



Orion: Target diagnostic

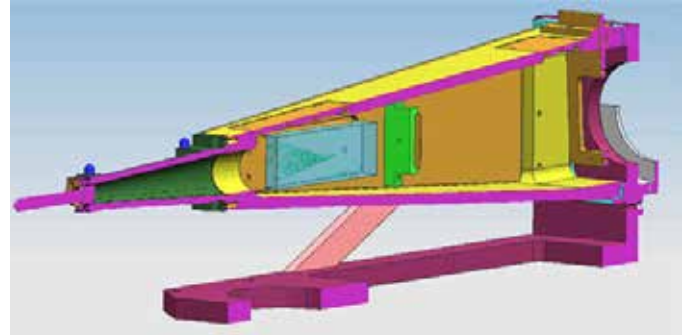
A photograph of the Orion laser facility building at AWE Aldermaston. The building is a large, modern structure with a curved, metallic facade and a large, dark, circular opening. It is set against a clear blue sky. The image is overlaid with a semi-transparent teal and blue gradient.

Multi Channel X-ray Pinhole Camera

The Orion laser facility at AWE Aldermaston, one of the largest scientific capital investments in the UK, houses a large neodymium glass laser system and a target chamber in which the high energy density physics experiments are performed. This is necessary to support certification of performance and safety of the UK deterrent.

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The Multi Channel X-ray Pinhole Camera is designed to provide Full-Field X-ray Imaging (FXI) of the laser/target interaction. The pinhole array has twelve 10 or 20 μm holes spaced on a regular grid which allows the recording of 12 images. The delicate pinhole array is protected by a thick collimator which sits in front of the pinholes and has 0.3 mm holes. Eight of the channels can utilise two grazing angle mirrors and all channels can use a separate filter. The design requires a different pinhole array for direct and indirect (using the grazing angle mirrors) imaging. A pointer used for alignment replaces the pinhole array, and sets the magnification at ~ 8 ($S_i=480$ mm, $S_o=60$ mm). Once alignment is complete the pointer is removed and a pinhole pellet is installed.



Specification

TIM based

Material: Aluminium

Dimensions

Source to pinhole: 61.53 mm

Pinhole to image plane: 486.85 mm

Pinholes: 10 μm or 20 μm

Magnification: ~ 8 ($S_i=480$ mm, $S_o=60$ mm)

Recording medium: Film

Weight: <10 kg