

## Detective Division - Ballistics Laboratory

Established in 1973, the Essex County Sheriff's Ballistics Laboratory is a state-of-the-art unit that has comprehensively analyzed weapons evidence, including bullets, shell casings and firearms, in more than 17,000 criminal cases.

Our Ballistics Laboratory performs three different types of weapons examinations: Operability Studies, Serial Number Restorations and Microscopic Comparisons.

Operability Studies are designed to determine if a weapon is capable of firing. This is an important issue when a case goes to trial.

During Serial Number Restorations, chemical agents are used to restore serial numbers which have been deliberately defaced or obliterated. This process aids in tracing the origins of weapons, automobiles and other metal evidence.

Microscopic Comparisons compare bullets and shell casings in an attempt to identify weapons used in a specific crime and to establish connections with weapons used in seemingly unrelated crime incidents.

Sheriff's officers assigned to our Ballistics Laboratory provide expert testimony for the Essex County Prosecutor's Office during criminal trials.  
Integrated Ballistics Identification System (IBIS)

In 1996, the Essex County Sheriff's Ballistics Laboratory was awarded a high tech, state-of-the-art, computerized imaging system — Integrated Ballistics Identification System (IBIS) — by the Federal Bureau of Alcohol, Tobacco and Firearms as part of that agency's National Integrated Ballistics Information Network (NIBIN) program.

Through IBIS, the Essex County Sheriff's Office is electronically connected with other top forensic laboratories, such as the New Jersey State Police, the New York City, Boston and Philadelphia police departments and Bergen, Passaic, Somerset, and Union County Sheriff's Offices.

Weapons, discharged projectiles and cartridge casings are brought to our Ballistics Laboratory from many different investigative agencies, further expanding IBIS's database.

A laser is used to analyze and measure each striation on bullets. These marking patterns, much like fingerprints, are stored in the IBIS database and are compared to striations on bullets from other cases. IBIS is designed to never forget the "fingerprint" of a bullet or cartridge case. In essence, IBIS quickly allows a firearms examiner to narrow down from an extensive database the images that will provide likely matches.

At this point in our examination, the firearms examiner, employing a comparison microscope, assesses the bullet or shell casing evidence with possible matches.

All evidence from test-fired weapons and the markings from discharged bullets and cartridge casings recovered at crime scenes are entered into the IBIS database.

Through IBIS, our Ballistics Laboratory is making a significant contribution to the national database on crime weapons.  
Making the Connection in Gun Crime

On March 30, 1997, a .38 caliber handgun was used to kill both a Paterson youth and man. The weapon was also used in the wounding of another man.

A suspect was charged with the shooting death of a 16-year-old boy. The suspect was also charged with shooting and wounding an 18-year-old man, and then hunting down and killing a 19-year-old man at a local diner.

The Paterson murders were the result of a shoving incident with the gunman's cousin that took place the prior day.

Through the Essex County Sheriff's IBIS computer, law enforcement officials determined that the .38 caliber handgun used in the Paterson incidents was the same weapon used in the Saint Patrick's Day execution-style killing of a restaurant owner in New Britain, Connecticut.

These cases marked the first time IBIS would link a New Jersey crime to an out-of-state crime.

On February, 19, 2000, the suspect was convicted of murder in the nation's first case utilizing IBIS generated evidence.

#### The IBIS Database

As of February 2011, there are 3,778 bullet and 16,541 casing images stored in the Essex County Sheriff's IBIS database.

In more than 350 instances, our ballistics experts have made "Cold Hit" (no previous investigative leads) connections between weapons and specific crimes. In addition to helping solve crimes throughout Essex County, our ballistics technicians and our IBIS computer system have been credited with solving homicides and other major crimes throughout the tri-state region.

Our Ballistics Laboratory accepts firearms evidence from area law enforcement agencies, including all Essex County municipal police departments, police and sheriff's departments in Hudson and Union counties and local morgues. Homicide evidence is also provided to us by the New Jersey State Police, the FBI, the Federal Drug Enforcement Administration and the Federal Bureau of Alcohol, Tobacco and Firearms.