

# JP Innovations, LLC

## *Long Range Imaging Range Finder*

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At JP Innovations, LLC our goal is to develop an optical system that can be used for monitoring ports, coastal waters, and US borders over land or sea. Our Long Range Imaging Rangefinder (LRI Rangefinder) is a solution that offers excellent remote detection capabilities to improve situational awareness in many operating scenarios and will also remotely calculate the geocentric coordinates of the potential threats. If it's monitoring small craft at sea, base perimeter surveillance, border surveillance, or observation of potential hazards to vessels in the open ocean, the LRI Rangefinder concept offers a covert solution to locating and detecting hazards.

Using a pulsed laser to illuminate a scene and a range-gated intensified (RGI) camera receiver, our system will be able to detect and track anomalous, threatening, or illegal behavior of vehicles, ships, or people. The system is scalable from short to long ranges with a maximum practical range of up to 80 kilometers.

The LRI Rangefinder system consists of the following core components:

- a diode pumped laser illuminator transmitter
- a receiving telescope
- a range-gated intensified camera and detector
- the mechanical package to bore sight the transmitter and receiver
- pointing and tracking motorized stages

The laser source is a diode pumped, TEC cooled Nd:YAG oscillator / amplifier followed by an Optical Parametric Oscillator (OPO) to convert the wavelength to the optimal wavelength for the range-gated intensified (RGI) camera. The illumination laser has performance requirements similar to other lasers that JP Innovations has developed and delivered, though these exact requirements are unique and the necessary laser does not exist today. Our intent is to develop the laser that can then be integrated with these components to produce a robust remote monitoring solution.

The receiver telescope uses a reflective primary mirror for maximum return light gathering ability. This creates a folded optical system, reducing weight and increasing tolerance of environmental conditions for the complete system. The detector / rangefinder package will be located at the focus of the receiver telescope. It is anticipated that this will be a completely integrated package, including the RGI camera, Avalanche Photodiode (APD) detector, amplifiers, and all range finding electronics. The detector assembly will have zoom and focus capability for far and near field operation.

The first step of the development program is for the LRI Rangefinder hardware only and no significant investment in automatic imaging processing software will be made initially. After the hardware has been developed sophisticated software can be added at a later time. Our strategy minimizes risks and initial investments.

JP Innovations, LLC designs and delivers solid state diode pumped lasers (DPSS), eye safe lasers, compact high pulse energy lasers, high peak power 2 ns lasers, optical parametric oscillators, and other non-linear optical systems that can be used for LIBS, LIDAR, medical, bathymetry, designator, illuminator, and other industrial or military applications. If your application requires a custom laser solution, JP Innovations will build it for you!

