Stealthy Shapes

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Purpose: My project was on the light reflectivity of geometric shapes. The hypothesis was if a light wave strikes an object, the reflectivity is determined by the shape and the color of the object. LED light waves can be used as LIDAR (Light Detection and Ranging) to simulate RADAR (Radio Detection and Ranging) because both light waves and radio waves are electromagnetic and travel at the speed of light. An object with low light wave reflectivity will also have a low radio wave signature. Procedure: In my experiment, I exposed shapes such as W, double W, V, flat, crinkled cylinder, smooth cylinder, and aircraft models of 1:18 and 1:32 scale to LED light waves. To test the shapes, I used an enclosed testing box with an LED lightbulb and light meter. The light source was fixed at a constant position and the light sensor was moved to various positions. Observations: Multiple light sensors are needed to detect stealthy shapes. The number of angled surfaces must be limited, or reflectivity is increased. Conclusion: In my project, the test results indicated the angular surfaces of the shape determined the direction the light waves were reflected. Lower light meter sensor readings indicated the angular surfaces directed the light waves away from the light source when the sensor was located at the light source position. The black V shape and the F-117A aircraft model were the least reflective and are the same general shape. An angular V shape is a stealthy shape.

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