SOLUTIONS FOR A SAFER SOCIETY.

Forensic Technology Update

PRESENTED BY

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June 18th 2008

FORENSIC TECHNOLOGY

Presentation Outline

- IBIS TRAX-3D version 2.2
  - ATF Acceptance Testing
  - IBIS TRAX-3D 2.2 Overview
- IBIS BULLETTRAX-3D Testing
  - Boston Trial – User Acceptance
  - IBIS BULLETTRAX-3D Overview
- Status on NUC Requests and Issues
- FastTRAX

IBIS TRAX-3D 2.2

IBIS TRAX-3D

ATF Acceptance Testing of IBIS TRAX-3D 2.2

- Week of July 7th in Montreal
- Security Acceptance
- Functional Acceptance

BRASSTRAX-3D
BULLETTRAX-3D
MATCHPOINT+
Data Concentrator
Correlation Server

IBIS TRAX-3D 2.2

BRASSTRAX-3D

- Primer 3D Image
- Full Headstamp Image
- Text Annotations
- Multi-Tasking
- Faster Acquisition
- Automated Focus and Lighting on Ejector and Rimfire
- Enhanced BF Side Light Image
- Acquisition Validation

MATCHPOINT+

- Reports
- Printing (in color)
- Comparison Viewer Usability
- Correlation Results Filtering
- CMS
- Performance Enhancements
- Multi-Import
- Go to SBS from Hit

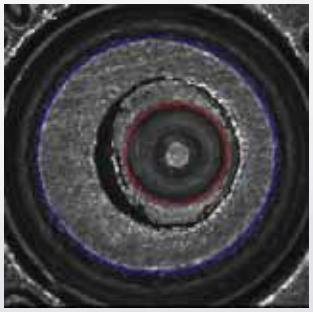
General

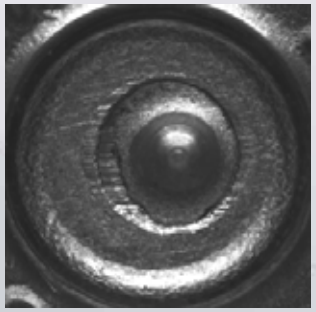
- Firearms Reference Table (FRT)
- User Preferences

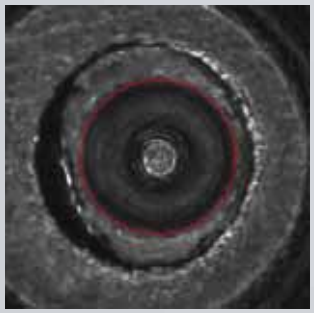
Blue features were introduced in 2.1 (2007)

IBIS TRAX-3D 2.2

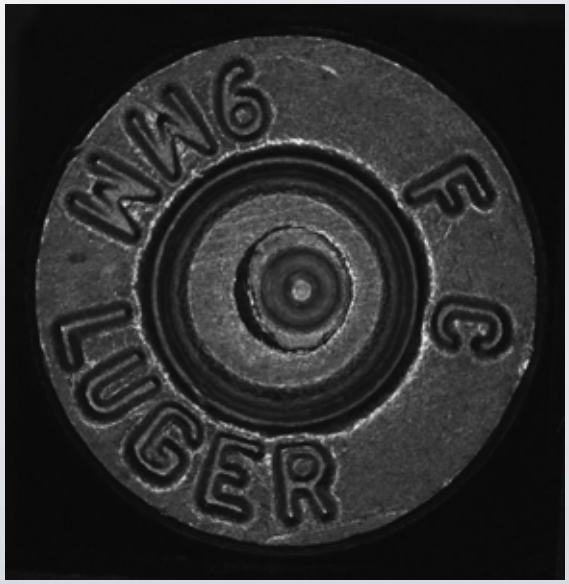
Breech Face and Firing Pin



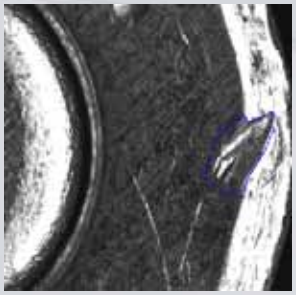




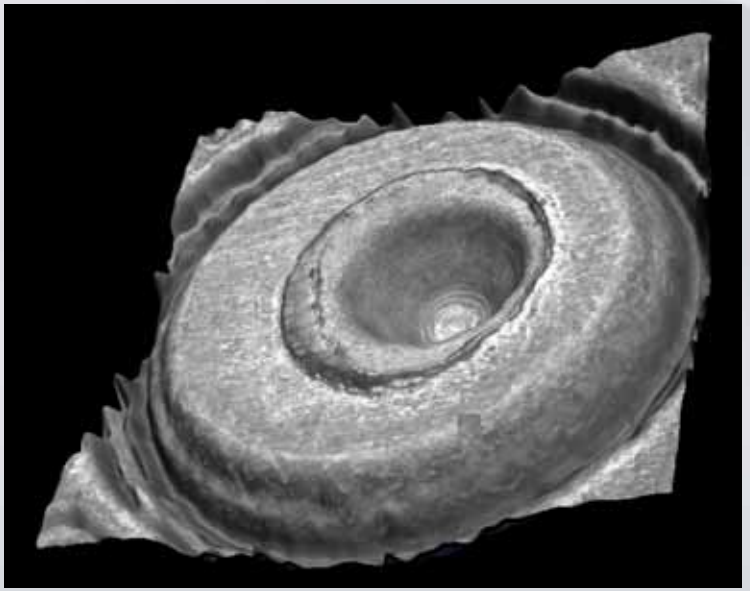
Full Headstamp Image

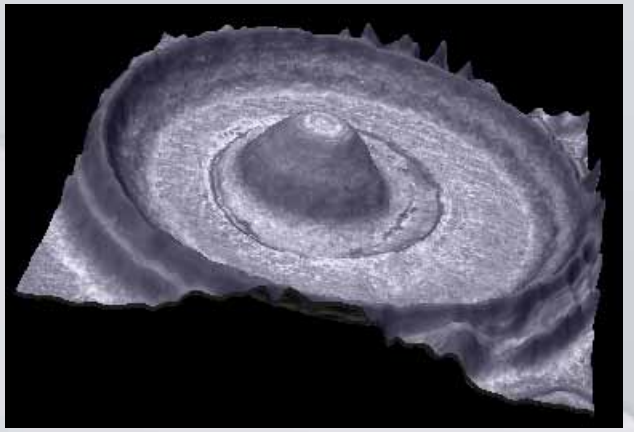


Ejector



Primer 3D Image

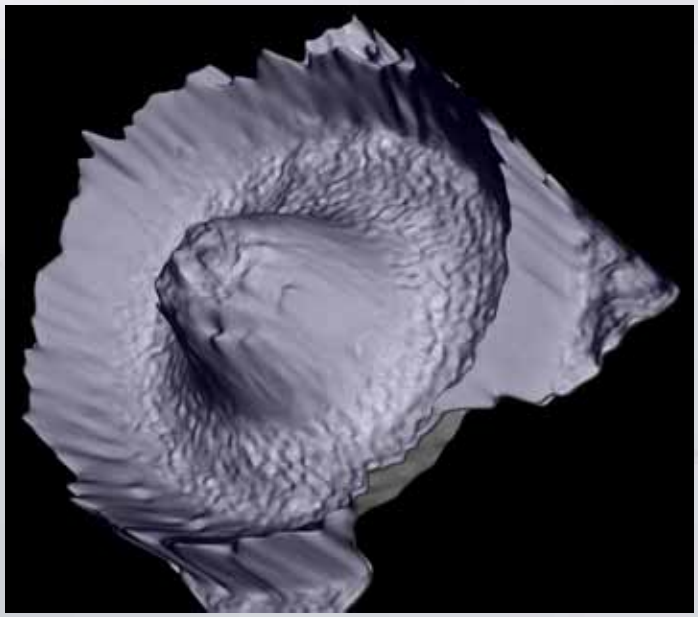


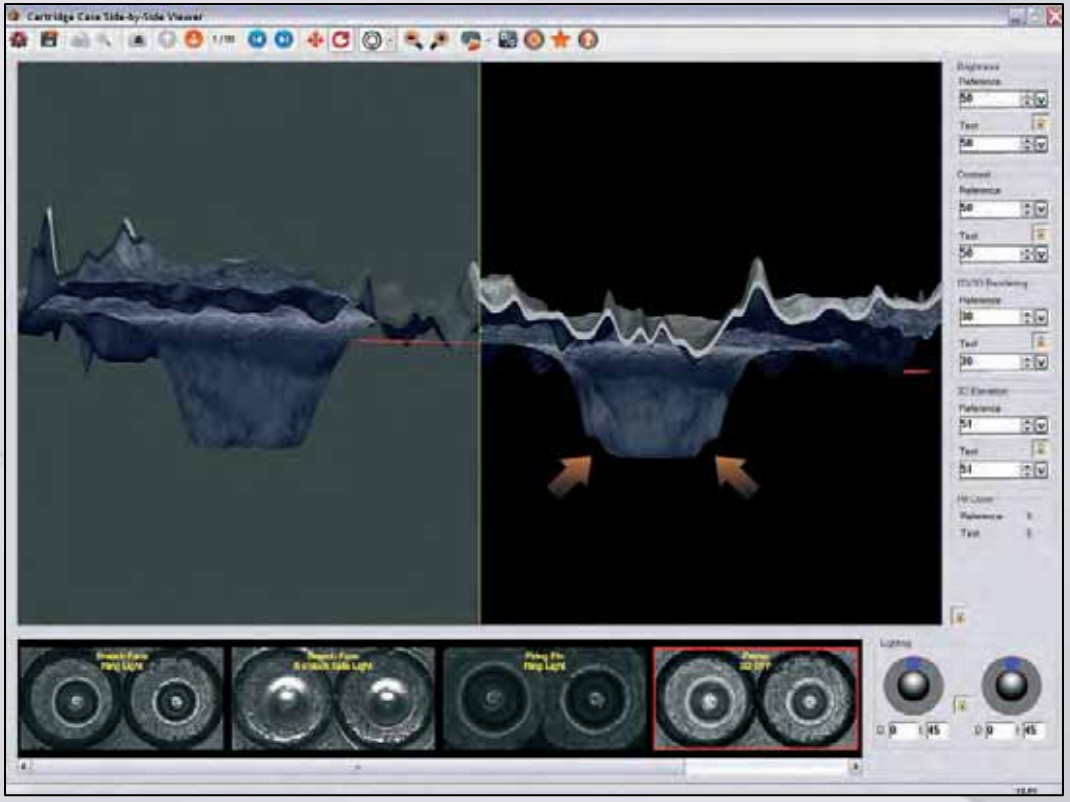


IBIS TRAX-3D 2.2

Primer 3D Image: Firing Pin Shape

- The 3D model manipulated to observe the shape of the firing pin

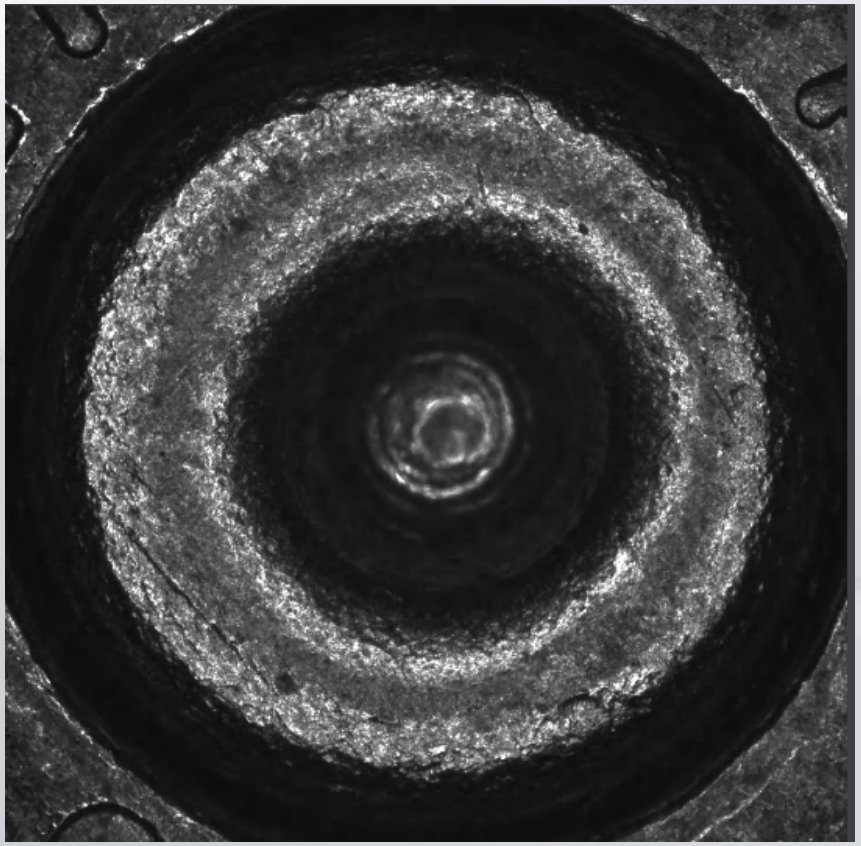




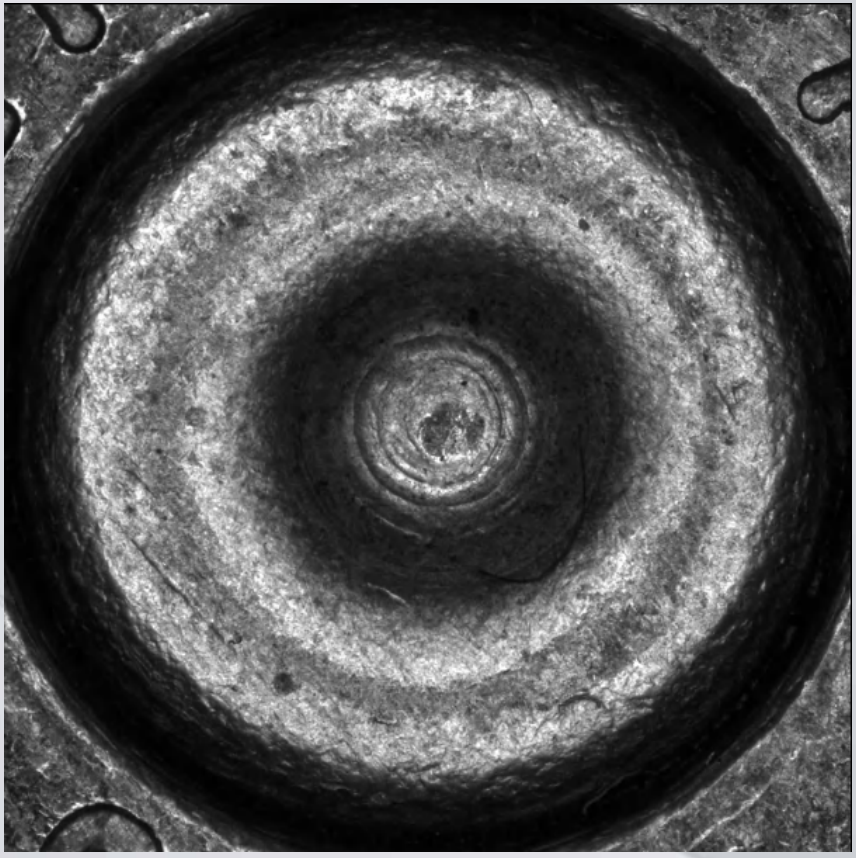
IBIS TRAX-3D 2.2

Primer All-In-Focus (from 3D DFF Image)

Breech Face – Ring Light



Primer – All-in-Focus

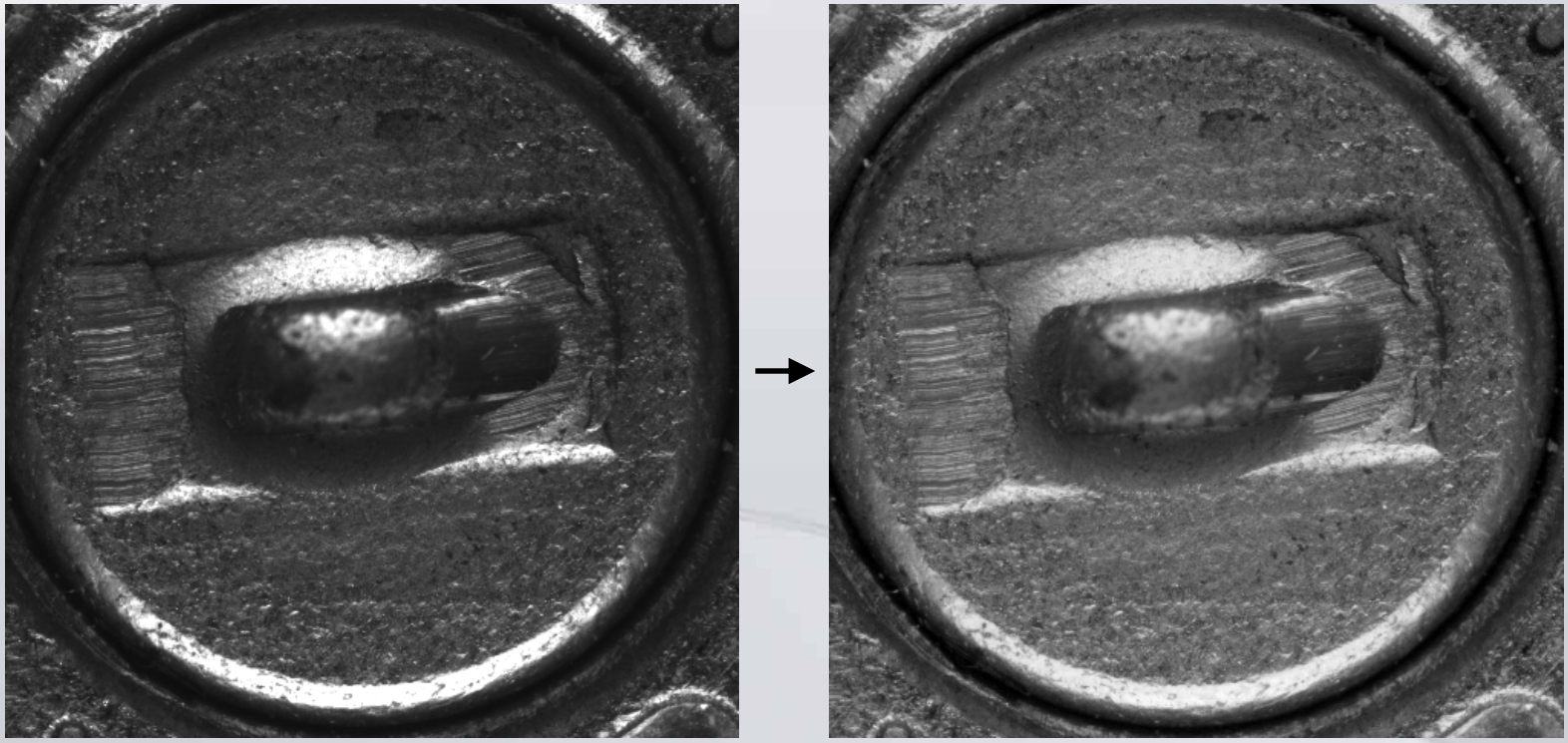


(Same Cartridge Case)

IBIS TRAX-3D 2.2

Enhanced Breech Face Side Light Image

Restores image details in washout and dark areas

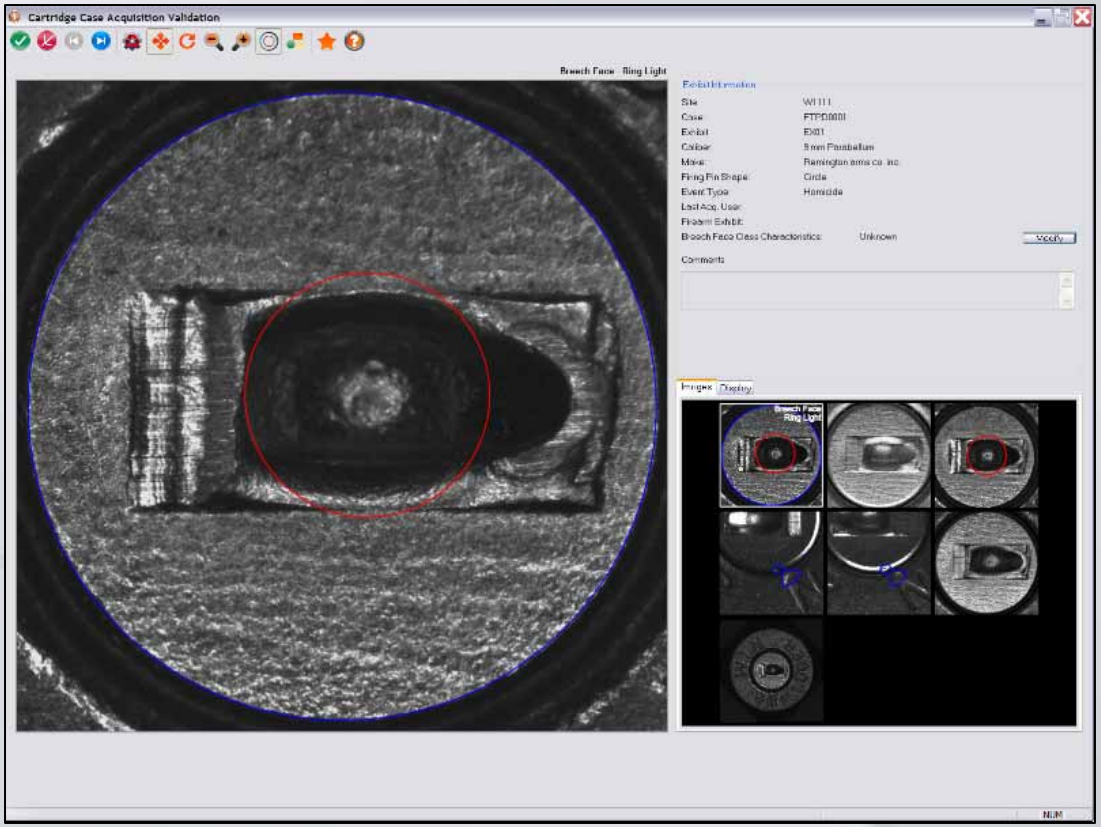


(Same Cartridge Case)

IBIS TRAX-3D 2.2

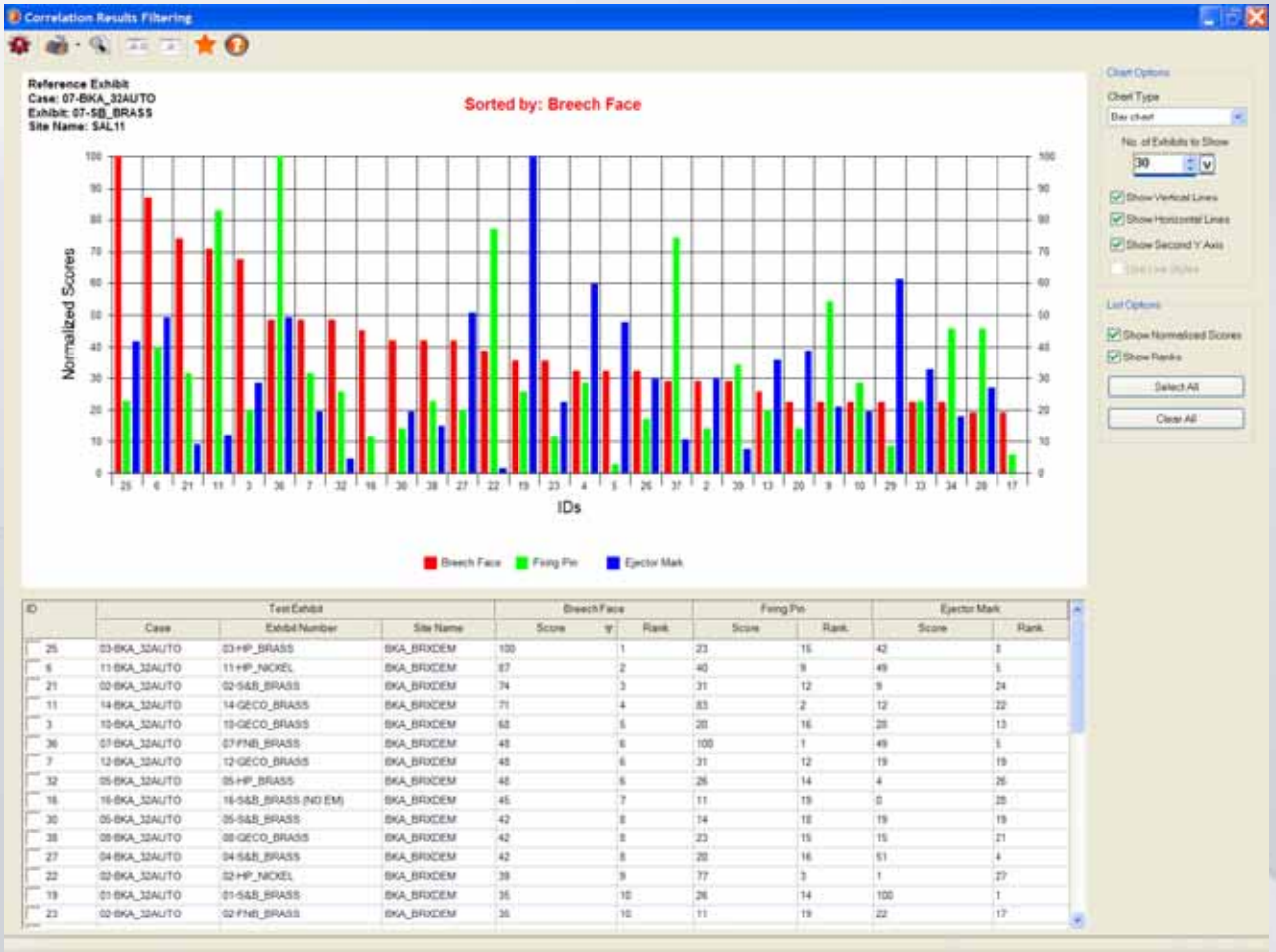
Acquisition Validation

- Validation step at the end of the acquisition (accept or reject)
- Immediate image review prior to storage and processing
- Outlines can be adjusted



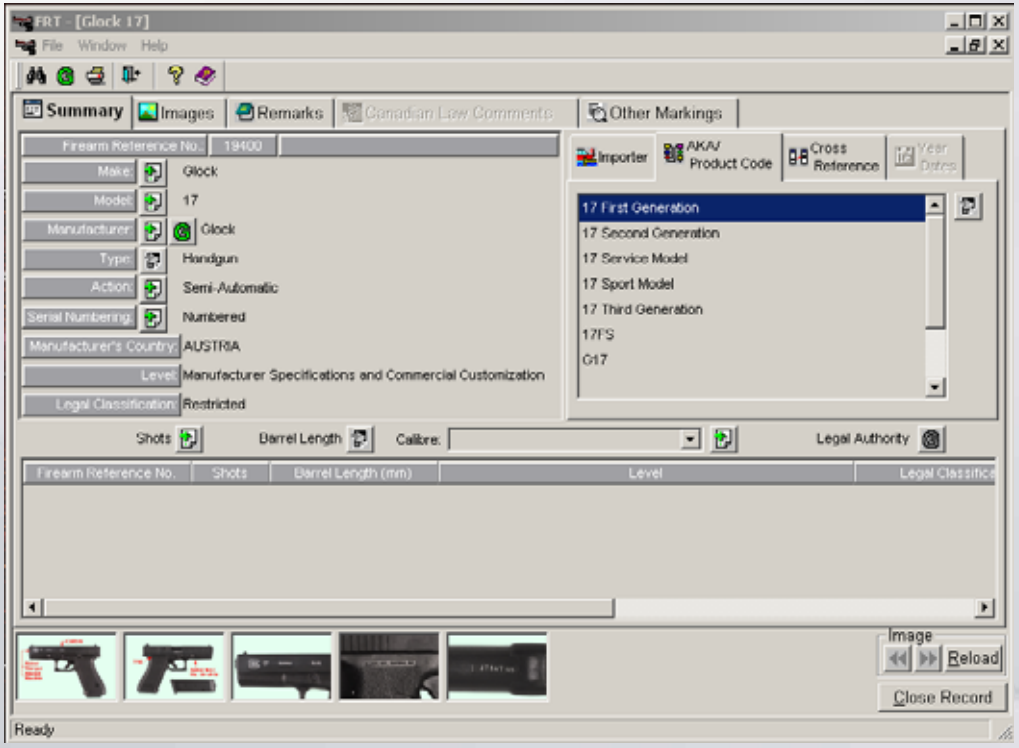
IBIS TRAX-3D 2.2

Correlation Results Filtering



IBIS TRAX-3D 2.2

Firearms Reference Table (FRT)



- Helps accurately identify and classify firearms
- Contains narrative and graphical information
- Developed by the RCMP (Canada)
- Accessible on acquisition and analysis stations

Optionally installed on BRASSTRAX-3D, BULLETTRAX-3D and MATCHPOINT+

IBIS BULLETTRAX-3D

IBIS BULLETTRAX-3D

Boston Trial – User Acceptance

Objectives

- Replace BulletProof
- Increase success rate
- Reduce operator hands-on time (automation)

Phase 1

- Demo in Montreal in April 2008 with Kevin Barry and Steven Faulkner of BPD
- Three test sets entered (damaged bullets) All matches were identified

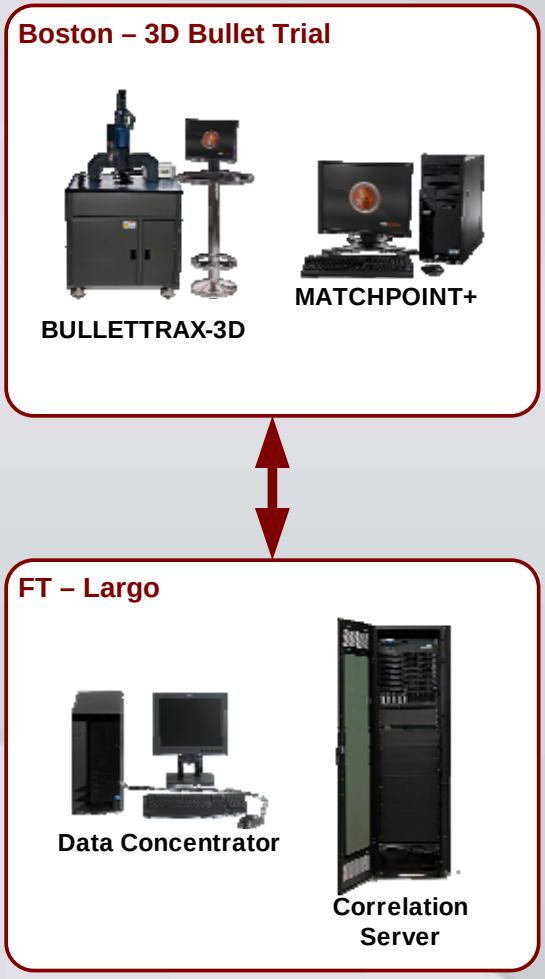
BULLETTRAX-3D

IBIS BULLETTRAX-3D

Boston Trial – User Acceptance

Phase 2

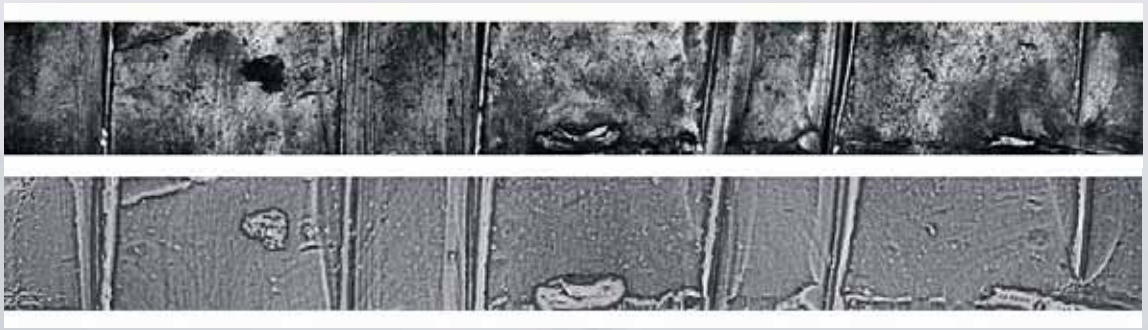
- Deployment in Boston
  Starting Sep 2008; Up to 12 months
- Not connected to NIBIN
  Goal: Use copy of NIBIN partition bullet data
- Double-entry into NIBIN during trial
- Focus on .38 caliber for revolver crimes
  Retroactive from year 2000



IBIS BULLETTRAX-3D

Key Features and Capabilities

- Captures 2D grayscale image and 3D topography of a 1.5 mm (1/16") band of the bullet's surface at a submicron depth resolution (0.2 microns)
- IBIS Heritage compatibility



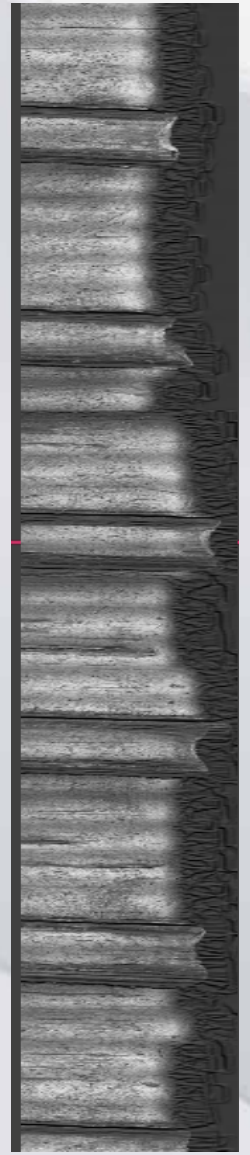
IBIS BULLETTRAX-3D

Key Features and Capabilities

- 360º circumference imaging of lands and grooves
- Wrap-around or partial regions

- From simple test fires to damaged crime scene bullets
- Calibers from .22 to .50
- Cut or Button, and Polygonal rifling

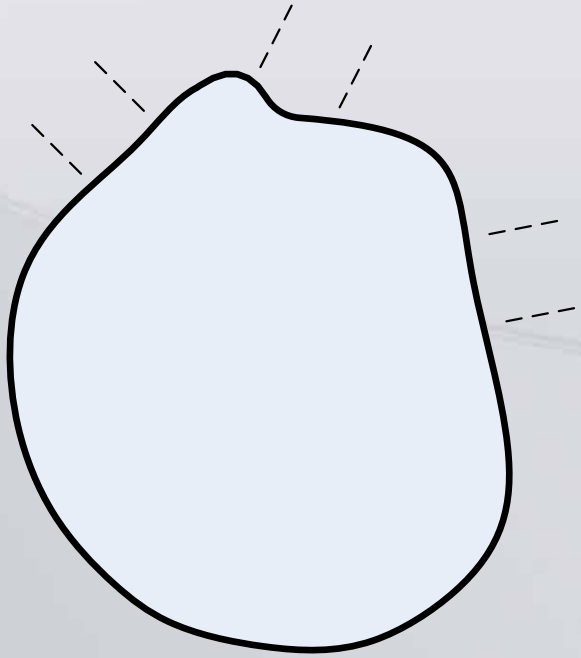
- Automated acquisition following initial setup
  - Hands-off operation allows multitasking
  - Shoulder delimiters are detected automatically



IBIS BULLETTRAX-3D

Key Features and Capabilities

- **Severely Damaged Bullet Acquisition**
  - Automatically adapts to surface deformations for a more consistent image quality, including convex, flat and concave surfaces
  - Applies to both “Wrap-around” and “Partial Regions” acquisitions

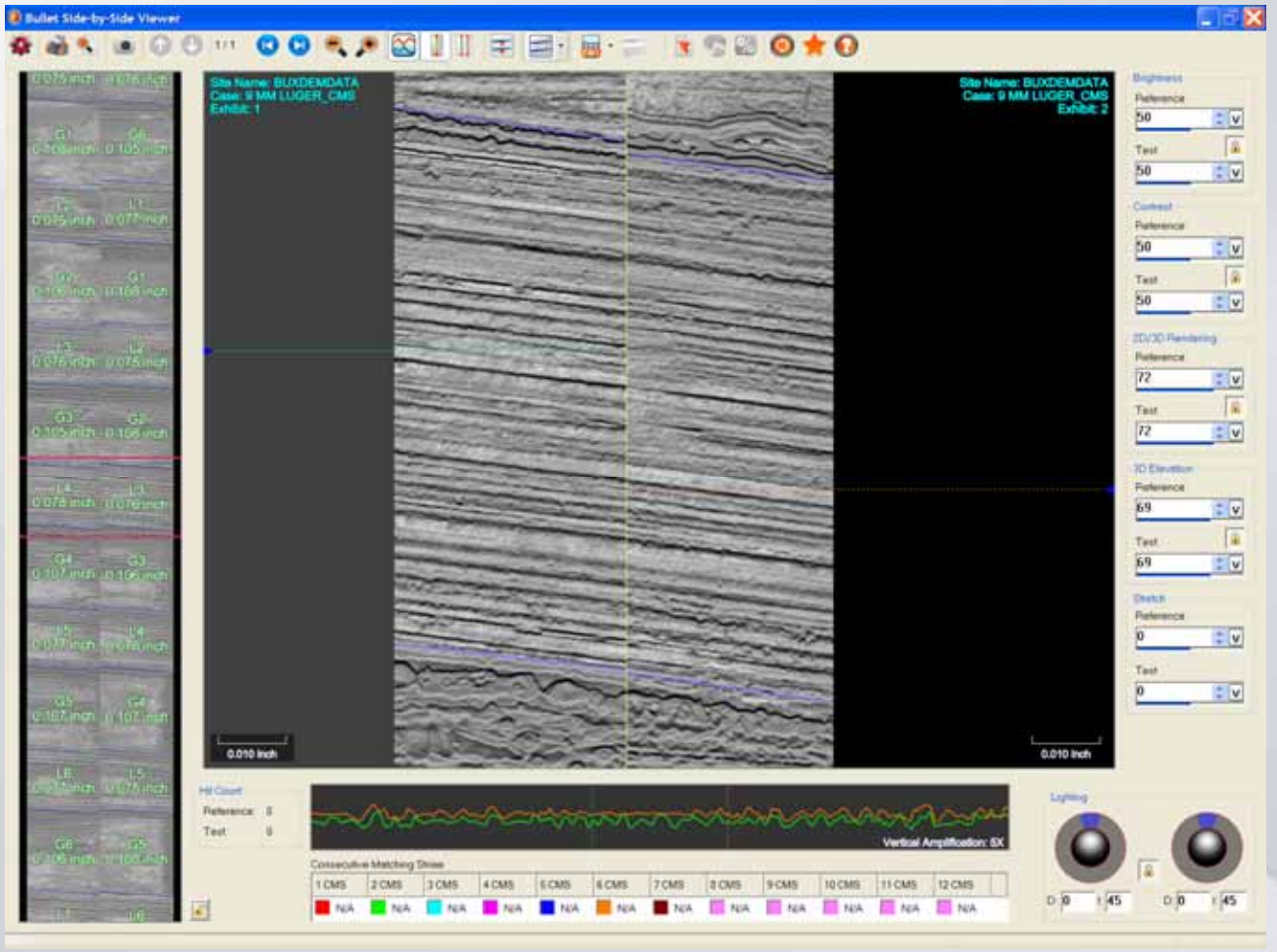


Analysis of Bullet Data on IBIS MATCHPOINT+

- Viewing of full circumference
- Viewing of 3D model merged with 2D image, with dynamic light source
- Three 2D scores + one 3D score:
  - Max LEA 2D
  - Peak Phase 2D
  - Max Phase 2D
  - Max LEA 3D

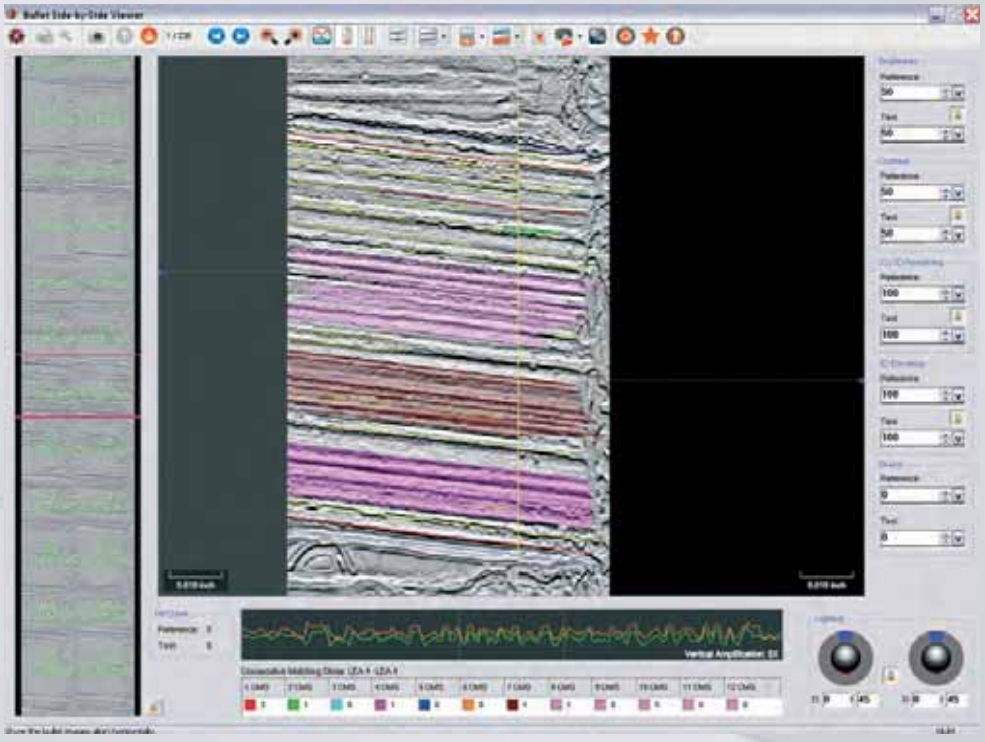
Analysis of Bullet Data on IBIS MATCHPOINT+

Bullet Side-By-Side Viewer



Analysis of Bullet Data on IBIS MATCHPOINT+

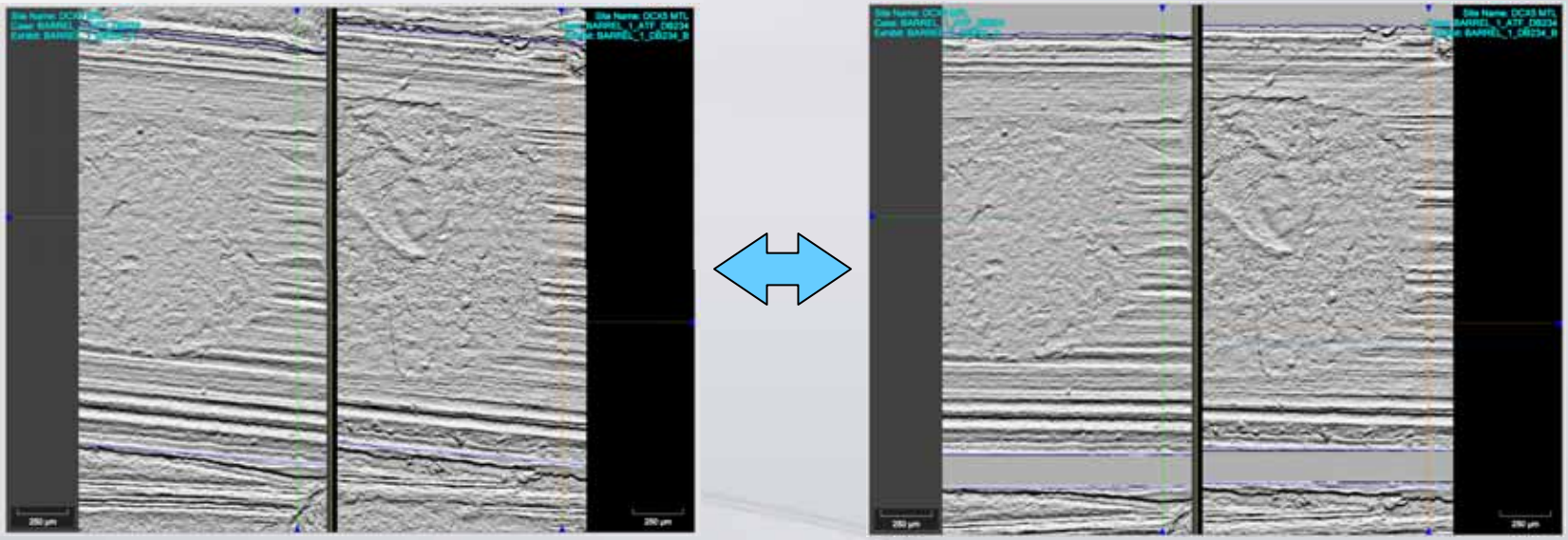
- CMS (Consecutive Matching Striae) tool based on 3D quantitative data
  - Peak or Valley Detection
  - Striae Height Threshold
  - Minimum Striae Length



- Cross-section profiles

Analysis of Bullet Data on IBIS MATCHPOINT+

- Optional horizontal bullet alignment



Bullet Compatibility

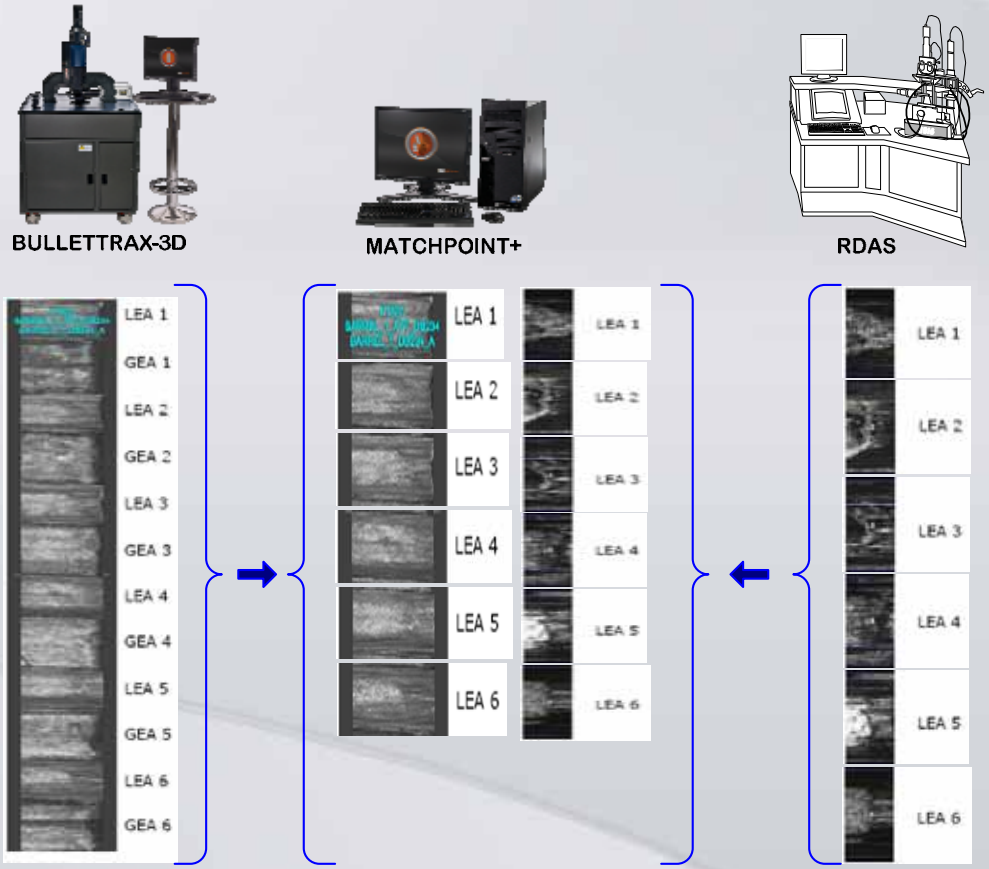
- IBIS TRAX-3D is compatible with IBIS Heritage
  - 2D image signatures are compatible
  - 3D correlation provides an additional score that is computed separately against 3D bullets only
  - Correlation results can contain exhibits from both product families

- When an IBIS Heritage site is decommissioned to be replaced by IBIS TRAX-3D products, its data is migrated to a Data Concentrator so that it remains accessible via IBIS MATCHPOINT+.

Bullet Compatibility

BulletProof Bullets on MATCHPOINT+

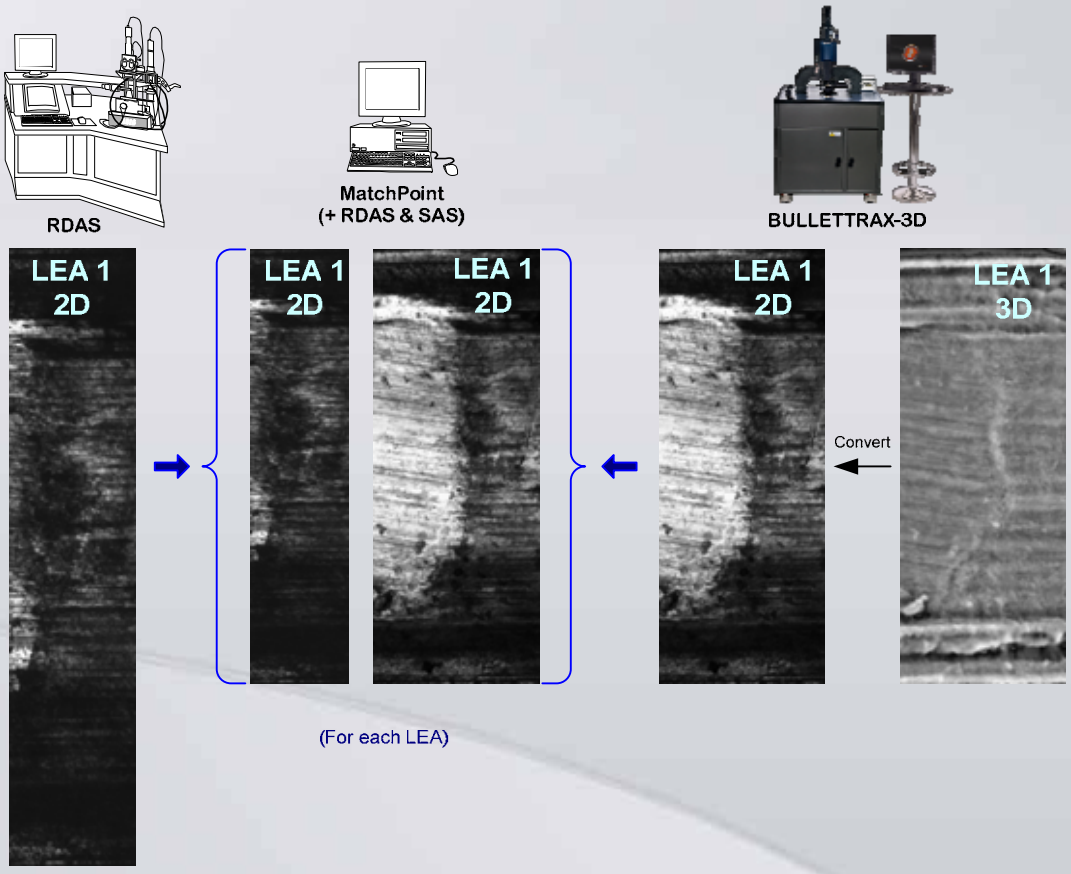
- MATCHPOINT+ can compare test exhibits acquired on BulletProof
- GEAs are removed
- Mosaic of LEAs with gaps
- Images are adjusted for height



Bullet Compatibility

BULLETTRAX-3D Bullets on RDAS/SAS/MPO

- RDAS/SAS/MPO can compare test exhibits acquired on BULLETTRAX-3D as 2D images of LEAs converted from the 3D bullet images
- Images are adjusted for height



Status on NUC Requests and Issues

Status on NUC Requests and Issues

Resolved with IBIS Heritage 3.4.6

- Change FRIM to import top 20 images rather than top 10
- Report on number of correlation requests viewed by an examiner
- Image Export Issues (network router configuration problem)
- Exhibit transfers from local to remote Database (FastTRAX and ATF Labs)

Status on NUC Requests and Issues

Resolved with IBIS TRAX-3D 2.2

- Select two images from MultiViewer test samples to perform a Side-by-Side comparison
- When deleting a correlation request have the cursor move to the next request
- Un-checking all sites when performing Manual Correlation is too time consuming
- Breech Face Class Characteristics Filter (Parallel, Arch, Crosshatch, etc.) [with 3.4.8]
- Increase Automation and Image quality of the BulletProof System (BULLETTRAX-3D)
- Remote Training

Planned for IBIS TRAX-3D 3.0

- Delete, or update to ‘Previously Viewed’, a batch of correlation requests
- Two correlation requests for each exhibit
- IBIS site would like to be able to configure the system to individual preferences (User Preferences and Preferred List configuration)

Hi-Point Issues

- FT Research concluded that doing a second acquisition at 180º can increase chances of finding a match by about 3% or 4% for Hi-Point cartridge cases
  - Due to the imperfect ring light symmetry on IBIS Heritage and the risk of the cartridge case not being perpendicular in the holder
    (These two aspects were corrected in the design of IBIS BRASSTRAX-3D)
- Hi-Points produce poor Breech Face impressions:
  - Newer Hi-Points: Fairly smooth with fine, shallow striated marks
  - Older Hi-Points: extremely smooth breech faces
- Firing Pin movement between shots does not affect correlation scores significantly
- No ejector mark
  - No ejector score to help refine the correlation results
  - More difficult to properly orient the cartridge case for acquisition, causing the 180º effect
  - Ejector for all Hi-Point firearm designs is the firing pin causing the firing pin score to be polluted by the double-strike
- Double-entry at 180º on all exhibits will reduce correlation performance by about 3%

FastTRAX: IBIS Data Services

FastTRAX: IBIS Data Services

- Overview of current contracts
- Marketing campaign
  - Targeted areas
  - Results
- Moving forward
  - Evidence Pilot Project
  - New Strategy / Open Discussion

Overview of Current Contracts

- **Puerto Rico**
  - Client: **Puerto Rico Institute of Forensic Sciences**
  - IBIS Data Entry and NIBIN Search Review
  - Contract size: 2000 test fires
  - Investigative leads: 52 sent
  - Hits: 3 reviewed, 3 confirmed

Overview of Current Contracts

- **New York**
  - Client: **Monroe County Public Safety Laboratory**
  - IBIS Data Entry and NIBIN Search Review
  - Contract size: 400 test fires
  - Investigative leads: 32 sent, 12 found within 1st week
  - Hits: 0 reviewed, 0 confirmed

FastTRAX Marketing Campaign

- **Areas Targeted:**
  - State and locals / Labs (NIBIN Users)
  - Top 25 most dangerous places to live
  - Cities with the highest populations
  - Cities with highest crime rate per capita

FastTRAX Marketing Campaign

- **Challenges:**
  - Limited knowledge of:
    - Value & benefits of NIBIN & IBIS
    - Reasons for service
  - Concept is not easily understood
  - Budget restraints
  - Making contact with the right person

FastTRAX: Evidence Pilot Project

- Reasons for incorporating evidence as part of our FastTRAX Services:
  - Requests from prospective state and local police departments and laboratories
  - Opportunity to learn the processes of handling evidence
  - Increase credibility, reach and range
  - Be able to offer full services

FastTRAX: Feedback

Open discussion