Microstamping: Developing Better Trace Data Through New Technology
“The accurate identification and tracing of recovered firearms is one of the most important steps in a criminal gun investigation.”
International Association of Chiefs of Police
Most Guns Used in **Violent Crime** are not Recovered

- Criminals don’t regularly abandon their guns at a crime scene
- Much more common to recover expended cartridges
- Microstamping provides the missing link between the cartridge case and the tracing system
# How to find a serial number from a “Recovered Cartridge”

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<th>Recovered Evidence</th>
<th>Firearm ID Technology (Capability) Benchmark</th>
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<td>Traditional Comparison By Hand</td>
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<td>Imaging (NIBIN)</td>
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<td><strong>Microstamping</strong></td>
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<tr>
<td>Recovered Firearm &amp; Cartridge</td>
<td>![Image]</td>
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<tr>
<td>Recovered Cartridge / No Firearm</td>
<td>![Image]</td>
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</tbody>
</table>

* Estimate based on ATF published Data 1.2 Million images in NIBIN versus ~20,000 Hits

Benchmarking Firearm Identification Technologies
Components of a Cartridge

- **BULLET**
- **POWDER**
- **CARTRIDGE CASE**
- **PRIMER**
Components of a Gun
Cartridge Case Ejection
MARKS LEFT ON EXPENDED CARTRIDGE CASINGS
(cycle of fire marks)
Trained Firearm Examiner Extracts Marks Through a Forensic Microscope
MARKS LEFT ON EXPENDED CARTRIDGE CASINGS
(cycle of fire marks & microstamping marks)

- BREECHFACE MARK
- BREECHFACE MICROSTAMP
- FIRING PIN DRAG MARK
- FIRING PIN IMPRESSION
- FIRING PIN MICROSTAMP
- FIRING PIN APERTURE MARK
- EJECTOR MARK
- CUT-OUT MARK
- MAGAZINE MARK
- EJECTION PORT MARK
- CHAMBER STRIATIONS
- EXTRACTOR OVERRIDE & GOUGE MARKS
Benefits of Microstamping Trace Data

• Microstamping leverages existing forensic techniques and the trace network Infrastructure (US / BATF)

• Microstamping = Fresh Intel / Trafficking Routes & Patterns
  *(Identifies the firearm the first time it is used in crime)*

• Microstamping provides “timely” data for a price equivalent to a couple cups of coffee
  *(≤$6.00 / Firearm for implementation)*

*Firearm Traffic Pattern Analysis (CompStat / GIS / ASAP)*
S&W 4006 – 2500+ Cartridge Test

Radial Code

Gear Code

SW10 1233

8 Digit Primary Tip Code

Cartridge #2501 – Scanning Electron Microscope (SEM) Image
.40 Cal – 60X Magnification / Embossed Primer
(Double Hit – With Pin Drag) Higher Clarity w/ SEM Image

Copyright 2006,2007
Fired Cartridge Cases from the Thompson SMG “Sub Machine Gun” after 2500 rds.

.45 Cal Cartridges Used

From a Study by Lucien Haag Presented to the National Academy of Sciences
9mm Glock Firing Pin Impression after 1400 rounds

Glock Firing Pin after 1400 rounds (image reversed)

From a Study by Lucien Haag Presented to the National Academy of Sciences
Optimized Ruger Mark III – 22 LR Rim Fire Cartridge (#128) “Single Hit”

* Cross Polarized Ring Illumination

* Flipped Image For Clarity
Multiple Hit Cartridges Easily Readable with SEM Microscopy

Optical microscopy stereo with polarization  
SEM microscopy  
SEM backscatter microscopy
September 10, 2007

THE HONORABLE MIKE FEUER
California State Assembly
State Capital
Sacramento, California 95814

Dear Assemblyman Feuer:

Thank you for this opportunity to explain how Laser Light Technologies, Incorporate (LLTI) anticipates processing firearm components on a job-shop basis in compliance to the pending bill AB1471.

Our staff at LLTI has extensive knowledge in producing these types of micro-marks and microstructures used to form the basis of microstamping. Even in the worst case scenario LLTI has determined that the service price would range between $0.50 and $3.00 per surface processed, based on volume. It should be noted that LLTI has provided such micro-marking serialization on ultra hard materials with marking volumes reaching millions per year. LLTI was awarded the Small Business company of the year in 1996 for the entire US. This award was founded on a major contract from 3M for micro marking.
Legislation

- California A.B. 1471 passed into law in 2007. Mandates new models of pistols have microstamping technology starting 1/1/10

- In 2008 Senator Kennedy/Representative Becerra introduce microstamping bills in US Congress

- CT, NY, NJ, RI, VA introduce microstamping legislation. Assembly Bill 9819 passes New York State Assembly.
More Information

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