San Diego Police
Forensic Science Section

Latent Print

Unit Manual

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1.1 UNIT OVERVIEW

DESCRIPTION

The Latent Print Unit is located on the 6th floor (room 670) of the San Diego Police Department Headquarters building. The laboratory address is 1401 Broadway, San Diego, CA 92101, Mail Station 725. The hours of operation are Monday through Friday, 0530 hours until 1630 hours.

The Latent Print Unit is composed of two supervisors and a staff of Latent Print Examiners and Latent Print Aides.

LATENT PRINT UNIT FUNCTIONS

The Latent Print Unit is an integral part of the San Diego Police Department ASCLD- LAB International accredited Crime Laboratory. The unit is charged with the responsibility of examining friction ridge evidence while maintaining evidence integrity.

SECURITY

The Latent Print Unit door will remain closed and locked during business hours. The unit is considered a secure evidence storage room. Only the electronic card key should be used to unlock the door.

Latent Print Unit personnel will maintain the security of their evidence casework in progress by doing the following:

1) When leaving their desk for any reason during the day, they will ensure case evidence left on their desk is not in an area where the evidence can be knocked off or fall into a trash/shred container.

2) When on extended absence such as vacation, furlough, medical leave, etc., the case evidence will be packaged in the original envelope(s) and left on their desk for access by the Latent Print Unit supervisors.

1.1 INCOMING EVIDENCE

A. Policy

Latent Print Unit personnel will retrieve latent print evidence from the Property Room. All new evidence must include a barcode.

Information on the envelopes must be accurately documented and reflect the contents within. The barcode label must have the correct incident number and barcode number.

B. Procedure

1) Property Room personnel will scan the barcodes indicating that the evidence was released to the Latent Print Unit.

   a. Latent Print Unit personnel should ensure that the evidence is properly sealed. If the evidence is not sealed, Property Room personnel will seal the evidence.

   b. Upon returning to the unit, Latent Print Unit personnel will scan the barcodes indicating that the evidence was received into the unit.

   c. Latent Print Unit personnel will initial and mark the received date on the envelope. An additional date will be required if the evidence is not assigned the date it is received.

   d. Latent Print Unit personnel will scan the evidence to the individual examiners.

   e. There may be circumstances where the evidence is brought into the Latent Print Unit (i.e. urgent nature, after hours, etc.). Under these circumstances, a barcode and envelope will be created in the Latent Print Unit by the requesting officer for the integrity of Chain of Custody. When possible, all envelopes should be received through the Property Room.

2) Evidence received with a property tag (i.e. without a barcode) will be handled as follows:

   a. Latent Print Unit personnel will sign the Property Room check-out log and the back of the property tag to receive the evidence.

3) Evidence with incomplete and/or incorrect documentation will be handled as follows:

a. Latent print cards with hinge lifters that are received securely attached on top of one another (i.e., taped or stapled), will be considered one latent print card.

b. If any item needs to be repackaged (i.e., officer used wrong envelope, barcode was placed over case information or if the barcode was used as a seal), the original container will be kept inside the new envelope and the case information will be written on the new envelope.

c. If any of the following are missing or incorrectly documented on the envelope, Latent Print Unit personnel will correct if possible. If it is not possible, Latent Print Unit personnel will notify and require the officer to come to the unit and complete the documentation on the envelope.

   i. Name of victim
   ii. Case number
   iii. Incident number
   iv. Contents (i.e. number of cards, elimination exemplars, DVDs/images)

d. At the beginning of examination, ensure that the latent lifts have the required documentation. At a minimum, the latent print cards should have the name ofthe lifting officer, the date of recovery and the location from which the lifts were taken. When the latent print cards do not meet the minimum required, are blank, or have insufficient information to complete the case, the officer will be notified and required to come to the unit to complete the documentation. The exception to this minimum requirement is for no value cases. For no value cases, the examiner shall add the case number or incident number and the barcode number.

e. The examiner should ensure the correct case number and/or incident number is documented on each latent print card.

f. If the case number or incident number is incorrect, Latent Print Unit personnel will correct if possible.

g. If the case number or incident number is missing, the examiner can write in the case number but must also add the barcode.

Non-latent print evidence (i.e., shoe impression lifts, fabric impression evidence, etc.) that contains friction ridge detail will be inventoried in the examiner's case notes and on the report. The officer will be notified of the additional evidence in the latent print envelope by Latent Print Unit Personnel.

Non-latent print evidence that does not contain any friction ridge detail will require Latent Print Unit Personnel to notify and have the officer come to the unit, repackage, and re-impound the non-latent print evidence into the property room.

1.2 LATENT PRINT EXAMINATION REQUESTS

A. Policy

A Latent Print Unit Work Request is needed for a manual comparison to a subject. Refer to the Work Requests section of the Quality Assurance (QA) Manual for exceptions to this policy.

All work requests must go through the supervisor (or supervisor OCA) before being assigned to an Examiner.

Cases assigned proactively do not require a request.
Priority or rush work must be approved by a Latent Print Unit supervisor.

B. Procedure

1) Requests are normally received and processed through the Clerical Unit.

2) All work requests will be reviewed by either a Latent Print Unit supervisor or an OCA, initialed and dated.

3) Latent Print Unit work requests are kept as an Admin Doc.

1.3 CASE MANAGEMENT COVER SHEET

A. Policy

The Cover Sheet is used by Latent Print Unit personnel to gather statistical data.

B. Procedure

1) Complete the case coversheet with the following guidelines in mind:

a. Case or incident number.

b. Crime Type – Property or Person.

c. Case Type – Proactive, ALPS (work request), Manual (work request) or TLI (Tenprint-to-Latent Inquiry).

d. Area Station.

e. Date completed (report date).

f. Prints of value remaining – Yes or no.

g. Examiner.

h. Evidence analyzed – total number of cards/images/scans/etc.

i. ALPS – total number of ALPS searches including datasets.

j. Manual – total number of manual examinations including elimination comparisons and known to known comparisons.

k. Total- sum of h through j.

l. TR/Verifications- Number of examinations for identifications, exclusions and known to known comparisons.

m. Information on subjects identified including the name and unique identifier.

n. Information on the lifting officer, detective or crime scene specialist to include name and ID number for the ALPS awards program.

2) The coversheet is reviewed during technical review.

3) The coversheet will be retained by the supervisor for monthly statistics.

1.4 EVIDENCE HANDLING FOR COURT AND RELEASING EVIDENCE

A. Policy

When an examiner is summoned to court, they may obtain any relevant evidence pertaining to the case from the Property Room. The evidence will be scanned to the examiner (or the property tag will be signed for older cases) for Chain of Custody purposes and will remain in the examiner's custody until their court hearing is completed. Any suspect, victim, officer, detective, district attorney, etc. who requests the release of original evidence and/or known exemplars (i.e. for court or outside examination) must go through the Property Room.

B. Procedure

1) Court

a. When the court retains any evidence, the following documentation is required:

1. A Court Evidence Receipt (PD-233) form must be completed for property tag evidence. It must be signed and stamped by the court clerk to verify custody of evidence. The original (white) will be given to the Property Room while the copy is placed into the case file as an administrative document.

2. A FileOnQ Court Evidence Receipt must be generated for barcoded evidence. The FOQ court receipt printout will be placed into the case file as an administrative document.

1.5 OUTSIDE EXPERTS

A. Policy

Prior to an in-house examination by an outside expert in the Latent Print Unit, a Latent Print supervisor and the Crime Laboratory Manager must give approval (see QA Manual regarding 'outside experts in the lab'). Copies of the latent print evidence will be provided through the QA Manager.

B. Procedure

1) In-house examination

a. A court order or the authorization by the assigned prosecutor to make available the original evidence for an in-house examination will require the completion of the following steps:

1. The examiner will retrieve the latent print evidence from the property room.
2. The examiner will perform an inventory of the evidence prior to viewing.
3. An internal chain of custody entry, completed by the examiner and outside expert, is sufficient documentation for receiving and transferring of the evidence. The existing chain of custody in the note packet can be used or a new chain of custody can be added to the note packet.
4. The evidence must also be inventoried by the examiner at the completion of the exam in the presence of the outside expert.
5. The examiner receiving the evidence being returned will document receipt on the chain of custody.
6. Upon completion of the in-house examination by an outside expert, the chain of custody and any additional note page must go through technical review and an administrative review.

3.1 OBTAINING AND MARKING EVIDENCE (ENVELOPES, CARDS, PHOTOGRAPHS, CDS, ETC.)

A. Policy

The contents of any envelope submitted will be referred to as an item.
All items must have case #, initials of analyst, and date.

Subsequent examinations by the initial examiner do not require re-marking (initials and date) of the evidence.

Numbering of individual items is not necessary with the exception of latent print cards either not previously numbered or incorrectly numbered by a submitting officer.

Morgue prints will normally be received packaged in clear plastic sleeves, sealed, and enclosed in a sealed, barcoded manila envelope.

When DVD's/CDs are received, a contact sheet of the images will be made. Identifying information for each image must appear on the thumbnail printouts. Any images determined to be suitable for further examination can be printed in a larger format and marked per unit policy. All printouts will be filed with the case notes. If an image is printed on photographic paper and is smaller than the standard paper size, then it will be taped to an 8 ½ x 11 sheet of paper and marked as per QA policy 2.5

B. Procedure

1) Obtain evidence from the Property Room.

2) Verify the correct case number/incident number is documented on each item.

3) Ensure that all cards taped together and photographs have the case number marked on them.

4) Sequential numbering of latent print cards taped together will be done by the examiner if not already numbered by the officer. Latent print cards will be marked as 1, 2, 3, etc. (not 1, 1a, 2, 2a). List or identify cards taped together in the case notes using the matrix or copy of the lift card(s).

5) Known print exemplars will be marked as 1 of 4, 2 of 4, etc.

6) The person retrieving known exemplars from the San Diego County Document Archive System, California DOJ Automated Archive System, or the FBI's known repository will:

   a. stamp the known exemplars with the local, DOJ, or FBI stamp to designate which database they came from, sign and date the stamp.
   b. known exemplars printed from the archive systems do not need a barcode because they can be repeatedly reproduced electronically. These exemplars will be retained in the case notes.
   c. receipt of copies of known exemplars received via email or fax will be documented in the case notes.

7) A barcode will be created for known exemplars not generated electronically. These exemplars are considered original evidence (i.e. inked finger or palm cards, major case prints, etc). A copy of the exemplars used during comparison will be retained in the case notes.

8) Known exemplars obtained by an examiner will be barcoded. The name of the individual, the case number, and the page number (ie. 1 of 6, 2 of 6, etc.) must appear on each exemplar. A barcode must be created for each exemplar and placed on each sheet.

   a. Known exemplars will be placed in a blank envelope with an additional barcode placed on the outside of the envelope. These exemplars will be impounded in the property room.

3.2 LATENT PRINT EXAMINATION AND MARKING OF EXAMINED IMPRESSIONS

A. Policy

The comparison method is based upon the ACE-V methodology. ACE-V is an acronym for: analysis (A), comparison (C), evaluation (E), and verification (V).

All identifications and exclusions will be verified.

In an identification, the latent print card and exemplar will be documented by both the examiner and verifier. Refer to the following procedure.

B. Procedure

The following criteria is a quality assurance standard adopted to provide a minimum standard with which to evaluate the case examiner's determination of suitability for comparison.

1) Suitability for Comparison

A latent print will be determined to be suitable for comparison if it contains at least eight clear minutiae that are easily discernible in a finger print (including middle and lower joints), and at least twelve clear minutiae that are easily discernible in a palm or plantar print. These minutiae are located during the analysis, prior to comparison. In addition, the latent print must meet one or more of the following criteria:

a) Discernible source area
b) Discernible orientation
c) At least one focal point (e.g. core, delta, crease, scar)
d) At least one target area (a target area is the friction ridge detail in the latent print that has been selected for search to the known exemplar)

Latent Prints that do not meet the above listed criteria may be marked suitable for comparison at the discretion of the case examiner. The case examiner must document on a photograph/image, which data permitted them to determine the latent print was suitable for comparison and include a copy in their case notes.

2) Suitability for Exclusions

The following criteria is a quality assurance standard adopted to provide a minimum standard with which to evaluate the case examiner's determination of suitability for exclusion.

A latent print will be determined to be suitable for exclusion if it meets all of the following criteria:

a) Discernible source area
b) Discernible orientation
c) At least one focal point (e.g. core, delta, major crease, scar)
d) First and second level detail (second level detail around a focal point is required)
e) More than one target area (a target area is the friction ridge detail in the latent print that has been selected for search to the known exemplar)

Latent prints that do not meet the above listed criteria may be marked suitable for exclusion at the discretion of the case examiner. The case examiner must document on a photograph/image, which data permitted them to determine the latent print was suitable for the exclusion and include a copy in their case notes.

3) Visually examine the evidence.

a. If there are sufficient characteristics to perform a comparison, the impression will be marked using the following guidelines:

1. a red permanent marking pen will be used to mark the impression to be examined.
2. each impression that is annotated will be assigned a subsequent alpha-character beginning with the letter "A." This can be done on each card corresponding with the matrix or consecutively when there is one lift attached to multiple cards.
3. an arc over the top of the impression indicates a finger or fingertip.
4. an impression located between two lines indicates a lower (second or third) finger joint.
5. an impression which has been circled indicates that the orientation and/or source area is not discernable.
6. partial palm or footprints will be marked with a line at the proximal position opposite the fingers or toes.

b. For any impression which is incidental to the lifting process, the examiner will notate "possible lifting officer prints" in their case notes.

4) Visually examine the known exemplars.

a. Is the area necessary for a comparison available in the known exemplar? If not, access the county or state finger or palm print archive systems for additional exemplars.

5) Analysis

a. The examiner conducts a thorough visual assessment of friction ridge detail determining if sufficient quality and quantity of detail are present. The examiner analyzes for:

1. first level detail

   Analysis of ridge flow/pattern type; includes core, delta location, ridge count, ridge flow and any ridge damage – scarring or genetic.

2. second level detail

   Analysis of the friction ridge path; includes ridge length ridge sequence, ridge type, lateral spatial relationship between ridges.

3. third level detail

   Analysis of ridge shape/thickness/thinness and relative pore location.

4. if the friction ridge impression is determined to be of no value or not suitable for comparison the examiner will document their results in their case notes. No further examination is performed.

6) Comparison

a. When the data in the friction ridge impression is determined to be suitable for comparison, the examiner will:

   1. choose a target area of ridge detail to begin the comparison
   2. determine correspondence between the source impression and exemplar based on
      a. ridge flow data (Level 1)
      b. ridge path data (Level 2)
      c. ridge shape data (Level 3)

7) Evaluation

a. The examiner formulates a conclusion based upon the analysis and comparison of the latent impression and known exemplar. The evaluation is based upon the significance of agreement or disagreement between friction ridge data. An examiner can conclude one of the following: identification, exclusion, or inconclusive.

8) Verification

a. A second examiner repeats the “ACE” process. The examiner performs an independent analysis (A), comparison (C), and evaluation (E) between the latent impression and known exemplar.

b. In the event of a disagreement between the examiner and verifier, refer to laboratory QA policy 2.9 Casework Review for resolution.

c. The verifier, if in agreement with an identification, will document the evidence and generate a side-by-side printout of their comparison.

C. Marking Procedure of Identified Impressions

1) The documentation will be placed as close to the identified impression as possible without disrupting or interfering with any other impression. The following information will be marked in red:

a. the name of the identified individual.

b. area of friction ridge skin identified.

c. finger number or palm (i.e., #1 RT, #1 right thumb, LP, Left palm). The description can be abbreviated or written out.

d. date the identification was established.

e. initials of the examiner making the identification.

2) the known exemplar used for the identification will require the following documentation in red ink:

a. date of the identification

b. examiner initials

3) The verifier, if in agreement, will document the evidence using red ink near the primary examiner's notation on the evidence and exemplar. The following information will be marked in red: examiner's initials and the date of the verification.

D. Latent to Latent Comparison/Documentation

If a latent to latent comparison is performed, and the conclusion is that they are from the same source, case notes must be documented on the evidence and/or in the case notes.

1) If you are documenting multiple lifts of the same impression, it can be shown by writing on the lift card or photograph. This can occur on the same or separate lift cards. Examples for writing this on the evidence would be:

- Impression A is the same lift as impression B (if both appear on the same card)
- Impression A on card 3 is the same lift as impression B on card 4
- No side by side comparison sheet or verification is required.

2) If you are documenting a comparison of different latent prints, then a side by side comparison sheet is needed in addition to writing on the lift card of photograph. Examples for writing this on the evidence would be:

- Impression A is the same impression as A on card 3
- Same as impression A on card #3
- A and C are the same impression, etc.

A verification is required and the words “I agree” must be written by the verifier along with their initials and the date. A separate comparison sheet is not needed from the verifier. If the verifier feels a need for additional information, a note page can be added.

3.3 KNOWN TO KNOWN COMPARISONS

A. Policy

Known print to known print (K to K) comparisons are conducted when multiple known exemplars are used for the same subject from the following sources:

Electronically generated known exemplars from different archive systems (Local, DOJ, FBI)
Major case prints
Elimination prints
Inked finger/palm prints

Known to known print comparisons are not required for exemplars generated from the same archive system if the SID #, FBI # or MAIN # are the same, the Date of Birth is the same, and the Names are the same or significantly similar as to associate to the same individual.

Known to known comparisons must be verified and will only be conducted in the latent print unit. They will not be performed in a courtroom or in the District Attorney's Office.

B. Procedure

1) Compare known exemplars.

2) If there is no identification, no further documentation is required other than indicating in the case notes that no identification was made.

3) If there is an identification, the examiner will document the exemplar in red with "K to K", date, and initials. The verifier will document the identification in red near the primary examiner's documentation with "K to K", date, and initials.

3.4 IDENTIFICATION IN DEATH CASES

A. Policy

When requested, the Latent Print Unit personnel will assist in the identification of unknown decedents.

When requested, the Latent Print Unit will assist in the recovery of friction ridge skin. This usually occurs when advanced decomposition hinders the routine collection of known exemplars or when other circumstances require expertise from a latent print examiner.

The examiner will record:

1) finger and palm prints from the unknown decedent for identity purposes.

2) all friction ridge skin from the hand for elimination of crime scene print evidence, and

3) foot print impressions when the found body was recovered bare foot.

Only by request and Chiefs approval will latent print examiners assist in the identification of deceased in major disasters.

Choices for recording friction ridge skin are as follows, and may not be limited to just one technique. Decide which procedure is best or required before starting with a recovery method:

1) Inked and morgue spoon method.

2) Powder “Kinderprint” method.

3) Tissue Builder Method.

4) Removing Fingers, palms, feet, or friction ridge Skin.

5) Silicone ("Mikrosil" or "Accutrans") casting material

6) Charred or Desiccated Hands

7) Re-hydration Technique for Mummified Fingers

B. Procedure

1) Inked Method

a. Examine hands to determine if all fingers are present. If any fingers, hands, toes or feet are missing, Medical Examiner personnel will determine if amputation or loss occurred during life or after death and the examiner will note this on the appropriate exemplar.

b. Clean the fingers of all foreign matter such as dirt, grease blood, etc.

c. Dry the skin surface.

d. Fingers may be inked with a spatula or small “porelon” pad.

e. Fingers may be printed on card strips or squares cut from a fingerprint card.

f. Use a morgue spoon or place the card in your cupped hand.

g. Roll the inked finger on the card

2) Powder “Kinderprint” Method: if the skin is intact, use the powder method on fingers and palms

a. Dust the skin surface with black fingerprint powder, wipe off the excess powder.

b. Apply opaque tape large enough to cover the skin surface.

c. Remove the tape and place it over a transparent sheet.

d. Prints can be viewed in the correct position by turning the transparent mount over

3) Tissue Builder Method: fingers are pliable and intact but wrinkles prevent adequate printing

a. Fill a hypodermic syringe with tissue builder.

b. Inject the needle below the distal crease of the finger up toward the tip, keeping the needle below the surface of the skin.

c. If needed, inject solution at the tip downward or side of the finger inward.

d. Inject solution until the finger bulb is free from wrinkles.

e. Allow tissue builder to solidify after a short time.

f. Ink and print the finger or apply the powder method.

4) Removing Fingers or Skin: only when authorized by a medical examiner

a. Severely decomposed bodies, amputation is best done at the wrist by a medical examiner to preserve the fingers and palm intact.

b. Transport the hands to the crime lab soaked in a preservative solution.

c. At the lab, examine the skin to determine the extent of decomposition of the epidermis. Natural separation of the epidermis from the dermis should occur.

d. A shallow cut around the wrist allows the entire epidermis to be peeled from the hand.

e. Fingers may be removed separately but maintain finger order.

f. Clean and thoroughly dry skin.

g. If possible, slip it over your gloved finger and print it as if taking your own fingerprints, or

h. Collect clean and mount the epidermis skin by placing the skin between glass slides.

i. Photograph slides using transmitted light; friction ridge skin will photograph in the positive form - black ridges

5) Silicone ("Mikrosil" or "Accutrans") casting material

a. Use when wrinkled or mummified fingers are encountered and removal of hand is not authorized by a medical examiner.

b. Mix ingredients per manufacture directions.

c. Spread silicone with a spatula over the friction skin.

d. Allow silicone to cure before removing.

e. Photograph to correct ridges that appear as furrows, and furrows that appear as ridges.

f. Mount silicon lifts on card stock with tape.

6) Charred or Desiccated Hands

a. A medical examiner may have to amputate charred hands.

b. Place hands or fingers in marked containers packed with cotton to minimize any further damage to the fingers.

c. Photograph ridge detail before proceeding with more intrusive techniques.

d. Use silicone material to cast ridge detail, if possible.

e. Remove the epidermal skin by carefully cutting it away.

f. Epidermal skin may be re-hydrated

7) Re-hydration Technique for Mummified Fingers

a. Remove the pattern area (epidermal skin) of the finger.

b. Place the cut away mummified epidermal skin in a plastic container.

c. Mixing two embalming fluids -- "Restorative," an anti-dehydration colloid, and "Metaflow," an arterial conditioner -- in equal parts.

d. Soak mummified skin in the re-hydration solution.

e. Excess tissue on the underside of the epidermal skin may need to be scrapped away to allow solution to permeate the skin.

f. Watch for flesh color to restore, and the skin looks like living tissue.

g. Place the skin between two glass slides and photograph it using transmitted light.

h. For recovery, you can attempt to ink and print ridges or dust black fingerprint powder to lift or photograph.

8) AFIS Search

a. Enter and search the best quality fingerprint impressions utilizing a range of automated fingerprint databases that are available (local, state, and FBI).

9) Request a Homeland Security or FBI Expedite fingerprint search

10) Latent Prints as Exemplars: known inked prints of the victim will not always be available for comparison purposes.

a. In this situation objects from the victim's residence should be processed for latent finger and palm prints.

3.5 ALPS/AFIS

A. Policy

All ALPS quality impressions will be searched through the local database; however, for cases in which a dataset is created and a hit is generated, a local search will not be required. The examiner will follow the ALPS criteria as a guide to determine which impressions are ALPS quality. If an impression meets the ALPS search criteria and does not result in a hit, the impression must be enrolled in the unsolved database.

Examiners, at their discretion, can search any impression that does not meet the ALPS criteria and determine if such impression should be enrolled in the unsolved database.

If an impression has been labeled with a “P” or “PP” number and for any reason an examiner decides not to search it, the “P” number must be crossed out with a single line, dated, and initialed.

A hard copy of the CA-IS user's manual is located in the Latent Print Unit and on the desktop. Refer to the manual for detailed information on how to operate the system.

B. Procedure

Suitability for ALPS Search and Enrollment

The following criteria are quality assurance standards adopted to provide a minimum standard with which to evaluate the case examiner's determination of suitability for ALPS search and enrollment.

FINGERS:

A latent finger print will be determined to be suitable for ALPS search and enrollment if it contains at least eight clear minutiae that are easily discernible, form a cluster and are not scattered throughout the print. These minutiae are located during the analysis. In addition, the latent print must meet one or more of the following criteria:

a) Discernible orientation
b) An approximate core location

Due to repeatability factors, if the following areas are searched, then the latent print must include at least twelve clear minutiae that are easily discernable, form a cluster, and are not scattered throughout the print:

a) Only the delta
b) Only the area below the pattern area

c) Only the area above the pattern area.

PALMS:

A latent palm print will be determined to be suitable for ALPS search and enrollment if it contains at least twelve clear minutiae that are easily discernible, form a cluster and are not scattered throughout the print. These minutiae are located during the analysis. If you have a large palm print with an abundance of data, it is highly recommended that multiple searches in different areas of the palm print are performed.

Definitions:

- **CRMS** (Criminal Record Management System). CRMS is used to obtain -case related information.. Because auto thefts do not appear in CRMS, the detective assigned to those cases can be found on the "Mail Stops for Area Stations/Units" list.
- **PD Roster.** The Roster is used to obtain employee information. It is used to obtain unit assignment and rank.
- **Marking fingers**: Each finger impression to be searched will be marked in red with an arc (to show orientation), a letter and a "P" number. If the orientation is unknown, circle the impression.
- **Marking palms**: Each palm impression to be searched will be marked with a red line at the base of the impression (to show orientation), a letter, and a "PP" number. If the orientation is unknown, circle the impression.
- **Databases:** The available databases are Local, State, and FBI. -For property crimes, a local search is required. For person crimes, a local and FBI search is required. -An examiner can use their discretion for searching additional databases including datasets.
- **Candidates list:** The candidates list is a list of individuals generated by the database. If available, a minimum of 10 candidates will generated.
- **Hit (Confirm Yes):** When a candidate cannot be eliminated on screen.
- **No Hit (Confirm No):** When a candidate list is reviewed on screen and all candidates are eliminated.
- **Search Confirmation Page:** this is a side-by-side of the latent impression searched and the candidate's known exemplar. If a Hit is generated, this page will become part of the case notes.

- **TLI/PLI (Tenprint to Latent Finger or Palm Inquiry):** When a candidate cannot be eliminated on screen. The exemplar will be printed and compared to the original evidence.

3.6 REWORKING CASES PREVIOUSLY EXAMINED

Policy

Additional work may be requested on cases previously worked by examiners no longer with the department. The supervisor will determine what work will be performed prior to assignment and will advise the new examiner.

If the new examiner does not agree with the conclusion of the previous examiner, they may consult with another examiner and notation(s) must be made in the notes. The supervisor and QA manager must be notified of any discrepancy, disagreement, or clerical error with the previous work.

The numbering and/or lettering system used at the time of the original request will be continued with the exception of the known exemplars. The name of the subject will be used instead of the "K#" (K number refers to known exemplars). In one system, Q#s were used. The "Q" stands for Questioned. The cards were documented as Q1-5, meaning envelope #1, card #5. In another system, the envelopes were numbered sequentially. For example, if more than one envelope was received on a case, the first envelope would be labeled #1 (1-7), the next envelope would be #2 (8-20), etc. If Q#s were used in the original report, refer to Q#s in the current report.

The examiner only needs to complete the internal chain of custody form for the envelopes used for the new exam. All latent print cards, photos, and known exemplars used for the new examination need to be dated and initialed.

All reports issued by the new examiner will follow current reporting procedures.

4.1 REPORTS AND NOTIFICATIONS

A. Reports

A Unit report is written after the completion of casework.

Reports must comply with the general format presented in the Laboratory Quality Assurance Manual. Technical and Administrative reviews are performed on all reports prior to issuance.

Identifications are not released without verification.

If elimination prints were received, the report must reflect that they were received and whether or not they were compared. Elimination prints will not be compared in our proactive program without Supervisor approval.

Refer to the Quality Assurance Manual Issuing Corrections policy for report corrections.

B. Notifications

Notifications are issued on unconfirmed TLI hits, in which no further work is going to be conducted. Reports are issued on confirmed TLI hits.

The side-by-side printout of the unconfirmed TLI is initialed and dated by the Examiner who evaluates the unconfirmed hit.

The notifications are issued by the supervisor or supervisor OCA.

The Detective is informed that there was an unconfirmed TLI hit and that no further work will be conducted.

The TLI Notification and printouts are scanned into the case file.

4.2 EVIDENCE DISPOSITION

A. Policy

Envelopes will be sealed, initialed, and dated before being returned to the Property Room. Cases retrieved from the Property Room will be checked out and returned by Latent Print Unit personnel.

Document any evidence released to the court in FileOnQ or with a Court Evidence Receipt (PD-233) which will be returned to the Property Room.

An examiner may not keep a case in their possession for longer than one year, without the approval of the supervisor and Laboratory Manager.

B. Procedure

1) The case examiner will seal, initial and date the latent print evidence and either place it in the Latent Print Unit file for return to the Property Room, or return the evidence to the property room in person.

2) From the file, Latent Print Unit personnel will scan the barcodes from the case examiner to the Latent Print Unit.

3) Latent Print Unit personnel will return latent print evidence to the property room.

4.3 LATENT PRINT CASE NOTES

A. Policy

For all annotated impressions, the case examiner must document their analysis and include a copy in the case notes.

All conclusions must be included in the case notes. A reason for an inconclusive result must be stated in the case notes.

For identifications, the examiner will generate a side-by side comparison showing features in agreement, and must have the word “identification” appear on it. The side-by-side comparison will be included in the case notes.

For all latent print evidence that is analyzed (i.e. latent print cards, images/scans or discs), a copy of them must be included in the case notes.

The latent print internal chain of custody form will be used to document the evidence transfers between the examiner, verifier, and the technical reviewer.

The first page of all notes will include the date that the examiner started casework (exam date) and the initials and date of the technical reviewer.

For the Cover sheet, the completed date is the date of the report. The completed date does not have to appear on any of the note pages. For the database, the completed date is the date the case packet gets administratively reviewed.

The verifier will indicate their verification of the identifications by generating a side-by-side comparison showing features in agreement, and must have the words “verification” and “identification” appear on it, along with their initials and date.

For exclusions, the verifier will handwrite in “I agree with all exclusions” on the matrix, or where the examiner has stated the conclusion.

For inconclusive results that contain similarities to a known exemplar, the technical reviewer will handwrite “I agree” on the examiner’s side-by-side comparison.

B. Procedure

1) The note packet must contain the following information if applicable depending on the case circumstances (also refer to QA manual 2.6):

   a. latent print evidence received, including elimination prints, including

barcodes or property tag #'s.
b. where and when the evidence was received.
c. if the evidence was received sealed or unsealed.
d. exam date.
e. Technical reviewer's initials and date.
f. copies of all latent print evidence analyzed.
g. analysis sheets for all annotated impressions.
h. results of all analyses and comparisons.
i. side-by-side comparisons for identifications.
j. side-by-side comparisons for verifications.
k. ALPS information, including impressions searched, databases searched, and results.
l. techniques used.
m. disposition of evidence.
n. chain of custody.

2) Complete a log reflecting any communications with persons associated with the case.

3) Examiner must write the case number on photographs or papers that are not standard letter size and attach them to a standard letter size (8½" x 11") blank piece of paper documented with the appropriate data.

4) Known exemplars electronically generated must contain the information used in the report. This information could include the subject's name, DOB, SID/FBI/Main #, and booking number for all identifications.

5) Each page of the case notes will contain the following information:

a. case or incident number.
b. page number.
c. date.
d. examiners handwritten initials.

6) The Latent Print Unit request form (PD-299) will be placed at the end of the note packet as an "ADMIN DOC."

5.1 LATENT PRINT UNIT EQUIPMENT LIST

ALPS COMPUTER TERMINAL

Use: For accessing data base(s) to search latent and/or known prints.

6.1 REVIEW PROCESS FOR LATENT PRINT CASEWORK

A. Policy

All cases (100%) will be technically reviewed.

The technical reviewer/verifier will determine if the conclusions reached were reasonable. All identifications and exclusions will be recompared and verified. All nonidentified latent print evidence will be technically evaluated to assure the original conclusions are reasonable. The technical reviewer will review all reports, notes, and evidence for errors and inconsistencies, and will ensure that the documentation of the evidence has been done properly and that unit policy and procedures were followed.

When discrepancies in the analysis or conclusion are discovered, the technical reviewer/verifier must address corrections or suggestions for change directly with the primary examiner. The technical reviewer cannot initial any paperwork until all corrections/changes have been made.

The examiner who performs the technical review does not have to be the verifier on the case.

Each examiner will maintain a log book showing the name of the examiner who performed the technical review.

B. Procedure

1) Technical Review

a. Refer to section 4.3A for requirements on documenting the review.

b. In the event of a disagreement between the primary examiner and reviewer, refer to laboratory QA policy 2.8 (Casework Review).

c. If an examiner changes a conclusion based on the review, keep all original documentation and make the appropriate notations to document the new conclusion.

7.1 PROFICIENCY TEST PROGRAM

A. Policy

Latent Print Examiners who have completed training and are independently working cases will be required to participate in annual proficiency testing.

B. Procedure

Proficiency tests are to be worked like normal case work, following all unit policies and procedures.

If an examiner is unable to complete the proficiency test or part of the proficiency test due to poor quality photos, the examiner will confer with the supervisor to determine course of action.

If there are any other proficiency-related questions, refer to the Laboratory's proficiency test policies in the QA manual on the G drive, and to the ASCLD-LAB - Proficiency Review Program document located on the:

G-Drive/Latent Prints/ASCLD-LAB - Proficiency Review Program

7.2 LATENT PRINT UNIT TRAINING PROGRAM

A. Policy

The unit supervisor is responsible for the administration of the training program.

The Latent Print Examiner training programs are approximately one year in duration.

Training outlines for each position are available in 7.2 and will be used to document the training process.

The trainer is responsible for the completion of the training and associated paperwork.

Latent Print Examiner Aide and Latent Print Examiner I trainees will receive training blocks A-L. The blocks can be completed in any order, and will be based upon the needs of the unit. The significant variation in training between the Aide and Examiner trainees occurs in the ACE-V module in which verification is only required for Examiner trainees, and Co-signed casework appropriate to the level of training.

A formerly trained or experienced trainee may complete the training blocks in a more abbreviated form, based upon past training, but will complete a competency test, written exam, and co-signed casework prior to performing independent casework. The Reading Lists may be amended with appropriate and more current references.

B. Procedure

Obtain the training documents from the supervisor.

The trainer, trainee and supervisor will initial and date of completion.

Refer to QA policy 7.6 for additional information on training and testing requirements.

TRAINING OUTLINE

MODULE A: GENERAL OVERVIEW AND CLERICAL DUTIES

OBJECTIVES

- Become familiar with how the unit operates and functions
- Learn and perform all of the latent print clerical duties
- Understand the chain of custody procedures
- Learn all of the databases utilized for clerical duties in the unit
- Demonstrate an understanding of our Quality Assurance Program and Policies
- Read and understand the Latent Print Unit Policy Manual

LECTURE:

1. Latent Print Functions and Organization
    a. Proactive versus requests

2. Procedures for Receiving Latent Print Evidence
    a. Chain of custody
    b. Property room
    c. Barcode procedures

3. Procedures for Releasing Latent Print Evidence
    a. Sealing of evidence
    b. Returning evidence back to the property room
    c. Court evidence receipt

4. Priorities for Service: Determined by the Supervisor
    a. Case management
    b. Preliminary or Trial date determined
    c. Person crimes
    d. Property crimes

5. Databases and assigning cases to examiners
    a. LabLynx
    b. CRMS
    c. PD Roster Plus
    d. File OnQ
    e. Outlook

6. Reports
    a. Scan and file finished latent print reports
    b. Send completed reports to assigned detectives and officers

7. Quality Assurance
    a. Technical review

b. Administrative review
c. Conflict resolution
d. Quality assurance manual
e. SDS location and use
f. Power DMS

REQUIRED READING

- NAS Report CH. 7, Accreditation
- Quality Assurance Manual
- Latent Print Unit Policy Manual
- Clerical Desk Guide

MODULE B: HISTORY

OBJECTIVES:

- Understand the historical aspects of how fingerprints evolved into being used for identification purposes. Become familiar with fingerprint pioneers who contributed to the science of fingerprints and the classifications systems and their uses.
- Obtain a general understanding of the science of friction ridge identification.

LECTURE: The History and Background of Fingerprints

a. Earliest recorded awareness of fingerprints.

b. Early anatomical observations.

c. Scientific observations and uses leading to modern fingerprint identification.

d. Awareness of fingerprint pioneers who contributed to the science of fingerprint comparison.

e. Awareness of classification systems and their uses (Henry and Vucetich). REQUIRED READING

- CH. 1 The Fingerprint Source Book.
- Ashbaugh, CH. 2 History.

EXAMINATION

MODULE C: BIOLOGY - FRICTION RIDGE SKIN FUNDAMENTALS AND FORMATION

OBJECTIVES:

- Understand the biological basis of uniqueness, persistence, pattern formation, wound healing, and aging of the friction ridge skin.

LECTURE:

1. Skin Formation – Gain an understanding of the persistence, pattern formation, wound healing, aging, and individual ridge characteristics of the skin.
2. Uniqueness – Gain an understanding of the significance and biological basis of uniqueness, including ridge characteristics, ridge flow, creases, and scars.

REQUIRED READING

- CH. 2, 3 The Fingerprint Source

Book. PRACTICAL ASSIGNMENT

EXAMINATION

MODULE D: HUMAN FACTORS

OBJECTIVES:

- Obtain a basic understanding of the human visual system
- Obtain a basic understanding of the nature of visual expertise
- Understand bias and the different types (contextual, confirmation, etc…)
- Obtain a basic understanding of the sources of human error
- Understand 'error rates' as it applies to the latent print discipline

LECTURE: PowerPoint Presentation

REQUIRED READING:

- CH. 15 The Fingerprint Source Book.
- CH. 1-3 – Human Factors Report
- Studies:
  - "Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications" – Dror, Charlton, Peron
  - "Why Experts Make Errors" – Dror

- "When Emotions Get the Better of Us: The Effect of Contextual Top-down Processing on Matching Fingerprint" – Dror, Charlton, Peron, and Hind
- "A Performance Study of the ACE-V Process: A Pilot Study to Measure the Accuracy, Precision, Reproducibility, Repeatability, and Biasability of Conclusions Resulting from the ACE-V Process" – Langenburg
- "Testing for Potential Contextual Bias Effects During the Verification Stage of the ACE-V Methodology when Conducting Fingerprint Comparisons" – Langenburg, Champod, Wertheim

WRITTEN EXAMINATION

MODULE E: PRINT EXEMPLARS

OBJECTIVES:

- Learn ink and Kinderprint techniques for obtaining exemplars
- Understand the reasoning for exemplar collection

LECTURE:

1. Print Exemplars
   a. Methods to record fingerprints and palm prints
   b. Major case prints
2. Recording Prints of a Deceased Individual
   b. Inked and morgue spoon method
   c. Powder "Kinderprint" method
   d. Tissue builder method
   e. Removing skin from fingers
   f. Silicone ("Mikrosil" or "Accutrans") casting material
   g. Charred or desiccated hands
   h. Re-hydration technique for mummified fingers
   i. Processing Human Skin for Latent
3. Prints REQUIRED READING

- CH. 4 The Fingerprint Source Book.

PRACTICAL ASSIGNMENT

EXAMINATION

MODULE F: LATENT PRINT DEVELOPMENT AND PROCESSING

OBJECTIVES:

- Understand the commonly used chemicals and powders used in the Crime Scene Unit (CSU) for latent print development.
- Understand how to choose latent print development techniques based on the type of surface examined.
- Understand the physiology and chemical composition of sweat and the components of latent prints that are targeted by the various chemical methods.
- Understand factors that can affect latent prints.
    - Ex.: Transfer conditions, substrate, and environmental
- Understand the proper sequencing of techniques.
- Understand proper evidence handling.
- Become familiar with the SDPD laboratory equipment (cameras, scanners, and printers).

LECTURE: Processing

1. Nonporous: a. Powders b. Cyanoacrylate Ester c. Dye Stains
2. Porous: a. Ninhydrin b. DFO c. Physical Developer d. Silver Nitrate
3. Bloody Impressions:
    a. Amido Black/Coomassie/DAB/Leucocrystal Violet
    b. DFO/Ninhydrin
4. Adhesive Surfaces:
    a. Sticky Side Powder
    b. WETWOP
    c. Gentian Violet
5. Textured Surfaces: Mikrosil
6. Wet/Greasy Surfaces:
    a. Small Particle Reagent
    b. Sudan Black
    c. Physical Developer
7. Light Sources: ALS

REQUIRED READING

- CH. 7 The Fingerprint Source Book.
- Triplett, Latent Print Recovery

Conditions. PRACTICAL ASSIGNMENT

EXAMINATION

MODULE G: FORGERY AND FABRICATION

OBJECTIVES:

- Understand the Forgery and Fabrication of latent prints, the different methods, and how an examiner can detect this unethical activity.

LECTURE: PowerPoint Presentation

REQUIRED READING

- Wertheim, Detection of Forged and Fabricated Latent

Prints. PRACTICAL ASSIGNMENT

WRITTEN EXAMINATION

MODULE H: DIGITAL PROCESSING/ADOBE PHOTOSHOP

OBJECTIVES:

- Become familiar with basic and advanced functions in Adobe Photoshop.
- Understand the policies and procedures for digital capture, storage, retrieval, display, and transmission of latent print images retained as evidence.
- Understand how to choose digital processing techniques based on the type of latent print image examined.
- Understand the importance of image quality, image integrity, and required casework documentation of latent print images that have been digitally processed in Adobe Photoshop.

LECTURE:

1. Original vs Working Images
    a. Importing images
    b. Image Size/Resolution/File Format
        1) Upsizing vs downsizing
        2) Resolution &Resolution for AFIS Entry
        3) File Formats-TIFF/RAW
2. Calibrating 1:1 Images

3. Using Layers
4. Adjustments
    a. Rotating
    b. Cropping
    c. Contrast (shadow/highlights & levels)
    d. Black & White
    e. Color Channels
    f. Invert
5. Processing Techniques:
    a. Calculations
    b. Using Actions (Automated Processing Techniques
6. Fast Fourier Transform (FFT)
    a. Printing out the Adobe Photoshop History Log
7. Using "ACE-V" in Adobe
    a. Marking friction ridge detail
    b. Tracing ridges
    c. "Zoning Out" Distortion
    d. Tile images side-by-side
    e. Note pages using Adobe Photoshop/Power Point/Bridge

REQUIRED READING

- SWGFAST Document #6 Standard for Friction Ridge Impression Digital Imaging

PRACTICAL ASSIGNMENT

- Process an image in Adobe Photoshop using various techniques; Process an image in Abode Photoshop using Fast Fourier Transform and Actions.

EXAMINATION

MODULE I: ACE-V and DOCUMENTATION

OBJECTIVES:

- Understand the philosophy of friction ridge identification.
- Learn how to efficiently determine anatomical origin of friction ridge impressions based on shape of the impression, ridge flow, and crease patterns.
- Understand the elements of analysis, including first, second and third level detail, threshold for suitability for comparison, exclusion, computer search.
- Understand the mechanics of touch and recognizing distortion.
- Understand variation in appearance in latent prints from the same source skin.
- Understand the comparison process.
- Understand the evaluation phase of the process.
- Understand how to properly document results and write reports

LECTURE:

1. ANALYSIS, COMPARISON, EVALUATION AND VERIFICATION OF FRICTION RIDGE SKIN IDENTIFICATION

   - Analysis
     a. Appearance of latent impressions (orientation and ridge flow)
     b. Levels of detail
     c. Quantitative/qualitative information
     d. Distortion Factors
     e. Effects of processing (distortion, tonal/lateral reversal)
     f. Suitability criteria (ALPS, Non-ALPS, No Value)

   - Comparison
     a. Search clues
     b. Target areas
     c. Focal points
     d. No minimum number of characteristics
     e. Incipient ridges

   - Evaluation
     a. Identification
     b. Exclusion
     c. Inconclusive
     d. Incomplete

- Verification (Examiner Trainees)

  a. Different procedures and documentation for each conclusion
  b. Blind verifications

- Annotating Evidence
  a. Marking of lifts, photographs, images, CDs, and DVDs

3. DOCUMENTATION, NOTES, AND REPORTS
   - Note packets
     a. Required elements
        - Scans/copies of all evidence physically examined
        - Chain of custody form
        - Reviewer initials – when/where
     b. Worksheets
     c. Comparison matrix
     d. Analysis images
     e. Case management cover sheet
     f. Technical and administrative reviews
     g. Conflict resolution and documentation
   - Reports
     a. Required elements
        - Header information
        - Description of evidence examined
        - Type of examination was performed
        - Conclusions
        - Initials of technical and administrative reviewers

REQUIRED READING:

- SWGFAST – *Standards for Examining Friction Ridge Impressions and Resulting Conclusions (Latent/Tenprint)*
- CH. 9 The Fingerprint Source Book.

PRACTICAL ASSIGNMENTS:

EXAMINATION:

MODULE J: AFIS AND DOCUMENTATION

OBJECTIVES:

- Understand the historical development of AFIS
- Understand the basic operations of AFIS
- Understand the SDPD search criteria for entering latent prints
- Learn how to search latent prints through various AFIS databases (local and FBI)
- Understand how to properly document AFIS cases and write reports

LECTURE:

1. COGENT SYSTEM
    a. CAFIS equipment/history and overview
    b. Search criteria
    c. LT/PL enrollment (demographics)
    d. Transaction queue
    e. Search options (finger and palm)
        - Other: FBI palms/ Finger Segments/ Side of thumb as a palm
    f. Retrieve candidates list for LT/PL and FBI Candidates list
    g. Searching other databases (DOJ and FBI CABIS Searches)
    h. Exemplar retrieval (local/DOJ/FBI)
    i. Registration/Deletion
    j. TLI
    k. Data Sets
        - Create from known exemplars
        - Importing images
        - Create from archives
    l. Cogent DVD/CD
    m. Enhancement Tools
    n. Printouts
    o. Quality Assurance

2. DOCUMENTATION, NOTES, AND REPORTS
    - Note packets (Refer to ACE-V module)
    - Cogent/ALPS printouts

REQUIRED READING:

- Cogent manual

- CH. 6 The Fingerprint Source Book.

PRACTICAL ASSIGNMENTS:

EXAMINATION:

MODULE K: LEGAL ISSUES AND EXPERT TESTIMONY

OBJECTIVES:

- Understand the Federal Rules of Evidence (FRE)
- Understand the Frye Standard, *Frye v. US* 1923.
- Understand the impact of *Daubert v. Merrell Dow Pharmaceuticals* 1993, *General Electric Co. v. Joiner* 1997, and *Khumo Tire v. Carmichael* 1999 on expert testimony.
- Understand the basis of criticisms of the latent print discipline and other forensic sciences.
- Learn the different court systems in which laboratory employees can testify to (superior, federal, etc…).
- Understand how discovery motions, court orders, and outside experts are handled by the SDPD Crime Laboratory.
- Courtroom etiquette
- Courtroom appearance and attire
- Learn how to prepare a demonstrative court exhibit.
- Understand Voir dire
- Learn how to present qualifications, present the basis and method of latent print examination, introduce evidence, present conclusions, and articulate the basis for conclusions.
- Be able to articulate laboratory accreditation standards and quality assurance policies and procedures.
- Be able to articulate general lab policies and procedures.

LECTURE:

1. PREPARATION FOR COURT TESTIMONY
    - Jury's perception
    - Research current issues (Daubert, NAS report, error rates)
    - Oral preparation prior to court (pre-trial conference)
2. PREPARING COURT EXHIBITS
    - Purpose
    - Creating a PowerPoint
3. PREPARE QUESTIONS AND ANSWERS FOR EXPERT TESTIMONY
    - Voir dire
    - Basic scientific principles
    - Defense questions

4. DISCUSS AND DEMONSTRATE EXPERT WITNESS TESTIMONY
    - Court room etiquette
    - Communication with prosecutors and defense attorneys
    - Audio/video recording of testimony
    - Discuss and review testimony

REQUIRED READING**:**

- Vanderkolk, CH. 1 Objectivity-Subjectivity.
- National Academy of Sciences. Strengthening Forensic Science in the United States: A Path Forward. National Academies Press 2009.

PREPARATION FOR MOOT COURT

MOOT COURT

MODULE L: SUPERVISED (CO SIGNED) CASEWORK

OBJECTIVES:

- AIDE Trainees: Demonstrate the ability to perform independent casework
    - Including all applicable conclusions to the latent print discipline (i.e., ALPS, Non- ALPS, No Value)

- EXAMINER Trainees: Demonstrate competency in all aspects of latent print casework (ALPS and MANUAL).
- EXAMINER Trainees: Demonstrate the ability to perform independent casework
    - Including all applicable conclusions to the latent print discipline (i.e., No value, Non-ALPS, ALPS, identification, inconclusive, and exclusion)

REQUIRED READING LIST

- **Ashbaugh**, Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology.
- **Cowger**, Friction Ridge Skin: Comparison and Identification of Fingerprints.
- **Cummins & Midlo,** Fingerprints, Palms, and Soles.
- **FBI**, The Science of Fingerprints: Classification and Uses.
- **NIJ**, The Fingerprint Source Book.
- **NIJ,** Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach.

Recommended Courses:

Alice Maceo

"Analysis of Distortion in Latent Prints," Alice Forensics

Jamie Bush

"Palm Print Comparison Techniques," Ron Smith & Associates

Ron Smith and Associates

"Ridgeology"

ADDITIONAL READING BY SECTION

MODULE B: HISTORY

- A fingerprint fable, Will and William West case.
- Cummins & Midlo, History.
- Faulds, Nature - On the Identification of Habitual Criminals by Finger-prints.
- Faulds, Nature - On the Skin-furrows of the Hand.
- Galton, Nature - Finger Print Evidence.
- Galton, Nature - Identification.
- Galton, Nature - Method of Indexing Finger Marks.
- Galton, Nature - Patterns in Thumb and Finger Marks.
- Herschel, Nature - Skin Furrows of the Hand.
- Moenssens, CH. 1 Fingerprint Techniques.

MODULE C: FRICTION RIDGE SKIN FUNDAMENTALS AND FORMATION

- Ashbaugh, Premises of Friction Ridge Identification, Clarity, and the Identification Process.
- Babler, Embryologic Development of Epidermal Ridges and Their Configurations.
- Babler, Prenatal Origins of Human Variation in Friction Ridge (Presentation).
- Maceo & Wertheim, Critical Stage of Friction Ridge and Patter Formation.

- Maceo & Wertheim, Friction Ridge and Pattern Formation Presentation.
- Maceo, Analysis of Distortion in Latent Prints.
- Swofford, Ontogeny of Friction Ridge – Explanation of Epidermal Ridge Development.
- Maceo, Alice. *Palm Prints*. 2013
- Ashbaugh, Palmar Flexion Crease Identification.
- Cowger, Palm Prints and Sole Prints.
- Johnson, Ridge Flow of the Feet.
- Ron Smith Palms Class.

MODULE D: HUMAN FACTORS

- Budowle, Bruce; et.al. A perspective on errors, bias, and interpretation in the forensic sciences and direction for continued advancement. JFS July 2009 54(4):798-809.
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- Busey, Tom and Vanderkolk, John. *Behavioral and electrophysiological evidence for configural processing in fingerprint experts.* Vision Research 45:431-448, 2005.

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- Langenburg, Glenn. *Pilot Study: A statistical analysis of the ACE-V methodology – Analysis stage*. JFI 45(1):64-79, 2004.
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- Reason, James. Human Error. Cambridge University Press, 2006.
- Schiffer, Beatrice and Champod, Chrisophe. *The potential (negative) influence of*

observational biases at the analysis stage of fingermark individualization. Forensic Science International, 2006.
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- Stacey, Robert. *A report on the erroneous fingerprint individualization in the Madrid train bombing case.* JFI 54(6):706-718, 2004.
- Tangen, Jason; Thompson, Matthew; and McCarthy, Duncan. *Identifying Fingerprint Expertise*. Psychological Science 2011 22(8): 995-997 doi:10.1177/0956797611414729
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- Ulery, Bradford; Hicklin, Austin; Buscaglia, JoAnn; and Roberts, Antonia Maria. *Accuracy and Reliability of forensic latent fingerprint decisions*. PNAS 2011 doi:10.1073/pnas.1018707108
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MODULE E: PRINT EXEMPLARS

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- Wertheim, Pat. *Inked Major Case Prints*, JFI
- FBI. *Proper procedures for taking Major Case Prints*

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- Tuthill, Life of a Latent Impression.
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MODULE G: FORGERY AND FABRICATION

- Wertheim, Integrity Assurance.
- Wertheim, Latent Fingerprint Fabrication.

MODULE H: DIGITAL PROCESSING/ADOBE PHOTOSHOP

- SWGFAST Document #6, Standard for Friction Ridge Impression Digital Imaging
- Foray Technologies, "Calibrating Your Images"
- Foray Technologies, "Image Processing Guidelines"
- Adobe, "Image Size and Resolution"
- Photoshop Essentials, "Image Resolution and Print Quality"
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