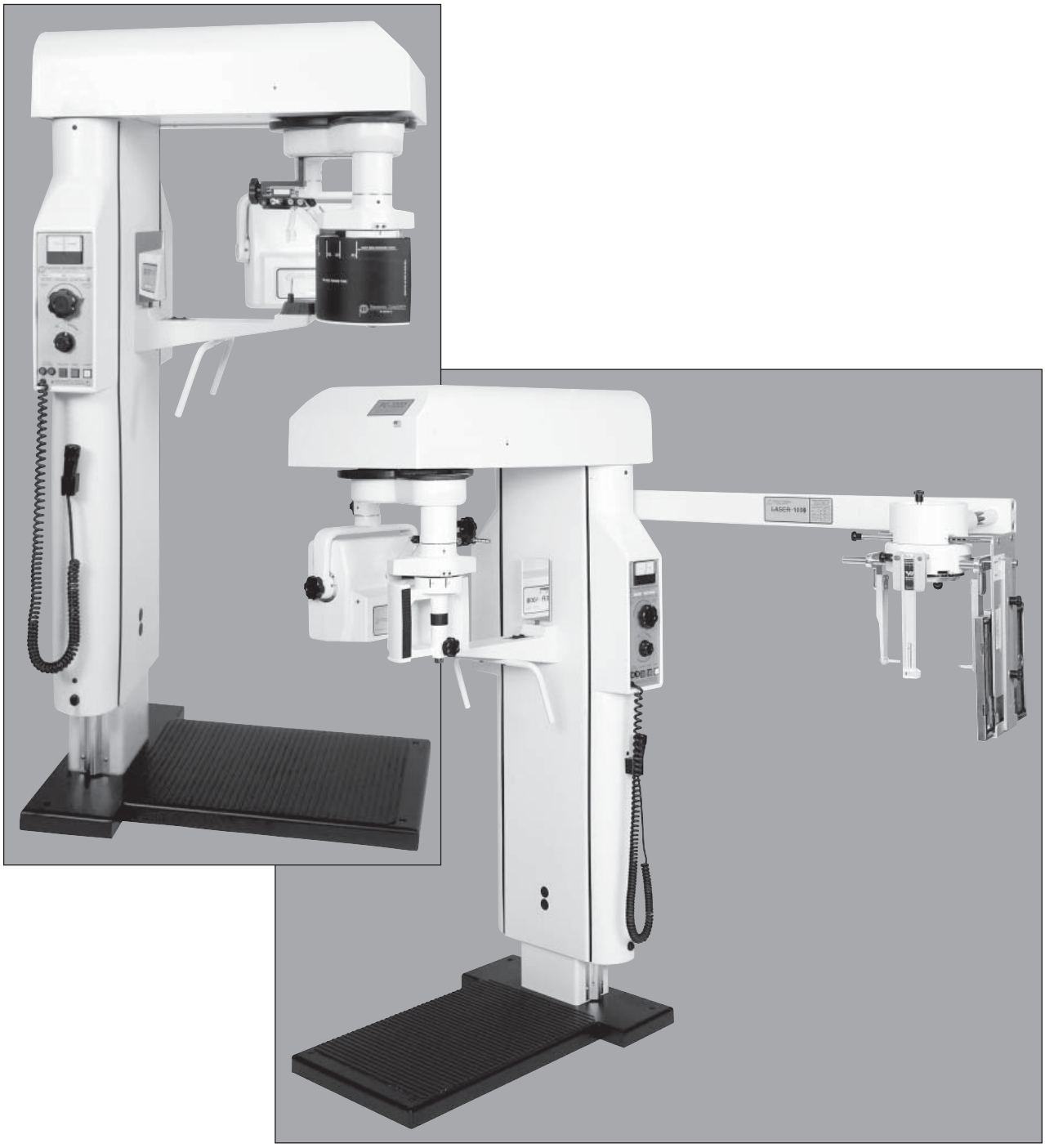
PC-1000/Laser 1000 Service Manual



Panoramic Corporation Dental Panoramic/Cephalometric X-ray Machine

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SM6000 Rev C

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Introduction

Purpose
Panoramic Corporation provides this printed manual as a guide for the operation of the PC-1000 dental panoramic X-ray machine and the PC-1000/Laser 1000 dental panoramic/cephalometric dental X-ray machine.

The PC-1000 will enable the user to take panoramic X-ray images. The PC-1000/Laser 1000 will enable the user to take panoramic X-ray images, as well as cephalometric X-ray images. A laser alignment device is incorporated into the PC-1000/Laser 1000.

The information contained in this manual is not all inclusive and Panoramic Corporation should be contacted for assistance and clarification when necessary.

It is imperative that this equipment be installed, serviced, and used by personnel familiar with the precautions required to prevent excessive exposure to both primary and secondary radiation. This equipment features protective designs for limiting both the primary and secondary radiation produced by the X-ray beam. However, design features cannot prevent carelessness, negligence, or lack of knowledge.

Only personnel authorized by Panoramic Corporation are qualified to install and service this equipment. Any attempt to install or service this equipment by anyone not so authorized will void the warranty.

Statement of Compatibility **January 1, 1988**
Please address any comments/questions concerning this statement of compatibility to:
Panoramic Corporation • 4321 Goshen Road • Fort Wayne, IN 46818 USA • Attn: Director of Engineering

The only components compatible with the PC-1000 are those supplied with the machine.

Regardless of possible statements made by other manufacturers, no one is authorized or certified to make additions or deletions to this machine. Only the combination of components delivered with the machine is certified compatible by the manufacturer. As compatible accessories become available, Panoramic Corporation will certify them as compatible and make them available to the user.

Statement of Compatibility Addendum **October 1, 1988**
The Laser 1000 Cephalometric Attachment is certified by Panoramic Corporation to be compatible with the PC-1000 dental X-ray machine, provided installation is performed by an authorized representative utilizing specific installation instructions furnished by Panoramic Corporation.

Statement of Compatibility Addendum **October 1, 1995**
Laser 1000 Cephalometric Attachments manufactured after October 1, 1995 are compatible only with

Introduction

Voltage Regulator Warning
Do not plug this machine into **ANY** voltage regulating device. Contact Panoramic Corporation with any questions regarding this.

X-ray Shielding Requirements
The requirements for panoramic and cephalometric shielding for building, operator, and patient, depend on state and local regulations. Contact your state Department of Health for compliance information. Compliance could involve a blueprint review, facility check, wall construction, film badge implementation, remote switch installation, and/or a lead apron. It is beyond the scope of this manual to advise on these regulations.

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Pre-Installation Check

Electrical Requirements
Optimally, the PC-1000 and the PC-1000/Laser 1000 should have a dedicated 105-125 VAC, 20 A circuit with line regulation of 5% or better. If a dedicated circuit is not available, a regular 20 A circuit will work as long as it is not taxed by other loads beyond 5 A. A standard 115 VAC, three-wire, grounded, electrical outlet should be installed by an electrician behind the machine.

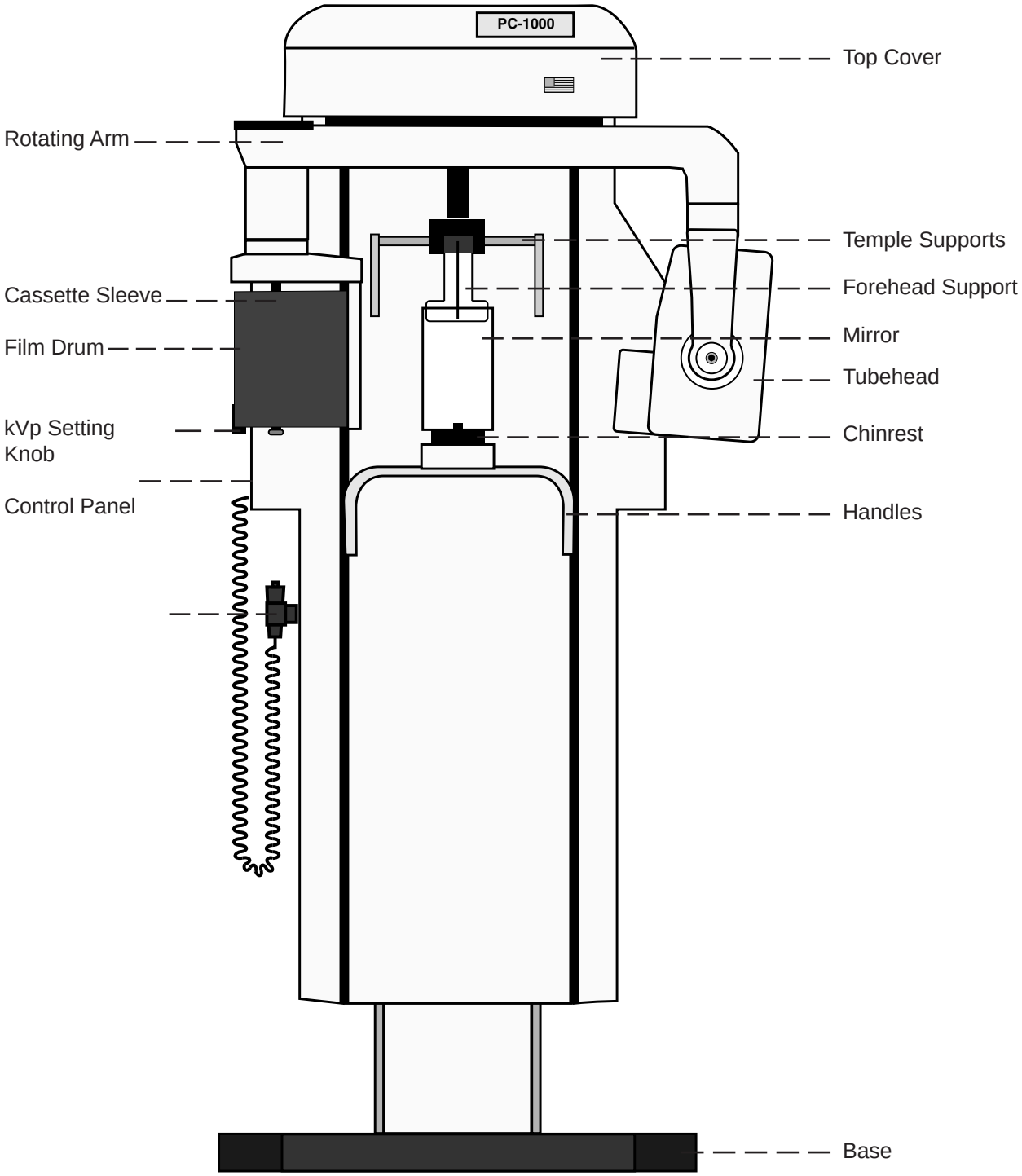
Control Panel Orientation
The control panel on the PC-1000 and the PC-1000/Laser 1000 is mounted directly on the side of the machine and requires no separate installation, wiring, or mounting. Although the control panel is mounted on the patient's left side from the factory, it can be easily relocated to the opposite side during installation. Verify with the doctor on which side the control panel should be located.

Cephalometric Arm Orientation
The cephalometric arm for the PC-1000/Laser 1000 is shipped in a separate box and can be mounted on either side of the machine. Verify with the doctor on which side the cephalometric arm should be located.

Remote Switch
Some states and local governments require that the exposure switch to be remotely installed. A remote switch kit is available from Panoramic Corporation. Refer to Appendix G for detailed procedures.

Darkroom Requirements
Proper darkroom facilities must be present before installing the PC-1000 or PC-1000/Laser 1000. The darkroom will be used to process test films at the time of installation to verify proper calibration. Refer to Appendix A for darkroom requirements and processing procedures.

PC-1000 Components



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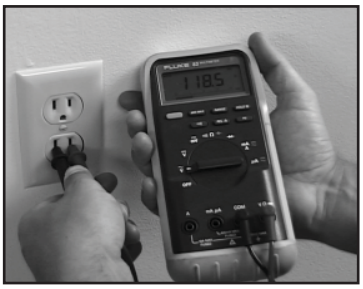
PC-1000 Installation

If there is any question concerning installation or calibration, please contact Panoramic Corporation immediately.

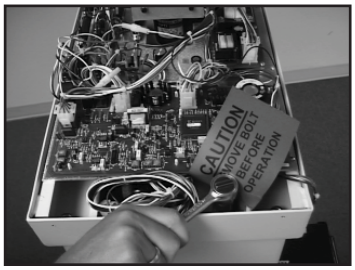


Tools Required
Multimeter, regular and phillips screwdrivers, allen wrenches, small fluorescent screen, knife, level, and a pulse counter or stopwatch.

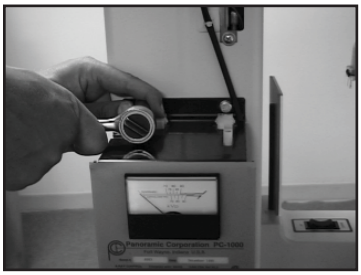
Verify Power
Verify that the outlet is a 110 VAC grounded outlet.

Remove Packaging and Shipping Restraints

1. Carefully remove all shipping packaging from the PC-1000, including the plastic wrap, cardboard, and wooden cover. Unpack the side and top covers shipped in the separate box.

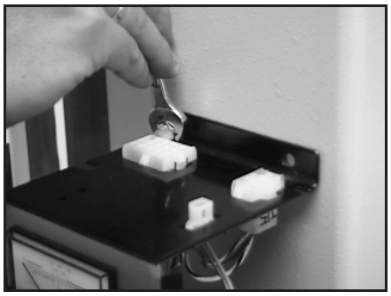


2. Remove the 3/4" hex head shipping bolt from the top rear of the overhead chassis. The shipping bolt is located between the aluminum chassis and the rear of the machine. There may be 1 or 2 shipping bolts. Leave these bolts with the office for future relocation.



Control Panel Relocation
Verify with the doctor, on which side the control panel needs to be located. To relocate it the opposite side:

1. Remove the 4 7/16" mounting bolts from the control panel.
2. Move the control panel to the opposite side of the machine, while carefully routing the wiring harness.
3. Reinstall the 4 7/16" bolts in the control panel.



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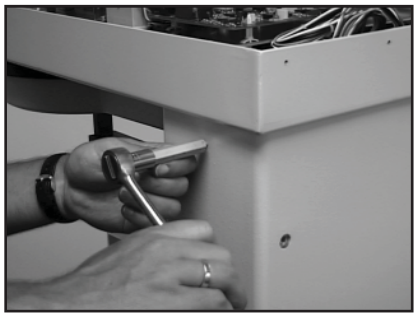
PC-1000 Installation

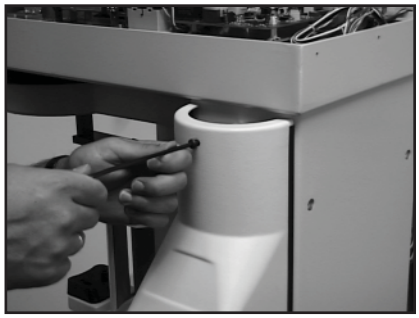
Install Side Covers

1. Install 3 metal standoffs in the pre-threaded holes on the side of the column opposite the control panel.

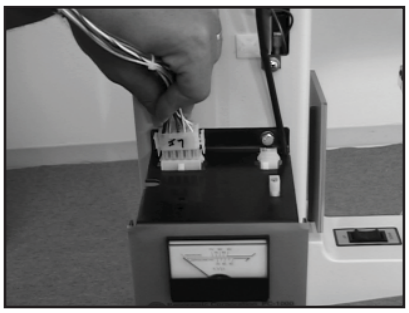


2. Place the side cover without the power cord over the standoffs.

3. Insert 3 allen head bolts into the holes in the side cover and tighten into the metal standoffs.



4. Install 3 metal standoffs in the pre-threaded holes on the control panel side of the column.



5. Locate the wire with the 15-pin molex connector J7 in the overhead and connect it to the 15-pin P7 connector on the top of the control panel.

6. Connect the 6-pin molex connector P15 on the main power cord in the side cover to the 6-pin connector J15 on the top of the control panel.

7. Route the power cord through the notches on the side of the control panel while placing the side cover over the standoffs.

8. Insert 3 allen head bolts into the holes in the side cover and tighten into the metal standoffs.

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PC-1000 Installation

Install Film Drum Assembly

1. Slide the black plastic cover off of the end of the rotating arm.

2. Remove the cardboard packing material from the rotating arm.

3. Remove the set screw, crown nut, and washer from the film drum spindle.

4. Insert the film drum spindle down through the rotating arm.

5. Install the film drum with the knob closest to the floor. Slide the film drum onto the spindle up as far as possible and tighten the film drum knob to temporarily hold the film drum in place.

6. Slide the flat washer up on the film drum spindle.

7. Install the crown nut on the film drum spindle with the slots in the crown nut facing up.

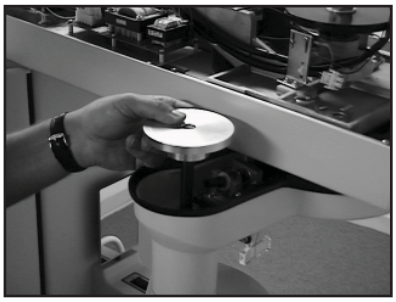
8. Thread the crown nut until the lower edge of the threaded hole in the film drum spindle is aligned to the lower edge of a slot in the crown nut.

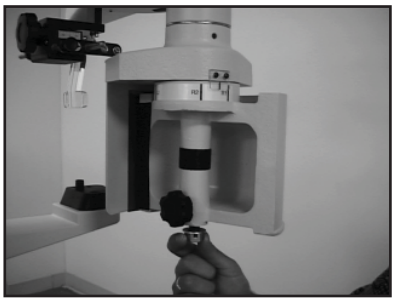
9. Insert the set screw in the threaded hole in the film drum spindle and tighten the screw.

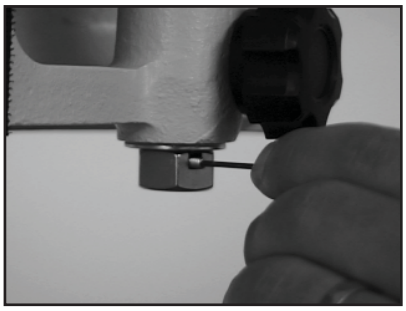
10. While supporting the film drum, loosen the film drum knob to allow the film drum to rest on the washer and crown nut.

11. Slide the black plastic cover back on the end of the rotating arm.

Note: *The film drum will rotate with increased friction after the film drum knob is tightened. Manual rotation, while the knob is tight, should be avoided to prevent abnormal wear.*







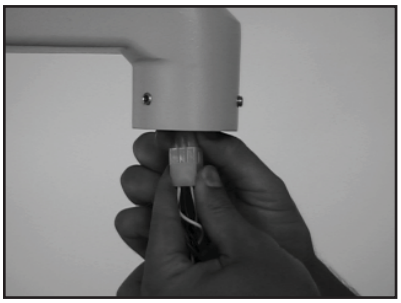
PC-1000 Installation

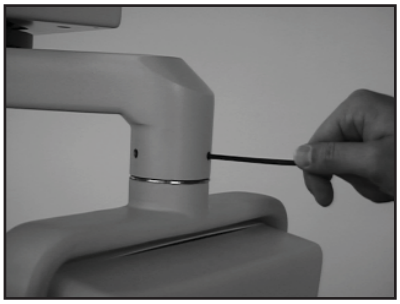
Install Tubehead Assembly

1. Connect the 6-pin molex connector from the end of the rotating arm to the 6-pin connector on the tubehead.

2. Carefully raise the tubehead into position facing the film drum, ensuring that the wires are not stressed or pinched.

3. Tighten the three set screws, then back each out slightly to allow alignment of the tubehead.

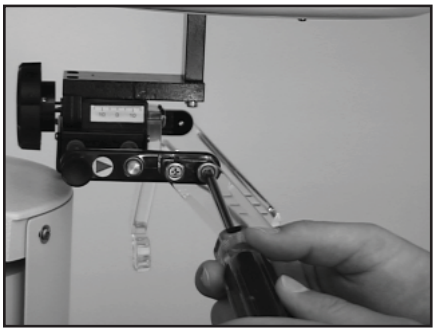




Install Temple Supports

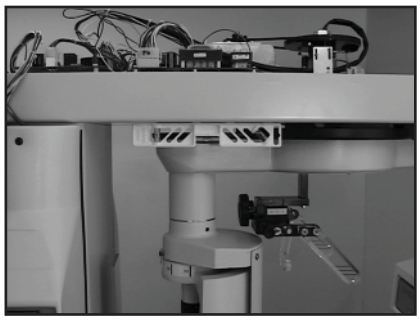
1. Install the 2 temple supports using the existing screws and washers in the head support assembly.

2. Ensure that the temple supports are angled away from the machine and that the horizontal red lines on the temple supports are facing out.



Level Machine

With a level on the underside of the main overhead chassis, level the machine in all directions using the 4 four adjustable feet under the base.



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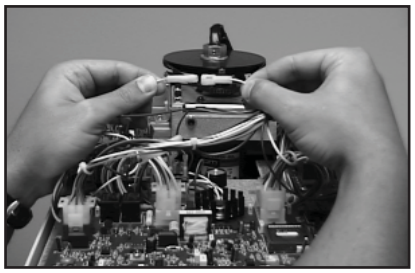
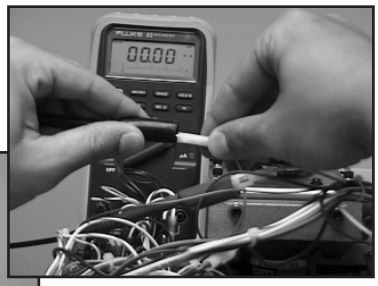


Perform mA Calibration

1. Disconnect the yellow wire, 1-pin molex connector in the overhead chassis.



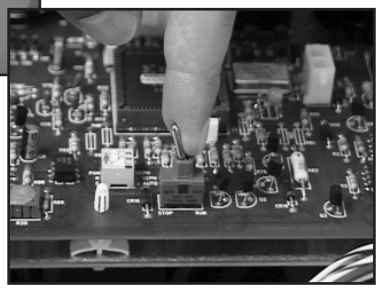
2. Connect a DC milliammeter in series with the molex connectors, positive lead to the male connector, negative lead to the female connector.

3. Power the machine on.

4. Using the function switch on the control panel, select PANORAMIC L or PANORAMIC R.

5. Using the kVp setting knob on the control panel, set the kVp meter to 80 kVp on the PANORAMIC scale.

6. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to STOP.



7. Locate the mA adjustment knob P1 in the overhead chassis.

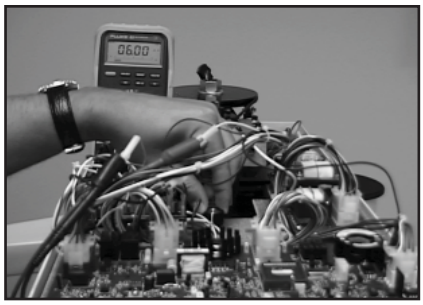
CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

8. Depress the exposure switch.

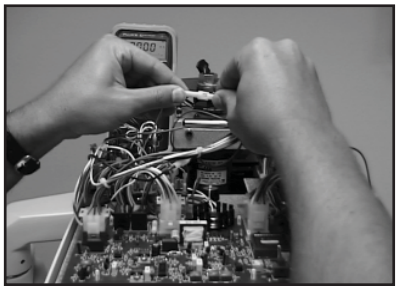
9. The milliammeter should show 6.0 mA ± .05 mA. If it does not:
   A. Adjust P1 clockwise (CW) to <u>increase</u> the mA until the milliammeter shows 6.0 mA ± .05 mA.

OR

   B. Adjust P1 counterclockwise (CCW) to <u>decrease</u> the mA until the milliammeter shows 6.0 mA ± .05 mA.



Note: *Contact Panoramic Corporation if the mA cannot be set to 6.0 mA ± .05 mA.*



10. Disconnect the milliammeter.

11. Reconnect the yellow wire, 1-pin molex connectors.

12. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to RUN.

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PC-1000 Installation

Perform Pulse Count Calibration

If a pulse counter **IS** available:

1. Disconnect the blue wire, 1-pin molex connector in the overhead chassis.

2. Connect the positive lead of a pulse counter to the male connector, negative lead to the aluminum chassis or neutral wire from the plug.

3. Power the machine on.

4. Using the function switch on the control panel, select PANORAMIC L.

5. Using the kVp setting knob on the control panel, set the kVp meter to 80 kVp on the PANORAMIC scale.

6. Ensure that the RUN/STOP switch on the printed circuit board in the overhead chassis is set to RUN.

7. Locate potentiometer R57 on the printed circuit board in the overhead chassis.

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

8. Depress the exposure switch for the entire 12 second exposure.

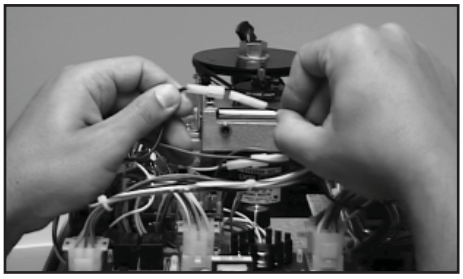
9. The pulse counter should show 720 pulses ± 10 pulses. If it does not:
   A. Adjust R57 counterclockwise (CCW) to increase the pulses and repeat the test until the pulse counter shows 720 pulses ± 10 pulses.

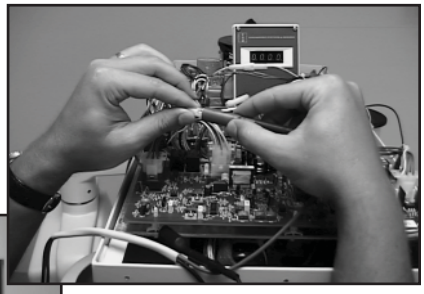
OR

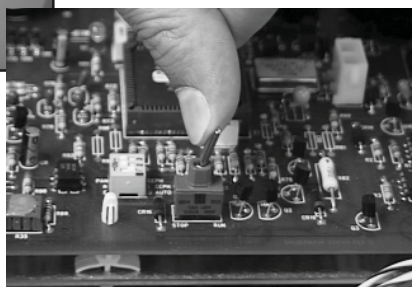
   B. Adjust R57 clockwise (CW) to decrease the pulses and repeat the test until the pulse counter shows 720 pulses ± 10 pulses.

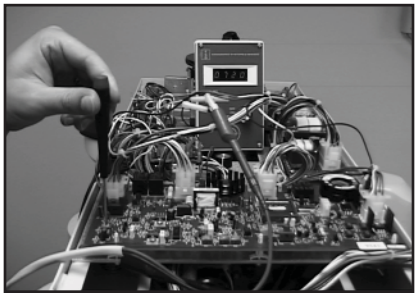
10. Disconnect the pulse counter.

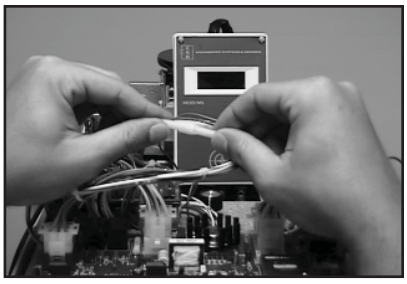
11. Reconnect the blue wire, 1-pin molex











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PC-1000 Installation

If a pulse counter **IS NOT** available:

1. Power the machine on.

2. Using the function switch on the control panel, select PANORAMIC L.

3. Using the kVp setting knob on the control panel, set the kVp meter to 0 kVp on the PANORAMIC scale.

4. Ensure that the RUN/STOP switch on the printed circuit board in the overhead chassis is set to RUN.

5. Use a stopwatch to time the duration of an exposure by timing the red exposure indicator on the control panel.

6. Locate potentiometer R57 on the printed circuit board in the overhead chassis.

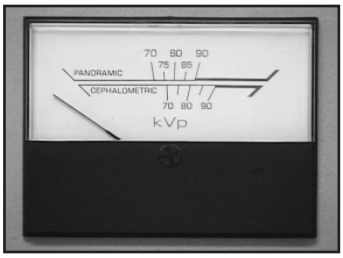
CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

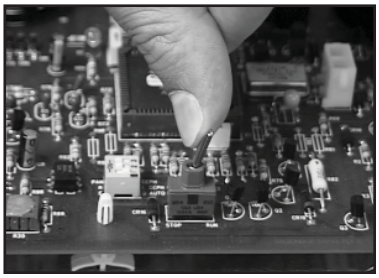
7. Depress the exposure switch for the entire 12 second exposure.

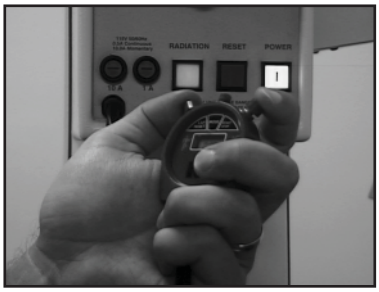
8. The stopwatch should show that the exposure is 12 seconds ± .5 seconds. If it does not:
   A. Adjust R57 counterclockwise (CCW) to <u>increase</u> the time and repeat the test until the stopwatch shows that the exposure is 12 seconds ± .5 seconds.

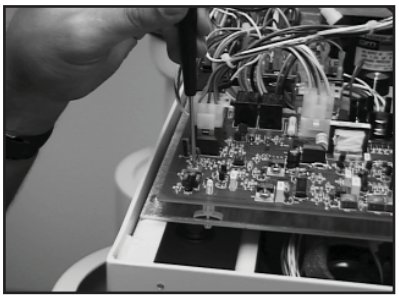
OR

   B. Adjust R57 clockwise (CW) to <u>decrease</u> the time and repeat the test until the stopwatch shows that the exposure is 12 seconds ± .5 seconds.









PC-1000 Installation

Perform X-ray Beam Alignment

1. Power the machine on.

2. Using the function switch on the control panel, select PANORAMIC L.

3. Using the kVp setting knob on the control panel, set the kVp meter to 90 kVp on the PANORAMIC scale.

4. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to STOP.

5. Temporarily affix a fluorescent screen behind the film drum mask (slotted plate in front of the film drum).

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

6. Darken the room and depress the exposure switch.

7. The fluorescent screen should glow, denoting the presence of X-rays. Adjust the tubehead so that the X-ray beam is centered horizontally in the film mask slot, and that the top edge of the X-ray beam is aligned to the top edge of the film drum mask slot.

8. Tighten the 3 set screws locking the tubehead assembly horizontally and the large allen bolt on the right side of the tubehead locking it vertically. Verify that the X-ray beam is still centered.

9. Remove the fluorescent screen.

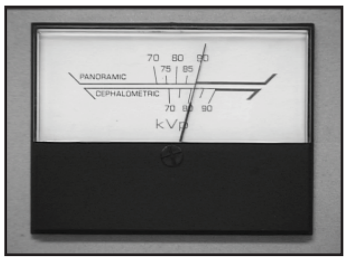
10. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to RUN.

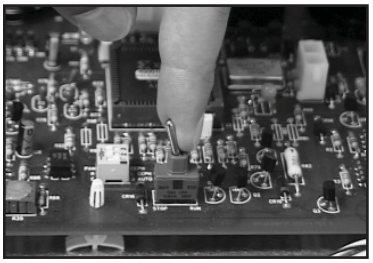
11. Using the kVp setting knob on the control panel, set the kVp meter to 70 kVp on the PANORAMIC scale.

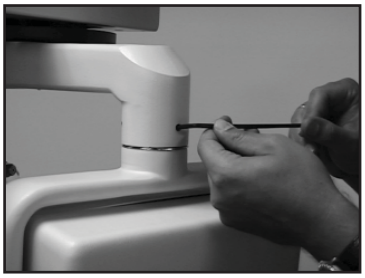
12. Place a loaded film cassette sleeve on the film drum and align the L1 pointer.

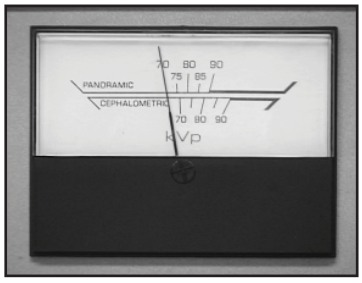
13. Depress the exposure switch for the entire 12 second exposure.

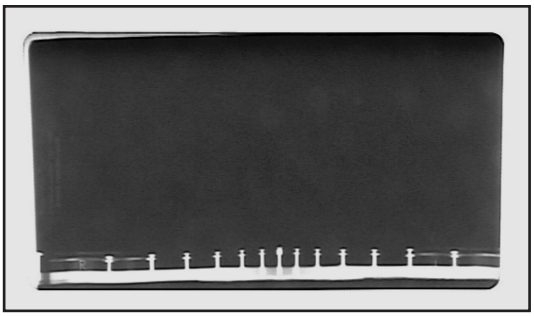
14. Process the film to verify proper alignment. The film should be black with clear edges.











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PC-1000 Installation

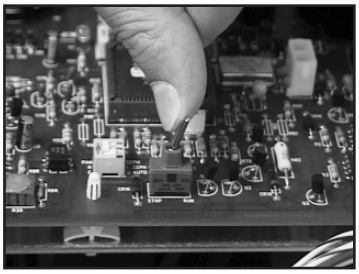
Install Top and Rear Covers

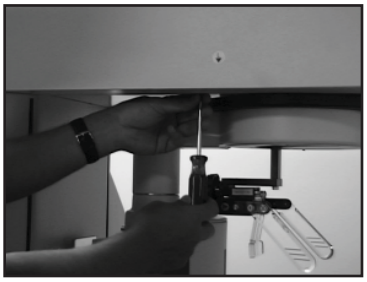
1. Ensure that the RUN/STOP switch on the printed circuit board in the overhead is in the RUN position.

2. Slide the top cover on the machine from the front. Ensure that the wiring on the control panel side is properly routed.

3. Install the 6 screws on the underside of the top cover.

4. Place the cover on the rear of the machine and install the 3 screws.



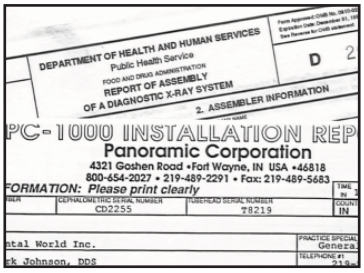


Complete Installation

1. Verify all steps have been completed.

2. Refer to the PC-1000/Laser 1000 User Manual and train the staff thoroughly.

3. Complete the Panoramic Corporation Installation Report and the FDA 2579 paperwork and distribute accordingly.


DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
FOOD AND DRUG ADMINISTRATION
REPORT OF ASSEMBLY
OF A DIAGNOSTIC X-RAY SYSTEM
D
2. ASSEMBLER INFORMATION
PC-1000 INSTALLATION REP
Panoramic Corporation
4321 Goshen Road • Fort Wayne, IN USA • 46818
800-654-2027 • 219-489-2291 • Fax: 219-489-5683
FORMATION: Please print clearly
CEPHALOMETRIC SERIAL NUMBER
CD2255
TUBEHEAD SERIAL NUMBER
T8219
IN
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General
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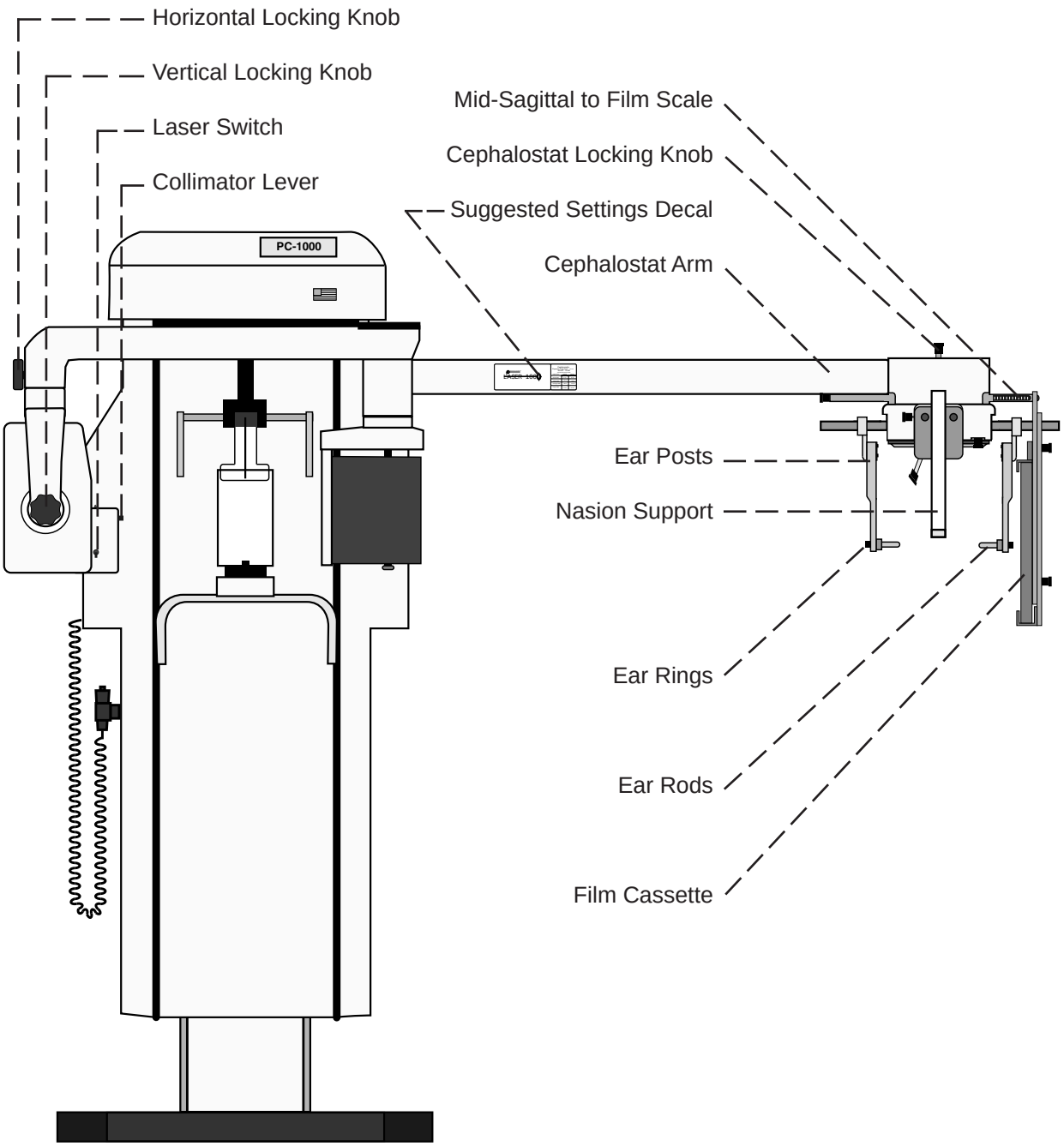
PC-1000/Laser 1000 Components



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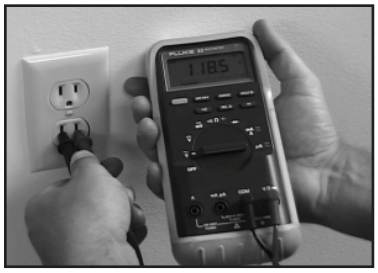
PC-1000/Laser 1000 Installation

If there is any question concerning installation or calibration, please contact Panoramic Corporation immediately.

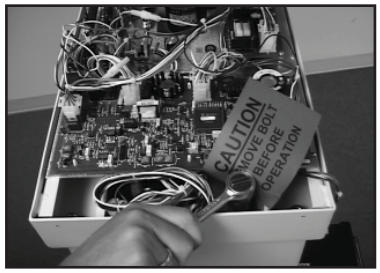


Tools Required
Multimeter, regular and phillips screwdrivers, allen wrenches, small fluorescent screen, knife, level, and a pulse counter.

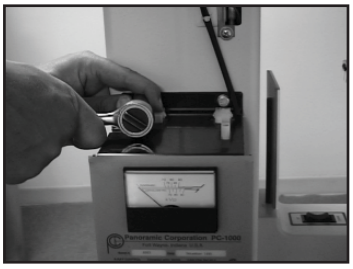
Verify Power
Verify that the outlet is a 110 VAC grounded outlet.

Remove Packaging and Shipping Restraints

1. Carefully remove all shipping packaging from the PC-1000/Laser 1000, including the plastic wrap, cardboard, and wooden cover. Unpack the side and top covers, and the cephalometric arm shipped in the separate box.

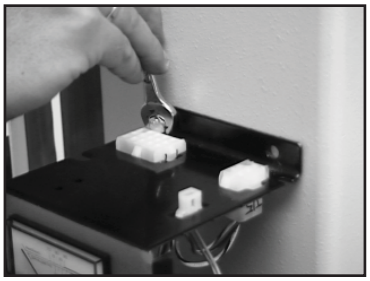


2. Remove the 3/4" hex head shipping bolt from the top rear of the overhead chassis. The shipping bolt is located between the aluminum chassis and the rear of the machine. There may be 1 or 2 shipping bolts. Leave these bolts with the office for future relocation.



Control Panel Relocation
Verify with the doctor, on which side the control panel needs to be located. To relocate it the opposite side:

1. Remove the 4 7/16" mounting bolts from the control panel.
2. Move the control panel to the opposite side of the machine, while carefully routing the wiring harness.
3. Reinstall the 4 7/16" bolts in the control panel.



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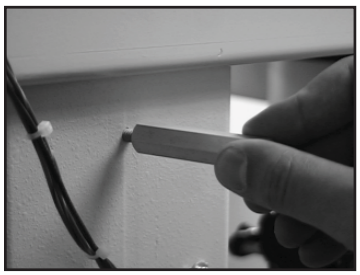
PC-1000/Laser 1000 Installation

Install Side Covers

1. Install 3 metal standoffs in the pre-threaded holes on the side of the column opposite the control panel.

2. Place the side cover without the power cord over the standoffs.

3. Insert 3 allen head bolts into the holes in the side cover and tighten into the metal standoffs.



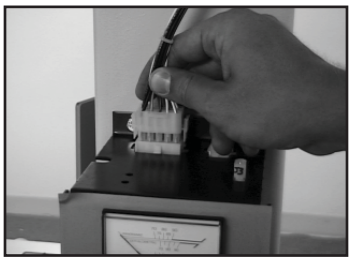
4. Install 3 metal standoffs in the pre-threaded holes on the control panel side of the column.

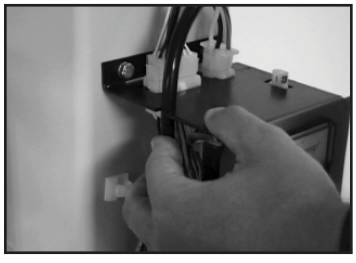
5. Locate the wire with the 15-pin molex connector J7 in the overhead and connect it to the 15-pin P7 connector on the top of the control panel.

6. Connect the 6-pin molex connector P15 on the main power cord in the side cover to the 6-pin connector J15 on the top of the control panel.

7. Route the power cord through the notches on the side of the control panel while placing the side cover over the standoffs.

8. Insert 3 allen head bolts into the holes in the side cover and tighten into the metal standoffs.





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PC-1000/Laser 1000 Installation

Install Film Drum Assembly

1. Slide the black plastic cover off of the end of the rotating arm.

2. Remove the cardboard packing material from the rotating arm.

3. Remove the set screw, crown nut, and washer from the film drum spindle.

4. Insert the film drum spindle down through the rotating arm.

5. Install the film drum with the knob closest to the floor. Slide the film drum onto the spindle up as far as possible and tighten the film drum knob to temporarily hold the film drum in place.

6. Slide the flat washer up on the film drum spindle.

7. Install the crown nut on the film drum spindle <u>with the slots in the crown nut facing up.</u>

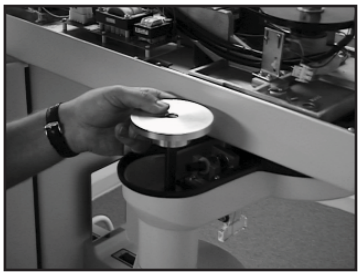
8. Thread the crown nut until the lower edge of the threaded hole in the film drum spindle is aligned to the lower edge of a slot in the crown nut.

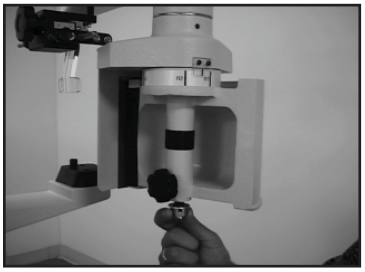
9. Insert the set screw in the threaded hole in the film drum spindle and tighten the screw.

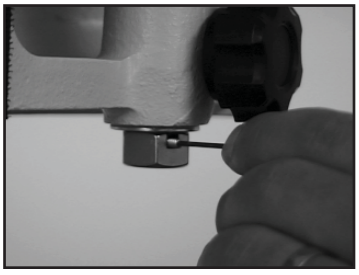
10. <u>While supporting the film drum</u>, loosen the film drum knob to allow the film drum to rest on the washer and crown nut.

11. Slide the black plastic cover back on the end of the rotating arm.

Note: *The film drum will rotate with increased friction after the film drum knob is tightened. Manual rotation, while the knob is tight, should be avoided to prevent abnormal wear.*







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PC-1000/Laser 1000 Installation

Install Tubehead Assembly

1. Connect the 6-pin molex connector from the end of the rotating arm to the 6-pin connector on the tubehead.

2. Carefully raise the tubehead into position facing the film drum, ensuring that the wires are not stressed or pinched.

3. Install and tighten the horizontal locking knob, the large knob with the smooth unthreaded end, into the rear of the rotating arm.

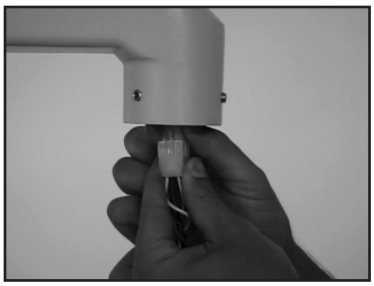
4. Remove the two small set screws on each side of the horizontal locking knob.

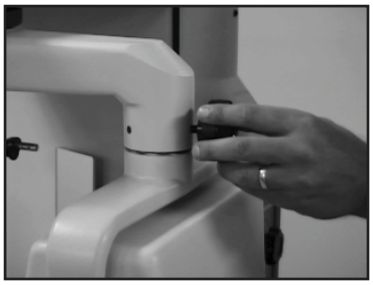
5. Install the two slotted screws. Snug, then break the snug fit to allow alignment of the tubehead.

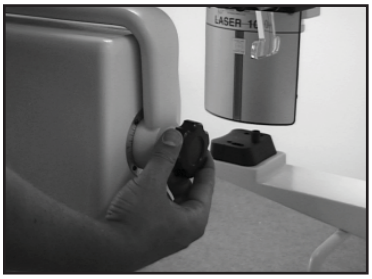
6. Install the two short set screws (from the cephalometric packaging, not those previously removed).

7. Remove the large allen bolt from the right end of the tubehead assembly and install the vertical locking knob in it's place.

8. Loosen both knobs and verify that the tubehead can move freely.



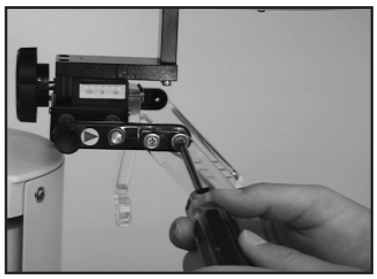




Install Temple Supports

1. Install the 2 temple supports using the existing screws and washers in the head support assembly.

2. Ensure that the temple supports are angled away from the machine and that the horizontal red lines on the temple supports are facing out.



Level Machine

With a level on the underside of the main overhead chassis, level the machine in all directions using the 4 four adjustable feet under

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PC-1000/Laser 1000 Installation

Install Cephalometric Arm

1. Verify with the doctor on which side the cephalometric arm should be mounted. The arm is typically installed to extend on the same side as the control panel.

2. Mount the arm, with the spacers facing the machine, on the rear of the machine using the 2 3/8" allen bolts with lock washers.

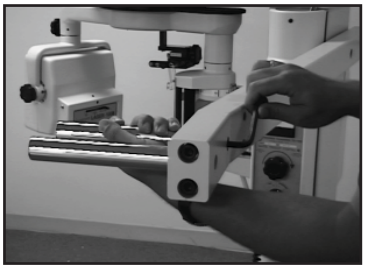
3. Level the cephalometric arm.

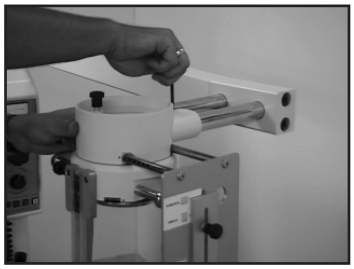
Install Cephalostat Head Positioner

1. Install the chrome mounting tubes on the cephalometric arm with the 2 allen bolts and lockwashers provided.

2. Slide the head positioner onto the 2 chrome mounting tubes.

3. Tighten the 2 allen bolts on the top rear of the head positioner.





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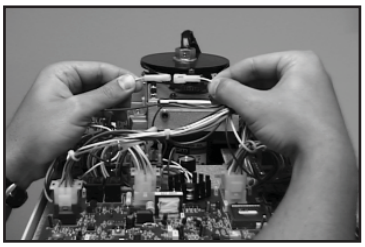
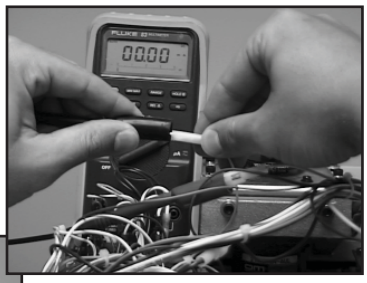
PC-1000/Laser 1000 Installation

Perform mA Calibration

1. Disconnect the yellow wire, 1-pin molex connector in the overhead chassis.



2. Connect a DC milliammeter in series with the molex connectors, positive lead to the male connector, negative lead to the female connector.

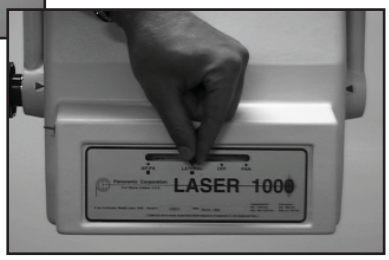


3. Power the machine on.

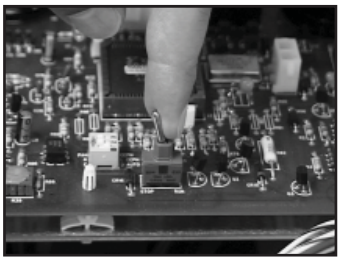
4. Using the function switch on the control panel, select CEPHALOMETRIC 2.0.

5. Using the kVp setting knob on the control panel, set the kVp meter to 80 kVp on the CEPHALOMETRIC scale.

6. Using the lever on the front of the collimator, select LATERAL.

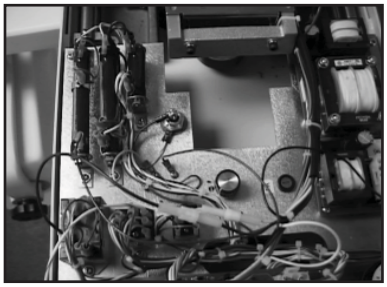


7. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to STOP.



8. Locate and turn the mA adjustment knob P1 in the overhead chassis clockwise (CW) as far as possible.

9. Locate power resistor R2 on the outside edge of the aluminum chassis.



CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

10. Depress the exposure switch.

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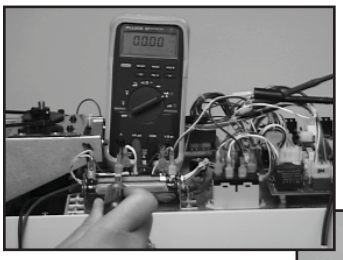
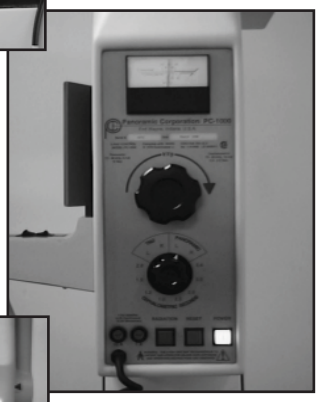
PC-1000/Laser 1000 Installation

11. The milliammeter should show 10.0 mA ± .09 mA. If it does not:
    A. Power the machine off.
    B. **Slightly** adjust (1/4") the slide on R2 toward the rear of the machine to <u>increase</u> the mA and repeat the test until the milliammeter shows 10.0 mA ± .09 mA.

OR

    C. **Slightly** adjust (1/4") the slide on R2 toward the front of the machine to <u>decrease</u> the mA and repeat the test until the milliammeter shows 10.0 mA ± .09 mA.





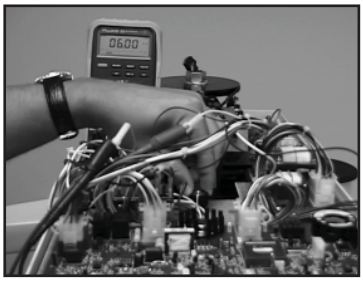
12. Using the function switch on the control panel, select PANORAMIC L or PANORAMIC R.

13. Using the kVp setting knob on the control panel, set the kVp meter to 80 kVp on the PANORAMIC scale.

14. Using the lever on the front of the collimator, select PANORAMIC.

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

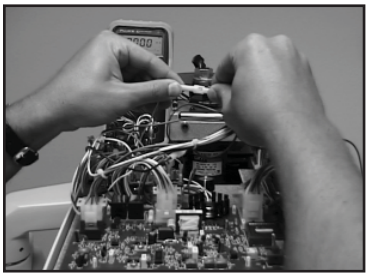
15. Depress the exposure switch.



16. The milliammeter should show 6.0 mA ± .05 mA. If it does not:
    A. Adjust P1 clockwise (CW) to <u>increase</u> the mA and repeat the test until the milliammeter shows 6.0 mA ± .05 mA.

OR

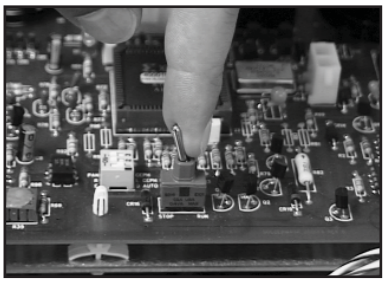
    B. Adjust P1 counterclockwise (CCW) to <u>decrease</u> the mA and repeat the test until the milliammeter shows 6.0 mA ± .05 mA.



Note: *Contact Panoramic Corporation if the mA cannot be set to 6.0 mA ± .05 mA.*

17. Disconnect the milliammeter.

18. Reconnect the yellow wire, 1-pin molex connectors.



19. Toggle the RUN/STOP switch on the printed circuit board in the overhead chassis to RUN.

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PC-1000/Laser 1000 Installation

Perform Pulse Count Calibration

1. Power the machine on.

2. Using the lever on the front of the collimator, select LATERAL.

3. Using the function switch on the control panel, select CEPHALOMETRIC 2.0.

4. Using the kVp setting knob on the control panel, set the kVp meter to 70 kVp on the PANORAMIC scale.

5. Position a radiation pulse counter so that the X-rays emitted from the tubehead will strike the pulse counter's target.

6. Locate potentiometers R11 and R20 on the printed circuit board behind the control panel.

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

7. Depress the exposure switch for the entire 2 second exposure.

8. The pulse counter should show 120 pulses ± 2 pulses. If it does not:
   A. Adjust R20 clockwise (CW) to <u>increase</u> the pulses and repeat the test until the pulse counter shows 120 pulses ± 2 pulses.

OR

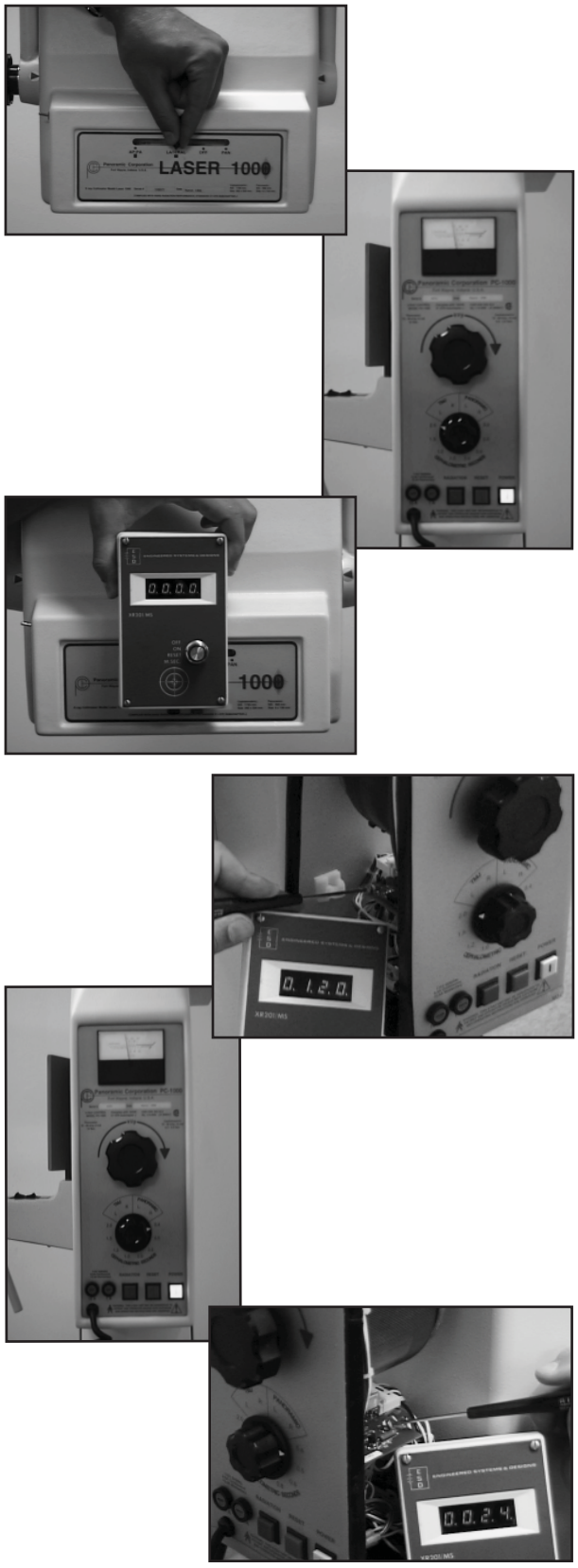
   B. Adjust R20 counterclockwise (CCW) to <u>decrease</u> the pulses and repeat the test until the pulse counter shows 120 pulses ± 2 pulses.

9. Using the function switch on the control panel, select CEPHALOMETRIC 0.4.

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

10. Depress the exposure switch for the entire 0.4 second exposure.

11. The pulse counter should show 24 pulses ± 1 pulse. If it does not:
   A. Adjust R11 clockwise (CW) to <u>increase</u> the pulses and repeat the test until the pulse counter shows 24 pulses ± 1 pulse.



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OR

B. Adjust R11 counterclockwise (CCW) to <u>decrease</u> the pulses and repeat the test until the pulse counter shows 24 pulses ± 1 pulse.

12. Disconnect the blue wire, 1-pin molex connector in the overhead chassis.

13. Connect the positive lead of a pulse counter to the male connector, negative lead to the aluminum chassis or neutral wire from the plug.

14. Using the function switch on the control panel, select PANORAMIC L or PANORAMIC R.

15. Using the kVp setting knob on the control panel, set the kVp meter to 80 kVp on the PANORAMIC scale.

16. Using the lever on the front of the collimator, select LATERAL.

17. Ensure that the RUN/STOP switch on the printed circuit board in the overhead chassis is set to RUN.

18. Locate potentiometer R57 on the printed circuit board in the overhead chassis.

CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

19. Depress the exposure switch.

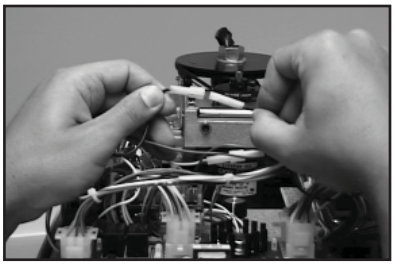
20. The pulse counter should show 720 pulses ± 10 pulses. If it does not:
    A. Adjust R57 counterclockwise (CCW) to <u>increase</u> the pulses until the pulse counter shows 720 pulses ± 10 pulses.

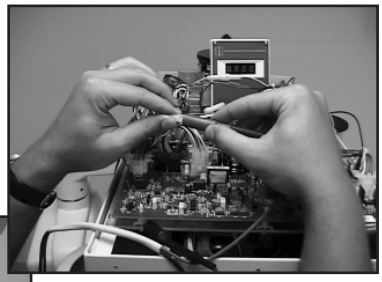
OR

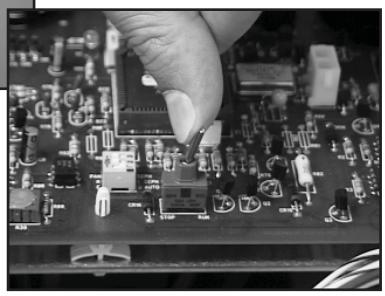
B. Adjust R57 clockwise (CW) to <u>decrease</u> the pulses until the pulse counter shows 720 pulses ± 10 pulses.

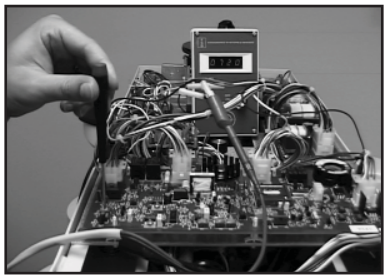
21. Disconnect the pulse counter.

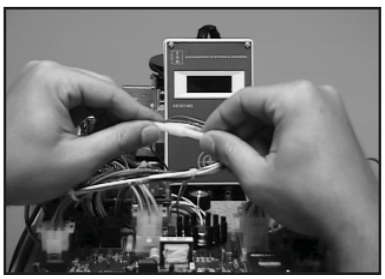
22. Reconnect the blue wire, 1-pin molex











PC-1000/Laser 1000 Installation

Perform Panoramic X-ray Beam Alignment

1. Power the machine on.

2. If the cephalometric arm is mounted on the right side of the machine, using the function switch on the control panel, select PANORAMIC R. If the cephalometric arm is mounted on the left side of the machine, using the function switch on the control panel, select PANORAMIC L.

3. Using the kVp setting knob on the control panel, set the kVp meter to 90 kVp on the PANORAMIC scale.

4. Slide the lever in the collimator assembly on the front of the tubehead to the PANORAMIC position.

NOTE: *If the collimator is NOT firmly seated in its locking notch:*
   a. the alignment laser will not fire
   b. when the exposure switch is depressed, the machine will beep rapidly, but no radiation will be emitted

5. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the the cross-hairs on the FACTORY LASER ALIGNMENT TARGET on the film drum mask.

6. Using the kVp setting knob on the control panel, set the kVp meter to 70 kVp on the PANORAMIC scale.

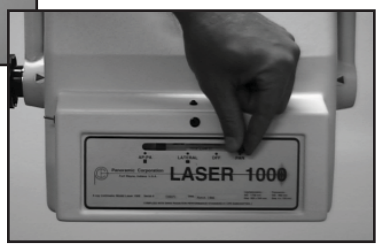
7. Place a loaded film cassette sleeve on the film drum and align the L1 pointer.

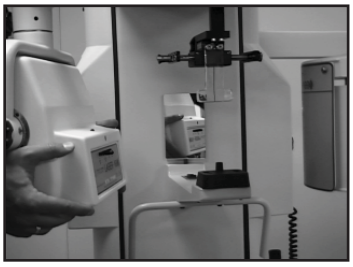
8. Depress the exposure switch for the entire 12 second exposure.

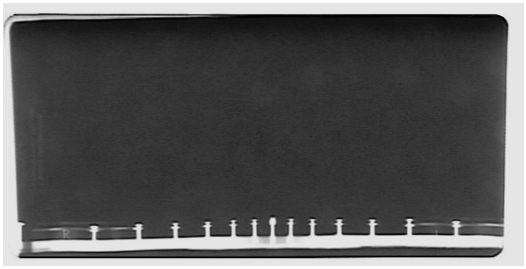
9. Process the film to verify proper alignment. The film should be black with clear edges.

10. Remove the FACTORY LASER ALIGNMENT TARGET decal and install the permanent cross-hairs target decal where the laser beam now strikes the film drum mask.

Note: *Contact Panoramic Corporation if the laser beam is no longer located within the original*







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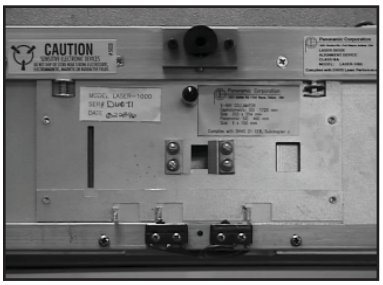
PC-1000/Laser 1000 Installation

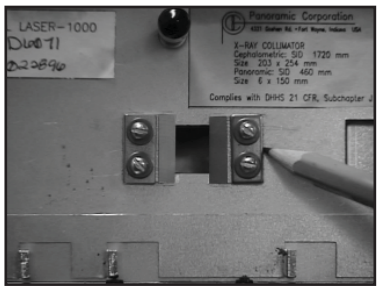
Remove Soft Tissue Shields
The PC-1000/Laser 1000 is shipped with 2 soft tissue shields installed on the lateral collimator on the front of the tubehead. The purpose of a soft tissue shield is to gradually filter the X-rays at the front edge of the cassette to allow the soft tissue, i.e. nose, to be visible on the processed film. The shields are factory-installed at 20% or approximately 2" on the processed film. During installation, in order to properly align the X-ray beam to the cephalometric cassette, both of the soft tissue shields can **optionally** be removed.

1. Remove the 2 small allen screws on each side of the front tubehead cover and remove the front tubehead cover. Do not stress the wires to the laser alignment switch or LED.



2. With a pencil or awl, mark the current position of both of the brass shields on the lateral collimator.

3. Remove the 2 screws from the shields and remove the shields.



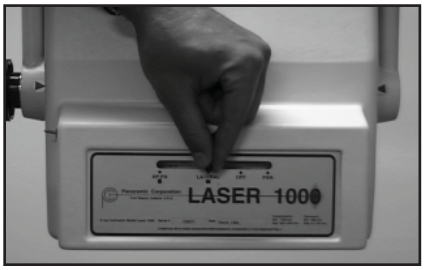
4. Temporarily reinstall the front tubehead cover. One of the soft tissue shields will be reinstalled after the installation is complete.

Perform Cephalometric X-ray Beam Alignment
1. Power the machine on.

2. Using the function switch on the control panel, select CEPHALOMETRIC 0.4.

3. Using the kVp setting knob on the control panel, set the kVp meter to 70 kVp on the CEPHALOMETRIC scale.

4. Slide the lever in the collimator assembly on the front of the tubehead to the LATERAL position.



NOTE: *If the collimator is NOT firmly seated in its locking notch:*
a. the alignment laser will not fire
b. when the exposure switch is depressed, the machine will beep rapidly, but no radiation will be emitted

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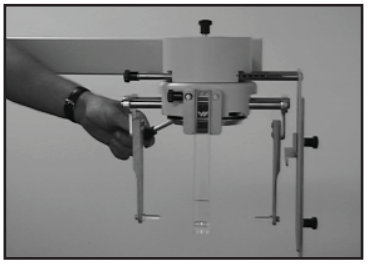
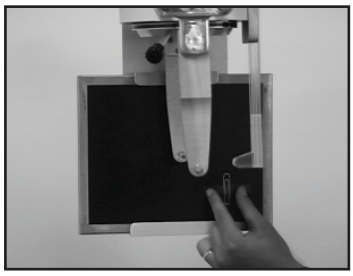
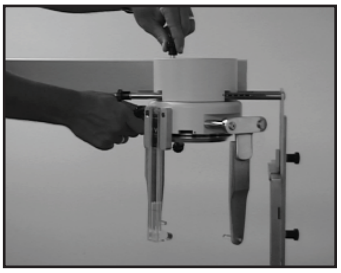
5. Remove the locking pin in the top of the cephalostat head positioner and rotate the ear rods to the LATERAL position. Open the ear posts as far as possible using the lever on the rear of the head positioner.



6. Place a loaded cephalometric film cassette in the cassette holder HORIZONTALLY at the end of the cephalometric arm. Align the top edge of the sliding portion on the rear of the cassette holder to the LATERAL position.

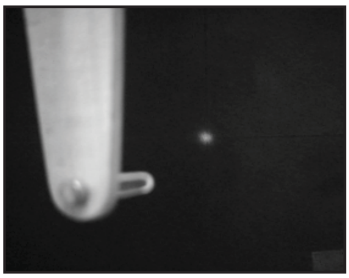


7. Position the cassette so that the inscribed lines on the front of the cassette are centered directly behind the closest ear rod. It may be helpful to temporarily tape a coin or paperclip, to be used as a reference after exposing a test film, in either of the lower quadrants of the cassette.



8. Remove the locking pin in the top of the cephalostat head positioner and rotate the ear rods to approximately 45°. This will allow the laser alignment beam to strike the cassette.

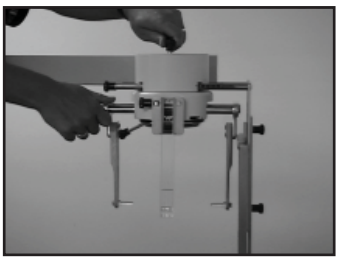
9. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the intersection of the inscribed lines on the front of the cassette.



10. Rotate the head positioner back into the LATERAL position and install the locking pin.

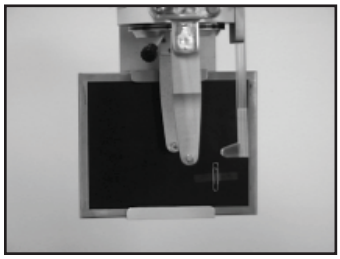
CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

11. Depress the exposure switch.



12. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.

13. Reposition the cassette in the cassette holder HORIZONTALLY so that the inscribed lines on the front of the cassette are centered directly behind the closest ear rod (same position as before).



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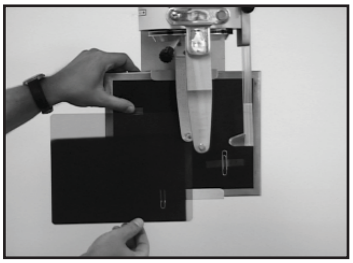
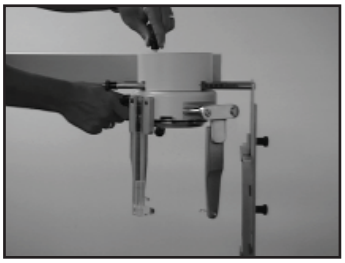
14. Temporarily tape the processed cephalometric film on the front of the cassette, in the same orientation, so that the top corner of the exposed area is aligned to the intersection of the inscribed lines on the cassette.

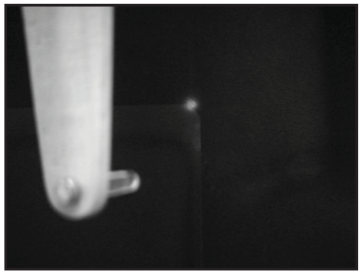


15. Rotate the ear rods to approximately 45° to allow the laser alignment beam to strike the cassette.



16. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the closest physical corner of the processed film.

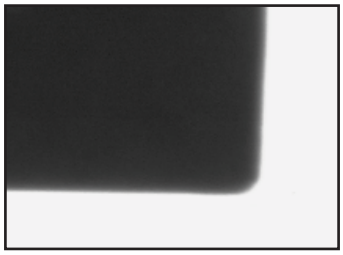
17. Rotate the head positioner back into the LATERAL position and install the locking pin.



CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

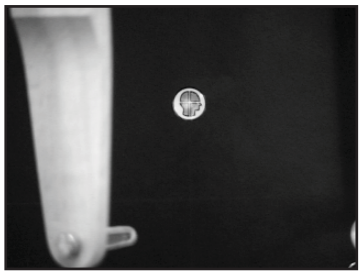
18. Depress the exposure switch.

19. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.



20. Continue to position the cassette and tubehead until the exposure is centered within the cephalometric film (steps 14-18).

21. When the exposure is properly centered within the cephalometric film, place a permanent head decal upright where the laser beam now strikes the cassette.



22. Slide the lever in the collimator assembly on the front of the tubehead to the AP-PA position.

NOTE: *If the collimator is NOT firmly seated in its locking notch:*

a. the alignment laser will not fire

b. when the exposure switch is depressed, the machine will beep rapidly, but no radiation will be emitted

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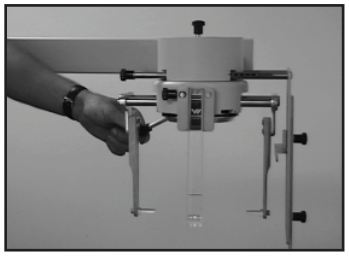
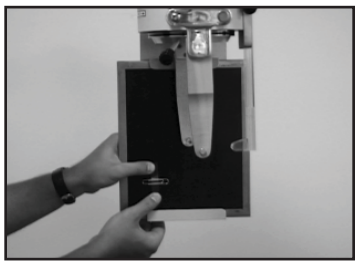
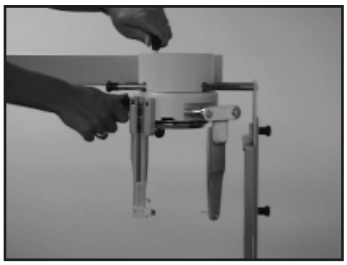
23. Rotate the head positioner to its LATERAL position and open the ear posts as far as possible using the lever on the rear of the head positioner.



24. Place a loaded cephalometric film cassette VERTICALLY in the cassette holder at the end of the cephalometric arm. Align the top edge of the sliding portion on the rear of the cassette holder to the AP-PA position.

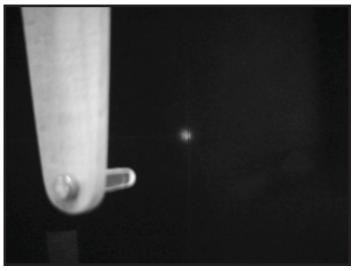


25. Position the cassette so that the inscribed lines on the front of the cassette are centered directly behind the closest ear rod. It may be helpful to temporarily tape a coin or paperclip, to be used as a reference after exposing a test film, in either of the lower quadrants of the cassette.

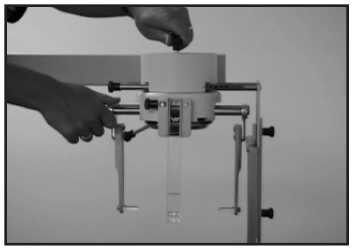


26. Rotate the ear rods to approximately 45°. This will allow the laser alignment beam to strike the cassette.

27. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the intersection of the inscribed lines on the front of the cassette.



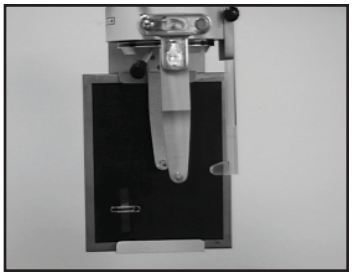
28. Rotate the head positioner back into the LATERAL position and install the locking pin.



CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

29. Depress the exposure switch.

30. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.



31. Reposition the cassette in the cassette holder VERTICALLY so that the inscribed lines on the front of the cassette are

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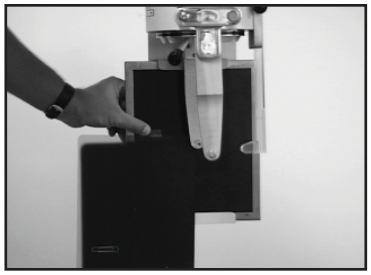
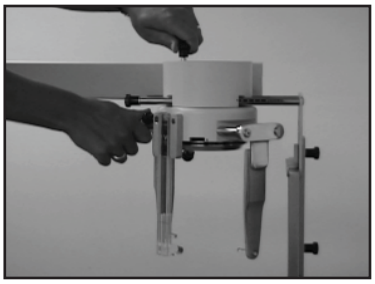
32. Temporarily tape the processed cephalometric film on the front of the cassette, in the same orientation, so that the top corner of the exposed area is aligned to the intersection of the inscribed lines on the cassette.



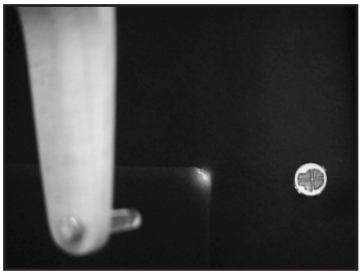
33. Rotate the ear rods to approximately 45° to allow the laser alignment beam to strike the cassette.

34. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the closest physical corner of the processed film.



CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

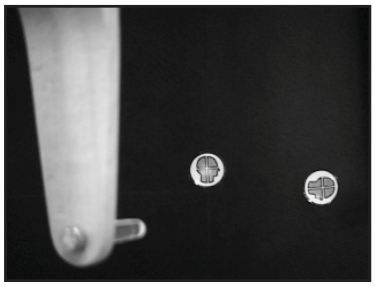
35. Depress the exposure switch.



36. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.

37. Continue to position the cassette and tubehead until the exposure is centered within the cephalometric film (steps 30-34).

38. When the exposure is properly centered within the cephalometric film, place a permanent head decal upright where the laser beam now strikes the cassette.



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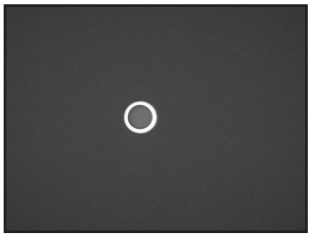
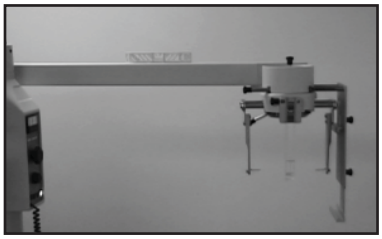
Perform Ear Rod Alignment
The ear rods are properly aligned when the ear rings appear concentric (one centered within the other) on the processed cephalometric film. The inside ring is the one closest to the film cassette.

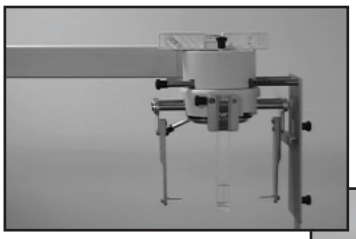


Vertical Alignment

1. With a level on the underside of the overhead chassis, verify the machine is level in all directions.



2. With a level on top of the cephalometric arm, verify the arm is level.

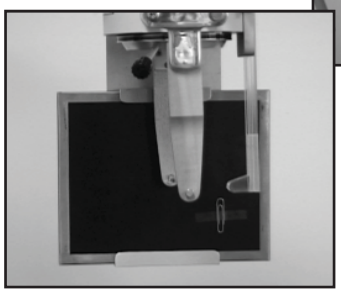


3. With a level on top of the cephalostat head positioner, verify the head positioner is level in all directions.

4. Power the machine on.

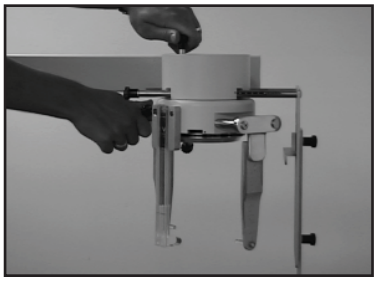
5. Using the function switch on the control panel, select CEPHALOMETRIC 0.4.

6. Using the kVp setting knob on the control panel, set the kVp meter to 70 kVp on the CEPHALOMETRIC scale.



7. Slide the lever in the collimator assembly on the front of the tubehead to the LATERAL position.

NOTE: *If the collimator is NOT firmly seated in its locking notch:*
   a. the alignment laser will not fire
   b. when the exposure switch is depressed, the machine will beep rapidly, but no radiation will be emitted



8. Remove the locking pin in the top of the cephalostat head positioner and rotate the ear rods to approximately 45°. This will allow the laser alignment beam to strike the cassette.

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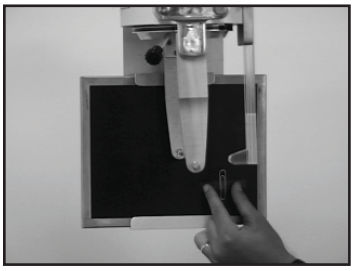
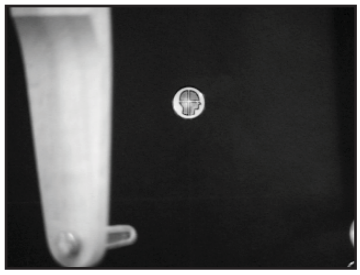
PC-1000/Laser 1000 Installation

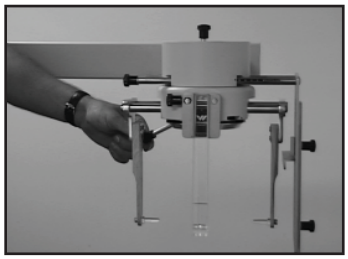


9. Place a loaded cephalometric film cassette in the cassette holder centered HORIZONTALLY at the end of the cephalometric arm. Align the top edge of the sliding portion on the rear of the cassette holder to the LATERAL position. It may be helpful to temporarily tape a coin or paperclip, to be used as a reference after exposing a test film, in either of the lower quadrants of the cassette.



10. Depress the laser switch on the right side of the tubehead to activate the laser. Adjust the tubehead so that the laser beam strikes the upright head target on the cassette.

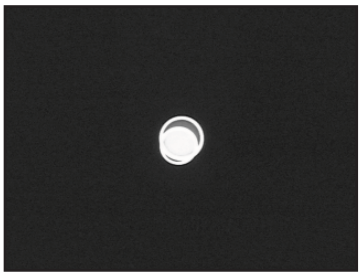
11. Rotate the head positioner back into the LATERAL position and install the locking pin.



12. Open the ear posts as far as possible using the lever on the rear of the head positioner.

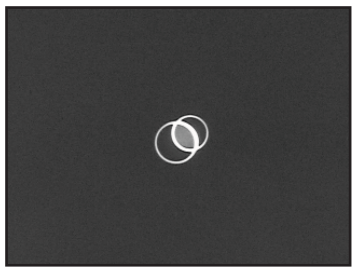
CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

13. Depress the exposure switch.



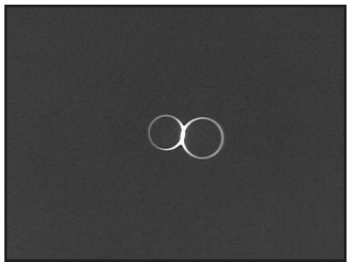
14. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.

15. The smaller ear ring should appear centered vertically inside the larger ear ring on the processed film. If it does not, loosen the 2 allen bolts holding the chrome mounting tubes and adjust the level of the cephalostat head positioner. If the larger ear ring is too low, slightly raise the ear rod farthest from the cassette (closest to the tubehead). If the larger ear ring is too high, slightly lower the ear rod farthest from the cassette (closest to the tubehead). Alternately tighten the 2 allen mounting bolts.



16. Continue to adjust the cephalostat head positioner and chrome mounting tubes until the smaller ear ring is centered vertically inside the larger ear ring (steps 12-15).

Note: *Contact Panoramic Corporation if the ear rings cannot be centered vertically.*



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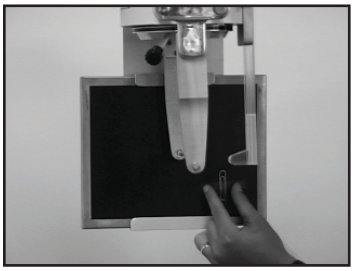
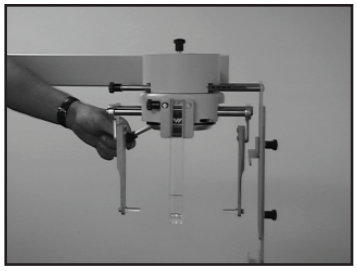
PC-1000/Laser 1000 Installation

Horizontal Alignment

17. Place a loaded cephalometric film cassette in the cassette holder centered HORIZONTALLY at the end of the cephalometric arm. Align the top edge of the sliding portion on the rear of the cassette holder to the LATERAL position. It may be helpful to temporarily tape a coin or paperclip, to be used as a reference after exposing a test film, in either of the lower quadrants of the cassette.



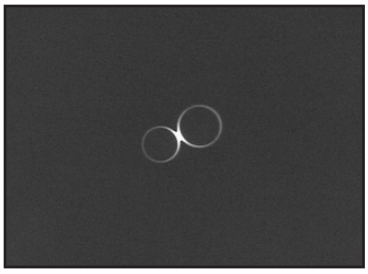
18. Open the ear posts as far as possible using the lever on the rear of the head positioner.



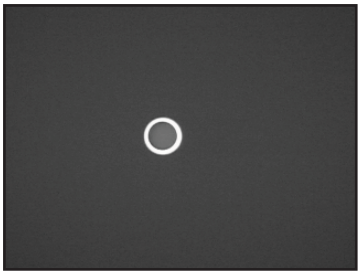
CAUTION: *X-rays will be emitted when the exposure switch is depressed.*

19. Depress the exposure switch.

20. Remove the cephalometric cassette from the cassette holder and process the film. Load the cassette again with cephalometric film for another test exposure.



21. The smaller ear ring should appear centered horizontally inside the larger ear ring on the processed film. If it does not, loosen the 4 allen bolts on top of the cephalostat and slightly rotate the ear posts. If the larger ear ring is too far to the right, slightly rotate the ear posts counter clockwise (CCW). If the larger ear ring is too far to the left, slightly rotate the ear posts clockwise (CW). Tighten the 4 allen bolts.



22. Continue to adjust the cephalostat head positioner until the smaller ear ring is centered horizontally inside the larger ear ring (steps 18-21).

Note: *Contact Panoramic Corporation if the ear*

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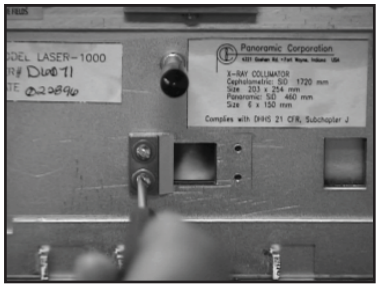
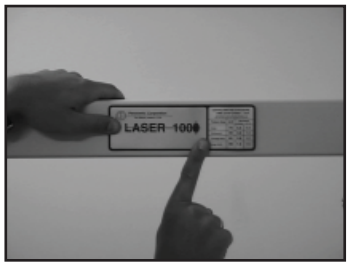
PC-1000/Laser 1000 Installation

Install Soft Tissue Shield
A soft tissue shield should be installed on the front of the tubehead to filter the X-rays striking the front edge of the cassette, allowing the soft tissue, i.e. nose, to be visible on the processed film.

1. Remove the 2 small allen screws on each side of the front tubehead cover and remove the front tubehead cover. Do not stress the wires to the laser alignment switch or LED.

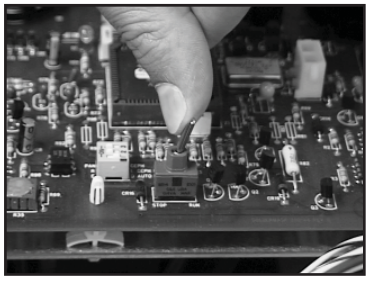


2. Place one of the soft tissue shields, previously removed, on the front of the tubehead collimator. It should be placed on the side farthest from the machine when the tubehead is properly aligned to the cephalometric cassette. Align the shield to the scribe marks made earlier and install the 2 screws.



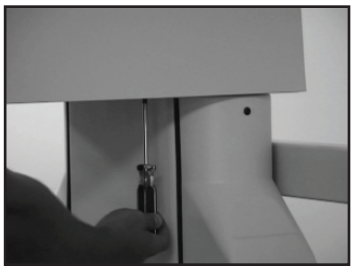
3. Reinstall the tubehead cover and 2 small allen screws.

Install Suggested Settings Decal
1. Place the suggested setting decal centered on the cephalometric arm.



Install Top and Rear Covers
1. Ensure that the RUN/STOP switch on the printed circuit board in the overhead is in the RUN position.

2. Slide the top cover on the machine from the front. Ensure that the wiring on the control panel side is properly routed.



3. Install the 6 screws on the underside of the top cover.

4. Place the cover on the rear of the machine and install the 3 screws.

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PC-1000/Laser 1000 Installation

Complete Installation

1. Verify all steps have been completed.

2. Refer to the PC-1000/Laser 1000 User Manual and train the staff thoroughly.

3. Complete the Panoramic Corporation Installation Report and the FDA 2579 paperwork and distribute accordingly.


DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
FOOD AND DRUG ADMINISTRATION
REPORT OF ASSEMBLY
OF A DIAGNOSTIC X-RAY SYSTEM
D 2
2. ASSEMBLER INFORMATION
PC-1000 INSTALLATION REP
Panoramic Corporation
4321 Goshen Road •Fort Wayne, IN USA •46818
800-654-2027 • 219-489-2291 • Fax: 219-489-5683
FORMATION: Please print clearly
CEPHALOMETRIC SERIAL NUMBER
CD2255
PUBEHEAD SERIAL NUMBER
78219
tal World Inc.
k Johnson, DDS

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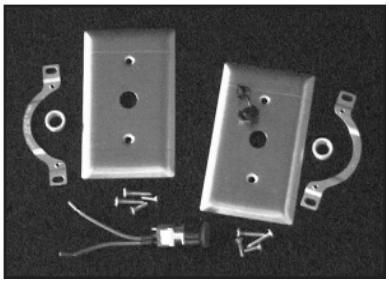
Notes

Remote Switch Installation

A remote switch kit is available from Panoramic Corporation. A remote switch must be installed if state or local regulations require.



Prior to the installation of a PC-1000, an electrician will need to install the following:

A. A 2" x 4" electrical box at standard outlet height on the wall directly behind the PC-1000.

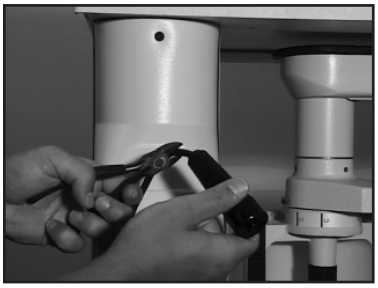
B. A 2" x 4" electrical box at the necessary location and height for the remote switch.

C. A 2-conductor, low voltage (24 VAC) wire routed between the 2 boxes with sufficient excess at each end to make connections.

Remote Switch Installation

1. Power the PC-1000 off.

2. Cut off the existing exposure switch from the coiled exposure cord.



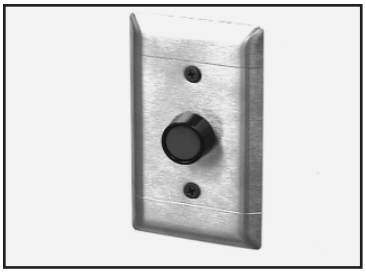
3. Install a grommet on one of the faceplates.

4. Insert the coiled cord through the grommet and connect the coiled cord to the existing 2-conductor, low-voltage wire behind the machine, previously installed by an electrician.

5. Install a strain relief on the coiled cord behind the faceplate and mount the faceplate on the standard electrical box, previously installed by an electrician, behind the machine.

6. Install the remote switch in the remaining faceplate.

7. Connect the remote switch to the other end of the low-voltage wire, previously installed by an electrician, at the remote location.



8. Mount the faceplate on the remaining electrical box.

9. Power the PC-1000 on and verify that the remote switch functions properly.

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Screw Motor Assembly Height Limit

The PC-1000 incorporates a height adjustment limit switch that will stop the machine from raising past a predetermined height. This limit height, factory set at approximately 92", can be adjusted for low ceilings in 3" increments down to approximately 83".

1. Power the PC-1000 off.

2. Remove the 3 allen head bolts in the left side cover and remove the side cover.

3. There are 2 limit switches on the outside of the column:
   A. The **top** limit switch terminates the height adjustment at the lower end of the travel (machine all of the way down). There is no adjustment for this switch.

   B. The **bottom** limit switch terminates the height adjustment at the upper end of the travel (machine all of the way up).

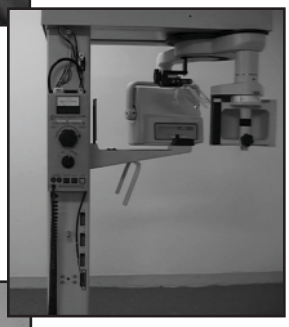
4. Remove the 2 phillips screws on the bottom limit switch.

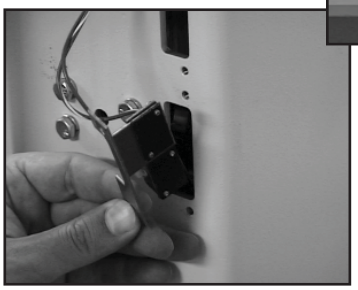
5. Move the bottom limit switch to 1 of the 3 remaining slots. Each slot changes the upper limit by 3".

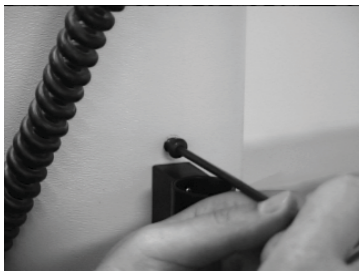
6. Reinstall the 2 phillips screws on the bottom limit switch.

7. Power the PC-1000 on.

8. Using the UP/DOWN switch on the chinrest arm, raise the machine and verify the height adjustment is automatically terminated.







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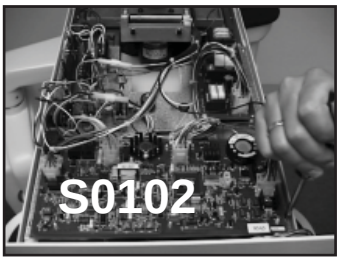
Screw Motor Assembly Exchange

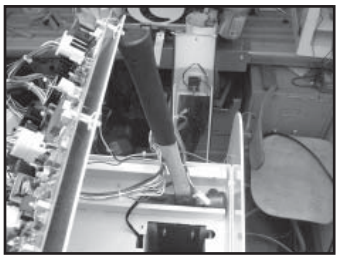
1. Using the UP/DOWN switch on the chinrest arm, lower the PC-1000 to its lowest position.



2. Power the PC-1000 off.

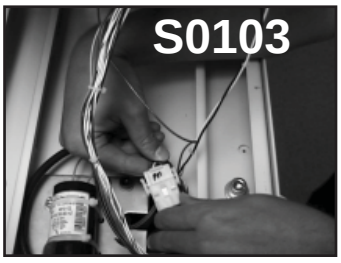
3. Remove the 6 screws on the underside of the top cover and remove the top cover. Ensure that the wiring on the control panel side is not damaged when removing the top cover.

4. Remove the 4 screws on the aluminum chassis in the overhead.



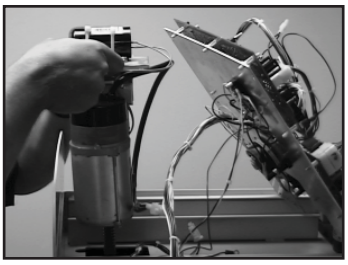
5. Prop the aluminum chassis up to allow access to the screw motor assembly in the rear of the machine.

6. Disconnect the molex connector J11/P11. Remove the phillip head screw mounted to the overhead chassis to disconnect the ground wire for the screw motor.



7. Remove the 4 5/16" allen head bolts from the top of the screw motor assembly. Be careful not to drop the bolts inside the column.

8. Lift the entire screw motor assembly out of the column. There is a bracket in the inner column that the threaded screw shaft must pass through before the assembly is free.



9. Remove all metal shims from under the metal plate for the screw motor. Do not reuse them.

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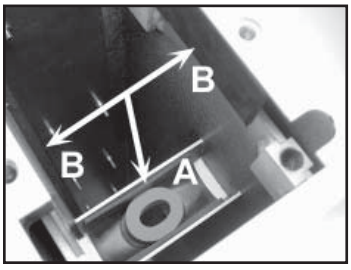
Screw Motor Assembly Exchange

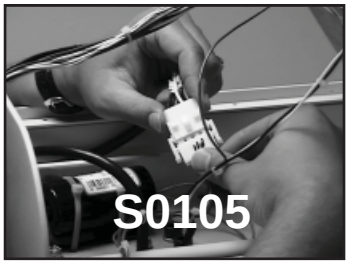
10. Install new rubber gaskets included with the screw motor.
    A. The bracket mounted in the column will receive two gaskets: first insert the black gasket with the hole. Center the hole with the hole on the bracket. Run a finger along the bottom side of the bracket making sure the gasket is centered. Next insert the orange "donut" on top of the black gasket again; make sure all holes are lined up.

    B. Remove the protective backing from the self-adhesive gasket. The two rubber pads will be installed in the inner column on the mounting block for the screw motor plate.

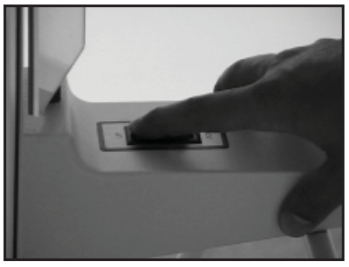


11. Lower the replacement screw motor assembly into the column, ensuring that the threaded screw shaft is inserted through the bracket on the inner column.

12. Now install the 2 5/16" allen head bolts that are shipped with the replacement screw motor and install them in opposite corners of the mounting plate. Tighten these two bolts down, drawing the mounting plate closer to the overhead of the machine. Now you can install two of the original 5/16" bolts in the remaining open mounting holes and tighten them completely. Last, remove the 2 5/16" allen head bolts that came with the replacement motor and reinstall the last two original bolts.



13. Reconnect the molex connector J11/P11.



14. Hinge the aluminum chassis back down into position, but do not reinstall the mounting screws, yet.

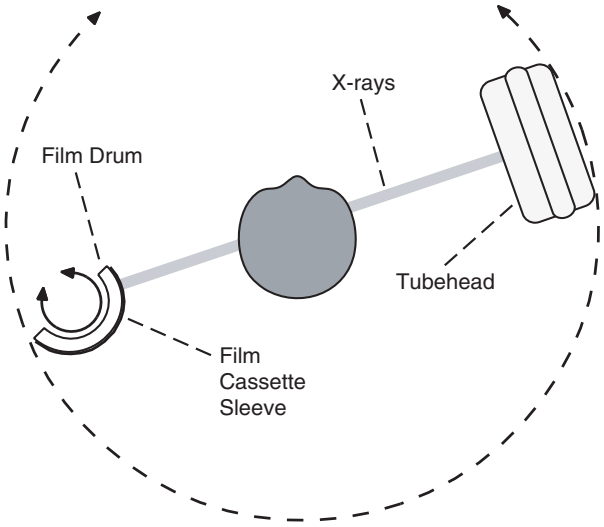
15. Power the PC-1000 on and verify that the new screw motor assembly is working properly.

16. Reinstall the 4 screws on the aluminum chassis in the overhead.

17. Slide the top cover on the machine from the front and reinstall the 6 screws. Ensure that the wiring on the control panel side is properly routed.

Panoramic Radiography

Panoramic Radiography has been in use for over 30 years. In panoramic radiography, the X-ray source and film rotate around the patient's head at the same speed. Simultaneously, the film rotates about its own axis.



X-rays are emitted from the tubehead in a very narrow vertical band, pass through the patient's head (where some are absorbed), and strike the film cassette sleeve. Intensifying screens are used inside the film cassette sleeve. The intensifying screens glow whenever X-rays strike them, the more X-rays striking the screen, the brighter the glow. Film, which is sensitive to light, is placed between the intensifying screens. The more light that is exposed to the film, the darker the film is. Since the patient is between the X-ray source and the film, the amount of X-rays that reach the film will vary depending on the density of the patient's anatomy. Dense matter, such as bone, will absorb more of the X-rays than less dense matter, such as tissue. Less X-rays reach the film when striking the teeth, causing them to appear on the film as lighter areas. More X-rays reach the film when striking tissue, causing it to appear on the film as darker areas.

In order to pass as many X-rays through the patient's head as possible, the tubehead is tilted at a slight upward angle to:

1. move the dense portion of the skull out of the path of the X-rays
2. cause the upper and lower anterior root tips to be aligned vertically
3. stretch the vertebrae in the neck to allow the X-rays to pass more efficiently through the vertebrae to expose the anterior teeth

As the tubehead and film rotate around the patient, the film is gradually exposed by a narrow vertical band. It is imperative that the film is aligned to start at the correct position and that nothing stops the film drum or tubehead from moving while the exposure is being taken.

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Darkroom Procedures

The darkroom must be lighttight. Extraoral (panoramic/cephalometric) film is more sensitive than intraoral (bite-wings) film to light, and processing time and temperature.

Manual Processing

- Lighttight darkroom
- Dip tanks
- Timer
- Thermometer
- Developer and fixer solutions
- Film Hanger
- Water supply and drain
- Safelight (GBX-2 filter or equivalent, 15 W bulb or less and at least 4' from film)

1. Prepare developer and fixer solutions according to the solution's directions.
2. Verify developer temperature.
3. Under safelight conditions, remove the exposed film from the cassette sleeve and attach it to a film hanger.
4. Set the timer based on the developer temperature and the processing chart.
5. Immerse the film quickly into the developer and agitate it vigorously for only 5 seconds to dislodge any air bubbles.
6. When the timer sounds, remove the film from the developer and immediately rinse it with water for 30 seconds while agitating it. Do not allow the excess developer to drain back into the developer tank.
7. Immerse the film into the fixer and agitate it for 5 seconds every 30 seconds. Allow the excess fixer to drain back into the fixer tank.
8. Immerse the film in the water wash tank and rinse it thoroughly.
9. Dry the film at room temperature or in a drying cabinet.

Automatic Processing

A thermometer should be present to periodically verify the temperature. It is imperative that the processor's maintenance schedule is followed thoroughly.

	Manual Processing				Automatic Processing
Film Type	Developer Temperature Time	Rinse	Fixer	Wash	
T-MAT (for use with Lanex screens)	68º F 20.0º C 8 min 72º F 22.0º C 7 min 76º F 24.5º C 5 min 80º F 26.5º C 4 min	30 sec 60º F 15.5º C to 85º F 29.5º C	2-4 min 60º F 15.5º C to 85º F 29.5º C	5 min 60º F 15.5º C to 85º F 29.5º C	82º F 28.0º C 5.5 min 83º F 28.5º C 4.5 min 85º F 29.5º C 4 min

Note: *Extraoral film requires more frequent solution replenishment than intraoral film. One ounce of chemicals are typically required for replenishment for every 75 intraoral, 3 panoramic, or 2 cephalometric films.*

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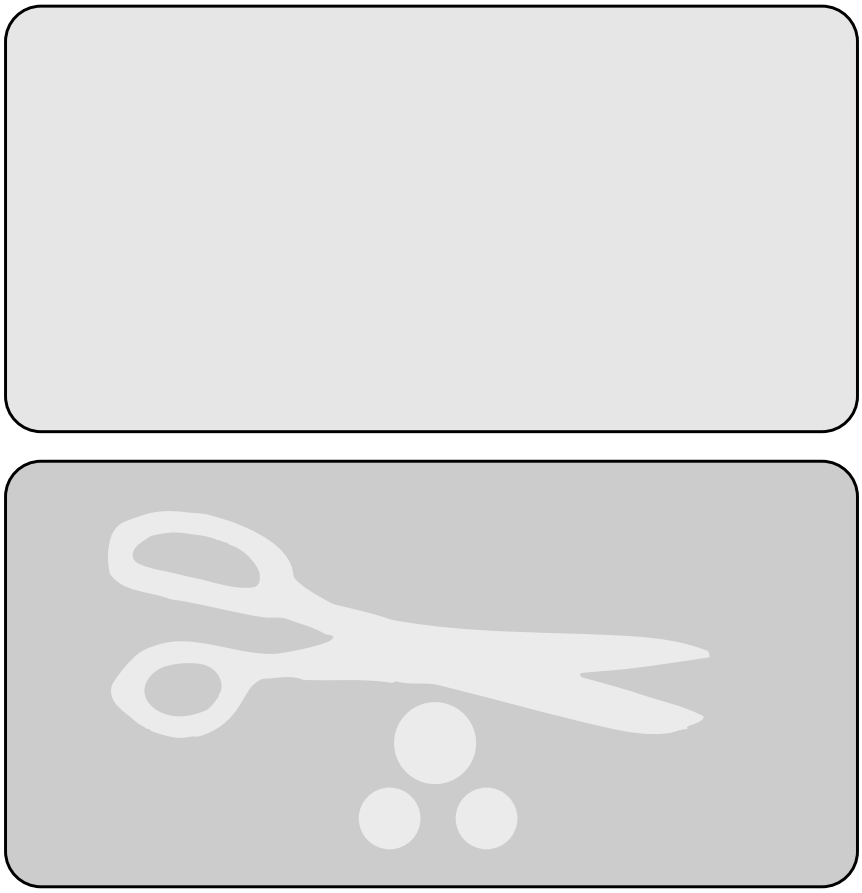
Darkroom Procedures

Darkroom Light Leak Test

Extraoral film is more sensitive to light than intraoral film. The purpose of the intensifying screens inside of the cassette sleeve is to convert the X-ray energy into light, thus exposing the film. While the light sensitivity of the film allows a very small amount of radiation to expose the film, it also can pose a problem if the darkroom is not completely lighttight. Small light leaks can cause fogging of the film while handling and processing the film in the darkroom.

The following test should be performed in the darkroom under safelight conditions to ensure it is lighttight:

1. Remove one sheet of extraoral film from the box.
2. Lay it on the counter in the darkroom under normal darkroom conditions.
3. Place a couple of coins, a pair of scissors, or any other opaque object on top of the film.
4. Wait for two minutes.
5. Process the film as usual.



The processed film should be clear. None of the objects should be visible on the film.

If any of the objects can be seen on the processed film, there is a light leak or other light source in the darkroom. The light leak fogs the test film, everywhere except where the opaque objects are blocking the light. To find the light leak, turn all of the lights off in the darkroom and inspect the darkroom for cracks around the door and ceiling tiles. Indicator lights on equipment, such as stereos, and improper safelights can also cause fogging. Turn off all unnecessary equipment and the safelight and try this test again.

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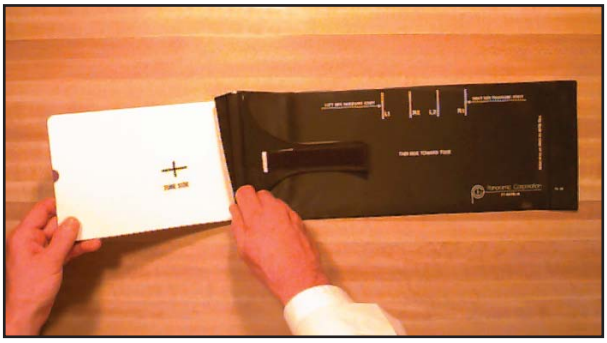
Darkroom Procedures

It is recommended that the panoramic and cephalometric cassettes be loaded with film just prior to use. Do not leave a film loaded in the cassettes for an extended period of time. This will prevent background radiation from prematurely exposing the film. The film should be stored in a cool and dark place.

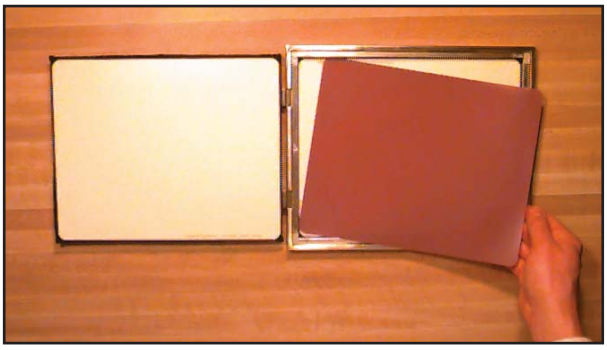
Loading The Panoramic Cassette

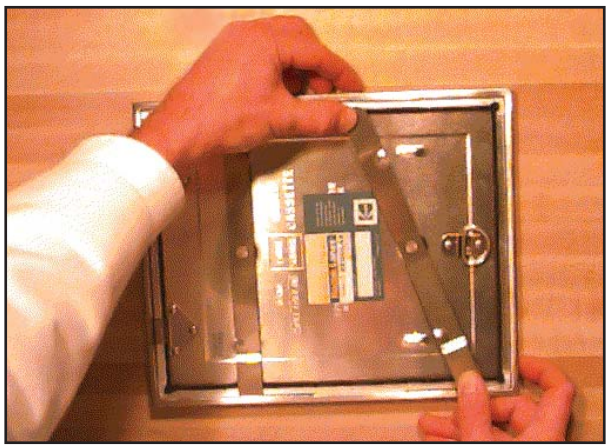
In a lighttight darkroom, open the flexible, panoramic cassette sleeve and slowly remove the intensifying screens. Open the screens on the counter and place a sheet of panoramic film on top of one of the screens. Close the screens and slowly slide them back into the cassette sleeve. Ensure that the hinged end of the screens is placed into the cassette sleeve first and the "TUBESIDE" decal is facing the same direction as the writing on the outside of the cassette sleeve. Ensure that all excess air is expelled from the cassette sleeve.



Loading The Cephalometric Cassette

In a lighttight darkroom, unlock and open the rigid, cephalometric cassette. Place a sheet of cephalometric film on top of one of the screens. Close and lock the cassette.





Note: *Remove and discard the protective sheet from between new intensifying screens before*

Maintenance Schedule

Refer to state and local regulations to determine how often to check the following items, or check at least every 3 months, when the machine is physically relocated, or when powered by a different outlet than when installed:

1. Tubehead
   a. oil leaks
   b. excessive drop on kVp meter during exposure (greater than 7 kVp)

2. Control Panel
   a. certification and identification labels in place
   b. power switch operating properly
   c. reset switch operating properly
   d. function switch operating properly
   e. exposure terminates when exposure switch is released
   f. exposure indicator light illuminates during exposure
   g. audible beeper sounds during exposure

3. Cephalometric Arm (PC-1000/Laser 1000 only)
   a. level
   b. smooth rotation of cephalostat head positioner
   c. ear rings aligned

4. Laser (PC-1000/Laser 1000 only)
   a. laser operating properly
   b. laser beam alignment target labels in place
   c. tubehead locking knobs allow easy alignment of tubehead

5. Intensifying Screens
   a. clean with cleaning/antistatic solution or nonabrasive soap and water
   b. no scratches or marks

6. Film cassette/sleeve
   a. lighttight
   b. no static electricity

7. Darkroom
   a. lighttight
   b. no light sources other than GBX-2 or equivalent (radios, clocks, etc.)
   c. timer/thermometer working properly

Check all parts of the PC-1000 for any physical damage that could affect radiation safety.

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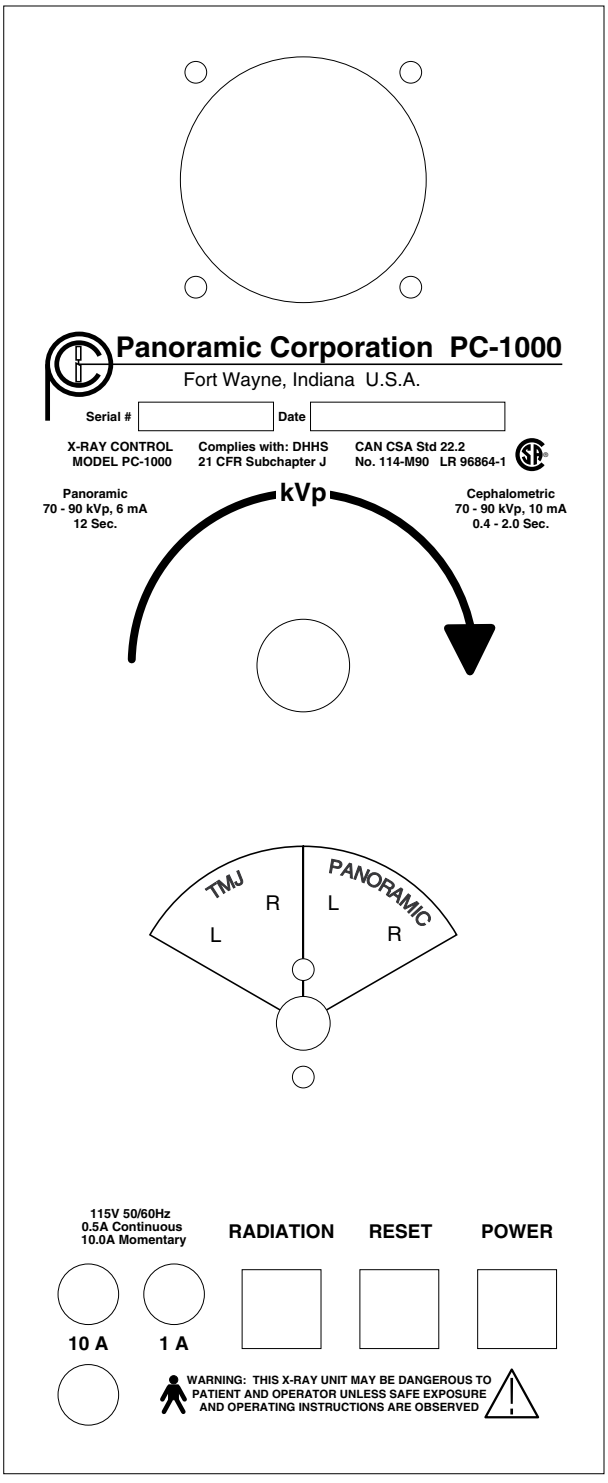
PC-1000 Labeling



Control Panel

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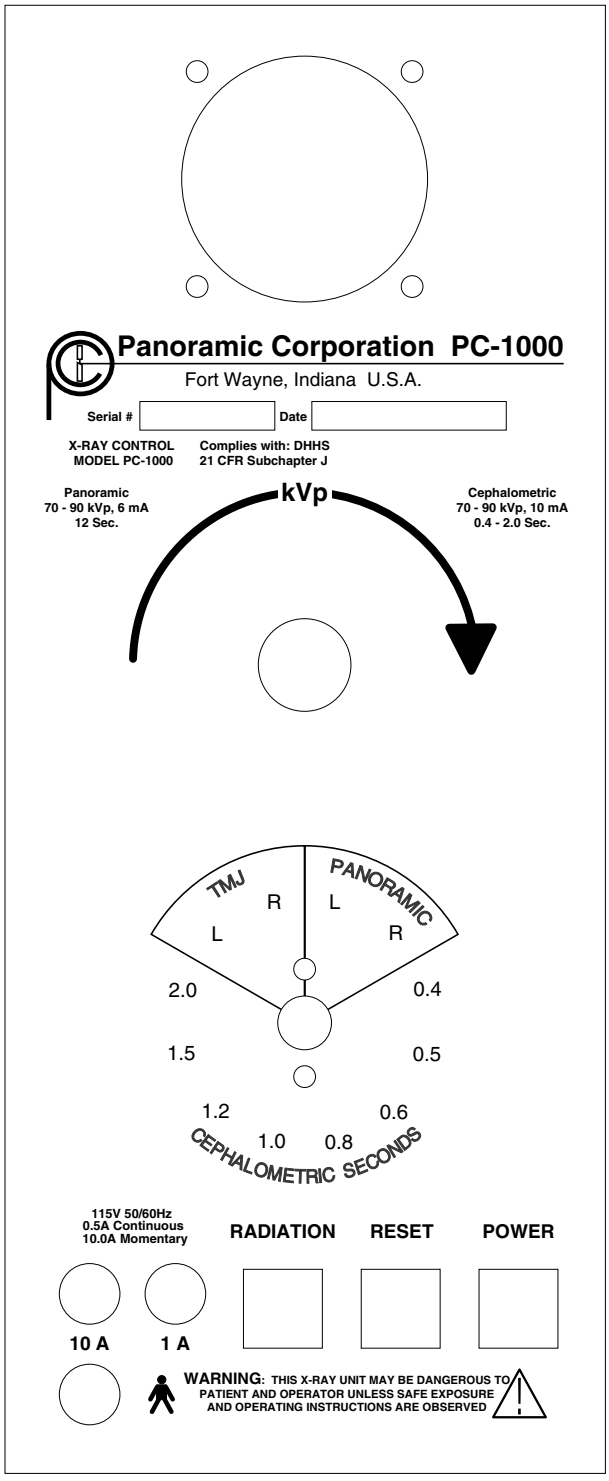
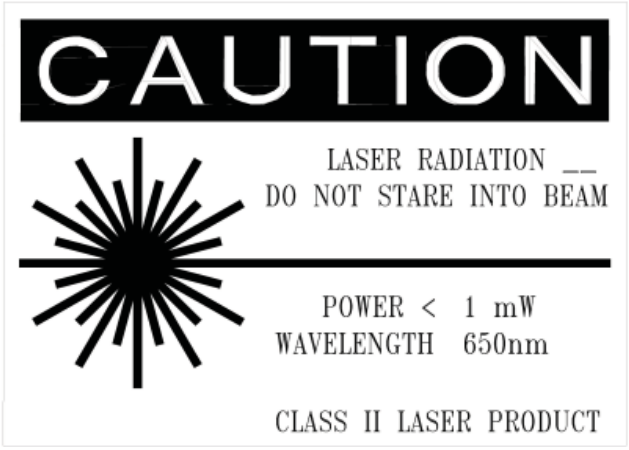
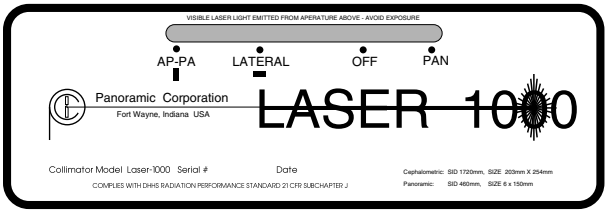
Laser 1000 Labeling



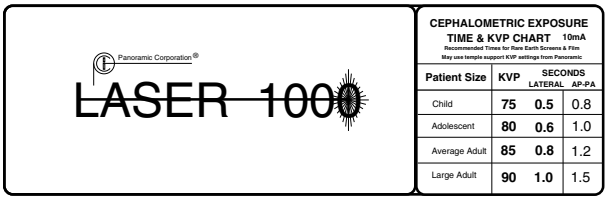
Control Panel



Rear Tubehead Cover



Front Tubehead Cover



Cephalometric Arm

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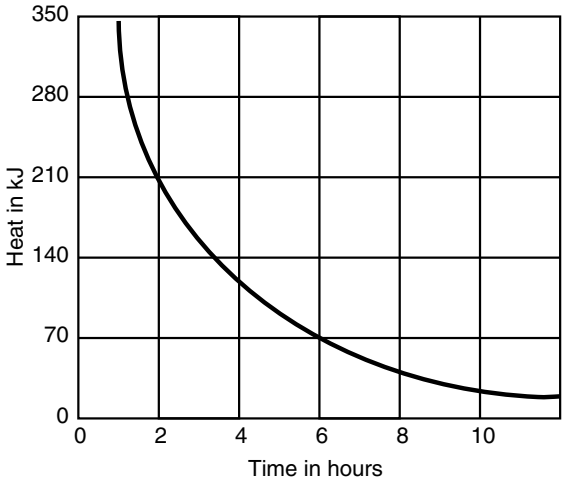
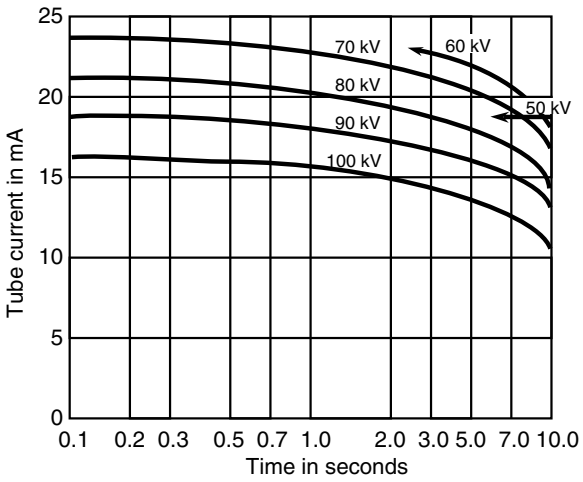
PC-1000/Laser 1000 Specifications

Tube Housing Thermal Characteristics

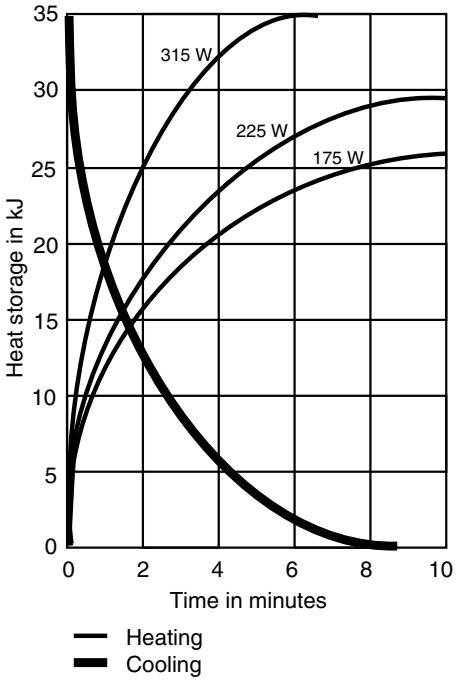


1 kJ=1400 H.U. 1 Watt=1.4 H.U./sec

Tube Maximum Current

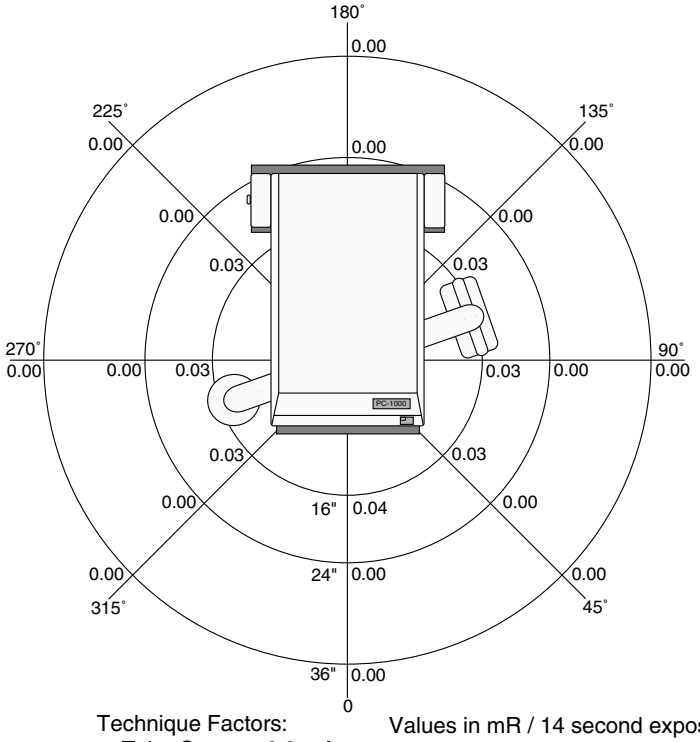


Anode Thermal Characteristics



Self-rectified Focal spot: 0.5 mm

Radiation Scatter Survey



Technique Factors: Values in mR / 14 second exposure
- Tube Current: 6.0 mA
- Tube Voltage: 90 kVp
- Exposure Duration: 14 seconds

Method:
Survey meter (Nuclear Associtates Model 06-107) at level of phantom skull at each position for duration of exposure.

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PC-1000/Laser 1000 Specifications

Power Requirements The PC-1000 and PC-1000/Laser 1000 requires line voltage from 105 to 125 VAC, no load at 5% or better line regulation and draws 12 A under worst case conditions. The total power required is 1.5 kVa.

Generator Type Single-phase, half-wave, self-rectified, center-grounded.

Duty Cycle At 90 kVp/6 mA - One 12 second exposure every 5 minutes to a maximum of 30 exposures.

Tubehead Assembly

X-ray Tube	Brand X-Ray or Superior or K-Alpha
Rated Tube Potential Peak	100 kVp
Leakage Technique Factors	90 kVp/6 mA
Inherent Filtration	1 mm
Added Aluminum Filtration	1.8 mm
Total Filtration	2.8 mm
Peak Tube Potential at which Aluminum Equivalent was Obtained	90 kVp/6 mA

X-ray Tube

Manufacturer	Brand X-Ray or Superior or K-Alpha	
Type	BX-4P0.5 or SXR-100-R-5P or KAX-90-10-P	
Focal Spot	.5 mm x .5 mm	
Maximum Peak Voltage	100 kVp	
Anode Heat Dissipation Rate	250 Watts	1 Watt=1.4 H.U./sec.
Anode Heat Storage Capacity	35 kJ	1 kJ=1400 H.U.

Statement of Deviation

Peak Tube Potential	± 12% over range of rated line voltage
Tube Current	± 10% over line voltage
Exposure Time	± 10% over line voltage

Measurement Techniques

Exposure Time	Measured with Engineered Systems & Design Model XR201MS pulse counter.
Tube Current	Measured directly with a DC mA meter having a basic accuracy of no less than ± 3%.
Peak Tube Potential	Measured using a computerized kVp measurement system. System accuracy is ± 3% exclusive of waveform, inherent filtration, and reproducibility.
Maximum Line Current	Machine set at 90 kVp/6 mA

Screen/Film Type Kodak Lanex Regular with Kodak T-MAT G (green/400 speed) or equivalent

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Laser 1000 Specifications

Cephalometric Attachment

Film Size	8" x 10"
Source to Image Distance (SID)	1624 mm - 1724 mm (63" - 68")
Exposure Times	0.4, 0.5, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0 seconds
Tube Voltage	70 - 90 kVp ± 12%
Tube Current	10 mA ± 10%

Laser

Class	II
Type	Laser Diode, Toshiba TOLD9442M
Wavelength	650 nm
Average Operating Current	34 mA
Average Operating Voltage	0.75 VDC
Maximum Average Radiant Power	0.2 mW
Maximum Peak Radiant Power	< 1 mW
Beam Divergence	0.9 mRadian
Beam Diameter	1.8 mm
Emission Duration	Operator-controlled by a momentary switch

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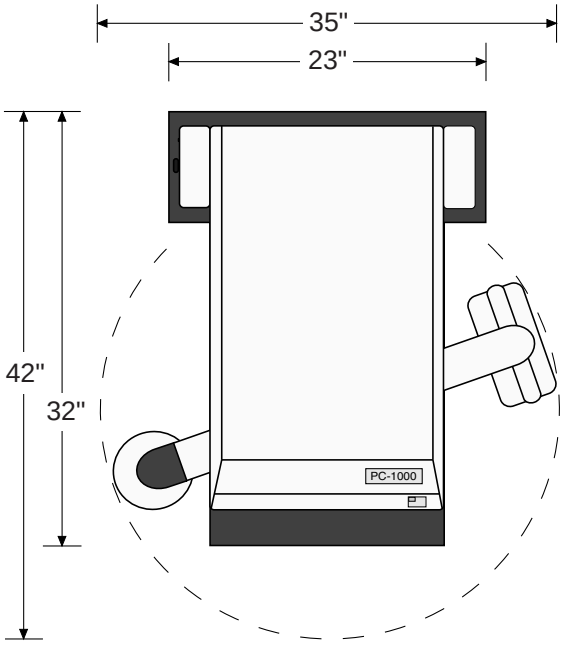
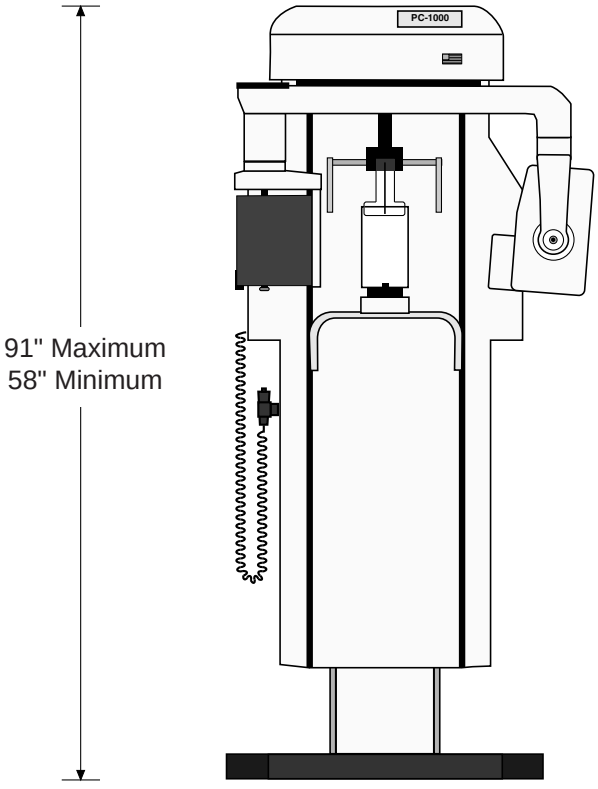
PC-1000 Space Requirements



Physical Dimensions
35" W x 42" D x 91" H

Minimum Working Space
48" W x 48" D x 91" H



The PC-1000 weighs approximately 485 pounds and is freestanding, requiring no extra support in the wall or floor.

The factory configuration is shipped with the control panel mounted on the patient's left side, unless specified by the customer prior to shipping. The control panel can be easily relocated to the right side at the time of installation.

Note: *The FDA requires that the technique factors (kVp meter) be viewable during the exposure.*

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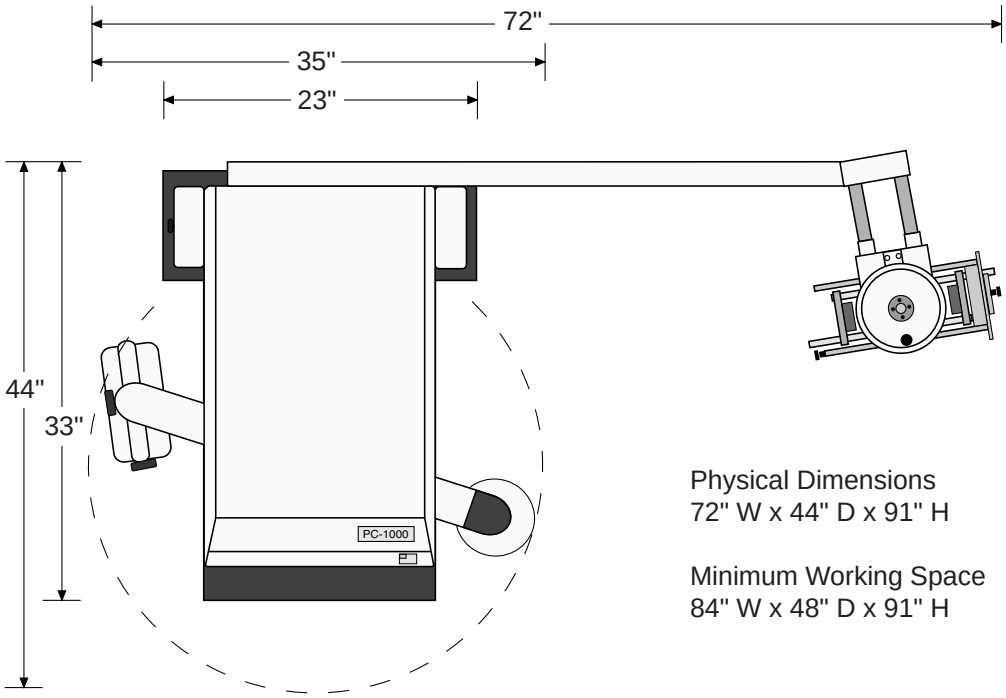
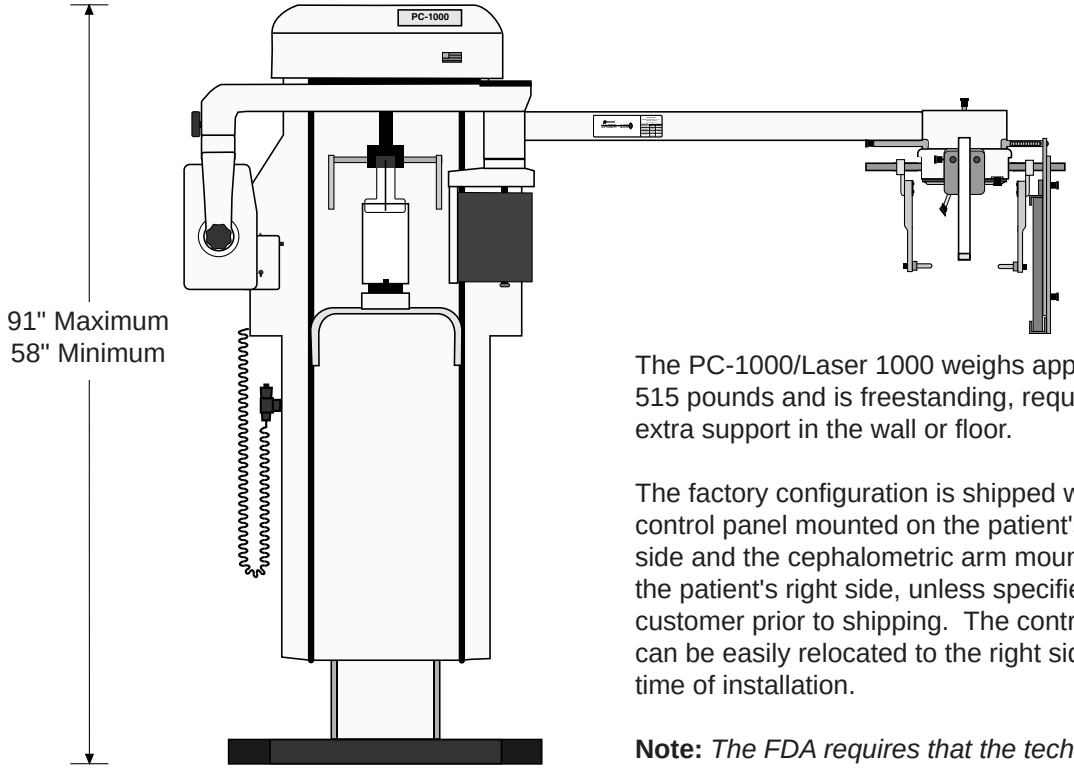
PC-1000/Laser 1000 Space Requirements



Physical Dimensions
72" W x 44" D x 91" H

Minimum Working Space
84" W x 48" D x 91" H



The PC-1000/Laser 1000 weighs approximately 515 pounds and is freestanding, requiring no extra support in the wall or floor.

The factory configuration is shipped with the control panel mounted on the patient's left side and the cephalometric arm mounted on the patient's right side, unless specified by the customer prior to shipping. The control panel can be easily relocated to the right side at the time of installation.

Note: *The FDA requires that the technique factors (kVp meter) be viewable during the exposure.*

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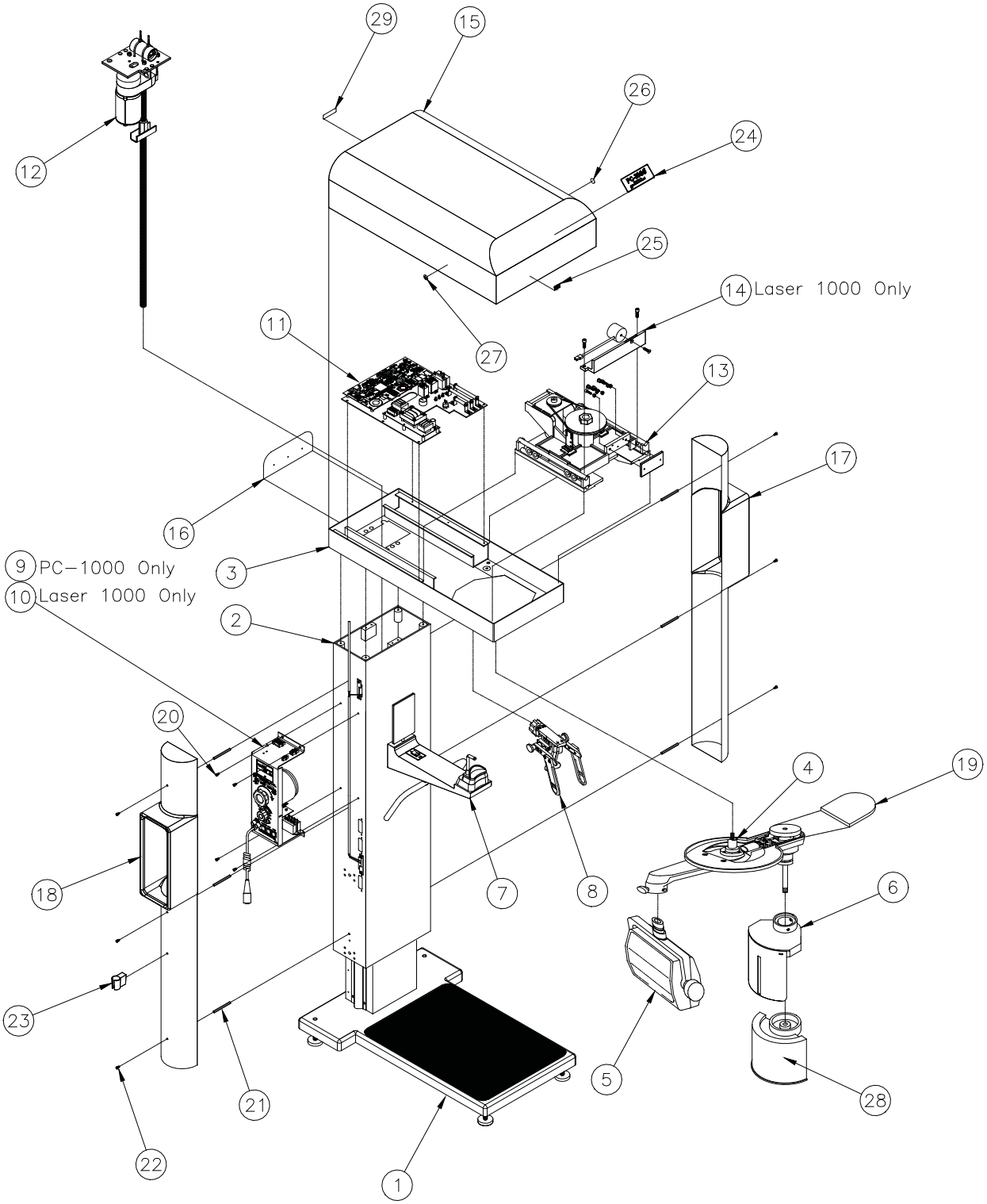
Final Assembly



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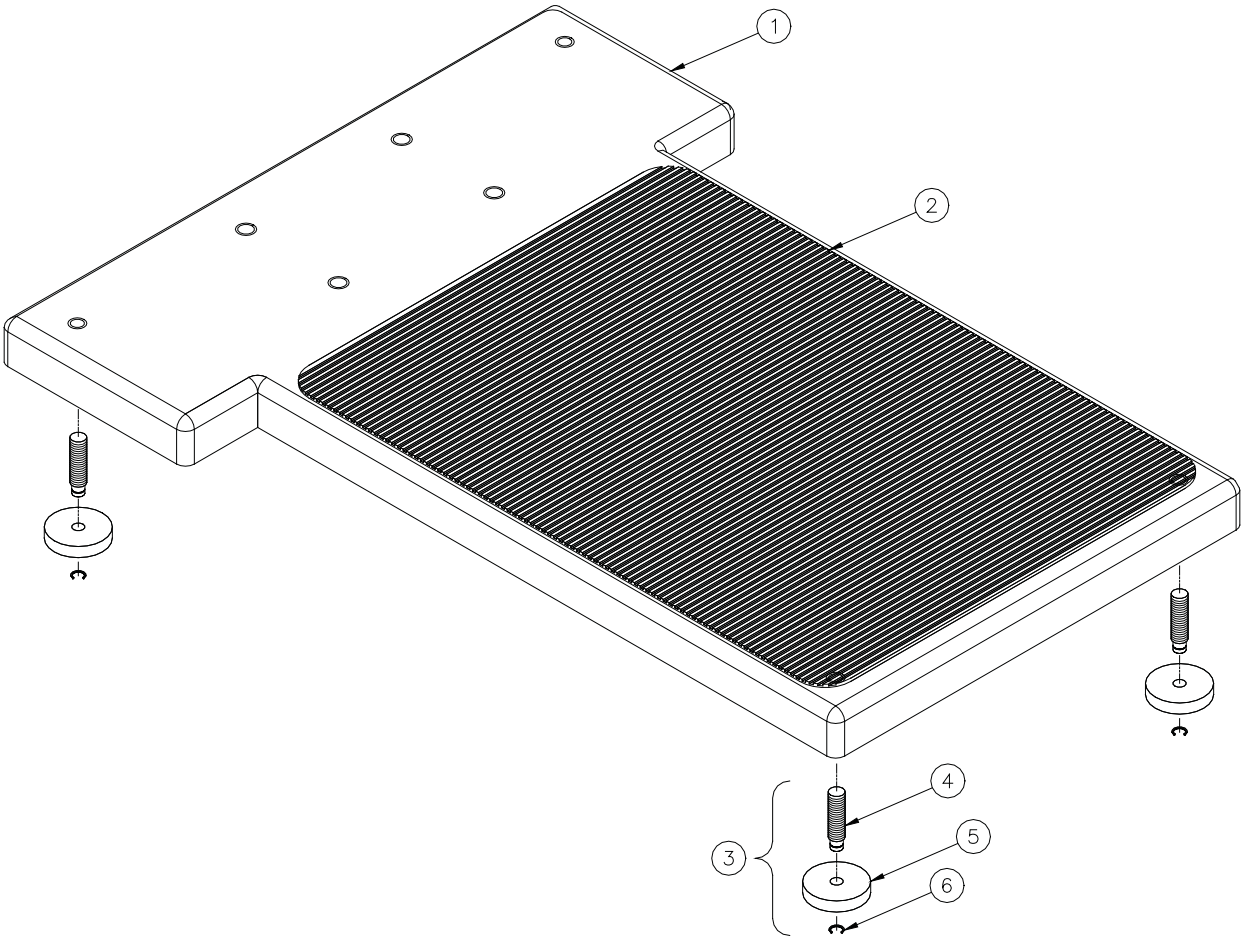
Final Assembly

1	300521-1	Base Weldment
2	800746-1	Outer Post Assembly
3	800747-1	Overhead Chassis
4	800758-1	Rotating Arm Assembly
5	1-418821	Tubehead/Yoke Assembly
6	800732-1	Film Drum Shield Assembly
7	800725-1	Chinrest Arm Assembly
8	2-419340	Head Support Assembly
9	800735-1	Control Panel Assembly, PC-1000
10	800735-2	Control Panel Assembly, Laser 1000
11	800749-1	Electronics Assembly
12	800741	Screw Motor Assembly
13	800655-1	Belt Drive Assembly
14	800752-1	Electromagnet Assembly, Laser 1000
15	300336-1	Top Cover
16	800705-2	Rear Cover
17	800701	Side Cover, Non-Control Panel
18	800704-1	Side Cover, Control Panel
19	1-229060	Cover, Inertia Wheel
20	1-50362	Mounting Bolt, 1/4-20X1/2" Long
21	1-133394	Hex Post (Standoff)
22	29-318027	PHMS 4-40 1 1/4" Long
23	1-317968	Holder, Exposure Switch
24	1-229983	Decal, Model
25	1-229548	Decal, USA Flag
26	1-229916	Decal, Right Arrow
27	2-229916	Decal, Left Arrow
28	800733-1	Film Drum Assembly
29	300533-1	Decal, Warning

Base Assembly



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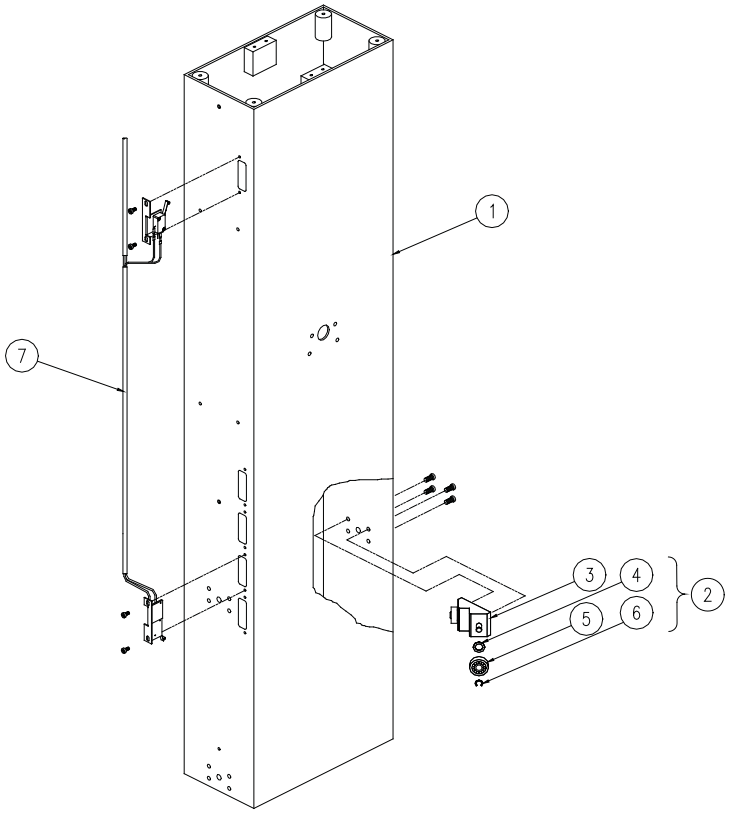
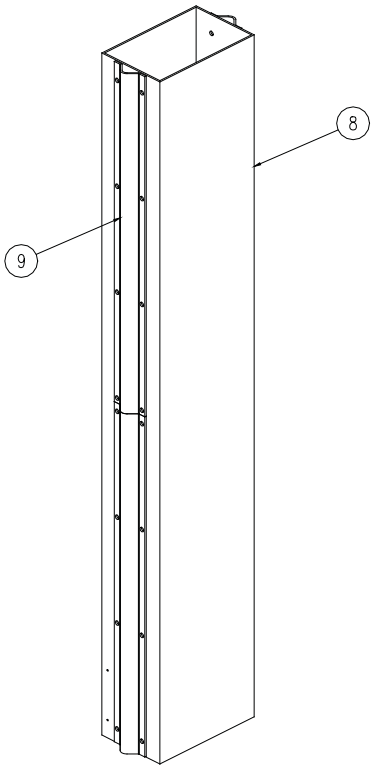
Base Assembly

1	300521-1	Base Weldment
2	318555-2	Tread, Foot
3	229847-2	Assembly, Leveling Foot
4	2-229846	Screw, Leveling Foot
5	1-229845	Pad, Leveling Foot
6	13-52922	Truarc Retaining Ring

Main Chassis Assembly





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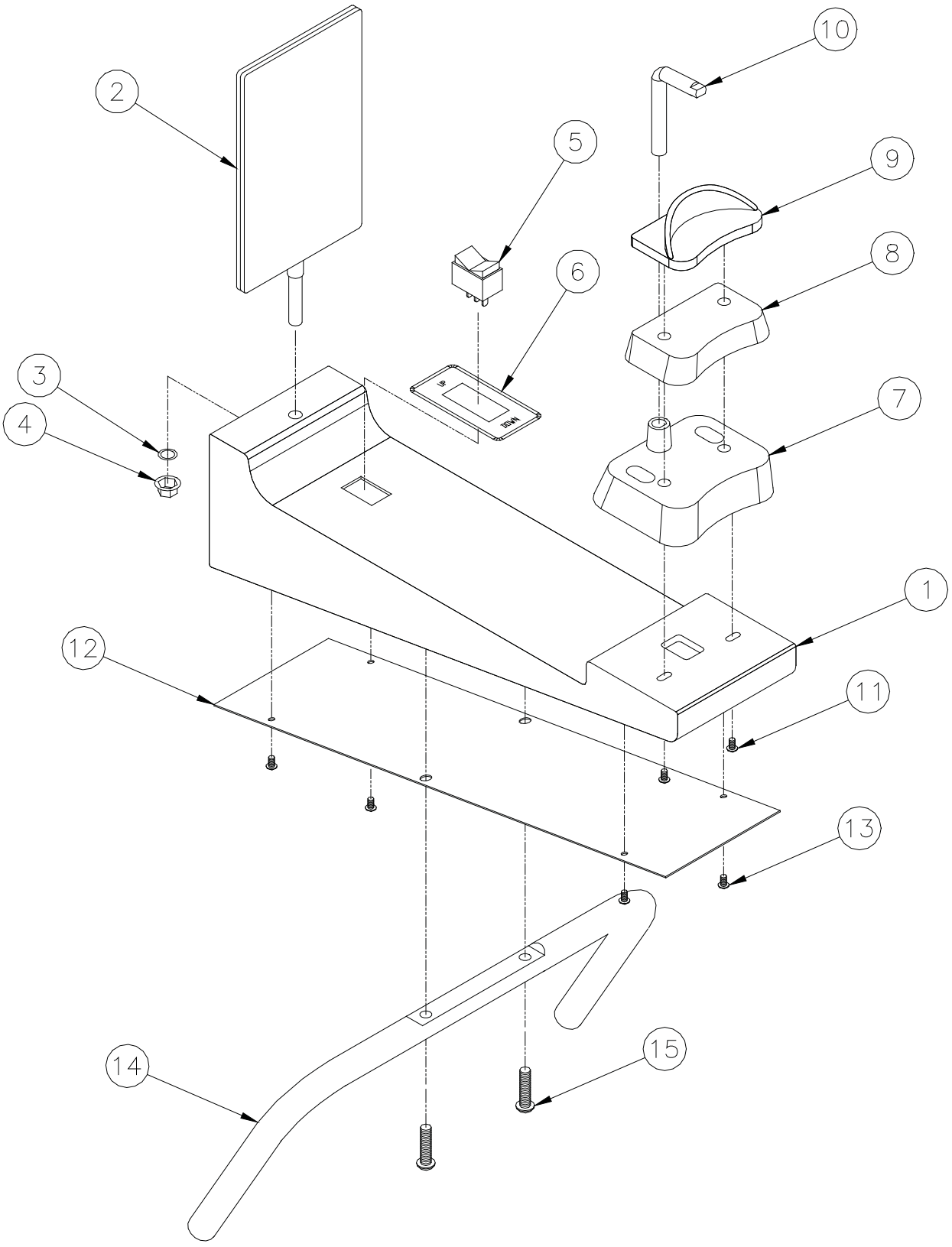
Main Chassis Assembly

1	800742-1	Outer Post Weldment
2	318560-1	Bearing Mounting Block Assembly
3	1-229959	Bearing Mounting Block
4	229098-4	Washer, Special
5	2-229065	Bearing, Ball
6	7-52482	Ring, Retaining
7	800728-1	Switch/Harness Up/Down Limit
8	800743-1	Inner Post Weldment
9	1-229955	Guide Rail

Chinrest Arm Assembly



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Chinrest Arm Assembly

1	300450-1	Arm, Chinrest
2	1-318683	Mirror
3	35-37106	O Ring
4	1-133584	Nut - Push-On .312
5	2-131761	Switch, Rocker w/Mount
6	1-229982	Decal, Direction Up/Down
7	300449-1	Base, Chinrest
8	317905-1	Chinrest, Black, Removable
9	1-229057	Chinrest, Clear, Endentulous
10	01-02472	Bite Guide, Disposable
11	18-52750	S.H.C.S 8-32X5/8
12	300452	Cover, Chinrest Arm
13	229988-7	6-32X1/4 BHCS
14	300453-1	Handle
15	229988-4	HBCS 1/4-20X1 Long

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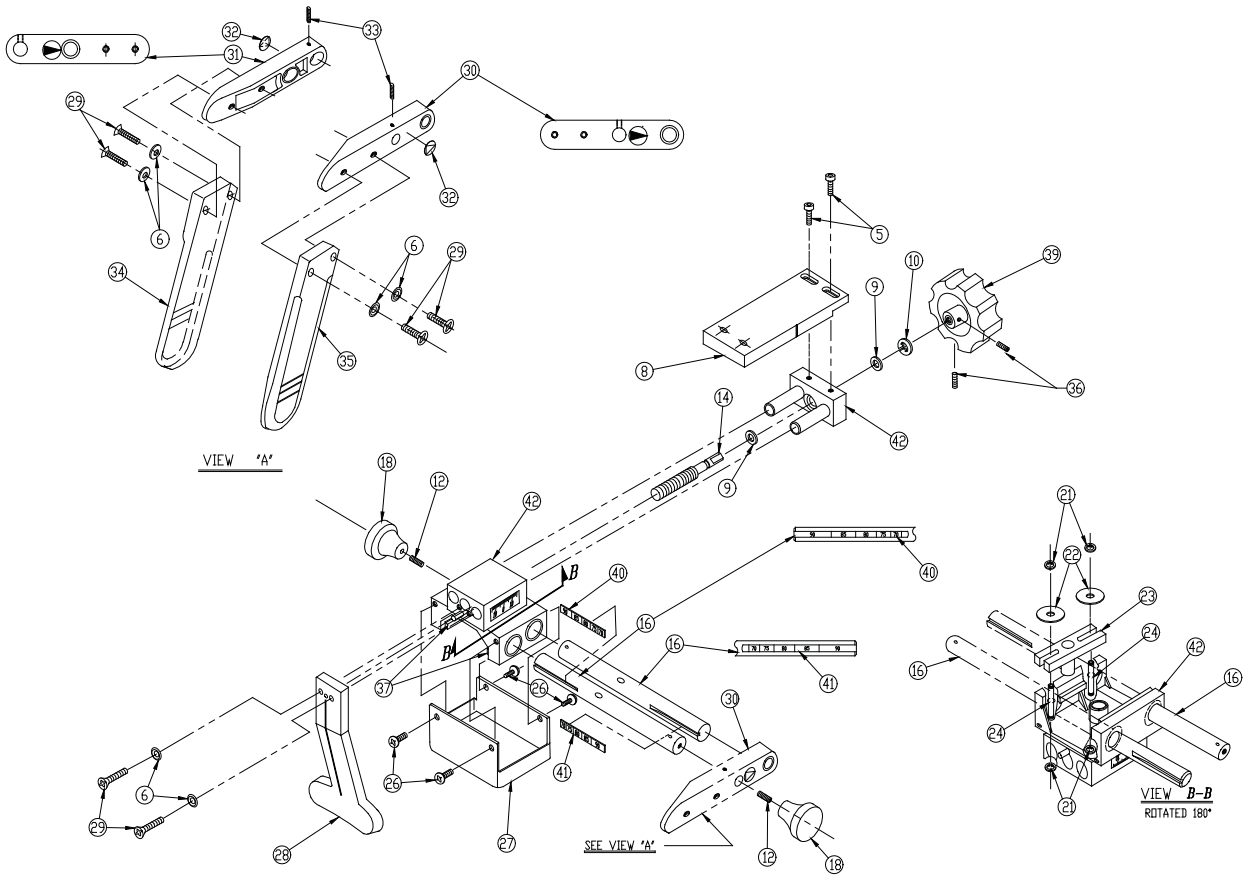
Head Support Assembly



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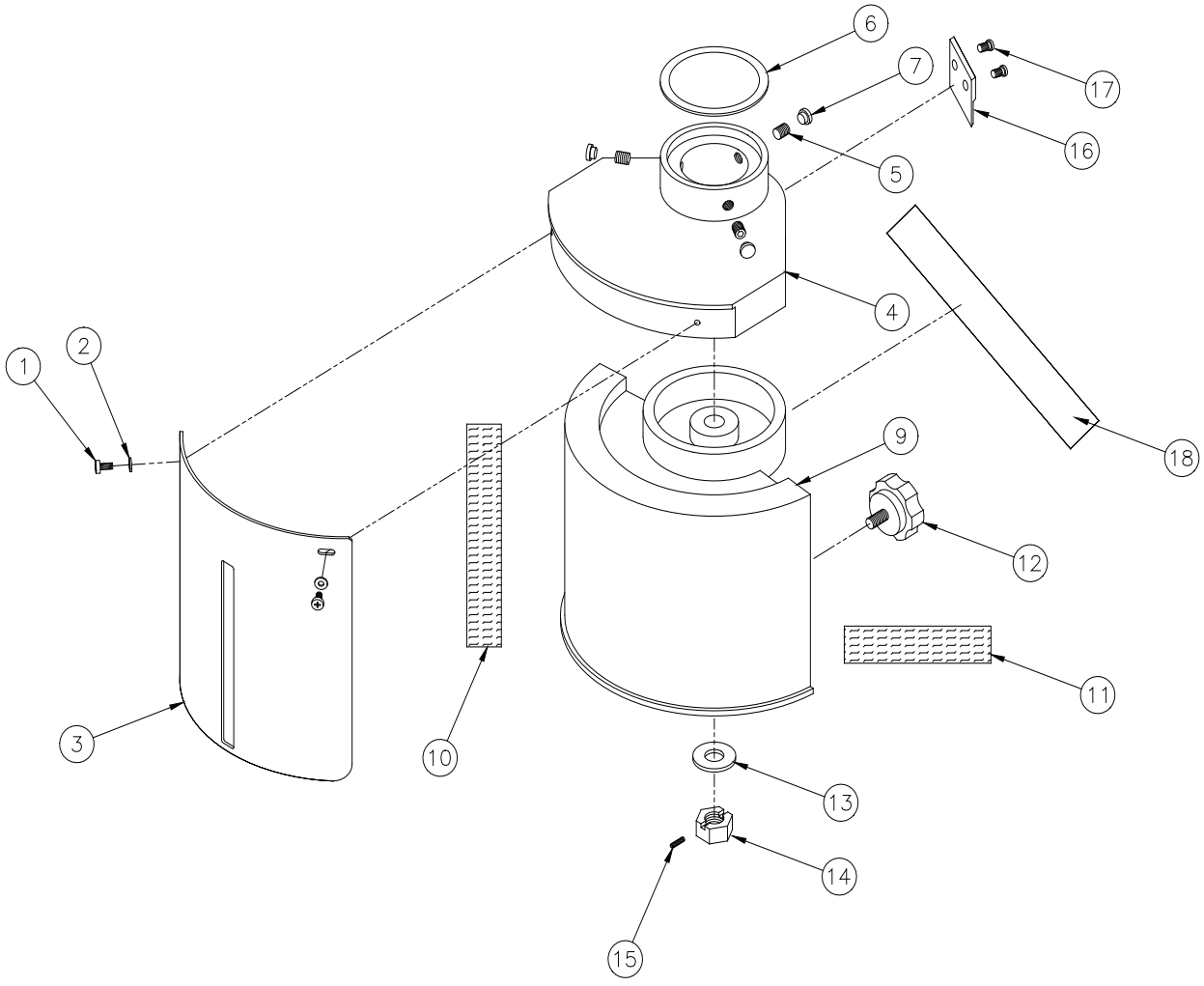
Head Support Assembly

5	16-52752	SHC 8-32X3/8" LG
6	1-133223	Washer, Special Head Support
8	1-229887	Plate, Head Support
9	229098-2	Washer, Nylon (Special)
10	12-52482	Ring, Retaining
12	237-50752	Screw, Set 8-32X1/2" LG
14	1-229075	Rod, Threaded
16	1-230098	Shaft, Head Cal
18	1-131739	Knob, Shaft Adjuster
21	5-52482	Ring, Retaining
22	229098-6	Washer, Special
23	230096-1	Guide Bar Assembly
24	1-229085	Pin, Guide Rod
26	21-318027	PHMS, 4-40 1/4" Long
27	1-229054	Cover, Head Support
28	1-317902	Support, Forehead
29	96-318028	FHS 8-32X3/4" LG
30	1-229055	Support Guide Rod Left
31	1-229056	Support Guide Rod Right
32	8-229543	Decal, Red Arrow Yoke
33	223-50752	Set Scr Cup Pt 6-23 1/4 L
34	1-229053	Support Head Right
35	1-229052	Support Head Left
36		#10-32 1/2" Set Screw (supplied with Knob, Head Support)
37	638001	Foam Tape 3/16X3/8
39	300468-1	Knob, Head Support
40	674008-2	Decal, kVp Left Side
41	674008-1	Decal, kVp Right Side
42	800770-1	Head Support Block Assembly

Film Drum Assembly



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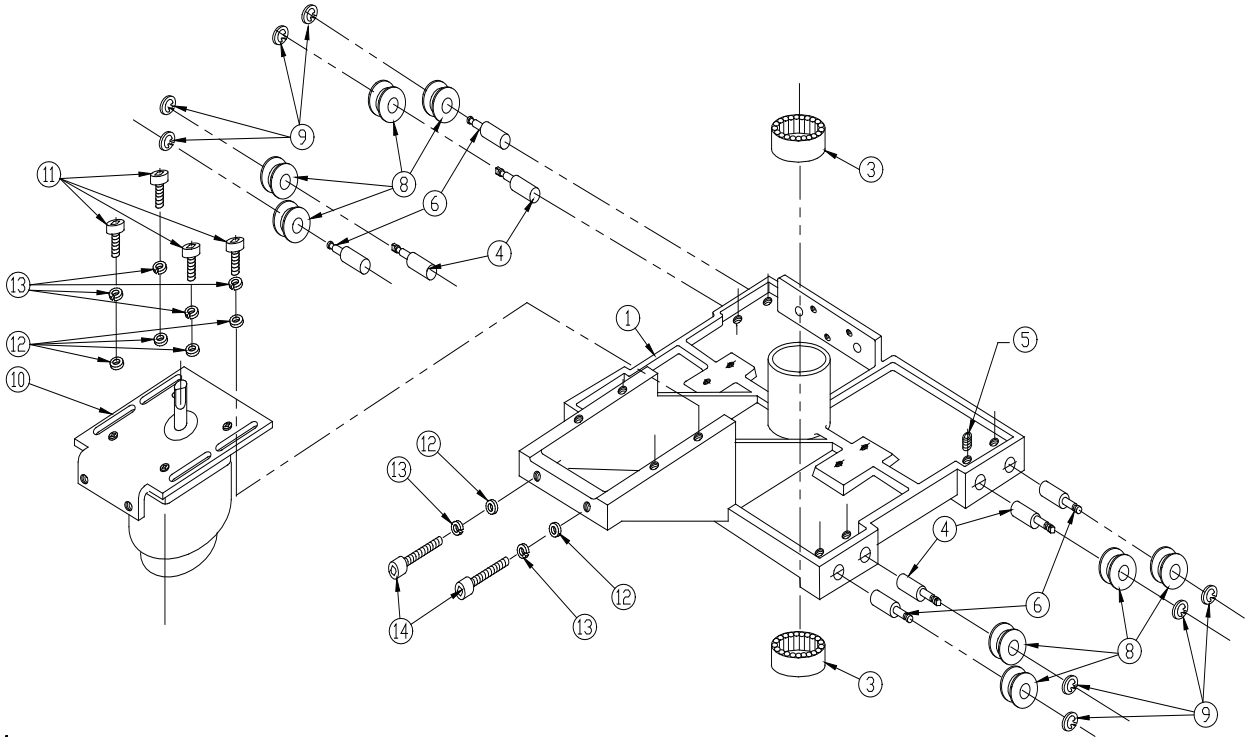
Film Drum Assembly

1	93-318027	PHMS 8-32X3/8 SS
2	4-50622	Washer #8
3	1-317942	Plate Assembly, Film Drum
4	2-317900	Slot Plate Support
5	266-507252	Set Screw 5/16-18 7/16" LG
6	1-131729	Spacer, Film Drum
7	1-133454	Plug, Push In
9	300454	Film Drum
10	1-133579	Velcro Hook Side, End
11	1-133579	Velcro Hook Side, Shaft
12	300467-1	Knob, Film Drum
13	12-50621	Washer 9/16"
14	1-229117	Nut, Special
15	226-50752	Set Screw #6-32X7/16L Hex
16	300455-1	Pointer, Film Drum
17	229988-5	BHMS #6-32X1/2
18	300461-1	Decal, Pointer Alignment

Upper Belt Drive Assembly



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Upper Belt Drive Assembly

1	300333-1	Machine Casting, Upper Drive
3	229063-1	Bearing, Needle Roller
4	1-317910	Shaft, Wheel
5	235-50752	Set Screw 8-32 3/8 SHCP
6	1-317911	Shaft, Wheel Plain Head
8	229576-1	Roller Assembly
9	7-52482	Ring, Retaining
10	800683-1	Drive Motor Assembly
11	550002-23	#10-32X1/2 SOC HD CAP Screw
12	5-50622	Washer, Flat #10
13	10-50642	Lockwasher, Split #10
14	550003	#10-32X1-3/4 SHCS Full Thread

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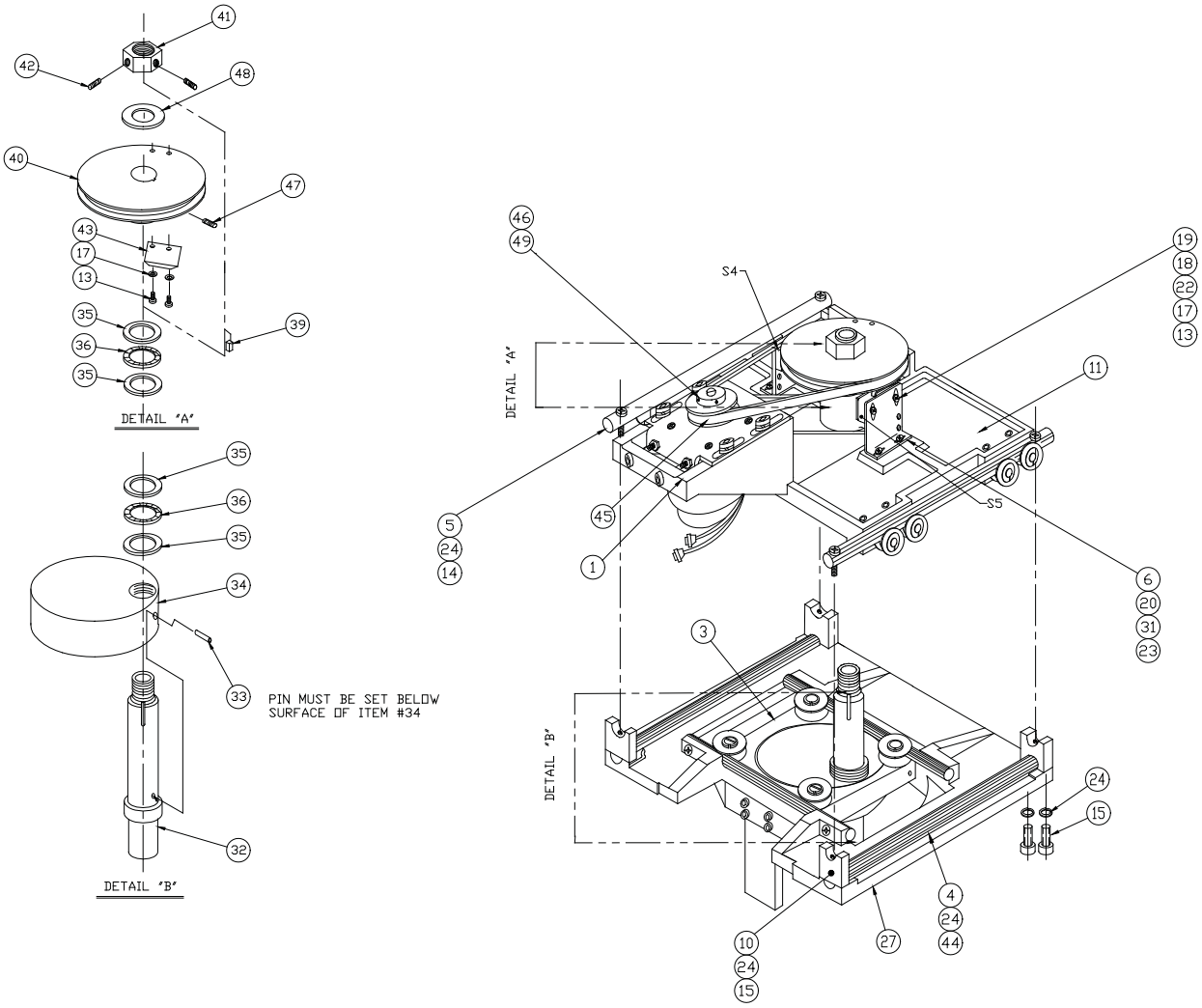
Belt Drive Assembly



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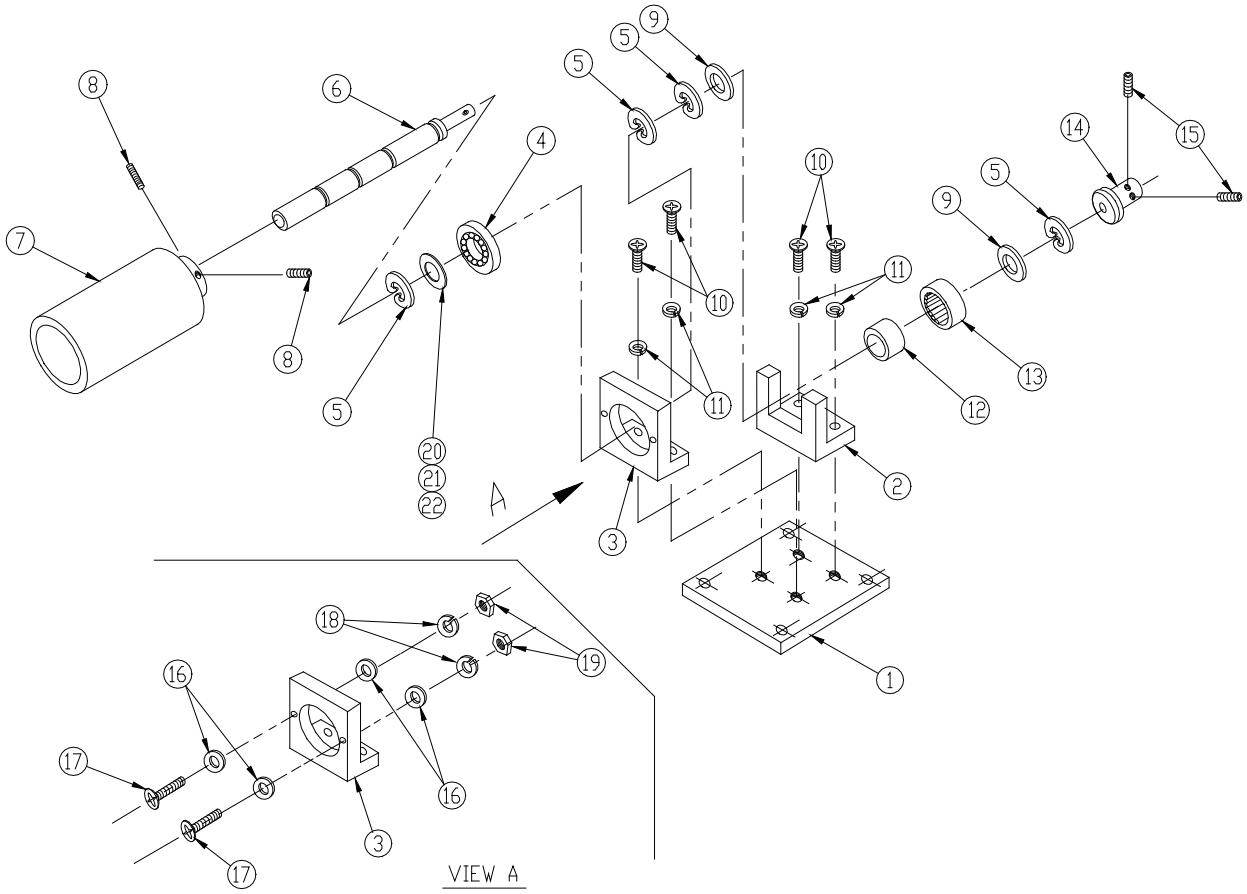
Belt Drive Assembly

1	800642-1	Upper Belt Drive Assembly
3	300543-1	Holder, Cam
4	1-317940	Rod, Guide Center
5	1-229305	Rod, Guide Top
6	300323	Bracket, Micro Switch
10	1-229303	Block Mounting Rod Support
11	800642-1	Upper Belt Drive Assembly
13	26-318027	Screw P.H. 4-40 3/4: Long
14	98-318027	#8-32X1 Pan Hd PHL SS
15	19-52752	S.H.C 8-32 3/4" Long
17	4-50642	Split Lockwasher #4
18	300529-1	Nut Plate
19	229090-1	Micro Switch
20	03-50622	Washer, Flat #6
22	2-50622	Washer, Flat #4
23	60-318027	P.H.S. 6-32 1/2" Long
24	8-50642	Split Lockwasher #8
27	317909-3	Lower Drive Assembly
31	6-50642	Lockwasher, Split #6
32	300321-1	Shaft, Cam Mounting
33	79-52901	Pin, Roll 3/16 Dia 1/2" Lg
34	1-318680	Cam, Upper Drive
35	2-229171	Washer, Thrust
36	2-229066	Thrust-Needle Bearing
39	1-131773	Key, Upper Drive Shaft
40	300328	Driven Pulley
41	1-131708	Nut, Hex Spc 3/4-10
42	243-50752	Set Scr 10-24 1/4" S.H.
43	300326	Actuator, Switch
44	95-318027	P.H.S. 8-32 5/8" Long
45	300331	V-Belt, Drive
46	300327-1	Pulley, Motor Drive
47	52-50720	1/4-20X1/4 Soc Set Cup
48	14-50622	Washer, Flat, 3/4 Std
49	550002-22	10-32X3/8 SHCS B.B.

Roller Orbit Drive Assembly



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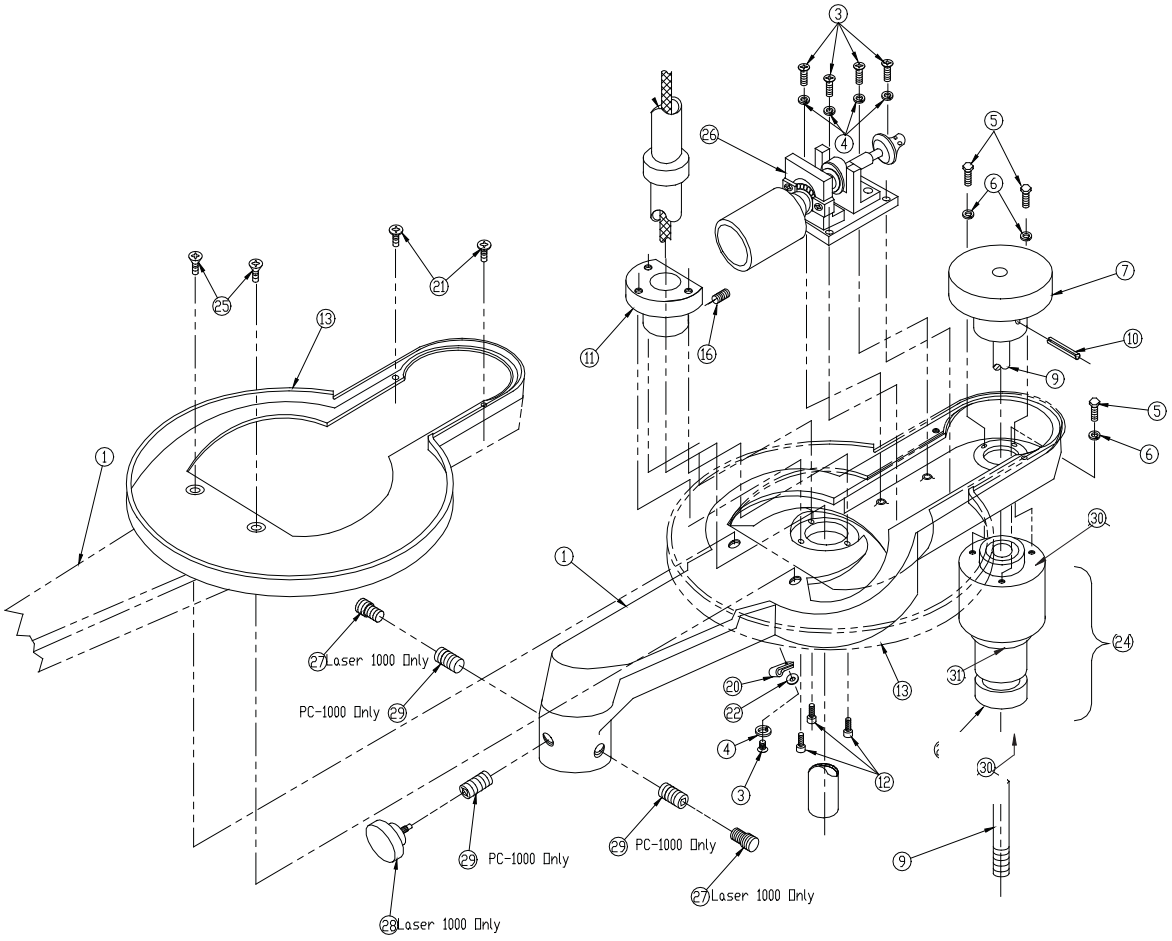
Roller Orbit Drive Assembly

1	229081-1	Plate, Shaft & Bearing Mounting
2	1-229079	Open Block, Bearing
3	229080-3	Block, Brg Retainer
4	1-229065	Bearing, Self Aligning
5	17-52922	Ring, Retaining
6	1-229083	Shaft, Wheel Drive
7	1-229082	Roller, Orbit Driving
8	40-50721	Set Scr 10-24X3/16 Lg
9	229098-1	Washer, Special Plastic
10	110-318027	Scr 10-32X1/2" Lg
11	10-50642	Lockwasher, Split #10
12	1-229097	Inner Race, Needle Rl Brg
13	229063-3	Bearing, Roller
14	1-131704	Roller, Wheel Drive
15	1-50721	Set Scr 4-40X1/8" Lg
16	03-50622	Washer, Flat #6
17	550015-62	Screw, Ph Phil, #6-32X3/4
18	6-50642	Lockwasher, Split #6
19	3-50212	Nut, Hex #6-32
20	542004-0209	Shim, .010THK, .5ID, .75OD
21	542004-0211	Shim, .015THK, .5ID, .75OD
22	542004-0212	Shim, .020THK, .5ID, .75OD

Rotating Arm Assembly



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Rotating Arm Assembly

1	317944-1	Rotating Arm Assembly
3	93-318027	PHMS 8-32X3/8 SS
4	8-50642	Split Lockwasher #8
5	5-50362	H.H.S. 1/4-20 1" Long
6	13-50642	Lockwasher, Split 1/4"
7	300509-1	Wheel, Inertia
9	300510-1	Shaft, Film Drum
10	78-52902	Pin, Roll 5/32X2" Lg
11	317927-1	Collar, Cam Shaft
12	27-52752	Shc Scr 10-24 1" Lg
13	1-418828	Trim, Rotating Arm
16	266-50752	Set Scr 5/16-18 7/16" Lg
20	3-127291	Clamp, Cable Holder
21	91-318027	P.P.H.S. 8-32 1/4" Long
24	318033-1	Assembly, Hsg Brg, Film Drum
25	91-318028	FHP Scr 8-32 1/4" Long
26	800698	Assembly, Roller Orbit Drive
27	300224-3	Screw, Slotted Dog
	131-18x0.15A	Screw, 5/16-18x5/32 AHHL (included only with Cephalometric units)
28	300470-1	Knob, Horizontal Rotation
29	126-50750	5/16-18X7/16 Soc Set Flat
30	1-229064	Roller Bearings
31	317923	Housing Bearing Film Holder

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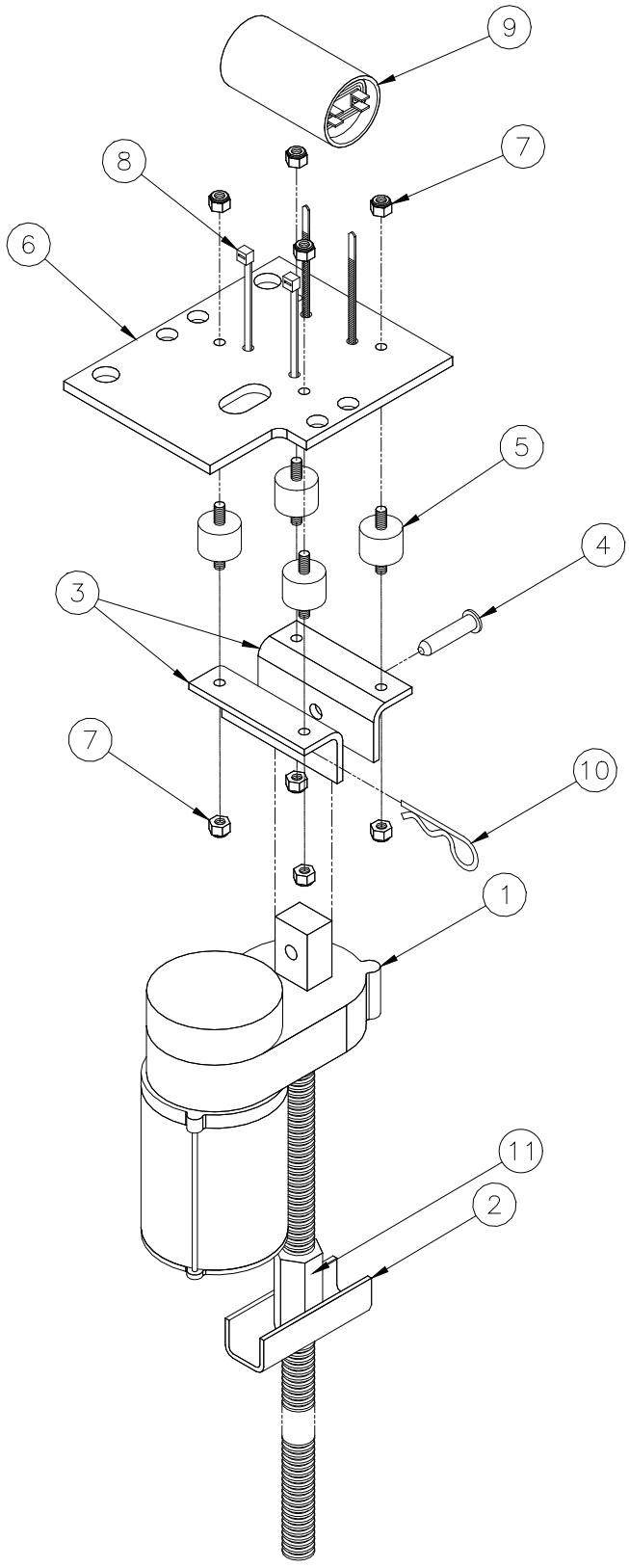
Screw Motor Assembly



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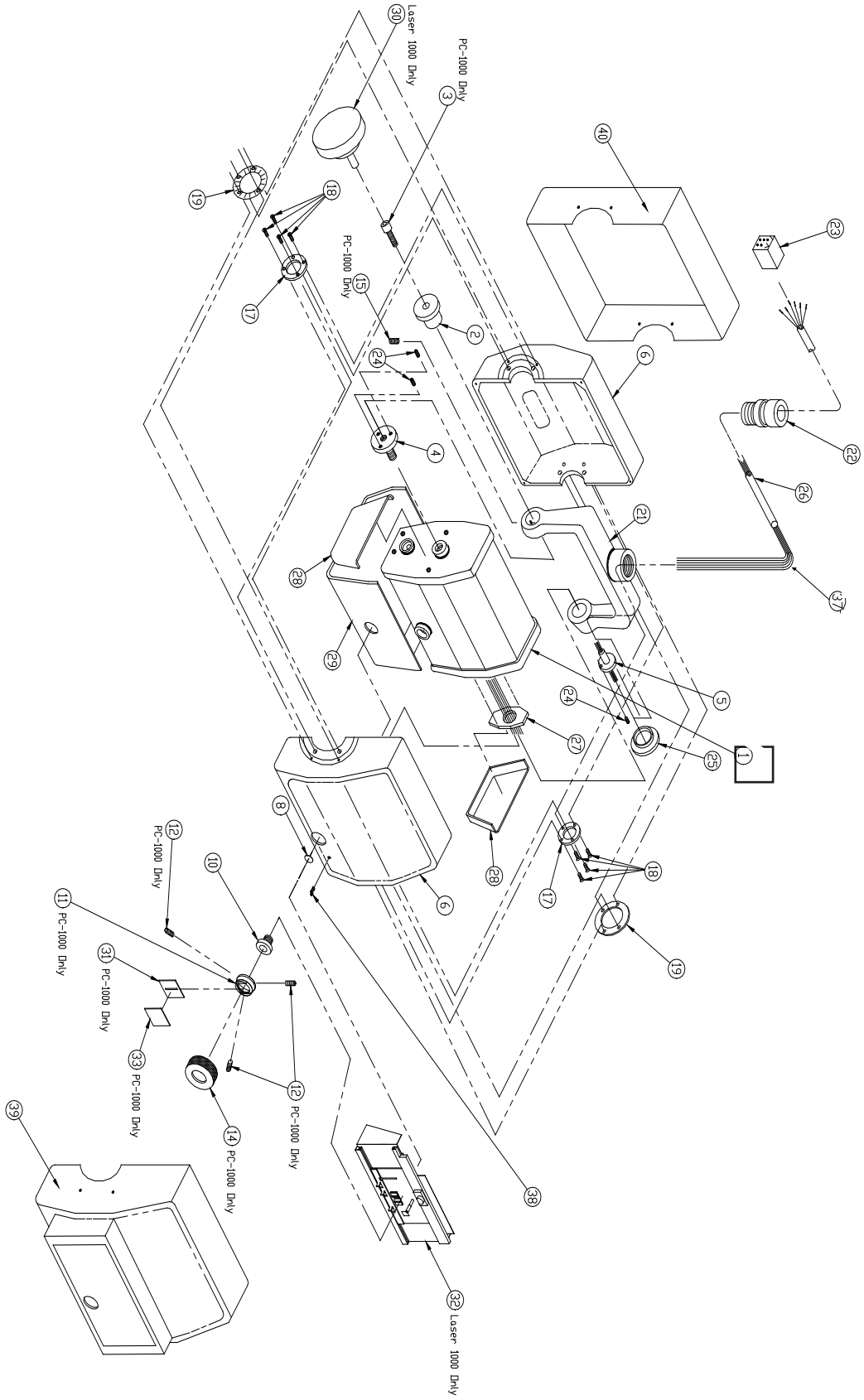
Screw Motor Assembly

1	300482-1	Motor, Screw Drive
2	300485-1	Cushion
3	300473-1	Bracket, Angle
4	1-131790	Pin Clevis
5	300466-1	Mounting, Cylindrical
6	300522-1	Plate, Screw Drive Mounting
7	550012-6	Nut, Hex, Nylon Lock, 1/4-20
8	660000-1	Cable Tie
9	300507-1	Capacitor, Motor
10	131749-1	Pin Cotter
11	800744-1	Nut Assembly

Tubehead Assembly



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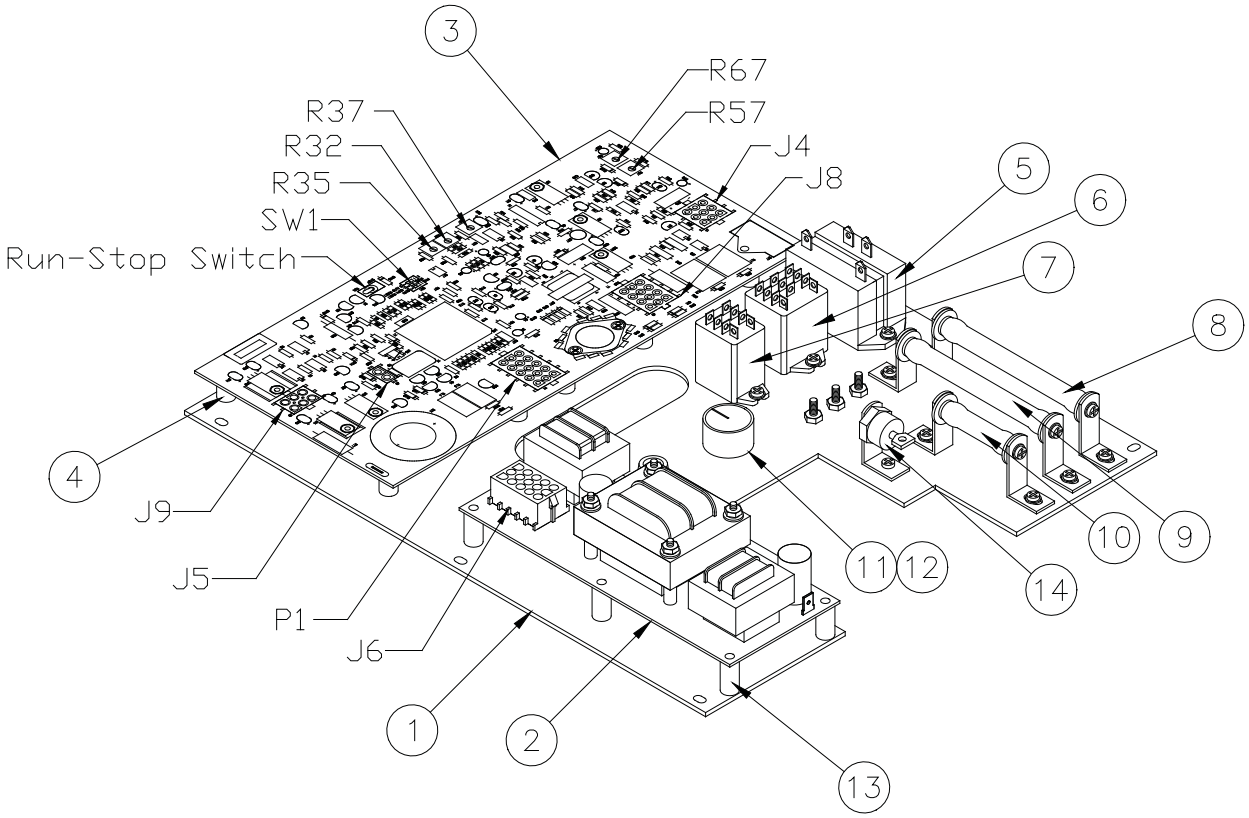
Tubehead Assembly

1	419321-1	Inner HSG Assy-Tube
2	1-229113	Collar, Adj X-ray Tube Hld
3	1-131792	SHCS 5/16-24X3/4 Chrome
4	1-131718	R.H. Adj. Sleeve
5	1-131719	Sleeve X-ray Tube Housing
6	419320-1	Assembly, Tube Halves Finished
8	1-131798	Shield, Radiation
10	229161-1	Collar Collimator Support
11	1-317929	Support, Collimator
12	3-50752	Set Scr, 4-40X1/4 Lg
14	1-229101	Ring Collimator
15	266-50752	Set Scr 5/16-18 7/16" Lg
17	1-131717	Plate, Housing
18	91-318028	FHP Scr 8-32 1/4" Long
19	1-229112	Plate Calibration
21	1-418805	Casting Yoke, Finished
22	1-229114	Shaft, Yoke
23	9-314300	Male Plug 6 Circuit
24	14-50752	Set Scr, 6-32X5/16" Long
25	680000-14	Button Plug, 1 3/16" Hole
26	1-229564	PVC Tubing-3/8" Black
27	1-229552	Shield, X-ray Tube Housing
28	1-229551	Lead Wrap, Ends
29	1-318024	Lead Wrap, Face
30	300469-1	Knob, Ceph
31	131720-2	Collimator, 0.030X0.845
32	800753-1	Aperture/Collimator Assembly
33	133582-2	Decal, Collimator
37	318003-2	X-ray Tube Wiring Assembly
38	624014-9	Terminal, Receptacle
39	300230	Cover, Tubehead, Front
40	419527	Cover, Tubehead, Back

Electronics Assembly



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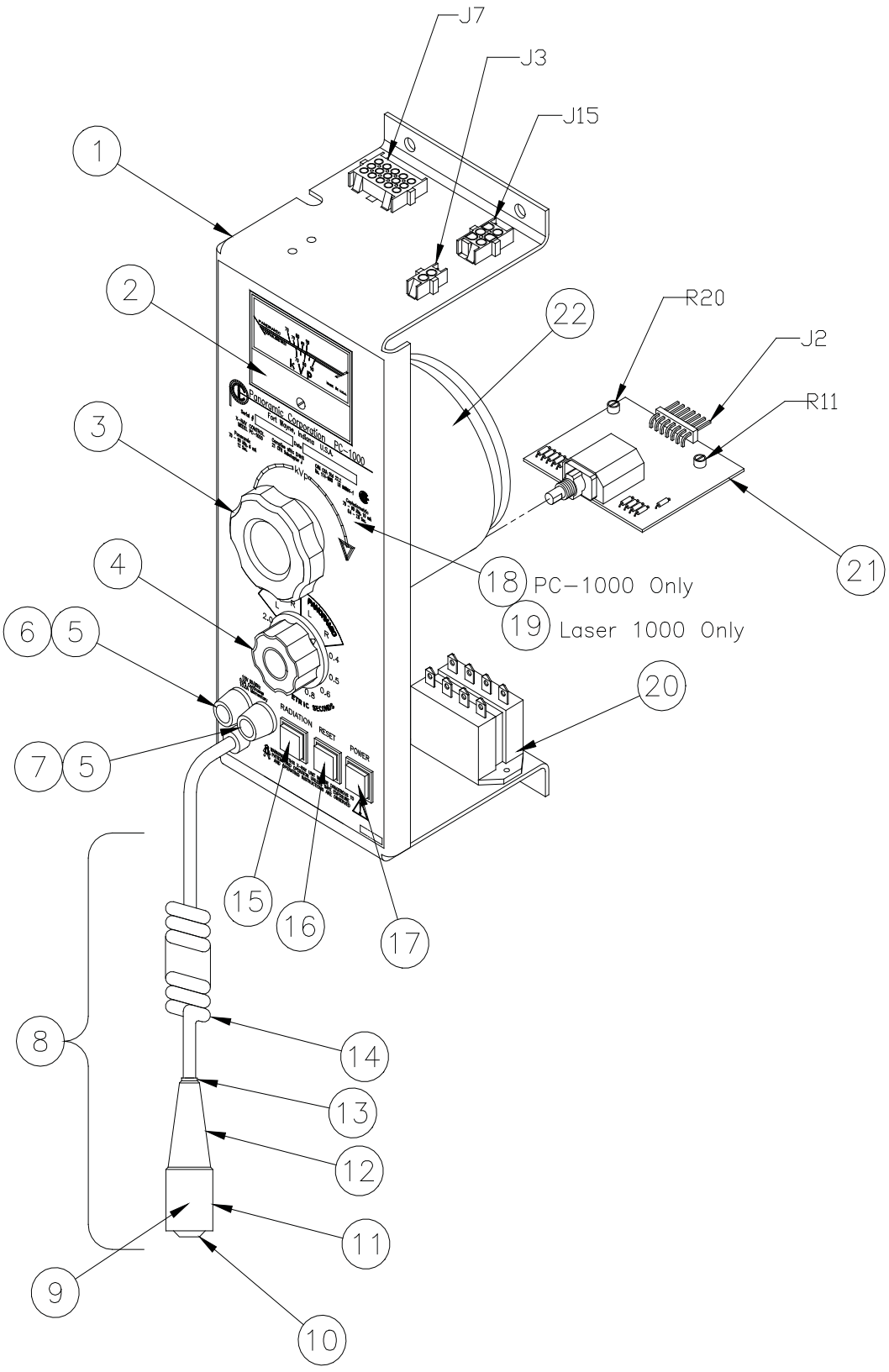
Electronics Assembly

1	300496-1	Plate, Electronics Controller
2	800751-1	PCB Assembly, Transformer Power Supply
3	800750	PCB Assembly, X-ray Controller
4	225470-2	PCB Standoff 0.010
5	594002	Relay, 12VDC, 25-30A, SPST
6	594003-2	Relay, 12VDC, 10A, 3PDT
7	594003-1	Relay, 12VCD, 10A, SPDT
8	3-131747	Resistor, 75 Ohm, 50W, WW Var
9	2-131747	Resistor, 100 Ohm, 50W, WW Var
10	1-131748	Resistor, 5 Ohm, 25W
11	1-229174	Rheostat
12	1-131787	Knob, Rheostat
13	542006-14	Spacer, #6X1/2 Round
14	5-226396	Diode, 40HF10

Control Panel Assembly



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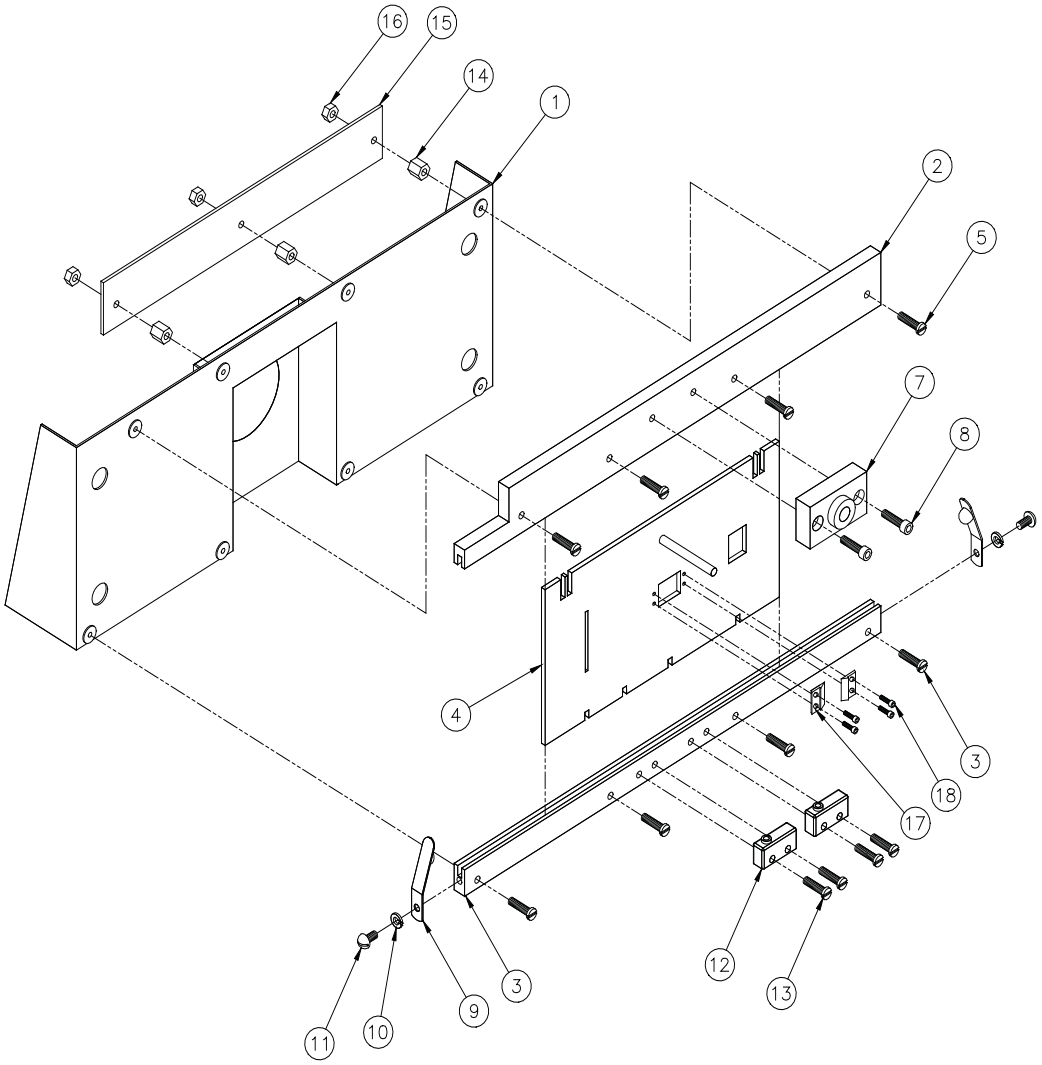
Control Panel Assembly

1	800730-1	Control Panel Weldment
2	800689-200	60-120 VAC Meter/PCB Assembly
3	300465-1	Knob, kVp Adjust
4	300463-1	Knob, Function Switch
5	2-131779	Fuseholder
6	4-131781	Fuse, 10A
7	3-131781	Fuse, 1A
8	318557-1	Exposure Cord/Switch Assembly
9	1-229192	Switch, Pushbutton
10	1-131772	Cap, Pushbutton Switch
11	1-229310	Housing-Switch, Top
12	1-229311	Housing-Switch, Bottom
13	2-131785	Bushing, Strain Relief
14	229990-1	Cable Spiral Assembly
15	1-229941	Indicator, Red
16	1-229940	Switch, Reset, Blue
17	2-229940	Switch, Main, Yellow
18	300460-1	Decal, Control Panel, PC-1000
19	300460-2	Decal, Control Panel, Laser 1000
20	1-229184	Relay, Power
21	800736-1	Timer/Rotary Switch Assembly
22	800768-1	Transformer Assembly

Laser Collimator Assembly



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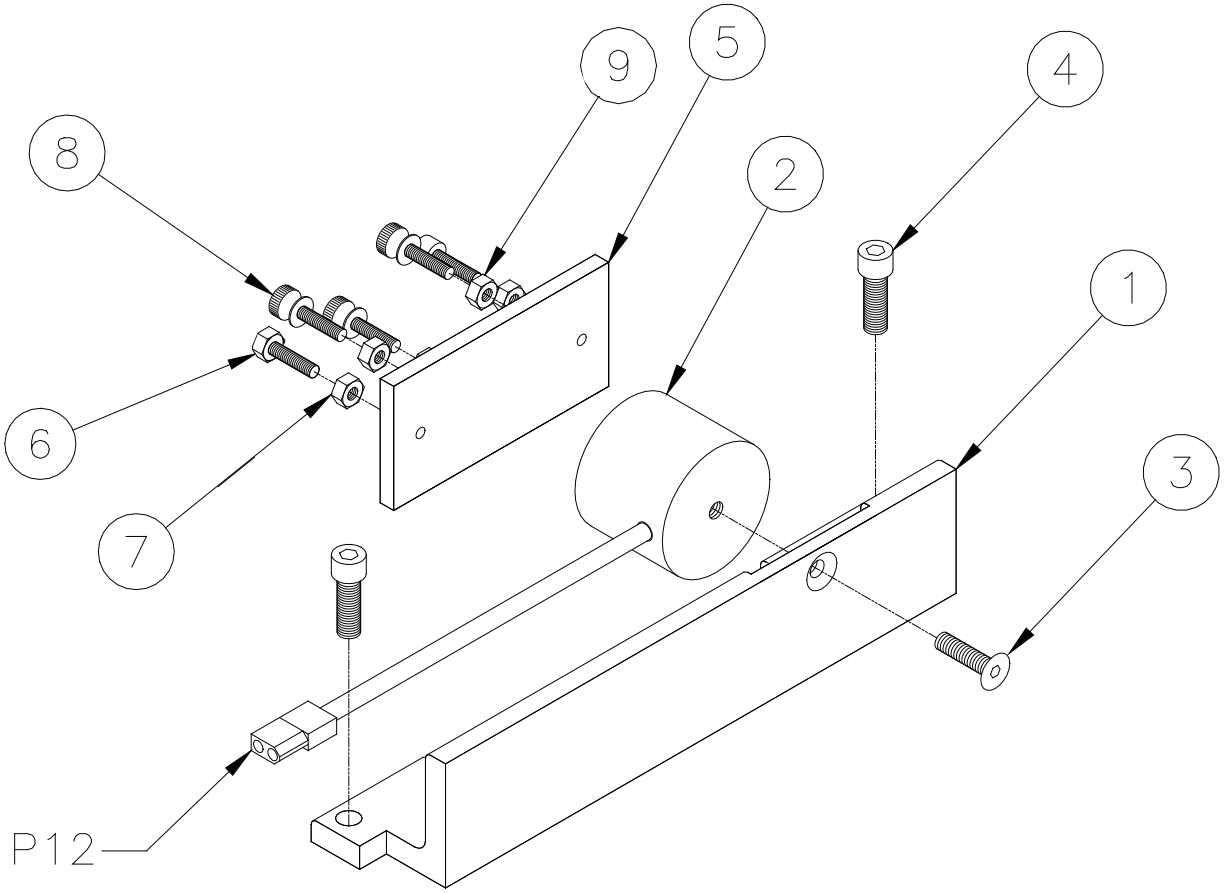
Laser Collimator Assembly

1	800757-1	Shell Assembly, Collimator
2	300504-1	Guide Rail, Top
3	300505-1	Guide Rail, Bottom
4	800756-1	Aperture Plate Assembly
5	28-318028	FHPS 4-40X1
6	26-318027	Screw PH 4-40 3/4 Long
7	800760-1	Laser Lens Assembly
8	02-52750	SHCS 4-40X3/8
9	600500	Snap Button, F-Flat Type
10	4-50642	Split Lockwasher #4
11	21-318027	PHMS, 4-40 1/4" Long
12	300508-1	Switch, Subminature
13	172-318027	PHMS #2-56X0.50
14	542006-2	Spacer
15	800720-1	PCB Assembly, Ceph Laser
16	2-50212	Hex Nut #4-40

Electromagnet Assembly



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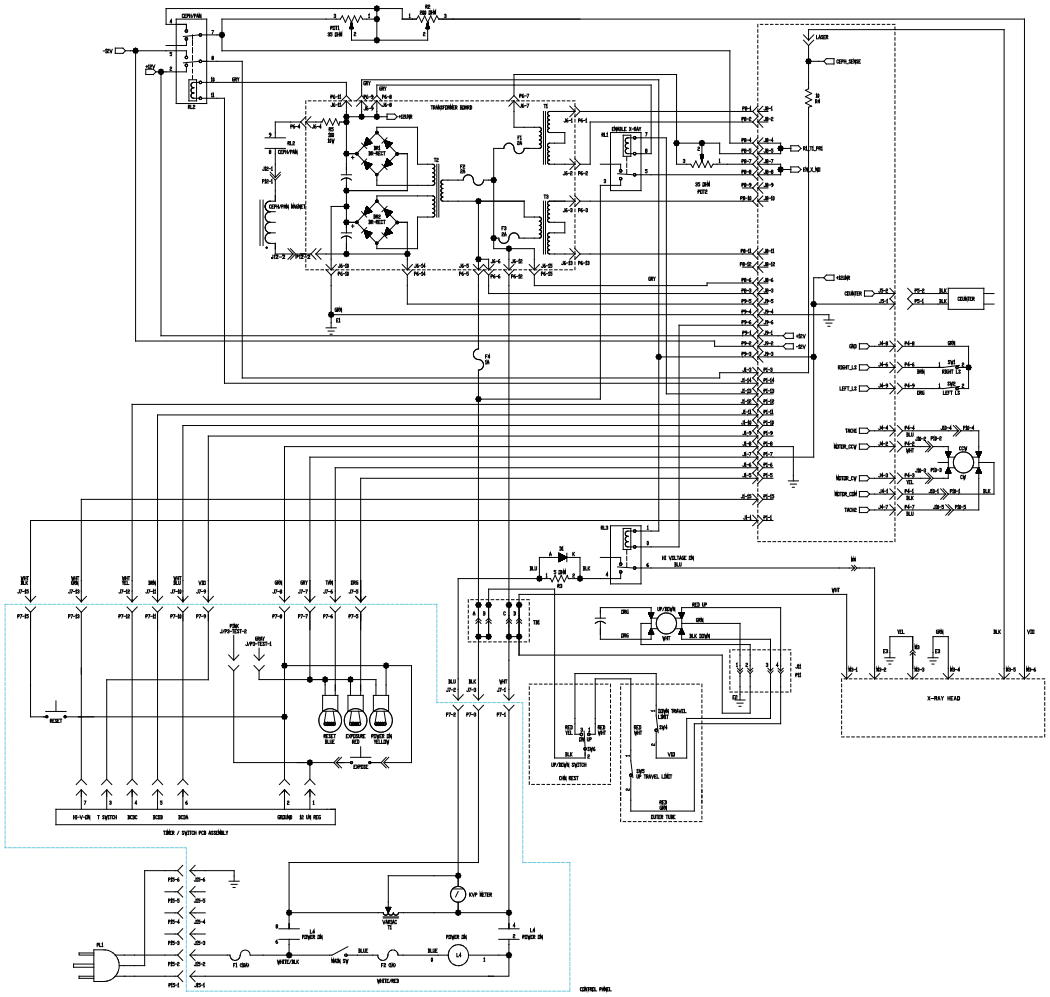
Electromagnet Assembly

1	300246-1	Angle, Mount-Casting
2	600014-1	Electromagnet, 24VDC, 200#
3	154-318028	PFHS 1/4-20X1/2
4	9-550002-53	5/16X24X1 1/2 SHCPSC
5	300413-1	Attachment Plate
6	9-07-50362	1/4X20X1 1/2 HexHd CP Screw
7	9-1-50302	1/4X20 Hex Nut
8	9-550014-9	8-32X1 Thumbscrew Common Knurled
9	4-50212	8-32 Hex Nut

System Wiring Schematic



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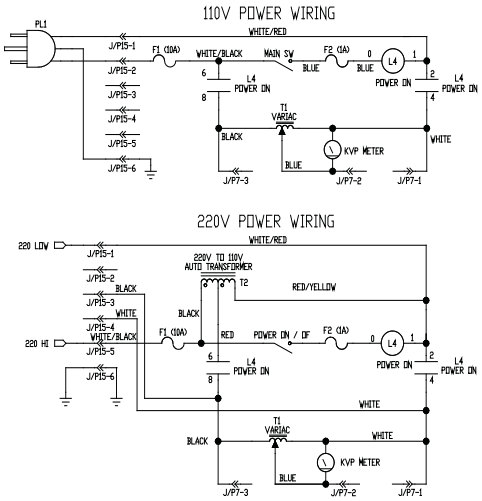
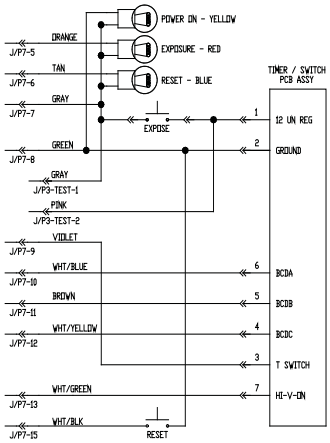
Control Panel Schematic

POWER CONNECTION OPTIONS:





COMMON TO ALL POWER CONNECTION OPTIONS

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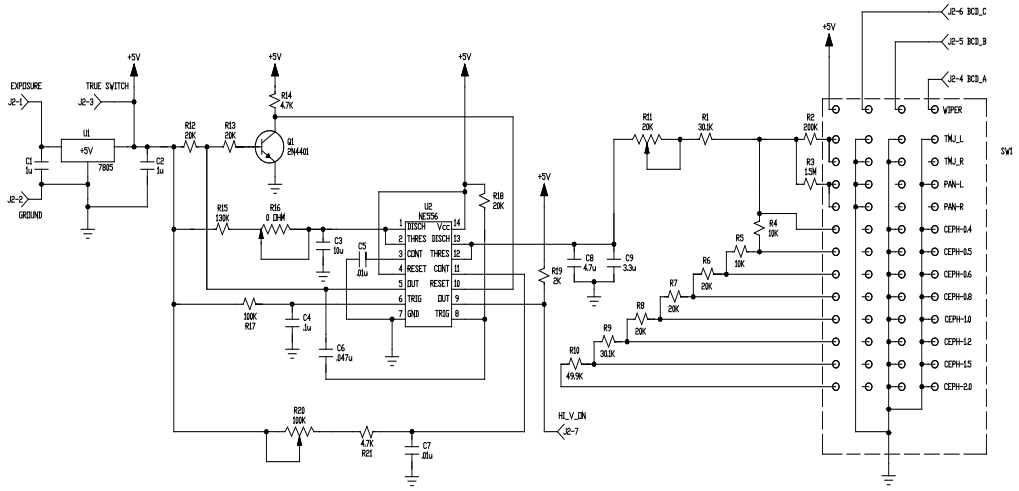
Timer Circuit Board Schematic



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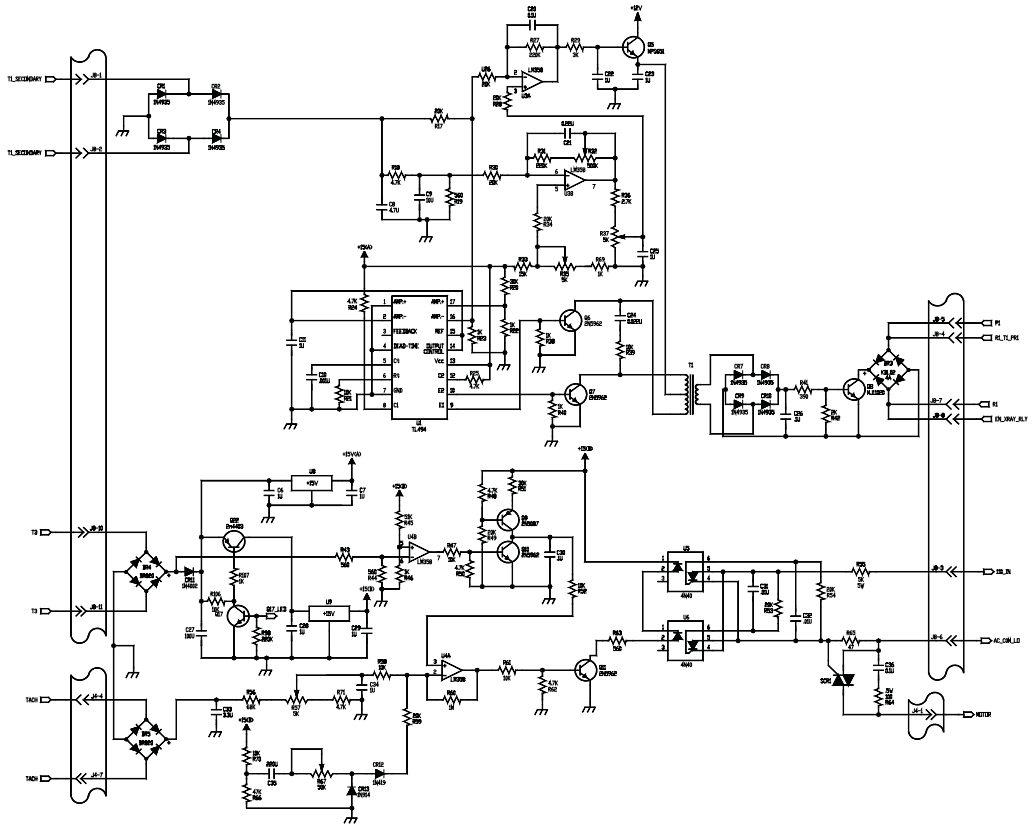
X-ray Control Schematic-1/3



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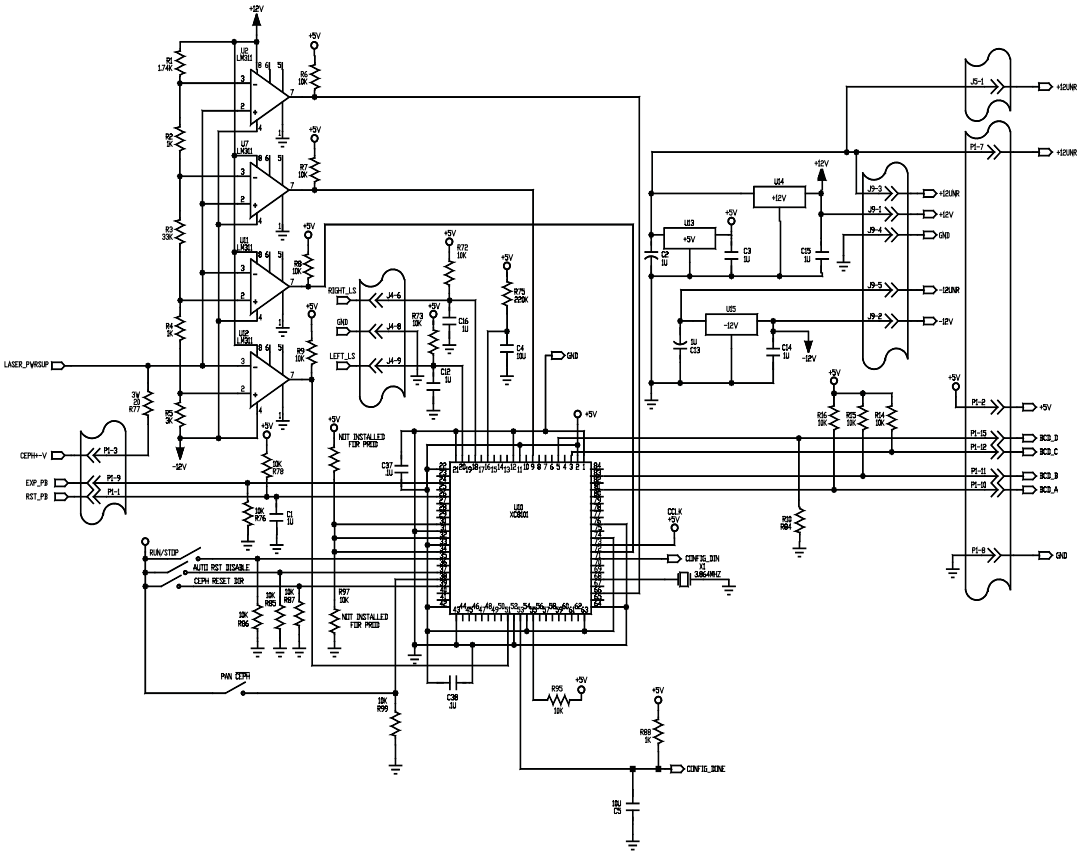
X-ray Control Schematic-2/3



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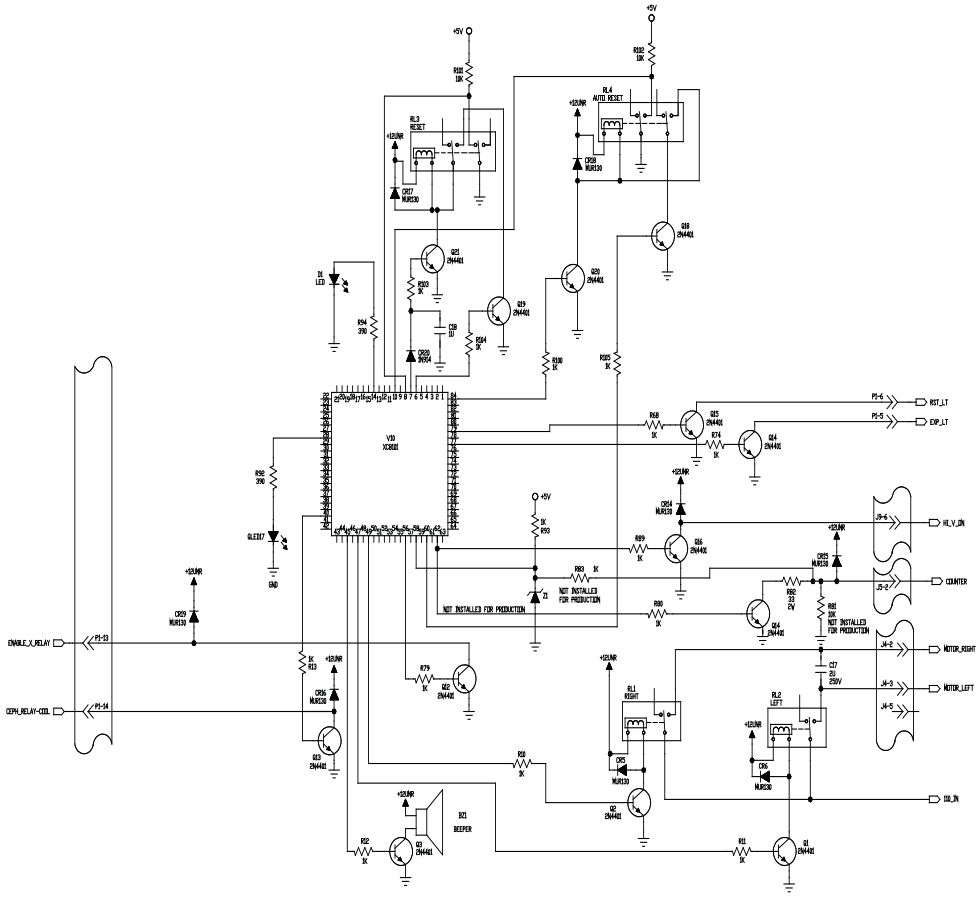
X-ray Control Schematic-3/3



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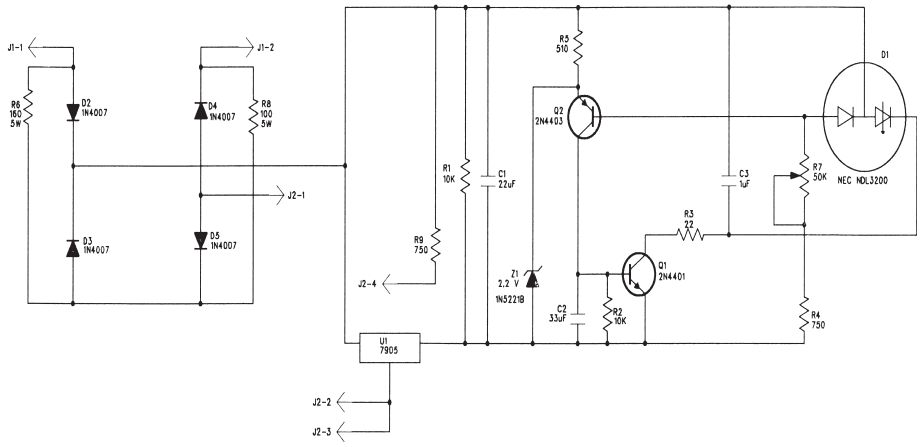
Laser Power/Control Schematic



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