



## ***Laser Background Information***

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Since its introduction, the “laser” has found many and varied applications in industry. The familiarity of the general public, however, has not kept pace with the technology. This has led to a majority of the public being misinformed and drawing erroneous conclusions about lasers. In some cases this has left to an outright fear of lasers.

It is well known that lasers have been used to cut and weld steel, to cut cloth and paper, and to “weld” retinas back in place at the back of the eye. Now they are being used to sense printed matter. Many misunderstandings arise from the fact that a laser used to sense newspapers cannot be used to weld steel. The key to understanding lasers and laser safety is to understand that the power output of a laser used for specific applications is directly associated with the power required to do the job. Federal Regulations must be carefully adhered to by the manufacturer.

A laser used to “weld” retinas not be powerful enough to weld steel. A “steel cutting” laser if used to “sense” printed matter, would also slice the material right down the middle.

Since we are only interested in casting a reflected image on an object, we do not require a high-power laser. For various reasons, two milliwatts has been chosen as the optimum power level for the Ranger.

The Ranger uses a laser beam that is approximately 1mm in diameter. With a maximum output level of two milliwatts, the energy density on anything being struck by the beam will be less than 2mW/square mm. This amount of light energy can be compared to a bright light bulb. In other words, having the laser beam enter the eye directly is very equivalent to staring at the sun on a bright day. Retina effects damage could occur by doing either. The hazards and effects are very much the same, and they should not be minimized.