

## ***Flying The Retroreflective Approach***

**By Terry Simcoe**

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Due to the remote locations of many airports in the Southwest, conventional airfield lighting can be impractical. Therefore, the New Mexico Aviation Division has encouraged the installation of retro-reflective runway markers at airports where no runway lighting is currently installed, or where budget constraints make electric lighting an impossibility. While this reflective lighting is of great use in an otherwise unlighted approach, it does require some basic pilot understanding to work effectively. First, the markers are called "retroreflective" because the material from which they are made has the property of reflecting light back to its source. For those aircraft with landing lights mounted in the cowl, or otherwise near the fuselage, the light will reflect back in such a way that the pilot can easily see it. However, for those aircraft where the landing light is mounted outboard on the wing, the pilot may have a more difficult time seeing the reflected light. Second, the pilot will not see the "points of light" which is typical of electric lighting, but rather, will see glowing rectangular panels, but only on final approach. Indeed, the panels we have had installed are 12 inches high by 24 inches wide. The panel's apparent brightness is directly related to the brightness of the plane's landing light. A higher wattage bulb will make the panels glow more brightly than a lower wattage bulb. It is imperative that the plane's landing light(s) is (are) working and correctly aimed. Third, the panels cannot be seen on downwind nor crosswind positions in the pattern. To help orient the pilot for landing, we have had three light strobe systems installed with the panels. These strobes can be activated on the CTAF frequency with five clicks of the mike button. They will stay on for about 15 minutes. These strobes are set up in one of two ways, the first being a string of three sequentially flashing lights to lead the pilot in to the runway. If airport space does not permit the string, a triangle of lights with two set at the runway threshold flashing together and the single light alternating with them so that the pilot can determine how to line up on final. These strobe systems are battery powered and recharged by solar collectors, so power outages will not affect their utility. Finally, the pilot must know the terrain around the airport before he or she attempts to fly a night approach. Fly a standard pattern and use the strobes for position information while lining up downwind. You must maintain excellent situational awareness throughout your landing pattern. Once on final, the plane's landing light(s) should begin illuminating the reflective panels and they should be visible when the plane is within one and a half miles of the threshold. (With brighter landing lights and experience, you may acquire the panels even further out.) Keep in mind that the light returns to the source, the landing light, so if you are crabbing into a crosswind or are off centerline the light may not be as visible. Practice makes perfect, so we recommend that you make your first landing before it is full dark, just to get acquainted with the system. As darkness deepens, the panels will appear brighter and brighter, until they are actually brighter than standard medium intensity runway lights when the plane is on short final. Remember, flaps tend to produce a nose down attitude in the plane, and that is a good thing for helping put the maximum amount of light on the panels. These reflective panels are currently installed throughout the Southwest, including the following New Mexico airports: Aztec, Tatum, Conchas Lake State Park Airport, Ute Dam at Logan, Magdalena, and Eunice, and will be installed soon at Navajo State Park Airport. We have also installed a Passive Approach Slope Indicator (PASI) reflective landing system at Aztec. The system should become visible at the same time the runway markers begin to illuminate. To fly the PASI, align the three white bars to form a straight, horizontal line. This will mean that you are on the glide slope, which is set for three degrees. If the middle bar begins to move down, you are high and should increase your rate of descent to again align all three bars horizontally. If you begin to see a red bar, you are getting too low on the approach and must immediately pull up to reacquire the correct glide slope. If you make an after-dark approach to one of these airports, let us know what you think of the retro-reflective runway lighting system. Our telephone number in Santa Fe is: 505-827-1525. (Terry Simcoe is Aviation Programs Manager with the New Mexico Aviation Division. In this position he is the state's airport inspector and is also responsible for the management of the four state-owned airports. He has had a private pilot's license since 1969 and is instrument rated.)