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**Radiation Products Design Inc**

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## INSTRUCTIONS

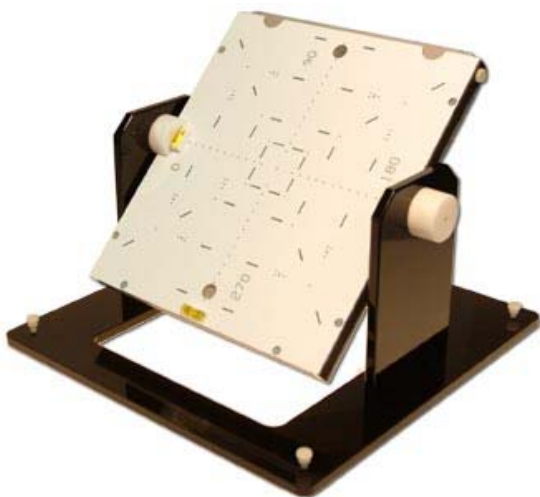
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### RPD INFORMATION

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### RPD PRODUCT INFORMATION

<b>Item Number</b>	<b>Description</b>
710-721	Tungsten Rotating Alignment Pattern Device for CR Cassette



## DISCLAIMER

This instruction manual is for informational purposes only. It is not to be used for clinical use or dosimetry calculations of any nature. The use of this information in such a manner is the sole responsibility of the user. The author or supplier of this information makes no claim or inference as to its clinical or dosimetric suitability and/or accuracy. The author and/or distributor of this information accepts no responsibility for the use of the data and information contained in the document.

## ASSEMBLY REQUIRED

Includes:

- (5) Threaded Leveling Screws
- (2) Snap-in Bubble Levels

## OVERVIEW

The Tungsten Rotating Alignment Pattern (TRAP) is an easy to use multi-purpose QA test tool for daily, weekly, monthly, or annual checks of the mechanical and geometric parameters of linear accelerators and simulators.

The TRAP has a 40.5 cm wide x 40.5 cm long black acrylic base with a 25 cm wide x 30 cm long cutout. The base cutout allows for viewing of the central axis on the plate with the gantry at 0°. The base has 5 rubber-tipped leveling screws (3 leveling screws and 2 stabilization screws).

### CAUTION

Even though the TRAP has non-slip rubber-tipped adjustment thumb screws for leveling, care must be taken not to move the TRAP during rotation of the plate. To rotate the plate, use both knobs together when turning. The plate will seat itself easily in the 45° indents.

The vertical supports are black acrylic with 1 3/4" (4.46 cm) diameter knobs for rotating the plate. The knobs have indents every 45° for accurate positioning when rotating the plate. The rotating plate consists of two white plates that allow a standard CR Cassette to be inserted between and secured by thumb screws. Two half-moon cutouts on the plates make it easy to grasp the cassette and pull it out.

On one plate there are 1.6 mm diameter tungsten balls and 1.6 mm diameter x 12.7 mm long tungsten rods embedded with gray epoxy which give a sharper film image. The dark markings allow for easy viewing of the field-light and central axis on the plate surface. The 5 cm<sup>2</sup>, 10 cm<sup>2</sup> and 20 cm<sup>2</sup> fields are defined by tungsten balls and rods. The tungsten balls are used to form arrows so film orientation is easily seen. Tungsten balls are also placed at central axis and every cm from 2 cm to 13 cm and again at 15 cm. Device orientation is accomplished with 0, 90, 180 and 270 markings on the plate.

Two bubble levels on one plate ensure level accuracy of the rotating plate. Dashed lines are used to correspond to central axis on the other plate. This allows for verification of lasers to central axis.

## QA TESTING

The TRAP checks the following mechanical and geometrical parameters of accelerators and simulators easily and accurately:

- Radiation field/light congruence
- Collimator rotation and field size accuracy
- Collimator, gantry, and table isocentricity
- ODI accuracy
- Laser alignment
- Uses a Standard CR Cassette

## PRODUCT SPECIFICATIONS

<b>Field Sizes</b>	5 cm <sup>2</sup> , 10 cm <sup>2</sup> and 20 cm <sup>2</sup>
<b>Rotation</b>	360° in 45° increments
<b>Positioning</b>	Self-seating indents
<b>Markers</b>	1.6 mm Dia. tungsten balls 1.6 mm Dia. x 12.7 mm L tungsten rods
<b>Leveling</b>	3-point with 2 bubble levels
<b>Maximum Size</b>	40.5cm Wide x 40.5cm Long x 36.7cm High
<b>Screen Size</b>	33.7cm Wide x 30.5cm Long
<b>Materials</b>	Black acrylic; White and clear engraving material
<b>Weight</b>	14 lb (6.36 kg)

## COLLIMATOR ZERO ROTATION

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 30 x 30.
4. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
5. Set white plate to horizontal position.
6. Moving the table, position the center of the white plate to the central axis of the beam.
7. Level the unit with the 3 leveling screws and center unit again, if necessary.
8. Set table height to isocenter on the center of the TRAP.
9. Rotate plate to vertical position.
10. Rotate gantry to 90° - CAX should fall on CAX of plate.
11. Rotate gantry 180° to opposite lateral. CAX of beam should fall on CAX of plate. The plate could also be rotated 180°. If CAX of the beam and plate do not line up, collimator is not at the 0 position.

## TABLE ISOCENTRICITY

### **Suggested Procedure**

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10.
4. Place cassette between the plate and tighten thumb screws.
5. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
6. Set white plate to the horizontal position.
7. Moving the table, position the center of the white plate on the central axis of the beam.
8. Level the unit with the 3 leveling screws.

9. Set the table height to isocenter on the center of the TRAP.
10. Adjust field width to 2 mm.
11. Make an exposure using MU or technique needed for type of cassette being used.
12. Move table 30° and repeat exposure.
13. Repeat in both directions over the table range of motion.
14. Loosen thumb screws and remove cassette carefully without moving unit.
15. Process cassette.
16. Check digital image for accuracy of isocenter position.

## **RADIATION / LIGHT FIELD ALIGNMENT**

### **Suggested Procedure**

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10.
4. Place cassette between the plates and tighten thumb screws.
5. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
6. Set white plate to the horizontal position.
7. Moving the table, position the center of the white plate on the central axis of the beam.
8. Level the unit with the 3 leveling screws.
9. Set the table height to isocenter on the center of the TRAP.
10. Make an exposure using MU or technique needed for the type of cassette being used.
11. Loosen thumb screws and remove cassette carefully without moving unit.
12. Process cassette.
13. Check digital image for accuracy of radiation and light field congruence.

## GANTRY ISOCENTRICITY

### Suggested Procedure

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10.
4. Place cassette between the plates and tighten thumb screws.
5. Place unit on the table with 90 towards gantry and 270 towards foot of table.
6. Set white plate to the horizontal position.
7. Moving the table, position the center of the white plate on the central axis of the beam.
8. Level the unit with the 3 leveling screws.
9. Set the table height to isocenter on the center of the TRAP.
10. Set field width to 2 mm.
11. Rotate plate so 270 is up and 90 is towards the floor.
12. Make an exposure using MU or technique needed for the type of cassette being used.
13. Rotate gantry to different angles - recommended angles are 0°, 70°, 135°, 180°, 225°, 290°.
14. Loosen thumb screws and remove cassette carefully without moving unit.
15. Process cassette.
16. Check digital image for accuracy of isocenter position.

## COLLIMATOR ISOCENTRICITY

### Suggested Procedure

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10 or 20 x 20.
4. Place cassette between the plates and tighten thumb screws.

5. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
6. Set white plate to the horizontal position.
7. Moving the table, position the center of the white plate on the central axis of the beam.
8. Level the unit with the 3 leveling screws.
9. Set the table height to isocenter on the center of the TRAP.
10. Set field width to 2 mm.
11. Make an exposure using MU or technique needed for the type of Cassette being used.
12. Rotate collimator 30 degrees and repeat exposure.
13. Repeat in both directions over the collimator range of motion.
14. Loosen thumb screws and remove cassette carefully without moving unit.
15. Process cassette.
16. Check digital image for accuracy of isocenter position.

## LIGHT FIELD READOUT ACCURACY

### **Suggested Procedure**

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10.
4. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
5. Set white plate to the horizontal position.
6. Moving the table, position the center of the white plate on the central axis of the beam.
7. Level the unit with the 3 leveling screws.
8. Set the table height to isocenter on the center of the TRAP.
9. Check for accuracy of light field size.
10. Repeat for 20 x 20
11. Record results.

## ODI ACCURACY

### **Suggested Procedure**

1. Set gantry to the vertical position pointing toward the floor.
2. Set the collimator to its standard position.
3. Set field size to 10 x 10.
4. Place unit on the table with markings 0 towards gantry and 180 towards foot of table.
5. Set white plate to the horizontal position.
6. Moving the table, position the center of the white plate on the central axis of the beam.
7. Level the unit with the 3 leveling screws.
8. Using a front pointer, adjust table height to isocenter on the center of the TRAP.
9. Remove front pointer, check ODI reading for accuracy.
10. Repeat for 10 cm on either side of isocenter.
11. Record results.

## OTHER USES

1. Laser alignment.
2. As a platform for HDR autoradiographs.