

**OPTO-ELECTRONICS 2007
OET401**

PROJECT TITLE

GATED CAMERA TECHNOLOGIES AND LASER BACKSCATTER

BACKGROUND:

The technology of laser-based range gated cameras was initially developed for under water applications. This technology was further developed and used in night vision applications especially in polluted atmospheres

In Figure 1 the basic operating principle of gated camera viewing using pulsed lasers is illustrated. An object needs to be viewed some distance from the unit. A laser is used to provide pulsed optical emission. Particles in the air such as dust etc, cause backscatter of light. By timing the camera shutter to ignore light reflected from the “noise” elements and only opening when it is time for light from the object itself to reach the camera, the object itself can be viewed. The camera gating is synchronized to be set OFF for at least the duration of time it takes the laser device to produce a laser pulse in its substantial entirety, in addition to the time it takes the laser pulse to complete traversing a zone proximate to the system and back to the camera. The gating is set ON for an ON time duration thereafter until the laser pulse reflects back from the target and is received in the camera. The laser pulse width substantially corresponds to at least the ON time duration.

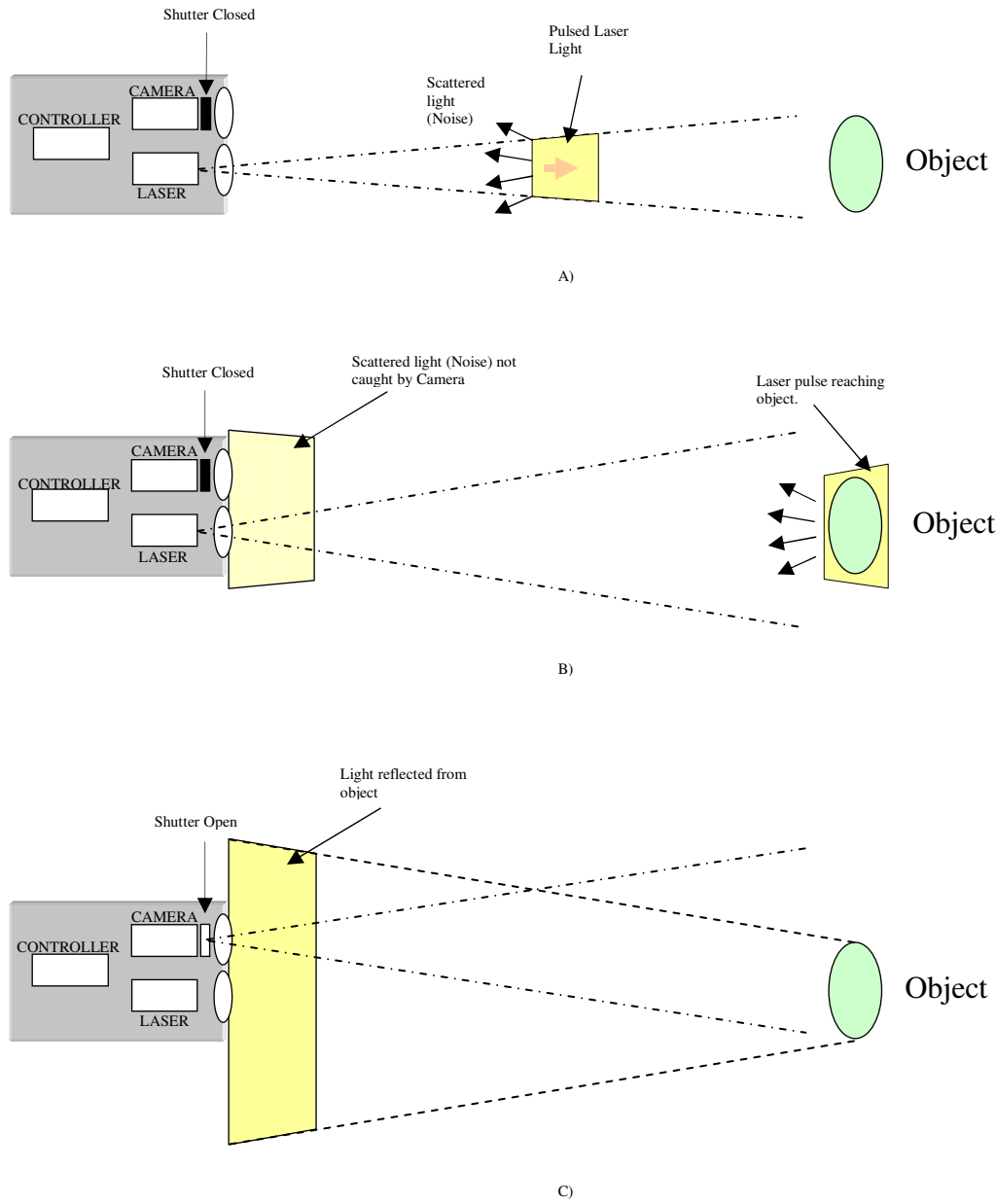


Figure 1 Basic operating principle.

PROJECT OUTPUTS:

CLASS DATES	PROJECT DELIVERABLES	Description
OELB-Intro 26-Jul-07		
OELB-U1 2-Aug-07		
OELB-U2 16-Aug-07	Project Prestudy Report Deliver Report	
OELB-U3 23-Aug-07	SOURCE: LASER Requirements Characteristics Power Levels Wavelength Beam Profiles Pulse/CW Reliability Drive Circuits Deliver Report	
OELB-U4 30-Aug-07	RECEIVER Requirements <ul style="list-style-type: none"> - High Speed - Gated Capabilities Detector types Image Sensors <ul style="list-style-type: none"> - CCD - CMOS Other Sensors - APD Characteristics Wavelength Sensitivity Receiver Circuits Deliver Report	
OELB-U5 6-Sept-07	OPTICS Requirements Characteristics Material types Wavelength Transmission Power Density Configurations Deliver Report	
OELB-U6 13-Sept-07	MECHANICS / SCANNING Methods Materials Expansion properties Mounting options Deliver Report	
OELB-U7 20-Sept-07	MEDIUM Atmosphere Transmission characteristics Scintillation Beam Wander Variables	

	Target Properties Absorption / Reflection Deliver Report	
OELB-TEST 4-Oct-07	SYSTEM Source parameters Receiver parameters Medium / Target Parameters System Parameters S/N Ratio Model Deliver Report	
OELB-U8 11-Oct-07	S/N Ratio Model Research Define Model Requirements Create mathematical Model for S/N Implement in software Simulate & Verify model Deliver Report	
OELB-U9 18-Oct-07		
OELB-U10+U11 25-Oct-07		