

AUSTIN POLICE DEPARTMENT
FORENSIC SCIENCE DIVISION
LATENT PRINT SECTION
AFIS TRAINING MANUAL

TABLE OF CONTENTS

Preface

Overview of Training Program

Chapter 1: Introduction to the Latent Print Section

Chapter 2: Ethics and Professionalism

Chapter 3: Introduction to the Science of Fingerprints

Chapter 4: Basic Friction Ridge Comparison

Chapter 5: AFIS Operations and Procedures

Chapter 6: Basic Image Enhancement

Chapter 7: Courtroom Testimony

Final: Moot Court and Written Examination

Preface

Purpose

To define minimum topics and critical tasks for AFIS Technician training. This program is designed to train AFIS Technicians assigned to support the discipline of latent print examinations with the Austin Police Department Forensic Science Division. Trainees will be instructed in the science of fingerprints dealing with Interpretation, Local AFIS, Image Enhancement, and Testimony by learning the application of proper techniques and procedures. Other areas of instruction include those topics that would assist the AFIS Technician in the performance of their duties with the Austin Police Department. Successful completion of this training program results in a AFIS Technician who is technically proficient in evaluating, enhancing, and searching latent prints in AFIS systems, as well as providing expert testimony in court.

Responsibility

The Latent Print Section Supervisor will supervise the maintenance of this training document. Revisions to this document are subject to the approval of Management.

Hours

This training manual encompasses 220 hours of training time. The total hours devoted to this program are dependent on the progress of the trainee.

| | |
|---|--|
| LP APFIS Training Manual Effective Date: October 1, 2014 | Approved by Laboratory Director Printed Copies are not Controlled Page 1 of 12 |
|---|--|

Overview of Training Program

This training program is designed to prepare the student to perform the duties of an APFIS Technician with the Austin Police Latent Print Section, and includes the following areas of instruction:

| Chapters | Course of Instruction | Approximate Hours Required |
|-----------------|---|-----------------------------------|
| 1 | Introduction to the Latent Print Section | 40 |
| 2 | Ethics and Professionalism | 10 |
| 3 | Introduction to the Science of Fingerprints | 20 |
| 4 | Basic Friction Ridge Comparison | 40 |
| 5 | AFIS Operations and Procedures | 40 |
| 6 | Basic Image Enhancement | 30 |
| 7 | Courtroom Testimony | 20 |
| Final | Moot Court and Written Examination | 20 |

This course listing does not preclude the instructor from adding other pertinent topics as may be applicable and/or related to the science of fingerprints, forensic science and the criminal justice system. The LPS supervisor must approve additional course or topics.

Blocks of instruction may be segmented as may be necessary for optimal understanding of the subjects and concepts presented. All courses will be supplemented by required readings, group discussion, independent and direct study, practical exercises, or research (or any combination thereof).

Although the student's primary interaction will be with the assigned instructor, this course of study promotes and encourages discussion with other experienced analysts and practitioners.

Chapter 1: Introduction to the Latent Print Section

1. TRAINING HOURS: Forty (40)
2. TRAINING OBJECTIVES: The trainee will attain:
 - A. An understanding of the mission and operation in effect for the City of Austin and the Austin Police Department.
 - B. An understanding of the mission and standard operating procedures in effect for the Forensic Science Division and specifically the Latent Print Section.
 - C. An introduction to the training program for an AFIS Technician.
 - D. An introduction to the records and forms as used by the Latent Print Section.
 - E. An introduction to the library and available reference material.
 - F. An understanding of the existence of federal, state, local criminal and civil fingerprint files.
3. TRAINING OUTLINE:
 - A. City of Austin Policies and Forms
 - B. Austin Police Department Policies and Forms
 - C. Forensic Science Division Procedures and Forms
 - D. Latent Print Section Procedures and Forms
 - E. APFIS Technician Training Program
4. REQUIRED READING:
 - A. City of Austin Personnel Policies, Public Drive
 - B. Austin Police Department Policy Manual Public Drive
 - C. Forensic Science Division SOP LIMS
 - D. Latent Print Section SOP LIMS
 - E. Latent Print Section Technical Manual LIMS
5. TRAINING STANDARD:
 - A. The trainee must pass an open-book test.

Chapter 2: Ethics and Professionalism

1. TRAINING HOURS: Ten (10)
2. TRAINING OBJECTIVES: The trainee will attain:
 - A. An understanding of the role and purpose of ISO, ASCLD and ASCLD/LAB.
 - B. An understanding of the role of membership in professional organizations
 - C. An understanding of ethics in Forensic Science.
 - D. An understanding of the importance of continuing education.

3. TRAINING OUTLINE:

- A. Professional Organizations (i.e. IAI, TDIAI, SWAFS, AAFS)
 - 1. Participation
 - 2. Purpose
- B. Codes of Ethics and Professional Conduct
 - 1. Forensic Science Division
 - 2. Latent Print Section
 - 3. IAI
 - 4. TDIAI
 - 5. SWGFAST
- C. Accreditation – Laboratory Quality Assurance Standards
 - 1. American Society of Crime Lab Directors (ASCLD)
 - 2. American Society of Crime Lab Directors / Laboratory Accreditation Board (ASCLD/LAB)
 - 3. International Organization for Standardization (ISO)
- D. Ethics – Rules or Standards Governing the Conduct of the Members of a Profession
 - 1. Abide by the Spirit and Intent of the Law
 - 2. Do Not Fabricate or Falsify Evidence or Reports
 - 3. Treat Everyone with Respect
 - 4. Follow Department Rules and Regulation
 - 5. Do Not Use Position for Personal Gain
- E. Continuing Education
 - 1. Attending Educational Conferences
 - 2. Attending Classes Offered by Other Agencies (i.e. FBI, DPS)
 - 3. Keeping Abreast of Current Issues and Relevant Court Cases
 - a. Journal of Forensic Science
 - b. Journal for Forensic Identification
 - c. Web Sites (i.e. CLPEX, ONIN)
 - 4. Reading Books and Articles

4. REQUIRED READING:

- A. Ethics and the Practice of Forensic Science, Bowen Chapter 5
- B. Fingerprint Identification, Leo Chapter 1
- C. Handout: *About ASCLD/LAB*
- D. Handout: *Cult of the Mediocre*
- E. Handout: *Confirmation Bias, Ethics . . .*
- F. Handout: *Ethics in Forensic Science*

5. TRAINING PRACTICAL:

None

6. TRAINING STANDARD:

None

Chapter 3: Introduction to the Science of Fingerprints

1. TRAINING HOURS: Twenty (20)
2. TRAINING OBJECTIVES: The trainee will attain:
 - A. An understanding on early methods of personal identification.
 - B. An understanding of the formation of friction ridges.
 - C. An understanding of the scientific observations leading to modern fingerprint identification.
 - D. An understanding of the chronology of fingerprints.
 - E. An understanding of the terminology used in the science of fingerprints.
 - F. An understanding of the premises of friction ridge identification.
3. TRAINING OUTLINE:
 - A. Personal Identification Methods and Their Uses
 1. Early Non Scientific Methods
 2. Scientific Methods Other Than Fingerprints
 - B. Formation and Physiology of Friction Ridge Skin
 - C. History of the Science of Fingerprints
 1. Pre - Christian Era
 2. Post - Christian Era
 3. 1600 to 1800
 4. 1800 to 1900
 5. 1900 to Present
 - D. Science of Fingerprint Terminology
4. REQUIRED READING:
 - A. Q&Q Friction Ridge Analysis, Ashbaugh Chapters 2, 3
 - B. Fingerprint Techniques, Moenssens Chapters 1, 2
 - C. Advances in Fingerprint Technology, Gaensslen, Lee Chapter 1(2nd Edition)
 - D. Fingerprint Source Book, NIJ Chapters 2, 3
 - E. Handout: *The Critical Stage . . .*
 - F. Handout: *Loss of Ridged Skin Before Birth*
 - G. Handout: *The History of Fingerprints*
 - H. Handout: *The Family who Brought . . .*
5. TRAINING STANDARD:
 - A. The trainee must pass a written test.

Chapter 4: Basic Friction Ridge Comparison

1. TRAINING HOURS: Forty (40)
2. TRAINING OBJECTIVES: The trainee will attain:
 - A. The basic skills necessary for comparing inked and latent friction ridge detail.
 - B. The use of friction ridge flow and characteristics to determine identity or non-identity.
 - C. Understanding of how to use ridge flow and search clues to orient prints for searching
 - D. The basic concept of friction ridge quality.
 - E. An understanding of what constitutes a valid identification.
 - F. Knowledge of key terms used in friction ridge comparison.
3. TRAINING OUTLINE:
 - A. The Use of Ridge Flow (Patterns)
 - B. Friction Ridge Characteristics
 1. Ending Ridge
 2. Bifurcation
 3. Dot
 - C. Natural Breaks in Friction Ridge Flow
 - D. Sufficiency in Detail to Establish Identity
 - E. Consultation in Difficult Prints
4. REQUIRED READING:
 - A. Scott's Fingerprint Mechanics, Olsen Sr. Chapter 1
 - B. Fingerprint Techniques, Moenssens Pgs. 252-270
 - C. Fingerprint Source Book, NIJ Chapter 9
 - D. Handout: *An Analysis of Standards* . . .
 - E. Handout: *Friction Ridge Characteristics* . . .
5. EXERCISES:
 - A. Inked to Inked 90 Singles
 - B. 1 to 5 Match 85 Sets
 - C. 1 to 5 Match 30 Sets
 - D. Full Pattern (B 1-20)
 - E. Delta Pattern (B 1-20)
 - F. Palm Print Exercise
 - G. 3 Selected Latent Print Comparison Exercises
6. TRAINING STANDARD:
 - A. The trainee must satisfactorily complete all practical exercises.

Chapter 5: AFIS Procedures / Operations

1. TRAINING HOURS: Forty (40)
2. TRAINING OBJECTIVES: The trainee will attain:
 - A. An understanding of the history of AFIS.
 - B. The operational procedures for local AFIS database.
 - C. An understanding of direct entry latent inquiries.
 - D. The aspects of on screen comparison.
 - E. The operational procedures for hit and non-hits.
 - F. The aspects of the unsolved latent database.
 - G. An understanding of the database maintenance.
 - H. General knowledge of automated classification systems.
 - I. An understanding of other biometric systems.
 - J. Live scan technology and how it differs from other method of recording fingerprints.
3. GENERAL TRAINING OUTLINE:
 - A. The History and Science behind AFIS
 - B. Different Types of Searches Performed
 - C. AFIS Operations (local)
 1. Maintaining Chain of Custody
 2. Determining Suitability
 3. Marking Latent for Entry
 4. Documentation in Appropriate Databases
 5. Latent Print Entry
 - a. Level of Case Determines Priority and Logical Search Progression
 - b. Importing Images From CD Into CAFIS
 6. Latent Print Editing
 7. Setting Search Parameters
 8. Viewing Candidate List
 9. Documentation of Hits
 - D. Database Maintenance
 1. Deleting Latent Prints That Have Been Identified or the Statues Have Expired
 2. When to Register in the Unsolved Latent Database
 - E. Retrieval of Known Standards
 - F. Compatibility Issues
 - G. How Live Scan Works
 - H. Electronic Transmission Standards (NIST)
 - I. Equipment Maintenance and Calibration
4. REQUIRED READING:
 - A. AFIS (Komarinski book)
 - B. Advances in Fingerprint Technology, Lee, Gaensslen
 - C. Fingerprint Source Book, NIJ
 - D. Article: *The Effect of Friction Ridge Skin Growth . . .*
 - E. Article: *Rethinking the Unsolved Latent File*

Chapters 1 - 6 & 8
Chapter 8 (2nd Edition)
Chapter 6

7. TRAINING PRACTICALS:

- A. 4 Selected CAFIS Proficiency Tests

8. TRAINING STANDARD:

- A. The trainee must satisfactorily complete all practical exercises.
- B. The trainee must satisfactorily pass a written test.

Chapter 6 Basic Image Enhancement

TRAINING HOURS: Twenty (20)

TRAINING OBJECTIVES: The trainee will attain:

- A. An overview of Photoshop software and its uses in Forensic work
- B. An overview of the nature of digital imaging and enhancement
- C. An understanding of how to adjust tonal values in a digital image
- D. An understanding of how to manipulate color to improve latent visualization
- E. Knowledge of how to calibrate a digital image to actual size
- F. Knowledge of how to create a digital contact sheet
- G. An understanding of how to set up the History Log in Photoshop
- H. Knowledge of how to set up and use actions within Photoshop
- I. An overview of court decisions involving Image Enhancement

TRAINING OUTLINE:

- A. Photoshop tools used in Latent Print work
 - a. Move and Hand tools
 - b. Tools for adjusting tonal values
 - i. Brightness and Contrast
 - ii. Levels
 - iii. Curves
 - iv. Dodge and Burn
 - b. Selection tools
 - i. Marquee tool
 - ii. Lasso and Magnetic Lasso tool
 - iii. Magic Wand tool
 - iv. Cropping tool
 - c. Eyedropper tool
 - i. ruler
 - d. Pencil
 - i. Selecting Size/Shape/Hardness/Color
 - e. Eraser tool
 - f. Paint Bucket
 - g. Blur/Sharpen/Smudge
 - h. Type Tool
 - i. Zoom Tool

- B. Filters used in Latent Print work
 - a. Sharpen
- C. Image Adjustments
 - a. Channel Mixer
 - b. Black and White adjustment
 - c. Invert color
- D. Image Sizing and Rotation
 - a. Resolution
 - b. Constrain Proportions
 - c. Image Interpolation
 - d. Resizing the Canvas
 - e. Transform and Free Transform
- E. Color Modes and Bit Depth
 - a. Grayscale
 - b. RGB
 - c. Indexed Color
 - d. CMYK
 - e. 8 bit and 16 bit
- F. Working with Layers
- G. Histogram
- H. Image History
- I. Creating and Using Actions and Action Sets
- J. Image Formats
 - a. Lossy vs. Lossless
 - b. Joint Photographic Experts Group (JPG)
 - c. Tagged Image File Format (TIFF)
 - d. Photoshop (PSD)
 - e. Raw
 - f. GIF
 - g. BMP (Bitmap)
- K. Calibration Steps for Images
- L. Documenting Image Enhancement Steps
- M. The SWGIT group documents
- N. Preparing Images for AFIS searching
- O. Documenting Analysis of Images
- P. Court Cases Involving Image Enhancement
 - a. Florida v. Reyes, 2002
 - b. California v. Jackson, 1995
 - c. Washington State v. Hayden, 1995
- Q. Preparing a Digital Contact Sheet using CSX script

REQUIRED READING:

- A. Handout: How to Calibrate an Image
- B. Handout: How to Create Actions in Photoshop
- C. Handout: How to Set Up the History Log in Photoshop
- D. Article: *Using Levels to Adjust Image Contrast*
- E. Article: *Using Curves for Precise Contrast Adjustment*
- F. Article: *Better Brightness and Contrast . . .*
- G. Article: *New & Improved Curves . . .*

- H. Article: . . . *Photoshop Black and White Adjustments*
- I. Article: *Admissibility in Court (Reis)*
- J. Article: *Legal Ramifications of Digital Imaging in Law Enforcement*
- K. Trial Memo: California vs. Phillip Lee Jacicson

PRACTICAL EXERCISES:

- A. Improving Tonal Quality Exercise
- B. Color Handling Exercise
- C. Selective Area Exercise
- D. Image Calibration Exercise
- E. Preparing a Contact Sheet

TRAINING STANDARD:

The student must complete all practical exercises.
The student must successfully pass a written test.

Chapter 7 Court Testimony

1. TRAINING HOURS: Twenty (20)

2. TRAINING OBJECTIVES: The trainee will attain:

- A. An introduction to courtroom demeanor.
- B. An introduction to the American court system; policy and procedure.
- C. An understanding of significant court cases.
- D. An understanding of the scientific admissibility of friction ridges.
- E. An understanding of the legal admissibility of evidence
- F. An understanding of the basic court terms and definitions.
- G. An understanding of proper case preparation prior to appearance in court.

3. TRAINING OUTLINE:

- A. The Criminal Justice System
 - 1. Municipal Courts
 - 2. County Courts
 - 3. Grand Juries
 - 4. State District Court
 - 5. Federal Court
- B. Notification
 - 1. Subpoena
 - 2. By the Witness Office
- C. Preparation
 - 1. Personal Appearance
 - 2. Pre-Trial Conference When Possible
 - 3. Preparation for Testimony
 - a. CV

- b. Qualifying Questions
 - 4. Review the Courtroom
- D. Custody and Control of Evidence
- E. Introduction of Evidence
- F. Courtroom Procedures
 - 1. Voir Dire (Qualifying the Expert)
 - 2. Direct Examination (Prosecution)
 - 3. Cross Examination (Defense)
 - 4. Re-Direct and Re-Cross
- G. General Rules of the Court
 - 1. Taking the Oath
 - 2. Invoking the Rule
 - 3. Objections
 - a. Sustained
 - b. Overruled
 - 4. Referring to Notes
 - 5. Directing Responses
 - 6. Ultimate Issue
 - 7. Being Excused From the Stand
 - 8. Guilt or Innocence Phase
 - 9. Punishment Phase (Pen Packets)
- H. Defense Tactics
- I. Federal Rules of Evidence
- J. Relevant Court Cases
 - 1. Frye vs. United States (1923)
 - 2. Daubert vs. Merrell Dow (1993)
 - 3. General Electric vs. Joiner (1997)
 - 4. Kumho Tire vs. Carmichael (1999)
 - 5. United States vs. Mitchell (2001)

4. REQUIRED READING:

- A. Effective Expert Witnessing, Matson, Daou, Soper
- B. Advances in Fingerprint Technology, Lee/Gaensslen
- C. Fingerprint Source Book, NIJ
- D. Article: *Defending Against the Critic's Curse*
- E. Article: *The Justice System . . .*
- F. Handout: Introduction of Latent Evidence (Questions)
- G. Article: *Non-Verbal Elements of Courtroom Demeanor*
- H. Handout: The Daubert Card (from CLPEX.com)
- I. Article: *Stop and Think about Fingerprint Charts*
- J. Article: *The Forensic Science is Challenged*
- K. Article: *Landmark Decisions . . . Friction Skin Identification*
- L. Article: *Rebutting the "No Fingerprint" Defense*
- M. Article: *Lifetime of a Latent Print. How Long? Can You Tell?*

Chapters 1-7
 Chapter 10 (2nd Ed)
 Chapters 13 & 14

6. TRAINING PRACTICAL:

- A. Preparation of direct examination questions.
- B. Participation in an internal mock court scenario.

7. TRAINING STANDARD:

- A. Student must pass a written test.
- B. Student can view testimony by other examiners when possible.
- C. Student must have acceptable performance in the mock court.

Final: Moot Court and Written Examination

1. TRAINING HOURS: Twenty (20)

2. TRAINING PRACTICAL:

- A. The moot court will consist of a case worked during training.
- B. The final examination will consist of all aspects that have been covered during training.

3. TRAINING STANDARD:

- A. Upon successful completion of practical, moot court and final examination the trainee will be released for independent case work.