

Standard Operating Procedures for Digital Images

1 Scope

Digital capture is used for the true and accurate recording of images, such as latent prints and known prints, while digital processing is used to improve the quality of friction ridge print images in a controlled and repeatable manner.

This document addresses the capture, processing, output, storage, and security of digital images for friction ridge print examination. Requirements for digital images/processing in the Next Generation Identification System are documented in the FBI Friction Ridge Discipline Operations Manual, Standard Operating Procedures for the Next Generation Identification System.

These procedures apply to appropriate personnel in the Friction Ridge Discipline, Operational Projects Unit, and Evidence Management Unit who create and/or utilize digital images as part of their current position, have received the appropriate training, and are supporting Friction Ridge Discipline casework.

2 Equipment/Materials/Reagents

The Technology Development Program Manager or Latent Imaging Team Supervisor will ensure a list of the specific items of digital equipment and software used by the Latent Print Support Unit and the Latent Print Operations Unit will be maintained. The Huntsville Laboratory Manager will ensure that a list of those items maintained by the Scientific and Biometrics Analysis Unit will be retained. Evidence Management Unit and the Operational Projects Unit will retain equipment and software listings per their own requirements.

3 Requirements for Digital Images

3.1 Captured Friction Ridge Prints

Digital images of friction ridge prints captured by Friction Ridge Discipline, Operational Projects Unit, and Evidence Management Unit personnel in support of Friction Ridge Discipline casework must include (documentation may be in written or electronic format):

1. Documentation of image source (e.g., item number, known card, substrate).
2. Documentation of capture device (e.g., scanner, digital camera).

3. Documentation indicating the image or photograph is an original capture, either through documentation in the case record or through the file metadata.

The following file properties, recorded through documentation in the case record or by the file metadata, are strongly recommended; however, not meeting these recommendations does not render the image unusable for examinations.

- A file format without compression or with lossless compression (e.g., RAW, TIFF) or with WSQ compression saved at a maximum of 15:1. JPEG 2000 will be accepted only with additional documentation in the case record that ensures the file is without compression or with lossless compression.
- A minimum of 8 bits per channel (8 bit for grayscale images and 24 bit for RGB color images).
- A resolution that meets or exceeds 1000 ppi when scaled to actual size (1:1) for latent prints and non-standard intentionally recorded prints
- A resolution that meets or exceeds 500 ppi when scaled to actual size (1:1) for standard intentionally recorded prints.

All images should be viewed to confirm the information is sufficient for examinations and prints recaptured, if possible.

3.2 Images of Friction Ridge Prints Submitted to the FBI Laboratory

Personnel will refer to the FBI Friction Ridge Discipline Quality Assurance Manual, Procedures for Case Acceptance for submitted digital evidence.

3.3 Requirements for Digital Images of Object Shots Captured in the Laboratory

Object shots of items that require a questioned document examination must be captured at a minimum resolution of 400 ppi when scaled to actual size (1:1), and the captured image must contain a scale. When requesting capture by forensic imaging personnel, a resolution of 400 ppi or higher must be specifically asked for by the requestor. All other object shots may be captured in the manner best suited for the object in question.

3.4 Requirements for Digital Image Processing

The original image will remain unaltered. A working copy of the original image will be created and used for digital processing to preserve the integrity of the original image. Digital image processing must not misrepresent nor compromise the integrity of the friction ridge print information contained in the original image. Digital image processes that cannot be used on a working image include, but are not limited to:

- Cloning/Healing tools
- Airbrush
- Paintbrush

- Paint bucket
- Eraser
- Vector based tools
- Filters (except Chromatic FFT/Calibration)
- File format conversion involving a lossy compression (e.g., TIFF to JPEG)

Dodge/burn may be used but must not isolate less than five ridges or be applied in the direction of the ridge flow.

Reversing the color and reversing the position are considered digital processing and must be tracked in the digital history. Scaling is not considered a digital process.

In addition to the approved Photoshop image processing tools, only Approved Photoshop Actions can be used from the Actions menu. Actions may not be altered.

3.5 Requirements for Image Output

An output device must be capable of producing a visually accurate representation of the input image. Unless materials are not available, images will be printed on glossy or photo-quality paper.

As necessary, personnel may reduce the resolution in order to produce an image of sufficient file size to be printed on digital printers. The re-scaled image is not required to be retained and personnel are not required to record the action in the case record. Any retained re-scaled image files must be clearly marked as such and used only for printing.

Personnel will utilize a printing method that produces the best quality images (e.g., printing latent prints directly from the printer at the Quantico site versus printing over the network).

3.6 Requirements for Digital Image Retention Systems

All digital imaging casework will be conducted in the appropriate digital image retention system as designated by management. Exceptions include work conducted in the Next Generation Identification System or situations listed in Section 3.7 through Section 3.7.2. The digital image retention system is considered a part of the case record and all work performed within the system will follow the guidelines below:

- System case identifier must be associated with submission and recorded in the case record.
- All images should be directly captured into the system. Images unable to be captured directly will be imported into the digital image retention system without additional change or alteration from original capture.
- Original image(s), all final processed image(s), and digital history must be retained.

- All work conducted in the system must be performed under the individual's login and clearly associated with the appropriate individual.
- Each image must be associated with its respective item identifier (if assigned).
- Captured images that are not to be used for examination (i.e. retained test image) will be so designated.

3.6.1 Image Deletion in Digital Image Retention System

Images will not be deleted from a digital image retention system. However, situations may arise that necessitate the removal of one or more images from the system (e.g. system errors, classification, or personnel oversight) for clarity or continuity.

Prior to deletion, personnel will attempt to confirm the image and any available asset information are retained or recaptured in the case record. A notation will be included in the digital image retention system case that states why the image was deleted, who performed the deletion, and when the image was deleted. If the presence of the image or asset information is unable to be confirmed in the case record, a notation will be added to the digital image retention system case.

3.7 Conducting Work Outside the Digital Image Retention System

Digital imaging casework may be conducted outside of the system in specific situations. See Section 3.7.1 if the system is temporarily unavailable or the work is related to a Consensus Panel, or Section 3.7.2 if the digital image retention system cannot be used at all for capture and/or processing.

3.7.1 Requirements for When the Digital Image Retention System is Temporarily Unavailable or for Work Conducted for a Consensus Panel

The system may be temporarily unavailable due to issues with the location or the system itself, or a Consensus Panel is active and shall work outside the system to limit contextual information. A notation will be added to the case record indicating the system is unavailable and why unless associated with a Consensus Panel. The original file, final processed file, and the digital processing history (either digitally or through written documentation) will be retained. File names will be associated with the Laboratory number. Original and processed files must be clearly distinguishable and easily connected to each other. Information will be temporarily retained on digital media or stored on a drive. The temporary storage is not considered the final record.

Any retained digital images and history must be imported into the appropriate digital image retention system once the system is restored or the Consensus Panel has concluded. Each image must be associated with its respective item identifier (if assigned). Examples of this include adding the item identifier to the asset name, digital image retention system notes or description, or by appropriately tagging the images. Captured images that do not meet a quality assurance check or otherwise should not be used for examination will have some designation that these

images will not be used for examination. Once the images have been successfully uploaded into the digital image retention system, any temporary digital media do not need to be retained in the case record. The case record must reflect the retention of images and disposal of temporary digital media, as appropriate.

3.7.2 Requirements for When the Digital Image Retention System Cannot be Used

Work cannot be conducted in the digital image retention system nor can images be imported to the system for certain case situations (e.g., classification issues, Foreign Intelligence Surveillance Act cases, some Confidential Human Source cases, and some Terrorist Explosive Device Analytical Center cases). In the event that a digital image must be captured and/or processed outside of the digital image retention system, the original file(s), final processed file(s), and the digital processing history (either digitally or through written documentation) will be retained in the case record. File names will be associated with the Laboratory number. Original and processed files must be clearly distinguishable and easily connected to each other.

Each image must be associated with its respective item identifier (if assigned). Examples of this include adding the item designation to the file name or retaining the images under a folder bearing the item designation. Captured images that do not meet a quality assurance check or otherwise should not be used for examination will have some designation that these images will not be used for examination.

In such situations where images will not be uploaded into the digital image retention system at any time, images and history will be recorded to digital media for retention in the physical case record. The digital media will be retained and personnel will note in the case record where the digital media is retained.

Personnel will refer to the appropriate documents to determine if secondary evidence is required.

3.7.3 Requirements for Image Storage on Digital Media

Any digital files retained in the physical case record must be recorded on digital media. Disc(s) or other media that can be finalized are preferred; however, circumstances may require the use of other forms of digital media. All digital media used must have some mechanism to prevent the addition to or changing of files after the initial recording session.

The user should view the image files from the digital media to ensure they were successfully recorded.

Retained digital media will be labeled with, at a minimum, the following information:

- Laboratory number(s)
- Date file(s) recorded to the digital media
- Classification level
- Handwritten initials of issuing examiner (if applicable)

- Handwritten initials of FBI Laboratory personnel responsible for the capture and/or the digital processing of the retained images..

A record of all item numbers stored on the retained digital media must be preserved in the case record. Personnel may write the item identifiers on the digital media, record the identifiers in the case notes, or retain a print out of the image files with the item identifiers. It must be clear which item identifiers are contained on which digital media.

Personnel may consolidate files to a smaller number of discs or other digital media, but no required images may be omitted. The creation of the new digital media and any disposal of the original digital media must be recorded in the case record, and all personnel who initialed the original digital media must initial the consolidated digital media containing their work. Personnel may also retain the original digital media. If the original digital media is retained, the handwritten initials of personnel responsible for the capture or processing are not needed on the final digital media.

3.8 Requirements for Discovery Requests or Testimony

Digital images used for demonstrative purposes in testimony must be true representations of the evidence. Illustrative aids (e.g., lines, letters, labels) may be applied to the image to demonstrate the Analysis, Comparison, and Evaluation process.

When a request is made for the examination records, the examiner must provide a copy of the images contained in the case record in addition to the digital processing history or digital assets of all images.

4 Procedures

4.1 Digital Images Submitted by a Contributor

4.1.1 Submitted Digital Files

The case record will contain a copy of every electronically submitted file that passes the virus scan (e.g., disc, email) or is retrieved from FBINET. Ideally, the files will be retained in the digital image retention system; however, other means are acceptable, such as retaining a copy of the images on digital media, in MorphoBIS, or in Sentinel. A hardcopy of the file will not meet the requirement. If the images were submitted by email, a copy of the email will be retained in the case record.

Images that will not be used for examination (e.g., object shots, duplicate images, non-evidentiary images) will be designated as such.

For each file submitted electronically, the case record will record the date or date range when the images were examined as well as who conducted the examination.

File names will be associated with the Laboratory number and original file name (folder names are acceptable). Original and processed files must be clearly distinguishable and easily connected to each other.

All work conducted in the digital image retention system must be performed under the individual's login to accurately record all activity associated with an image. All work must be clearly associated with the appropriate individual.

4.1.1.1 Submitted Images of Latent Prints and Non-Standard Intentionally Recorded Prints

When an examiner claims a print(s) on a submitted digital image, the original contributor file name of the image and original image source (e.g., "indicated to be from a car door"), if available, will be maintained in the case record (e.g., notes, Adams Web, or MorphoBIS). In the case record, each suitable for comparison print must be associated with an original file name.

When a submitted digital image is examined and does not contain a print(s) suitable for comparison, the analysis decision must be recorded in the case record.

4.1.1.2 Submitted Images of Standard Intentionally Recorded Prints

If all recordings of all fingers within the submitted image(s) of a standard intentionally recorded print(s) are not suitable for comparison, the analysis will be recorded in the case notes.

4.2 Digital Images Captured by Personnel Listed in Scope

All captured images will contain a verified scale or other measurable item as described in Section 5. Meeting the requirements for digital capture and/or processing will be the responsibility of the party capturing the image or conducting the digital processing. The Laboratory number, date, process (if applicable), and item identifier must be associated with each image, and, if possible, all information on an identification tag will be recorded. It is not necessary to maintain any exploratory images or test images in the case record.

When using the digital image retention system, if personnel determine that an image does not meet requirements or did not pass the quality assurance check, the image will be designated as such (includes both the original and any applicable digitally processed versions) in the case record.

For all captured images, the following must be contained in the case record:

- Copy of the original captured image
- Copy of the final processed image, if applicable

- Processing history, including date(s) of processing, if applicable
- Name of individual who captured the original image
- Name of individual(s) who conducted any digital processing
- Date the original image was captured

All actions must be clearly associated with the person who performed them.

4.2.1 Analysis/Comparison/Evaluation Work

Examiners may mark information on images in conjunction with any part of the Analysis, Comparison, and Evaluation process. If the examiner scans or captures a print(s), all captures must be through the digital image retention system. If the examiner uses existing digital images, any digital processing must occur through the digital image retention system and the additional digital processing will be retained. Images that cannot be retained in a digital retention system will be captured, processed and/or retained as detailed in Section 3.7 through Section 3.7.2.

Annotations made to document any part of the Analysis, Comparison, and Evaluation process are not considered digital processing; however, a record of final annotations must be retained in the case record. If annotations are retained within a digital image retention system or on digital media, all work must be clearly associated with the individual who performed it.

5 Identifier Tags or Scale Verification

Each batch of identifier tags received from the printing vendor will be measured against American National Standards Institute /National Institute of Standards and Technology rulers to ensure the accuracy of the size of the scale after printing. Tags on the first and last page, and at least every 500th sheet (full sheet or strip) will be measured. In capture systems where measured tags cannot be used, the system ruler will be measured against the ruler and recorded either in a log book or in the case notes. These measurements and quality checks will be tracked by the Standards and Practices Program Manager and the Huntsville Laboratory Manager.

Personnel must use measured or quality checked identifier tags or must verify the size of any tags they create using the American National Standards Institute /National Institute of Standards and Technology rulers. If a measurable item is used for a scale in images captured in the FBI Laboratory, the value for the measurable item must be taken with the rulers. These checks must be recorded in the case record.

6 Terrorist Analysis Group Known Standard Library

The Terrorist Analysis Group Known Standard Library consists of fingerprints and secondary biometrics, submitted to or obtained by the Latent Print Operations Unit, of individuals suspected of involvement in terrorist activities and/or major cases. The Terrorist Analysis Group

Known Standard Library is not considered an individual characteristic database or reference collection and is maintained by the Latent Print Operations Unit at the FBI Laboratory in Quantico. The Terrorist Analysis Group Known Standard Library currently consists of digital captures of the following known recordings: recordings taken by Friction Ridge Discipline personnel of persons of interest in major cases; originals, negatives, and/or copies of records that have been submitted to the Laboratory as part of a case; and composite records of identified known or latent prints. All records, with the exception of the composite records, contained in the Library are also retained in the Next Generation Identification System. The Terrorist Analysis Group Known Standard Library is an extension of the case record as long as the case notes clearly indicate that the records were retrieved from the Terrorist Analysis Group Known Standard Library.

6.1 Retention of Friction Ridge Recordings

The retention of records in the Terrorist Analysis Group Known Standard Library is at the discretion of the Major Case Coordinator.

6.1.1 Composite Records

Composite records will be generated from identified and verified prints from casework. For each print recording on a card, the card will list the lab number including relevant case record number where the print was identified and verified. The card will be filed under a Universal Control Number or other unique identifier.

6.1.2 Remaining Records

All remaining digital recordings within the Terrorist Analysis Group Known Standard Library have at least one unique number: Internment Serial Number, Universal Control Number, or legacy Integrated Automated Fingerprint System Identification number. Some records may have more than one of these numbers. The Universal Control Number will either be verified by Criminal Justice Information Services Division or verified and documented by Friction Ridge Discipline personnel on a printout of a record from the Integrated Automated Fingerprint Identification System or the Next Generation Identification System that is maintained in the library. If no Universal Control Number exists for the individual, the original cards or a copy is provided to the Criminal Justice Information Services Division, who will generate a Universal Control Number for those submissions that meet its criteria. The digital copies in the Terrorist Analysis Group Known Standard Library are filed by Universal Control Number. If there is no Universal Control Number, then they will be filed by legacy Integrated Automated Fingerprint Identification System number.

6.2 Requests for Copies of Records Retained in the Terrorist Analysis Group Known Standard Library

The Major Case Coordinator will ensure requests for copies of records retained in the Terrorist Analysis Group Known Standard Library will be answered and may be forwarded to Criminal Justice Information Services Division for dissemination.

7 Standards and Controls

Not applicable.

8 Sampling

Not applicable.

9 Calculations

Not applicable.

10 Measurement Uncertainty

Not applicable.

11 Limitations

Not applicable.

12 Safety

Not applicable.

13 References

ADAMS Workplace Quick Reference Guide, Foray™ Technologies, San Diego, CA.

American National Standard for Information Systems Data Format for the Interchange of Fingerprint, Facial & Scar Mark & Tattoo (SMT) Information, American National Standard Institute (ANSI), National Institute of Standards and Technology (NIST), U.S. Department of Commerce, ANSI/NIST-ITL 1-2007.

Approved Adobe Photoshop Actions, Friction Ridge Discipline. Federal Bureau of Investigation, Laboratory Division. Latest Revision.

FBI Friction Ridge Discipline Operations Manual, Standard Operating Procedures for Examining Friction Ridge Prints. Federal Bureau of Investigation, Laboratory Division. Latest Revision.

FBI Friction Ridge Discipline, System Security Plan for Latent Print Digital Imaging System. Federal Bureau of Investigation, Laboratory Division. Latest Revision.

FBI Friction Ridge Discipline Operations Manual, Standard Operating Procedures for the Next Generation Identification System. Federal Bureau of Investigation, Laboratory Division. Latest Revision.

Scientific Working Group on Friction Ridge Analysis, Study, and Technology, Standard for Friction Ridge Digital Imaging (Latent/Tenprint). Latest Revision.

Rev. #	Date	History
13	11/07/18	Minor wording changes throughout document, removal of “-Latents group”, changed multiple instances of “examiner” to “personnel”, and clarified file name composition. Intentionally recorded print requirements further distinguished between standard and non-standard in document. Document specifies specific units and casework involved. Section 5.2, added number 3 and renumbered. Section 5.7.1, further clarified image deletion. Section 5.8.3, clarified initials. Section 6.1.1.2, removed approval requirement and duplicate retention requirement. Section 6.2, clarified responsibilities and added “if applicable”. Section 6.2.1, removed redundant phrase. Section 8, updated and clarified wording used and added systems storage notation.
14	04/17/20	Latent Print Units changed to Friction Ridge Discipline throughout document as well as other appropriate changes with similar terms. Minor wording, grammar, reorganization of material, and punctuation changes in document. Reorganized sections and renumbered and renamed as appropriate. Section 1, removed extraneous paragraph, clarified coverage of work, and changed affected personnel. Removed specific listing in Section 2 and updated for added personnel. Section 3.1, updated affected personnel, consolidated all capture sections and lessened requirement for file properties with added caveats. Section 3.4, removed specific filter type and added clarification on reverse color and position. Section 3.5, clarified expectations for printed images, modified Quantico network requirements to a more generalized statement. Section 3.6, generalized content and second bullet point, replaced direct capture requirement with direct upload requirement. Section 3.6.1, generalized reason for deletion requirement. Section 3.7 through Section 3.7.2, three sections were reorganized and further clarification on expectations added. Section 3.7.3, content broadened to include all digital media with caveats and restrictions added. Section 4.1.1, changed and clarified retention requirements. Section 4.2, Title changed to specify who is affected by requirements and added date(s) of processing requirement. Section 4.2.1, clarification added on retention. Section 6.2.2 (old), removed. Section 5, broaden sources and responsibility clarified. Section 6, composite records added. Section 6.1, removed designee. Added Section 6.1.1 and created new Section 6.1.2 with existing information. Section 13, updated.

Approval

Redacted - Signatures on File

Friction Ridge Discipline
Technical Leader

Date: 04/16/2020

Latent Print Operations
Unit Chief

Date: 04/16/2020

Acting Latent Print Support
Unit Chief

Date: 04/16/2020

Acting Scientific and
Biometrics Analysis Unit Chief

Date: 04/16/2020

Evidence Management Unit
Chief

Date: 04/16/2020

Operational Projects Unit
Chief

Date: 04/16/2020