



Expect Service

Radiation Products Design Inc

INSTRUCTIONS

RPD INFORMATION

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RPD PRODUCT INFORMATION

Item Number	Description
710-720	Tungsten Rotating Alignment Pattern Device for Ready Pack Film



DISCLAIMER

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ASSEMBLY REQUIRED

Includes:

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

INTRODUCTION

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 10" x 12" ready pack film to be inserted between and secured by a clamp. Two half-moon cutouts on the plates make it easy to grasp the film 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 cm², 10 cm² and 20 cm² fields are defined by tungsten balls and rods. The tungsten balls are used to form arrows so film orientation is easily seen and no film pricking is necessary. 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 10" x 12" Ready-Pack Film

SPECIFICATIONS

Field Sizes	5 cm ² , 10 cm ² and 20 cm ²
Rotation	360° in 45° increments
Positioning	Self-seating indents
Markers	1.6 mm Dia. tungsten balls 1.6 mm Dia. x 12.7 mm L tungsten rods
Leveling	3-point with 2 bubble levels
Maximum Size	40.5cm Wide x 40.5cm Long x 36.7cm High
Screen Size	33.7cm Wide x 30.5cm Long
Materials	Black acrylic; White and clear engraving material
Weight	9 lb (4.09 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 ready-pack film between the plates.
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 ready-pack film being used.
12. Move table 30° and repeat exposure.
13. Repeat in both directions over the table range of motion.
14. Remove film carefully without moving unit.
15. Develop film.
16. Check film 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 ready-pack film between the plates.
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 type of ready-pack film being used.
11. Remove film carefully without moving unit.
12. Develop film.
13. Check film 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 ready-pack film between the plates.
5. Place unit on the table with markings 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 type of ready-pack film being used.
13. Rotate gantry to different angles - recommended angles are 0°, 70°, 135°, 180°, 225°, 290°.
14. Remove film carefully without moving unit.
15. Develop film.
16. Check film 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 ready-pack film between the plates.
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 type of ready-pack film being used.
12. Rotate collimator 30 degrees and repeat exposure.
13. Repeat in both directions over the collimator range of motion.
14. Remove film carefully without moving unit.
15. Develop film.
16. Check film 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.