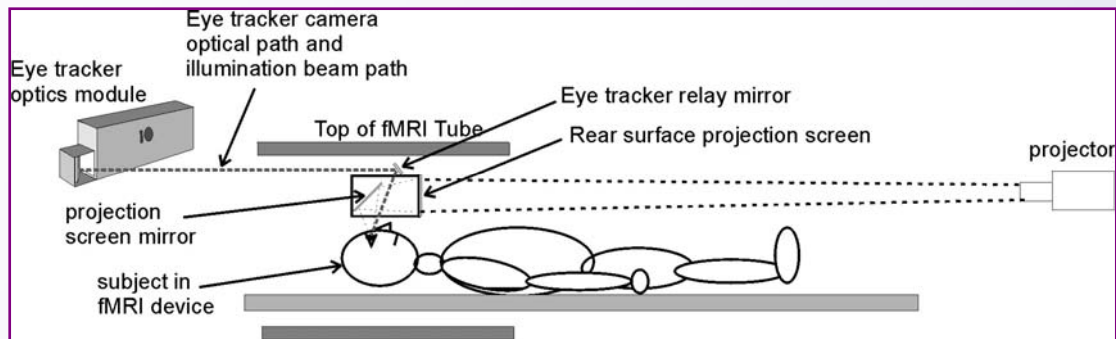




Eyetracking Expertise

Why Choose the R-LRO6?



Setup and calibration for each subject is quick and easy.

Once the system has been installed, setup between subjects is quick and easy. Normally minor adjustments are made to the relay mirror to insure proper alignment before the subject is moved into the magnet. Calibration consists of the subject looking at 9 predetermined points while the operator insures proper discrimination and depresses a key for each point. Calibration should take 30 seconds or less. Normally, one calibration is all that is needed. The ASL system does not drift or loose calibration over time.

The R-LRO6 does not require set-up and take down between uses.

Since the system normally uses the same mirror used for the stimulus display, there is no set up or take down between uses. The optics can be mounted up to 15' from the magnet bore and, normally, does not have to be moved.

The R-LRO6 can be moved between uses, if desired.

If permanent mounting is undesirable, the R-LRO6 optics can be put on a rolling cart that can be positioned for use and moved out of the way between uses. While some set-up is required, the system is designed to do this quickly and easily.

ASL is the only company whose system has been successfully installed and used in fMRI's for over 9 years, with over 70 installations worldwide.

A list of current users is available, upon request.

The R-LRO6 is the only system that uses bright pupil eyetracking technology.

The ASL system is the only one that uses the bright pupil illumination technique which has been shown to provide better contrast between the pupil and background features, and to produce an image with fewer undesirable artifacts than does the dark pupil illumination technique. This results in a more robust eye tracker performance (i.e. acceptable performance over a wider range of subjects, equipment placement geometry and other environmental variations including glasses and contact lenses).

Applied Science Laboratories

175 Middlesex Turnpike, Bedford, MA 01730 USA

Tel.: (781) 275-4000 ☉ Fax: (781) 275-3388 ☉ www.a-s-l.com ☉ Email: asl@a-s-l.com

The bright pupil technique offers even greater advantages as the distance between the subject and the optics increases. The bright pupil signal is a nearly collimated beam retro-reflected from the retina, and therefore its intensity diminishes very little as distance between the eye and camera increases. The isotropic reflections from the surrounding features appear to diminish in brightness with the square of the distance. Thus, contrast between the bright pupil and the surrounding features actually improves with increasing eye to camera distance, whereas it becomes more and more difficult to distinguish a dark pupil from increasing dark surrounding features as eye to camera distance increases.

ASL assists you on-site for installation and training

Once a system is purchased, ASL engineers will work with you to determine the best installation configuration. When the eye tracker is delivered, ASL personnel will set up the system in a lab and train you on its use. When you are ready to install the eye tracker in the fMRI, ASL will assist in the installation and calibration.

The R-LRO6 has been installed in MRI's ranging from 1.5T to 4T.

The system will work with any scanner where we can view the eye from outside the scanner (approximately 1" of clearance is required).

The R-LRO6 optics are designed specifically for the fMRI environment.

Virtually no ferrous metal is used in the optics module. The camera and illumination source are kept well away from the magnet (up to 16') and no metal is installed inside the magnet bore. Fiber optics links are used to transfer the video signal and custom DC power cables are designed to go through your RF filters and penetration panel.

The LRO does not cause interference in the fMRI data or images. Conversely, the fMRI does not cause interference with the eye tracker data.

Over the years, the R-LRO6 has been tested and installed in magnets ranging from 1.5T to 4T. ASL has taken every precaution to insure the system does not cause interference. Our technicians work with each customer to insure their rigid requirements are met.

The system is available with high speed optics.

The standard configuration can be adjusted to record at 50/60Hz. A high speed camera can be included that will run at 120, 240 or 360Hz, with no loss of resolution.

Data output and input are real time.

The system outputs real-time X and Y coordinates and pupil size that the experimenter can use for any purpose. This data is available in analog, digital and video. In addition, the system will import data (16 bit parallel digital port, TTL level positive true) that can also be used to flag data.

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Data can be recorded and analysed offline.

The ASL 6000 series of eye trackers include our EYENAL™ and FIXPLOT™ software programs for analyzing and displaying the collected data. This software allows you to do the following:

- Reduce data to a list of fixations
- Specify areas of interest (AOI)
- Match fixations with AOIs
- Compute statistics relating fixations to AOIs
- Superimpose plot of fixation "scan path" over image viewed by subject

The system will measure pupil size.

Our system measures and outputs real-time pupil size.

The eyetracker works with most stimulus displays.

The eye tracker will work with any stimulus display as long as we can view the eye from outside the scanner.

Software development kit.

ASL's SDK currently supports interfaces to:

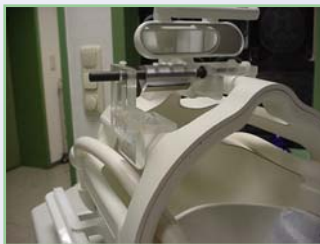
- Matlab
- E Prime
- Presentation

Part of a modular system.

The ASL long range optics are part of a modular system. This allows you to attach remote optics to the same system, that can be used outside the magnet room for testing experiments and training subjects without using valuable magnet time. The exact same software is used for both.

Installations include the Siemens Allegra 3T and the MRI devices 8 channel head coil.

As the fMRI systems change ASL is working to insure compatibility. As your needs change ASL will be there with solutions to your changing environment.



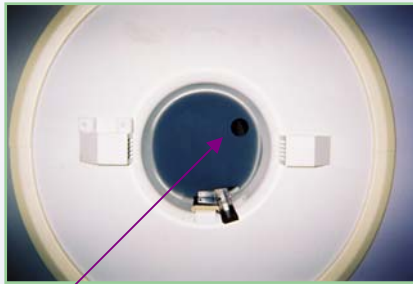
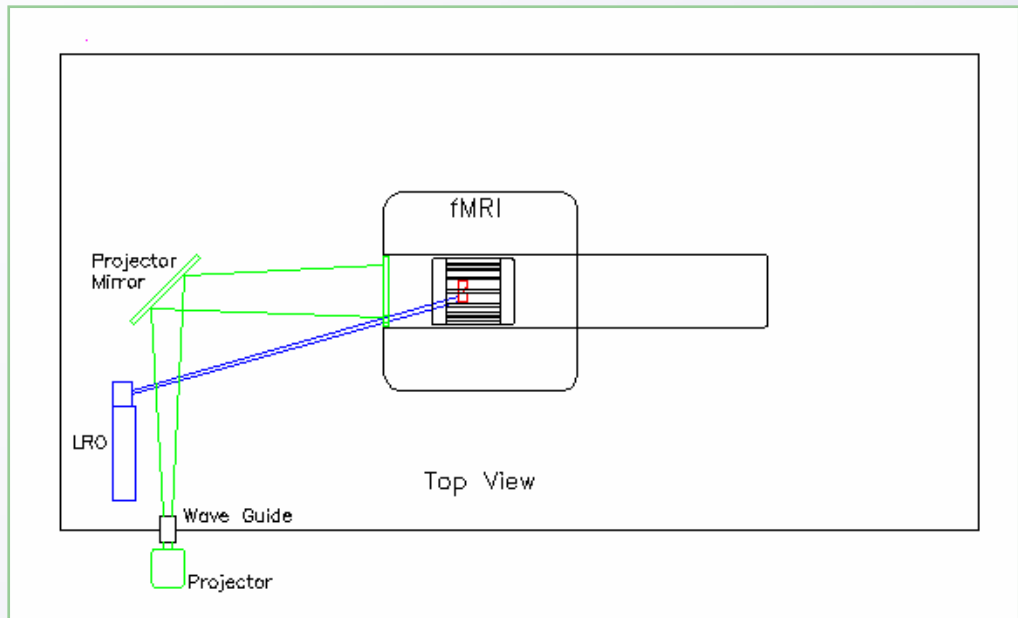
Eyetracking mirror mount for the MRI Devices 8 channel head coil

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EXAMPLE SIEMENS ALLEGRA 3T INSTALLATION (PRINCETON)



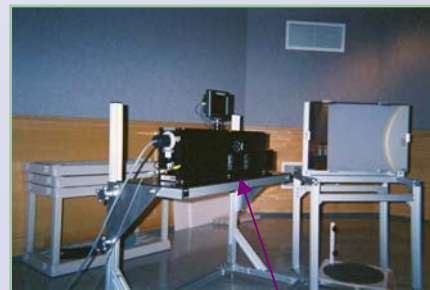
Eye tracking cut-out in stimulus display screen



Stimulus mirror used to view display and track the eye



Projection through wave guide outside the magnet room



ASL optics module, 9' from stimulus mirror

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