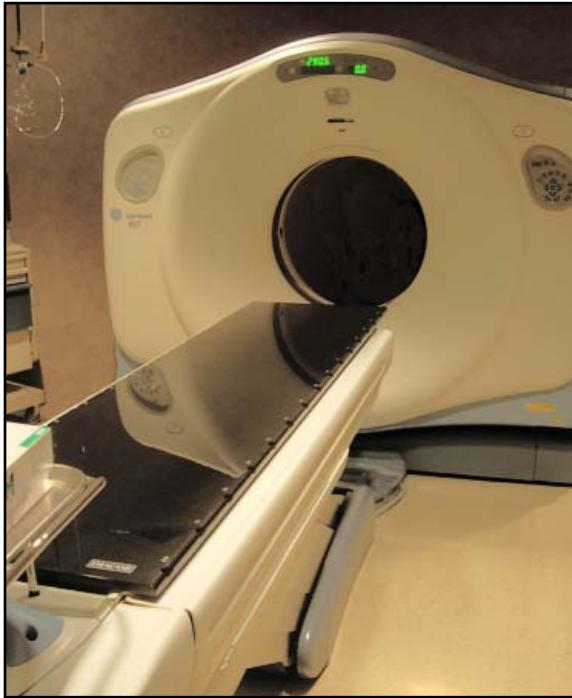


CT SIMULATORS, CT PRODUCTS & LASERS

CT OVERLAY FLAT TABLE for GE Healthcare CT and PET/CT Systems



Precisely reproduce treatment environment during CT simulation

The Radiation Therapy Planning Flat Table Top, or CT Overlay, provides a secure flat surface for CT and PET/CT Simulation applications, consistent with the treatment couch, for accurate and reproducible patient positioning.

- Incorporates Varian Exact Technology and Indexed Immobilization Patient Positioning System along entire length of the overlay
- Designed for GE LightSpeed™ and LightSpeed-compatible tables and GE VCT and Global tables
- Easily locks and unlocks from the table, providing easy transition between therapy and diagnostic procedures
- Solid, flat surface overlay is available for environments not requiring insert capabilities
- Carbon fiber construction with foam core provides a durable, light-weight device with outstanding imaging properties

Specifications

Size: 85.25" L x 20.87" W x 1.62" H (217.17 x 53 x 4.12 cm)

Weight: 30 lb (13.61 kg)

Item #	Optional Items
684-001	Carbon Fiber CT Overlay for GE Tables, Standard
684-010	Carbon Fiber CT Overlay for GE GT Table with (2) Exact Couch Indexing Bars, (1) Varian Respiratory Gating Block
684-015	Carbon Fiber CT Overlay for Brightspeed Select Table, with (2) Exact Couch Indexing Bars, (1) Varian Respiratory Gating Block
684-030	CT Overlay Interface Plate for Varian Respiratory Gating System
684-022	Carbon Fiber CT Overlay for GE HiSpeed/LightSpeed/HP Couches; with Locking Accessories and Varian Exact™ Couch Indexing Bar
684-024	Carbon Fiber CT Overlay for GE PET/CT Discovery Couches; with Locking Accessories and Varian Exact™ Couch Indexing Bar

B

PREMIUM CT OVERLAY FLAT TABLE



- Accepts Varian Exact™ Couch treatment and immobilization inserts, ensuring accurate reproduction of the treatment environment
- Works with MammoRxc breast board insert to lower patient position in relation to the CT bore, allowing higher positioning angles and increasing aperture space
- Incorporates Varian Exact Technology and Indexed Immobilization Patient Positioning System along entire length of the overlay
- Designed for GE LightSpeed™ and LightSpeed-compatible tables
- Easily locks and unlocks from the table, providing easy transition between therapy and diagnostic procedures
- Solid, flat surface overlay is available for environments not requiring insert capabilities

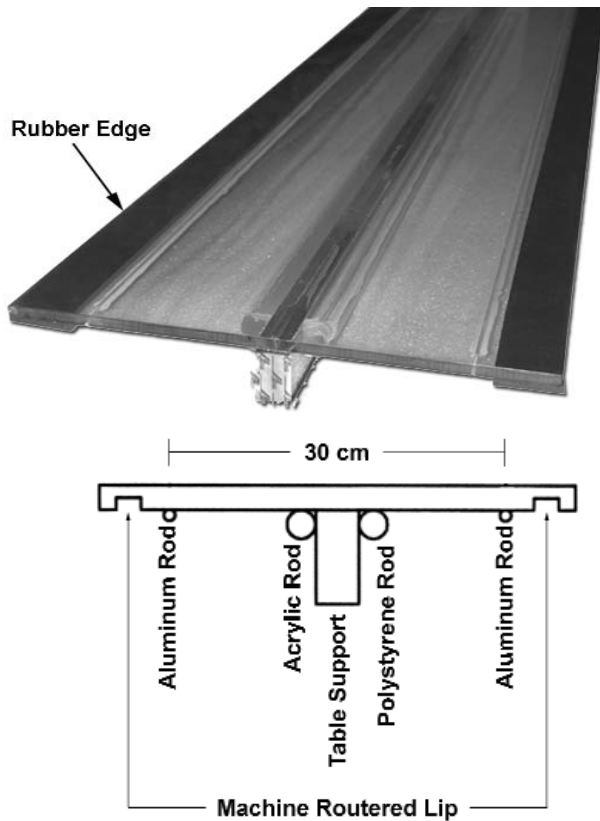
Precisely reproduce treatment environment during CT simulation

The Diacor® CT Overlay enhances IMRT by taking patient positioning to an even higher level of precision. Because the carbon fiber CT Overlay accepts various types of treatment table and immobilization inserts, you can easily reproduce the treatment environment during CT simulation. Exact duplication of your CT SIM and treatment environments ensures proper patient alignment—improving therapist control and accuracy while enhancing patient care.

Item #	Optional Items
684-005	Carbon Fiber CT Overlay with Exact™ Couch Insert Capabilities for GE Tables
684-020	Carbon Fiber CT Overlay with Insert Capabilities, MammoRx Breast Insert Immobilization System, and Exact Couch Solid Insert

B - 1

CT / PET TABLE INSERT For Radiation Therapy Treatment Planning



The ideal CT Image for radiation therapy treatment planning should have the patient on a flat table, magnification indicators, and density markers.

The Radiation Products Design CT/PET Table Insert is made of 3/8" (0.97 cm) clear polycarbonate. The insert measures 84" (213.5 cm) long and the width is custom made to fit the CT or PET Table. A center support runs the length of the insert to prevent any sag.

The CT/PET Table Insert can be made with or without a machine routed lip on each side of the table insert. The machine routed lip fits over the edge of the curved CT bed. The table insert with foam rubber edges is not machine routed and will sit on top of the edges of the curved CT bed.

Optional Magnification and Density Rods

The bottom of the CT/PET Table Insert has two 1/8" (3.31 mm) diameter aluminum rods, spaced 30 cm apart that run the length of the insert and are used for magnification measurements.

A 1" (2.54 cm) diameter polystyrene rod and a 1" (2.54 cm) diameter acrylic rod are placed on either side of the center support. Both these rods run 72" (183 cm) along the bottom of the insert. These rods provide a reference for density checks.

Specifications

Table Density: Polycarbonate - 1.2 g/cm³

Rod Density: Acrylic - 1.185 g/cm³
Polystyrene - 1.05 g/cm³

Size: 84" L x 3/8" T (213.4 x 0.97 cm)

Weight: 55 lb (25 kg)

Order Processing Information

- Provide contact information, name, phone number and email
- When order is placed specify CT/PET table manufacturer and width of CT/PET table
- Prior to manufacturing an information sheet requesting dimensions will be sent to the contact to fill out
- A cross-section sample of the Table Insert will be sent to the contact for verification of proper fit
- When proper fit is determined the depth for center support will need to be specified by the contact

Item #	CT/PET Table Manufacturer	Magnification and Density Rods	Edging
683-110	GE	Included	Routed
683-120	Siemens	Included	Routed
683-130	Philips	Included	Routed
683-210	GE	Not Included	Routed
683-220	Siemens	Not Included	Routed
683-230	Philips	Not Included	Routed
683-310	GE	Included	Foam Rubber
683-320	Siemens	Included	Foam Rubber
683-330	Philips	Included	Foam Rubber
683-410	GE	Not Included	Foam Rubber
683-420	Siemens	Not Included	Foam Rubber
683-430	Philips	Not Included	Foam Rubber

SLESSINGER BOARD FOR HDR BRACHYTHERAPY



Photos courtesy of S.Dahlbeck, MD and A. Fung, PhD, University Medical Center, Lubbock, TX

- **CT and MR Compatible**
- **Easy to Clean**

The Slessinger Board is a padded sliding board that is CT and MR compatible. It is designed to facilitate HDR brachytherapy, specifically for pelvic treatments. The patient can be transferred onto the board from the operating room couch and remain on the board in recovery, during imaging for planning and until the HDR treatment is given. The intent is to minimize patient movement to ensure that the imaging for planning is not compromised by patient leg movement prior to treatment and thus delivering the treatment plan faithfully. The legs are slightly elevated, affording ready access to the perineum and preventing applicators from resting against anything. Leg elevation is maintained with the use of two (2) tightening knobs at the end of the elevation panels. Transfers

on and off CT/MR/simulator couches are relatively easy due to the smooth plastic bottom surface and side handles. The board is also very useful when a patient is transferred via ambulance from the surgical facility to the treatment facility.

Image guided HDR brachytherapy is gaining in prominence. Prostate and gynecological applications are reliant on patient stability and comfort between the acquisition of imaging for planning and treatment. Although the Slessinger Board was devised to facilitate precise prostate HDR brachytherapy its application for image guided GYN HDR is also very significant with increasing reliance on DVH analyses. The concept of limiting rotation of a multichannel APBI balloon is yet another possible application, by avoiding the patient walking between imaging and treatment prior to each treatment fraction. The rationale and description of the Slessinger Board has also been described in the Brachytherapy Journal article by Slessinger, entitled "Practical considerations for prostate HDR brachytherapy", published early in 2010.

The Slessinger Board can be easily cleaned with non-caustic germicidal cloths or sprays. Patients may not be carried on the Slessinger Board, but rather are transferred directly from one support to another.

Specifications

Base Dimensions: 24" W x 72" L x 0.75" T (61 x 183 x 1.9 cm)

Base Material: Corrugated polypropylene

Pad Dimensions: 23.5" W x 69" L x 1.5" T (60 x 175 x 3.8 cm)

Pad Material: Vinyl coated closed cell foam

Weight Limit: 350 lb (159 kg)

Item	Description
946-000	Slessinger Board for HDR Brachytherapy

B

CT SIMULATORS, CT PRODUCTS & LASERS

ZEPHYR HDR PATIENT TRANSPORT SYSTEM

Scan, transport and treat HDR Brachytherapy patients with ease and accuracy



CT treatment planning has demonstrated its value of providing complete 3D structure definition and dose volume histogram analysis for High Dose Rate (HDR) Brachytherapy treatments. Unfortunately, most facilities lack the ability to perform CT imaging and HDR Brachytherapy treatments within the same, dedicated room.

While there are many logistical challenges, below are some of the more common facing radiation therapy centers desiring to implement CT Imaging within their HDR Brachytherapy programs:

- Most centers require movement of the patient from the CT simulation room to the HDR Brachytherapy suite for treatment. Patient movement can be difficult, particularly for larger patients, often requiring multiple therapists to transfer the patient.
- Patient transportation becomes challenging as multiple transfers of the patient, from CT table to patient stretcher to HDR treatment table, pose high risk for applicator movement and possibly extreme patient discomfort.
- Inability to mount patient stirrups to a standard CT Couch.

The Zephyr HDR Patient Transport System uses air-bearing technology to easily move patients from CT couchtop to patient stretcher to HDR Brachytherapy Table, all the while reducing the possibility of applicator or needle movement. Treatment accuracy is increased while reducing patient transfer challenges.

Item 945-000 Zephyr HDR Patient Transport System Includes

- Zephyr Patient Transport Sled
- Air pillows
- Blower
- Air hose
- Zephyr Patient Transport stretcher
- One pair of stirrups

- Patient scanned in desired treatment position
- Air-bearing technology enables smooth, virtually effortless, lateral and longitudinal movement
- Minimizes changes in implant geometry during patient transfer
- Fast, reliable and safe way to transfer patients from CT couch to stretcher while still in stirrups
- Patient can be treated on Zephyr Patient Stretcher or easily transferred to your current HDR Brachytherapy table
- HDR Brachytherapy procedure can be performed in the same position as the patient was in when implanted and scanned, thereby optimizing the relevance of treatment planning data

Item	Description
945-000	Zephyr HDR Patient Transport System

CT SIMULATORS, CT PRODUCTS & LASERS

VISIONMARK™ CT



The VisionMark™ CT markers offer the perfect combination of tack surfaces and easy-peel corners, keeping the markers correctly positioned with minimal discomfort to the patient on removal. These **NON-METALLIC** markers reduce read time on CT scans with virtually no scatter. These sizes and ball densities are perfect for all CT skin marking applications. Available in 3 mm, 4 mm, and 5 mm ball sizes. No lead means they are safer for yourself, your patient and the environment.

Item	Visionmark™ CT	Quantity
680-305	2.0 mm Ball	50
680-310	2.5 mm Ball	50
680-312	3.0 mm Ball	50
680-314	4.0 mm Ball	50
680-316	5.0 mm Ball	50

CT Mark Wire and Dots



The CT Mark wire and dots are a new blue formation designed specifically for CT. These markers are lead free, will not cause artifact (scatter) on CT scans and the labels are latex-free.

Item	Description	Quantity
680-350	CT Mark Wire, 2.0 mm	300 cm
680-352	CT Mark, 2.3 mm	110
680-354	CT Mark, 4.0 mm	50

CT MARKER-INDICATOR RADIOPAQUE



680-401

680-403

680-410

- Use in CT, RT Simulation, Treatment Planning, Diagnostic Radiology, Angiography, Mammography and Fluoroscopy
- Use to identify masses, scar tissue, moles, birth marks or any point of interest
- Provides a clear and accurate reference point with no spray artifacts
- Flat marker - will not indent tissue
- Disposable
- Clear adhesive backing
- Multiple sizes available
- Lead Free
- Crosses - 0.38" L (9.5 mm)
- Dots - 0.125" diameter (3 mm)
- Lines - cut to desired length
- NOT for use in MRI

Item #	CT Marker-Indicator Radiopaque	Quantity
680-401	Crosses, 10 mm	130
680-402	Crosses, 20 mm	130
680-403	Dots, 1.5 mm	115
680-404	Dots, 2.0 mm	115
680-405	Dots, 2.5 mm	115

Item #	CT Marker-Indicator Radiopaque	Quantity
680-406	Dots, 3.0 mm	115
680-408	Dots, 4.0 mm	115
680-410	Line, 0.5 mm	69" (175 cm)
680-411	Line, 1.0 mm	66" (167 cm)
680-412	Line, 1.50 mm	62.5" (159 cm)

B

CT SIMULATORS, CT PRODUCTS & LASERS

MULTI-MODALITY MARKERS



462-029



462-030

Item 462-029 Multi-Modality Markers for CT/MRI

- Appears as bright object on CT, MRI and Diagnostic Imaging scans
- Inner center hole affords passage of needle through central hole
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole with 2 mm central hole
- Composed from hydrogel with medical grade adhesive

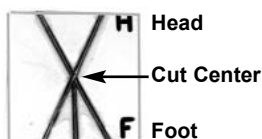
Item 462-030 Multi-Modality Markers for Nuc Med/PET

- Visible on Nuclear Medicine, CT and MRI scans
- Liquid-containing well suitable for injection of short-life radionuclide using a conventional hypodermic needle
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole
- Composed from hydrogel with medical grade adhesive

Item #	Description	Quantity
462-029	Multi-Modality Markers for CT/MRI	50
462-030	Multi-Modality Markers for Nuc Med/PET	50

B

CT MARKER



Material: Aluminum Wire
Size: 1" (2.54 cm) Square

Item #	Description
680-125	CT Marker

MULTIMODAL SPOT MARKERS

Written Verification of Radioactive Materials License is Required to Place an Order



Specifications

Model MMS02

Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic
Active Dimensions: 1.5 x 1.5 mm cylinder
CT Target: 1/4" (0.64 cm) OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

Model MMS03

Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic with etched "crosshairs" centered on active element for laser alignment
Active Dimensions: 1 mm diameter sphere
CT Target: 2 mm OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

The Multimodal Spot Markers are used for patient orientation and image registration in camera studies. The Co-57 is used for CT-SPECT and Ge-68 and Na-22 for CT-PET fusion imaging.

Model	Nuclide	10 μ Ci .37 MBq	25 μ Ci .925 MBq	50 μ Ci 1.85 MBq	100 μ Ci 3.7 MBq
MMS02	Co-57	680-200	680-201	680-202	680-203
MMS02	Ge-68	680-210	680-211	680-212	680-213
MMS02	Na-22	680-220	680-221	680-222	680-223
MMS03	Co-57	680-230	680-231	680-232	680-233
MMS03	Ge-68	680-240	680-241	680-242	680-243
MMS03	Na-22	680-250	680-251	680-252	680-253

CT SIMULATORS, CT PRODUCTS & LASERS

SIMULATOR LEAD FOIL TAPE



Simulator Lead Foil Tape is used on the patient to outline the treatment field. It sticks to patients and is easily removable.

Item	China Markers	Quantity
682-080	Aluminum Wire 0.25" (0.635 cm) Wide	36 Yds (33 m)

CT MARKING WIRE



Item	China Markers	Quantity
682-080	Aluminum Wire 0.080" (2.03 mm) Diameter	42' (12.8 m)
682-090	Aluminum Wire 0.040" (1.02 mm) Diameter	175' (53.3 m)
682-100	Aluminum Wire 0.064" (1.63) mm Diameter	67' (20.4 m)
682-102	Copper Insulated Wire, Black 0.055" (1.40) mm Diameter	100' (30.5 m)
682-104	Copper Insulated Wire, Red 0.080" (2.03) mm Diameter	100' (30.5 m)

B

THE FAST FIND GRID™

The Low-Cost Positioning Grid for Quick, Accurate CT Biopsies and Drainage Procedures



- Cuts down on repositioning by finding the point of entry quickly and accurately, thus reducing repeated x-ray exposure
- Helps prevent cross-contamination with one-time use only
- Allows precise pinpointing of area with marking pen
- Helps provide greater patient comfort

The Fast Find Grid is a simple, disposable tool that can be used for all computed tomography (CT) guided biopsies and drainage procedures, regardless of the body part. This includes thyroid, lung, liver, abdominal, pelvic and extremity biopsies and drainages.

Why should doctors use the Fast Find Grid? It's about saving time.

- By increasing the accuracy of needle placement with 1 cm markings on the grid.
- By reducing the number of needle re-positioning and rescanning with radio-opaque markers prior to needle placement.
- No slipping: Taped edges assures it stays in place.
- Extremely flexible. Conforms to areas scanned, no problem to position.

Item #	Description
680-450	Fast Find Grid for CT Biopsy

CT SIMULATORS, CT PRODUCTS & LASERS

CT RECTAL MARKER

Rectal - Vaginal - External



The **NON-METALLIC** CT Rectal Marker is a flexible tube packed with teflon balls spaced at 1 cm intervals from center to center.

The Rectal Marker is used to accurately obtain both the rectum position and magnification by counting the balls. This determines the rectum location relative to the radiation field.

An adjustable anus marker can be utilized during CT simulation.

The Rectal Marker can be used as a vaginal marker or an external marker.

Specifications

Sterilization: Gas

Tubing: 5/16" (8 mm) Dia. x 30 cm Flexible

Balls: 3/16" (5 mm) Dia. Spaced Every cm

Anus Locator: Adjustable Delrin

Latex Cover: 2.0 cm Dia. x 30 cm L

Item #	Description
460-010	CT Rectal Marker with Anus Marker
460-006	Latex Cover for Rectal Marker, 1/pkg
460-006-12	Latex Covers for Rectal Marker, 12/pkg

B

SHADOWFORM MARKERS



- T-Bar handle which can be removed for insertion of barium
- Disposable
- Rectal markers are available in two lengths and are marked at 1 cm intervals
- No cross contamination
- Outlines the soft tissue of the pelvic region
- Latex-free
- Markers are made from a soft, smooth, flexible plastic
- Used for Simulation and CT Planning
- Provides excellent localization of pelvic structures

CE

Item	Shadowform Markers	Quantity
460-501	18 cm Vaginal Marker	10
460-502	38 cm Rectal Marker	10
460-503	10 cm Rectal Marker	10

CT VAGINAL DEPTH SCALE



The **NON-METALLIC** CT Vaginal Depth Scale is 1.6 cm in diameter and 26 cm long and has teflon balls which are spaced 1 cm apart and are 5 mm diameter. A delrin introitus marker is included with the 1.6 cm diameter vaginal scale (Item 707-145). A thumb screw holds the introitus marker in position.

The Vaginal Depth Scale Holder (Item 707-020) can be used in CT if the area to be scanned does not include the holder.

Specifications

Material: Acrylic

Density: 1.1859 g/cm³

Material: Teflon

Density: 2.16 g/cm³

Item #	Description
707-145	CT Vaginal Depth Scale with Introitus Marker
707-020	Vaginal Depth Scale Holder
460-006	Latex Cover for Vaginal Depth Scale, 1/pkg
460-006-12	Latex Covers for Vaginal Depth Scale, 12/pkg

3.2 cc CT ION CHAMBER



Specifications

Detector Type: Vented air ion chamber
Volume: 3.2 cc
Sensitive Length: 10.0 cm
Chamber Material: Polystyrene
Chamber Inside Diameter: 6.4 mm
Chamber Wall Thickness: 54 mg/cm²
Electrode Material: Aluminum
Sensitivity: 10 R•cm/nC (nominal)
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)

Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Phantom Adapter OD: 1.27 ± 0.04 cm (0.50 ± 0.015 in)
Leakage Current (300 V collection potential): Less than 1013 A at 10 min polarization time, less than 1014 A at 2 hr polarization time
Intensity Limits: Continuous beam: 4.86 kR/min (1% recombination loss)
Pulsed Beam: 51.5 mR/pulse (1% recombination loss)
Maximum Pulse Repetition Rate: 3.3 kHz
Cable Length: 3' (0.9 m)
Operating Voltage: -300V

Item #	Description
300-505	CT Ion Chamber, 3.2 cc, with triax BNC: used with the 35040 (ATD), TRIAD™ and TRIAD™ TnT
300-515	CT Ion Chamber, 3.2 cc, with coax BNC for signal and banana plug for bias: used with the 4000, 8000 and RAD-CHECK® PLUS Dosimeter

B

10 cc CT ION CHAMBER



Specifications

Detector Type: Vented air ion chamber
Volume: 10.1 cc
Sensitive Length: 10.0 cm
Chamber Material: Acrylic (PMMA)
Chamber Outside Diameter: 0.5 in ± 0.015 in (12.7 mm ± 0.4 mm)
Chamber Inside Diameter: 0.45 in (11.4 mm)
Chamber Wall Thickness: 77 mg/cm²

Electrode Material: Aluminum, 1100
Sensitivity: 3.2 R•cm/nC (nominal) or 0.3/n
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Leakage Current: (300 V collection potential) Less than 10⁻¹⁴A at 10 min polarization time
Intensity Limits: Continuous beam: 31.6 R/Sec, (1% recombination loss)
Pulsed Beam: 15.8 mR/pulse (1% recombination loss)
Collection Time: 0.478 mSec
Cable Length: 3' (0.9 m)
Operating Voltage: -300 V

Item #	Description
300-510	CT Ion Chamber High Sensitivity, 10 cc for multislice CT, with triax BNC: used with the 35040 ATD and other electrometer/dosimeters, including TRIAD™ and TRIAD™ TnT

EXRADIN A17 CT ION CHAMBER



Exradin A17 Schematic

- Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam
- Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines
- Shell and guard are made of durable, long lasting Shonka conductive plastic
- Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements
- Axially symmetric design of the chamber provides an uniform, isotropic response
- Inherent waterproof construction eliminates need for additional protective coverings
- The Model A17 Exradin Slice Therapy Chamber has an inherent ⁶⁰Co buildup cap built into its wall thickness for air calibrations and measurements
- Ionization collection efficiency is 99.9% or better
- Collecting volume is 1.91 cc

CT ion chambers combine robust design with uniform energy response for high energy MV applications.

For performing measurements necessary for calculating CTDI (CT dose index)

The Model A17 Exradin Slice Therapy Chamber is designed for tomotherapy applications. This chamber is useful for weekly QA checks or patient dose verification with phantoms or water tank setups. It has excellent response uniformity over the central 8 cm of the chamber length, with variation less than plus or minus 1.5%.

Fast, Precise Measurements

Its waterproof construction makes it ideal for checking the consistency of beams at various jaw widths. The chamber vents through a flexible tube that surrounds the triaxial cable, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last

The Model A17 Exradin Slice Therapy Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

- Collecting Volume:** 1.91 cm³
- Collecting Volume Length:** 8.0 cm
- Collector Diameter:** 2.4 mm
- Body Tube Outside Diameter:** 12.7 mm
- Wall Thickness:** 3.3 mm
- Chamber Length:** 17.0 cm
- Body Tube and Guard Material:** Shonka air-equivalent plastic C552
- Response Uniformity Over the Central 8.0cm of Chamber Length:** ±1.5%
- Collector Material:** Carbon fiber
- Electrical Power Requirements:** Operates at ±300 VDC
- Nominal Collection Efficiency:** 100%
- Maximum Polarizing Potential:** 1000 V
- Nominal Inherent Leakage Currents:** 10-15 A
- Low-Noise Triaxial Cable:** 50 ohms, 29 pF/ft, 1.5 m long
- Signal Connector:** Triaxial BNC plug (2-Lug, male pin); others available upon request
- Waterproof:** Yes
- Product Standards:** CE₀₄₁₃, Designed to meet IEC 60601-1, IEC 61674



Item	Description
300-540	CT Ion Chamber, Exradin A17 Slice Therapy

EXRADIN A101 CT CHAMBER



Exradin A101 Schematic

- Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam
- Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines
- Shell and guard are made of durable, long lasting Shonka conductive plastic
- Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements
- Axially symmetric design of the chamber provides an uniform, isotropic response
- Ionization collection efficiency is 99.9% or better
- Collecting volume is 4.6 cc

Uncompromising Quality

CT ion chambers combine robust design with uniform energy response for low energy kVCT applications.

For Performaing Measurements Necessary For Calculating CTDI (CT Dose Index)

The Exradin Model A101 CT Ion Chamber is designed to perform the measurements necessary for calculating the CTDI (computed tomography dose index) as described in the AAPM TG 74, Quality Control in Diagnostic Radiology. The chamber is 10 mm in diameter and comes with an acrylic sheath for use with phantoms that have the typical 13.1 mm cavity. It has excellent response uniformity over the central 10 cm of the chamber length, with variation less than plus or minus 3%.

Fast, Precise Measurements

Model A101 is ideal for checking the consistency of beams at various jaw widths. The chamber is vented to the ambient, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last

The Model A101 CT Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

Collecting Volume: 4.6 cm³

Collecting Volume Length: 10.0 cm

Collector Diameter: 2.4 mm

Body Tube Outside Diameter: 10.0 mm

Wall Thickness: 1.0 mm

Chamber Length: 164.3 mm

Body Tube and Guard Material: Shonka air-equivalent plastic C552

Response Uniformity Over the Central 10 cm of Chamber Length: ±3%

Energy Response: 80 kVp to 150 kVp ±4%

Collector Material: Carbon fiber

Electrical Power Requirements: Operates at ±300 VDC

Nominal Collection Efficiency: 100%

Maximum Polarizing Potential: 1000 V

Nominal Inherent Leakage Currents: 10⁻¹⁵ A

Low-Noise Triaxial Cable: 50 ohms, 29 pF/ft, 1.5 m long

Included Adapter Sleeve: Wall thickness of 1.3 mm; constructed of PMMA

Signal Connector: Triaxial BNC plug (2-Lug, male pin); others available upon request

Waterproof: No

Product Standards: CE₀₄₁₃, Designed to meet IEC 60601-1, IEC 61674



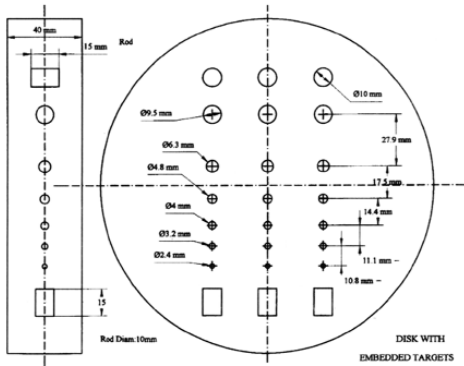
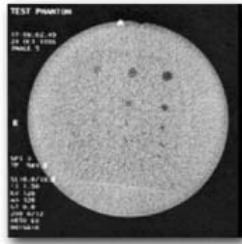
Item #	Description
300-550	Exradin A101 CT Chamber

B

CT SIMULATORS, CT PRODUCTS & LASERS

SPIRAL/HELICAL CT PHANTOM

Optimize Collimation and Table Speed - Ensure Detection of Small Lesions



- Usable on all standard and helical scanners
- Background = water equivalent
- Target Contrast = 5, 10, 20 HU above background
- Contrast valid contrast at all energy settings
- Compact
- Indestructible

The Spiral/Helical CT Phantom is designed to test scanning protocols to verify that small low contrast lesions will be detected. The phantom permits complete testing of low contrast detectability when scan parameters are varied. These parameters include collimation, pitch, reconstructed field of view, reconstruction algorithms, z-axis interpolators, kVp, mA and rotation time. Testing can be applied to protocols designed for head and abdomen. The Spiral/Helical CT Phantom contains clinically-relevant spherical targets that are 5, 10 and 20 HU above the water equivalent background matrix.

Item 680-061 Spiral/Helical CT Phantom Includes

- | | |
|-------------------------|----------------------------|
| 1 CT Disk | 1 Water Equivalent Top |
| 1 Water Equivalent Base | 1 Soft-sided Carrying Case |

Specifications

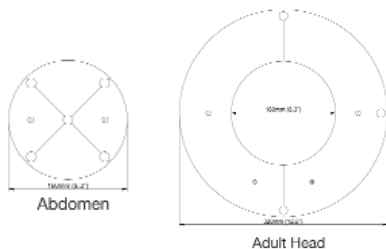
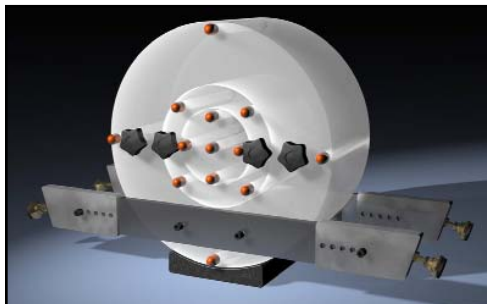
Size: 8" x 7" x 7" (20.3 x 17.8 x 17.8 cm)

Material: Tissue Equivalent epoxy materials

Weight: 12 lb (4.5 kg)

Item #	Description
680-061	Spiral/Helical CT Phantom

CT DOSE PHANTOM



- Abdominal and Adult Head configurations
- PMMA disks and plugs with density of 1.10 g/cc
- 1.31 cm diameter holes sized for standard CT Dose probes
- Nesting PMMA disks minimize storage space
- Compatible with all CT scanners

For all computed tomography systems, the Food and Drug Administration recommends measuring the CT Dose Index. Each section of the CIRS CT Dose Phantom can provide separate dose information. The user can also measure maximum, minimum and mid-range values of the nominal tomographic section thickness when performing dose profile measurements.

The CT Dose Phantom consists of a set of nesting 15 cm thick solid PMMA disks measuring 16 cm (head) and 32 cm (body) in diameter. The adult head disk is also suitable for pediatric body measurements. Handles on the body and head are provided for ease in handling and maneuverability.

Through holes measuring 1.31 cm in diameter will accommodate standard CT probes. Acrylic rods are provided to plug the holes when not in use. The acrylic rods are machined to receive 1 mm diameter TLD rods.

The CT Dose Phantom is manufactured to comply with the FDA's performance standard, 21 CFR 1020.33 that details the measurement requirements.

An optional Support Bracket can be used to suspend the CT Dose Phantom above the imaging couch and align it along the axis of X-ray tube rotation. This enables the phantom to be used to assess CT dose in helical mode or any mode that requires the extended travel of the imaging couch or a wide beam. This set-up might be used to address the dosimetry approach described in TG111. An additional application of the support bracket is to provide a body to simulate continuous scatter radiation from the patient during helical CT for dose safety measurements inside and outside the exam room.

Item 682-007 CT Dose Phantom Includes

- | | |
|-------------------------|---------------------------|
| (1) Abdominal Cylinder | (1) Foam Lined Carry Case |
| (1) Adult Head Cylinder | (1) User Guide |
| (9) Acrylic Rods | (1) 48 Month Warranty |

Specifications

Overall Dimensions: 12.5" x 12.5" x 5.5" (31.8 x 31.8 x 15 cm)

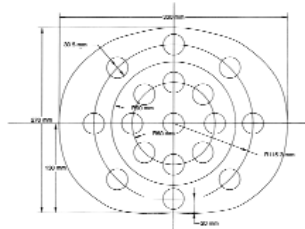
Weight: 29 lb (13 kg)

Materials: PMMA

Item #	Description
682-007	CT Dose Phantom
682-009	CT Dose Phantom Support Bracket, Optional

ELECTRON DENSITY PHANTOM

Correlate CT Number and Tissue Electron Density



The Electron Density Phantom consists of nested disks made from Plastic Water®. This enables both head and abdomen configurations. Eight different tissue equivalent inserts can be positioned at 17 different locations within the scan field. Included is a syringe insert that can be filled with any fluid or solid material. Special marker inserts enable quick assessment of the CT scanner's distance measurement accuracy.

Physicists performing treatment planning need accurate tools to evaluate CT scan data, correct for inhomogeneities and to document the relationship between CT number and tissue density. To improve the accuracy of your treatment planning, consider the Electron Density Phantom.

Specifications

Overall Dimensions: 13" x 2" x 10.6" (33 x 5 x 27 cm)

Weight: 24 lb (8.9 kg)

Materials: Water and Tissue Equivalent Epoxy Materials

Item #	Description
682-062	Electron Density Phantom

- Evaluate CT scan data
- Correct for inhomogeneities
- Document relationship between CT number and tissue electron density
- Simulate indicated tissue within the diagnostic energy range
- Quick assessment of distance registration

Because CT scans are used to correct for tissue inhomogeneities in radiotherapy treatment planning, it is important to obtain a precise relationship between CT number (in Hounsfield units) and electron densities. The Electron Density Phantom enables precise correlation of CT data to electron density of various tissues. The phantom is manufactured from CIRS Tissue Equivalent Materials.

ELECTRON DENSITY PHANTOM ITEM 682-062 INCLUDES

Qty	Description	Physical Density	Electron Density Per cc x 10 ²³	RED (Relative to H ₂ O)
1	Electron Density Body with Head Insert	1.01	3.346	1.002
1	Phantom Body (Outer Ring)	1.01	3.346	1.002
1	H ₂ O Syringe Insert	1.00	3.340	1.000
2	Lung (Inhale) Equivalent Insert	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent - Replacement Insert	0.99	3.261	0.976
2	*Dense Bone (800 mg/cc HA) Equivalent Core Insert	1.53	4.862	1.456
2	Trabecular Bone (200 mg/cc HA) Equivalent Insert	1.16	3.730	1.117
2	Liver Equivalent Insert	1.07	3.516	1.052
2	Muscle Equivalent Insert	1.06	3.483	1.043
2	Adipose Equivalent Insert	0.96	3.170	0.949
2	Distance Marker Insert	1.01	-	-
1	Holder			
1	Carry Case			
1	User Guide			
1	48 Month Warranty			

ELECTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

Item	Description	Physical Density	Electron Density Per cc x 10 ²³	RED (Relative to H ₂ O)
682-065	*Titanium Rod Core Insert	4.51	12.475	3.735
682-070	†H ₂ O Equivalent Insert with Cavity for Ion Chamber	1.01	3.346	1.002
682-072	Dense Bone (800mg/cc HA) Equivalent Insert	1.53	4.862	1.456
682-073	H ₂ O Equivalent Insert	1.01	3.346	1.002
682-066	*Dense Bone (1000mg/cc HA) Equivalent Core Insert	1.66	5.243	1.570
682-067	*Dense Bone (1250mg/cc HA) Equivalent Core Insert	1.83	5.718	1.712
682-074	*Cortical Bone Equivalent Core Insert	1.93	5.956	1.780
682-068	*Dense Bone (1500mg/cc HA) Equivalent Core Insert	2.00	6.209	1.859
682-069	*Dense Bone (1750mg/cc HA) Equivalent Core Insert	2.17	6.698	2.005
682-071	Bone Ring for Head Insert	-	-	-

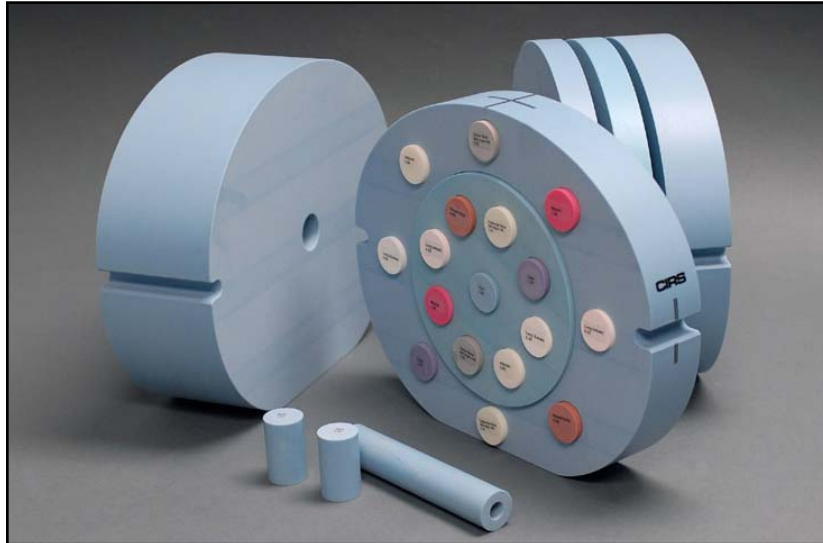
* These inserts contain a 10 mm diameter core of indicated bone reference surrounded by H₂O background. Hydroxyapatite (unit mg/cc) in H₂O background Plugs to accommodate chambers, TLD's and film available upon special request.

† Refer to separate CIRS cavity and plug code list for available chamber cavities.

B

CT SIMULATORS, CT PRODUCTS & LASERS

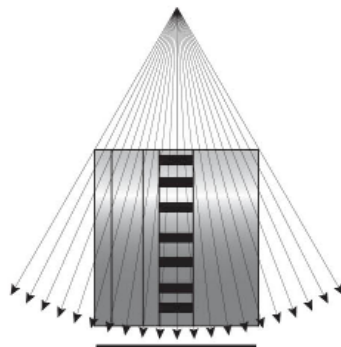
CBCT ELCTRON DENSITY PHANTOM Increase HU Value Confidence for Adaptive RT



DIAGNOSTIC CT

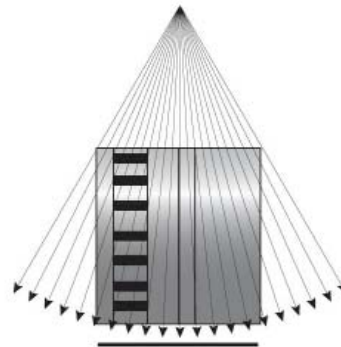


CONE BEAM CT



CBCT Electron Density Phantom
Central Axis Configuration

CONE BEAM CT



CBCT Electron Density Phantom
Offset Configuration

A large number of HU readings can be obtained by placing the electron density plugs in different positions both in central axis and offset configurations. Using the equation of curve fitting for collected values, a CBCT to electron density calibration curve can be calculated.

- Can be used for multi-slice CT and Cone Beam CT
- Can be configured for central axis and off-set measurements
- Manufactured from durable epoxy
- Tissue equivalent inserts can be positioned at 17 different locations
- Special marker inserts enable quick assessment of distance registration
- All materials accurately simulate indicated tissue within CT and Cone beam CT energy range

The Cone Beam (CBCT) Electron Density Phantom is an extended version of Item 682-062 CT Phantom for Electron Density and specifically designed for Cone Beam CT Imaging systems. Preliminary data shows that there may be differences between the HU readings for Diagnostic CT and Cone Beam CT. The geometry of the Cone Beam CT requires additional material and suggests that off central axis measurements should be taken.

The phantom was designed in collaboration with Dr. Peter H. Cossmann, PhD to provide a reliable tool for CT number to electron density calibration in volumetric imaging. Reliable CT calibration curves help enable treatment plan adaptation directly from Cone Beam CT data. Additionally, the phantom can accommodate any ion chamber for dose measurements and validation of heterogeneity correction based on the corrected CT calibration curve.

The CBCT Electron Density Phantom's size covers geometries for imagers with dimensions of up to 40 cm x 40 cm. It is made of Plastic Water® and contains the same set of tissue equivalent electron density inserts as the standard Item 682-062. Additional interchangeable slabs allow for repositioning of the electron density section with an increment of 2.5 cm.

Specifications

Overall Dimensions: 9.8" x 13" x 10.6" (25 x 33 x 27 cm)

Weight: 40 lb (18 kg)

Materials: Water and Tissue Equivalent Epoxy Resin

CT SIMULATORS, CT PRODUCTS & LASERS

CBCT ELCTRON DENSITY PHANTOM ITEM 682-200 INCLUDES

Qty	Description	Physical Density	Electron Density Per cc x 10 ²³	RED (Relative to H ₂ O)
1	CBCT Electron Density Head Insert	1.01	3.346	1.002
1	CBCT Electron Density Body with Head Insert	1.01	3.346	1.002
1	H ₂ O Syringe Insert	1.00	3.340	1.000
2	Lung (Inhale) Equivalent Insert	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent - Replacement Insert	0.99	3.261	0.976
2	*Dense Bone (800 mg/cc HA) Equivalent Core Insert	1.53	4.862	1.456
2	Trabecular Bone (200 mg/cc HA) Equivalent Insert	1.16	3.730	1.117
2	Liver Equivalent Insert	1.07	3.516	1.052
2	Muscle Equivalent Insert	1.06	3.483	1.043
2	Adipose Equivalent Insert	0.96	3.170	0.949
2	Distance Marker Insert	1.01	-	-
1	Chamber Rod for CV501			
1	H ₂ O Equivalent Insert	1.01	3.346	1.002
1	Holder			
1	Carry Case			
1	User Guide			
1	48 Month Warranty			

CBCT ELCTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

Item	Description	Physical Density	Electron Density Per cc x 10 ²³	RED (Relative to H ₂ O)
682-212	*Titanium Rod Core Insert	4.51	12.475	3.735
682-214	†H ₂ O Equivalent Insert with Cavity for Ion Chamber	1.01	3.345	1.002
682-215	Dense Bone (800 mg/cc HA) Equivalent Insert	1.53	4.862	1.456
682-217	*Dense Bone (1000 mg/cc HA) Equivalent Core Insert	1.66	5.243	1.57
682-218	*Dense Bone (1250 mg/cc HA) Equivalent Core Insert	1.83	5.718	1.712
682-219	*Cortical Bone Equivalent Core Insert	1.93	5.956	1.78
682-220	*Dense Bone (1500 mg/cc HA) Equivalent Core Insert	2.00	6.209	1.859
682-221	*Dense Bone (1750 mg/cc HA) Equivalent Core Insert	2.17	6.698	2.005
682-226	Dense Bone (1000 mg/cc HA) Equivalent Insert	1.66	5.243	1.57
682-227	Dense Bone (1250 mg/cc HA) Equivalent Insert	1.83	5.718	1.712
682-228	Dense Bone (1500 mg/cc HA) Equivalent Insert	2.00	6.209	1.859
682-229	Dense Bone (1750 mg/cc HA) Equivalent Insert	2.17	6.698	2.005

* These inserts contain a 10 mm diameter core of indicated bone reference surrounded by H₂O background.
 Hydroxyapatite (unit mg/cc) in H₂O background Plugs to accommodate chambers, TLD's and film available upon special request.
 † Refer to separate CIRS cavity and plug code list for available chamber cavities.

References

P. Cossmann, A Stuessi, C von Briel, Characterisation of a Linac Cone-Beam-CT Option: What Is the Future Potential for Treatment Planning? SU-GG-T-536, Medical Physics, Vol. 35, No. 6, June 2008

P. Cossmann, U Gneveckow, C von Briel Characterisation of a Linac Cone-Beam-CT Option: What Is the Future Potential for Treatment Planning? SSK17-04, RSNA Scientific Assembly and Annual Meeting Program 2008, p. 546

PH Cossmann, U. Gneveckow Characterisation of a Linac Cone-Beam-CT Option: What Is the Future Potential for Treatment Planning? Medical Physics, submitted

PH Cossmann, V. Varchena A novel phantom design for the electron density calibration of a linac CBCT option, Zeitschrift fuer Medizinische Physik, submitted

Item #	Description
682-200	CBCT Elctron Density Phantom

B

CT SIMULATORS, CT PRODUCTS & LASERS

HEAD/BODY CT PHANTOM



- Head Module of a uniform disc of Solid Water® Material
- Ring of Bone mimicking material that mounts around the head module
- Body scanning module, body annulus is mounted on the head module.
- The head has 5 tapered cavities which accept tapered inserts and the body annulus ring has 4 cavities, providing a total of 9 test positions.

The Head/Body CT Phantom provides a set of tools for evaluating CT image quality. The main modules are constructed of Solid Water®. This permits testing without the difficulties of filling phantoms with water. The set of standard inserts is sufficient for many users. The Head/Body CT Phantom comes complete with a custom carrying case.

Specifications

Phantom Construction: Solid Water® Material

Inserts Included:

- (9) Uniform Solid Water® inserts for measurement of Noise, CT Number, and Uniformity
- (1) Edge/Contrast Scale Response
- (1) Spatial Resolution (1.50 to 0.4 mm at 100% contrast)
- (1) Low Contrast Detectability (0.6%)
- (1) Alignment Artifact (Aluminum Pin)
- (4) Alignment, Slice Thickness, Phantom Position
- (2) Slice Thickness and Sensitivity Profile 2:1 Slope (26.6° Slope)
- (2) Beam Hardening Artifact (Simulated Bone)
- (6) Linearity

Case Size: 24" x 16" x 8" (70 x 41 x 22 cm)

Weight: 35.7 lb (16.2 kg)

Item #	Description
682-461	Head/Body CT Phantom

TISSUE CHARACTERIZATION PHANTOM



- Easy method for electron density measurement of different tissue materials
- 14 different tissue and insert materials to measure
- Distance measurement holes to assist in measuring CT distance measurement accuracy
- Includes a handy carrying case for storage and transportation
- Proven Solid Water core design
- Interchangeable rods permits positioning customization
- Interchangeable inserts of materials permits easy measurement of a wide range of tissues
- Compact design makes storage and transportation simple and easy
- Wide range of materials permits full range of measurements
- Optional Titanium insert for use where such inserts are wanted to be included in the program
- Economical
- Also permits checking the CT scanner's distance measurement accuracy
- Data measured can be transferred to the TPS for more additional corrections for tissue inhomogeneities

The Gammex Tissue Characterization Phantom can be used to provide accurate corrections for tissue inhomogeneities. The Phantom can be used to establish the relationship between the electron density of various tissues and their corresponding CT number.

The Phantom consists of a Solid Water disk approximately the size of an average pelvis. A matrix of 16 holes in the disk hold interchangeable rods made of various tissue and water simulating materials. The physical density (gm/cm³) and electron density relative to water of the rod materials are provided on a specification sheet with each phantom.

Scanning the phantom on a periodic basis provides data useful for the QA program of both the CT scanner and treatment planning system.

Specifications

Disk Material: Solid Water® (Gammex 451)

Size: 12.9" Dia x 2" H (32.8 x 5.08 cm)

Weight of Disk and Rods: 10 lb (4.6 kg)

Phantom with case: 14.5 lb (6.6 kg)

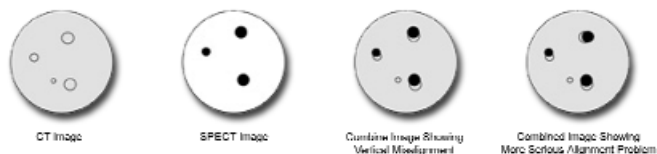
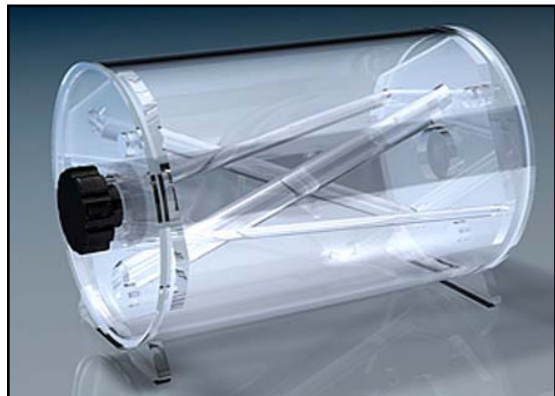
Warranty: One year

Rod Material	Electron Density Relative to Water	Physical Density g/cm ³
Lung (LN-300)	0.29	0.30
Lung (LN-450)	0.40	0.45
Adipose (AP6)	0.90	0.92
Breast	0.96	0.99
CT Solid Water	0.99	1.02
Brain	1.05	1.05
Liver (LV1)	1.07	1.08
Inner Bone	1.09	1.12
Bone (B200)	1.11	1.15
Bone (CB2-30% Mineral)	1.28	1.34
Bone (CB2-50% Mineral)	1.47	1.56
Cortical Bone (SB3)	1.69	1.82
True Water	1.00	1.00
Optional Titanium Insert	3.79	4.59

Item #	Description
682-467	Tissue Characterization Phantom
682-468	Titanium Insert, Optional

GILLIAN QA PHANTOM

Evaluate Image Distortion and Alignment in SPECT/CT, PET/CT & CT/MRI



- Compatible with SPECT/CT, PET/CT and CT/MRI
- Check alignment and distortion across the entire imaging field
- Easy to fill and drain
- Allows for independent assessment of equipment function
- Simple geometry allows for quick visual interpretation

Hybrid scanning systems such as SPECT/CT, PET/CT and CT/MRI are increasingly being used to improve tumor identification, treatment delivery and monitor treatment effectiveness. By combining images from two different imaging modalities, hybrid scanning systems take advantage of the strengths of individual imaging modalities while minimizing their respective weaknesses. Proper alignment of the fused images is an ongoing concern.

The Gillian QA Phantom provides a simple and cost effective solution to verify image alignment and distortion. The phantom consists of a water tight acrylic cylinder that can be filled with a variety of fluids. Four non-parallel rods of varying diameter run the entire length of the cylinder. Images produced with the phantom can quickly and clearly show if there is any mismatch in the fused images.

Gillian QA Phantom - SPECT/CT, PET/CT, CT/MRI Includes:

- (1) Phantom body with rods
- (1) Plug
- (1) Stand

Specifications

Overall Dimensions: 10" x 10.75" x 16" (25.4 x 27.3 x 40.7 cm)

Weight: 8.3 lb (3.1 kg)

Materials: Acrylic

Rod Diameters: 9.72 mm, 16.26 mm, 20.80 mm and 28.75 mm

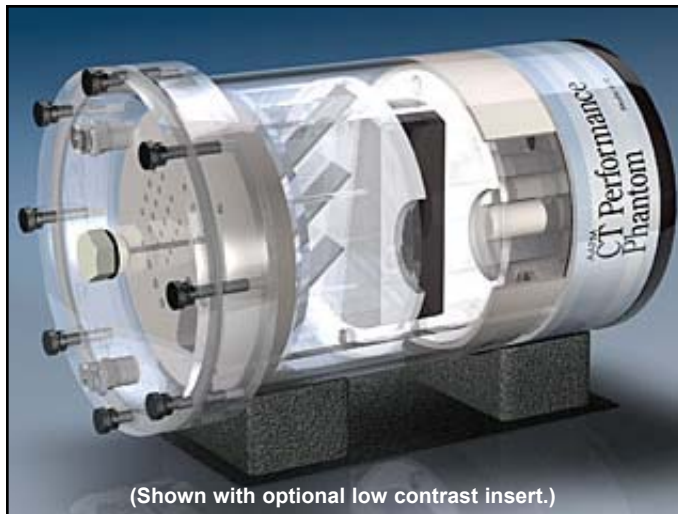
Item #	Description
682-850	Gillian QA Phantom

B

CT SIMULATORS, CT PRODUCTS & LASERS

AAPM CT PERFORMANCE PHANTOM

Meets guidelines in AAPM Report #1 "Performance Evaluation and Quality Assurance of CT Scanners"



(Shown with optional low contrast insert.)

The AAPM CT Performance Phantom offers the user a single test object that measures ten distinct CT performance parameters. The phantom design is based on the guidelines presented in Report #1 of the American Association of Physicists in Medicine Task Force on CT Scanner Phantoms. The goals of report #1 were to "(1) define 'performance' of a CT scanner and (2) describe methods of performance testing through utilization of particular phantoms."

A CT number linearity insert, high contrast resolution insert and slice width insert are housed in an 8.5" diameter (21.6 cm) PMMA water tank with quick disconnect valves for ease of filling and draining between use. Also included is a 0.25" (0.64 cm) bone equivalent ring that can be fit over the inserts to evaluate the effects of beam hardening.

A contrast test object is adhered to the bottom of the tank that includes two rows of cavities from 1 to 0.125" diameter (2.54 to 0.32 cm). The cavities can be filled with various solutions for contrast evaluation. An aluminum alignment insert is incorporated in the lid of the tank and can be interchanged with a polystyrene TLD insert for dose measurements.

A user's manual, holding cradle, filling tubes and other accessories are included. Optional items: Low contrast test object insert external whole-body resolution / noise ring or afoam lined carry case.

Specifications

Overall Dimensions: 8.5" OD x 15.5" L (21.6 x 39.4 cm)

Empty Weight: 17.25 lb (7.9 kg)

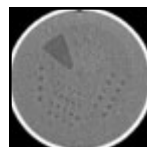
Phantom Housing: PMMA cast tubing 8.5" ID x 12.75" L (21.6 x 32.4 cm) with removable lid

Optional Accessories



Item 682-014 TLD Insert

0.5" dia. x 3.5" L (1.3 x 8.9 cm) PMMA rod drilled 3" deep (7.6 cm) to accept TLD's. Can be swapped with Alignment pin in housing cover without removing the cover.



Item 682-012 Low Contrast Insert

8" OD x 1.18" L (20.3 x 3 cm) proprietary epoxy with CT density 6-10 HU above water. The test object contains a series of water-filled holes from 2.5 to 7.5 mm in diameter, in 0.5 mm steps. For each target size the center-to-center distance between holes is twice the hole diameter.



Item 682-013 Whole Body Resolution and Noise Ring

12" OD x 8.5" ID x 2.5" L (30.5 x 21.6 x 6.4 cm) fits over phantom housing and contains the same test object as the Resolution Insert, at two locations 90° apart.



Item 682-015 Low Contrast Insert- Spherical Targets

8" OD x 1.18" L (20.3 x 3 cm) liver equivalent background. The test object contains spheres 5, 10 & 20 CTU below background and 3 reference plugs for each material used as spheres.

Item #	Description
682-010	AAPM CT Performance Phantom
682-014	TLD Insert
682-012	Low Contrast Insert
682-013	Whole Body Resolution & Noise Ring
682-015	Low Contrast Insert - Spherical Targets
682-020	Carrying Case, Foam-Lined

B

Measurement Capability

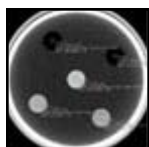
- Noise
- Sensitivity / Detectability
- Mechanical Alignment
- Beam Hardening
- Slice Thickness
- Size Independence
- Radiation Dose
- Spatial Uniformity
- HU Linearity
- Spatial Resolution & line spread function

Item 682-010 Includes



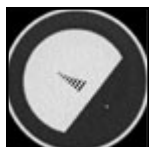
Contrast Test Object

(This option is only available with purchase of the phantom body) 8.5" OD x 2.5" L (21.6 x 6.35 cm) solid acrylic equivalent disk block with 12 fillable cavities 2.25" deep (5.72 cm). Two of each cavity with diameters: 1, 0.75", 0.50", 0.375", 0.25", and 0.125" (2.54, 1.9, 1.27, 0.95, 0.64, 0.32 cm), spaced twice their diameter apart from a center line. Cavities can be easily filled from the outside with dextrose or sodium chloride solutions of various concentration.



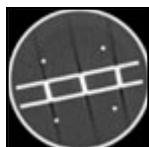
CT Number Linearity Insert

7.5" OD x 2.5" L (19.05 x 6.35 cm) includes 1" diameter (2.54 cm) rods of polyethylene, PMMA, polycarbonate, polystyrene, and nylon. Density values (g/cc): polyethylene - 0.95, polystyrene - 1.05, nylon - 1.1, acrylic - 1.19, polycarbonate - 1.20.



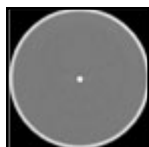
Resolution Insert

7.5" OD x 2.5" L (19.05 x 6.35 cm) with acrylic equivalent test object with 8 sets of air thru holes (five holes per set): Diameter of holes is 1.75, 1.5, 1.25, 1.00, 0.75, 0.61, 0.50, and 0.40 mm. Distance between each hole equal to hole diameter. Each row is 5 mm apart. Insert also contains a 0.009" (0.023 cm) stainless steel wire positioned longitudinally for calculation of linespread function.



Slice Thickness Insert

7.5" OD x 3.5" L (19.05 x 8.89 cm) Contains three 0.025 x 1" (0.064 x 2.54 cm) aluminum strips angled at 45°, positioned on center and aligned vertically.



Alignment Pin

0.25" diameter x 3" L (0.64 x 7.62 cm) aluminum pin with threaded attachment to housing cover plate.



Bone Ring

7.65" ID x 0.2" wall thickness x 2.8" L (19.43 x 0.5 x 7.1 cm) cortical bone ring. Fits over linearity, resolution and slice thickness insert to harden the beam.

CT SIMULATORS, CT PRODUCTS & LASERS

NUALINE LASERS FOR CT AND LINAC ROOMS



710-993



710-994



710-995



710-998



710-997



- Individual laser line has micro Angular and Transverse adjustments.
- It is extremely easy for installation and routine calibration. Customers may be able to install the lasers without professional help.
- The laser's compact size makes it fit any existing laser systems.
- No tools required.

Item 710-993 GSG1 Green Sagittal Laser

The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-994 GCR1 Green Crosshair Laser

The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-995 SG1 Red Sagittal/Backpointer Laser

The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser head could be adjusted over the mounting base for laser center alignment.

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less. This feature brings easiness for both installation and

routing calibration.

This laser (without a line generator lens) could also be used as a back-pointer.

Item 710-997 CR2 Red Crosshair Laser

Model CR2 is designed for small treatment rooms with diagonal layout. The laser head has a pivoting range of 135°. No additional mounting bracket is needed.

Two internal screws for adjusting cross hair line (as a whole) horizontally and vertically. The line titling is done by rotate the laser head over the mounting base.

Item 710-998 CR3 Red Crosshair Laser

The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely.

The adjustment is tool-less. This feature brings easiness for both installation and routing calibration.

Specifications

Electrical power consumption

Red laser: <0.2A / 7VDC.

Green laser: <1A / 3VDC

FDA Compliance

Nualine laser meets FDA requirement of class I medical device. Nualine laser devices are listed with FDA and the company is registered with FDA. A warning label on the device meets FDA code 1040.10.

Item #	710-993	710-994	710-995	710-997	710-998
Model	GSG1	GCR1	SG1	CR2	CR3
Description	Green Sagittal	Green Crosshair	Red Sagittal/Backpointer	Red Crosshair	Red Crosshair
Wave Length	532nm DPSS	532nm DPSS	635nm	635nm	635nm
Line Width	< 1 mm	< 1 mm	< 1 mm	< 1 mm	< 1 mm
Range	4 -15' (1.2 - 4.5 m)	4 -15' (1.2 - 4.5 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)
Focus	Adjustable	Adjustable	Fixed	Fixed	Fixed
Size	3" x 5.9" x 2" (7.6 x 15 x 5 cm)	4" x 5.9" x 1.8" (10.2 x 15 x 4.5 cm)	3.2" x 2.75" x 2.3" (8.1 x 7 x 5.8 cm)	3.5" x 3" x 2.3" (8.9 x 7.6 x 5.8 cm)	4.5" x 4" x 2" (11.4 x 10.2 x 5 cm)
Weight	15 oz (425 gm)	28.3 oz (800 gm)	10.6 oz (300 gm)	12.9 oz (365 gm)	19.5 oz (550 gm)

B

CT SIMULATORS, CT PRODUCTS & LASERS

CENTRALITE® RED DIODE FIXED LASERS



Warranty: Two-year warranty of parts and repair labor.
Dimensions: Mounting plate and case 5.5" W x 3.9" D x 13" H
Certification: Complies with CDRH regulations for Class II lasers.



Low Profile Laser

Mounting Plate: 5.5"W x 7.5"L x 0.2"D

Case: 4.25"W x 5.75"L x 1.85"D

Transmitter

Units Controlled: Up to 4 units in one room

Transmitter Adjustment Speed: 0.18 mm / sec at 3 m. (0.36 mm / sec at 3 m after 4 seconds)

Transmitter Power: 9 VDC battery with automatic power turnoff

Transmitter Output Beam Width: More than 60 degrees

Receiver

Units Controlled: One unit

Wiring: Wiring required between unit and receiver, Standard 8 conductor 10-BASE-T cable and connector

Receiver Power: 115/220 VAC 50/60 HZ AC/DC Converter or 12 VDC

Item	Centralite® Lasers
710-910	Red Diode Cross Laser
710-915	Red Diode Motorized Cross Laser
710-920	Red Diode Sagittal Laser
710-925	Red Diode Motorized Sagittal Laser
710-928	Low Profile Red Diode Cross Laser
710-929	Low Profile Red Diode Sagittal Laser

Red diode lasers have long been the standard in radiation therapy. Three configurations are offered for the Centralite® Red Diode Lasers. The lasers may also be purchased individually.

B Motorized System

The optional motorized system for red diode lasers uses a handheld infrared transmitter that enables you to make minute adjustments to the laser beam while inspecting the image at isocenter. It's an ideal solution for hard-to-reach locations, such as an overhead laser.

Specifications

Red Diode Laser

Laser Beam Output: Less than 1 mW per beam (Class II laser)

Line Width: 0.9-1.2 mm at isocenter when mounted 3 m from isocenter.

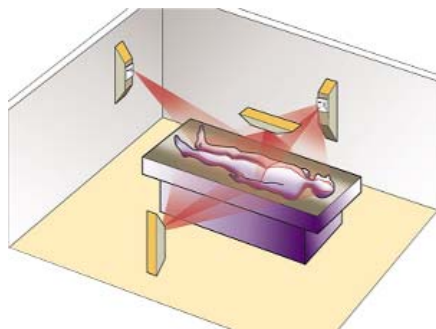
Fan Beam Angle: Greater than 50 degrees.

Wavelength: 650 nm

Adjustment Sensitivity: Less than 0.1 mm (manual or motor drive).

Power: 115/220 Vac 50/60 Hz AC/DC converter.

LS-1 LASER SYSTEM



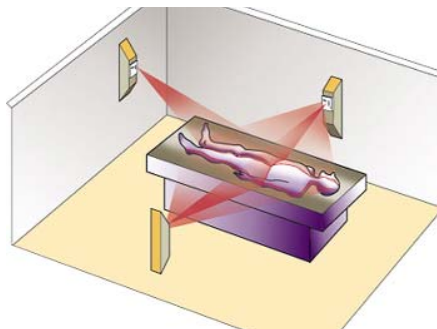
Depending on the configuration of the room, the two lateral and overhead cross lasers may be mounted either vertically or horizontally. The sagittal laser mounts vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes

3 Red Diode Cross Lasers
 1 Red Diode Sagittal Laser
 Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-941	LS-1 Red Diode
710-951	LS-1 Motorized Red Diode

LS-2 LASER SYSTEM



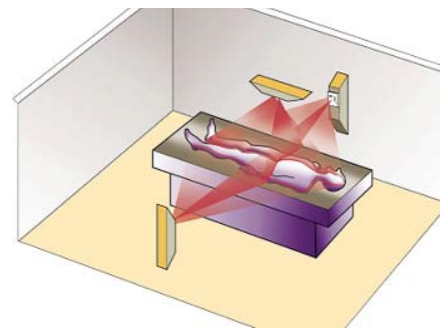
The two lateral cross lasers may be mounted vertically or horizontally. The sagittal laser is mounted vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes

2 Red Diode Cross Lasers
 1 Red Diode Sagittal Laser
 Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-942	LS-2 Red Diode
710-952	LS-2 Motorized Red Diode

LS-3 LASER SYSTEM



In this configuration, two cross lasers may be mounted vertically or horizontally on opposing walls. The third laser is mounted on the ceiling, allowing the two beams to project downward through the isocenter.

System Includes

3 Red Diode Cross Lasers
 Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-943	LS-3 Red Diode
710-953	LS-3 Motorized Red Diode

CT SIMULATORS, CT PRODUCTS & LASERS

CENTRALITE® GREEN DIODE FIXED LASERS



Specifications

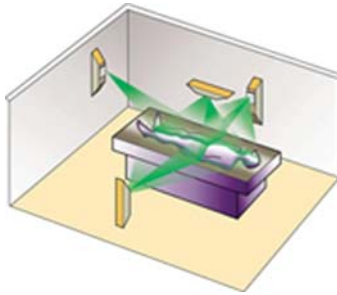
Laser Beam Output: Less than 1 mW (Class II laser)
Line Width: 0.9-1.1 mm at isocenter when mounted 3 m from isocenter
Fan Beam Angle: Greater than 50°
Wavelength: 532 nm
Adjustment Sensitivity: Less than 0.2 mm
Power: 115/230 Vac 50/60 Hz AC/ DC converter
Dimensions: Mounting plate and case 5.5" W x 3.9" D x 17.5" (14 x 10 x 44.5 cm)
Warranty: One-year warranty of parts and repair labor
Certification: Complies with CDRH regulations for Class II lasers
CE

Green diode lasers deliver the same accuracy as red diode lasers while projecting an image that is easier to see across a wider variety of skin tones. A Green laser also minimizes line diffusion on the skin.

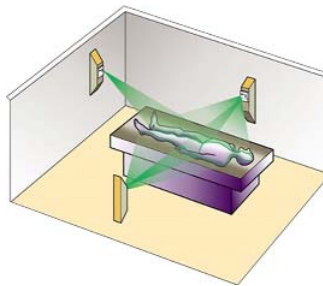
Item	Centralite® Lasers
710-930	Green Diode Cross Laser
710-935	Green Diode Sagittal Laser

B

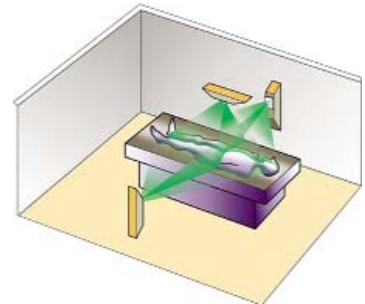
LS-4 LASER SYSTEM



LS-5 LASER SYSTEM



LS-6 LASER SYSTEM



To match the configuration of your room, the overhead and lateral cross lasers may be mounted either vertically or horizontally. The cylindrical lens of the sagittal laser projects the beam at a 20° angle that runs the length of the couch.

System Includes

3 Green Diode Cross Lasers
 1 Green Diode Sagittal Laser
 Mounting Plates and AC/DC Converter

The two lateral cross lasers may be mounted vertically or horizontally. The sagittal laser is mounted vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes

2 Green Diode Cross Lasers
 1 Green Diode Sagittal Laser
 Mounting Plates and AC/DC Converter

In this configuration, two cross lasers may be mounted vertically or horizontally on opposing walls. The third laser is mounted on the ceiling, allowing the two beams to project downward through the isocenter.

System Includes

3 Green Diode Cross Lasers
 Mounting Plates and AC/DC Converter

Item	Centralite® Laser System
710-944	LS-4 Green Diode

Item	Centralite® Laser System
710-945	LS-5 Green Diode

Item	Centralite® Laser System
710-946	LS-6 Green Diode

CT SIMULATORS, CT PRODUCTS & LASERS

CENTRALITE® CT MOVING LASER SYSTEM



B

- Provides complete system control through graphical handheld terminal - including remote coordinate transfer from TPS system - allowing therapist to maintain focus on the patient
- Delivers accurate, error-free marking of patients due to precise, self-calibrated laser line positioning
- Provides seamless interface to all major commercial virtual simulation and treatment planning systems, allowing you to choose the system that works best for your facility

The Centralite®CT moving laser system lets you use treatment-planning data to directly identify tumor locations and mark patients for treatment. It was designed expressly for radiation therapy departments that use CT scanners for virtual simulation to provide an accurate and reliable patient alignment system. The Centralite® CT moving laser system positions laser diode-generated lines at X, Z and Y coordinates. Used in conjunction with a digitized CT scan of the affected area, it can help you precisely identify tumor location, yielding more effective treatment. Each system includes a combination of moving laser actuators and fixed lasers (depending on configuration), a system controller that manages up to five actuator positions, and a graphical handheld interface terminal.

CENTRALITE® CT SYSTEM COMPONENTS

Moving Laser Actuator

- Count on extremely accurate positioning of the laser line at isocenter thanks to factory calibration
- Easily adjust alignment of vertical and horizontal positions using buttons at the bottom of the actuator
- Mount actuators on a wall, ceiling and/or pedestal to match the unique layout of your facility

The moving laser actuator moves the laser line to the position commanded by the system controller. A laser diode is moved from one end of the actuator to the other using a precision, stepper-motor-controlled positioning system.

Lasers lines may be turned off at the actuator. An LED display indicates when lasers are either on or off.

Operators may also make adjustments using an optional remote-control drive.

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Handheld Terminal

- Displays patient ID information, laser positions and status, and control menus
- Makes critical information available to the therapist in the CT simulation room
- Allows rapid movement between coordinates, streamlining the patient-marking process.

The graphical handheld terminal - located in the CT simulation room and featuring a 24-key pad and easy-to-follow menus - delivers complete control over the moving laser system and empowers the therapist to work more efficiently and effectively.

Standard functions that may be executed from the handheld terminal or PC include

Home: Home position is defined as any position within the stroke of the actuator. Pressing the Home button instantly returns all actuators to the Home position.

Align: Actuators may be moved individually to set your Home position and align the lasers.

Move: X and Y coordinates may be entered to quickly position the actuators at the correct coordinates.

System Controller

- Interfaces to all major commercial treatment planning systems
- Eliminates need to place an additional computer monitor in the CT control room
- Controls power to all moving actuators

The heart of the moving laser system is a microprocessor-based, multi-axis position controller. Designed to control the position of 1 to 5 actuators, the operator uses the handheld terminal to communicate with the system controller. When configured with an optional single-board computer, moving laser coordinates may be imported from the treatment planning system. This ensures more efficient data entry while eliminating potential operator error.

Optional System Controller with PC

Operators may also communicate with the system using a Windows™-based program on a PC. Standard functions are executed using a graphical user interface. The program may also be customized to receive data from an external source and automatically send appropriate commands to the position controller.

Optional Accessories

In some rooms any one or more of the optional items may be necessary, or preferred, for installation of a CT Laser System. If unsure of the necessity, call RPDinc prior to ordering to determine what items may be needed. A sketch of the room layout will usually be requested prior to processing an order.

CT SIMULATORS, CT PRODUCTS & LASERS

Specifications

Moving Laser Actuator

Line Positioning Accuracy: ±0.3 mm

Encoder Resolution: 0.004 mm

Length of Travel: 500 mm

Beam Alignment Adjustment: ±38 mm

Physical Dimensions: 4.5" W x 4.1" H x 41" L
(11.5 x 10.5 x 104 cm)

Weight: 22 lb (10 kg)

Laser Beam Output: < 1 mw

Line Width: < 1.0 mm

Fan Beam Angle: 50°

Wavelength: 650 nm

Adjustment Sensitivity: < 0.1 mm

Power: Supplied by system controller

Warranty: Two-year warranty on parts and labor

Certification: Complies with CDRH regulations for Class II lasers



Optional Remote Control

Transmitter

Units Controlled: Up to four (4) units in one room

Adjustment Speed: 0.09 mm/sec at 3 m (0.18 mm/sec at 3 m after 4 sec)

Power: 9 VDC Battery with automatic power turnoff

Output Beam Width: More than 60°

Receiver

Drives one unit

Wire Between Unit and Receiver: Standard 8 conductor 10-BASE-T

Receiver Power: 115/220 VAC 50/60 Hz. AC to DC converter

Handheld Terminal

Display: 4-line x 20-character LCD Display

Keypad: 24 key

Physical Size: 5.1" W x 9" L x 1.4" H (13 x 23 x 3.5 cm)

Weight: 1.3 lb (0.6 kg)

Power: Supplied by System Controller

System Controller

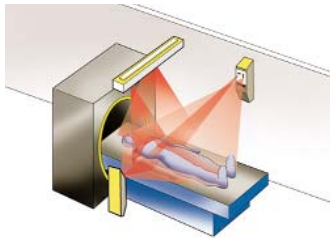
Size: 7.1" W x 17.1" L x 3.9" H (18.2 x 43.5 x 10 cm)

Weight: 7 lb (3.2 kg)

Power: 100-240 VAC, 50-60 Hz

B

Centralite® CT Single-Moving Laser System



The Centralite® CT single-moving laser system (Items 710-660 or 710-965) provides one moving plane (X) and two fixed planes (Y and Z).

Item 710-960 CT Single-Moving Laser System Includes

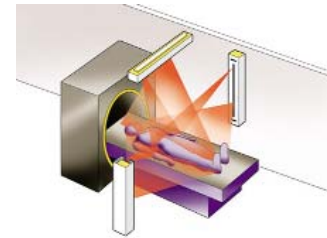
- (1) Moving Laser Assembly
- (1) Moving Laser Controller (1 laser)
- (2) Red Diode Cross Lasers (fixed)
- (1) Moving Laser Handheld Pendant
- (1) CT Laser Alignment Phantom
- Associated System Cabling

Item 710-965 CT Single-Moving Laser System with Embedded PC Includes

- (1) Moving Laser Assembly
- (1) Moving Laser Controller with Embedded PC (1 laser)
- (2) Red Diode Cross Lasers (fixed)
- (1) Moving Laser Handheld Pendant
- (1) CT Laser Alignment Phantom
- Associated System Cabling

Item	Description
710-960	CT Single-Moving Laser System
710-965	CT Single-Moving Laser System - Embedded PC
710-980	Installation of CT Moving Lasers

Centralite® CT Three-Moving Laser System



The Centralite® CT three-moving laser system (Items 710-970 or 710-975) provides two moving planes (X and Z) one fixed plane (Y)

Item 710-970 CT Three-Moving Laser System Includes

- (3) Moving Laser Assembly
- (1) Moving Laser Controller (3 lasers)
- (1) Moving Laser Handheld Pendant
- (1) CT Laser Alignment Phantom
- Associated System Cabling

Item 710-975 CT Three-Moving Laser System with Embedded PC Includes

- (3) Moving Laser Assembly
- (1) Moving Laser Controller with Embedded PC (3 lasers)
- (1) Moving Laser Handheld Pendant
- (1) CT Laser Alignment Phantom
- Associated System Cabling

Item	Description
710-970	CT Three-Moving Laser System
710-975	CT Three-Moving Laser System - Embedded PC
710-980	Installation of CT Moving Lasers

Systems with Phase Two Actuators are Available, Call to Request More Information

Item	Optional Accessories
710-985	CT Moving Laser Bridge
710-986	Angle Bracket Kit for Diode Cross Lasers
710-987	Angle Mounting Kit for Moving Laser Actuator

Item	Optional Accessories
710-988	Pedestal Mounting Kit for Moving Laser Assembly
710-989	Pedestal Mounting Kit for Diode Cross Laser
710-990	Centralite CT Laser Alignment Phantom

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CT SIMULATORS, CT PRODUCTS & LASERS

LAP LASERS

Laser Systems for Patient Alignment



Integrated Tilttable Bracket



ASTOR RED

Manual Adjustments

1. Rotates Vertical Line
2. Rotates Horizontal Line
3. Moves Vertical Line Left/Right
4. Moves Horizontal Line Up/Down
5. Tilts Vertical Plane
6. Tilts Horizontal Plane
7. Turns to Focus Vertical Line
8. Turns to Focus Horizontal Line

ASTOR GREEN

Manual Adjustments

1. Moves Cross Left/Right
2. Moves Cross Up/Down
3. Rotates Cross
4. Tilts Horizontal Plane
5. Tilts Vertical Plane
6. Turns to Focus Lines
- Cross Angle, Factory Set to 90°

APOLLO RED & GREEN

Remote Controlled Adjustments

- Moves Cross Left/Right
- Moves Cross Up/Down
- Rotates Cross
- Tilts Vertical Plane
- Tilts Horizontal Plane
- Turns to Focus Lines
- Cross Angle, Factory Set to 90°

ASTOR Treatment Room Lasers set the standard for accuracy, stability, ease of adjustability and quality.

They are available with red or green laser lines and have the added benefit of an all internal six axis adjustment system that is unparalleled when it comes to precision applications such as stereotactic radio surgery. The ASTOR's dual diode system with special optics delivers extremely long fine lines. The compact housing and angle bracket make it extremely versatile when it comes to mounting the unit in your treatment room environment.

The green Astor lasers have a uniquely engineered thermostatic control system to further prolong the diode life. Special optics such as a prism allow the green laser lines of the ASTOR laser to be extremely long, narrow, bright and of equal line width.

The remote control adjustable APOLLO lasers are the most advanced treatment room laser on the market today.

The all internal adjustment system - standard on all of LAP treatment room lasers - makes them the best available option for precision applications such as stereotactic radio surgery. On the APOLLO laser all six axis internal adjustments are available to you through the single infrared remote control that can be programmed to operate up to six lasers in a room. APOLLO lasers are available in red or green. The green APOLLO lasers have a uniquely engineered thermostatic control system to further prolong the diode life.

Special optics such as a prism allow laser lines of the APOLLO laser to be extremely long, narrow, bright and of equal thickness. The APOLLO's compact housing and angle bracket make it extremely versatile when it comes to mounting the unit in your treatment room environment.

Specifications	ASTOR Red	ASTOR Green	APOLLO Red	APOLLO Green
Line Width Up to 4 m Distance	<1 mm	<1 mm	<1 mm	<1 mm
Line Length at 3 m / 10 ft Distance	5 m / 15 ft	3 m / 10 ft	4 m / 12 ft	3 m / 10 ft
Laser Type	Laser diode	Diode Pumped Solid State	Laser diode	Diode Pumped Solid State
Wavelength	635 nm	532 nm	635 nm	532 nm
Output	<1mW	<1 mW	<1mW	<1 mW
Power Requirements	110/230 V AC/5 V DC	110/230 V AC/5 V DC	110/230 V AC/5 V DC	110/230 V AC/5 V DC
Main Voltage	5 V DC	5 V DC	5 V DC	5 V DC
Power Consumption	1 W	10 W	1 W	10 W
Ambient Temperature	0-40 ° C	15 -30 ° C	0-40 ° C	15 -30 ° C
Dimensions (H x W x D)	188 x 86 x 93 mm	221 x 110 x 101 mm	221 x 110 x 104 mm	221 x 110 x 104 mm
Weight	1.5 kg / 3.3 lbs	2.4 kg / 5 lbs.	2.3 kg / 5 lbs	2.3 kg / 5 lbs.
Isocenter Adjustment Accuracy	± 0.5 mm	± 0.5 mm	± 0.5 mm	± 0.5 mm

BACKPOINTER



The solid state diode Backpointer laser come in either red or green. The small housing of the red diode Backpointer has been specially designed to replace the fiber optic head of the older generation

Item	LAP Lasers
711-001	ASTOR Red - Crosshair
711-002	ASTOR Red - Line
711-010	ASTOR Green - Crosshair
711-012	ASTOR Green - Line
711-015	APOLLO Red - Crosshair
711-017	APOLLO Red - Line
711-020	APOLLO Green - Crosshair
711-022	APOLLO Green - Line
711-025	Backpointer Laser - Red
711-026	Backpointer Laser - Green

EXACT-ALIGN (HeNe) LASERS



Red Turret Style Green Turret Style

- Turret design for easy, flexible mounting (+ 45°)
- Red laser (628 nm) and green laser (543 nm) for easy visibility in bright light rooms
- Long life for the laser element
- Mount to most walls saving space
- Bright light source makes the HeNe laser a good choice for rooms with bright lights
- Wavelengths selected for both Red and Green laser provide appearance of brighter light than lasers of different wavelengths
- Compact design
- Combine in either Tri-Flex or Ter-A-Cross configuration
- Proven technology

The Exact-Align Helium Neon (HeNe) turret lasers are the standard for patient positioning. The turret design allows for a line angulation capability of $\pm 45^\circ$ which means that the lasers can be mounted at an angle to the patient couch if necessary without requiring angle brackets. This direct wall mounting provides for greater stability of the laser. Optical adjustments are easily accessible. The red turret style lasers project at 628.8 nm wavelength which is highly visible in normal lighting conditions.

The green turret style lasers project at 543.5 nm wavelength which is visible on any skin tone. The high quality fine line of the green lasers also proves useful in situations such as stereotactic radiosurgery where precision positioning is critical. The green light is "absorbed" into the skin which minimizes the "spattering" effect thereby maintaining the thinnest line available.

Specifications

Laser Beam Output

Power: <0.2 mW (each beam, green only); <1.0 mW (each beam, red only)

Spot Size: 0.05" (1.2 mm) diameter at 10' (3.05 m)

Range: Up to 30' (9.10 m)

Line Width: <0.04" (1.0 mm) at 10' (3.05 m)

Drift: 0.01" (0.25 mm) at 10' (3.05 m) maximum

Wave Length: 543.5 nm visible green and 628.8 nm visible red

Visibility: Clearly visible in strong ambient light

Laser Beam Adjustment

Horizontal Range of Vertical Projection Spot or Line: $\pm 130''$ (330.2 cm) at 10' (3.05 m)

Vertical Range of Horizontal Projection Spot or Line: +40" -120" (+102.0 cm -305.0 cm) at 10' (3.05 m)

Line Angle Adjustment Range: $\pm 180^\circ$

Mounting: Turret adjustable to $\pm 45^\circ$ walls

Laser

Size: 16.9" L x 5.4" W x 3.12" D (43 x 13.7 x 7.9 cm)

Weight: 10 lb (4.5 kg)

Power Requirements: 115 or 230 VAC, 50/60 Hz, 25 W

Certification

Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (MDD 93/42/EEC)

Item	Exact-Align (HeNe) Lasers
711-200	Red Crosshair
711-202	Red Sagittal
711-205	Green Crosshair
711-207	Green Sagittal

B

PROBE DIODE LASERS



Another benefit these lasers offer is a protective shielding for the electronics and especially the diode. This enables the lasers to last longer and perform better than other similar lasers on the market. The Probe also features a variable intensity control that allows you to adjust the laser brightness based on the room lighting conditions. The Probe Diode laser is provided with a 110 VAC to 12 VDC power supply.

Specifications

Laser Beam Output

Power: <0.5 mW (each beam)

Range: Up to 20' (6.0 m)

Line Width: <1.0 mm at 3 m

Line Length: >0.61 m at 3 m

Drift: No measurable drift

WaveLength: 6350 Å (635 nm) visible red

Visibility: Clearly visible in strong ambient light

Intensity: User adjustable to desired levels

Laser Beam Adjustment

Horizontal Range of Vertical Projection: 130" (330.2 cm) at 10' (3.05 m)

Vertical Range of Horizontal Projection: Plus 102 cm/minus 305 cm at 3.05 m

Line angle adjustment range: ±180°

Mounting: Turret adjustable to ±45°

Laser

Size: 6.5" L x 5.4" W x 2.9" D (16.51 x 13.7 x 7.3 cm)

Weight: 4 lb (1.8 kg)

Power Requirements: 12 VDC, 300 mA

Optional Power Supply: 110/220 V (67A400CE)

Certification

Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (MDD 93/42/EEC)

Item	Probe Diode Lasers
711-220	Red Crosshair
711-222	Red Sagittal

- B** • Variable light intensity adjustment
- Similar footprint as the HeNe lasers
- Compact design
- 635 nm laser diode
- Protective shielding around the laser lamp itself to enhance its life
- Line adjustment range of 180°
- Economical
- Very bright laser and thus easy to see
- Simple and easy to mount
- Protective shielding for the electronics to help the laser last longer
- Variable intensity control permits users to adjust the laser brightness based on room lighting conditions

The Probe Diode Laser offers an alternative technology to the standard HeNe lasers. The Probe meets all of the specifications of the Exact-Align turret laser. This means that all of the existing features of the turret laser are now available in this more convenient and compact size. It also has the same width base plate as the Exact-Align system so it can be retrofitted to existing turret laser installations with no modifications. This makes conversion from the HeNe systems to the Diode systems cost friendly and easy. Most of the diode products currently available for patient alignment are in the 650 to 670 nm range. The Probe Diode Laser utilizes a 635 nm diode. Because of the optical response of the human eye, the Probe line is perceived as four times as bright as the 670 nm and two times as bright as the 650 nm. The 635 nm yields essentially the same brightness that you can obtain with the helium neon (HeNe) lasers.

CT SIMULATORS, CT PRODUCTS & LASERS

PROBE+ DIODE LASERS



- 160° turret which permits adjustments + 80°
- Easily adjustable horizontal and vertical line controls
- Similar footprint as the HeNe lasers
- Compact design
- 635 nm laser diode
- Protective shielding around the laser lamp itself to enhance its life
- Line adjustment range of + 180°
- Turret design permits installation of lasers on non-conventional walls for more efficient use of space
- Very bright laser and thus easy to see
- Simple and easy to mount
- Protective shielding for the electronics to help the laser last longer
- Variable intensity control permits users to adjust the laser brightness based on room lighting conditions

The Probe+ Diode Lasers are designed with a 160° turret rotation. Often, existing architectural configurations limit sites from installing traditional lasers, but with the Probe+ difficult room designs are no problem. Our unique and proprietary thermal design of the Probe+ series ensure users of no visible "drift". Vertical and horizontal adjustments allow for angular and planar movement making the Probe+ system easy to install.

The Probe+ Diode Laser alignment systems use a 635 nm wave length laser light and built-in controls to vary the light intensity. Most of the diode products currently available for patient alignment are in the 650 to 670 nm range. Because of the optical response of the human eye, the Probe+ line is perceived as four times as bright as the 670 nm, and two times as bright as the 650 nm. The 635 nm yields essentially the same brightness that you can obtain with our helium neon (HeNe) lasers. The Probe+ also allows a variable intensity control that allows you to adjust the laser brightness based on the room lighting conditions.

Another benefit Probe+ Diode Lasers offer is a protective shielding for the electronics and especially the diode. This enables our lasers to last longer and perform better than other similar lasers on the market. The Probe+ series also have the same width base plate as the Exact-Align system so it can be retrofitted to existing turret laser installations with no modifications. This makes conversion from the HeNe systems to the Diode systems cost friendly and easy.

The Probe+ Diode Laser has a 0.5 mm line at a distance of 2 meters. Complete documentation on laser beam profile is included with each Probe+ diode alignment system.

The standard Probe+ Diode Laser utilizes an external power supply adaptable for international use. The Probe+ Diode Laser system is easy to repair and maintain.

Specifications

Laser Beam output

- Power:** 0.5 mw (each beam)
- Range:** Up to 6.0 m
- Line width:** <0.5 mm at 2 m
- Line Divergence (Length):** 15-17°
- Drift:** No measurable drift
- WaveLength:** 6350 Å (635 nm) visible red
- Visibility:** clearly visible in strong ambient light

Laser Beam adjustment

- Horizontal range of Vertical Projection:** 330.2 cm at 3.05 m
- Vertical range of Horizontal Projection:** Plus 100 cm /minus 300 cm at 3 m
- Line angle adjustment range:** ±180°
- Mounting:** Turret adjustable to ±80°

Laser

- Size:** 6.75" L x 5.5" W x 3" D (17.3 x 14 x 8 cm)
- Weight:** 4 lb (1.8 kg)
- Power requirements:** 12 VDc, 300 mA

Universal Power Supply

- Power requirements:** 110 VAc - 220 VAc, 50 - 60 Hz, 0.4 A
- Laser unit includes various adapters for U.S. and international use.

Certification and Compliance

- Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (IEC 61140:2001)
- CE marked
- Power supply UL, cUL, GS and CE marked

Item	Probe+ Diode Lasers
711-225	Red Crosshair
711-227	Red Sagittal

B

PROBEG DIODE LASERS



it easy to use and maintain. Most fine laser controls are performed by simply raising the hinged cover and making the desired adjustment. No laser line drift is visible after initial adjustment. The laser is shielded to reduce radiation exposure to the diode and incorporates novel power stabilizing circuitry to extend diode life. ProbeG optics and mounting holes match Probe, Probe+ and HeNe lasers to allow easy retrofit mounting.

Specifications

Laser Beam Output

Power: <1.0 mW (each beam)

Range: Up to 6.0 m

Line Width: <0.8 mm at 3 m

Line Divergence (Length): 15-17°

Drift: No measurable drift

WaveLength: 5320 Å (532 nm) visible green

Visibility: Clearly visible in strong ambient light

Laser Beam Adjustment

Horizontal Range of Vertical Projection: 330 cm at 3 m

Vertical Range of Horizontal Projection: +100 cm / -300 cm at 3 m

Line angle adjustment range: ±180°

Mounting: Turret adjustable to ±45°

Laser

Size: 10.6" L x 5.5" W x 3.1" D (27 x 14 x 8 cm)

Weight: 7 lb (3.2 kg)

Universal Power Supply

Power Requirements: 110 VAC - 220 VAC, 50 - 60 Hz, 0.4 A

Laser unit includes various adapters for U.S. and international use.

Certification

Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (MDD 93/42/EEC)

Item	ProbeG Diode Lasers
711-230	Green Crosshair
711-232	Green Sagittal

B

- 160° turret which permits adjustments + 80°
- Similar footprint as the HeNe lasers
- Compact design
- 635 nm laser diode
- Protective shielding around the laser lamp itself to enhance its life
- Line adjustment range of + 180°
- Turret design permits installation of lasers on non-conventional walls for more efficient use of space
- Very bright laser and thus easy to see
- Simple and easy to mount
- Protective shielding for the electronics to help the laser last longer
- Variable intensity control permits users to adjust the laser brightness based on room lighting conditions

The ProbeG Green Diode Laser is designed to ensure precise patient positioning during CT simulation and radiation therapy. The ProbeG provides enhanced contrast on various skin tones. Projected green light is "absorbed" thereby minimizing line diffusion which, in turn, creates crisper lines. ProbeG lasers have less than 0.8 mm line width projected at a distance of three meters. This high quality fine line allows precision positioning in all situations. The ProbeG laser's unique mechanical design makes

ACCUCHROM 3 OPTICAL ALIGNMENT INSTRUMENTS



Light Visibility on Different Skin Tones



Medium Skin Tone



Dark Skin Tone



Darker Skin Tone

The Gammex AccuChrom 3 is the first innovative improvement in optical alignment in medical imaging since the laser was introduced in 1969. In place of lasers, AccuChrom 3 uses Light Emitting Diodes (LED) light sources.

AccuChrom 3 provides users with 3 different light colors that can be changed by pressing 1 button. Multiple aligner configurations can be controlled by a single remote control so that the colors of up to 5 different AccuChrom 3 units can have their light color changed instantly by pressing a single button.

The colors that are included in the AccuChrom 3 were selected due to their viewing ease over a wide range of different skin tones.

The colors are:

Cyan (blue), White and Green. No color is best in all situations with all skin tones. Room light variations can affect the ease of being able to detect different colors as much as the skin tone of the individual being treated. Because LED light sources do not emit any harmful radiation, lead shielding to protect the light source is not required. AccuChrom 3 is an environmentally friendly optical aligner.

Specifications

Size: 5.6" W x 5.0" D x 13.5" L (14 x 12.7 x 34.3 cm)

Weight: 9 lb (4.1 kg)

Remote Control Size: 2.5" W x 1.1" D x 5.5" H (6.1 x 2.9 x 14.0 cm)

LED Beam Output

Line Width: <0.8 mm @3 m

Drift: None measurable

Visibility: Clear in strong light

Power Supply Requirements: 110 VAC - 240 VAC, 50 - 60 Hz (Various adapters included for International use)

Item	Description
711-100	Crosshair Optical Alignment Instrument
711-102	Sagittal Optical Alignment Instrument
711-104	Remote Control for Optical Alignment Instruments

B