

# MR3T LASER SYSTEMS IN RT

ESSENTIAL FOR PRECISE PATIENT ALIGNMENT





PHOTO: COURTESY OF PHILIPS

## LAP IS YOUR IDEAL PARTNER FOR YOUR EXTERNAL LASER SYSTEMS

OUR CUSTOMIZED MR3T LASER BRIDGE SYSTEMS ARE RECOMMENDED BY LEADING MRI SCANNER VENDORS.

The characteristic features of LAP laser systems are sophisticated technology, quality and design for more than 30 years. This level of excellence has made us the global market leader for patient alignment in radiotherapy. With our dedicated technology for MRI we are setting standards with the world's only certified MR conditional laser systems.

### LAP – WE KNOW PATIENT ALIGNMENT

- Since 1984
- Global market leader
- In-house hardware and software development
- Scientific collaborations
- Worldwide service network
- Certified in accordance to ISO 9001 and ISO 13485
- Made in Germany

## MRI IN RADIATION THERAPY

The irradiation of tumor tissue has been enormously improved over the last 20 years. Dose and beam can be accurately controlled with today's modern Linacs to minimize patient risks. The increasing precision of the linear accelerators requires a more precise irradiation planning. To determine the dose and the target position, the tumor and healthy tissue must be discriminated precisely from one another.

Magnetic Resonance Imaging (MRI) provides excellent soft tissue contrast for more detailed information to distinguish healthy tissue from gross tumor volume. In addition, physiological information such as diffusion and perfusion of the treatment

region can be obtained to better define the target volume. MRI does not use X-rays or other radiation so that the patient is not exposed to any additional dose. This is another important factor that increases the interest in MRI as complementary image modality in RT.

In order to be able to utilize the advantages of additional imaging by means of MRI in RT, a precise and reproducible patient position on both imaging modalities - CT and MRI - is essential for accurate image fusion later in the treatment chain.



# CHOOSING LAP'S MR3T LASER SYSTEMS IN RT INCLUDE ...

## ... SAFETY FIRST

### WITH THE WORLD'S ONLY MR CONDITIONAL CERTIFIED LASER SYSTEMS IN RT

Continuous in-house research and development is our cornerstone to qualify for the certificate.

The design and technology of each component is specifically designed for use in the MRI environment.

In perfect synergy with MR scanners from leading suppliers, we guarantee SAFETY FIRST:

- Our free standing customized laser bridge systems compensate for all magnetically induced displacement forces
- All electronic components have no impact on the MR image quality

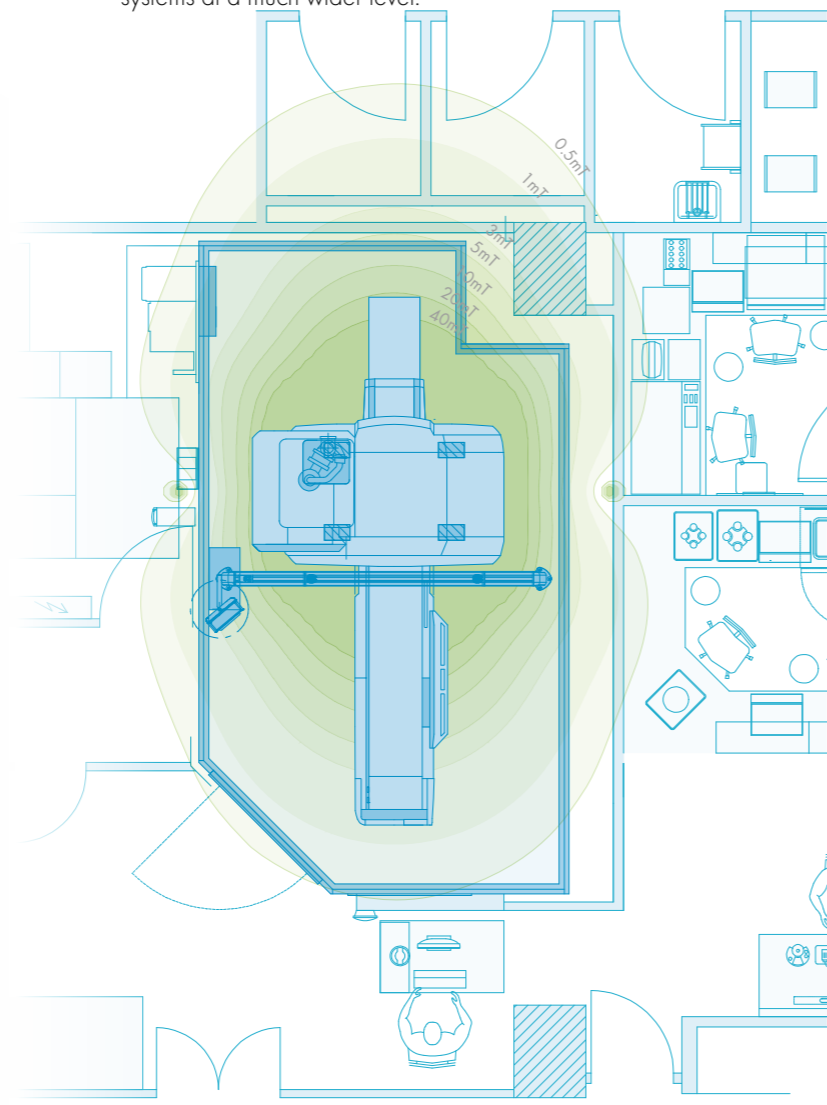
Certified by an independent testing facility DORADOnova MR3T and APOLLO MR3T are the world's only laser systems for patient alignment which fulfill MRI conditional requirements up to 3 Tesla.



## ... ROOM PLANNING

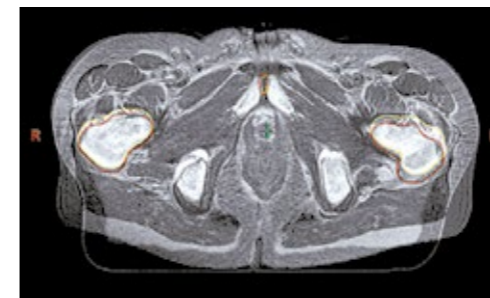
### OUR PRE-INSTALLATION SERVICE

No radiation therapy facility set up is alike. LAP always integrates room planning into each MRI project. With the same care with which we develop innovative products, we support you with our professional room planning service. We take your individual room situation into account and thus ensure the accuracy and safety of our MRI dedicated, customized laser bridge systems at a much wider level.

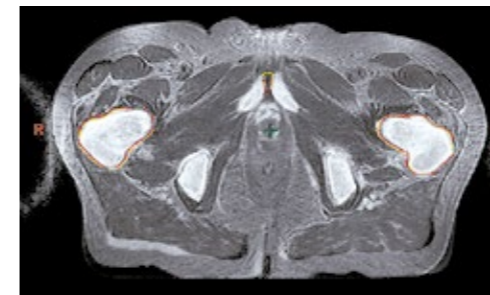


## ... ACCURACY AND PRECISION

### IN PATIENT POSITIONING



DATA MATCHING WITHOUT LASERS



DATA MATCHING WITH LASERS

The fusion of MR images with CT images is advantageous for the contouring of the target volume and identifying organs at risk. The combination of LAP MR3T laser systems and MRI is highly qualified for accurate, fast and better adaptation of the two imaging modalities. An accurate and precise anatomical patient position with the support of a customized laser bridge system can not be replaced by rigid and deformable image registration algorithms. Modern treatment techniques require precision in every stage of the entire treatment chain, beginning with precise and reproducible patient positioning with the help of a dedicated external laser system.

### AS PRECISION MATTERS ...

Our customized MR3T laser bridge systems with a robust and durable construction assure a vibration free and mechanically stable set up in each MR room environment. In addition all walls and ceilings stay unaffected and the Faraday cage in the MR room remains intact. The customized MR3T laser bridge from LAP and the MRI scanner form a reliable unit.

# LAP'S FIRST CLASS LASER TECHNOLOGY ...

... IS ESSENTIAL TO SUPPORT PATIENT ALIGNMENT IN YOUR MR-ENHANCED TREATMENT CHAIN

ESSENTIAL AND  
ELEMENTARY

ESSENTIAL AND  
COMFORTABLE

## CT SCAN

Patient positioning and marking with external laser system in treatment position

## MR SCAN

Patient positioning with external laser system identical to CT position

### LAP LASER APOLLO MR3T

Customized laser bridge system configuration with three integrated cross-hair lasers projecting fixed 3D coordinates of body planes to support patient alignment according to CT.

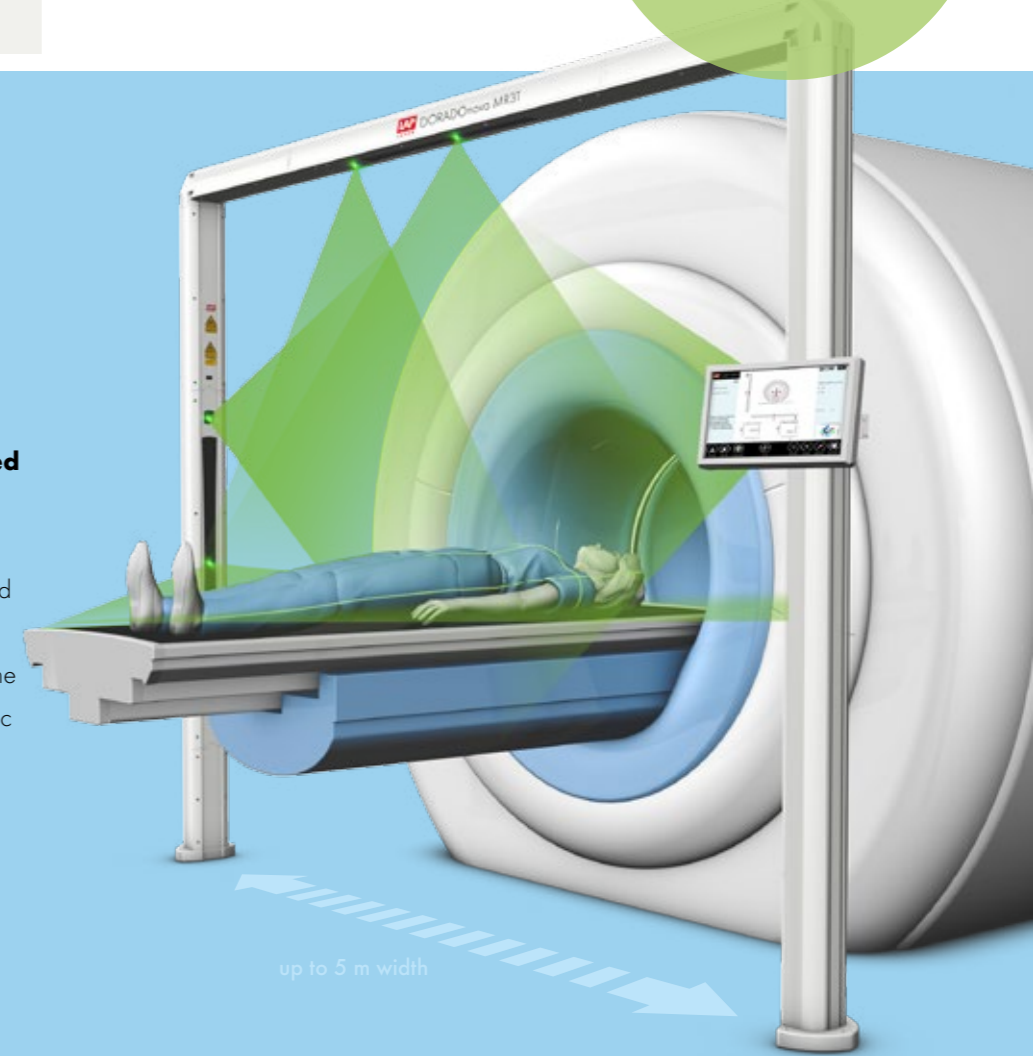
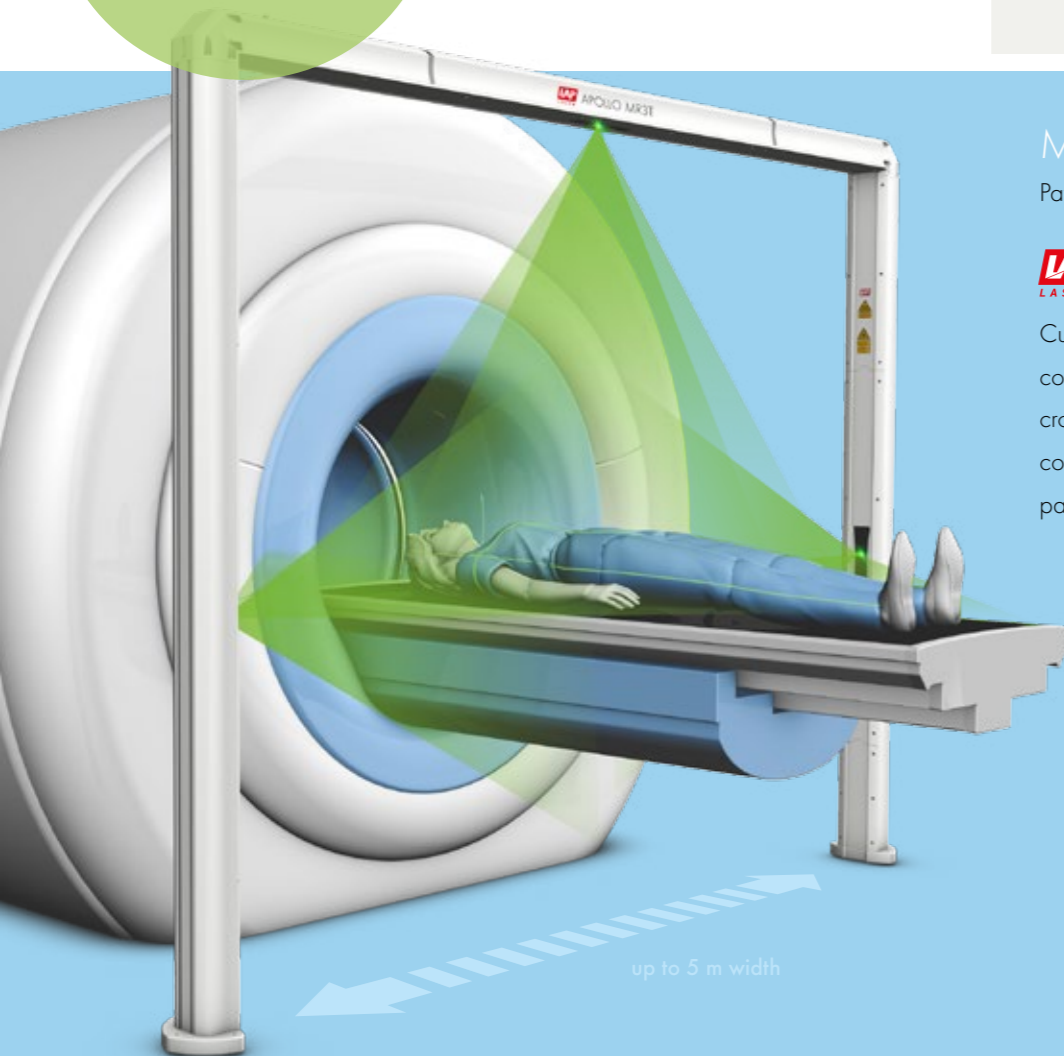
### LAP LASER DORADOnova MR3T

Customized laser bridge system configuration for a corresponding projection of laser lines according to CT position. The sagittal and horizontal planes are steerable by the **included CARINAnav laser control**, allowing easy and efficient patient alignment. The control software is operated by a touch screen mounted to the customized bridge, for easy laser control in the MR room. The fibre optic connection to the PC in the control room fulfills the electromagnetic interference requirements for MR.

### LAP LASER CARINAnav

MR Version:

- Touchscreen operation
- Easy navigation, intuitive laser control
- Windows 10 based desktop PC



## IMAGE FUSION

For contouring the target volume and identifying organs at risk

## TREATMENT PLANNING

For precise and successful patient irradiation

## TREATMENT

Patient positioning with external lasers

## YOUR WORKFLOW - YOUR CHOICE

Whichever LAP MR3T Laser System you choose – safety first – the world's only MR conditional certified laser systems in RT.

## DID YOU KNOW?

LAP's MR3T laser systems also support QA tool adjustments.

# TECHNICAL DATA

	LAP LASER APOLLO MR3T*	LAP LASER DORADOnova MR3T
Laser color	red (638 nm), green (520 nm), blue (450 nm)	
Laser class	2	
Line width up to 4 m distance	< 0.5 mm (blue), < 1 mm (red, green)	
Line length at 3 m distance	3 m	
Positioning accuracy	± 0.1 mm	
Projection accuracy	± 0.5 mm at a projection distance of 4 m	
Travel range	-	700 mm
Travel speed	-	up to 200 mm/s
Power supply	100 ... 240 VAC, 50 ... 60 Hz	
Width (customized)	2594 - 5000 mm (102.0" - 196.9")	
Height (customized)	2300 - 2800 mm (90.6" - 110.0")	
Weight	approx. 100 kg	

\*For commercial availability, please check our website

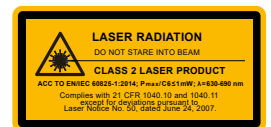
## FEATURES

- Customized bridge configuration as guarantee for accuracy
- Advanced mechanical components and unique optoelectronics to meet the high quality requirements
- QA tool adjustment

## LASER ADJUSTMENT

Full 6 degrees of freedom for adjustment via remote control

- shift, tilt, rotation
- focus



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