



### **D6 The Potential Value of Ejected Cartridge Casing Impact Marks in Shooting Scene Reconstruction**

*James K. Poorman, BA, MFS\*, U.S. Air Force Office of Special Investigations, 2927 Marsh Hawk Drive, Waldorf, MD; and Thomas F. Spring, MFS, U.S. Air Force Office of Special Investigations, 1535 Command Drive, Andrews Air Force Base, MD*

The goals of this presentation are to raise awareness of the potential value of ejected ammunition cartridge marks at shooting scenes. This presentation proposes that scene investigators should consider the possible presence, and potential value, of ejected cartridge impact marks at shooting scenes.

According to the Federal Bureau of Investigation's 1999 Uniform Crime Report statistics, 65.2 percent of all murders committed in the U.S. involve the use of a firearm, and 78.6 percent of those were committed with a handgun. The study of matters related to firearms use during the commission of offenses is vitally important to the successful investigation and accurate reconstruction of these crimes.

Post-event reconstruction requires a thorough scene examination, comprehensive scene documentation, interviews of eyewitnesses, and the careful collection and examination of physical evidence. In cases where firearm discharges are involved, forensic examinations of weapons, projectiles, and ammunition casings are commonly conducted. In addition, trajectory assessments, range-of-fire determinations, blood-stain patterns, and gunshot residue findings are oftentimes considered in reconstructing events.

Stemming from observations made at a police firing range, this study sought to determine if ejected cartridge casings leave characteristic marks when they impact nearby materials. This paper will present information and images pertaining to marks made when expended 9mm ammunition cartridges were ejected from a handgun. The dynamics and mechanical processes at work when an expended cartridge is ejected from a pistol will be reviewed. The results of test firings from a Sig-Sauer model P228, 9mm pistol, where ejected casings were allowed to impact 3/8-inch wallboard, will be summarized. Photographic images showing four characteristic impact marks will be presented.

In conclusion, hypothetical examples of how the presence of casing impact marks might be helpful in scene reconstruction will be presented and discussed.

#### **Shooting Scene Reconstruction, Ammunition Cartridges, Impact Impressions**